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# SCOPE AND FEE ASSUMPTIONS

#### Project Management

##### Scope, Schedule and Change Management *(7/28/16)*

###### 886 Develop Project Scope *(7/13/16)*

This activity is primarily done by WisDOT staff, unless the project is a planning study.

* + - 1. 886.0 Includes activities directly related to scope development

Determine the basic project characteristics and limitations, establish alternatives, determine project requirements, complete field inspections, develop initial project schedule and budget and facilitate the scoping kickoff meeting.

* + - 1. 886.1 Develop and review project concept definition

To establish initial agreement between the Region PDS, SPO, TSS and other sections as to the timing and scope of the project, initiate authorization to incur engineering charges.

**Low –** Preventative Maintenance: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts.

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate.

The selection of Low, Medium and high should consider such factors as Jurisdictional Relationships, Connecting Highways, Functional Classification, Special Bridges and Detours/temporary routes.

* + - 1. 886.2 Define purpose and need

**Low –** Preventative Maintenance projects, Improvement type: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts. Regulatory compliance is not at issue.

**Medium –** Roadway improvements blended with community goals, economic development, agency coordination, avoidance and minimization of environmental impacts.

**High –** All projects for which an EIS is prepared. Any proposed major action significantly affecting the quality of the human environment.

* + - 1. 886.3 Define study area and logical termini

**Low –** Preventative Maintenance: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts.

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate.

* + - 1. 886.4 Conduct field review

Review online maps, review photo log, visit project site

**Low** – Spot improvement, does not require site visit, project within initial footprint, review online maps

**Medium** – Drive by project site review photo log

**High** – Requires site visit, take pictures of site

* + - 1. 886.5 Identify and define design deficiencies

**Low –** Preventative Maintenance projects, Improvement type: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts. Regulatory compliance is not at issue.

**Medium –** For Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors

**High –** For Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban, interstate

* + - 1. 886.6 Identify design issues

A small amount of time is assumed within developing project scope, prior to design tasks being conducted. Time is for issues related to geometric design.

**Low –** Preventative Maintenance projects, Improvement type: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts. Regulatory compliance is not at issue.

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate.

* + - 1. 886.7 Identify geotechnical issues

Parameters very depending on the type of construction proposed, the project size, soil and groundwater conditions and related factors.

**Low –** Projects that require minimal field tests and site conditions are easily accessible.

**Medium –** Varied field exploration, drilling and sampling needed, site conditions and accessibility is limited. Minimal impact to wetlands. Required field and laboratory testing.

**High –** Large project, multiple field exploration efforts, test pits, extensive drilling and sampling needed, site conditions and accessibility is limited. Required field and laboratory testing.

* + - 1. 886.8 Identify utility issues

Includes review list of utilities and project limits, look for high cost utilities, look for utilities with long coordination timelines, look for utilities with restrictions on when the relocation can occur, review old plats for utilities, look for any utilities on structures, look for utilities within railroad ROW on project

**Low –** Roadway improvements that have minimal utility impacts and no utility relocations needed.

**Medium –** Utility impacts/relocations that can be managed prior to construction. Relocations of typical distribution utility facilities (i.e. electrical, communications, low-pressure gas, minor municipal utilities).

**High –** Utility impacts/relocations that can be managed prior to construction. Relocations of transmission utility facilities (i.e. steel towers, interstate communication lines, high-pressure gas, cellular towers, major municipal utilities, sanitary sewer districts).

* + - 1. 886.9 Identify railroad issues

**Low –** Railroad in project vicinity, little to no impacts

**Medium –** OCR involvement required, RR crossings on project, bridge over RR

**High –** multiple OCR hearings, new RR crossings, RR relocation or track carrying structure.

* + - 1. 886.10 Identify environmental issues

**Low –** Preventative Maintenance projects, Improvement type: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts.

**Medium –** For Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors with impacts less than 3 acres.

**High –** For Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors with impacts greater than 3 acres.

* + - 1. 886.11 Identify storm water/drainage issues

**Low –** For ordinary design rainfall frequencies, the peak runoff after the provision of drainage facilities, is not significantly different (after construction of the project) than it would be if such development had not taken place.

**Medium –** Is a part of a larger storm drainage system, including all natural and man-made drainage facilities in an entire watershed. Outfall options are available

**High –** A larger storm drainage system, including all natural and man-made drainage facilities in an entire watershed. Outfall facilities are inadequate or do not exist.

* + - 1. 886.12 Identify traffic issues (capacity-safety/crash)

**Low –** Preventative Maintenance projects, Improvement type: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement. Lower volume Average Daily Traffic (ADT) counts, below-average crash rates, minimal current deficiencies identified, rural project.

**Medium –** For Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects. This involves projects with average to above average ADT and crash rates, more complex traffic patterns, urban or rural-urban mix.

**High –** For Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban, interstate. High volume traffic, more complex safety/crash rate factors, high-level mitigation needs.

* + - 1. 886.13 Identify real estate issues

**Low –** Less than 25 parcels, residential relocations

**Medium –** 25 – 50 parcels, residential and commercial relocations, minimal special feature right of way impacts.

**High –** 50+ parcels, residential, commercial relocations, adult entertainment, franchise related businesses and significant special feature right of way impacts.

(Special feature includes, historical, archeological and environmental)

* + - 1. 886.14 Identify airport issues

**Low –** A proposed highway project with a horizontal and or vertical alignment of a highway is within five miles of a public use or military airport.

**Medium –** A proposed highway project with a horizontal and vertical alignment of a highway within two miles of a public use or military airport and airway-highway clearances requires project alterations.

**High –** A proposed highway project with a horizontal and vertical alignment of a highway within two miles of a public use or military airport and airway-highway clearances requires extensive project alterations.

* + - 1. 886.15 Determine street lighting and traffic signal needs

**Low –** Preventative Maintenance projects, Improvement type: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement. No or minimal lighting needs on project, rural location, minimal needs for new or improved signing.

**Medium –** For Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects. Urban or mixed urban-rural, anticipated need for new or enhanced lighting and signals, interaction with non-WisDOT signal owners, anticipated communication and public involvement needs with community.

**High –** For Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban, interstate. Significantly upgraded lighting needs with aesthetics, new or upgraded signals, anticipated multi-jurisdictional ownership and maintenance, complex stakeholders.

* + - 1. 886.16 Determine ITS needs for project

**Low** – Initial evaluation determines that there is no need for ITS.

**Medium** – Urban project, further evaluation of ITS needed, preliminary assessment of potential alternatives. Likely to have some level of existing ITS on current roadway.

**High** – Complex urban project with high-intensity improvement concept and scope, multiple jurisdictional stakeholders, significant modification or new investment in ITS anticipated.

* + - 1. 886.17 Determine structure needs

**Low** – Review determines that there are no structures within the project limits, or no work or coordination efforts are involved with existing structures.

**Medium** – Improvement concept is non-structure related; structures within the project limits require assessment and evaluation to determine project scope impacts.

**High** – Structure-related improvement concept (Bridge Rehabilitation, Bridge Replacement, etc.). Multiple or multi-span structures within the project limits if roadway improvement concept. Complex urban or interchange project. Requires active outreach to and coordination with BOS to assess design hours needed.

* + - 1. 886.18 Determine complete streets needs for project (bike-pedestrian-transit)

**Low –** Project impacts areas of limited or negligible pedestrian and bike usage.

**Medium** – For Improvement types: Reconstruction, new alignment, and expansion projects. Current bike-ped lanes or transit service is in place on the existing route require coordination with stakeholders. Urban or suburban location. Stakeholder (local government, community) interest in enhancing bike-ped-transit service.

**High** – For Improvement types: Reconstruction, new alignment, and expansion projects. Urban environment, high-volume corridor for all traffic types, complex traffic patterns, multiple existing bike-ped facilities and transit routes. High demand anticipated for enhanced bike-ped-transit accommodations from local officials.

* + - 1. 886.19 Determine public involvement needs (PIM-Hearings)

*Note: WisDOT Facilities Development Manual Chapter 6 provides detailed descriptions, requirements and guidance for Public Involvement on improvement projects.*

**Low** – Preventative Maintenance projects, Improvement type: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement. Low anticipated impacts, minimal community interest, no anticipated opposition, no capacity increase or extension of current footprint.

**Medium** – For Improvement types: Reconstruction, new alignment, multi-span bridge replacement and expansion projects. Project complexity and anticipated impacts fit criteria for multiple PIMs – Public Hearing in FDM. Community interest (and potential opposition) indicated.

**High** – Complex and/or controversial project, high degree of political/community interest or opposition, potential for substantial impacts on socio-economic, natural or physical environment, anticipates capacity improvements that will increase the roadway footprint (ROW needs, environmental impacts).

* + - 1. 886.20 Determine aesthetic needs (landscaping-streetscaping - CSS)

Feedback received indicated that CSS needs are never identified during scoping. A percentage is kept in the estimate but actual needs not identified. Hours not assigned.

**Low –** Preventative Maintenance: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts.

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate.

* + - 1. 886.21 Determine construction traffic control needs (staged or detour)

**Low –** Preventative Maintenance: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts.

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate.

* + - 1. 886.22 Determine local participation

*Note: WisDOT Facilities Development Manual Chapter 6 provides detailed descriptions, requirements and guidance for Public Involvement on improvement projects.*

**Low** – Preventative Maintenance projects, Improvement type: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement. Low anticipated impacts, minimal community interest, no anticipated opposition, no capacity increase or extension of current footprint.

**Medium** – For Improvement types: Reconstruction, new alignment, multi-span bridge replacement and expansion projects. Project complexity and anticipated impacts fit criteria for multiple PIMs – Public Hearing in FDM. Community interest (and potential opposition) indicated.

**High** – Complex and/or controversial project, high degree of political/community interest or opposition, potential for substantial impacts on socio-economic, natural or physical environment, anticipates capacity improvements that will increase the roadway footprint (ROW needs, environmental impacts).

###### 887 Manage Project Scope and Schedule

* + - 1. 887.0 Includes processes for establishing the policies, procedures, and documentation needed to plan, develop, manage, execute, and control the project schedule and scope.
      2. 887.1 Create project schedule

Includes creating project schedule and estimating resources. Define and sequence activities key deliverables, milestone dates to deliver the scope of work. Identify any activity constraints.

Project manager, scheduler/overall responsibility for development

**Low** – well defined milestones, specialty projects, short project duration

**Medium** – One PS&E, well defined milestones

**High** – multiple PS&E, multiple delivery, multi-year project and coordination with others

* + - 1. 887.2 Update and Track project progress/percent complete

Updating activity start, percent complete and finish information. Documenting and analyzing progress.

Project manager, scheduler/overall responsibility for development

**Low** – well defined milestones, specialty projects, short project duration

**Medium** – One PS&E, well defined milestones

**High** – multiple PS&E, multiple delivery, multi-year project and coordination with others

* + - 1. 887.3 Prepare/attend scope and schedule meetings / conference calls

Updating activity start, percent complete and finish information. Documenting and analyzing progress.

Project manager, scheduler/overall responsibility for development

**Low** –

**Medium** –

**High** –

* + - 1. 887.4 30% Plan review meeting

Assumptions: Drive time to/from meeting venue to be added to base hours. Base hours for a general meeting. Assumes preparing for meeting, attending and preparing meeting minutes included in the base hours. Does not include time to review plans.

Anticipated Staff: project manager, project engineer, staff engineer, WisDOT functional areas

**Low –** Low complexity, handled without meeting, exchange electronic comments

**Medium –** Medium complexity, attend a two hour meeting

**High –** High complexity, multiple functional areas involved, attend a two hour meeting

* + - 1. 887.5 60% Plan review meeting

Assumptions: Drive time to/from meeting venue to be added to base hours. Base hours for a general meeting. Assumes preparing for meeting, attending and preparing meeting minutes included in the base hours. Does not include time to review plans.

Anticipated Staff: project manager, project engineer, staff engineer, WisDOT functional areas

**Low –** Low complexity, attend two hour meeting

**Medium –** Medium complexity, attend a two hour meeting

**High –** High complexity, multiple functional areas involved, attend a three hour meeting

* + - 1. 887.6 90% Plan review meeting

Assumptions: Drive time to/from meeting venue to be added to base hours. Base hours for a general meeting. Assumes preparing for meeting, attending and preparing meeting minutes included in the base hours. Does not include time to review plans.

Anticipated Staff: project manager, project engineer, staff engineer, WisDOT functional areas

**Low –** Low complexity, attend two hour meeting

**Medium –** Medium complexity, attend a two hour meeting

**High –** High complexity, multiple functional areas involved, attend a three hour meeting

* + - 1. 887.7 Develop and maintain financial plan

Assumptions: Includes developing and updating federal highways, short or long version financial plans. Includes review and coordination with budget office and internal personnel.

**Low** – Low complexity, less than $500M

**Medium** – medium complexity, less than $500M, under 50% federal dollars

**High** – high complexity, greater than $500M with a majority of federal dollars

###### 884 Manage Change *(7/28/16)*

* + - 1. 884.0 Includes processes for identifying, monitoring, and controlling change on a project.

Manage Change includes the process laid out in FDM 2-20-15.2.2 Change Management. Process of reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating their disposition. It review all requests for changes or modification to project documents, deliverables, baselines, or the project management plan and approves or rejects the changes.

* + - 1. 884.1 Change management process and plan

Change Management definition and process steps can be found in FDM 2-20 Attachment 15.1. This task includes effort to set up project change management process and plan and monitor throughout the duration of the project.

Includes looking at design duration, type of project and simple to formal change management process used. All effort to determine and document scope changes.

Anticipated Staff: Entry, PE, PM’s, Dept. Mgr, Principal, Supervisor, Chief

**Low –** Preventative Maintenance: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts. Process set within Region Teams.

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors. Coordination at milestone meetings and with project team required.

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate. Coordination with Region “Change Management Team.” Formal Change Management Plan identified and unique to the project. Change management process could span years for duration of the design and construction of the project.

* + - 1. 884.2 Program Re-balance

Unit chosen “Re-Balance.” For each Re-balance occurrence on a project. Some projects may not have any re-balance. Assume that rebalance creates a change in project schedule or scope

Anticipated Staff: WisDOT PE, PM, Dept. Mgr.

**Low –** No re-balance required. If re-balance does occur, minimal time spent coordinating dollars.

**Medium –** Re-balance would typically occur on the project. Process in place and efficient when rebalance does occur.

**High –** Re-balance very likely to occur. A project with multiple PS&E’s and LET packages. Constant evaluation of the program and use of available dollars. Contingency plans in place to move on multiple re-balance possibilities.

* + - 1. 884.3 Coordinate construction timing with other projects & completion restrictions

Once a change has occurred or is being considered, coordination with the design teams on other projects.

Anticipated Staff: Entry, PM, Sup

**Low –** Preventative Maintenance: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts. Construction schedules are simple and easily shifted. Coordination occurs with brief discussion. Most likely no construction restrictions.

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors. Coordination required at separate meetings. Construction timing is more complex and has larger impacts on adjacent roadways and projects. Could have construction restrictions.

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate. Construction timing is complex and has a longer duration. Construction restrictions are very likely and could be complex.

* + - 1. 884.4 Monitor funding resources (local-state-federal)

WisDOT only

Anticipated Staff: Planning PM

**Low –** No funding sources other than state

**Medium –** Typical funding structure (80/20). No SMA, or simple SMA required.

**High –** Complex SMA’s, multiple municipalities, unique bid items and participation

* + - 1. 884.5 Analyze and review contractor change order and claims request

Assume timeline is strict and decisions are made quickly during construction. Resolution is required quickly.

Anticipated Staff: PE, PM, Dept. Mgr.

**Low –** Minimal opportunities for change orders/requests/proposals

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors.

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate. Formal Change Order/RFI/Proposal process in place. Multiple staff dedicated to change orders and resolutions.

##### Budget, Cost, Procurement and Resource Management *(7/12/16)*

###### 888 Manage Project Delivery

* + - 1. 888.0 Includes management of project engineering delivery costs.
      2. 888.1 Develop and manage project human resources

Determine type and availability of human resources, assemble project team. Includes time to account for staff changes and manage project team transitions.

**Low** – Project of short duration, low complexity, fewer functional areas

**Medium** – medium duration and complexity, moderate number of functional areas

**High** – long duration, high complexity, many functional areas

* + - 1. 888.2 Develop initial project delivery cost estimate

**Low** – Lower-intensity improvement concept with less complexity and shorter duration; lower anticipated risk; lower anticipated level of public/stakeholder involvement; no or few parcel acquisitions; project comparable data easily available.

**Medium** – Mid-range intensity and complexity (i.e. recondition or reconstruct); anticipated risk or change management needs; mix of I/E and C/E components on project; uncertain environmental or real estate needs and stakeholder support at initial scoping phase.

**High** – Highly-complex, multi-year reconstruct or reconstruct expansion; multiple varied stakeholders with higher risk and change management potential; complex real estate and environmental needs/issues; coordination among multiple design resources required to complete project design delivery (i.e. in-house staff and 2+ consultants).

* + - 1. 888.3 Review and develop revised and final project delivery cost estimate

**Low** – Lower-intensity improvement concept with less complexity and shorter duration; lower anticipated risk; lower anticipated level of public/stakeholder involvement; no or few parcel acquisitions; project comparable data easily available.

**Medium** – Mid-range intensity and complexity (i.e. recondition or reconstruct); anticipated risk or change management needs; mix of I/E and C/E components on project; uncertain environmental or real estate needs and stakeholder support at initial scoping phase.

**High** – Highly-complex, multi-year reconstruct or reconstruct expansion; multiple varied stakeholders with higher risk and change management potential; complex real estate and environmental needs/issues; coordination among multiple design resources required to complete project design delivery (i.e. in-house staff and 2+ consultants).

###### 883 Manage Consultant Selection *(7/7/16)*

* + - 1. 883.0 Involves the process of selecting a consultant based on federal and state requirements (ex. QBS). Includes time to document all selection activities. **WisDOT only activity.**
      2. 883.1 Prepare solicitation package

Gather project information necessary to prepare Scope of Services Narrative (includes selection criteria ;) Cost Benefit analysis (if required ;) and interview questions, benchmarks and interview team (if required.) Estimate done as part of *888 – Manage Project Delivery Cost*. Submit solicitation package documents (Scope of Services, Cost Benefit Analysis and interview information) to contract specialist.

Responsible People: Project Manager, Project Leader, Contract Specialist

**Low** – Construction Fair package, regular solicitation for a project of limited complexity or “renewal solicitation” for a project that has been previously solicited (e.x. staffing contract.)

**Medium** – Most regular solicitation packages of average complexity where interviews will not be conducted.

**High** – Regular solicitation packages of increased complexity, interviews will be conducted. Coordinate with other functional areas, and put together interview questions panel.

* + - 1. 883.2 Review solicitation package

Review of solicitation documents for completeness and errors, revise as needed. Set fixed fee, Disadvantaged Business Enterprise goals, and prepare for publication.

Responsible People: Contract Specialist, Engineer

**Low** – Construction Fair package, regular solicitation for a project of limited complexity or “renewal solicitation” for a project that has been previously solicited (e.x. staffing contract.)

**Medium** – Most regular solicitation packages of average complexity where interviews will not be conducted.

**High** – Regular solicitation packages of increased complexity, interviews will be conducted.

* + - 1. 883.3 Review NOIs

Includes creating reviewing NOIs, documenting comments and creating short list. Time is per NOI per person.

Possible reviewers include contract specialists, technicians, engineers, project managers and supervisors.

**Low** – N/A

**Medium** – N/A

**High** – N/A

* + - 1. 883.4 Conduct and evaluate consultant interviews

Includes time to prepare for and attend interview and document comments.

Possible interviewers include engineers, project managers, supervisors and chiefs.

**Low** – 30 min interview length (e.x. Construction Fair; Design Opportunity Day)

**Medium** – N/A

**High** – One hour interview length

* + - 1. 883.5 Make final selection

Includes time for selection team to review shortlist, seek additional opinions on complex issues, document comments and prepare selection recommendation documents.

Possible selection team members include contract specialists, technicians, engineers, project managers, supervisors and chiefs.

**Low** – Regular solicitation for a project of limited complexity or “renewal solicitation” for a project that has been previously solicited (e.x. staffing contract ;) small purchase contract

**Medium** – Most regular solicitation packages of average complexity.

**High** – Regular solicitation packages of increased complexity.

* + - 1. 883.6 Review final selection

**Low** –Project of limited complexity or “renewal solicitation” for a project that has been previously solicited (e.x. staffing contract ;) small purchase contract

**Medium** – Most projects of average complexity.

**High** – Projects of increased complexity.

* + - 1. 883.7 Prepare/attend consultant scoping meeting

**Low** –Project of limited complexity or “renewal solicitation” for a project that has been previously solicited (e.x. staffing contract ;) small purchase contract

**Medium** – Most projects of average complexity.

**High** – Projects of increased complexity.

* + - 1. 883.8 Negotiate contract

**Low** –Project of limited complexity or “renewal solicitation” for a project that has been previously solicited (e.x. staffing contract ;) small purchase contract

**Medium** – Most projects of average complexity.

**High** – Projects of increased complexity.

* + - 1. 883.9 Prepare and review consultant contract documents

**Low** –Project of limited complexity or “renewal solicitation” for a project that has been previously solicited (e.x. staffing contract ;) small purchase contract

**Medium** – Most projects of average complexity.

**High** – Projects of increased complexity.

###### 773 Manage Consultant Contract *(9/1/16)*

* + - 1. 773.0 Includes activities to determine and manage the scope of the consultant contract(s), negotiation, consultant management oversight, and consultant contract administration oversight. **WisDOT only activity.**
      2. 773.1 Prepare consultant invoice and supporting documents

Time to develop and submit each consultant invoice and prepare/upload supporting documentation. This includes the prime and all subconsutlants.

\*\*\*Check in with Audit Dept on overhead charging of these items

Staff – Administrative, Project Manager, and Supervisor/Department Lead

**Low** – Prime only, no subconsultants, few expenses, 1-2 staff reporting hours.

**Medium** – Prime, 1-2 subconsultants. Approved direct expenses, typical/clear supporting documentation.

**High** – Prime, 2+ subconsultants. Unique expense items, lengthy supporting documentation, several submittals required in CARS.

* + - 1. 773.2 Review consultant invoices

**Low** –

**Medium** –

**High** –

* + - 1. 773.3 Review and negotiate contract amendments

This includes ONLY WisDOT hours. Hours are not included for Consultant staff, since these hours would not be included in a contract.

**Low** –

**Medium** –

**High** –

* + - 1. 773.4 Review errors and omissions/disputes

This subtask includes the correspondence and notification process for E&Os. Design work time related to resolving the E&O would fall under 853.

Calculating premium costs as it relates to E&Os would fall under this task.

Bill Mohr – ask opinion of hours.

As E&O issues escalate, more high level staff would become involved.

**Low** –

**Medium** –

**High** –

* + - 1. 773.5 Setting up CARS roles - Region administrator

Includes time for the Region administrator to set up WisDOT staff permissions as it relates to each contract.

**Low** –

**Medium** –

**High** –

* + - 1. 773.6 Evaluate performance of contract

Includes time to prepare consultant evaluation documentation in CARS.

**Low** –

**Medium** –

**High** – Time for consultant/WisDOT face to face meeting to discuss evaluation if requested.

###### 889 Manage Project Non-Delivery Cost *(7/12/16)*

* + - 1. 889.0 Includes management of payments made to contractor(s) for the construction project.
      2. 889.1 Manage and review construction project cost estimate

Assumption: Includes gathering all data including preparation of quantities and unit prices, preparation of any exhibits, correspondence with WisDOT PM, one revision to address WisDOT PM comments. Hours anticipated are for 1 iteration. Multiply by the number of iterations anticipated for the contract duration. Done every six months.

Anticipated Staff: project manager, project engineer, staff engineer

**Low –** Estimate less than $2 million

**Medium –** Estimate $2 to $10 million

**High –** Estimate greater than $10 million

* + - 1. 889.2 Manage and review R/W costs

Assumption: Includes gathering all data including preparation of quantities and unit prices, preparation of any exhibits, correspondence with WisDOT PM, one revision to address WisDOT PM comments. Hours anticipated are for 1 iteration. Multiply by the number of iterations anticipated for the contract duration. Done every six months.

Anticipated Staff: project manager, project engineer, right of way engineer/specialist

**Low –** Less than 5 parcels

**Medium –** 5 to 20 parcels

**High –** More than 20 parcels

* + - 1. 889.3 Mange and review Utility costs

Assumption: Includes gathering all data including preparation of quantities and unit prices, preparation of any exhibits, correspondence with WisDOT PM, one revision to address WisDOT PM comments. Hours anticipated are for 1 iteration. Multiply by the number of iterations anticipated for the contract duration. Done every six months.

Anticipated Staff: project manager, project engineer, utility engineer/specialist

**Low –** 2 or fewer utilities

**Medium –** 3 to 5 utilities

**High –** 6 or more utilities

* + - 1. 889.4 Manage and review "supplied by WisDOT" costs (signals, cabinets, etc.)

Assumption: Includes gathering all data including preparation of quantities and unit prices, preparation of any exhibits, correspondence with WisDOT PM, one revision to address WisDOT PM comments. Hours anticipated are for 1 iteration. Multiply by the number of iterations anticipated for the contract duration. Done every six months.

Anticipated Staff: project manager, project engineer, traffic engineer/specialist

**Low –** 1 signal or ITS location

**Medium –** 2 signal or ITS locations

**High –** 3 or more signal or ITS locations

###### 892 Manage Procurement of Good and/or Services

* + - 1. 889.0 Includes activities related to purchase and acquisition of other goods & non-engineering services needed for a project.
      2. 892.1 Purchasing
         1. 892.1.1 Develop and manage simplified bid

Includes purchases less than $50,000. This task includes developing a scope of work and or requirements, selecting 3 or more vendors to get a quote, reviewing the quotes, selecting a vendor, and processing the purchase order.

**Low –** 1-2 products with no requirements needed to be written/service requiring simple labor not requiring special skill or certification.

**Medium –** 3-10 products with known requirement for scope of work/service requiring simple labor not requiring special skill or certification.

**High –** Product (s) requiring development of requirements or service requiring special skill or certification.

* + - * 1. 892.1.2 Develop and manage RFB/RFI

Includes request for bid purchases for products or services which are more field labor related that are greater than $50,000. This task includes developing scope of work and/or requirements, working with purchasing to develop request, reviewing responses, making selection and completing contract and purchase order.

Includes request for information scope, working with purchasing to send out RFI, receive and review responses, set up interviews if warranted.

**Low –** 1-2 products with no requirements needed to be written/service requiring simple labor not requiring special skill or certification.

**Medium –** 3-10 products with known requirement for scope of work/service requiring simple labor not requiring special skill or certification.

**High –** Product (s) requiring development of requirements or service requiring special skill or certification.

* + - * 1. 892.1.3 Develop and manage RFP

Includes request for proposal purchases for products or services which are more field labor related that are greater than $50,000. This task includes developing scope of work and/or requirements, working with purchasing to develop request, reviewing responses, making selection and completing contract and purchase order.

Includes request for information scope, working with purchasing to send out RFI, receive and review responses, set up interviews if warranted.

**Low –** 1-2 products with no requirements needed to be written/service requiring simple labor not requiring special skill or certification.

**Medium –** 3-10 products with known requirement for scope of work/service requiring simple labor not requiring special skill or certification.

**High –** Product (s) requiring development of requirements or service requiring special skill or certification.

* + - * 1. 892.1.4 Develop and manage Sole Source purchase

Includes developing justification for sole source purchase, developing scope of work, after approval develop the purchase order. Sole source is used when a product or services is only provided by one vendor in the world or requirements are only suited for a proprietary function or skill needed.

Low – low complexity, proprietary item

Medium – medium complexity, proprietary service

High – high complexity, greater than $50k item, needing research to justify sole source

* + - 1. 892.2 Coordinate "supply by WisDOT" orders

Includes work needed to review plans for products or services provided for projects to ensure ordering and delivery matches with construction schedule when item is installed. Coordinating service to purchased items, if required.

Low - low complexity, review plan with no orders

Medium – medium complexity, review plan with orders all obtained through current contracts

High – high complexity, review plan with orders needing new contract

* + - 1. 892.3 Pay invoices for purchased items

Includes review of delivered product or service completed, review of invoices through final payment and approval of payment to be made.

Low – low complexity, review and pay

Medium – medium complexity, review and pay

High – high complexity, review and pay

##### Quality and Risk Management *(8/24/16)*

###### 890 Manage Project Quality *(8/24/16)*

* + - 1. 890.0 Includes activities directly related to managing and monitoring quality outcomes.
      2. 890.1 Prepare/attend oversight meetings

Includes preparing and updating project information for distribution to upper management (e.x. mega major meetings, PDS chief meetings, internal management meetings)

**Low** –

**Medium** –

**High** –

* + - 1. 890.2 Review project documentation/reports/plans and documents

Includes reviews by Consultant and WisDOT project managers, Consultant QA/QC reviewer and WisDOT eleven functional areas (design, structures, construction, materials, environmental, survey, real estate, utilities, traffic, planning & maintenance) at each 30%, 60% and 90% milestone. Includes the review, validation and updating of scope. Hours are per project.

PM, PE (QA/QC Reviewer and Functional Area Reviewers)

**Low –** Simple project complexity, < 100 sheets or low complexity bridge project

**Medium –** medium project complexity, 100 – 300 sheets or medium complexity bridge project

**High –** high project complexity, over 300 sheets or high complexity bridge project

* + - * 1. 890.2.1 Review 30% project plan

See explanation in 890.2

* + - * 1. 890.2.2 Review 60% project plan

See explanation in 890.2

* + - * 1. 890.2.3 Review 90% project plan

See explanation in 890.2

* + - * 1. Review special provisions and supporting documents

Includes reviews by Consultant and WisDOT project managers, Consultant QA/QC reviewer and WisDOT eleven functional areas (design, structures, construction, materials, environmental, survey, real estate, utilities, traffic, planning & maintenance) at pre-PS&E stage

PM, PE (QA/QC Reviewer and Functional Area Reviewers)

**Low –** simple project complexity

**Medium –** medium project complexity

**High –** high project complexity

* + - 1. 890.3 Specialty - Technical construction expert

Includes hours for having a technical construction expert review a construction plan and make recommendations. Level of effort unique to each project

**Low** – at PSE stage

**Medium** – at 60% stage

**High** – at planning or 30% stage

* + - 1. 890.4 Specialty – Value Engineering

Level of effort unique to each project.

**Low** –

**Medium** –

**High** –

###### 884 Manage Project Risks *(8/24/16)*

* + - 1. 894.0 Includes activities related to risk planning, identification, analysis, and response/control.
      2. 894.1 Develop and define risk register

Includes review of scope and developing risk associated activities for unknown and known risks

**Low** – delivery of project in current footprint rural setting

**Medium** – delivery of project in current footprint with urban setting

**High** – delivery of project in new footprint with environmental/real estate/utility impacts. Urban setting

* + - 1. 894.2 Evaluate risk

Includes assessing probability of risk and cost and schedule impact associated with risk

**Low** – delivery of project in current footprint rural setting

**Medium** – delivery of project in current footprint with urban setting

**High** – delivery of project in new footprint with environmental/real estate/utility impacts. Urban setting

* + - 1. 894.3 Prepare risk management plan

Includes creating action plan for all risks and identifying owner. Also includes developing alternative actions and options for risk allocation

**Low** – delivery of project in current footprint rural setting

**Medium** – delivery of project in current footprint with urban setting

**High** – delivery of project in new footprint with environmental/real estate/utility impacts. Urban setting

* + - 1. 894.4 Manage Risk

Includes creating action plan for all risks and identifying owner. Also includes developing alternative actions and options for risk allocation

**Low** – less than 10 risks on project

**Medium** – between 10 and 30 risks on project

**High** – 30 or more risks on project

##### Communication and Stakeholder Management *(7/12/16)*

###### 743 Manage Project Stakeholders *(7/12/16)*

* + - 1. 743.0 Includes engagement of both internal and external stakeholders in project information activities such as public involvement meetings, hearings, operational planning, scoping, local officials meetings, neighborhood, open house, community, property owner, or other contacts and response to inquiries. Includes preparation, planning, invites, logs, attendance, summary, certification for all pre-meetings, actual meeting, and post meeting review.
      2. 743.1 Respond to inquiries (public, government, media)

Assumptions: Correspondence by e-mail or phone call; Includes preparation of exhibits that are e-mailed and preparation of a phone record. Does not include any meetings with the stakeholder.

Anticipated Staff: project manager, project engineer

**Low –** non-controversial, low public involvement effort, specialty, rehabilitation or recondition of a rural nature.

**Medium –** in between

**High –** controversial, high public involvement effort, reconstruction or major project of an urban nature.

* + - 1. 743.2 Develop public involvement plan

Assumptions: Includes the effort to prepare the plan along with one iteration of revisions proposed by the WisDOT PM. Does not include any updates to the plan required throughout the contract.

Anticipated Staff: project manager, project engineer, possibly admin/clerical

**Low –** non-controversial, low public involvement effort, specialty, rehabilitation or recondition of a rural nature.

**Medium –** in between

**High –** controversial, high public involvement effort, reconstruction or major project of an urban nature.

* + - 1. 743.3 Prepare and maintain public involvement log/comment database

Assumptions: Includes preparing and maintaining a spreadsheet or database of public/stakeholder contacts and comments.

Anticipated Staff: project manager, project engineer, possibly admin/clerical

**Low –** non-controversial, low public involvement effort, specialty, rehabilitation or recondition of a rural nature.

**Medium –** in between

**High –** controversial, high public involvement effort, reconstruction or major project of an urban nature.

* + - 1. 743.4 Notify property owners

Assumptions: For specialized work such as survey, geotech, arch, etc. Includes research of the public tax records for tax identification number, owner name, property and tax mailing address and entry of that data into a spreadsheet file for use in preparing property owner notification letters for WisDOT review. Includes one iteration of revisions to address WisDOT comments to the letter.

Anticipated Staff: project engineer, GIS Professional, admin/clerical, possibly project manager

**Low -** County has good ownership records available on line

**Medium -** County has good ownership records (may not be available on line)

**High -** County has poor ownership records available with difficult access to the records

* + - 1. 743.5 Pre-meeting (PIM PAC TAC)
         1. 743.5.1 Develop and maintain contact mailing list (email/address)

Assumptions: Includes preparing and maintaining a project contact list. Includes one update to the list for the contract (typically one year contract duration or less). Multi- year contracts should include additional effort for updates at an agreed upon duration.

Anticipated Staff: project manager, project engineer, GIS Professional, admin/clerical, specialty consultant

**Low –** rural, low population density

**Medium –** suburban, medium population density.

**High –** urban and/or business district - high population and/or business density. Apartments with owners and tenants.

* + - * 1. 743.5.2 Plan pre-meeting and meeting arrangements

Assumptions: Includes scheduling and reserving the meeting venue. The hours provided are per meeting.

Anticipated Staff: project engineer, admin/clerical

**Low –** seating up to 20

**Medium –** seating between 20 and 100

**High –** venue with special requirements, i.e. audio/visual, seating for more than 100

* + - * 1. 743.5.3 Prepare/print/mail/email meeting invites

Assumptions: Postage and printing are expenses. Applies to PIM’s or project open house meetings as examples. Could also include public hearing addressed elsewhere in these tasks.

Anticipated Staff: project manager, project engineer, admin/clerical, specialty service such as a production service for creating a proof and printing/mailing.

**Low –** Up to 20 invites

**Medium –** 20 to 100 invites

**High –** Over 100 invites

* + - * 1. 743.5.4 Prepare news release

Assumptions: Consultant prepares, WisDOT publishes. Applies to PIM’s or open house meetings only.

Anticipated Staff: Project engineer, admin/clerical

**Low –** Up to 20

**Medium –** 20 to 100

**High –** Over 100

* + - * 1. 743.5.5 Prepare/Review/Revise meeting materials (handouts, exhibits, presentation) PIM, PAC, TAC

Assumptions: Includes preparing, reviewing with WisDOT and making one revisions to the materials.

Anticipated Staff: project manager, project engineer, staff/entry engineer, CAD Tech, admin/clerical

**Low –** Handouts and exhibits only (less than 10 total). No presentation necessary.

**Medium –** More than 10 exhibits. No presentation necessary.

**High –** Presentation, many exhibits

* + - * 1. 743.5.6 Attend PIM, PAC, TAC

Assumptions: Drive time to/from meeting venue to be added to base hours. Base hours are for a PIM, PAC, TAC meeting. Customize to fit project specific meetings and number of meetings. Assumes set up and take down time included in the hours.

Anticipated Staff: project manager, project engineer, staff/entry engineer, possibly admin/clerical, possibly specialized (interpreter)

**Low –** Low complexity, one person attends (2 hour meeting, 2 hours set up and take down)

**Medium –** Medium complexity, two people attend (2 hour meeting, 2 hours set up and take down)

**High –** High complexity, three plus people attend (3 hour meeting, 2 hours set up and take down)

* + - * 1. 743.5.7 Prepare/Review PIM, PAC, TAC meeting minutes or summary

Assumptions: Prepare a summary of the meeting, review the summary with WisDOT, does not include revisions or multiple iterations of the meeting summary

Anticipated Staff: project engineer, staff engineer, possibly admin/clerical

**Low –** Low complexity (i.e. rural, few abutting property owners)

**Medium –** Medium complexity

**High –** High complexity (i.e. urban, many abutting property owners)

* + - 1. 743.6 General Project Meeting

(examples: OPM, LOM, Property Owner, Business Owner, Agency, Special Interest Groups)

* + - * 1. 743.6.1 Prepare for, attend, and summarize meeting

Assumptions: Drive time to/from meeting venue to be added to base hours. Base hours for a general meeting. Customize to fit project specific meetings and number of meetings. Assumes preparing for meeting, attending and preparing meeting minutes included in the base hours.

Anticipated Staff: project manager, project engineer, staff engineer, possibly admin/clerical

**Low –** Low complexity, one person attends a one hour meeting

**Medium –** Medium complexity, two people attend a two hour meeting

**High –** High complexity, three plus people attend a two hour meeting

###### 893 Develop and Manage Project Communications

* + - 1. 893.0 Includes development and implementation of communications plans and tools based on stakeholder information needs and project requirements.
      2. 893.1 Develop/Prepare materials, update and manage project website

Assumption: Includes preparation of materials for use by the WisDOT project manager for communicating the project features to stakeholders. Examples include the following:

• Individual property owner/stakeholder exhibits

• Project overviews for use in sending via e-mail to stakeholders and publishing on the website

• Prepare 3D renderings for stakeholder use

Hours provided are per exhibit or website update. Multiply by the number of anticipated exhibits or website updates for the contract.

Anticipated Staff: project manager, project engineer, staff engineer

**Low –** project with no new right of way

**Medium –** project with minor right of way acquisition (strip acquisition less than 1 acre)

**High –** Project with significant right of way acquisition (full parcel acquisition, circulation modifications at a business, driveway or parking modifications, building modifications)

* + - 1. 893.2 Develop project pamphlet/brochure/newsletter

Assumption: Hours provided are per pamphlet/brochure/newsletter. Multiply by the number of pamphlets/brochures/newsletters anticipated for the contract.

Anticipated Staff: project manager, project engineer, staff engineer, clerical

**Low –** resurface or pavement replacement project (minor right of way acquisition for TLE’s)

**Medium –** recondition project (some permanent right of way, less than 1 acre)

**High –** reconstruction project (permanent right of way acquisition, TLE’s, PLE’s, etc. more than 1 acre)

* + - 1. 893.3 Manage news media releases and social media

Assumption: Prepare responses to news media or social media. E-mail the responses to the WisDOT PM or communication manager for WisDOT distribution. Hours are per response. Multiply by the number of responses anticipated for the contract.

Anticipated Staff: project manager, project engineer, staff engineer

**Low –** resurface or pavement replacement project. Non-controversial rural type project.

**Medium –** recondition project. Minor controversy. Minor impacts to adjacent properties and/or some traffic staging on local roads.

**High –** reconstruction project. Significant impacts to adjacent properties and/or significant traffic staging on local roads, closed roads and/or detours.

* + - 1. 893.4 Regional communication manager coordination

Assumption: E-mail or phone conference with the WisDOT PM and/or communication manager regarding project information. Hours are per interaction. Multiply by the number of responses anticipated for the contract.

Anticipated Staff: project manager, project engineer, staff engineer

**Low –** resurface or pavement replacement project. Non-controversial rural type project.

**Medium –** recondition project. Minor controversy. Minor impacts to adjacent properties and/or some traffic staging on local roads.

**High –** reconstruction project. Significant impacts to adjacent properties and/or significant traffic staging on local roads, closed roads and/or detours.

###### 266 Coordinate Local Public Agency (LPA)

* + - 1. 266.0 Includes activities related to Local Public Agency coordination.

**Low –** Preventative Maintenance: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts. Initial coordination outreach conducted early (30% design). Assume discussed and resolved at 30/60/90 milestones. Approximately 2 hours at each milestone. 0-1 Local Public Agencies

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors. Initial coordination outreach conducted early (30% design). Assume discussed and resolved at 30/60/90 milestones. Approximately 6 hours at each milestone. 1-3 Local Public Agencies

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate. 3-5 Local Public Agencies. Coordination beings at 30% and continues throughout duration of the project. Weeks leading up to milestone meetings and following peak in hours spent on coordination.

* + - 1. 266.1 Develop SMA

Hours assumed per municipality/agreement

**Low –** Preventative Maintenance: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts. No SMA required. No local participation or requests. Time includes documentation of no agreement to project file.

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors. 1-2 SMA’s required for the project. 3-5 local public agencies to coordinate, some entering into SMA’s. Standard items and minimal unique features.

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate. 3-5 Local Public Agencies or more. Unique bid items and local requests. Lengthy maintenance agreements. Coordination of local municipalities with Regional Management. SMA evolving throughout duration of the project – several signatures required with LET schedule and multiple construction packages. Specific project staff assigned solely to drafting, updating and revising SMA.

* + - 1. 266.2 LPA coordination

I do not understand how this item varies from 266.0. Either 266.2 or 266.0 could be eliminated or further detail given to the activity task description.

**Low –** Preventative Maintenance: Resurfacing, Reconditioning and Pavement Replacement projects, Bridge Rehabilitation, Single Span Bridge Replacement – minimal right of way impacts. Initial coordination outreach conducted early (30% design). Assume discussed and resolved at 30/60/90 milestones. Approximately 2 hours at each milestone. 0-1 Local Public Agencies

**Medium –** Within the State Highway Rehabilitation (SHR) Program: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban interstate, rural or urban collectors. Initial coordination outreach conducted early (30% design). Assume discussed and resolved at 30/60/90 milestones. Approximately 6 hours at each milestone. 1-3 Local Public Agencies

**High –** Within the Major Highway Development subprogram, Improvement types: Reconstruction, new alignment, multi-span bridge replacement and Expansion projects on urban arterial, complex urban and interstate. 3-5 Local Public Agencies. Coordination beings at 30% and continues throughout duration of the project. Weeks leading up to milestone meetings and following peak in hours spent on coordination.

#### Preliminary and Final Design

##### Pavement and Soils Design *(9/1/16)*

###### 208Design Soils and Earthwork *(9/1/16)*

Linear foot costs

Collect existing subsurface and maintenance information, previous soils reports, lab testing and analysis and all tasks listed below for 208.

Roadways typically require 10’ boring depth every 800’. Retaining walls typically require 30’ boring depth every 200’. Structures typically require 80’ boring depth for every substructure.

**Low** – Sandy soils, no fills, general roadway, easy access

**Medium** – Typical roadway, local excavation below subgrade

**High** – Organic-marsh soils, fills, retaining wall, difficult access

* + - 1. 208.0 Includes design activities related to earthwork and soils engineering.

Field activities to complete “208 – Design Soils and Earthwork” are commonly associated with costs additional to company-wide overhead rates, due to the use costly equipment (e.g. drill rigs); these additional costs might be accounted for through a drilling overhead rate or by some other approved method. The hours included in the user guide spreadsheet are only the estimated personnel hours to complete the task. Additional cost drivers for subsurface explorations, which are dependent on the nature of the individual site conditions and are not a part of this fee guide (except as they might apply to overhead calculations), include but are not limited to:

* Mobilization, per diem, lodging costs
* All-terrain drill rig costs
* Equipment for night drilling operations
* Specialized traffic control (attenuator) vehicle
* Barge work
* Right of entry fees, permits, or costs for work on private land
* Railroad flagger and site specific railroad liability insurance
* Hydro vacuum excavation for utility location
* Testing and/or disposal of environmentally-impacted soils
* Geotechnical instrumentations, including standpipe piezometers
* Specialized equipment to provide drilling access such as a dozer or crane

Laboratory testing activities to complete “208 – Design Soils and Earthwork” are commonly associated with costs additional to company-wide overhead rates, due to the use of costly laboratory equipment. For example, some automated equipment is expensive to own and maintain and requires only a relatively low amount of labor. These additional costs would be added by some approved method. The hours included in the user guide spreadsheet are only the estimated personnel hours to complete the task.

* + - 1. 208.1 Roadway
         1. 208.1.1 Review Available Geotechnical and Design Information

Components:

• Assume medium project is 2.5 mile long rural, or 1 mile long urban.

• Locate and review existing Soils roadway reports.

• Obtain necessary preliminary design information from roadway designer, including project scope and grade lines.

• Locate and review available geologic/soil survey/bedrock/waterway/etc. maps and reports.

• Locate and obtain pavement/roadway maintenance as-built information.

• Work completed by Project Geotechnical Engineer.

Cost Notes:

• Dependent on project, and soil complexity.

• All estimates need to be compared to base assumptions above, and adjusted accordingly.

Unit: Per Project.

**Low –** Low complexity project, Good quality soils, Limited information available.

**Medium –** Soil and design meet above assumptions. Average amount of information available.

**High –** More complex design and/or difficult soils, Longer project, Work necessary on adjacent/intersecting roadways, Lot of available information from multiple sources, May require site review.

* + - * 1. 208.1.2 Develop Subsurface Exploration Program

Components:

• Assume medium project is 2.5 mile long rural, or 1 mile long urban.

• Assume 4 roadway (8’-deep) SPT borings per mile of rural two-lane roadway, and 10 (8’-deep) roadway borings per mile of urban two-lane roadway.

• Compare preliminary design information from roadway designer, including project scope and vertical/horizontal grade lines to available subsurface information.

• Locate necessary boring locations and determine estimated depths and necessary sampling.

• Compare proposed boring locations to any access/utility/traffic limitations.

• Work completed by Project Geotechnical Engineer.

Cost Notes:

• Dependent on project needs, and soil complexity/variability.

• All estimates need to be compared to base assumptions above, and adjusted accordingly.

Unit: Per Project.

**Low –** Low complexity project (resurface, recondition), Granular soils, Much/adequate existing subsurface information available.

**Medium –** Soil and design meet above assumptions. Average amount of investigation required.

**High –** More complex design and/or difficult soils, Longer project, Investigation necessary for adjacent/intersecting roadways, Possible need for alternate field investigation methods (cone penetrometer, pressure meter, geophysical testing, FWD, GPR, etc.), Additional investigation needed for rock cuts/EBS/waste/borrow/etc., Difficult site access, Little existing information available.

* + - * 1. 208.1.3 Complete Subsurface Investigation

Components:

• Perform typical coordination to complete subsurface investigation. Typically performed by Entry, Project, or Project Manager Geotechnical Engineer; CE Technician; or Field Technician.

• Prepare equipment and materials for subsurface investigation. Typically performed by CE Technician and Field Technician.

• Mobilize (time only) to reach project site. Performed by CE Technician and Field Technician.

* Assume an average of one hour (one-way travel) to project site

• Collect subsurface information, which normally includes soil borings, and sometimes include marsh probes and hand augers. Does not include pavement coring, GPR, or FWD.

* Assume average SPT boring depth is 8 feet
* Assume drill crew can complete about 10 borings per 10-hour day
* Assume 2-person crew, consisting of CE Technician and Field Technician

• Add effort described under (Additional Resources…) as appropriate.

Cost notes:

• Need to apply effort hours to number of units required for project.

Unit: Per urban mile (or per rural 2.5 miles).

**Low –** Average of 5 borings per urban mile (or 5 borings per rural 2.5 miles).

**Medium –** Average of 10 borings per urban mile (or 10 borings per rural 2.5 miles).

**High –** Average of 15 borings per urban mile (or 15 borings per rural 2.5 miles).

* + - * 1. 208.1.4 Additional Resources for Subsurface Investigation

Components:

* This includes items not necessarily required for every roadway project. These items include, but are not limited to:
  + Traffic control
    - Flagging operations, crash attenuators, full lane closures, etc.
  + Difficult site access
    - Tree clearing, rig travel time between boreholes, drill pad preparation
  + Complex borehole layouts, utility meets, etc. by field crew
  + Obtaining permits, coordination with landowners/RR, etc. by office staff
  + This does not include items such as subcontracted services or barge drilling. Some of the traffic control and difficult site access items may be subcontracted on some projects.
* Services commonly performed by CE Technician and Field Technician, but may require Geotechnical Engineer for some items.
* Assumes medium effort for completing subsurface investigation (average of 10 borings per urban mile, or 10 borings per 2.5 rural miles).

Cost notes:

* Highly variable dependent on project needs.
* Need to apply estimate to each unit on the project
* All estimates need to be compared to base assumptions above.

Unit: Per urban mile (or per rural 2.5 miles).

**Low** – No off-road subsurface investigation; traffic control consists of signs and cones only

**Medium** – Two flag persons needed for duration of drilling, or some tree clearing and slow travel between boring locations; other moderate effort needed. (Most common level of effort)

**High** – High complexity of access and traffic control. Requires significant effort by office and field staff.

* + - * 1. 208.1.5 Perform laboratory testing and evaluate results

Components:

* Review soil and bedrock samples collected during the field investigation as necessary to prepare final boring logs. Includes typing the boring logs. Typically performed by Entry or Project Geotechnical Engineer, or by Mid or Senior Civil Engineering Technician.
* Review obtained subsurface information to develop a laboratory testing program. Typically performed by Entry, Project, or Project Manager Geotechnical Engineer.
* Perform the selected laboratory tests.
  + Index tests typically performed by Civil Engineering Technician (e.g. gradation, moisture content, Atterberg Limits, and organic content testing)
  + Although generally rarely performed for road projects, more sophisticated testing would generally be performed by Staff or Project Geotechnical Engineer (e.g. consolidation and triaxial testing)
* Prepare laboratory test result sheets. Typically performed by Staff or Project Geotechnical Engineer or by Civil Engineering Technician.
* Evaluate laboratory test results to select parameters to be used in analyses. Typically performed by Entry, Project, or Project Manager Geotechnical Engineer.
* This section does not include laboratory testing for analysis of embankments, marshes, structures, etc., but just the actual roadway.
* The effort needed is based on the project length, since the laboratory testing for road projects typically includes only index testing.

Cost notes:

Unit: Per urban mile (or per rural 2.5 miles).

**Low –** Average of 5 borings per urban mile (or 5 borings per rural 2.5 miles).

**Medium –** Average of 10 borings per urban mile (or 10 borings per rural 2.5 miles).

**High –** Average of 15 borings per urban mile (or 15 borings per rural 2.5 miles).

* + - * 1. 208.1.6 Complete analysis and develop soils report

Components:

* Includes the following tasks:
  + Review soil survey information
  + Assign Soil Parameters for use in Pavement Design
  + Estimate Excavation Below Subgrade (EBS)
  + Evaluate need for Select Materials
  + Recommend Expansion/Reduction factors
* Includes review of report recommendations with design team, and minor modifications to the report for small changes in the plan after the report is issued.
* Typically performed by Project or Project Manager Geotechnical Engineer.

Cost notes:

* Hours for each additional unit should only be 25% of the initial unit.

Unit: Per urban mile (or per rural 5 miles)

**Low** – Resurfacing, Replacement, or reconditioning (no significant widening or grade change).

**Medium** – Reconstruction.

**High** – Expansion and new construction, or medium with spot (horizontal/vertical grade) corrections, Relocation.

* + - 1. 208.2 Structures
         1. 208.2.1 Review and evaluate available geotechnical and design information

Components:

* Assume work estimate is for one, single-span bridge, box culvert or retaining wall.
* Similar analyses is needed for each structure site/location.
* Locate and review existing structure Geotechnical report (if replacement), and/or nearby structure Geotech reports.
* Locate and review existing structure plans and any rehabilitation plans of structure.
* Obtain necessary preliminary structure design information from structural designer, including project scope, anticipated span/wall lengths and grade lines.
* Locate and review available geologic/bedrock/waterway/etc. maps and reports.
* This does not include miscellaneous structures such as sign or light structures, high mast lights, high-tension beam guard, etc.

Cost Notes:

* Need to apply this estimate to each structure on the project.
* Additional structures generally have reduced work, due to some duplication of effort/findings.
* All estimates need to be compared to base assumptions above, and adjusted accordingly.

Unit: Per structure.

**Low** – Lower complexity structure and soils than above assumptions, No existing structure information.

**Medium** – Soil and structure meet above assumptions. Existing structure Geotechnical information is available.

**High** – More complex structure and/or soils, longer structure, Additional work needed on other miscellaneous structures on project. Multiple historical foundation rehabilitation projects. Urban structure with adjacent buildings/facilities.

* + - * 1. 208.2.2 Develop subsurface exploration program

Components:

* Assume work estimate is for one, single-span bridge, box culvert or retaining wall.
* Similar analyses is needed for each structure site.
* Review existing structure plans and collected subsurface information in relation to the preliminary structure design plans and grade lines.
* Determine necessary boring locations, depths and necessary sampling. Generally one boring per bridge substructure unit, retaining wall borings at 200-300’ intervals, and one boring at each end of a box culvert.
* Compare proposed boring locations to any access/utility limitations.
* Work completed by Project Geotechnical Engineer.
* This does not include miscellaneous structures such as sign or light structures, high mast lights, high-tension beam guard, etc.

Cost Notes:

* Need to apply this estimate to each structure on the project.
* Additional structures generally have reduced work, due to some duplication of effort.
* All estimates need to be compared to base assumptions above, and adjusted accordingly.

Unit: Per structure.

**Low** – Lower complexity structure or box culvert, Good soils, Good existing structure subsurface information.

**Medium** – Soil and structure meet above assumptions. Existing structure Geotechnical information is available.

**High** – More complex structure and/or soils, longer structure, Multi-span structure over water, Additional work needed on other miscellaneous structures on project. Multiple historical foundation rehabilitation projects. Highly variable subsurface conditions, possible drilled shaft foundations, Lateral pile concerns, difficult site access, RR and/or utility coordination needed, Urban-located structure with adjacent buildings/facilities.

* + - * 1. 208.2.3 Complete subsurface investigation

Components:

* Assume work estimate is for one bridge, box culvert or retaining wall.
* Similar analyses is needed for each structure site.
* Assume one single-span bridge with 2 substructure units, or one retaining wall that is 500’ long and 20’ maximum height.
* Boring Assumptions:
  + Bridge - 2 borings that are 80’ deep
  + Box Culvert – 2 borings that are 30’ deep
  + Retaining wall – 3 borings that are 30’ deep
* Two days drilling work for a 2-person crew. Assume 10-hour days. Total of 40 hours. Time split between 20 hours of CE Technician and 20 hours of Field Technician.
* This does not include miscellaneous structures such as sign or light structures, high mast lights, high-tension beam guard.
* Assume noise walls are equivalent to retaining walls.

Cost notes:

* Need to apply estimate to each structure on the project.
* All estimates need to be compared to base assumptions above, and adjusted accordingly.

Unit: Per structure

**Low** – Lower complexity structure and soils than above assumptions, Box culvert, Short-length noise wall, shallower borings.

**Medium** – Soil and structure meet above assumptions, typical site access.

**High** – More complex structure and/or soils, longer (3-span or more) structure, deeper borings needed, Additional work needed on other miscellaneous structures on project. Difficult drilling conditions.

* + - * 1. 208.2.4 Additional Resources for Subsurface Investigation

Components:

* This includes such items as traffic control, difficult site access, Utility meets, RR/municipal coordination, etc.
* Work may be completed by Civil Engineer Technician, or possibly other level staff.
* Two days work for a 2-person crew. 10-hour days, Total of 40 hours of Field Technician.

Cost notes:

* Highly variable dependent on project needs.
* Need to apply this estimate to each structure on the project.
* All estimates need to be compared to base assumptions above.

Unit: Per structure.

**Low** – No additional resources needed.

**Medium** – Two flag persons needed for duration of drilling.

**High** – High complexity of access and/or traffic control and/or coordination.

* + - * 1. 208.2.5 Perform laboratory testing and evaluate results

Components:

* Review soil and bedrock samples collected during the field investigation as necessary to prepare final boring logs. Includes typing the boring logs. Typically performed by Entry or Project Geotechnical Engineer, or by mid or Senior Civil Engineering Technician.
* Review obtained subsurface information to develop a laboratory testing program. Typically performed by Entry, Project, or Project Manager Geotechnical Engineer.
* Perform the selected laboratory tests.
  + Index tests typically performed by Civil Engineering Technician (e.g. gradation, moisture content, Atterberg Limits, and organic content testing)
  + More sophisticated testing generally performed by Staff or Project Geotechnical Engineer (e.g. consolidation and triaxial testing)
* Prepare laboratory test result sheets. Typically performed by Staff or Project Geotechnical Engineer or by Civil Engineering Technician.
* Evaluate laboratory test results to select parameters to be used in analyses. Typically performed by Entry, Project, or Project Manager Geotechnical Engineer.
* This does not include laboratory testing for analysis of roadways, marshes, etc. Note that structures are often associated with embankments, slope stability issues, and other geotechnical items; the effort levels in this section do not fully consider these additional aspects.

Cost notes:

Unit: Per structure.

**Low** – Box culvert or noise wall (up to 1,000 feet long), sign structure (custom design), high mast light tower, high tension beam guard (two ends).

**Medium** – Noise wall over 1,000 feet long, retaining wall or single-span bridge meeting above assumptions with no significant settlement or consolidation concern.

**High** – Larger retaining wall or wall/bridge (3-span or longer) meeting above assumption but with poor soils that requires advanced analysis.

* + - * 1. 208.2.6 Complete analysis and develop soils report

Components:

* The unit of ‘each’ represents one single-span Bridge with 2 substructure units, or one retaining wall that is 500’ long and 20’ maximum height. Other equivalent level-of-effort structures would include:  1 noise wall, 1 box culvert, 1 high mast tower, and 1 high tension beam guard location with 2 ends.
* Similar analysis (and work effort) is needed for each structure site.
* Typical work includes the following:
  + Prepare Subsurface Exploration Sheet
  + Bridge Report – Foundation recommendations (shallow [spread footings] and deep [CIP and H-piles])
  + Retaining wall – Foundation recommendations, External stability and Slope stability analysis, as required per bridge manual
* More advanced analysis that is not related to structure foundation to be shown as a “Miscellaneous” Geotech work item.  Examples include:
  + Global stability not satisfied by proposed grades and standard construction methods
  + Evaluation of settlement effects on nearby features/structures.
* Work includes review of report recommendations with design team, and minor modifications to the report for small changes in the plan after the report is issued.
* Typically performed by Project or Project Manager Geotechnical Engineer. More complex designs may involve Departmental Manager Geotechnical Engineer.

Cost notes:

* Need to apply estimate to each structure on the project.

Unit: Per structure.

**Low** – Box culvert or noise wall (up to 1,000 feet long), sign structure (custom design), high mast light tower, high tension beam guard (two ends).

**Medium** – Noise wall over 1,000 feet long, retaining wall or single-span bridge meeting above assumptions with no significant settlement or consolidation concern.

**High** – Larger retaining wall or bridge (3-span or longer) meeting above assumptions.

* + - 1. 208.3 Miscellaneous
         1. 208.3.1 Review and evaluate available geotechnical and design information

Components:

* Assume work estimate is for one Geotechnical issue/feature. This could be a marsh crossing, slope stability, high embankment over soft soils, or other similar Geotechnical feature/issue.
* Similar analyses is needed for each individual site on a project.
* Assume site/issue extends 300’ longitudinally.
* Assume ‘medium’ complexity issue.
* Locate and review available geologic/soil survey/bedrock/waterway/etc. maps and reports.
* Obtain necessary preliminary structure design information from roadway designer, including project scope, plan and profile, and grade lines.
* Obtain and review pertinent existing roadway maintenance/as-built history, if appropriate.

Cost notes:

* Need to apply estimate to each Geotechnical issue/site on the project.
* Work effort is highly variable, dependent on project needs and encountered soils.
* Additional issue sites generally have reduced work, due to duplication of effort/findings.
* All estimates need to be compared to base assumptions above, and adjusted accordingly.

Unit: Per individual site of Geotechnical issue.

**Low** – Lower complexity issue/feature and soils than above assumptions, No existing subsurface information.

**Medium** – Medium complexity design and subsurface conditions, No/limited information available.

**High** – Lot of existing information available including borings and lab test data, Longer site, More complex/variable soils, Known maintenance issues, May require site review.

* + - * 1. 208.3.2 Develop subsurface exploration program

Components:

* Assume work estimate is for one Geotechnical issue/feature. This could be a marsh crossing, slope stability, high embankment over soft soils, or other similar Geotechnical feature/issue.
* Similar analyses is needed for each individual site on a project.
* Assume site/issue extends 300’ longitudinally.
* Assume ‘medium’ complexity issue.
* Review available geologic/bedrock/waterway/etc. maps and reports.
* Obtain necessary preliminary design information from roadway designer, including project scope, plan and profile and vertical/horizontal grade lines.
* Define area of necessary subsurface information.
* Determine necessary boring locations, depths and necessary sampling.
* Compare proposed boring locations to any access/utility limitations.
* Work completed by Project Geotechnical Engineer.

Cost notes:

* Need to apply estimate to each Geotechnical issue/site on the project.
* Highly variable dependent on project needs and subsurface conditions.
* Additional issue sites generally have slightly reduced work, due to duplication of effort.
* All estimates need to be compared to base assumptions above, and adjusted accordingly.

Unit: Per individual site of Geotechnical issue.

**Low** – Lower complexity roadway design and soils than above assumptions, Existing subsurface information available, relatively uniform subsurface conditions.

**Medium** – Medium complexity design and subsurface conditions, No/limited information available.

**High** – No existing information available, Longer site, More complex roadway design, Highly variable subsurface conditions, Water table location influences analyses, More complex sampling and/or lab/field tests are necessary, Possible Geophysical work needed, Difficult site access, Potential effect on adjacent structures/facilities.

* + - * 1. 208.3.3 Complete subsurface investigation

Components:

* Assume work estimate is for one Geotechnical issue/feature. This could be a marsh crossing, slope stability, high embankment over soft soils, or other similar Geotechnical feature/issue.
* These issues may be associated with a structure.
* Similar analyses is needed for each individual site on a project.
* Assume site/issue extends 200’ longitudinally.
* Boring Assumptions:
  + 6 borings that are 30’ deep
* Two days drilling work for a 2-person crew. Assume 10-hour days. Total of 40 hours. Time split between 20 hours of CE Technician and 20 hours of Field Technician.

Cost notes:

* Need to apply estimate to each Geotechnical issue/site on the project.
* Costs do not include more sophisticated field exploration methods that may be necessary (Shelby tubes, GPR, Cone penetration testing, pressure meter, geophysical, etc.)
* All estimates need to be compared to base assumptions above, and adjusted accordingly.

Unit: Per individual site of Geotechnical issue.

**Low** – Lower complexity design and subsurface conditions, shallower borings, Simple solution.

**Medium** – Soil investigation generally meets above assumptions.

**High** – More complex design and/or subsurface conditions, longer site, More/deeper borings needed. More sophisticated subsurface investigative methods (CPT, pressure meter, geophysical, etc.) are needed.

* + - * 1. 208.3.4 Additional Resources for Subsurface Investigation

Components:

* This includes such items as traffic control, difficult site access, Utility/RR meets, etc.
* Work may be completed by Civil Engineer Technician, or possibly other level staff.
* One day of work for a 2-person crew. 10-hour days, Total of 20 hours of Field Technician.

Cost notes:

* Highly variable dependent on project.
* Need to apply estimate to each individual Geotechnical issue/site on the project.
* All estimates need to be compared to base assumptions above.

Unit: Per individual site of Geotechnical issue.

**Low** – Simple subsurface investigation, No additional resources needed.

**Medium** – Some issues with obtaining subsurface information.

**High** – Highly complex site or design, Need for special equipment/sampling or extensive traffic control, Extensive utility/RR coordination.

* + - * 1. 208.3.5 Perform laboratory testing and evaluate results

Components:

* Review soil and bedrock samples collected during the field investigation as necessary to prepare final boring logs. Includes typing the boring logs. Typically performed by Entry or Project Geotechnical Engineer, or by mid or Senior Civil Engineering Technician.
* Review obtained subsurface information to develop a laboratory testing program. Typically performed by Entry, Project, or Project Manager Geotechnical Engineer.
* Perform the selected laboratory tests.
  + Index tests typically performed by Civil Engineering Technician (e.g. gradation, moisture content, Atterberg Limits, and organic content testing)
  + More sophisticated testing sometimes performed by Staff or Project Geotechnical Engineer (e.g. consolidation and triaxial testing)
* Prepare laboratory test result sheets. Typically performed by Staff or Project Geotechnical Engineer or by Civil Engineering Technician.
* Evaluate laboratory test results to select parameters to be used in analyses. Typically performed by Entry, Project, or Project Manager Geotechnical Engineer.

Cost notes:

Unit: Per feature/site (e.g. one embankment, one slope investigation, one marsh).

**Low** – Shallow marsh up to 300-ft in length expected to be addressed by EBS without need for advanced analysis, Embankment or slope investigation with predominantly granular soils.

**Medium** – Embankment or slope investigation with predominantly stiff or better cohesive soils.

**High** – Embankment or slope investigation with predominantly soft cohesive soils, significant depth of soft soil requires use of advanced analysis (per 300-feet of length).

* + - * 1. 208.3.6 Complete analysis and develop soils report

Components:

* Assume work estimate is for one Geotechnical issue/feature. This could be a marsh crossing, high embankment over soft soils, or other similar Geotechnical feature/issue not associated with a structure (therefore not already address in 208.2.7)
* Similar analyses is needed for each individual site on a project.
* Low effort assumes site/issue extends up to 300’ longitudinally.
* Advance analysis requiring High level of effort includes:
  + Global stability not satisfied with proposed grades with standard construction methods, and alternative grading or other methods required.
  + Evaluation of multiple solutions such as flattened slopes, toe berms, geotextile fabric, multi-stage fill placement etc.
* Typically performed by Project, Project Manager, and Department Manager Geotechnical Engineer.

Cost notes:

* Need to apply estimate to each Geotechnical issue/site on the project.

Unit: Per individual site of Geotechnical issue.

**Low** – Shallow marsh up to 300-ft in length expected to be addressed by EBS without need for advanced analysis, Embankment or slope investigation with predominantly granular soils. Uniform soil conditions.

**Medium** – Embankment or slope investigation with predominantly stiff or better cohesive soils.

**High** – Embankment or slope investigation with predominantly soft cohesive soils, significant depth of soft soil requires use of advanced analysis (per 300-feet of length). Complex site geometry and/or variable subsurface conditions, high fills.

* + - 1. 208.4 Identify possible waste, borrow, and aggregate sources

**Low** –

**Medium** –

**High** –

* + - 1. 208.5 Analyze select material in subgrade

**Low** –

**Medium** –

**High** –

* + - 1. 208.6 Specialty - Subsurface exploration drilling and field operations/testing services

**Low** –

**Medium** –

**High** –

* + - 1. 208.7 Specialty - Geotechnical engineering

**Low** –

**Medium** –

**High** –

###### 277 Design Pavement Structure *(6/21/16)*

Units of measure for *Design Pavement Structure* are based on the number of different pavement structural designs that are required. This is controlled by a number of factors such as:

1. Significant changes in traffic volumes and/or truck percentages

2. Significant changes in soil conditions

3. Changes in roadway type (e.g. ramps, intersections, roundabouts, separate shoulder design, etc.)

4. Changes in roadway cross section (e.g. from 2 lanes to 4 lanes in different segments of the project).

* + - 1. 277.0 Includes roadway site investigation; pavement design; and pavement design report.
      2. 277.1 Conduct site investigation

**ASSUMPTIONS:** Review existing pavement distress, type of distress and level of distress, determine possible causes of distress, determine number of pavement structures to be designed, review existing land use and traffic patterns in the field for high volumes and heavy load generators, review site of proposed improvement for unusual conditions (poor drainage, marsh or poor soils, rock outcroppings, ability to construct pavement in staging, etc.). Determine if pavement cores, GPR, FWD or other test are necessary. Prefer to conduct site investigation without snow on the ground to better identify issues, except for frost heaves.

**PERSONNEL REQUIRED:** Project Engineer, Technician

**LOW –** single roadway reconstruction with no, or minimal, widening or expansion or the existing alignment

**MEDIUM –** new construction, or reconstruction with expansion, some variation in traffic volumes, land use and soil conditions.

**HIGH –** 3R project with some widening, numerous roadway cross sections with different distresses and bordering land uses. Staged construction.

* + - 1. 277.2 Develop Preliminary Pavement Design Recommendation

**ASSUMPTIONS:** This report is developed, based on limited information, either in the scoping process by Region personnel or very early in the project development process by the Consultant to get a preliminary feel for the pavement structure and associated construction costs.

**PERSONNEL REQUIRED:** Project Engineer, Technician

**LOW –** single roadway reconstruction with no, or minimal, widening or expansion or the existing alignment

**MEDIUM –** new construction, or reconstruction with expansion, some variation in traffic volumes, land use and soil conditions.

**HIGH –** 3R project with some widening, numerous roadway cross sections with different distresses and bordering land uses. Staged construction.

* + - 1. 277.3 Review information

**ASSUMPTIONS:** Review geotechnical report, traffic forecast report - Verify truck classification percentages/ volumes are consistent with actual conditions. Review roadway maintenance history and construction as-built plans. Inventory existing pavement and roadway: geometry, typical section, pavement structure, maintenance/ rehabilitation history. Determine pavement design segment limits (segments with similar traffic, soils, roadway geometry, existing pavement condition, construction staging, etc.), determine potential pavement rehabilitation/ reconstruction alternatives for each segment. Obtain proposed roadway typical section(s), preliminary roadway layouts and alignment plans for roadway geometry information and location. Schedule and review pavement cores, FWD, GPR, etc. information – this may require additional time to obtain this information.

**PERSONNEL REQUIRED:** Senior Engineer, Project Engineer, Technician

**LOW –** All applicable information is readily available

**MEDIUM –** Some information is readily available

**HIGH –** Information is not readily available requiring research, searching of archives, conversations with other Region personnel (maintenance, etc.), requires scheduling the collection of additional data

* + - 1. 277.4 Perform pavement structural calculations/evaluations

**ASSUMPTIONS:** Utilize WisPAVE 4 or AASHTOWare M-E structural design software. Check AASHTOWare design against WisPAVE to confirm reasonableness. Identify likely pavement mix types, aggregate sources, and engineering parameters (ME Design inputs), Number of pavement structures to be designed. Number of alternatives required for each pavement structure design. Identify constructible pavement and base layer thickness. Coordinate with WisDOT pavement engineer for feasibility of alternatives and any special design considerations (staging, materials available, etc.)

**PERSONNEL REQUIRED:** Senior Engineer, Project Engineer

**LOW –** Pavement structural design not required, but some justification required. See FDM 14-15.1.4.1.

**MEDIUM –** WisPAVE 4.0 software required for the pavement structure design.

**HIGH –** AASHTOWare ME software required for the pavement structure design including much more data. Numerous pavement structures and pavement types requiring structural design.

* + - 1. 277.5 Perform LCCA calculations/evaluations

**ASSUMPTIONS:** From FDM, determine if roadway classification and volumes require preparation of a LCCA. Review reasonableness of maintenance scenarios and schedules and adjust as necessary. Research current bid item prices based on geography and quantity.

**PERSONNEL REQUIRED:** Senior Engineer, Project Engineer

**LOW –** No LCCA required - see FDM 14-15-1.4.2

**MEDIUM –** LCCA required for one pavement structure design with two alternatives

**HIGH –** LCCA required on numerous pavement structure designs with two or more alternatives

* + - 1. 277.6 Prepare Draft and Final pavement design report

**ASSUMPTIONS:** Prepare the Pavement Design or Pavement Type Selection Report with exhibits such as project location maps and existing and proposed typical sections. Draft report is prepared for review internally, and in the case of Consultants also for Region personnel review. Final report updated/revised and submitted for approval. Updates to this report may be required as the project development process continues.

**PERSONNEL REQUIRED:** Project Manager or Senior Engineer, Project Engineer, Technician

**LOW –** Abbreviated Pavement Design Report required - see FDM 14-15-1.4.1. No LCCA information required - see FDM 14-15-1.4.2

**MEDIUM –** Two to three pavement structure designs with LCCA information included

**HIGH –** Three or more pavement designs with LCCA included, unique conditions requiring additional documentation and exhibits (AASHTOWare ME documentation)

* + - 1. 277.7 Specialty - FWD and GPR data collection and/or analysis

**ASSUMPTIONS:** Includes separate data collection versus analysis

**Low** –

**Medium** –

**High** –

##### Design Development *(9/12/16)*

###### 268 Develop and Manage Access Control *(7/17/16)*

* + - 1. 268.0 Determine development/access issues that need to be addressed on the project.
      2. 268.1 Determine land development and access

Includes land use maps/plats/zoning, future land use, roadway classification, traffic volume, research with local municipality, access standards, crash information, access control plan

Civil Engineer – Entry, Civil Engineer – Project, GIS Professional - Project, Civil Engineering Technician – Mid

**Low** – State statute 84.295 (freeway) without modifications

**Medium** – typical rural state highway, medium volume urban highway, expressway

**High** – High density, urban, commercial, numerous access points (multiple property owners), high traffic volumes

* + - 1. 268.2 Analyze access locations

Review and evaluate materials gathered under activity task 268.1 and compare to standards

Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineering Technician – Mid

**Low** – State statute 84.295 (freeway) without modifications

**Medium** – typical rural state highway, medium volume urban highway, expressway

**High** – High density, urban, commercial, numerous access points (multiple property owners), high traffic volumes

* + - 1. 268.3 Identify access management recommendations (moving-removing-consolidation)

Includes providing recommendations to add, remove, consolidate or not change access. Documentation of recommendation. Includes negotiation with property owners, municipalities for review and development of final recommendations.

Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineering Technician – Mid, Administrative Assistant

**Low** – minor change

**Medium** – moving a short distance or reconfiguring

**High** – Removing, substantial reconfiguration, consolidation

* + - 1. 268.4 Develop service road/emergency access feasibility

Includes a new service road or emergency access. Emergency vehicle turn around, fence gate, farm access. Includes coordination with emergency agencies, municipalities, maintaining agencies and property owners

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid, Civil Engineering Technician – Mid

**Low** – Fence gate

**Medium** – New service road in rural area

**High** – New service road in highly developed area

* + - 1. 268.5 Develop multi-modal overpass/underpass justification

Review pedestrian traffic data, review crash/safety data, evaluating existing pedestrian facilities, evaluation feasibility of location, create cost estimate. Communicate with community, stakeholders, municipalities, school board, police and special interests. Includes documentation of findings/justifications/negotiations.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineer – Department Manager, CADD Technician – Mid, Civil Engineering Technician – Mid

**Low** – highway at grade/culvert crossing

**Medium** – high volume urban/interstate grade separation or high volume at grade crossing

**High** – high volume urban/interstate grade separation, politically and community sensitive

* + - 1. 268.6 Specialty - Reasonable access studies

**Low** –

**Medium** –

**High** –

###### 778 Design Drainage *(8/17/16)*

* + - 1. 778.0 Includes activities related to existing and preliminary drainage structures/systems, existing drainage areas, and flow rates.
      2. 778.1 Identify existing drainage structures/systems, drainage patterns

Task includes: Gathering as-builts and survey materials and determining presence of existing drainage structures/systems, general drainage patterns, private system outfalls; includes field review to verify/clarify information

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low –** Straightforward drainage systems/patterns, well-defined drainage, rural land-use or pavement only projects.

**Medium –** Moderate complexity of drainage systems & basins

**High –** Complex drainage systems/patterns, older urban drainage systems, flatter drainage areas, private system outfalls

* + - 1. 778.2 Identify existing land use, land cover, soil types, imperviousness (CN, C)

Task includes: Reviewing aerial photos, topographic mapping, and soil maps to determine runoff composite coefficients/curve numbers for various drainage basins/subbasins.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low –** Minimal variability in land use, land cover, soil types, imperviousness

**Medium –** Overall moderate variability in land use, land cover, soil types, imperviousness

**High –** Widely varying land use, land cover, soil types, imperviousness

* + - 1. 778.3 Establish existing drainage areas, time of concentration (tc) flow paths, flow rates

Task includes: Reviewing contour maps, existing surface information, field review to determine drainage basins, percent ponding, flow paths, and Time of Concentration. Also includes identifying applicable rainfall intensity/rainfall depths. Also includes computing existing flow rates for the applicable design frequency (years) using methods such as Rational Method, TR-55, etc. May include software modeling of existing basins & flows.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low –** Well-defined drainage basins, flow paths; typically straightforward rural basins or small urban basins; Rational Method for predominantly paved/roadway drainage areas.

**Medium –** Moderate complexity urban or rural basins, flow paths; predominantly rural drainage areas using TR-55 method.

**High –** Complex drainage basins, flow paths; large or flat basins; significant amounts of ponding; extensive analysis to determine proper tc flow path; Mix of urban and rural drainage areas with TR-55 for off-site flows and Rational Method for storm sewer design; analyzing private system outfalls.

* + - 1. 778.4 Identify existing deficiencies/concerns

Task includes: Field reviews of existing drainage issues and related photos/notes; investigation of unusual existing drainage circumstances (drainage discharge from project to private drainage systems or drain tile, or directly to waterways); coordination with maintenance or local officials to determine known deficiencies or concerns

Typical staff level: project engineer, senior/advanced engineer

**Low –** No deficiencies/concerns

**Medium –** Minor deficiency or concern requiring minimal investigation/documentation

**High –** Substantial investigation and coordination to determine and document existing concerns

* + - 1. 778.5 Prepare Existing Condition Drainage Area Exhibits

Task includes: Preparing existing condition drainage area exhibits, including drainage basins, contours, discharge locations, land use, flow patterns; exhibits to document existing drainage issues

Typical staff level: entry engineer, project engineer, CAD tech

**Low –** preparing 1-2 overview exhibits, limited drainage issues

**Medium –** preparing 1-2 overview exhibits plus 100 scale detail sheets for moderate length project (0-2 miles), moderate drainage issues

**High –** preparing multiple overview exhibits plus 100 scale or more detailed detail sheets for longer project length, extensive drainage issues & documentation

* + - 1. 778.6 Establish and evaluate proposed drainage flow path /time of concentration/peak discharge

Task includes: Determining proposed drainage basins, computing composite runoff coefficient curve numbers for proposed basins, determining proposed flow paths and time of concentration, assigning applicable rainfall intensity/rainfall depths, and computing proposed flow rates for the applicable design frequency (years) using same methods as were used to determine existing flows. May include software modeling of proposed basins & flows.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low –** proposed imperviousness and complexity similar to existing conditions; basins, runoff coefficients, tc flow paths are essentially the same as existing; little to no drainage modifications and refinement required after first-run of analysis

**Medium –** imperviousness greater than existing with anticipated increase in flows; moderate change in basins, runoff coefficients, tc flow paths are essentially the same as existing; moderate drainage modifications and refinement required after first-run of analysis

**High –** imperviousness much greater than existing with large anticipated increase in flow, challenging drainage area; substantial differences in drainage basins, runoff coefficients, tc flow paths from existing condition; analyzing private system outfalls; substantial drainage modifications and refinement required after first-run of analysis

* + - 1. 778.7 Design storm sewer system, size pipes, and inlet spacing

Task includes: Sizing conveyance/storm sewer system per FDM Chapter 13; includes chosen modeling method. May include software modeling of proposed storm sewer system, 3D modeling of storm sewer system (InRoads, C3D pipe networks).

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low -** Minimal storm sewer design or utilization of existing trunk sewer with addition of inlets or connections. Inlet spacing/spread calculated for one design storm event

**Medium -** Single Trunk Line with inlets/laterals and well-defined drainage boundaries. Inlet spacing/spread calculated for design storm and one construction staging storm event.

**High -** Multiple Connecting Trunk Line with multiple inlet laterals and/or with poorly defined drainage boundaries; additional complexity for ultra-urban, utilities, combined sanitary/storm, or private system outfalls. Inlet spacing/spread calculated for design storm and multiple stages of construction, cross-overs, etc.

* + - 1. 778.8 Design temporary drainage for staged construction

Task includes: Evaluating overall drainage system design for staged construction; identifying pre-stages, temporary pipes, stub pipes, drainage structure adjustments required to accommodate staging; assessing constructability of drainage based on staging (when can outfall be built, do cuts/fills necessitate modifications to existing or proposed drainage to maintain drainage throughout construction, etc.)

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low –** 1 stage, minimal need for temporary pipes, stubs, other temporary connections

**Medium –** 2 stages with moderate amount of temporary pipes, stubs, other temporary connections

**High –** 3 or more stages, extensive temporary pipes, stubs, other temporary connections, private system outfalls

* + - 1. 778.9 Analyze hydraulics and design culvert pipes

Task includes: Analyzing existing and proposed culvert pipes based on estimated runoff (Q), length and slope of culvert, allowable headwater depth, headwater/depth ratio, culvert entrance type/cross-sectional shape/roughness factor, and tail-water conditions. Typical computations are performed using charts, nomographs, or software such as HY8. May include software modeling of proposed culverts, 3D modeling of culverts (InRoads, C3D pipe networks).

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low -** Replacement of existing structure in-kind, proposed flows and conveyance similar to existing; little to no drainage modifications and refinement anticipated after first-run of analysis

**Medium -** Minimal proposed pipe alternatives (sizes, shapes, slopes, materials); minimal restrictions on headwater depth; moderate drainage modifications and refinement anticipated after first-run of analysis

**High -** Substantial difference between existing and proposed flows; multiple proposed pipe alternatives (sizes, shapes, slopes, materials); restrictions on headwater depth; substantial drainage modifications and refinement anticipated after first-run of analysis

* + - 1. 778.10 Analyze hydraulics and design ditches

Task includes: Analyzing existing and proposed ditches for appropriate design storm. Includes evaluating water surface elevation vs. pavement subgrade and adjacent private property, and checking for overtopping roadway during check storms. Hours listed in user guide are per mile of ditch. Water quality analysis may be needed, but effort would be included under Water Quality tasks. Does not include 3D modeling of ditches.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low** – No increase in impervious area; minimal change in ditch capacity and alignment; no existing drainage concerns; little to no drainage modifications and refinement anticipated after first-run of analysis

**Medium** – Minor increase in impervious area; moderate drainage modifications and refinement anticipated after first-run of analysis

**High** – Known ditch drainage concerns, roadway overtopping; substantial increase in impervious area; substantial drainage modifications and refinement anticipated after first-run of analysis

* + - 1. 778.11 Perform hydraulic analysis for navigable/flood zone bridges/culverts

Task includes: Determine if proposed structure is within FEMA regulated flood zones. Identify flood zone types and quantify the allowable impacts through coordination with agencies as required. Use existing, modify existing, or build new hydraulic model. Evaluate hydraulic opening of proposed structure. Coordinate with structure designer.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low -** FEMA Zone AE (model is available), replacing in kind or similar hydraulic opening to existing

**Medium -** FEMA Zone A (modifying existing HEC-2 or developing new model), multiple structure alternatives and evaluations

**High -** FEMA Zone A (unstudied and new model development is needed), multiple structure alternatives and evaluations, and CLOMR or LOMR Required

* + - 1. 778.12 Design channel relocation

Task includes: Determining proposed channel horizontal alignment, vertical alignment, cross section. Includes evaluating water surface elevation vs. adjacent private property. Evaluate downstream conditions, evaluate channel location vs available right-of-way or real estate acquisition areas, design of channel to meet peak flow desired. Develop appropriate layout for site, grading plan, staking table. Includes determining appropriate vegetation, seed mixes, rootstock, and plantings, and developing associated plans, details, and miscellaneous quantities. Water quality analysis may be needed, but effort would be included under Water Quality tasks. Does not include 3D modeling of relocated channel.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low** – N/A

**Medium** – N/A

**High** – Task is complex for all channel relocations.

* + - 1. 778.13 Perform Water Quality Calculations

Task includes: Identifying required pollutant reduction, calculations to determine pollutant reduction achieved by the project design, and comparing the achieved reduction to required reduction. Includes TSS reduction calculations. May include TMDL calculations.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low** – 0% TSS reduction required. No increase in paved area or no change to culvert or storm sewer system that drains the project.

**Medium** – 40% TSS reduction required. Pollutant reduction calculated via ditch design criteria (e.g. 1.5 fps threshold)

**High** – Projects in TMDL basins; projects with multiple TSS reduction scenarios, requiring calculation of area-weighted TSS reduction goal. WinSLAMM or other computer modeling.

* + - 1. 778.14 Design detention pond(s) and outlet control structure(s)

Task includes: evaluate downstream conditions and flow controls, evaluate volume needed vs available right-of-way or real estate acquisition areas, design outlet structure to meet peak flow desired. Develop appropriate layout for site, grading plan, staking table, 3D model design of pond grading/contours. Includes determining appropriate vegetation, seed mixes, rootstock, plantings, and developing associated plans, details, and miscellaneous quantities. Includes determining clay liner and clay embankment fill need, depth, material, and establishing emergency spillway. Water quality analysis may be needed, but effort would be included under Water Quality tasks. Structural design of outlet control structure is not included in this task; structural analysis and design would be included under Structures area.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low** – No permitting requirements; no adjacent property owner concerns; virgin soil; greater than 5-feet above groundwater

**Medium** – Minor permitting involved; minor property owner concerns

**High** – Adjacent floodplain, wetlands, or other permitting requirements; suspect soils; neighboring property concerns; high water table

* + - 1. 778.15 Water Quality/Storm water Control Measure Design

Task includes: Evaluate downstream conditions and flow controls, evaluate volume needed vs available right-of-way or real estate acquisition areas, design outlet control to meet peak flow desired. Develop appropriate layout for site, grading plan, staking table, 3D model design of grading/contours. Includes determining appropriate vegetation, seed mixes, rootstock, plantings, underdrain/standpipes, other materials (e.g. paver blocks, porous pavement), and developing associated plans, details, and miscellaneous quantities. Includes establishing emergency spillway. Water quality analysis may be needed, but effort would be included under Water Quality tasks.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low** – Catch basins

**Medium** – Grass lined swales, filter strips

**High** – Biofiltration (bioswales), porous pavement, regenerative storm water conveyance

* + - 1. 778.16 Storm water-Drainage-Water Quality (WQ) Spreadsheets

Task includes: Completing applicable sections of WisDOT Storm water-Drainage-WQ Report Spreadsheet: Drainage Summary, Drainage Data (info for outfalls, sub basins, urban/Trans 401 projects, culvert design, floodplain management, drainage districts, aquatic organism passage, culvert liner design), Water Quality Summary, and Water Quality-Grass Swales/Filter Strips/Wet Detention Ponds/Catch Basins.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low** –No increase in paved area or no change to culvert or storm sewer system that drains the project. No storm water control measures.

**Medium** –Moderate increase in paved area or moderate change to culvert or storm sewer systems or outfall locations. Few storm water control measures.

**High** – Substantial changes in impervious area and substantial changes to culvert or storm sewer systems or outfall locations. Substantial storm water control measures.

* + - 1. 778.17 Prepare Proposed Drainage Area Exhibits

Task includes: Preparing existing condition drainage area exhibits, including drainage basins, contours, discharge locations, land use, flow patterns

Typical staff level: entry engineer, project engineer, CAD tech

**Low –** preparing 1-2 overview exhibits

**Medium –** preparing 1-2 overview exhibits plus 100 scale detail sheets for moderate length project (0-2 miles)

**High –** preparing multiple overview exhibits plus 100 scale or more detailed detail sheets for longer project length

* + - 1. 778.18 Complete Storm water Report

Task includes: Developing storm water management summary memo, compiling WisDOT Storm water-Drainage-WQ Spreadsheet calculations, exhibits, photos/documentation of existing problem areas, other documentation into Storm water Report.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low** – No increase in paved area or moderate change to culvert or storm sewer systems or outfall locations; no storm water control measures; no existing drainage issues.

**Medium** – Moderate increase in paved area or moderate change to culvert or storm sewer systems or outfall locations; few storm water control measures; few existing drainage issues.

**High** – Substantial increase in paved area or moderate change to culvert or storm sewer systems or outfall locations; few storm water control measures; substantial existing drainage issues private system outfalls

* + - 1. 778.19 Complete Hydraulic Report

Task includes: Compiling flow calculations, hydraulic calculations, exhibits, photos/documentation of existing drainage area, other documentation into Hydraulic Report.

Typical staff level: entry engineer, project engineer, senior/advanced engineer

**Low -** Replacing in kind or similar hydraulic opening to existing

**Medium -** Modifying existing HEC-2 or developing new model, multiple structure alternatives and evaluations

**High -** Unstudied and new model development is needed, multiple structure alternatives and evaluations, and CLOMR or LOMR Required

###### 768 Design Erosion Control Landscaping

* + - 1. 768.0 Design erosion control and landscaping plan
      2. 768.1 Analyze existing erosion control conditions

Includes reviewing existing project area for erosion concerns, soil types, existing topography and slopes, identifying waterway channels, environmentally sensitive areas (water resources such as lakes, streams, and wetlands)

Entry level engineer, senior/advanced engineer

**Low** – urban highway, roadway without ditches, no stream crossings, not staged construction

**Medium** – rural undivided highway, roadway with ditches, stream crossings

**High** – rural divided highway (freeway, expressway), roadway with ditches, stream crossings, staged construction

* + - 1. 768.2 Determine temporary erosion control features

Includes reviewing state statutes, administrative codes, WisDNR comments, and FDM guidelines for BMP selection and application, confirm adequate space for feature installation (r/w, permanent easement, temporary easement), evaluating critical locations (ditches and channelized flow, discharge locations, cut-to-fill transitions, long and/or steep slopes), calculating sheer stress in channels, evaluating channel linings, consider sediment control devices, evaluate temporary seeding, identify needs for details (construction or S.D.D.), evaluate drainage transition locations

Typical temporary erosion control features consist of the following: temporary seed, fertilizing, mulching, temporary ditch checks, erosion mat, soil stabilizer, silt fence, erosion bales, rock bags

Entry level engineer, senior/advanced engineer

**Low –** urban highway, roadway without ditches, no stream crossings, not staged construction

**Medium –** rural undivided highway, roadway with ditches, stream crossings

**High –** rural divided highway (freeway, expressway), roadway with ditches, stream crossings, staged construction

* + - 1. 768.3 Determine permanent erosion control features

Includes reviewing state statutes, administrative codes, WisDNR comments, and FDM guidelines for BMP selection and application, confirm adequate space for feature installation (r/w, permanent easement), evaluating critical locations (ditches and channelized flow, discharge locations, cut-to-fill transitions, long and/or steep slopes), calculating sheer stress in channels, consider diversion measures, evaluating channel linings, consider sediment control devices, identify type and rate of permanent seeding, identify sodding, identify needs for details (construction or S.D.D), evaluate drainage transition locations

Typical permanent erosion control features consist of the following: permanent seeding, sodding, fertilizing, mulching, sod watering, stone/rock ditch checks, riprap ditch checks, riprap, articulated concrete block, slope paving, flumes, slope drains, dikes, intercepting embankments, sediment traps

Entry level engineer, senior/advanced engineer

**Low –** urban highway, roadway without ditches, no stream crossings, not staged construction

**Medium –** rural undivided highway, roadway with ditches, stream crossings

**High –** rural divided highway (freeway, expressway), roadway with ditches, stream crossings, staged construction

* + - 1. 768.4 Erosion control plan preparation

Includes creating plan sheets, setting the sheet scale, determine legends, submitting plans for critical milestones (DT1078, 60%, Draft PS&E, Final PS&E), illustrating the location of all erosion and sediment control devices, show drainage patterns, show drainage devices, identify drainage discharge locations, dust control, tracking pads, include runoff coefficient table, evaluate cost vs effectiveness, evaluate maintenance considerations, specify appropriate standard detail drawings, create construction detail drawings

Entry level engineer, senior/advanced engineer, CADD tech, admin assistant, project manager

**Low –** urban highway, roadway without ditches, no stream crossings, not staged construction

**Medium –** rural undivided highway, roadway with ditches, stream crossings

**High –** rural divided highway (freeway, expressway), roadway with ditches, stream crossings, staged construction

* + - 1. 768.5 Review & define landscaping parameters

Includes reviewing base information (geotechnical, survey, aerial photography, tree inventory, etc.), performing site visit to verify survey information and field identify existing vegetation species as well as the general health and quality, coordinate with roadway/utility engineers to understand existing and proposed infrastructure, coordinate with private utilities to understand existing and proposed infrastructure parameters (routings, required offsets, special requirements related to planting design), coordination with municipal representatives to understand project intent and obtain background information (list of acceptable street tree species, discuss general forestry and landscape outcomes and concerns), coordination with department (understand funding sources, define maintenance agreements, budget for landscaping, commitments to municipalities in terms of level of effort and landscape development)

Entry level landscape architect, project landscape architect, project manager landscape architect

**Low –** rural divided or undivided highway and urban roadway where plantings are limited to infields and re-vegetation to restore existing character

**Medium –** urban roadway where plantings are limited to infields, roadsides, and minor (tree only) plantings in medians and terraces, or WisDOT maintained roundabouts

**High –** urban roadway where complex plantings (trees, shrubs, perennials) in medians, municipal maintained roundabouts, infield or where additional landscape related items are impacted adjacent to historical or cultural resources (fences, entries to parks, businesses, residences) and replacement in-kind of complex landscapes is considered

* + - 1. 768.6 Landscaping plan preparation

Includes creating plan sheets, setting the sheet scale, determine legends, submitting plans for critical milestones (DT1078, 60%, Draft PS&E, Final PS&E), development of Plant Data Table and Plant Quantities Table, create cost estimates, specify appropriate standard detail drawings, create construction detail drawings

Entry level landscape architect, project landscape architect, project manager landscape architect

**Low –** rural divided or undivided highway where plantings are limited to infields and re-vegetation to restore existing character

**Medium –** urban roadway where plantings are limited to infields, roadsides, and minor (tree only) plantings in medians and terraces, or WisDOT maintained roundabouts

**High –** urban roadway where complex plantings (trees, shrubs, perennials) in medians, municipal maintained roundabouts, infield or where additional landscape related items are impacted adjacent to historical or cultural resources (fences, entries to parks, businesses, residences) and replacement in-kind of complex landscapes is considered

###### 776 Design Geometrics and Details *(9/12/16)*

* + - 1. 776.0 Includes existing horizontal alignment; existing vertical profile; preliminary horizontal alignment; preliminary vertical profile; and preliminary intersection/interchange design and reports associated with these
      2. 776.1 Determine and document design criteria

Review functional classification of roadway, existing traffic information existing and forecast, design speed. Determine appropriate controlling criteria. Review/summarize/list design guidance from appropriate manuals. Includes mainline, side roads and ramps.

Typical Staff: Entry and project design engineer and project manager; civil engineering technicians; with support of traffic engineers

**Low –** Two lane roadway, limited of typical roadway sections, consistent design speeds.

**Medium –** Roadway with multiple typical sections and varying design speeds and intersection types. Bike, pedestrian and multimodal considerations.

**High –** Interstate or multilane roadway. Includes interchanges, roundabouts and nontraditional designs. Many typical sections and varying design speeds and intersection types. Bike, pedestrian and multimodal considerations.

* + - 1. 776.2 Analyze existing geometrics

Review asbuilt and survey information and compare to design criteria. Identify deficiencies and document appropriately.

Typical Staff: Entry and project design engineer and project manager; civil engineering technicians; with support of traffic engineers

**Low –** Roadway with limited of typical roadway sections, consistent design speeds. Level terrain with minimal number of curves.

**Medium –** Roadway with multiple typical sections and varying design speeds and intersection types. Bike, pedestrian and multimodal considerations. Rolling terrain with moderate number of curves.

**High –** Roadway that includes interchanges, roundabouts and nontraditional designs. Many typical sections and varying design speeds and intersection types. Bike, pedestrian and multimodal considerations.

* + - 1. 776.3 Develop preliminary horizontal alignments

Includes creating horizontal alignments for mainline, side roads, interchange ramps, driveways, sidewalks and pedestrian paths. Assumes usage of horizontal alignment and super elevation design criteria assumed under 776.1. “Mile” unit is measured as total of all types of reference line for existing condition and all proposed alternatives.

Typical Staff: Entry and project design engineer and project manager; civil engineering technicians

**Low –** Reference line with minimal number of curves and intersections

**Medium –** Reference line with moderate number of curves and intersections

**High –** Reference line with a high number of curves and intersections

* + - 1. 776.4 Develop preliminary vertical alignments

Includes creating vertical alignments for mainline, side roads, interchange ramps, driveways, sidewalks and pedestrian paths. Assumes usage of vertical alignment and sight distance criteria assumed under 776.1. “Mile” unit is measured as total of all types of reference line for existing condition and all proposed alternatives.

Typical Staff: Entry and project design engineer and project manager; civil engineering technicians

**Low –** Level terrain, minimal vertical constraints

**Medium –** Rolling terrain, multiple vertical constraints

**High –** Many vertical constraints

* + - 1. 776.5 Develop preliminary intersection design

Includes design of all intersections, intersection approaches, pedestrian and bike accommodations, medians and channelization. Includes checking turning templates.

Typical Staff: Entry and project design engineer and project manager; civil engineering technicians; with support of traffic engineers

**Low –** Uses standard intersection design features

**Medium –** Signalized intersection

**High –** Multilane, multiple turning lane, roundabout or nonstandard intersection

* + - 1. 776.6 Develop preliminary interchange design

Includes design of all ramp intersections, grade separations, bridge approaches, pedestrian and bike accommodations, medians and channelization. Includes checking turning templates, horizontal and vertical clearances.

Typical Staff: Entry and project design engineer and project manager; civil engineering technicians; with support of traffic engineers

**Low –** Standard diamond

**Medium –** Nontraditional, high capacity

**High –** Free flow system interchange

* + - 1. 776.7 Analyze and document geometric alternatives

Compile data from previous developments (traffic, real estate, etc.) and analyze and compare alternatives. Produce needed exhibits

**Low –**

**Medium –**

**High –**

* + - 1. 776.8 Finalize preliminary geometrics

**Low –**

**Medium –**

**High –**

* + - 1. 776.9 Create basic templates

**Low –**

**Medium –**

**High –**

* + - 1. 776.10 Develop preliminary surface models
         1. 776.10.1 Roadway

**Low –**

**Medium –**

**High –**

* + - * 1. 776.10.2 Intersection

**Low –**

**Medium –**

**High –**

* + - * 1. 776.10.3 Interchange

**Low –**

**Medium –**

**High –**

* + - * 1. 776.10.4 Roundabout

**Low –**

**Medium –**

**High –**

* + - * 1. 776.10.5 Construction staging

**Low –**

**Medium –**

**High –**

* + - * 1. 776.10.6 Miscellaneous

**Low –**

**Medium –**

**High –**

* + - 1. 776.11 Perform airway/railway/highway clearance analysis

**Low –**

**Medium –**

**High –**

* + - 1. 776.12 Determine need for design exception

**Low –**

**Medium –**

**High –**

* + - 1. 776.13 Design aesthetic & Community Sensitive Design Features

**Low –**

**Medium –**

**High –**

* + - 1. 776.14 Beam guard calculations and geometrics

**Low –**

**Medium –**

**High –**

* + - 1. 776.15 Develop preliminary roadside design elements

(ditch-sidewalk-bike path-transit-curb ramp-driveway-parking lot-retaining wall structure)

**Low –**

**Medium –**

**High –**

* + - 1. 776.16 Update intersection geometrics and details

**Low –**

**Medium –**

**High –**

* + - 1. 776.17 Update interchange geometrics and details

**Low –**

**Medium –**

**High –**

* + - 1. 776.18 Develop final horizontal alignments (mainline and side road)

**Low –**

**Medium –**

**High –**

* + - 1. 776.19 Develop final vertical alignments (mainline, side road, and driveway)

**Low –**

**Medium –**

**High –**

* + - 1. 776.2 Develop final intersection design

**Low –**

**Medium –**

**High –**

* + - 1. 776.21 Develop final interchange design

**Low –**

**Medium –**

**High –**

* + - 1. 776.22 Finalize geometrics

**Low –**

**Medium –**

**High –**

* + - 1. 776.23 Refine and finalize surface models

**Low –**

**Medium –**

**High –**

* + - 1. 776.24 Design Documentation
         1. 776.24.1 Prepare and review interchange access justification report (IAJR)

Includes preparing, writing, and reviewing an Interchange Access Justification Report (IAJR) as described in FDM 7-45. This includes providing substantial information justifying and documenting the eight criteria established by FHWA. This task includes efforts to provide the information including traffic modeling; review of Transportation System Management (TSM) methods; operational and safety analyses; review of local road access; review of local and regional land use and transportation plans; a comprehensive corridor or network study if access changes are within the context of a longer-range system or network plan; completing necessary coordination if the new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use; and providing supporting information and current status of the environmental processing. This task includes coordination meetings and reviews with FHWA Wisconsin Division, WisDOT, and local municipalities.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineer – Department Manager, Civil Engineer – Principal, GIS Professional – Project, Structural Engineer – Project, CADD Technician – Entry, CADD Technician – Mid, Civil Engineering Technician – Mid, Civil Engineering Technician – Senior, Administrative Assistant

**Low** – Standard Project IAJR

**Medium** – Complex Project IAJR

**High** – High Risk Complex Project IAJR requiring Preliminary Engineering & Operational Review (PEOR)

* + - * 1. 776.24.2 Develop and document Encroachment Report

Includes preparing, writing, and reviewing an Encroachment Report documenting the project encroachments and their disposition as described in FDM 12-1-20. This includes reviewing the project for unauthorized objects located partially or wholly within the highway right of way. Efforts include field reviewing the project site and photographing encroachments. The encroachment report includes completing a project overview showing the general location of the encroachments, an encroachment summary table of information regarding each encroachment, and an encroachment reporting form for each encroachment that includes a plan graphic showing encroachment location and distances along with a photograph of the encroachment. This task includes coordination and reviews by WisDOT PDS and Real Estate.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineering Technician – Entry, Administrative Assistant

**Low** – Less than five encroachments

**Medium** – Between 6 and 10 encroachments

**High** – More than 10 encroachments

* + - * 1. 776.24.3 Develop and document Roadside Hazards Report

Includes generating a list of roadside hazards or locations of concern and documenting what roadside design methods to be used on a particular hazard or area of concern. Includes completing the Roadside Hazard Analysis form for inclusion as an attachment to the Design Study Report. Includes providing justification when hazards are proposed to be shielded, delineated, or when taking no action. Also includes performing cost analysis if necessary.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager,

**Low** – Project with no or limited number of roadside hazards (< 5)

**Medium** – Typical project with an average number of roadside hazards (between 5 and 20)

**High** – Project with a large number of roadside hazards with some requiring cost analysis (>20)

* + - * 1. 776.24.4 Develop and document Design Study Report

Includes preparing, writing, and reviewing a Design Study Report (DSR) as described in FDM 3-15-25.4. Includes determining existing geometric conditions, existing intersection and interchange information including determining sight distances, performing a level of service analysis if necessary, incorporating crash analysis information performed under Task 313.2, summarizing and documenting design criteria outside of desirable standards and exceptions to standards that are not controlling criteria, summarizing and incorporating exceptions to standards information performed under Task 776.20.5, discussing the typical section cross section elements considered, documenting proposed geometrics, incorporating the roundabout critical design parameters chart performed under task 776.17 if necessary, documenting proposed structures information, discussing safety enhancements and mitigations, documenting financing and scheduling for the project, and discussing unique project features. Includes preparation and assembly of attachments.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Structural Engineer – Project, Civil Engineering Technician – Senior, Administrative Assistant

**Low** – Abbreviated DSR or regular DSR for low complexity project such as resurface

**Medium** – Regular DSR for average complexity project

**High** – Regular DSR for higher complexity project such as majors projects

* + - * 1. 776.24.5 Prepare addendum to the Design Study Report

Includes preparing, writing, and reviewing an addendum to a Design Study Report (DSR) including preparation and assembly of attachments.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineering Technician – Senior, Administrative Assistant

**Low-** Minor project revision requiring limited (one or two) number of revisions to the original DSR.

**Medium** – Project revisions requiring some (>2) revisions to the original DSR

**High –** Major project revisions requiring an extensive revision of the original DSR.

* + - * 1. 776.24.6 Develop and prepare Design Exceptions Report

Includes preparing, writing, and reviewing an Exceptions to Standards Report (ESR) as described in FDM 11-1. Includes documenting the existing highway conditions and proposed improvement; thoroughly describing the substandard feature(s); determining and providing crash data related to the requested exception to standard; includes effort to complete a design to meet current standards at a level sufficient to determine and document applicable cost data including construction, real estate and utility costs; describing adverse impacts that would result from upgrading each substandard feature to meet current standards; and describing mitigation and enhancements proposed to offset the substandard feature(s). Includes preparation and assembly of attachments including maps, charts, photographs, tables or other graphical data.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Structural Engineer – Project, Civil Engineering Technician – Senior, Administrative Assistant

**Low** – Substandard feature that requires limited to average effort to prepare a design using current standards and develop costs for the current standards design.

**Medium** –N/A

**High** – Substandard feature that requires extensive effort to prepare a design using current standards and develop costs for the current standards design.

* + - * 1. 776.24.7 Develop and prepare Programmatic Exceptions to Standards Report

Includes identifying substandard controlling criteria within the 3R type project; analyzing the project roadway using the Metamanager (MM) safety module; manually reviewing crash summaries, evaluating MetaManager segments on which there are substandard controlling criteria; and evaluating un-addressed Investigation Flags to identify countermeasures to address any known safety issues.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineering Technician – Senior, Administrative Assistant

**Low** – Substandard feature that is limited in length or location requiring minimal review of PES elements.

**Medium** – N/A

**High** – Substandard feature that is extensive in length or number of locations requiring a high level of review of PES elements.

* + - * 1. 776.24.8 Perform Value Engineering evaluation

Includes completing the Value Engineering (VE) work order request form and submitting it to the State VEPM; providing the VE Team Leader with current design information such as plans, alternatives, estimates, and other reports; coordinating and attending meetings with the VE team leader; selecting a VE Team; coordinating the VE Study details including dates, times, location, and site visit; attendance by project team members at the VE study workshop; holding a presentation of recommendations (out-brief session); review of the draft report of the VE study; and coordinate and attend meeting to review and determine the VE recommendations to implement.

Efforts for leading the VE study and the VE Team Leader are not included here since this effort will be part of a separate work order developed by the State VEPM.

Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineer – Department Manager, Civil Engineer – Principal, Construction Manager – Project, Environmental Engineer – Project, Geotechnical Engineer – Project, GIS Professional – Project, Structural Engineer – Project, CADD Technician – Mid, CADD Technician – Senior, Administrative Assistant

**Low**- Projects with average complexity, alternatives, right of way, or utility requirements. VE study length of 3 days.

**Medium**- Projects with complex traffic control or staging/phasing, or right of way or utility requirements; extensive or expensive environmental, geotechnical, or structural requirements. VE study length of 4 days.

**High** - Projects with complex technical issues, challenging project constraints, unique requirements, or competing community and stakeholder objectives. VE study length of 5 days.

* + - * 1. 776.24.9 Prepare Technical memorandum for design related issues

Includes preparing, writing, and reviewing a technical memorandum documenting a design related issue. Includes preparing and assembling attachments such as maps, graphics, cost estimates, and coordination with affected stakeholders.

Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineering Technician – Senior, Administrative Assistant

**Low** – Short technical memorandum (<2 pages) addressing a minor design related issue.

**Medium** – Average length technical memorandum (>2 and <10 pages) addressing a design related issue with some attachments and review.

**High** – Extensive technical memorandum (> 10 pages) with multiple attachments addressing a significant design issue and involving several iterations of review prior to final document

* + - 1. 776.25 Plan Preparation
         1. 776.25.1 Title sheet

Assumes location map is created; Project manager obtains information, Cadd Tech drafts, reviewer verifies info. Sheet tends to be higher in designer/reviewer hours rather than Cadd Tech.

Hours are work hours by sheet

Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid

**Low-** Project limits are short, or work is minor such as a single bridge replacement with limited roadway approach.

**Medium** – Urban or larger rural project, multiple lanes, widening or major rehab

**High –** Complex work such as interstate reconstruction with multiple roads or multiple projects involved.

* + - * 1. 776.25.2 General notes

Assumes utility coordination is handled in a separate task. This effort includes information gathering and drafting, such as review of environmental documents to capture all commitments. Assumes commitments are defined in the environmental document.

Hours are work hours by sheet

Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid

**Low** -Rural or local project, short work limits, limited work such as a single bridge replacement, mill/fill project. Minimal number of environmental commitments

**Medium** - Urban or larger rural project, multiple lanes, widening or major rehab. Moderate number of environmental commitments (up to 5)

**High**- Complex larger urban or interstate project, multiple improvement involvement. More than 5 environmental commitments.

* + - * 1. 776.25.3 Project Overview

Assumes alignments are developed under alignment diagram. Includes using project and construction limits from plan/profile, draft, label, review.

Hours are work hours by sheet

Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid

**Low** – Rural or local project, short work limits, limited work such as single bridge replacement

**Medium** – Urban or larger rural project, moderate number (less than 10) side roads, structures, limits and feature call outs

**High** – Complex larger urban or interchange project, more than 10 ramps, structures, limits and feature call outs

* + - * 1. 776.25.4 Typical sections

Includes determining section from the L&D, draft, label, review. Verify existing build up based on geotech. Design transitions, super elevation, beam guard. Designer develops information, Cadd Tech drafts, reviewer verifies info.

Hours are work hours by individual section. Overall hours can be a mix of low, medium, and high typical sections.

Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid, CADD Technician – Mid

**Low**- Rural, two lane, uncurbed. Minor Mill/fill. Details

**Medium**- Urban or multi-lane rural. Complex mill/fill or pavement rehab.

**High** - 6 or more lanes total, divided freeway.

* + - * 1. 776.25.5 Construction details

Includes construction details such as removals, drainage details, pipe underdrain, and fencing. Storm sewer and utilities, erosion control, traffic signal plan, temporary traffic signals, sign removal, signing, lighting, pavement marking, landscaping are shown elsewhere.

Hours are work hours by individual detail. Overall hours can be a mix of low, medium, and high details. Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid

**Low** – Use department provided construction details with limited modifications. Includes verifying applicability of detail to project conditions.

**Medium** – Develop detail for specific site conditions, detail addresses one issue.

**High** – Develop detail for specific site conditions, detail addresses more than one issue. If detail requires more than one sheet, each sheet is considered one detail.

* + - * 1. 776.25.6 Building and site clearance details

Includes plan preparation for developing sheets, labeling.

Hours are work hours by sheet

Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid

**Low** – One building or removal area.

**Medium** – Site with 10 or less items to remove that are standard bid items.

**High** – Complex site with more than 10 items to remove.

* + - * 1. 776.25.7 Jointing details

Includes paving joint details. Assume this does not include location of concrete pavement joint placement as this would be completed by contractor with SPV item.

Hours are work hours for each detail.

Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid

**Low** – Resurfacing type project with department provided joint construction detail with limited modifications

**Medium** – Urban project with non-standard joint construction requiring additional detail.

**High** –multiple construction stages, requiring multiple types of joints.

* + - * 1. 776.25.8 Driveway details

Includes determining applicability of department provided detail, fit to site conditions, or development of site specific detail.

Hours are work hours for each detail.

Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid

**Low** – department provided rural driveway detail with limited modifications

**Medium** – department provided rural driveway detail with limited modifications

**High** – specific site detail due to complex geometry or conditions

* + - * 1. 776.25.9 Curb ramp details

Includes drafting only, assumes 3d model of curb ramp is completed with design elements 2.2.4.16.

Hours are work hours for each detail.

Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid

**Low** – Rural project or urban with standard intersection where FDM Standard Detail Drawings are applicable, no detail required

**Medium** – Multi-use trail or path with wider curb ramp requiring detectable warning field detail

**High** – Complex urban project with non-standard curb ramps

* + - * 1. 776.25.10 Plan / paving details

Includes plan preparation only, assumes 3d model is completed with design elements 2.2.4.19-20. Includes create base file, attach reference files, sheet layout, beam guard LON calcs, construction limits, pavement dimensions, labels.

Hours are work hours for each sheet.

Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineer – Dept Manager, CADD Technician – Mid

**Low** – Rural or urban resurfacing, mill/fill or bridge approach projects, no profile

**Medium** – two lane urban

**High** – four or more lanes

* + - * 1. 776.25.11 Intersection details

Include railroad intersections & running truck turn templates

Hours are work hours by intersection. Overall hours can be a mix of low, medium, and high intersections.

**Low** - T-intersection or 4-way, asphalt pavement, graded shoulders

**Medium** – 4-way intersection, two-or more lanes, asphalt pavement with curbs and ramps.

**High** – 4-way intersection, multiple lanes, with concrete pavement and curbs and ramps.

* + - * 1. 776.25.12 Interchange details

This effort includes creating interchange plan/profile sheets. Assume that the creation of the proposed horizontal and vertical alignments are not included in this effort – they are included in 2.2.4.22. Includes create proposed base file, reference files, design notes

, label.

Hours are work hours by sheet.

Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineer – Department Manager, CADD Technician – Mid

**Low** – Low complexity service interchange

**Medium** – Service interchange

**High** – System interchange

* + - * 1. 776.25.13 Storm Sewer and Utilities details

Includes incorporation of storm sewer and plan information received from utilities into the base map (in addition to locations already obtained through field survey). Includes storm sewer removal plan. Includes create base file, reference files, design notes, storm sewer structures and conflicts in profile, annotate elevations and slopes.

Compensable will take longer than non-compensable utilities because the designer is responsible for the new location.

Address mark up plans from utilities

Hours are work hours per plan sheet

Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineer – Department Manager, CADD Technician – Mid

**Low** - basic coordination with minimal to no impacts.

**Medium** - simple project (e.g. rural) with utility relocation. Newer suburban

**High** - numerous utilities, with conflicts; several underground, older urban.

* + - * 1. 776.25.14 Alignment diagram

Includes retrieving horizontal alignments from Civil 3D; creating sheets, clean up and labeling, adding curve tables

Hours are work hours per plan sheet

Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid

**Low** – Rural two-lane roadway with less than 10 intersections

**Medium** – Two-lane roadway with more than 10 intersections or multi-lane roadway

**High** – Interchange

* + - * 1. 776.25.15 Super elevation table

Includes super elevation calculations, table generation, transition

Hours are work hours by sheet.

**Low** - two-lanes

**Medium** – multiple lanes, non-complex

**High** – multiple lanes, auxiliary lane, bi-furcated section, etc.

* + - * 1. 776.25.16 Plan and profile sheets

Assume that the creation of the proposed horizontal and vertical alignments are included in this effort.

Assume complexity of urban verse rural is mostly covered in the variance of scale used for Plan and Profile.

Create BP (proposed base file, approx. 10hr/sheet), refine horizontal & vertical alignments create sheets, reference files, clean up, label, include drainage in plan,

Assume hours for drainage profile is included with storm sewer profile task.

Include guardrail LON calculations, construction limits, and pavement dimensions.

Assume CL of R/W is established under the R/W task.

Separate plan/profile sheets count as one sheet.

Hours are work hours by sheet.

Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineer – Department Manager, CADD Technician – Mid

**Low** -rural, local urban two-lane.

**Medium** - urban interstate, rural or urban collectors

**High** – urban arterial, complex urban interstate

Selection of Low, Medium and high should also consider such factors as number of drives, complexity of drainage, amount of right-of-way take, or other features that would complicate a plan sheet.3

* + - * 1. 776.25.17 Plan and profile – mainline

Hours are work hours by section.

**Low** - set pattern lines, cut sections, show existing (pavement, utilities), show proposed (criteria runs, establish vba). Two-lane or undivided four lane projects with shoulders and minimal cut/fill. Mill/fill projects, non-interstate.

**Medium** -define super elevation template. Multiple lane curbed sections, or undivided highways. Mill/fill interstate projects.

**High** - adds extensive utilities, retaining walls, noise walls, match lines, special benching, undercut, reinforced soil slopes & drainage (assume drafting of storm structures and network with design accounted for in drainage tasks is similar to the iterative design & drafting of ditches).

* + - * 1. 776.25.18 Plan and profile – crossroads

Same as mainline

Hours are work hours by sheet.

**Low** - rural, local urban two-lane.

**Medium** - urban interstate, rural or urban collectors.

**High** – urban arterial, complex urban interstate

* + - * 1. 776.25.19 Plan and profile – ramps

Same as mainline

Hours are work hours by sheet.

**Low** -rural

**Medium** - urban interstate

**High** – urban arterial

* + - * 1. 776.25.20 Cross sections

Includes retrieving automated cross sections from Civil 3D; creating sheets, clean up and labeling, adding utility labels, construction stages

Hours are work hours by sheet

Civil Engineer – Project, Civil Engineer – Project Manager, CADD Technician – Mid

**Low** – Rural two-lane

**Medium** – Rural multilane or urban with varying typical sections and more utilities

**High** – complex rural or urban with multiple stages, marsh excavation, wetland, interchange match lines

* + - 1. 776.26 Specialty - Roundabout design

**Low** –

**Medium** –

**High** –

###### 786 Develop Quantities and Estimates *(7/17/16)*

* + - 1. 786.0 Includes developing miscellaneous quantities and preparing estimate materials
      2. 786.1 Calculate/estimate quantities

Includes developing a list of bid items; calculating and determining quantities for each bid item; breaking down quantities by construction stages; documenting hand calculations; reviewing and documenting computer generated quantities; preparing tables for use on miscellaneous quantity sheets.

See below for separate earthwork task.

Structure quantities are separate and included under task 656 Design Structure.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineering Technician – Entry, Civil Engineering Technician – Mid, Civil Engineering Technician – Senior

**Low** – Small rural projects with a limited number of bid items and generally one category

**Medium** – Typical rural state highway, medium volume urban highway, or expressway with average number of bid items, limited number of categories (5 or less)

**High** – Complex, multi-staged project with significant number of bid items, multiple ID’s, and multiple categories.

* + - 1. 786.2 Calculate Earthwork and Develop Summary Tables

Includes retrieving automated earthwork quantities from Civil 3D; developing computer earthwork data tables; developing earthwork summary table for MQ sheet; breaking down earthwork by divisions and construction stages; preparing computer earthwork data plan sheets.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineering Technician – Entry, Civil Engineering Technician – Mid, Civil Engineering Technician – Senior

**Low** – Small, shorter length (< 1 mile) 3R type project with limited grading areas

**Medium** – Typical rural state highway, medium volume urban highway, or expressway with average amount of grading, EBS, and salvaged unusable materials

**High** – Complex, long length (> 5 miles), and/or multi-staged grading project with significant earthwork including EBS, rock, or marsh excavation

* + - 1. 786.3 Prepare Estimate Documentation Report/Determine unit prices

Determining unit prices includes reviewing estimating tools such as Estimator, Bid Express, WisDOT Estimating website, past bid results and Statewide average unit prices for each bid item to determine a project specific unit price; using cost based estimating for atypical bid items; determining significant bid items and using multiple estimating tools and resources to determine final unit prices for these significant items.

Preparing the Estimate Documentation Report includes writing and preparing an item level documentation for significant items, asphalt items, lump sum items, SPV items, items with no Estimator history, or where Estimator unit prices are not used; writing and preparing an Estimate Documentation Report including project information, executive summary, estimator parameters, unit price documentation of significant items, and estimate review summary. Includes independent review by experienced personnel.

Determining unit prices and preparing documentation for structures items is included within this task. This effort is anticipated to be completed by the structural engineer (Project engineer) calculating the structure quantities.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineering Technician – Entry, Civil Engineering Technician – Mid, Civil Engineering Technician – Senior, Admin Assistant

**Low** – Small rural projects with a limited number of bid items; minimum number of SPV items; standard construction factors

**Medium** – Typical rural state highway, medium volume urban highway, or expressway with average number of bid items; average number of SPV items; some construction factors adding complexity (e.g. night work).

**High** – Complex, multi-staged project with significant number of bid items; higher number of SPV items; multiple construction factors such as night work, staging, contract duration that impact unit prices.

* + - 1. 786.4 Prepare non-delivery cost (Estimator/Trns.port PES estimate)

Preparing the non-delivery cost includes preparing an estimate and developing a proposal in preparation for PS&E submittal. This task involves entering project information, categories, and bid items into Estimator. Also includes uploading the Estimator file to Trns.port, checking/changing/adding information in Trns.port, and then creating a proposal.

Civil Engineer – Entry, Civil Engineer – Project, Civil Engineer – Project Manager, Civil Engineering Technician – Entry, Civil Engineering Technician – Mid, Civil Engineering Technician – Senior

**Low** – Small rural projects with a limited number of bid items

**Medium** – Typical rural state highway, medium volume urban highway, or expressway with average number of bid items

**High** – Complex, multi-staged project with significant number of bid items

###### 856 Develop PSE Documents *(7/17/16)*

* + - 1. 856.1 Develop special provisions

Include special directions or project specific requirements that are not otherwise satisfactorily specified or stated in the Standard Specifications for Highway and Structure Constructions

Project engineer and administrative assistant, with review by Project Manager

**Low** – projects with low complexity, simple traffic staging that use contract items directly from the spec book, with few or no additions or modifications, and few non-standard detail drawings.

**Medium** – projects with moderate complexity, some traffic staging, some items that are not standard items from the spec book but need to be added, or modified, a moderate number of non-standard detail drawings. May also include specialty projects with non-roadway work that require the writing of specifications not currently a part of the standard spec book, but may be part of the STSP’s.

**High** – projects with high complexity, multiple traffic stages, non-roadway type projects, local utility work included with plan, have items that that are not standard items from the spec book but need to be added, or modified, a large number of non-standard detail drawings. May also include specialty projects with non-roadway work that require the writing of specifications not currently a part of the standard spec book, but may be part of the STSP’s.

* + - 1. 856.2 Develop construction time chart

The construction operations for a project should be analyzed in sufficient detail to determine a reasonable contract time. Contract time can be set up on the basis of working days, calendar days, or by specifying a completion date. The analysis should take into account type of work, time of year, production rates, time for curing, environmental constraints, utility constraints, traffic issues, time sensitive events, work operation efficiencies, and other considerations. The analysis may be done using bar chart, linear schedule, or CPM methodologies but the delivered document will be in a standard bar chart format as specified in the FDM

Project engineer with review by Project Manager

**Low** – projects with low complexity, simple traffic staging, and a smaller number of contract items.

**Medium** – projects with moderate complexity, work operations in multiple stages, may include some interim completion dates, constrained construction time,

**High** – projects with high complexity, work operations in multiple stages, multiple years, multiple I.D.’s, and may include interim completions dates, constrained construction times, higher production rates, night operations, and other factors. The contract time analysis for these projects typically cannot be analyzed with a simple bar chart.

* + - 1. 856.3 Develop certificate of right of way

Complete a certificate that provides data relative to status of real estate acquisition for a project.

Real estate agent, and administrative assistant with review and signature by Project Manager

**Low** – Projects with no right of way purchase.

**Medium** – Projects with less than 18 parcels

**High** – Projects with more than 18 parcels

* + - 1. 856.4 Develop Utility status report

Complete a certificate that provides data relative to utility facilities within the project and the status of utility parcels and agreements.

Project engineer (utilities), and administrative assistant with review and signature by Project Manager

**Low** – Projects with no utility parcels, or no effect on utilities.

**Medium** – Projects with utility work plans turned in and complete

**High** – Projects complex utility work plans, significant utility parcels/agreements, or multiple construction I.D. numbers

* + - 1. 856.5 Develop Certification of Railroad Coordination

Complete a certificate that provides data relative to railroad facilities within the project and the status of railroad parcels and agreements. This is required for all projects.

Project engineer

**Low** – Projects with no railroad impact.

**Medium** – Projects with railroad impact

**High** – Projects with railroad impact

* + - 1. 856.6 Develop Governors Bond - DT25

Complete the Governors Bond form

Project engineer, and administrative assistant

**Low** – Project with a single project I.D.

**Medium** – Project with three project I.D.’s

**High** – Project with more than three project I.D.’s

* + - 1. 856.7 Develop highway work proposal

Complete the highway work proposal form

Project engineer, and administrative assistant

**Low** – Project with a single project I.D.

**Medium** – Project with three project I.D.’s

**High** – Project with more than three project I.D.’s

* + - 1. 856.8 Develop plan letter

Complete the plan letter for the project. Its objective is to provide BPD the information required to authorize the plan and process the PS&E without delays. It also informs others within the department of the transmittal and its general concepts.

Project engineer and administrative assistant

**Low** – Simple project with few special provisions

**Medium** – Project of moderate complexity

**High** – Project of high complexity

* + - 1. 856.9 Develop news release form

Compete the news release form to provide communications staff at WisDOT information to provide the media

Project engineer and administrative assistant

**Low** – Simple project with few special provisions

**Medium** – Project of moderate complexity

**High** – Project of high complexity

* + - 1. 856.10 Develop notes to construction engineer

Document design assumptions, comments, important details, and other information during the design process and compile them into a document for the construction engineer to aid him or her in the construction of the project

Project engineer

**Low** – Project of low complexity

**Medium** – Project of medium complexity

**High** – Project of high complexity

* + - 1. 856.11 Develop Region Specific PS&E Documents

Project engineer

**Low** – Project of low complexity

**Medium** – Project of medium complexity

**High** – Project of high complexity

* + - 1. 856.12 AutoCAD Civil 3D Project Data Submittal

Submit the entire Civil 3D project as a single zipped file in accordance with FDM 19-10-43.3.1. Prepare a meta-data document that lists the files contained in the zipped file.

Project engineer, CADD technician, engineering technician

**Low** – Low complexity project without staging and limited number of surfaces (< 5).

**Medium** – Average complexity project with staging and average number of surfaces (between 5 and 20)

**High** – Complex project with multiple stages and high number of surfaces (>20)

* + - 1. 856.13 Project Archive

Upon receipt of electronic project data, complete the Civil 3D Electronic Data Checklist (See FDM 1-10-43 Attachment 43.2) Store the project data in a project directory in the CADDs Filing Cabinet where it can later be checked out for use by WisDOT personnel. Includes providing a letter to the consultant confirming receipt and acceptance of the data.

Project engineer, CADD technician, engineering technician

**Low** – Low complexity project without staging and a limited number of alignments and surfaces (< 5).

**Medium** – Average complexity project with staging and average number of alignments and surfaces (between 5 and 20)

**High** – Complex project with multiple stages and high number of alignments and surfaces (>20)

* + - 1. 856.14 Contractor Data Packet

Provide a Contractor Data Packet for each LET project in accordance with FDM 19-10-43.10. Data required is based on project type as detailed in Table 43.4 in FDM 19-10-43. Includes exporting and preparing specified file types (i.e. LandXML, Basic AutoCAD files, CSV files, Datum surface slope stake reports). Includes copying files to electronic media and checking the data for accuracy before delivery to the Region.

Project engineer, CADD technician, engineering technician

**Low** – Low complexity project without staging and a limited number of alignments and surfaces (< 5).

**Medium** – Average complexity project with staging and average number of alignments and surfaces (between 5 and 20)

**High** – Complex project with multiple stages and high number of alignments and surfaces (>20)

* + - 1. 856.15 Create Standard Detail Spreadsheet

The Standard Detail Drawings (SDDs) must be specified in the SDD spreadsheet and the spreadsheet must accompany the EPlan as an additional exhibit.

Project engineer, CADD technician, engineering technician

**Low** – non-complex project with no staging

**Medium** – project of medium complexity with some staging

**High** – project of high complexity with multiple stages

* + - 1. 856.16 Prepare e-plan submittal

Prepare the EPlan submittal in accordance with the FDM chapter 19.

Project engineer, CADD technician, engineering technician

**Low** – non-complex project with single project ID and no plan sections by others

**Medium** – project of medium complexity with more than one project ID and more than one plan sections by others

**High** – project of high complexity with more than two project ID and more than two plan sections by others

##### Data, Survey and Mapping *(8/11/16)*

###### 610 Acquire Aerial Imagery *(6/15/16)*

Flight plan is prepared as well as ground control plan (target document). Regions perform survey work to place and survey ground targets. Result is photography (or digital images if digital camera) which is scanned to create digital files which are processed to create mapping products. Flight plan and target document are done by WisDOT or consultant and checked by WisDOT. Greenie –Photogrammetric Mapping\DTM and LIDAR Product Request

Flight line miles do not equal centerline miles. Consult with an aerial imagery specialist to determine an estimate of flight line miles.

* + - 1. 610.1 Develop flight plans and target document

Flight plans are required to determine altitude and alignment of flight and image locations. Target document shows locations for ground control targets to be placed by surveyors before flight.

Aerial imaging/geospatial specialist

Hours are work hours for 1 flight line mile.

**Low** – 2-4 lanes straight road one direction (N-S), ~500’ each side, no crossing flight lines

**Medium** – Low number of curves, limited number of crossing flight lines.

**High** –Interchanges, intersections, curves, crossing flight lines, proximity to large water bodies, wetlands, large forested areas, and multiple parallel flight lines. Increased difficulty placing targets.

Schedule impact: Without flight plans and target document, aerial imagery cannot be flown and mapping request will be delayed (one year delay for spring flights).

* + - 1. 610.2 Capture aerial imagery

Aerial imagery is captured with a special large format mapping camera from airplane.

Aerial imaging/geospatial specialist, pilot

Hours are work hours for 1 flight line mile.

**Low** – 2-4 lanes straight road one direction (N-S), ~500’ each side, no crossing flight lines

**Medium** – Low number of curves, limited number of crossing flight lines.

**High** – Urban areas with high volume air traffic; multiple crossing flight lines; proximity to large water bodies, wetlands, and large forested areas causing air turbulence.

* + - 1. 610.3 Image processing - film; develop; QA/QC

Aerial imaging/geospatial specialist

Hours are work hours for 1 flight line mile.

**Low** – 2-4 lanes straight road one direction (N-S), ~500’ each side, no crossing flight lines

**Medium** – Low number of curves, limited number of crossing flight lines.

**High** –Interchanges, intersections, curves, crossing flight lines, proximity to large water bodies, wetlands, large forested areas, and multiple parallel flight lines. Increased difficulty placing targets

* + - 1. 610.4 Image processing - digital; initial processing; QA/QC

Aerial imaging/geospatial specialist. Includes: Inspect digital frame thumbnails (low resolution frames) for coverage and quality, download RAW data to shared network, create radiometric profile for post-processing imagery, post-process digital frames, post-process ABGPS/IMU, and quality assurance. Units are based on per project basis.

**Low** – 1-4 flight line miles

**Medium** – 5-15 flight line miles

**High** – 16+ flight line miles

###### 668 Scan Aerial Images *(6/15/16)*

* + - 1. 668.1 Convert film imagery to digital with high resolution scanners

Aerial imaging/geospatial specialist

Hours are work hours for 1 flight line mile.

**Low** – Small project on one roll of film flown in one continuous mission; i.e., 2 hours continuous flight.

**Medium** – Large project on one roll of film with reflights.

**High** – Large project on multiple rolls of film flown on multiple days.

###### 237 Perform Analytical Triangulation *(6/15/16)*

* + - 1. 237.1 Analytical Control

Includes reviewing ground control file for correctness, translating to adjacent coordinate systems, requesting image points.

Geospatial specialist

Hours are work hours for 1 mile of project length.

**Low** – 2-4 lanes straight road one direction (N-S), no crossing flight lines

**Medium** – Limited number of crossing flight lines.

**High** – Crossing flight lines, proximity to large water bodies, wetlands, large forested areas, and multiple parallel flight lines.

* + - 1. 237.2 Softcopy Analytical Triangulation

Photogrammetrists use special software to tie imagery to the ground by measuring elevations and locations of ground control targets. Special software uses algorithms to come up with a solution from which elevations and locations of other items such as road edges, poles, etc., can also be measured. Includes importing imagery, reading terrain points and ground control, processing the bundle adjustment, and preparing summary report.

Geospatial specialist

Hours are work hours for 1 mile of project length.

**Low** – 2-4 lanes straight road one direction (N-S), no crossing flight lines

**Medium** – Limited number of crossing flight lines.

**High** – Crossing flight lines, proximity to large water bodies, large forested areas, and multiple parallel flight lines.

###### 232 Develop Digital Terrain Model (DTM) *(6/15/16)*

* + - 1. 232.1 Create Base Mapping

Task includes the vertical measurement of all existing features, including roads, ditches, buildings, etc., within the limits of the mapping requested by the Region. Measurements consist of break lines and random points.

* + - * 1. 232.1.1 No R/W

Assumes digital terrain width of 300 feet left and right of centerline or 300 feet from outside edge of pavement on multiple lane highways.

Geospatial specialist

Hours are work hours for 1 mile of project length

**Low** - 2 lane road, project site is rural or very few buildings and trees, relatively flat terrain.

**Medium** – 2 to 4 lane road, project site is rural with approximately 20 buildings per mile and scattered trees.

**High** - Multiple lane road, interchanges, numerous intersections, urban project, steep terrain.

* + - * 1. 232.1.2 With R/W

Assumes digital terrain width of 500 feet or more left and right of centerline or 500 feet or more from outside edge of pavement on multiple lane highways.

Geospatial specialist

Hours are work hours for 1 mile of project length

**Low** - 2 lane road, project site is rural or very few buildings and trees, relatively flat terrain.

**Medium** – 2 to 4 lane road, project site is rural with approximately 20 buildings per mile and scattered trees.

**High** - Multiple lane road, interchanges, numerous intersections, urban project, steep terrain.

###### 236 Develop Planimetric Mapping *(6/15/16)*

* + - 1. 236.1 Create base planimetric mapping

Task includes the location of all existing planimetric features, including roads, buildings, fences, utility poles, etc., within the limits of the mapping requested by the Region.

* + - * 1. 236.1.1 No R/W

Assumes mapping width of 300 feet left and right of centerline or 300 feet from outside edge of pavement on multiple lane highways.

Geospatial specialist

Hours are work hours for 1 mile of project length

**Low** - 2 lane road, project site is rural or very few buildings.

**Medium** – 2 to 4 lane road, project site is rural with approximately 20 buildings per mile,

**High** - Multiple lane road, urban project.

* + - * 1. 236.1.2 With R/W

Assumes mapping width of 500 feet or more left and right of centerline or 500 feet or more from outside edge of pavement on multiple lane highways.

Geospatial specialist

Hours are work hours for 1 mile of project length

**Low** - 2 lane road, project site is rural or very few buildings.

**Medium** – 2 to 4 lane road, project site is rural with approximately 20 buildings per mile,

**High** - Multiple lane road, urban project.

###### 665 Edit Mapping and Digital Terrain Model *(6/15/16)*

* + - 1. 665.1 Edit planimetric mapping

Clean line work and review mapping for completeness; review mapping extents; export AutoCAD .dwg files

Geospatial specialist

Hours are work hours for 1 mile of project length.

**Low** - Mapping width is 300 feet left and right, 2 lane road, project site is rural or very few buildings.

**Medium** – Mapping width is 500 feet left and right, 2 to 4 lane road, project site is rural with approximately 20 buildings per mile,

**High** - Urban project with dense buildings and curb and gutter with numerous side roads.

* + - 1. 665.2 Edit digital terrain model (DTM)

Clean line work and review digital terrain model for completeness; review DTM extents; check for obscure, weak, and building areas to be closed polygons; check for crossing break lines; export .SRV file for Civil3D.

Geospatial specialist

Hours are work hours for 1 mile of project length.

**Low** - Digital terrain width is 300 feet left and right, 2 lane road, project site is rural or very few buildings; fairly flat terrain. No or minimal compilation errors.

**Medium** – Digital terrain width is 500 feet left and right, 2 to 4 lane road, project site is rural with approximately 20 buildings per mile. Some compilation errors.

**High** - Urban project with dense buildings and curb and gutter with numerous side roads; steep terrain. Many compilation errors resulting in resets.

###### 669 Develop Digital Orthophotos *(6/15/16)*

* + - 1. 669.1 Develop digital orthophotos

Add description

Aerial imaging/geospatial specialist

Hours are work hours for 1 flight line mile

**Low** – Small project with no bridges.

**Medium** – Project with some curves, crossings, and bridges.

**High** – Project with numerous curves, crossings, and bridges, especially interchanges and long bridges.

* + - 1. 669.2 Develop digital georeferenced imagery

Aerial imaging/geospatial specialist

Hours are work hours for 1 flight line mile

**Low** – Straight or minimal curves requiring one flight line only, urban areas

**Medium** – Few curves requiring no more than several flight lines, mostly urban areas.

**High** – Multiple curves requiring numerous flight lines, rural areas.

###### 373 Acquire Aerial LiDAR *(6/15/16)*

Note: Aerial LiDAR only provides a digital terrain model while aerial imagery can provide a digital terrain model, planimetric mapping and orthophotography. Aerial LiDAR can provide a more accurate digital terrain model than aerial imagery alone. Aerial LiDAR is especially useful in wooded or swampy areas. Aerial imagery is also required whenever aerial LiDAR is requested.

* + - 1. 373.1 Develop flight plans and target document

Lidar/geospatial specialist. Aerial LiDAR from a fixed-wing aircraft. Tasks include project site research to determine number of targets needed and locations of target placement. Units are a per-project basis.

**Low** –no crossing flight lines, limited vegetation, flat terrain

**Medium** – limited number of crossing flight lines, moderate vegetation, moderate terrain

**High** – Urban, crossing flight lines, proximity to large water bodies, multiple parallel flight lines. Increased difficulty placing targets. High vegetation, complex terrain.

* + - 1. 373.2 Collect aerial LiDAR data

Lidar/geospatial specialist, pilot. Includes collection of aerial LiDAR from a fixed-wing aircraft. Units are based on flight line miles.

**Low** – N/A. Time is same for all.

**Medium** – N/A. Time is same for all.

**High** – N/A. Time is same for all.

Schedule impact: Schedule impact: LiDAR should be acquired in the spring, leaf-off state (March – May).

###### 374 Process Aerial LiDAR *(6/15/16)*

* + - 1. 374.1 Data preparation and registration; QA/QC

LiDAR/geospatial specialist. Tasks include quality control of raw LiDAR, calibration and registration of LiDAR to ground control, tiling and formatting LiDAR to prepare point cloud for classification and extraction. Units are based on flight line miles.

**Low –** Rural corridor with relatively low topographic relief and sparse vegetation cover. No crossing flight lines.

**Medium –** Rural or urban corridor with moderate topographic relief and moderate vegetation cover. May include multiple crossing flight lines.

**High –** Rural or urban corridor with substantial topographic relief and dense vegetation cover. Typically includes multiple crossing flight lines.

* + - 1. 374.2 Process data and create deliverables; QA/QC

Processing of LiDAR includes point cloud classification and extraction of DTM and planimetric features. Preparation of deliverables includes design file drawings and Civil3D surface models, and point cloud. Units are based on project centerline miles (assumes project is based on corridors < 1000-ft wide).

**Low –** Rural, two-lane corridor with at-grade crossing roads. No curb and gutter.

**Medium –** Divided highways with interchanges and bridge decks (including overpasses and underpasses). No, or limited, curb and gutter.

**High –** Urban environment which includes divided highways with 2 or more lanes per direction of travel, complex interchanges, and multiple bridge decks (including overpasses and underpasses).

###### 375 Acquire Static LiDAR *(6/15/16)*

* + - 1. 375.1 Develop scan positions and target document

LiDAR/geospatial specialist

Hours are work hours for 1 mile of project length

**Low** – No or very few side roads, no or very few bridges.

**Medium** – Some side roads, several bridges.

**High** – Many side roads, multiple bridges.

* + - 1. 375.2 Collect scan data and images

LiDAR/geospatial specialist

Hours are work hours for 1 mile of project length

**Low** – Rural, no or very few side roads, small projects such as 1 bridge or intersection.

**Medium** – Semi-dense urban areas with relatively few side roads, projects with several bridges or intersections.

**High** – Very dense urban areas with many side roads, bridges and/or intersections.

###### 376 Process Static LiDAR *(6/15/16)*

* + - 1. 376.1 Data preparation and registration; QA/QC

Includes loading final control data, tying scans to control, coloring scans, exporting LAS files, tiling data.

LiDAR/geospatial specialist

Hours are work hours for 1 mile of project length

**Low** – Small projects, no or very few side roads

**Medium** – Medium size projects with some side roads

**High** – Large, complex projects with many side roads, interchanges.

* + - 1. 376.2 Process data and create deliverables; QA/QC

Extraction of all plan and DTM features, creation of bare earth and model key points, creation of index file with all scan and photo locations, export of final data to .dgn file.

LiDAR/geospatial specialist

Hours are work hours for 1 mile of project length

**Low** – Small projects, no or very few side roads, width limited to back of curb to back of curb, rural areas.

**Medium** – Medium size projects with some side roads, width from building face to building face, semi-urban areas with few buildings or downtown areas.

**High** – Large, complex projects with many side roads, interchanges, very dense urban areas with many buildings.

###### 377 Acquire Mobile LiDAR *(6/15/16)*

* + - 1. 377.1 Develop drive paths and target document

Survey coordinator, department manager, possibly senior surveyor. Tasks include project site research to determine drive lines needed. Units are per-project basis.

**Low** – Rural, two-lane corridor with at-grade crossing roads

**Medium** – Divided highways with four or more lanes with crossing roads and/or interchanges. Includes centerline of both directions of travel plus centerline miles of crossing roads in the estimate.

**High** – Urban environment with high traffic volume, divided highways with four or more lanes, and complex interchanges. Work hour restrictions on highway may apply. Include centerline of both directions of travel plus centerline miles of crossing roads in the estimate.

Schedule impact: Mobile LiDAR data cannot be acquired without developing the drive paths and target document, causing delays to the project.

* + - 1. 377.2 Collect scan data and images

LiDAR/geospatial specialist, technician (driver). Units are based on centerline miles. For divided roads include centerline of both directions of travel plus centerline miles of crossing roads in the estimate.

**Low** – Rural, two-lane corridor with at-grade crossing roads.

**Medium** – Divided highways with four or more lanes with crossing roads and/or interchanges. Includes centerline of both directions of travel plus centerline miles of crossing roads in the estimate.

**High** – Urban environment with high traffic volume, divided highways with four or more lanes, and complex interchanges. Include centerline of both directions of travel plus centerline miles of crossing roads in the estimate.

Schedule impact: Mobile LiDAR deliverables cannot be created without collecting the scan data and images, causing delays to the project.

###### 378 Process Mobile LiDAR *(6/15/16)*

* + - 1. 378.1 Data preparation and registration; QA/QC

LiDAR/geospatial specialist. Units are based on centerline miles. For divided roads include centerline of both directions of travel in the estimate.

**Low** – Rural, two-lane corridor with at-grade crossing roads.

**Medium** – Divided highways with four or more lanes with crossing roads and/or interchanges. Includes centerline of both directions of travel plus centerline miles of crossing roads in the estimate.

**High** – Urban environment with high traffic volume, divided highways with four or more lanes, and complex interchanges. Include centerline of both directions of travel plus centerline miles of crossing roads in the estimate.

Schedule impact: Mobile LiDAR deliverables cannot be created without data preparation and registration, causing delays to the project.

* + - 1. 378.2 Process data and create deliverables; QA/QC

LiDAR/geospatial specialist. Processing of LiDAR includes point cloud classification and extraction of DTM and planimetric features within 30-70-ft beyond outside edge of pavement. Preparation of deliverables includes design file drawings (.dgn) of dtm and planimetrics, Civil3D surface model, digital images, model key points, and creation of index file with all scan and photo locations. Units are based on centerline miles. For divided roads include centerline of both directions of travel in the estimate.

**Low** – Rural, two-lane corridor with at-grade crossing roads. No curb and gutter.

**Medium** – Divided highways with four or more lanes with crossing roads and/or interchanges. Includes centerline of both directions of travel plus centerline miles of crossing roads in the estimate.

**High** – Urban environment with high traffic volume, divided highways with four or more lanes, and complex interchanges. Include centerline of both directions of travel plus centerline miles of crossing roads in the estimate.

Schedule impact: Mobile LiDAR deliverables cannot be created without processing the data, causing delays to the project.

###### 379 Merge LiDAR Data *(6/15/16)*

* + - 1. 379.1 Develop boundary between data types; delete unneeded data

LiDAR/geospatial specialist

Hours are work hours for 1 mile of project length

**Low** – Merging data from only 2 data sources, rural

**Medium** – Merging data from only 2 data sources, urban

**High** – Merging from more than 2 data sources with complex boundaries, data sources collected at different times

* + - 1. 379.2 Create deliverables; QA/QC

LiDAR/geospatial specialist

Hours are work hours for 1 mile of project length

**Low** – Merging data from only 2 data sources, rural

**Medium** – Merging data from only 2 data sources, urban

**High** – Merging from more than 2 data sources with complex boundaries, data sources collected at different times

###### 382 Setup Survey Project *(8/24/16)*

* + - 1. 382.1 Fill out "Greenie" request form

Designers need mapping – ask survey coordinator for flight and/or LiDAR scanning. Survey coordinators fill out “Greenie” request form to list specifics of project – types of mapping needed, limits, small location map, and dates of need.

Survey coordinator, Region project engineer

Hours are work hours required to fill out each form

**Low** – Small projects, no or very few side roads

**Medium** – Medium size projects with some side roads

**High** – Large, complex projects with many side roads, interchanges.

Schedule impact: If “Greenie” is not submitted, request for mapping products will be delayed. November 1 deadline for spring flight for aerial imagery (delay is one year to following spring) and aerial LiDAR. August 21 deadline for fall flight for aerial imagery (lower accuracy for planning only) (delay is to next spring or following fall). Static and mobile LiDAR mapping products should be requested at least 2 months in advance, depending on project size and type.

* + - 1. 382.2 For aerial photography flights

Includes office activities: Review target document; landowner contact and coordination; assemble materials and build hard target templates and soft targets.

Survey coordinator, department manager, possibly senior surveyor

Hours are work hours for each project

**Low** – Small projects with low number of targets; urban with lots of pavement; few landowners.

**Medium** – Medium size projects; semi-rural or semi-urban.

**High** – Large projects with many targets; mostly rural but also urban with many landowners.

* + - 1. 382.3 For aerial LiDAR

Survey coordinator, department manager, possibly senior surveyor. Tasks include project site research to determine number of targets needed and locations for target placement. Units are per-project basis.

**Low** – no crossing flight lines, limited vegetation, flat terrain.

**Medium** – limited number of crossing flight lines, moderate vegetation, moderate terrain.

**High** – Urban, crossing flight lines, proximity to large water bodies, multiple parallel flight lines. Increased difficulty placing targets. High vegetation, complex terrain.

* + - 1. 382.4 For mobile LiDAR

Survey coordinator, department manager, possibly senior surveyor. Tasks include project site research to determine number of targets needed and locations of target placement. Units are per-project basis.

**Low** – Rural, two-lane corridor with at-grade crossing roads.

**Medium** – Divided highways with interchanges and bridge decks (including overpasses and underpasses). Wide and accessible shoulders.

**High** – Urban environment with increased difficulty placing targets. May include: divided highways with 2 or more lanes per direction of travel, complex interchanges, narrow or non-existent road shoulders, and multiple bridge decks (including overpasses and underpasses).

* + - 1. 382.5 For static LiDAR

Survey coordinator, department manager, possibly senior surveyor. Tasks include project site research to determine number of targets needed and locations of target placement. Units are per-project basis.

**Low** – Project corridor does not include overpass or bridge structures. Static LiDAR set-ups needed every 200-ft on alternating sides of the corridor to achieve appropriate point cloud coverage.

**Medium** – Project corridor includes overpass or bridge structures. Static LiDAR set-ups needed every 100-ft on alternating sides of the corridor and top/bottom of bridge structures to achieve appropriate point cloud coverage.

**High** – Project corridor includes overpass or bridge structures. Static LiDAR set-ups needed every 50-ft on alternating sides of the corridor and top/bottom of bridge structures to achieve appropriate point cloud coverage.

###### 381 Place and Survey Targeting *(6/15/16)*

* + - 1. 381.1 Targeting for aerial photography and aerial LiDAR

Includes placing soft (plastic) or hard (paint) targets on the ground or photo identifiable object, occupying for horizontal and vertical values, revisiting targets prior to flight for refreshing, removing soft targets after flight.

Survey coordinator, department manager, possibly senior surveyor

Hours are work hours for 1 flight line mile

**Low** – Urban with lots of pavement, hard surfaces; numerous intersecting roads, interchanges; low difficulty placing targets.

**Medium** – Semi-urban, semi-rural; mixed hard surfaces and vegetation; moderate difficultly placing targets.

**High** – Rural; livestock present; access barriers such as fences; trees; landowner concerns; increased difficulty placing targets.

* + - 1. 381.2 Targeting for static LiDAR

Survey coordinator, department manager, possibly senior surveyor. Tasks include: Place and measure targets that encompass project area by traversing and leveling from primary control; place targets as data collection takes place to allow adequate stitching of final point cloud; process target control data and provide datasheets and KMZ on targets measured. Unit rate is 1 acre.

**Low** –Project corridor does not include overpass or bridge structures. Static LiDAR set-ups needed every 200-ft on alternating sides of the corridor to achieve appropriate point cloud coverage.

**Medium** – Project corridor includes overpass or bridge structures. Static LiDAR set-ups needed every 100-ft on alternating sides of the corridor and top/bottom of bridge structures to achieve appropriate point cloud coverage.

**High** – Project corridor includes overpass or bridge structures. Static LiDAR set-ups needed every 50-ft on alternating sides of the corridor and top/bottom of bridge structures to achieve appropriate point cloud coverage.

* + - 1. 381.3 Targeting for mobile LiDAR

Survey coordinator, department manager, possibly senior surveyor. Target material may be traffic paint, traffic tape, or image points (identifiable in the LiDAR intensity). Tasks include place and measure targets by GPS/GNSS RTK VRS methods and digital leveling from primary control (total station for vertical values in certain instances); process target control data; and provide KMZ on targets measured. Units are based one-mile, corridor centerline length. Units are based on centerline miles. For divided roads include centerline of both directions of travel in the estimate.

**Low** – Two-lane rural state highway with at grade road crossings every half mile. Assume 500’ each direction from mainline for the side roads.

**Medium** – Divided highways with interchanges and bridge decks (including overpasses and underpasses). Wide and accessible shoulders.

**High** – Urban environment with increased difficulty placing targets. May include: divided highways with 2 or more lanes per direction of travel, complex interchanges, narrow or non-existent road shoulders, and multiple bridge decks (including overpasses and underpasses). Traffic control may be required but not included in hours shown. Work hour restrictions on highway may apply.

###### 666 Establish Project Control *(8/11/16)*

* + - 1. 666.0 Includes activities related to establishing project control.
      2. 666.1 Set horizontal and vertical control for GPS or other conventional methods
         1. 666.1.1 Set project control

**Low** –

**Medium** –

**High** –

* + - * 1. 666.1.2 Set project benchmarks

**Low** –

**Medium** –

**High** –

* + - * 1. 666.1.3 Create control tie sheets

**Low** –

**Medium** –

**High** –

* + - * 1. 666.1.4 Set project reference points

**Low** –

**Medium** –

**High** –

* + - * 1. 666.1.5 GPS observation

**Low** –

**Medium** –

**High** –

* + - * 1. 666.1.6 Total station observations (closed traverse)

**Low** –

**Medium** –

**High** –

* + - * 1. 666.1.7 Perform leveling (closed traverse)

**Low** –

**Medium** –

**High** –

* + - 1. 666.2 Replace Height Modernization geodetic survey control
         1. 666.2.1 Perform geodetic survey control station reconnaissance

Work includes finding new, suitable location for a replacement geodetic survey control station, mobilization, collecting nearby location ties, Diggers Hotline – Planning Ticket call-in and verification.

**Low** – Minor mobilization efforts, no trees or other obstructions in area of interest to consider, call in Diggers Planning ticket, check Diggers Planning ticket – no utility conflicts.

**Medium** – Medium mobilization efforts, some trees or other obstructions in area of interest to consider, call in Diggers Planning ticket, check Diggers Planning ticket – minor utility conflicts requiring nearby relocation.

**High** – Large mobilization efforts, major forest or other obstructions in area of interest requiring more time to find suitable location, call in Diggers Planning ticket, check Diggers Planning ticket – major utility conflicts requiring new Diggers Planning ticket due to relocation.

Surveyor Crew Chief

* + - * 1. 666.2.2 Install geodetic survey control station

Work includes Diggers Hotline – Dig Ticket call-in and verification, mobilization, traffic control if applicable, auger/drill hole to an approximate 8 foot depth, pour and finish concrete, install bronze disk and witness posts and site restoration.

**Low** – Minor mobilization efforts with no utility conflicts upon site arrival, no rocks or other obstructions encountered during auger/drill operations with simple site restoration.

**Medium** – Minor mobilization efforts with minor utility conflicts upon site arrival, various rocks or other obstructions encountered upon auger/drill operations, minor site restrictions for concrete pour and restoration.

**High** – Minor/Major mobilization efforts with major utility conflicts upon site arrival requiring possible new Diggers Hotline call-in, many rocks or other obstructions encountered during auger/drill operations, major site restrictions for concrete pour and site restoration.

Surveyor Technician and Project Surveyor

* + - * 1. 666.2.3 Develop a geodetic survey control station description

Work includes mobilization, collecting and verifying location ties, describing geodetic survey control station location and features and taking National Geodetic Survey (NGS) photographs.

**Low** – Minor mobilization with simple location ties to nearby features.

**Medium** – Minor/Major mobilization with simple/complex location ties to nearby features.

**High** – Major mobilization with complex location ties to nearby features.

Surveyor Technician

* + - * 1. 666.2.4 Perform Second Order, Class 1 geodetic leveling (double-run)

Work includes mobilization performing Second Order, Class 1 geodetic leveling to NGS specifications.

**Low** – Minor mobilization to rural environment along low traffic corridor with low elevation changes and normal weather conditions.

**Medium** – Minor/Major mobilization to rural/urban environment along average traffic corridor with minimal elevation changes and small durations of inclement weather conditions.

**High** – Major mobilization to urban environment along heavy traffic corridor with large elevation changes and large durations of inclement weather conditions.

Surveyor Technician(s) and Surveyor Crew Chief

* + - * 1. 666.2.5 Perform static GPS observations to National Geodetic Survey (NGS) standards

Work includes mobilization and collecting GPS observations conforming to NGS standards.

**Low** – Minor mobilization with normal weather conditions.

**Medium** – Minor/Major mobilization with small durations of inclement weather conditions.

**High** – Major mobilization with large durations of inclement weather conditions.

Surveying Technician, Surveyor Crew Chief and Project Surveyor

* + - * 1. 666.2.6 Perform data post-processing, analysis, adjustment for acceptance and inclusion into the National Spatial Reference System (NSRS)

Work includes post-processing, analyzing and adjusting geodetic data for future publication into the NSRS.

**Low** – Clean data with negligible to minimal errors.

**Medium** – Semi-clean data with minimal to significant errors requiring possible re-leveling or re-observations.

**High** – Poor data with significant errors requiring re-leveling or re-observations.

Surveyor Crew Chief, Project Surveyor and Surveying Department Manager

* + - 1. 666.3 Specialty - Wisconsin height modernization program

**Low** –

**Medium** –

**High** –

* + - 1. 666.4 Specialty - Geodetic services

**Low** –

**Medium** –

**High** –

###### 723 Conduct and Process Existing Field Survey *(6/15/16)*

* + - 1. 723.0 Survey of existing surface, utilities, storm sewer; process data; and create existing surface model.
      2. 723.1 Review plans and as-builts

**Low** – Project is short in length (0-5 miles). As built is newer than 10 years old and has correct datums noted.

**Medium** – Project is medium in length (6-10 miles). As built may be older than 10 years old and may have multiple lanes.

**High** – Project is long in length (11 or more miles). As built may be many pages with multiple lanes and details for intersections. More than one as built may be needed to scope project needs.

* + - 1. 723.2 Measure existing centerline

**Low** – Project is short in length (0-5 miles), two lane divided highway with low traffic volume and will be generally in a rural area. Highway will have minimal curves and only require measurements on tangents for at least 70% of the project.

**Medium** – Project is medium in length (6-10 miles), two or more lanes with two way traffic. Traffic volumes will be medium and require a safety flag person. Highway may have multiple curves (50% of project length) requiring measurements on PC’s, PT’s, and Points on Curve and on tangents.

**High** – Project is long in length (11 or more miles), two or more lanes with two way traffic. Traffic volumes will be medium and require a safety flag person. Project may have medians, turn lanes and reference lines that are different than the paving joints. Project may have many curves (50% of project length) requiring measurements on PC’s, PT’s, and Points on Curve and on tangents.

* + - 1. 723.3 Measure existing monumentation

**Low** – Project is short in length, (0-5 miles), has recent platting and monuments are visible with little or no tree canopy. Adjacent properties are large aliquot described properties and not subdivided. Roadway has few curves (less than 25% of length).

**Medium** – Project is medium in length, (6-10 miles), has plat up to 10 years old and 50% of property is easily accessible and has tree canopy on 50% of project. Adjacent properties are combination aliquot, meets and bounds and quasi meets and bounds and possible subdivisions with many property corners. Roadway may have curves more than 25% of project.

**High** – Project is long in length, (11 or more miles), has older plats (older than 10 years old) or multiple plats to locate. Adjacent properties are multiple, subdivided with many different types of descriptions and many corners. Roadway may have many curves more than 25% of project.

* + - 1. 723.4 Existing surface and topographic survey

**Low** – Project is short in length (0-5 miles). Project is only on existing Right of Way and is in an area that has little or no tree canopy. Project is in an unpopulated rural area and does not have many utilities or buildings. Project does not have a waterway in or along project and has less than 5 intersections and is only two lane divided highway.

**Medium** – Project is medium in length (6-10 miles). Project requires data beyond existing Right of Way and is in an area that is populated and has some buildings. Project may have up to 5 stream crossings and have up to 5 intersections. Project may have turn lanes and more than two lanes.

**High** – Project is long in length (11 or more miles). Project requires a multiple lane two way traffic area with more than 5 intersections with turn lanes. Project may be in an urban highly populated area and have many buildings and utilities. Project may have more than 5 stream crossings and require stream surveys.

* + - 1. 723.5 Structure field survey

**Low** – Project has a structure one span with two lane traffic and is a structure rehab and not replacement.

**Medium** – Project has a multiple span multiple lane structure and is a replacement and requires upstream and downstream measurements.

**High** – Project is a complex structure with many spans and piers. Structure will be replaced and need upstream downstream measurements. Structure may be over a major deep and wide river or over a high capacity highway.

* + - 1. 723.6 Call diggers hotline

**Low** – Project is short in length (0-5 miles) and has up to 3 utilities.

**Medium** – Project is medium in length (6-10 miles) and has up to 6 utilities. Project will require one meeting on site

**High** – Project is long in length (11 or more miles) and has more than 6 utilities. Project will require multiple meetings on site to ensure locate areas.

* + - 1. 723.7 Dip manholes and water valves

**Low** – Project is in low traffic volume area and does not require major traffic control.

**Medium** – Project is in medium traffic volume area and requires traffic control.

**High** – Project is in high traffic volume area and requires lane closures and traffic control.

* + - 1. 723.8 Stake marking limits

**Low** – project is less than 1 mile in length.

**Medium** – project is more than 1 mile in length.

**High** – project is long more than 6 miles and requires multiple locations.

* + - 1. 723.9 Photographs

**Low** – Project is 1 – 5 miles.

**Medium** – Project is 6-10 miles and require multiple location photos.

**High** – Project is 11 or more miles and require multiple location photos.

* + - 1. 723.10 Meet with utility locator in field

**Low** – Project is short in length (0-5 miles) and has fewer than three utilities.

**Medium** – Project is medium in length (6-10 miles) and has three to six utilities and requires one to two on site meetings.

**High** – Project is long in length (11 or more miles), and has more than six utilities which require multiple meetings to locate and meet with utility markers.

* + - 1. 723.11 Review 1077 utility facility map

**Low** – Project is short in length (0-5 miles). Has up to three utilities.

**Medium** – Project is medium in length (6-10 miles). Has three to six utilities.

**High** – Project is long in length (11 or more miles). Has more than six utilities.

* + - 1. 723.12 Field survey existing utilities

**Low** – Project is short in length (0-5 miles). Project is only on existing Right of Way and is in an area that has little or no tree canopy. Project is in an unpopulated rural area and does not have many utilities or buildings. Project has less than 5 intersections and is only two lane divided highway.

**Medium** – Project is medium in length (6-10 miles). Project requires data beyond existing Right of Way and is in an area that is populated and has some buildings. Project may have 5 intersections. Project may have turn lanes and more than two lanes.

**High** – Project is long in length (11 or more miles). Project requires a multiple lane two way traffic area with more than 5 intersections with turn lanes. Project may be in an urban highly populated area and have many buildings and utilities.

* + - 1. 723.13 Perform storm sewer structure evaluations (size-depth-invert)

**Low** – Project is in low traffic volume area and does not require major traffic control.

**Medium** – Project is in medium traffic volume area and requires traffic control.

**High** – Project is in high traffic volume area and requires lane closures and traffic control.

* + - 1. 723.14 Process survey data and create existing surface

**Low** – Project is short in length (0-5 miles). Project is only on existing Right of Way and is in an area that has little or no tree canopy. Project is in an unpopulated rural area and does not have many utilities or buildings. Project does not have a waterway in or along project and has less than 5 intersections and is only two lane divided highway.

**Medium** – Project is medium in length (6-10 miles). Project requires data beyond existing Right of Way and is in an area that is populated and has some buildings. Project may have up to 5 stream crossings and have up to 5 intersections. Project may have turn lanes and more than two lanes.

**High** – Project is long in length (11 or more miles). Project requires a multiple lane two way traffic area with more than 5 intersections with turn lanes. Project may be in an urban highly populated area and have many buildings and utilities. Project may have more than 5 stream crossings and require stream surveys.

* + - 1. 723.15 Field notes

**Low** – Project is short in length (0-5 miles). Project is only on existing Right of Way and is in an area that has little or no tree canopy. Project is in an unpopulated rural area and does not have many utilities or buildings. Project does not have a waterway in or along project and has less than 5 intersections and is only two lane divided highway.

**Medium** – Project is medium in length (6-10 miles). Project requires data beyond existing Right of Way and is in an area that is populated and has some buildings. Project may have up to 5 stream crossings and have up to 5 intersections. Project may have turn lanes and more than two lanes.

**High** – Project is long in length (11 or more miles). Project requires a multiple lane two way traffic area with more than 5 intersections with turn lanes. Project may be in an urban highly populated area and have many buildings and utilities. Project may have more than 5 stream crossings and require stream surveys.

* + - 1. 723.16 Measure/map existing drainage features

**Low** – Project is short in length (0-5 miles). Project is only on existing Right of Way and is in an area that has little or no tree canopy. Project is in an unpopulated rural area and does not have many utilities or buildings. Project does not have a waterway in or along project and has less than 5 intersections and is only two lane divided highway.

**Medium** – Project is medium in length (6-10 miles). Project requires data beyond existing Right of Way and is in an area that is populated and has some buildings. Project may have up to 5 stream crossings and have up to 5 intersections. Project may have turn lanes and more than two lanes.

**High** – Project is long in length (11 or more miles). Project requires a multiple lane two way traffic area with more than 5 intersections with turn lanes. Project may be in an urban highly populated area and have many buildings and utilities. Project may have more than 5 stream crossings and require stream surveys.

* + - 1. 723.17 Traffic control for survey

Does not include railroads.

**Low** – Included a flag person with a sign. Not heavy traffic and slow moving.

**Medium** – Advanced warning signs and flag person needed. Medium speed traffic.

**High** – High traffic area, lane restrictions with signs and flag person.

* + - 1. 723.18 Create deliverables in Civil 3D

**Low** – Project is short in length (0-5 miles). Project is only on existing Right of Way and is in an area that has little or no tree canopy. Project is in an unpopulated rural area and does not have many utilities or buildings. Project does not have a waterway in or along project and has less than 5 intersections and is only two lane divided highway.

**Medium** – Project is medium in length (6-10 miles). Project requires data beyond existing Right of Way and is in an area that is populated and has some buildings. Project may have up to 5 stream crossings and have up to 5 intersections. Project may have turn lanes and more than two lanes.

**High** – Project is long in length (11 or more miles). Project requires a multiple lane two way traffic area with more than 5 intersections with turn lanes. Project may be in an urban highly populated area and have many buildings and utilities. Project may have more than 5 stream crossings and require stream surveys.

* + - 1. 723.19 Reduce field notes

**Low** –

**Medium** –

**High** –

* + - 1. 723.20 Level 1500 feet upstream and downstream from structure

Task includes leveling upstream or using GPS elevations where applicable.

Hours are work hours for 0.1 mile of project drainage length

**Low** - Drainage site is Rural and generally open site suitable for VRS surveying with a shallow (can be crossed with knee high boots) water depth or dry channel typically less than 20 feet wide

**Medium** - Drainage site is residential, has a moderate (can be safely crossed with chest wades) water depth typically less than 50 feet wide, moderate surrounding terrain with partially open site suitable for some potential VRS surveying

**High** - Drainage site is urban, with significant or unknown water depth requiring the use of a boat and special hydrographic surveying techniques, typically greater than 50 feet wide, with steep banks, moderate surrounding terrain with dense vegetation not suitable for VRS surveying

* + - 1. 723.21 Measure structure clearances

**Low** – Small structure with 6 or less girders over less dangerous crossings and can be reached easily.

**Medium** – Medium sizes structure over low traffic roadway or slow moving stream. Can be accessed easily.

**High** – Large multiple structure with many obstacles and high traffic or water. Area is not easily accessible or may include railroads.

* + - 1. 723.22 Measure water and high water elevations

**Low** – Small structure with 6 or less girders over less dangerous crossings and can be reached easily.

**Medium** – Medium sizes structure over low traffic roadway or slow moving stream. Can be accessed easily.

**High** – Large multiple structure with many obstacles and high traffic or water. Area is not easily accessible or may include railroads.

* + - 1. 723.23 Create stream cross sections

**Low** – Small structure with 6 or less girders over less dangerous crossings and can be reached easily.

**Medium** – Medium sizes structure over low traffic roadway or slow moving stream. Can be accessed easily.

**High** – Large multiple structure with many obstacles and high traffic or water. Area is not easily accessible or may include railroads.

* + - 1. 723.24 Railroad Profile Survey

**Low** –

**Medium** –

**High** –

###### 726 Survey Existing and Proposed Right of Way *(6/27/16)*

* + - 1. 726.0 Develop existing and proposed right-of-way; temporary staking, and permanent property pins.

This is an all-encompassing task, similar to saying we need a right of way plat or TPP. As such it combines many other tasks that themselves are included in one or more sections of the spread sheet and will not be treated as its own task per say.

**Low** – Bridge replacement survey or other site improvement where the project limits are generally less than a quarter mile in length. These projects usually only impact a handful of owners and require minimal title reports and record research.

**Medium** – Design projects between a quarter mile and a mile in length, generally along one road and if there are any intersecting side roads, their design does not require survey much more than about 400 feet along those roads. These projects generally require moderate records research, field survey using 1 or 2 person crews, and up to 100 title reports.

**High** – Large design projects more than a mile in total length and generally include multiple intersecting side roads and often design on new relocation. This requires additional survey research in harder to reach locations and staking that generally require 2-person crews to enable points to be shot and later set in locations that can vary from urban to brush and woods, all of which are not really GPS or even robotic friendly. Traffic control safety procedures add to the cost and manpower needed. These projects usually require extensive survey research and can require hundreds of title reports to coordinate, purchase and review. Urban design and those involving interchanges with multiple alignments including ramps increase the level of difficulty.

* + - 1. 726.1 Measure existing right of way and property monumentation

Similar to or the same as 726.10. Tasks include: contacting owners prior to the survey to inform them that surveyors will be onsite to locating property irons and right of way markers. Typical survey will use a 1 or 2 person survey crew though more may be required if site safety is an issue.

Classifications used: Instrument Person / field tech, Field Survey Party Chief, and often the Department Manager to coordinate public outreach prior to looking for irons along property boundaries.

Units: hours (per person) per 1/4 mile. This is one of the more common segments on a TPP sheet between match lines.

**Low** – Same as the low level effort on 726.0 above. Locating the irons can often be done with a 1-person crew using GPS or a robot. A 2-person crew may be needed in areas with heavy vegetation.

**Medium** – Similar to the medium effort on 726.0 above. Urban projects always take more time to field survey as the irons tend to be buried, disturbed, or in areas where survey is difficult including parking lots and along or inside fenced-in areas. A 2-person crew is often required to ensure that tough shots can be picked up while the crew is on-site.

**High** – Same as high effort on 726.0 above. Survey is often required away from the road. Parking and survey safety is more of an effort for research. Field survey normally involves a 2 person crew to help with tough shots. A third person can assist with the equipment and safety equipment such as signs, cones, flagging, etc.

* + - 1. 726.2 Measure evidence of occupation

This is often not a separate task. but would be included either as part of the design topo survey when fences and other topo items are located or as a specific task as part of 726.2 above and then only for specific situations where encroachments or other title issues may be in play based on information provided by the project manager or owners in the field.

Classifications used: Instrument Person / Field Tech, Party Chief and probably Project Surveyor and / or Department Manager.

Units: hours (per person) per 1/4 mile

**Low** – One or two parcels in a rural setting. Maybe an encroaching fence line.

**Medium** – A handful of locations but still adjacent to and within the limits of the design field survey. One or two section corners that cannot be found and occupation evidence will help reduce the search window.

**High** – Known issues come to light such as feuding between neighboring parcels, adverse possession issues, or when irons are found in locations that do not fit occupation. The project surveyor or department manager will be involved with these situations to investigate the possible legal implications.

* + - 1. 726.3 Measure government corners and ties

Like everything in the survey world this is a variable task and totally dependent on the status of that particular counties past perpetuation success or not. Some counties have maintained a successful program for decades and most if not all corners are in and up to date monument records with county coordinates (or state plane in SEWRPC counties) exist. Other counties have been less proactive and few records exist. These will require a larger investment in effort by the surveyor because they know that many hours may be required to properly reestablish just 1 corner.

Classifications involved: Instrument Person / Field Tech and Party Chief. Project Surveyor will be involved with the coordination and following corner updates and filing with the county as required. Department Manager could be involved if issues arise regarding access and permission to enter private property to locate the corners.

Units: hour each using a combination of classifications as required.

**Low** – Calls to the county or past personal knowledge of the area let you know the corners are intact. Corner record sheets have been properly maintained by surveyors using these corners. They will be relatively easy to survey in with GPS or a robot.

**Medium** – Typical project where two or more corners in any section can be found so that separate corner restoration tasks and associated cost will not be required to complete the design survey.

**High** – Corners are either in a county where little or no corner restoration work has occurred, or in an area where searching for the corners and then being able to tie them in can be very time consuming due to topography such as in dense forested areas, wetlands, farms with free-roaming livestock including bulls, on or near railroad property, and in or near heavily-traveled highways. Looking for corners in many of these areas can create legal or survey safety problems that require extensive pre-mission planning to be safe and successful.

* + - 1. 726.4 Re-establish missing government corners and ties

This task assumes that the corners required for a design project or Transportation Project Plat are missing. They can be lost which infers that all evidence for the corner is gone, or they can be obliterated which means the corner itself is gone but evidence exists allowing its former location to be re-established.

Classifications used: Instrument Person / Field Tech and Party Chief for the field survey, and Project Surveyor to supervise and approve the final work.

Units: hour each using a combination of classifications as required.

**Low** – The corner monument cannot be found but there is a tie sheet on file at the county surveyor’s office or other depository like SEWRPC in the southeastern states. All tie monuments are found intact and in correct relationship as shown on the tie sheet.

**Medium** – The corner is missing and some evidence of the corner is available such as an old tie sheet but missing one or more ties, or a reference to the corner from a previous survey, subdivision, railroad map or right of way plat.

**High** – No evidence of the corner can be found. This will require the methods used to re-establish lost corners per previous Wisconsin court cases be used. Or some evidence may exist but the corner is in a very difficult location to survey. This can be in a central-city location, along or in a high-volume highway, or in difficult topography such as forest, wetlands or some farmland settings. Corners such as these require preliminary research so the cost time involved for their re-establishment can be adequately incorporated into the project budget.

* + - 1. 726.5 Produce tie sheets for government corners

Many corners have an existing tie sheet on file at a public office such as the county court house. These can be updated rather easily depending on field conditions. Other corner tie sheets will be old and the ties missing or disturbed and no longer useful. Those will require drafting and filing a new tie sheet.

Classifications used: Instrument Person / Cadd Tech for drafting and Project Surveyor to stamp, sign and file the tie sheets or affidavit stating that everything was found intact on that particular date.

Units: hours each

**Low** – Existing tie sheet on file. The tie monuments are in place and measure the same. All that is required is a letter sent in stating that the corner was found and all corners were intact and measured the same as shown on the existing tie sheet.

**Medium** – An existing tie sheet exists but the information shown is no longer valid and a new tie sheet needs to be drafted and filed.

**High** – No tie sheet exists so a new one will be drafted and filed from scratch.

* + - 1. 726.6 Research public records

Records research traditionally meant a trip to the county surveyor’s office to manually search their survey records in file cabinets or using micro-fiche technology that was introduced 50 years or so ago. There are now becoming more counties placing much of their surveys of record on-line, some free to the public and others by a nominal subscription service which is practical if you live and work in that county. The older survey records (1800’s county surveyor records, city surveyor field books and the like) generally have to be hand researched and are not likely to be added on line given that they are hard to scan due to their shape and condition of the books, and legibility can be an issue.

Classifications used: Project Surveyor, and Department Manager if issues are discovered.

Units: hours per mile (using whichever classification is best required).

**Low** – Small project like a bridge replacement or intersection design. No right of way anticipated, only enough survey research required to determine limits of existing right of way. Most of the research can be obtained either on line or from phone calls to the local highway department shop or WisDOT plat coordinators. Title reports will probably not be ordered until such time as the design shows the need for additional right of way takings.

**Medium** – Larger project, more the typical design which may be up to a mile in length. The project is likely to be rural but could involve some research in older communities affected by the project. These projects will probably require a trip to the court house along with calls or emails to local highway departments and WisDOT. Title reports will likely be ordered up front and may provide copies of previous conveyance documents, subdivision and CSM copies which would otherwise have to be ordered on line or picked up at the court house. There will almost always be some areas on the project where follow-up research will be necessary to pin down the survey area.

**High** – This type of project typically involves design in and through an old community if in a rural setting, or an older urban setting which means many years of records to search for and then compare in an effort to rectify differences and changes that occur over time. This can also be a project in an areas where almost no records exist, or where the initial records research does not jive with what is shown on line with county or local GIS mapping, or where the record documents do not fit found field evidence and result in multiple encroachments which have to be documented. Surveys in non-sectionalized land parts of the state also result in a higher than normal effort such as on reservation lands, trust lands, French lots such as near Prairie du Chien, and on military reservation like the Fort Howard area near Green Bay. These areas require special knowledge of local survey and history and substantially higher research budgets and dollars. The Department Manager may likely become involved when unusual circumstances arise to let the client know about the possible issues encountered during research that may result in higher than anticipated project costs.

* + - 1. 726.7 Review legal documents

This task can involve reviewing easement documents, highway conveyances, quit claim deeds, mortgages, town road resolutions and laid-out road records, warranty deeds, along with zoning documents and similar restrictions. The more detailed document review is when title reports are needed and then in complex settings

Classifications used: Project Surveyor and / or Department Manager when reviewing difficult or unusual documents.

Units: total hours each

**Low** – No new right of way platting is anticipated. Document review will be limited to existing right of way plats or other simple documents including perhaps a last deed of record to verify current ownership and the current legal description, and those needed to locate section corners that may be disturbed during construction and need to be tied off. This will allow the existing right of way to be determined without the need for parcel research.

**Medium** – This would be a more typical project where both existing and proposed right of way takings are anticipated. Title reports will be ordered but assume they are for parcels in a primarily rural area and are pretty basic. Court house or on-line survey research will be necessary but all records required should be available. Coordinate with the local municipalities and WisDOT for information relating to their right of way and easement documents. Municipalities may be contacted for local subdivision documents. Railroad documents are reviewed but only in a general setting and no issues are anticipated.

**High** – There may be multiple partial conveyances to try and sort out or a layer of deeds to review in which pieces of a parcel have been split off over a long period of time. Tract indexes at the county court house are great and simplify deed research but sometimes research is needed in the grantee-grantor indexes and this is usually tedious and long. This can also include projects where railroad coordination and re-establishing existing railroad properties and ownership is involved as these too involve old records that have likely not been updated in 100 years or more but are still valid and hard to interpret and map.

* + - 1. 726.8 Review plans and as-builts

This task generally involves obtaining and reviewing copies of previous plan profiles, as-built plans, and previous right of way maps.

Classifications used: these tasks could be done by an experienced Party Chief but are more likely handled by the Project Surveyor or Department Manager.

Units: total hours each

**Low** – Existing roadway is likely in a rural setting with few if any changes through the years. The basis of existing right of way is from a basic plan profile or right of way plat with very few bends or curves.

**Medium** – This is a typical project where the basis of existing right of way will be determined from a combination of plan profiles and right of way plats. As-built drawings will probably not be required. Old plans and field notes or as-builts may be needed to review if they were the basis for the original road or when there are discrepancies between documents.

**High** – Typical on a very old project where highway relocations occurred but portions of the existing right of way were apparently retained which prompts a review by all available evidence including the original field books if they were saved, and as-built documents which may show the intentions of the project, whether it be to run the new(er) right of way line along the old right of way line or through it, meaning the intent was to convey in one form or another to the adjacent owner at that time.

* + - 1. 726.9 Review title work

This task is required on all projects where land or easements are anticipated in the project scope. It used to be common for consultants to have to pick and choose between title companies and then sub-contract with them for reports. The FDM used to have a page of “approved” title companies. More common now is for WisDOT to contract directly with the title companies. It is important to know whose responsibility it is, because that coordination can be time consuming in its own right.

Classifications used: Experience in reading and understanding legal documents is necessary so this is the area where a PLS is required.

Units: total hours each

**Low** – No new right of way anticipated, or if so, then perhaps only a few parcels. More likely just TLEs for grading. Last deed of record may suffice.

**Medium** – Typical project, likely in a rural area. 60-year reports with easements are required. These reports tend to be straight forward since often there are no large corporate parcels.

**High** – This will involve a project that is likely in an urban setting or where multiple layers of design with many changes have taken place over a long period of time. The title reports on these sorts of projects tend to be very thick, very complex, and very expensive. Sorting through all of the real estate, mortgage, utility and easement documents can be extremely time consuming but very important so that all pieces of the pie are accounted for. Missing a document can be expensive and lead to amended plats of affidavits of correction being filed or even having to contact the owners a second time and re-record the deed. This is critical when working in areas where the eminent domain process is anticipated or known. Title reports may be required going back 100 years or more in cities or where development has been occurring for many years in order to capture the full chain of title and very old easements.

* + - 1. 726.10 Field locate section corners, block corners, iron pins

This task is very dependent on site conditions, ranging from pretty simple to very difficult.

Classifications used: Party Chief, Project Surveyor or Department Manager depending on the circumstances and experience of available staff.

Units: total hours each based on classifications as required

**Low** – Simple project where no new right of way is anticipated such as a bridge or culvert replacement or maybe a resurfacing project. Only need to locate monuments is to establish the existing right of way line or when there is a chance of disturbing irons during construction and this will allow them to be restored after project completion.

**Medium** – Typical project which can vary in length but where it is anticipated that new right of way or easements will be required from adjoining parcels. Most of the irons and section corners will be along or in the road and relatively easy to access, dig up and then locate.

**High** – Projects requiring a high degree of effort include those in urban areas, especially older parts of well-established cities. Corners can be very difficult to find because they tend to be destroyed, buried or disturbed over time. Multiple (think pin cushion) corner scenarios are common which require additional corners be located to try and sort through which ones to hold. Projects in forested, low areas or farms with cattle and bulls can all take much longer due to the physical factors of getting on the parcel, moving around, and then finding evidence of the corners. Projects in the southwestern part of the state often require much more searching for section corners given they were some of the first to be set, and they often used wood posts which have long since vanished. They can require searching for additional corners as a way to determine the required corner. It may be prudent to do some limited court house research prior to even putting a budget together so as to have a better understanding of what will be involved and then convey that information during negotiations where those hours can be captured. Corners that lie along and in railroad properties can present challenges due to safety and legal issues. It is illegal to trespass on any railroad property without prior permission, and this is rarely granted without the railroad requiring their providing one or more flag persons. Corners along railroad right of way lines are notoriously difficult to find due to them being along old fence lines and with lots of old metal objects and ore in the area. Field survey may be necessary just to come up with a better idea of where to look for corners, especially those not associated with topo items like fences, yards, edge of woods, etc.

* + - 1. 726.11 Survey property corners

This task is required when new right of way interests are required and involves tying in property corners such as iron pipe and rebar though many other corner types are common such as PK nails and railroad spikes in asphalt pavement and chisel marks in sidewalks, especially in older urban areas.

Classifications used: Instrument Person / Field Tech and Party Chief.

Units: total hours each based on a combination of classifications as required.

**Low** – Probably a rural survey with few parcels involved. There may only be a couple irons to look for and those will likely be along the highway right of way. Topography is generally open so that the corners can often be shot using GPS technology or with a 1-person crew using a robot.

**Medium** – Typical project running along a rural or residential area where there may be many corners to shoot in varying topography such as businesses, yards and some landscaping including trees and shrubs. This can occasionally require multi-person crews using total stations to shoot difficult irons in obstructed locations such as under trees or in brushy areas.

**High** – Property corners on or adjacent to railroads can be difficult to shoot without going on their property and with proper permission as noted above. This is often very expensive and must be factored in to project costs. Corners in urban settings can be hard to find even when survey research shows that corners were set. These corners are often buried under pavement and can require digging using proper tools and safety gear. Winter survey is always more difficult just because the same corners required and easier to see in the summer are often under piles of snow or a blanket of ice. Property corners in urban settings are always difficult to shoot due to the inability of GPS to accurately work in this setting, and many corners end up under cars, piles of garbage or landscaping materials, or inside gated and fenced in business areas which require special permission to enter.

* + - 1. 726.12 Survey section corners

This task is included on most design projects with the anticipation of new TLE or right of way interests. It is important to scope the number of efforts needed. Projects can include one effort for real estate appraisal and another for utility relocations. Determine if effort can be included to replace points knocked out prior to the appraiser or utility company arriving on scene. This is very common.

Classifications used: Instrument Person / Field Tech, a Technician / cadd drafter for setting up a staking sheet, and a Party Chief. There may be circumstances where the Project Surveyor or Department Heat has to go to the site such as on a politically sensitive project or when dealing with owners who object to the project. This is rare but does occur.

Units: hours per point

**Low** – Small project in an open area without many topographic features to hinder the survey. These projects can often be done with a 1-person crew.

**Medium** – Typical project where some points can be set using GPS but others that fall in brush, adjacent to buildings or under tree cover may require additional survey with a robot. These projects often use a 2-person crew to help carry equipment and lath, etc. Length of the project is not as much of a factor as is the topography or neighborhood to work in.

**High** – Project staking that may require 3 or more crew members for safety and traffic control such as work in an urban environment. Other projects require staking in hard to reach locations such as across ditching or in wet environments, or in farm locations where it may be necessary to offset corners or reset multiple times due to their falling in pastured areas or planted fields. Urban staking projects can be hindered by parked vehicles sitting on control or where the staking point is intended to fall, or inside fenced manufacturing areas which can then require staking during off-hours such as evenings or weekends.

* + - 1. 726.13 Appraisal staking

This task is included on most design projects with the anticipation of new TLE or right of way interests. It is important to scope the number of efforts needed. Projects can include one effort for real estate appraisal and another for utility relocations. Determine if effort can be included to replace points knocked out prior to the appraiser or utility company arriving on scene. This is very common.

Classifications used: Instrument Person / Field Tech, a Technician / CADD drafter for setting up a staking sheet, and a Party Chief. There may be circumstances where the Project Surveyor has to go to the site such as on a politically sensitive project or when dealing with owners who object to the project. This is rare but does occur.

Units: hours per point

**Low** – Small project in an open area without many topographic features to hinder the survey. These projects can often be done with a 1-person crew.

**Medium** – Typical project where some points can be set using GPS but others that fall in brush, adjacent to buildings or under tree cover may require additional survey with a robot. These projects often use a 2-person crew to help carry equipment and lath, etc. Length of the project is not as much of a factor as is the topography or neighborhood to work in.

**High** – Project staking that may require 3 or more crew members for safety and traffic control such as work in an urban environment. Other projects require staking in hard to reach locations such as across ditching or in wet environments, or in farm locations where it may be necessary to offset corners or reset multiple times due to their falling in pastured areas or planted fields. Urban staking projects can be hindered by parked vehicles sitting on control or where the staking point is intended to fall, or inside fenced manufacturing areas which can then require staking during off-hours such as evenings or weekends.

###### 897 Place Monumentation *(6/27/16)*

* + - 1. 897.0 Includes tasks to identify, recover, and preserve a landmark, monument or corner.
      2. 897.1 Set right of way pins

This task is similar in scope to appraisal staking but requires additional effort due to the need to set irons and then check them.

Classifications used: Instrument Person / Field Tech, a Technician / cadd drafter for setting up a staking sheet, and a Party Chief and Project Surveyor.

Units: hours per point

**Low** – Small project, probably rural, with little topography to hinder staking. Potential for conflicts with utilities are small. R/W maker posts will probably be set at all corners.

**Medium** – Typical project that is likely rural in nature but could have a component in residential or business areas. Most points will be set using GPS but some will require a 2-person crew using total station or robots. R/W marker posts will be set at most corners except those falling in a front yard or business setting.

**High** – Monumentation falling along busy or high-volume roadways which limit access making parking and setup difficult. Points falling along railroad rights of way will often fall in overgrown or falling down fenced areas making monumentation difficult if unable to gain legal access to the railroad lands. Monumentation in urban areas can be difficult to set using standard Type 2 monuments since corners may fall on pavement, near building faces, under parked vehicles or in gated or fenced in areas requiring permission to enter. The known presence of utility lines from design survey can require another Diggers Locate and points falling within about 18” of those markings require hand digging to ensure the facilities are not damaged which is both hazardous and expensive. This scenario is time consuming but necessary and should be part of the initial scoping and negotiations. The project surveyor is often the PLS stamping the TPP and has to be confident with the staking, either by being on the staking crew or by reviewing the check-shot coordinates and working with the Party Chief.

* + - 1. 897.2 Place type 1, 2, 3, 4 monument

Type 1 monuments are meant to be permanent, stable and identifiable and are to last for at least 50 years. They may require additional equipment, tools and manpower to set including drills, concrete, etc. Type 2 monuments are meant to be stable and last for at least 25 years. This class is what is specified for right of way plats and transportation project plats and includes iron pipes and metal rod monuments along with chiseled cross and cut square monuments. Most can be set manually with hammers and fence post driving equipment. Type 2 monuments in an urban setting may require hammer drills, chisels or other equipment if the corners will fall in paved areas. Type 3 monuments are temporary and often for a single project and commonly include spikes, PK nails and some metal rods and can almost always be set with hammers. Type 4 are very temporary and have few practical applications.

Classifications used: Same as 897.1, being Instrument Person / Field Tech, a Technician / cadd drafter for setting up a staking sheet, and a Party Chief and possibly Project Surveyor.

Units: hours per point

**Low** – Same scenario as setting low effort right of way markers.

**Medium** – Same scenario as setting medium effort right of way markers.

**High** – Same scenario as setting high effort right of way markers. Type 1 monuments will likely require specialized equipment and tools, additional crew members including safety staff, and the supervision of the Project Surveyor or Department Head.

* + - 1. 897.3 Recover monumentation

This task seems similar to 726.11, 726.12 and 726.13 and would include searching for and surveying in all monumentation required to re-establish the existing reference and right of way lines, and could also include adjacent monumentation that may be disturbed during construction or will require subsequent ties in the case of PLSS corners. HARN stations and other high-accuracy control has to be located and if the potential exists for future disturbance then notify the central office geodetic survey unit so they can plan ahead to protect or replace the control station.

Classifications used: A combination of Instrument Person / Field Tech, Party Chief or Project Surveyor.

Units: hours each

**Low** - Previous Plans indicate Centerline and/or Right of Way monumentation is available, County has good survey records available on line, Rural, low volume traffic and generally open site.

**Medium** - Previous Plans indicate Centerline and/or Right of Way monumentation is available, County has good survey records, urban location with low to medium traffic volume and speed and partially open site. May require safety considerations/staff for points in an active roadway.

**High** - Previous Plans indicate minimal if any Centerline and/or Right of Way monumentation is available and may have little or no alignment defined, County has poor survey records, urban or high speed, high volume traffic and minimal open site with limited potential for GPS survey methods. This will almost certainly require traffic or railroad safety procedures in addition to the monument recovery itself.

###### 745 Develop Transportation Project Plat (TPP) *(9/7/16)*

* + - 1. 745.0 Includes activities related to providing design information to TPP plat section; identifying existing TPP lines, easements, alignments and access control; section corners; determining property ownership and property lines; conducting field review; developing preliminary plat; identifying proposed TPP lines, easements, alignments and parcels; and completing final plat and relocation order. This includes any drafting and revisions.
      2. 745 .1 Railroad right of way

Includes plat-related research on the particular railroad company and its history, and re-establishment of the associated property lines and right of way for parallel tracks, crossings, and grade separations (bridges under/over). Complexity can vary depending on the individual railroad company and the magnitude of the impact. Remember that no field survey work including looking for irons can be done on railroad right of way or property without first getting permission from the railroad and then usually only if or when accompanied by a railroad-supplied flag person. Allow plenty of time for survey coordination with the railroads.

**Low** – Resurfacing or other highway work that doesn’t require replacement of crossing surface. Will not involve monetary exchange or work to be done by RR. Typically handled by letter agreement. Railroad probably runs parallel to the project with little or no impact but will still need to be shown on the map. Approximate property lines should be shown to assess possible impacts.

**Medium** – Standard crossing (RR signal or crossing surface work.) May result in force work agreements with RR. Force work agreement has language for right of entry.

Railroad property line must be researched and re-established so its exact width and location can be shown on the TPP. Allow plenty of time for coordination.

**High** – Any type of land interest required (TLE, PLE, HE, Fee title)

Railroad property line must be researched and re-established so its exact width and location can be shown on the TPP. Determine the type of interest required and coordinate with the railroad as to what interests they recommend or will accept for the given circumstance. Railroads rarely if ever accept a FEE taking. Highway Easement is more common. Allow plenty of time for coordination.

* + - 1. 745.2 Develop property exhibits

This task may or may not be required. Exhibits are more often needed on urban or high-value projects where there is considerable interest in seeing the proposed takings in relation to existing buildings and topography. They can take the form of whatever product the project manager feels best fits the intended interest and audience.

**Low** – preliminary TPP and/or plan-profile plots

**Medium** – TPP or plan-profile plots with added graphics to fit the purpose and need

**High** – create individual graphics in preparation for meetings with individual owners

* + - 1. 745.3 Develop schedule of lands

WisDOT is going to a standardized Excel sheet template that will ease its future use by others per recent FDM updates. Time spent creating the template will be a function of the number of owners. Insertion time will not vary significantly between low, medium and high.

**Low** – 5 parcels or less

**Medium** – 5 to 10 parcels

**High** – over 10 parcels or multiple acquisition interests including TLEs, PLEs, HEs and/or RDEs.

* + - 1. 745.4 Legal descriptions

Legal descriptions are very basic with TPPs compared to those on a traditional plat. They can vary slightly by the number of interests required per parcel and more significantly if or when access rights are required. Access clauses are parcel-specific and should be reviewed by region or central office access management staff prior to recording.

**Low** – single interest per parcel

**Medium** – multiple interests per parcel

**High** – multiple interests per parcel including possible acquired access rights

* + - * 1. 745.4.1 Closure reports

These reports are sheet-specific and generally only vary by the number of right of way points on a particular sheet, or when there are additional PLEs or HEs on the sheet, each of which needs their own closure report.

**Low** – single interest

**Medium** – N/A

**High** – multiple interest

* + - 1. 745.5 Record TPP

This task is handled by the regions plat coordinator in conjunction with central office surveying and mapping staff. Consultants cannot e-record TPPs in those county allowing this type of recording - only central office staff. Not all counties allow e-recording which is quick, easy and pdf-based. All other counties still require hard copies made from specialty papers such as Copy Tuff and similar brands. This is still performed by central office staff and very little difference at the region or consultant level. Some local road projects may require consultants to hand record their own TPPs with the counties.

**Low** – ability for counties to accept e-recorded TPPs

**Medium** – hard copy recording in those counties that do not allow e-recording

**High** – local road project requiring hard copy hand recording

* + - 1. 745.6 Design information to TPP section

This task varies by the complexity of the project and relates to the amount and type of data that the plat preparer requires to produce the TPP. Rural two-lane roads may not require anything more than a simple alignment and slope intercepts while complex urban projects can require multiple intersecting alignments including possibly ramps and side roads, slope intercepts and information for additional TLEs, PLEs, RDEs, and/or proposed access rights to be acquired.

**Low** – rural single lane project with under 5 alignments. Base mapping may be provided.

**Medium** – suburban or rural project with 5 to 10 alignments and possible interchanges. Base mapping will usually be provided.

**High** – probably an urban project with structures, multiple alignments and complex peripheral issues such as drainage easements, railroads, access rights, and other non-standard interests. Base mapping will usually be provided.

* + - 1. 745.7 Section corners

These are office tasks involved with showing section corners and land lines as part of overall TPP preparation. Review the field survey section corner data against published tie sheets and existing surveys. Compute and draft the land line network on the base map files in preparation for referencing onto a TPP. Add section corner symbols and notate corner type and coordinates. Resolve issues of conflicting corners and/or land lines from other surveyors or record sources including the county surveyor.

**Low** – TPP is in a county known to have excellent records and a majority of all corners or their tie sheets intact and readily available, possibly even on-line.

**Medium** – TPP involves dealing with issues of possible or suspected obliterated corners, meanders corners, and center quarter corner (center of section) monuments.

**High** –TPP is in a county known to have very few corner records, or when the corners involved are missing or lost corners. When there are multiple monuments at one corner, it can be difficult, time consuming and potentially lead to future legal challenges of the TPP (pin cushion effect). TPPs along large bodies of water or along town lines can also be challenging due to the non-standard lines that need to be computed, verified and plotted as part of the overall land line network.

* + - 1. 745.8 Review title searches and updates

This is a multi-faceted task involving the determination of which parcels will potentially require title reports, putting together an exhibit or list of tax parcels that will need a report, coordination with the title company or the region depending on whose responsibility it is to order and pay for the reports, and then time to review each report and pull out the necessary information such as owner name, description, easements and prior conveyance documents. Depending on the parcel and location it will probably be necessary to request a report for more than what has been the standard 60-year report since many easements were created before that time period. 100-year reports are becoming more common, as are requests to go back to a particular year in an effort to capture all easements and other pertinent documents.

Unit – each/parcel

**Low** – urban lot/block, aliquot part of section

**Medium** – A mix of descriptions by metes and bounds and also by aliquot parts of sections (e.x NW1/4 of the NE1/4 of Section 23). Typical reports containing a few utility easements and possibly a short chain of title to review for ownership changes and easement ownership.

**High** – Railroad parcels - there are only a few companies in the state that will provide railroad title reports; urban areas where the title reports can be an inch or more thick; parcels with known title issues; lake and other riparian parcels.

* + - 1. 745.9 Existing R/W lines, easements, alignments, and access control

This task is essential to any project where a new real estate interest is a possibility. This is a function of plat layout and requires copies of previous existing right of way plats, title reports, certified surveys and other surveys of record along with field survey information including found irons and right of way markers/pins, section corners. These are all essential to preparing what some regions call a “base plat”, being the initial cadd file in the preparation of the TPP.

**Low** – Generally a rural highway or bridge project on an existing alignment with few curves, an existing right of way plat, and larger parcels defined by the public land survey system. Title reports are small and pretty basic.

**Medium** – Typical project where an older existing right of way plat and plan profile is available. Some evidence of the right of way may be found in the way of abutting surveys, irons and right of way markers but is not complete. Title reports and previous conveyance documents will be required to re-establish and verify the existing right of way. Some section corners may be in but others will require field and office research to locate them. Title reports may include multiple deed splits and some easements.

**High** –Typically an urban project or along a major highway or utility corridor. Title reports can be very thick and may contain multiple mortgages, deed splits and other documents including utility easements, all of which may or may not be on the project but will have to be plotted to make that determination. Existing right of way plats are old with little in the way of valid section corner ties and monumentation to help determine the intention of the original right of way lines, stations and offsets. Multiple curvilinear alignments and intersecting side roads are likely. Railroads and other fenced in areas or swampy or woody land can make field survey difficult at best.

* + - 1. 745.10 Field review-property owner walkthrough

DOT project manager/Real Estate appraisal function, doesn’t belong in TPP section, should be in railroad, real estate and utilities,

* + - 1. 745.11 Preliminary TPP (layout and annotation)

This is the next step after the base plat, where proposed slope intercepts and/or right of way lines along with new alignments are added. A majority of the plat preparation is spent in this area. Preliminary parcel computations are made. The draft schedule of lands and interests spread sheet is set up. The sheet cell is added and decisions made on match lines and plot scale after referencing in the land line network, property lines and existing right of way lines. Possible compensable utilities are identified for early utility coordination.

Unit – 1/4-1/4 section

**Low** – same guidelines as 745.9

**Medium** – same guidelines as 745.9

**High** – same guidelines as 745.9

* + - 1. 745.12 Determine/label compensable utilities and utility easements

This task is a collaborative effort between consultant plat preparers, region plat preparers and region utility coordinators. It involves a review of utilities surveyed using diggers hotline locates, utility system maps (when available), utility easements, and other supplemental materials. This step assumes that proposed takings are shown so that the interaction between facilities and acquisitions can be seen on the sheet. The region utility coordinators will ultimately have the last call in determining whether utilities will be shown as compensable on the TPP. Utility coordinators need to be informed early in the platting process of the future TPP so they are aware of the upcoming project and can begin their own coordination efforts.

Unit – PLSS Quarter Section

**Low** – typically a rural highway with few utilities, perhaps some overhead lines and buried cable. Little or no compensability is expected.

**Medium** – Average highway corridor. 2 to 4 compensable utilities expected on each sheet.

**High** – Major utility corridor or an older urban area. Multiple service providers and many buried lines make ownership difficult. Underground utilities such as old, storm and sanitary sewer are old and difficult to find or make sense of. Utility easements are old, complex and/or conflicting with the owner names being many times removed from current ownership.

* + - 1. 745.13 Utility legal descriptions (may be included in legal descriptions and closure calculations)

This is a functional duty of the utility coordinator, generally at the region but can be a consultant if they are handling their own utility coordination. The descriptions are drafted after the TPP has been recorded so the number of descriptions will not be known when initially scoping the project either by the Department or the consultant.

**Low** – Descriptions are about the same with little change in difficulty from one to another

**Medium** – Descriptions are about the same with little change in difficulty from one to another

**High** – Descriptions are about the same with little change in difficulty from one to another

* + - 1. 745.14 Proposed R/W lines, easements, alignments, parcels, etc.

This involves many of the same tasks as 745.11 but with final data so should be scoped based on the number of revisions which may occur throughout the project from its inception till recording.

**Low** – Generally a rural project with only 1 or two proposed alignments and no unique design elements.

**Medium** – Project with some unique or challenging features which could result in late design changes resulting in parcel and right of way revisions prior to recording.

**High** – Typically urban projects or other projects with multiple alignments, easements, drainage or access issues. These projects almost always have multiple late changes resulting in revisions to the TPP.

* + - 1. 745.15 Final plat to Technical Services Section

Preparing the TPP for recording including packaging the pdf file; the cadd files including those unique to Civil3D as described in the recent FDM update (see 12-10-1.2.6); the metadata files; parcel descriptions; and various coordinate and other files, some of which may be region-specific. This also includes packaging the files for other end users as described in the FDM including the schedule of lands and interests in the specified spread sheet format. Since this is a project-wide task, it will be dependent on how many sheets are anticipated since some of the deliverables are sheet-specific. This can also include anticipated review comments and revisions requested by the region plat coordinator that must be made prior to recording a consultant-based TPP.

**Low** – Basic rural two-lane road or bridge, probably with 5 or less parcels per sheet.

**Medium** – Typical project with 5 to 10 parcels per sheet and 1 or 2 alignments.

**High** – Similar to other tasks, this will likely be an urban project, or one with multiple curvilinear alignments. More than 10 parcels are anticipated. Multiple interests including TLE, PLE, HE and/or RDEs along with proposed access rights may be anticipated. These all increase the number of deliverables and review comments from the region and central office reviewers including plat, real estate and utility coordinators.

* + - 1. 745.16 Final TPP relocation order

This task does not belong in the TPP section since the relocation order is on the face of all TPPs and not a separate document needing to be filed such as with a traditional plat.

* + - 1. 745.17 TPP drafting (Title sheet)

This addresses only those hours spent preparing a title sheet if used for plat recording. A separate title sheet is not required but most plat preparers choose to use them since they free up space on the plat sheets for parcel information. Only one title sheet is needed regardless of the number of detail sheets so there is really not much difference in difficulty.

**Low** – Same for all TPPs

**Medium** – Same for all TPPs

**High** – Same for all TPPs

* + - 1. 745.18 Relocation order revision (sheet amendments)

This task is only required for those sheets that need to be revised and re-recorded at the county register of deeds. As such it is almost impossible to estimate the number of amended sheets unless the project falls under some of the same criteria as discussed for other high difficulty tasks. Using best practices throughout the design and TPP preparation phase along with thorough utility coordination should reduce the estimated numbers of amended sheets.

**Low** – Same guidelines as 745.9

**Medium** – Same guidelines as 745.9

**High** – Same guidelines as 745.9

* + - 1. 745.18 Traditional plats
         1. 745.19.1 Existing R/W lines, easements, alignments, and access control

This task is essential to any project where a new real estate interest is a possibility. This is a function of plat layout and requires copies of previous existing right of way plats, title reports, certified surveys and other surveys of record along with field survey information including found irons and right of way markers/pins, section corners. These are all essential to preparing what some regions call a “base plat”, being the initial cadd file in the preparation of the TPP.

**Low** – Generally a rural highway or bridge project on an existing alignment with few curves, an existing right of way plat, and larger parcels defined by the public land survey system. Title reports are small and pretty basic.

**Medium** – Typical project where an older existing right of way plat and plan profile is available. Some evidence of the right of way may be found in the way of abutting surveys, irons and right of way markers but is not complete. Title reports and previous conveyance documents will be required to re-establish and verify the existing right of way. Some section corners may be in but others will require field and office research to locate them. Title reports may include multiple deed splits and some easements.

**High** –Typically an urban project or along a major highway or utility corridor. Title reports can be very thick and may contain multiple mortgages, deed splits and other documents including utility easements, all of which may or may not be on the project but will have to be plotted to make that determination. Existing right of way plats are old with little in the way of valid section corner ties and monumentation to help determine the intention of the original right of way lines, stations and offsets. Multiple curvilinear alignments and intersecting side roads are likely. Railroads and other fenced in areas or swampy or woody land can make field survey difficult at best.

* + - * 1. 745.19.2 Proposed R/W lines, easements, alignments, parcels, etc.

This is a functional duty of the utility coordinator, generally at the region but can be a consultant if they are handling their own utility coordination. The descriptions are drafted after the TPP has been recorded so the number of descriptions will not be known when initially scoping the project either by the Department or the consultant.

**Low** – Descriptions are about the same with little change in difficulty from one to another

**Medium** – Descriptions are about the same with little change in difficulty from one to another

**High** – Descriptions are about the same with little change in difficulty from one to another

* + - * 1. 745.19.3 Title sheet

**Low** – Standard sheet without much variance in effort

**Medium** – Standard sheet without much variance in effort

**High** – Standard sheet without much variance in effort

* + - * 1. 745.19.4 Overview sheet

**Low** – Project in a rural area, probably 1 quarter section, with 5 or fewer parcels

**Medium** – Project in a predominantly rural area with 5 to 20 parcels

**High** – Projects in an urban area require much more time allotted to the overview map due to having to show more lines including lots, streets, and alleys. A project with more than 20 or 25 parcels also means more drafting time.

* + - * 1. 745.19.5 Schedule of lands and interests

**Low** – Less than 5 parcels and probably no utility release of rights

**Medium** – 5 to 20 parcels, perhaps a couple utility conveyances.

**High** – More than 20 parcels or where it is anticipated that there will be parcels with multiple interests including but not limited to TLEs, PLEs, RDEs, HEs, and access control. This is often the case with urban plats.

* + - * 1. 745.19.6 Detail sheets

**Low** – Most likely a rural project with few adjoining parcels or property lines. Probably fewer than 5 parcels.

**Medium** – Rural to suburban setting with 5 to 20 parcels per sheet. Perhaps on relocation and with an alignment with one or two curves.

**High** – Suburban to fully urban project or where there are multiple alignments including intersecting curves. There will likely be many lots in the background that have to be show, with the potential for many existing easements. Potential for TLEs on every parcel for carriage walks, driveways, or general sloping. Railroad parcels may be present.

* + - * 1. 745.19.7 Legal descriptions

**Low** – Parcels are in subdivisions where “of” descriptions can be used without the need for metes and bounds or envelope descriptions.

**Medium** – Typical envelope description for FEE or Highway Easement. Some parcels may have additional interests such as TLEs.

**High** – Envelope description in an urban setting, with multiple right of way curves, or where multiple interests are anticipated in addition to TLEs. This can include various PLEs, HEs, RDEs, and purchased access rights.

* + - * 1. 745.19.8 Relocation order and revision

**Low** – First time relocation order. Very straight forward and may just be a form to fill out.

**Medium** – No difference as with the low effort with no anticipation of a relocation order revision form.

**High** – Relocation order revision forms which take time to detail out the various changes and revisions required for each sheet.

##### Environmental and Cultural Impact *(8/4/16)*

###### 762 Analyze Socio-Economic and Physical Environment Impacts *(8/4/16)*

* + - 1. 762.0 Analyze air, noise, agricultural, and environmental justice impacts.
      2. 762.1 Conduct air quality analyses
         1. 762.1.1 Overview of conformity and discussion of MSATs

Includes reviewing the project for conformity with the state implementation plan; documenting conformity; and completing all necessary coordination.

Documentation – entry level engineer, planner, scientist

Review and coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – In attainment area; no MSAT analysis required

**Medium** – Non attainment area in MPO conformity analysis; part of capacity expansion only. Qualitative MSAT analysis required.

**High** – Non attainment area or project not included in MPO conformity analysis. Part of capacity expansion only.

Quantitative MSAT analysis or PM 2.5 hot spot analysis requires use of MOVES model. Contact environmental coordinator; should be negotiated on a case by case basis.

* + - * 1. 762.1.2 Review/compare carbon monoxide

Includes determining CO concentrations and effects on air quality by comparing to a similar location where air quality modeling has previously been completed; documenting the comparison and expected air quality impacts; and completing all necessary coordination.

Comparison and documentation – entry/project level engineer, planner, scientist

Review and coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – same level of effort for all projects

**Medium** – N/A

**High** – N/A

* + - * 1. 762.1.3 Run air quality model

Includes computer modeling to determine the CO concentrations for the project and effects on air quality; determining all appropriate input parameters for the computer model; running the model; documenting the results; and completing all necessary coordination.

Hours in spreadsheet assume use of CALQ3HC model. When using MOVES model contact environmental coordinator; should be negotiated on a case by case basis.

Computer modeling and documentation – entry/project level engineer, planner, scientist

Review and coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – same level of effort for all projects

**Medium** – N/A

**High** – N/A

* + - 1. 762.2 Conduct farmland studies

Includes gathering information from agencies (Department of Agriculture, Trade, and Consumer Protection; County; others); reviewing soil types to be impacted; completing the Natural Resources Conservation Service Farmland Conversion Impact Form (form AD-1006 for non-corridor projects; form CPA-106 for corridor projects); and completing all necessary coordination

Information gathering – entry level engineer, planner, scientist

Review and initial agency coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – No agricultural land impacts.

**Medium** – Agricultural land impacts

**High** – N/A

* + - * 1. 762.2.1 Conduct farmland studies with low to moderate impacts

Includes quantifying farmland impacts, preparing the Agricultural Impact Notice and exhibits, submitting the Agricultural Impact Notice to DATCP, and coordinating with DATCP as they complete the Agricultural Impact Statement

Information gathering – entry level engineer, planner, scientist

Review and initial agency coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – non-significant acquisitions only (1 acre or less of impact to all individual owners); no relocations, severances, or access changes; no change in tax status for remaining land

**Medium** – acquisitions of more than 1, but less than 5 acres from all individual owners; no relocations, severances, or access changes; no change in tax status for remaining land

**High** – acquisition of more than 5 acres from one or more individual property owners; no relocations, severances, or access changes; no change in tax status for remaining land

* + - * 1. 762.2.2 Conduct farmland studies with high impacts

Includes quantifying farmland impacts, preparing the Agricultural Impact Notice and exhibits, submitting the Agricultural Impact Notice to DATCP, and coordinating with DATCP as they complete the Agricultural Impact Statement

Information gathering – entry level engineer, planner, scientist

Review and initial agency coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – N/A

**Medium** – N/A

**High –** relocation of complete farms, farm buildings, or irrigation systems; severing farm parcels; relocating or limiting farm or field access; creation of substantial indirection to access fields; change in tax status for remaining land; other major impacts to farm operation

* + - 1. 762.3 Review economic factors (general, business, agriculture)

Includes gathering data on general economics, businesses, and agriculture in the project area; determining impacts of the project on these items; identifying any potential mitigation measures to offset negative impacts; and summarizing data, impacts, and mitigation measures

Data gathering, determination of impacts, identification of mitigation measures, summarizing information – entry level engineer, planner, scientist

Determination of impacts, identification of mitigation measures, and review – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – project has minimal right of way impacts; no access changes; no displacements; no agricultural impacts

**Medium** – project has moderate right of way impacts; minor access changes; possible business displacement

**High** – project has large right of way impacts; substantial access changes; displacement of businesses

* + - 1. 762.4 Review community and residential issues
         1. 762.4.1 Evaluate right of way impacts

Includes quantifying right of way acquisition requirements (TLE, PLE, and FEE) from each parcel along the project length

Quantifying impacts – entry level engineer, planner, scientist

Review – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – mostly TLE impacts or small acquisitions at intersections

**Medium** – minor acquisitions along entire project length; more extensive acquisitions at intersections or other isolated locations

**High** – larger acquisitions at numerous locations; acquisition of parking from commercial properties

* + - * 1. 762.4.2 Evaluate relocation impacts

Includes quantifying relocation requirements (number of displacements, type of displacement, etc.); coordinating with affected property owners; includes completion of Conceptual Stage Relocation Plan. Could also mean land locking a parcel.

Quantifying impacts and drafting CSRP – entry level engineer, planner, scientist

Coordination with impacted property owners and review – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – single family residential

**Medium** –primarily multi-family residential or smaller business

**High** – relocation of larger multi-family properties; relocation of larger business/major employer; relocation with environmental justice issues; or low availability of replacement property (manufactured homes, cell towers)

* + - * 1. 762.4.3 Collect/obtain socio-economic data

Includes gathering data from various sources (US Census Bureau, Wisconsin Department of Administration, local governments, etc.) and determining presence of environmental justice or Title VI populations

Data gathering and evaluation – entry level engineer, planner, scientist

WisDOT – environmental analyst and review specialist

**Low** – rural area with low population; project only affects one municipality; no environmental justice populations. Using American Fact Finder

**Medium** – suburban or lower population urban area; project affects only one or two municipalities; no environmental justice populations. Using American Fact Finder and exhibit

**High** – larger urban area with high population; project affects three or more municipalities; potential environmental justice populations. Projects with high environmental justice populations can have significantly more effort.

* + - * 1. 762.4.4 Collect/obtain population data

Includes gathering data from various sources (US Census Bureau, Wisconsin Department of Administration, local governments, etc.) Note: may not be needed for CE projects

Data gathering – entry level engineer, planner, scientist

WisDOT – environmental analyst and review specialist

**Low** – rural area with low population; project only affects one municipality

**Medium** – suburban or lower population urban area; project affects only one or two municipalities

**High** – larger urban area with high population; project affects three or more municipalities

* + - * 1. 762.4.5 Evaluate impacts to environmental justice and Title VI populations

Includes determining location of environmental justice and Title VI populations along the project corridor, identifying impacts to those populations, and evaluating avoidance or mitigation measures

Determining impacts and developing mitigation measures – project level engineer, planner, scientist

Review and coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – rural area with little or no environmental justice or Title VI population; affected individuals are scattered throughout project area; no anticipated effects

**Medium** – suburban or small urban area with low environmental justice or Title VI population concentrated in limited areas along the project; primarily residential impacts

**High** – urban area with high environmental justice or Title VI population concentrated throughout majority of the project corridor; primarily business impacts; includes interviews with business/property owners to determine the number of environmental justice or Title VI persons affected

* + - * 1. 762.4.6 Evaluate transportation, access, and alternate mode impacts

Includes locating and identifying impacts to access points and alternative modes of transportation in the project area

Identifying access points, alternative modes of transportation and impacts – project level engineer, planner, scientist

Review and coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – rural area with few access points; no other modes of transportation

**Medium** – suburban or small urban area; moderate number of accesses; up to one additional mode of transportation

**High** – larger urban area; numerous access points; two or more additional modes of transportation

* + - * 1. 762.4.7 Obtain land use plans

Includes obtaining land use plans from local communities

Obtaining plans from communities – entry level engineer, planner, scientist

Coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – only one community affected by project

**Medium** – one to three communities in one county affected by project

**High** – project spans more than three communities and may affect communities in multiple counties

* + - * 1. 762.4.8 Complete indirect and cumulative effects pre-screening worksheets

Includes completion of the Pre-Screening Worksheet, preparation of exhibits, submission to WisDOT, and any needed revisions

Preparation of report and exhibits – project level engineer, planner, scientist

Review and coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – project only affects one community; corridor is already fully developed; no substantial changes in access are anticipated

**Medium** – project only affects one community; corridor is partially developed; some minor changes to access

**High** – project spans multiple communities; corridor is relatively undeveloped; substantial changes to access

* + - * 1. 762.4.9 Conduct indirect effects analysis

Includes delineating a study area for indirect effects analysis; analyzing indirect effects following WisDOT’s six-step method or the eight-step method found in the National Cooperative Highway Research Program Report 466; identifying mitigation measures; all public participation required to complete the indirect effects analysis; and documentation of the indirect effects analysis

Indirect effects analysis and documentation – project level engineer, planner, scientist

Indirect effects analysis and documentation – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – N/A

**Medium** – EA level project; capacity expansion on existing alignment; moderate access changes; economic development may be part of purpose and need

**High** – EIS level project; roadway on new alignment; substantial access changes; economic development may part of purpose and need

* + - * 1. 762.4.10 Conduct cumulative effects analysis

Includes analyzing cumulative effects following the Council on Environmental Quality eleven-step process; identifying potential mitigation measures; and documentation of the cumulative effects analysis

Cumulative effects analysis and documentation – project level engineer, planner, scientist

Cumulative effects analysis and documentation – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – N/A

**Medium** – EA level project; few direct effects

**High** – EIS level project; many direct effects

* + - * 1. 762.4.11 Evaluate aesthetic impacts

Includes evaluating potential aesthetic impacts from the proposed project on adjacent properties, conducting full visual impact analysis if required, identifying any mitigation measures, and determining appropriate environmental commitments needed.

Evaluate impacts – entry level engineer, planner, scientist

Environmental commitments and/or mitigation measures – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – N/A

**Medium** – project does not have substantial visual impacts; completion of Factor Sheet is sufficient to address aesthetic issues

**High** – project will have substantial adverse visual impacts or affect important cultural, natural, or physical features; full visual impact analysis is required

* + - * 1. 762.4.12 Evaluate construction noise impacts

Includes evaluating potential impacts from construction noise on adjacent properties, determining appropriate special provisions needed, and identifying any required noise abatement measures

Evaluate impacts – entry level engineer, planner, scientist

Special provisions and/or abatement measures – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – very few adjacent receptors; only standard specifications required

**Medium** – moderate number of adjacent receptors; may require special provisions; requires limits on the hours of operations

**High** – project has numerous adjacent receptors, including libraries, schools or other sensitive receptors; project includes night work; noise abatement measures needed in addition to special provisions

* + - 1. 762.5 Perform noise analysis
         1. 762.5.1 Perform field review/measurement for sound quality impact

Includes identifying sampling sites, determining appropriate sampling periods, mailing letters to property owners, conducting noise measurements at the sampling sites, and summarizing data collected for use in computer modeling; hours do not include travel time

Identify sites, conduct sampling, and summarize data – entry level engineer, planner, scientist

Review and coordination – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** –five or fewer sampling sites

**Medium** – six to ten sampling sites

**High** – more than ten sampling sites; projects with more than fifty sampling sites should be negotiated on a case by case basis

* + - * 1. 762.5.2 Set up existing conditions model

Includes preparing model with elevation data, traffic data, speed data, horizontal alignment, etc.; also includes validating outdoor receptor readings

Input data – entry level engineer, planner, scientist

WisDOT – environmental analyst and review specialist

**Low** – single roadway with straight alignment and less than 10 receptors

**Medium** – single roadway with varying alignment; less than 50 receptors

**High** – multiple roadways modeled; varying alignment and more than 50 receptors

* + - * 1. 762.5.3 Set up future no-build model

Includes using existing conditions model and updating traffic data

Input data – entry level engineer, planner, scientist

WisDOT – environmental analyst and review specialist

**Low** – single roadway with consistent traffic

**Medium** – single roadway with varying traffic

**High** – multiple roadways with varying traffic

* + - * 1. 762.5.3 Set up build model

Includes preparing model with elevation data, traffic data, speed data, horizontal alignment, etc.

Input data – entry level engineer, planner, scientist

Review – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – use future no-build model with minimal changes, including additional lanes and/or small horizontal/vertical shift in roadway

**Medium** – prepare new model with all necessary data for a single roadway with varying alignment and less than 50 receptors

**High** – prepare new model with all necessary data for multiple roadways with varying alignments; more than 50 receptors

* + - * 1. 762.5.5 Create sound quality report

Includes summarizing the existing and expected noise levels at each receiver location, determining locations with noise impacts, and identifying and evaluating potential abatement measures

Summarize data, identify noise impacts, identify and evaluate abatement measures – entry level engineer, planner, scientist

Review – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – same level of effort for all projects

**Medium** – N/A

**High** – N/A

* + - * 1. 762.5.6 Identify impacted receptors (owners and occupants)

Includes identifying property owners and occupants and developing mailing list

Identify owners and occupants and develop mailing list – entry level engineer, planner, scientist

WisDOT – environmental analyst and review specialist, project leader

**Low** – same level of effort for all projects

**Medium** – N/A

**High** – N/A

* + - * 1. 762.5.7 Perform noise wall analysis

Includes modeling and evaluating level of noise reduction achieved with noise wall; identifying costs and impacts of constructing noise wall; determining the number of receptors benefitted by noise wall; determining the reasonableness and feasibility of the noise wall; and evaluating other noise mitigation options

Identifying costs and impacts, determining receptors benefitted, summarizing data – entry/project level engineer, planner, scientist

Review and determination of reasonableness – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – single wall with short length; few receptors; no impacts from wall construction

**Medium** – longer single wall; moderate number of receptors; minor impacts from wall construction

**High** – multiple walls; high number of receptors; moderate impacts from wall construction

* + - * 1. 762.5.8 Conduct Public Involvement Meeting for Noise Abatement Measures

Includes making all meeting arrangements, preparing and sending meeting invitations, preparing all meeting notices and advertisements, placing notices and advertisements, preparing all meeting handout materials and exhibits, attending meeting, and preparing meeting minutes; hours do not include travel time

Meeting arrangements, invitations, notices and advertisements, preparing handouts and exhibits, attending meeting, preparing meeting minutes – entry/project level engineer, planner, scientist

Input and review on meeting materials, attend meeting, follow up after meeting – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – single barrier with short length; few affected receptors; no impacts from barrier construction

**Medium** – longer single barrier; moderate number of affected receptors; minor impacts from barrier construction

**High** – multiple barriers; high number of affected receptors; moderate impacts from barrier construction

* + - * 1. 762.5.9 Prepare, mail and tabulate Noise Wall Voting Ballot

Includes preparing and mailing the noise wall voting ballots, counting the ballots as they are returned, and compiling the results of the balloting

Prepare and mail ballots, collect ballots, and compile results – entry level engineer, planner, scientist

WisDOT – environmental analyst and review specialist

**Low** – ballots in English only

**Medium** – ballots in both English and additional language

**High** – N/A

* + - * 1. 762.5.10 Follow-up/request unreturned ballots

Includes contacting eligible voters that have not returned ballots by the date indicated and documenting efforts made to gather the ballots

Follow up with eligible voters and documentation – entry level engineer, planner, scientist

Follow up with eligible voters – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – same level of effort for all projects

**Medium** – N/A

**High** – N/A

* + - * 1. 762.5.11 Document Noise Analysis, Voting, and Barrier Selection Process

Includes documenting the results of the noise and barrier analysis; summarizing the voting, including efforts made to gather all ballots; and documenting the decision on whether or not to construct noise barrier.

Documentation – entry level engineer, planner, scientist

Decision on noise barrier construction and review – Project Manager

WisDOT – environmental analyst and review specialist, project leader

**Low** – single barrier with short length; few affected receptors; no impacts from barrier construction

**Medium** – longer single barrier; moderate number of affected receptors; minor impacts from barrier construction

**High** – multiple barriers; high number of affected receptors; moderate impacts from barrier construction

* + - * 1. 762.5.12 Coordinate Results with WisDOT

Includes coordination with WisDOT on the voting, keeping WisDOT informed of the efforts made to gather ballots, and in the determination of whether or not to construct barrier

Coordination – Project Manager

WisDOT – project leader

**Low** – same level of effort for all projects

**Medium** – N/A

**High** – N/A

###### 763 Analyze Archaeological and Historical Impact and Tribal Consultation *(7/27/16)*

Does not include programmatic agreements. See your environmental coordinator if your project has a major site. Assumes fed funding and/or permit. Inadvertent discoveries are not covered in these tasks. Consider traditional cultural places (TCP) for all. Assumes no National Historic/Natural Landmarks.

* + - 1. 763.0 Archaeological and historical impact analysis
      2. 763.1 Identify Consulting Parties/Notify

ASSUMPTIONS: Parties include tribes with interest in the county that the project will occur, property owners, and local historical societies, etc. Prepare notification letters (there are templates available for each) and appropriate enclosures (maps, etc.). Track responses. Reply to responses and provide additional information as necessary

STAFFING LEVEL: Project Manager CE, CADD and/or GIS tech, Admin assistant

Hours are per project

SCHEDULE IMPACTS: Needs to be done prior to project being placed on screening list or approval of Section 106

**Low** – Short project, few interested parties

**Medium** – larger more complex project with numerous notifications required

**High** – larger more complex project with numerous notifications required and addition coordination needed as a result of response(s) from interested party(ies).

* + - 1. 763.2 Does the project have the potential to affect historic properties (screening list)

ASSUMPTIONS: projects that acquire less than 0.5 acres or in strips less than or equal to 5 feet wide, that disturb less than 0.5 acres previously undisturbed land, are not adjacent to any properties that are listed on or eligible for the National Register of Historic Places (NRHP), do not have changes in type or dimension of any highway related element, do not remove trees, shrubs or landscaping elements, and for which results of solicitation of input from Tribe/public did not result in concerns about historic properties can be considered for screening. Screening is complete through a WisDOT central office (CO) contract with the Museum Archaeology Program at the Wisconsin Historical Society (MAP). If project qualifies for screening, Section 106 is complete (Do not need to complete 763.3-763.8). If not, continue to follow steps below.

STAFFING LEVEL: Historian/Archaeologist (project and senior), environmental specialist

Hours are per project

**Low** – archival review sufficient to determine if project qualifies for screening.

**Medium** – N/A

**High** –additional research is required to determine if the project qualifies for screening.

* + - 1. 763.3 Determine Area of Potential Effect (APE)

ASSUMPTIONS: the APE for archaeology and history is often not the same. The APE for archaeology is typically the existing and proposed right of way (including any land needed for mitigation measures). The APE for history is typically broader and includes areas that the project may cause changes in setting or use of historic buildings/structures. Consultation is required to establish APE

STAFFING LEVEL: Project CE, environmental specialist, Archaeologist/historian

Hours are per project

**Low** – project involves minor changes to roadway dimensions/features/alignment. No/few consulting parties

**Medium** – Project involves more substantial changes to the roadway characteristics. No/few consulting parties or agreement easily reached.

**High** – Complex project with many consulting parties and difficulty in reaching agreement.

* + - 1. 763.4 Conduct archaeological and historical surveys (Identification)
         1. 763.4.1 Conduct archaeological surveys

ASSUMPTIONS: Archival and lit review, obtain permits (ARPA – note ARPA permits particularly with tribal govt. can be time consuming to secure –, state), negotiate access, field survey (16 shovel tests per acre, a staff member can shovel test between 2-3 acres per day depending on soils and whether sites are found, completion of ASFR. Prepare technical report if sites are identified. ASI, BAR, as appropriate. Curation.

TIMING CONSIDERATIONS: Archaeological surveys cannot be complete in winter and are best done in spring before fields are planted or in fall after crops are harvested.

STAFFING LEVEL: Archaeologist (project and senior), GIS tech

Hours are per acre of new disturbance

SCHEDULE IMPACTS: Archaeology survey cannot be completed in winter when ground is frozen

**Low** – Limited area of previously undisturbed land within the APE. APE includes mostly farm fields (pedestrian survey sufficient)

**Medium** – Moderate level of new disturbance, shovel tests in sandy soils, access reasonably granted, few artifacts found

**High** – More substantial new disturbance, shovel test in clay soils, property owners deny access, and/or numerous artifacts found.

* + - * 1. 763.4.2 Conduct historical surveys

ASSUMPTIONS: Archival and lit review, field survey, completion of A/HSR. Prepare technical report if sites are identified. Survey card updates as appropriate

STAFFING LEVEL: Historian (project and senior), GIS tech

Hours are per mile

**Low** – Few building/structures present within the APE or all structures less than 50 years old. Letter report needed or non-history survey documentation.

**Medium** – Numerous structures of historical age present in APE. AHSF report needed, but no potentially eligible properties.

**High** – Numerous structures of historical age present in APE and presence of previously surveyed properties that need to be updated. AHSF report, potentially eligible buildings identified, Determinations of Eligibility (DOE) recommended.

* + - 1. 763.5 Determine if properties eligible for the National Register of Historic Places are present

ASSUMPTIONS: If no sites were identified in the field surveys, this step is not necessary. Apply National Registry criteria of eligibility. Complete the Wisconsin Historical Society Determination of Eligibility (DOE) form (History) or Wisconsin version of Nation Park Service Form 10-900 (Archaeology). Requires additional research and field survey. Consultation required (parties must agree on eligibility).

* + - * 1. 763.5.1 DOE - archaeology

ASSUMPTIONS: Includes background research into site, obtaining permits, field work, preparation of report, and the WI version of National Park Service for 10-900, ASI update, and curation of artifacts.

STAFFING LEVEL: Archaeologist (project and senior), GIS tech

Hours are per potentially eligible site

SCHEDULE IMPACTS: additional field survey required which cannot be completed in winter when ground is frozen

**Low** – Access to site easily granted, mechanical stripping, historic site, sufficient information to make determination is readily available. Limited artifacts discovered.

**Medium** – Difficulty in obtaining permission to access property. More extensive background research is needed. Agreement on eligibility easily reached

**High** – Access difficult, mechanical stripping not possible, excavation units present, prehistoric site, extensive background research needed, field survey time intensive, numerous artifacts discovered (curation), or disagreement among parts about eligibility.

* + - * 1. 763.5.2 DOE - history

ASSUMPTIONS: Includes background research into site, field work, and preparation of report and Wisconsin Historical Society Determination of Eligibility (DOE) form.

STAFFING LEVEL: Historian (project and senior), GIS tech

Hours are per potentially eligible site/building

**Low** – Public building or access to site easily granted, information to make determination is readily ascertained.

**Medium** – Difficulty in obtaining permission to access property. Residential or commercial building. More extensive background research is needed. Agreement on eligibility easily reached

**High** – Historic district, building with multiple units (e.x. apartments) access difficult, extensive background research needed, or disagreement among parts about eligibility.

* + - 1. 763.6 Determine if there is an effect (if NRHP listed or eligible properties are present)

ASSUMPTIONS: If NRHP listed/eligible sites are identified, consider whether the project will affect them. Can involve redesign to avoid effects to a property. For no effect, notify consulting parties that no historic properties will be affected and complete/ submit Section 106 form (763.7). The process is complete upon signature of the form (no need to complete 763.8). If NRHP listed/eligible properties will be affected, continue with steps below.

STAFFING LEVEL: Historian/Archaeologist, Project CE

Hours are per eligible site/building

**Low** – No affect determination can easily be made

**Medium** – N/A

**High** – Consulting parties do not agree to no effect determination

* + - 1. 763.7 Complete/submit Section 106 form

ASSUMPTIONS: Includes time to compile reports and complete Section 106 form. Submit to SHPO/THPO with appropriate supporting information. Assume all steps above are complete. Survey/technical reports and Plan sheets are available.

STAFFING LEVEL: Project CE, environmental specialist, Archaeologist/historian

Hours are per project

**Low** – Packet complete and acceptable

**Medium** – N/A

**High** – CO or SHPO/THPO request additional information/justification or disagree with determinations of eligibility or no effect

* + - 1. 763.8 Assess Effects (if NRHP listed or eligible properties are affected).

Options are no adverse effect, conditional no adverse effect or adverse effect. Requires consultation

**Either 763.8.1 OR 763.8.2 is needed for each eligible resource that will be affected by the project.**

* + - * 1. 763.8.1 Prepare Determination of No Adverse Effect (DNAE) or Conditional No Adverse Effect (CNAE)

ASSUMPTIONS: Use template available on internet page. Consider criteria of adverse effect. Includes consultation with interested parties. Resubmit Section 106 review form with DNAE or CNAE attached (note, it is possible that DNAE or CNAE will be developed early enough that it could be included with the first submittal of the Section 106 review form. In this case, signature on the Section 106 form would be concurrence with the DNAE/CNAE. Therefore, the form would only need to be submitted once). Consulting parties must agree to no adverse effect

STAFFING LEVEL: Historian/Archaeologist (project and senior), project CE, environmental specialist, GIS tech

Hours are per project

**Low** – No objections to DNAE/CNAE document or decisions

**Medium** – Objections to DNAE/CNAE that are easily resolved

**High** – Objections require lengthy consultation to resolve or result in a determination of adverse effect

* + - * 1. 763.8.2 Resolution of Adverse Effects

763.8.2.1 Prepare Finding of Adverse Effect (FAE aka DforC, now through e106)

ASSUMPTIONS: Use e106 form on ACHP internet page. Apply criteria of adverse effect. Determine if ACHP will participate. Requires consultation

STAFFING LEVEL: Historian/Archaeologist (project and senior), project CE, environmental specialist, GIS tech

Hours are per project

**Low** – No objection to effect document, good participation in consultation meetings

**Medium** – consulting parties have comments that need to be addressed in effect document (e.x. concerns with avoidance and minimization efforts, etc.)

**High** – Consulting parties express numerous concerns, difficulty in getting consulting parties to participate in meetings

763.8.2.2 Develop and Evaluate Measures to Avoid, Minimize, or Mitigate Adverse Effects to Historic Properties. Prepare MOA. Obtain agreement on stipulations of MOA. Obtain signatures on MOA.

ASSUMPTIONS: Requires consultation. Develop stipulations that will become part of the mitigation package. Typically necessitates one or more consultation meetings. Includes preparing MOA and obtaining signatures of signatories. Note: MOAs involving COE are much more time consuming to prepare, as their legal generally reviews and comments. File executed (signed) MOA with ACHP. If consensus cannot be reached with consulting parties, request ACHP comment.

STAFFING LEVEL: Historian/Archaeologist (project and senior), project CE, environmental specialist

Hours are per project

**Low** – Timely review by all parties. Consulting parties readily agree to mitigation measures/stipulations

**Medium** – Minor delays in comments from consulting parties. Objections that can easily be resolved

**High** – Lengthy consultation required to reach agreement and/or lengthy review times

* + - 1. 763.9 Implementation of commitments or stipulations

ASSUMPTIONS: Some commitments/stipulations must be fulfilled prior to construction. However, others will be during or following construction. Central Office tracks status of MOA stipulations. Other commitments are tracked by the region

STAFFING LEVEL: Historian/Archaeologist (project and senior), project CE, environmental specialist

Hours are per project

SCHEDULE IMPACTS: If commitments include data recovery at an archaeological site, field work cannot occur in the winter

**Low** – few commitments, can be implemented in short term (Note likely Section 106 commitments that result from projects not requiring an MOA)

**Medium** – many commitments, more time intensive

**High** – Many commitments, more time intensive, commitments require consultation with interested parties (e.x. public interpretation) and/or property owners (e.x. NRHP nomination) highly complex project may require significantly more effort.

* + - 1. 763.10 State Burial Site Law (Wisconsin 157.70)
         1. 763.10.1 Determine whether the boundary of the cemetery or other type of burial site extends into the project's APE

ASSUMPTIONS: use DT 1614 for marked cemeteries. For unmarked grave sites, a qualified profession shall determine the boundary of the site & whether or not it extends into the project area. For prehistoric burial sites where there is no longer a mound visible – you have to consider Lidar analysis, historic map review, and field survey –none of which will verify presence or absence of graves without stripping and ground truthing. For historic cemeteries, the issue of addressing potential for unmarked graves would be addressed separately heading via monitoring.

STAFFING LEVEL: Archaeologist, Project CE

Hours are per burial site

**Low** – marked cemetery with good documentation of burial locations

**Medium** – unmarked burials, some records available, field work required

**High** – limited records available or potential for burials in project area, field work and/or monitoring required.

* + - * 1. 763.10.2 Petition for permission to work within the boundaries of the site

ASSUMPTIONS: Permit is valid for 1 year, so time request on construction schedule. An extension can be requested if necessary. Project manager sends request to central office cultural resources team, and they submit petition to SHPO.

STAFFING LEVEL: project CE, Environmental specialist

Hours are per project

SCHEDULE IMPACTS: Permit is only valid for a year

**Level of effort similar for all projects** – submit request to WisDOT CO cultural resources team (CRT). CRT will submit petition to SHPO

* + - 1. 763.11 Prepare Section 4(f) determination

ASSUMPTIONS: Only required if there is a “use” of a historic or archaeological site. Typically use involves real estate acquisition. If there is no real estate acquisition, can consider constructive use in unique situations (consult with FHWA). Options for processing include temporary occupancy, de minimis, programmatic evaluations or full 4(f). An exception applies for archaeological sites that are not important for preservation in place. Activities involve determining appropriate determination type (consult with FHWA), coordination with the official with jurisdiction, public involvement as needed, alternatives analysis if needed, on completion of the 4(f) document. NOTE: FAST Act allows that FHWA can adopt Section 106 packet rather than detailed 4(f) analysis

STAFFING LEVEL: project CE, environmental specialist

Hours are per 4(f) property adjacent to property

**Low** – 4(f) property, but no use, temporary occupancy of a 4(f) property, archaeological exception applies

**Medium** – de minimis or programmatic 4(f) is applicable

**High** – Full (individual) 4(f) determination needed

###### 765 Analyze HazMat Site Impact *(7/29/16)*

* + - 1. 765.0Investigation of potentially contaminated sites. Includes Phase 1-3 investigation, Phase 4 remediation, and asbestos inspection and abatement
      2. 765.1 Perform Phase 1 hazardous materials assessment
         1. 765.1.1 Data Collection and Review

Staffing: hydrogeologist, scientist, engineer, planner (entry)

**Low** – Small project, few sites (less than 10)

**Medium** – Mid-sized project, 10 or more sites

**High** – Large project, 20 or more sites

* + - * 1. 765.1.2 Field reconnaissance

Staffing: hydrogeologist, scientist, engineer, planner (entry)

**Low** – Small project, few sites (less than 10)

**Medium** – Mid-sized project, 10 or more sites

**High** – Large project, 20 or more sites

* + - * 1. 765.1.3 Data evaluation and review, prepare conclusions and recommendations; prepare site summaries and draft/final hazardous materials report

Staffing: hydrogeologist, scientist, engineer, planner (entry/mid)

**Low** – Small project, few sites (less than 10)

**Medium** – Mid-sized project, 10 or more sites

**High** – Large project, 20 or more sites

* + - 1. 765.2 Perform additional hazardous materials assessment
         1. 765.2.1 Perform field investigation and prepare phase 2 report

Staffing: hydrogeologist, geologist, scientist, engineer, (entry)

Subcontractors: driller, analytical lab, traffic control

**Low** – Small residential or commercial site, or most site data available from previous investigations, strip Fee acquisition or TLE

**Medium** – Medium sized commercial site with multiple uses, or limited data from previous investigations, strip or partial Fee acquisition or PLE

**High** – Large commercial site with multiple uses or no data from previous investigations, partial or total Fee acquisition or PLE of most of property

* + - * 1. 765.2.2 Perform Phase 2.5 investigation, develop materials handling plan and special provisions

765.2.2.1 Perform field investigation and Prepare phase 2.5 report

Staffing: hydrogeologist, geologist, engineer, (Entry/mid)

Subcontractors: driller, analytical lab, traffic control

**Low** – small project, few sources (less than 5)

**Medium** – medium sized project, multiple sources (5-10), varying degrees of excavation, some utility work

**High** – large project, multiple sources, mingled plumes, coordination with RPs on remediation options for material in R/W, varying depth of excavation, moving, repairing or new utilities

765.2.2.2 Obtain DNR concurrence on materials handling plan

Staffing: hydrogeologist, geologist, engineer, (Entry/mid)/Sr)

**Low** – minimal material to manage or all material to be landfilled

**Medium** – more material to be managed, some material to be beneficially reused within project limits.

**High** – most material to be beneficially reused within project limits, coordination with multiple RP’s, multiple contamination types requiring segregation and special handling, sensitive areas within project limits, high –level contamination, groundwater management, sediment management

* + - * 1. 765.2.3 Perform Phase 3 investigation, Determine full nature and extent of contamination and prepare remediation plan

765.2.3.1 Perform field investigation

Staffing: hydrogeologist, geologist, engineer, (MID/Sr)

Subcontractors: driller, analytical lab, specialty subcontractors (vapor sampling, induced light fluorescence, other)

**Low** – Small site, single source of contamination

**Medium** –Larger site, multiple sources of contamination, comingled contamination

**High** – Large site, multiple sources of contamination, non-petroleum contamination or DNAPL (Denser than water non-aqueous phase liquid) contamination.

765.2.3.2 Develop remediation plan

Staffing: hydrogeologist, geologist, engineer (Mid/SR)

**Low** – excavation and removal of contaminated soil, or stable or receding plume, low level groundwater contamination or no contaminated groundwater, no vapor intrusion, tight soils, limited area of contamination

**Medium** –low level groundwater contamination, no vapor, tight soils, moderate to heavy soil contamination, large area of contamination, sediment management

**High** – vapor intrusion into buildings, comingled plume, active remediation system required fractured bedrock, breached confining layer, granular soils, DNAPL or high dissolved-phase contamination, free product, sediment management

765.2.3.3 Obtain DNR Concurrence on Remediation Plan

Staffing: hydrogeologist, geologist, engineer (SR)

**Low** – Level of effort is relatively the same for all levels.

**Medium** – N/A

**High** – N/A

765.2.3.4 Prepare Phase 3 report

Staffing: hydrogeologist, geologist, engineer (entry/Mid/SR); Project manager for QA/QC, Admin for report production and GIS for mapping component

**Low** – limited remediation required

**Medium** – some engineering required, phased remediation or multiple monitoring events

**High** – complex engineering plans, remediation system plans, vapor intrusion abatement

* + - * 1. 765.2.4 Perform Phase 4 Hazardous Materials Remediation and Materials Management

Staffing: hydrogeologist, geologist, scientist, engineer, (Entry in field, mid for support, Sr for review) Admin staff for report production/duplication, GIS for mapping component, CADD for asbuilts.

Subcontractors: HAZWOPER trained excavator, tank remover, licensed waste hauler or licensed hazardous waste hauler; traffic control, analytical laboratory

765.2.4.1 Prepare phase 4 report, site closure package

**Low** – UST removal and closure assessment, oversight of remediation work performed by construction contractor, documentation of management and disposal, low level groundwater contamination or no contaminated groundwater, no vapor intrusion, tight soils, limited area of contamination, single year remediation

**Medium** – remediation performed by environmental consultant and their contractors, low level groundwater contamination, no vapor, tight soils, moderate to heavy soil contamination, large area of contamination, sediment management single year or 2-3 year remediation.

**High** – remediation performed by environmental consultant and their contractors, off site contamination, vapor intrusion, high levels of groundwater contamination, moderate to heavy soil contamination, fractured bedrock, breached confining layer, granular soils, DNAPL or high dissolved-phase contamination, free product, sediment management, multi-year remediation.

* + - 1. 765.3 Conduct asbestos inspection

Staffing: licensed asbestos inspector (Entry/Mid) Project manager for review and QA/QC, Admin staff for report production/duplication and GIS staff for mapping component.

Subcontractors: Analytical laboratory; Traffic Control; occasionally cherry picker or other specialized access equipment.

**Low** – box culvert or small bridge (e.g. STH 19 over Token Creek), single family residence

**Medium** – multi-span bridge (e.g. Madison So. Beltline over Yahara River) or smaller bridge with major significant traffic control needs (e.g. night work, lane closures), multi family residence, school, small business building

**High** – very large or long bridge with multiple ramps/approaches/subsections e.g. Hoan Bridge or Bong Bridge, Leo Frigo Bridge, Dresbach Bridge, I 90/94 Wisconsin River Bridge, manufacturing facility, motel or other large business building.

* + - 1. 765.4 Conduct asbestos abatement

Staffing: Licensed asbestos abatement contractor (includes asbestos management planner, site supervisor, site workers, asbestos project designer) (Entry for most field staff, mid/Sr for management and abatement planning/designing) Project manager for review and QA/QC, Admin staff for report production/duplication and GIS staff for mapping component.

**Low** – box culvert or small bridge (e.g. STH 19 over Token Creek)

**Medium** – multi-span bridge (e.g. Madison So. Beltline over Yahara River) or smaller bridge with major significant traffic control needs (e.g. night work, lane closures)

**High** – very large or long bridge with multiple ramps/approaches/subsections e.g. Hoan Bridge or Bong Bridge, Leo Frigo Bridge, Dresbach Bridge, I 90/94 Wisconsin River Bridge

* + - * 1. 765.4.1 Prepare abatement plan

Staffing: Mid/Sr (Asbestos management planner, asbestos project designer)

**Low** – small amount of asbestos in a few discrete locations.

**Medium** – larger quantities of asbestos in multiple locations

**High** – multiple forms of asbestos scattered throughout or large quantities located throughout structure (e.g. ceilings, floors, walls).

* + - * 1. 765.4.2 Prepare notification of Demolition

Staffing: ENTRY

**Low** – Level of effort is same for all levels.

**Medium** – N/A

**High** – N/A

* + - * 1. 765.4.3 Conduct abatement

Staffing: Entry for workers /Mid/Senior for asbestos supervisor

Subcontractors: Licensed waste hauler and landfill licensed to accept asbestos

**Low** – small amount of asbestos in a few discrete locations

**Medium** – larger quantities of asbestos in multiple locations

**High** – multiple forms of asbestos scattered throughout or large quantities located throughout structure (e.g. ceilings, floors, walls)

* + - * 1. 765.4.4 Prepare and submit abatement report and disposal documentation

Staffing: Entry/Midfor report prep and disposal documentation, Project manager for review and QA/QC, Admin staff for report production/duplication and GIS staff for mapping component.

**Low** – small amount of asbestos in a few discrete locations

**Medium** – larger quantities of asbestos in multiple locations

**High** – multiple forms of asbestos scattered throughout or large quantities located throughout structure (e.g. ceilings, floors, walls)

###### 766 Analyze Natural Environment Impact *(7/27/16)*

* + - 1. 766.0 Analyze impact to natural environment (wetlands, streams, lakes, upland), coordinate with resource agencies, and develop permits and mitigation measures.
      2. 766.1 Evaluate impact on wetlands
         1. 766.1.1 Determine presence and delineate existing wetlands

ASSUMPTIONS: Gather information from agencies, available databases and mapping sources to determine potential presence of wetlands. Level of effort is influenced by whether a formal delineation or informal determination is appropriate. If wetlands are present, identify location on project plans and environmental document, quantify impacts. Determine functional type. Off alignment delineations require more effort than identified in the “High” level of effort.

STAFFING LEVEL:

Environmental Specialist with wetland training, GIS technician, Project Engineer

Hours are per project

SCHEDULE IMPACTS: Delineation must be done during growing season. Agency (WDNR and USACE) may need to evaluate delineation via a field review during the growing season. This could impact project schedule/permit timeline.

**Low** – No wetlands in project

**Medium** – Small quantity (< 5 acres) of wetlands on project which are impacted. General Permit or Letter of Permission required.

**High** – Impacts greater than 5 acres on the project; individual permit required.

* + - * 1. 766.1.2 Determine and Quantify wetland and waterway impacts

ASSUMPTIONS: Using wetland delineation data and project plans, quantify wetland area impacted by project.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low** – No wetlands in project

**Medium** – Small quantity of wetlands on project which are impacted.

**High** – Impacts greater than 5 acres on the project.

* + - * 1. 766.1.3 Prepare wetland finding if needed

ASSUMPTIONS: This only applies to projects where there is no practical avoidance alternative, all practical measures to minimize harm have been taken.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low** – Less than 7.4 acres of wetlands in project.

**Medium** – Wetlands on project which are impacted. More than 7.4 acres.

**High** – same as medium

* + - * 1. 766.1.4 Develop 401/404 permit application

ASSUMPTIONS: Project impacts wetlands/waterways and a 404 permit of some kind is required for compensation of unavoidable loss. Includes coordination with WDNR and USACE for concurrence on mitigation plan.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low** – Under 0.1 acres of impact; general permit required (may be non-reporting)

**Medium** – 0.1 to 5.0 acres of impact; general permit or letter of permission required

**High** – Impacts greater than 5 acres on the project; individual permit required.

* + - 1. 766.2 Evaluate impacts to rivers, streams and floodplains
         1. 766.2.1 Inventory resources, document impacts and mitigation

ASSUMPTIONS: Gather information from agencies, available databases and mapping sources to determine potential impacts to rivers, streams and floodplains. If present, identify location on project plans and environmental document, quantify impacts. See FDM Procedure 21-25-25. See FDM Procedure 24-5-5 for general guidance. See WDNR Surface Water Classifications: Outstanding Resource Waters (NR 102.10): Exceptional Resource Water (NR 102.11): Great Lakes Systems (NR 102.12(1)): Fish and Aquatic Life Waters (NR 102.13): Waters listed in NR 104.05-104.10, Tables 3-8.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low** – no impacts to rivers, streams and floodplains

**Medium** – impacts to river, stream or floodplain where data gathering is required, but no impacts that would require permit

**High** – impacts to river, stream or floodplain where permit (i.e. Section 10, etc.) is required

* + - * 1. 766.2.2 Obtain permits/approvals as applicable: USACE - Section 10 (with 404 permit), Section 408 USCG Section 9

ASSUMPTIONS: This only applies to projects categorized as “High” in 766.2.1. Navigable water is affected by the project and coordination with U.S. Coast Guard or U.S. Army Corps of Engineers is required.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low** – Nationwide Permit is applicable (i.e. previously authorized structure, bank stabilization, road crossing, etc)

**Medium** – individual permit(s) is/are required. Additional coordination with permitting authority/ies.

**High** – same as Medium

* + - 1. 766.3 Evaluate impacts to lakes and other open water
         1. 766.3.1 Inventory resources, document impacts and mitigation

ASSUMPTIONS: Gather information from agencies, available databases and mapping sources to determine potential impacts to lakes and other open water. If present, identify location on project plans and environmental document, quantify impacts. See WDNR Surface Water Classifications: Outstanding Resource Waters (NR 102.10): Exceptional Resource Water (NR 102.11): Great Lakes Systems (NR 102.12(1)): Fish and Aquatic Life Waters (NR 102.13): Waters listed in NR 104.05-104.10, Tables 3-8.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low** – no impacts to lakes and other open water

**Medium** – impacts lakes or other open water where data gathering is required, but no impacts that would require permit (i.e. depredation permit, Section 10, etc.)

**High** – impacts to lakes or other open water where permit (i.e. depredation permit, Section 10, etc.) is required

* + - 1. 766.4 Evaluate impacts to groundwater wells and springs
         1. 766.4.1 Inventory resources (locate wells and springs), document impacts and mitigation

ASSUMPTIONS: Gather information from agencies, available databases and mapping sources to determine potential impacts to groundwater wells and springs. If present, identify location on project plans and environmental document, quantify impacts. See WDNR Surface Water Classifications: Outstanding Resource Waters (NR 102.10): Exceptional Resource Water (NR 102.11): Great Lakes Systems (NR 102.12(1)): Fish and Aquatic Life Waters (NR 102.13): Waters listed in NR 104.05-104.10, Tables 3-8. See USGS maps, high capacity wells, springs, well drillers repots to find water table.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low** – no wells or springs in project area, project excavation above groundwater table, work not within area with well head protection plan, groundwater management plan, ordinances to protect wells, aquifers or sensitive groundwater recharge area, or similar plans and/or programs.

**Medium** – potable wells, ground monitoring wells, or other wells w/in project corridor but no impact to wells or water quality in wells. Excavation below water table; dewatering required (dewatering not anticipated to impact wetlands or springs, reduce groundwater recharge to sensitive areas, etc).

**High** – high capacity well within project limits, flowing springs, seeps, excavation below water table, dewatering required (potential for impact to resources), project encroaches on protected areas that may result in non-compliant wells or plans, large wetland fill section that may impact water flow, construction of wetland mitigation site, or project may cause contamination to migrate to new locations.

* + - 1. 766.5 Evaluate impacts to upland habitat
         1. 766.5.1 Inventory resources (habitat and wildlife), document impacts

ASSUMPTIONS: Gather information from agencies, available databases and mapping sources to determine potential impacts to upland habitat. If present, identify location on project plans and environmental document, quantify impacts. See Factor Sheet C-5 “blue language” for guidance, because most of this habitat is not protected by law. An example of an exception to this is suitable habitat, occupied habitat or designated critical habitat for federally-listed threatened/endangered species.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low** – no impacts to upland habitat

**Medium** – impacts to upland habitat, but none that require additional agency coordination

**High** – impacts to upland habitat that require additional agency coordination

* + - 1. 766.6 Evaluate impact to coastal zones
         1. 766.6.1 Identify if project is in Coastal Zone, coordinate with Coastal Management Program, obtain coastal zone consistency determination

ASSUMPTIONS: Refer to FDM 5-10-35.2 “Coastal Management Program” and Factor Sheet C-6 “blue language” for guidance to determine if the project is within a Coastal Zone.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low** – project not within Coastal Zone

**Medium** – project within a Coastal Zone county, but does not affect a Special Coastal Area.

**High** – project within a Coastal Zone county and affects a Special Coastal Area

* + - 1. 766.7 Evaluate impacts to Threatened and Endangered Species
         1. 766.7.1 Determine if any species are present in project area (IPaC/official species list for federally listed species, NHI review for state listed species)

ASSUMPTIONS: Request NHI review from DNR (or will be included with initial comments letter). Use IPaC to generate an official species list

STAFFING LEVEL: Environmental Specialist

Hours are per project

**Level of effort similar for all projects**

* + - * 1. 766.7.2 Survey for species/habitat

ASSUMPTIONS: Only required if there are listed species and appropriate habitat is present. Field survey to determine presence or probable absence of species. Create maps for field review. Prepare documentation report. NOTE: Some surveys require federally- or state-permitted individuals (permitted by FWS or WDNR to handle listed species; typically required for wildlife species), or individuals with unique expertise (ex. Mussel surveys may require divers; snake surveys may require very experienced individuals).

STAFFING LEVEL: Environmental Specialist, GIS technician

Hours are per project

SCHEDULE IMPACTS: species often have a window for identification in which the surveys need to be completed.

**Low** – One/few species potentially present with suitable habitat that is sparsely located along project corridor

**Medium** – One/few species potentially present with suitable habitat common along corridor

**High** – Many species present with different timeframes for identification

* + - * 1. 766.7.3 Evaluate impacts and make effect determinations for species/critical habitat

ASSUMPTIONS: For each listed species determine how the habitat will respond to the proposed action, and assess how the species is expected to respond to these habitat changes. Coordinate with DNR and use USFWS Section 7 technical assistance webpage to assist in these decisions. For Northern Long Eared Bat (NLEB), use one of the two keys to the final 4(d) rule (depending on whether or not it is a Federal Project) to determine if the project will result in a prohibited take. Possible determinations include: No Effect; May Affect, Not likely to Adversely Affect; May Affect, Likely to Adversely Affect.

STAFFING LEVEL: Environmental Specialist, Project Engineer

Hours are per listed species

**Low** – Potential to impact species/habitat is readily evident

**Medium** – Additional investigation, survey or agency consultation is needed to make effect determinations for one species. Only one species affected or if more than one species impacted, level of impact to other species is readily evident.

**High** – Additional investigation, survey, or agency coordination is needed to make effect determinations on multiple species.

* + - * 1. 766.7.4 Agency Consultation

766.7.4.1 Federally Listed Species (Section 7 Consultation): United States Fish and Wildlife Service (USFWS)

ASSUMPTION: If take is not prohibited for NLEB and no other federally listed species are impacted, use streamlined consultation form: <http://www.fws.gov/midwest/endangered/mammals/nleb/s7.html>. If streamlined consultation does not apply (Prohibited take of NLEB and/or determination of “May Effect” for any other federally listed species) follow standard informal consultation process: <http://www.fws.gov/midwest/endangered/section7/s7process/index.html>.

STAFFING LEVEL: Environmental Specialist, Project Engineer

Hours are per project

**Low** – Determination of No Effect for all listed species. Coordination with USFWS is not necessary. Note: at this point, this is unlikely because there will be very few project that we could make a No Effect Determination for Northern Long Eared Bat (NLEB).

**Medium** – Determination of may affect, not likely to adversely affect for any listed species is easy to determine through coordination with WDNR (able to minimize impacts to species to a level that will not result in adverse impacts). FWS consultation (informal consultation) and concurrence on finding required, but consultation not necessary to make effect determination. Streamlined 4(d) consultation applies for the NLEB (Requirements: Take not prohibited for NLEB, No Effect for all other federally listed species)

**High** – Determination of may affect, not likely to adversely affect for any listed species requires FWS consultation to make final determination. Activity will cause prohibited take of the NLEB or other listed species. Determination of may affect, likely to adversely affect, requiring formal consultation (must be led by FHWA), preparation of a biological assessment (by WisDOT/FHWA), biological opinion (by FWS) and jeopardy determination (by FWS).

766.7.4.2 State Listed Species: Wisconsin Department of Natural Resources (WDNR)

ASSUMPTIONS: Coordination with WDNR is required for all projects under the WisDOT-WDNR Cooperative Agreement. WDNR will identify species of concern in their initial comments letter. WDNR will also help make affect determinations and assist in survey/relocations as necessary. If incidental take is required, complete take application and put together conservation plan <http://dnr.wi.gov/files/PDF/forms/1700/1700-067.pdf>.

STAFFING LEVEL: Environmental Specialist, Project Engineer

Hours are per project

**Low** – There are occurrences of rare species in the project area, but the project will not have an effect on these species

**Medium** – Coordination with WDNR shows that mitigation measures which can be incorporated into the project will prevent take

**High** – Incidental Take Authorization needed. Take permit/conservation plan required.

* + - * 1. 766.7.5 Relocations (mussels, rare plants, host plants, etc.)

ASSUMPTIONS: relocate all T&E species from project footprint. Includes any reporting and monitoring actions required by the conservation plan. The high effort value could be significantly higher depending on complexity of issue (number of species, density of species, monitoring requirements, availability of suitable relocation habitat, etc.)

STAFFING LEVEL: Environmental Specialist

Hours are per project

**Low** – Limited individuals of single species need to be relocated, all individuals occur within close proximity of each other, suitable area to relocate is readily identified, few reporting/monitoring requirements

**Medium** – Limited individuals, but multiple species and/or more widely dispersed through project corridor

**High** – Many relocations required, can be multiple species, widely dispersed throughout the corridor and more reporting/monitoring requirements.

* + - 1. 766.8 Analyze Drainage and Storm water Impacts
         1. 766.8.1 Determine and document project's effect on drainage/storm water

ASSUMPTIONS: Gather information from agencies and project engineers/designers to identify project’s effect on drainage and storm water management. Refer to Trans 401. See Factor Sheet D-5 “blue language” for guidance.

STAFFING LEVEL:

Environmental Specialist, Project Engineer

Hours are per project

**Low** – no change to drainage and storm water

**Medium** – changes to drainage and storm water, but none within a storm water management area and none that require property acquisition

**High** – changes to drainage and storm water within a storm water management area and/or require property acquisition

* + - 1. 766.9 Section 4(f) – This section covers parks/refuges only. Historical 4(f) is covered under 763.11
         1. 766.9.1 Determine if Section 4(f) properties are present

ASSUMPTIONS: Gather information from agencies, available databases and mapping sources to determine if Section 4(f) properties are present. Refer to FDM 21-25-1, see Factor Sheet B-8 “blue language” for guidance.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low –** Parks, recreation areas, wildlife and waterfowl refuges are easily identified through land use plans, CORP (Comprehensive Outdoor Recreation Plan), etc.

**Medium –** More effort is involved in determining whether a property(ies) is/are a park, recreation area or refuge, or in determining whether the property is significant (requires consultation with the official with jurisdiction). Often requires coordination with FHWA

**High** – Unique situations where properties are privately owned but open to the public (are there any long term agreements with the municipality? Requires consultation with owner, municipality and FHWA), properties are jointly developed, properties with multiple use, properties that encroach on the right of way, etc

* + - * 1. 766.9.2 Determine if there is a "use" of the 4(f) property

ASSUMPTIONS: If a Section 4(f) property, or properties, is/are present, determine if there will be a “use” of the property. Types of “use” include: Permanent Incorporation/Permanent Easement where right-of-way is acquired permanently for the project as fee or easement, Temporary Occupancy where activities on the property that are temporary in nature are necessary during construction, and Constructive Use where the project creates an indirect impact on the Section 4(f) property. Refer to https://www.environment.fhwa.dot.gov/section4f/use\_types.aspx

STAFFING LEVEL:

Environmental Specialist, GIS technician, Project Engineer

Hours are per project

**Low –** it is easy to determine whether or not there is use, and the decision can be made by project team.

**Medium –** coordination is required before making a use determination e.g., agreement from the official with jurisdiction when we think the temporary occupancy exception is appropriate, of determination requires coordination with FHWA.

**High –** Unique situations e.x., if constructive use is considered; park boundary overlaps roadway, etc

* + - * 1. 766.9.3 Prepare Section 4(f) Evaluation

ASSUMPTIONS: There is a “use” of a Section 4(f) property on the project; documentation of that “use” is required. Refer to <https://www.environment.fhwa.dot.gov/projdev/impTA6640.asp> and <https://www.environment.fhwa.dot.gov/section4f/evaluations.aspx>

STAFFING LEVEL:

Environmental Specialist, Project Engineer

Hours are per project

**Low** – De Minimis 4(f) Evaluation

**Medium** – Programmatic 4(f) Evaluation

**High** – Individual (full) 4(f) Evaluation

* + - 1. 766.10 Section 6(f) and other grant funded properties
         1. 766.10.1 Identify if any properties have special funding associated with them

ASSUMPTIONS: Gather information from agencies, available databases and mapping sources to determine if Section 6(f) properties are present. Refer to FDM 21-25-5, see Factor Sheet B-8 “blue language” for guidance.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Engineer

Hours are per project

**Low –** Few properties with encumbrances, and encumbrances are easily identified

**Medium –** more properties. All encumbrances associated with the properties are the same (only dealing with one type of grant funded properties), and it is a grant type is one that we are familiar with working with

**High –** multiple properties, multiple grants associated with them, or a grant type we are not familiar with requirements of

* + - * 1. 766.10.2 Identify conversion/mitigation requirements. Identify replacement property, if required; prepare Section 6(f) conversion request

ASSUMPTIONS: From FDM 21-25-5 – “If a highway project requires the acquisition of Section 6(f) lands, the lands acquired for right of way purposes must be replaced with other property of at least equal fair market value and of reasonably equivalent usefulness and location. Note that Section 6(f) lands are often Section 4(f) lands and should be addressed as such. In evaluating the impacts of the acquisition on these lands, a recommendation of replacement lands should be included, indicating the areas under consideration for replacement.” Includes completion of LWCF Proposal Description and Environmental Screening Form.

STAFFING LEVEL:

Environmental Specialist, GIS technician, Engineer, Real Estate manager

SCHEDULE IMPACTS: very time consuming

**Low** – For 6(f) properties: Temporary Non-conforming Use or Small Conversion Policy is appropriate, see FDM 21-25-5.1.1. For other properties conversion/mitigation requirements are readily identified and can be easily accomplished.

**Medium** – For properties requiring replacement property, a replacement property that is agreed upon by the agencies and has a willing seller is easily identified. For other properties, additional effort is required to what conversion/mitigation requirements are for that particular grant but mitigation can be accomplished with reasonable effort. Medium effort would involve one or two different grant types.

**High –** Difficulty finding a replacement property with willing seller that agencies agree on (if replacement is required). Mitigation for other grant funded properties is extensive. Some programs (e.g., WRP) are extremely difficult to convert.

* + - 1. 766.11 Specialty - Storm water management

**Low** –

**Medium** –

**High** –

* + - 1. 766.12 Specialty - Biological services

**Low** –

**Medium** –

**High** –

###### 769 Environmental Documentation and Agency Coordination *(7/26/16)*

* + - 1. 769.0 Prepare and review environmental document
      2. 769.1 Initial Agency and Tribal Coordination

This activity task includes drafting an initial letter to agencies in accordance with FDM Section 5-5 and Section 5-10. FDM Section 5-1 Attachment 1.1 provides a table showing basic coordination associated with a project. The initial coordination involves contacting agencies with pertinent details of the project, specific to each agency, and requesting comments. Some coordination involves submitting specific forms associated with the coordination.

* + - * 1. 769.1.1 WDNR - General Coordination & Assessment

This activity task involves preparing and sending a letter to the WDNR in accordance with the WDNR - WisDOT Cooperative agreement. The letter should include:

* General description of the project
* Purpose and need for the project
* Range of alternatives that could be considered
* Range of potential impacts that could occur
* Project schedule
* WisDOT checklist for WDNR reviews

In accordance with the provisions of the Cooperative Agreement, the DNR should be contacted with regard to any project involving their areas of jurisdiction, namely, land and water resources including state and federal wild and scenic rivers, air quality, threatened and endangered species, Section 4(f) (parks), and hazardous substances. Evidence of that contact, such as letters or records of telephone conversations, meetings, field reviews, etc. should be included in the draft environmental document. Each item/issue could involve multiple letters and/or meetings with the WDNR.

Normally the WDNR will send an initial project review letter providing initial comments and discussing the potential impacts and ways to minimize harm. During the Section 404 process the WDNR authorizes 401 water quality certification. Coordination also takes place between the WDNR Floodplain Zoning Section for concurrence in navigational clearance and backwater requirements associated with bridges.

Ultimately WisDOT needs to receive final concurrence from the WDNR before construction on any project can begin.

This activity task is for one initial letter to the WDNR liaison. Note that projects with high complexity may require multiple letters and or coordination meetings.

**Low** – Low complexity project, such as resurfacing, with minimal impacts.

**Medium** – Moderate complexity project with impacts to multiple areas under WDNR jurisdiction. Examples include bridge replacements, projects that expand the typical section, etc.

**High** – High complexity project with impacts to multiple areas under WDNR jurisdiction. Examples include projects that require substantial amounts of right of way, have impacts to special resources, etc.

* + - * 1. 769.1.2 USFWS

USFWS is under the Department of Interior. Coordination with USFWS is required for projects involving 404 permits, navigable waterways, wetlands, threatened and endangered species, and Section 4(f) properties. This activity task involves preparing and sending a letter to the USFWS. The letter should include:

* General description of the project
* Purpose and need for the project
* Range of alternatives considered
* Range of potential impacts
* Project schedule

**Low** – Low complexity project, such as resurfacing, with minimal impacts.

**Medium** – Moderate complexity project with impacts to multiple areas where USFWS has expertise. Examples include bridge replacements, projects that expand the typical section, etc.

**High** – High complexity project with impacts to multiple areas where USFWS has an interest. Examples include projects that require substantial amounts of right of way, have impacts to special resources, threatened and endangered species, etc.

* + - * 1. 769.1.3 Bureau of Indian Affairs - Native American Tribes

Section 106 of the National Historic Preservation Act (Act) stipulates that Native American

Tribes be provided a reasonable opportunity to identify their concerns about historic properties, advise on the identification and evaluation of historic properties (including those of traditional religious and cultural importance), articulate their views on the undertaking’s effects on such properties, and participate in the resolution of adverse effects.

This activity task involves drafting a letter (on WisDOT stationary) to the Tribal Historic Preservation Officer of the tribes listed for that county on WisDOT’s Tribal Mailing List. Typically the letter includes:

* General description of the project
* Location of the project
* Project schedule

**Low and Medium** – A one or two page letter with a project location map sent to up to 12 tribal preservation officers

**High** – A three or more page letter with a project location map sent to more than 12 tribal preservation officers.

* + - * 1. 769.1.4 BOA

When a highway project comes within 5 miles of a public use airport, the Bureau of Aeronautics and the airport in question will be contacted. The coordination is described in FDM Section 5-10-25. This activity task includes contacting both entities with a letter describing the project and the projected effect. This activity task includes:

* Downloading software at [http://wisconsindot.gov/Pages/travel/air/airport-info/arp.aspx](http://apwmad0p4145:37108/Pages/travel/air/airport-info/arp.aspx) to view data maps.
* Checking FAA’s Obstruction Evaluation Website; https://oeaaa.faa.gov/oeaaa/external/portal.jsp and using the ‘Notice Criteria Tool’ to determine if a notice of proposed construction will be required to be filed with the FAA. (Contact the Airspace Safety Program Manager at the Bureau of Aeronautics with questions on using the FAA’s Obstruction Evaluation Website and the notice of proposed construction filing process.)
* Transmitting the results along with a corresponding letter explaining the project to the BOA.

The BOA will determine if further coordination with the FAA is necessary. This coordination should be noted in the environmental document.

**Low** – A non-complex project, within 5 miles of a public airport, which does not change the horizontal or vertical alignment of the roadway.

**Medium** **and High**– A project within 5 miles of a public airport that changes the horizontal and/or vertical alignment of the roadway.

Note that all non-public use airports that may be affected by a highway project shall be contacted by the design project manager or other responsible party.

* + - * 1. 769.1.5 FAA

The BOA will determine if further coordination with the FAA is necessary and what information will be needed. This activity task will be negotiated on a case by case basis.

* + - * 1. 769.1.6 County Drainage Board

This activity task entails:

* Contacting the county to determine if there is a drainage district within the project area.
* Contacting drainage district board if there is a roadway crossing of a ditch that is being constructed or reconstructed.

**Low** – Consists of contacting the county to determine if there is a drainage district, and no drainage district exists.

**Medium** **and High**– Consists of contacting the county to determine if there is a drainage district, and a drainage district exists. Then contacting the drainage district board to obtain pertinent details.

* + - * 1. 769.1.7 USACE

Early coordination with the USACE on projects involving the placement fill or dredge material into waters of the United States, including wetlands, will assist in expediting the USACE project review. Early coordination with the WDNR and the U.S. Fish and Wildlife Service maybe sufficient during the planning process. If a 404 permit is required, early coordination with USACE is necessary.

This activity task includes drafting a letter that provides:

• General description of the project

• Purpose and need for the project

• Range of alternatives considered

• Range of potential impacts

• Project schedule

This activity task does not include services associated with obtaining a Section 404 permit.

**Low** – Low complexity project, such as resurfacing, with minimal impacts.

**Medium** – Moderate complexity project with impacts to multiple areas where USACE has expertise. Examples include bridge replacements,

**High** – High complexity project with impacts to multiple areas under USACE jurisdiction. Examples include projects have impacts to wetlands, waterways etc.

* + - * 1. 769.1.8 US EPA

Typically direct coordination with the US EPA does not occur, except on projects involving an EIS. In that case the coordination process would follow the 2015 Red Book for synchronizing the NEPA and 404 processes. This activity task does not include the full process described in the Red Book, but only includes Step 1, invitation to the introductory meeting. This coordination would consist of a letter with the following information:

• General description of the project

• Potential project issues

• Potential NEPA schedule

• Pertinent scoping meeting information

Effort levels for low, medium and high complexity projects are the same.

* + - * 1. 769.1.9 Local Agency Coordination

This activity task involves initial contact with local governments with a letter explaining the project and can be associated with an invitation to a local officials meeting, or an Operational Planning Meeting (see FDM 3-10-1). This activity task includes sending only the initial letter, with the following information:

• General description of the project

• Brief description of purpose and need for the project

• Brief sentence indicating the range of alternatives that could be considered

• Project schedule

• Pertinent meeting information

Effort level for low, medium, and high complexity projects is the same, per local agency.

* + - * 1. 769.1.10 Additional Coordination (NPS, USGS)

This activity task involves additional coordination with local, state, or federal agencies that may have a direct expertise or interest in the project. The letter should include:

* General description of the project
* Purpose and need for the project
* Range of alternatives considered
* Range of potential impacts
* Project schedule

The effort level is the same for low, medium, and high complexity projects.

* + - 1. 769.2 Determine document type

This activity task involves determining the type of document appropriate for the project being evaluated in accordance with FDM Section 21-5. This activity task is typically performed during the project scoping process.

The effort level is the same for low, medium, and high complexity projects.

* + - 1. 769.3 Prepare draft project initiation letter, submit to REC

For EAs and EISs, a project initiation letter (PIL) needs to be sent to FHWA in accordance with 23 USC 139(e). This activity task involves drafting and submitting the PIL. There is a draft template for the letter on the environmental webpage at the following location http://wisconsindot.gov/Documents/doing-bus/eng-consultants/cnslt-rsrces/environment/pil-template-3-12-15.docx

The effort level is the same for low, medium, and high complexity projects. The activity task includes one revision by the Region.

* + - 1. 769.4 Categorical Exclusion Checklist

This activity task prepares the Categorical Exclusion Checklist, which entails:

* Preparing two to three paragraphs describing the proposed action
* Preparing one paragraph on the Purpose and Need for the project
* Reviewing and checking the conditions listed to be in compliance with 23 CFR 771.117 (e) and (f)
* Preparing a project location map and other applicable graphics.
* Filling out the environmental commitment table.
* Collating appropriate information (developed under other activity tasks) for the appendices. Appendices are likely to include agency correspondence, typical sections, preliminary plans, Section 4(f) materials, Section 106 form, and other reports and studies.

It is anticipated the Categorical Exclusion Checklist, when completed would range from 5 to 10 pages, with up to 50 pages for appendices, not including typical section or plan set pages. This activity task includes responding to two sets of review comments from the WisDOT Region (or local program) and one set of review comments from WisDOT Central Office.

The effort level is the same for low, medium, and high complexity projects

* + - 1. 769.5 Programmatic Categorical Exclusion

This activity task prepares the Programmatic Categorical Exclusion, which entails:

* General project information
* Completing the checklist associated with 23 CFR 771.117 applicability
* Preparing two to three paragraphs for the project description
* Preparing two to three paragraphs for the improvement type, stating the 23 CFR 771.17(d) applicability
* Preparing three to four paragraphs describing the alternatives that were considered for the project
* Completing the Programmatic Categorical Exclusion Criteria checklist, which briefly summarizes project impacts and references information from local governments and agencies.
* Completing the Federal Aid Criteria checklist
* Preparing supporting graphics, likely to include:
  + Project map with aerial photograph (preferred)
  + Project maps which need to include:
    - Project boundary
    - Needed right of way
    - Adjacent resources (waterways, wetlands, etc.)
* Filling out the environmental commitment table
* Collating appropriate information (developed under other activity tasks) for the appendices. Appendices are likely to include agency correspondence, Section 4(f) materials, Section 106 form, typical sections, preliminary plans, reports, studies, etc.

The Programmatic Categorical Exclusion when completed will range from 10 to 20 pages, with up to 50 pages for appendices, not including typical section and plan set pages. This activity task includes responding to two sets of review comments from the WisDOT Region and one set of review comments from WisDOT Central Office.

The effort level is the same for low, medium, and high complexity projects

* + - 1. 769.6 Environmental Report

The following activity tasks involve drafting an environmental report and the supporting documentation in accordance with FDM Section 21-15-15. It does not include any of the analyses or data collection associated with the environmental report preparation.

* + - * 1. 769.6.1 Environmental Report Basic Sheets

This activity task involves preparing Basic Sheets 1 through 9 using information developed under other task codes. This activity task does not include the safety, traffic, and other analyses associated with developing the Purpose and Need. Much of these analyses are under Activity Task 313. Additionally, this activity task does not include the development or evaluation of alternatives, which can require considerable effort and should be individually scoped on a case-by-case basis.

The activity task includes responding to two sets of review comments from the Region and two sets of review comments from Central Office. It also includes printing up to 10 copies of the ER basic sheets for distribution. The following table lists approximate content (pages) anticipated for each effort level.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low** | **Medium** | **High** |
| Basic Sheet 1  Project Summary | 1 page | 1 page | 1 page |
| Basic Sheet 2  Table of Contents, Abbreviations/Acronyms, Document Description | 1 page | 2-3 pages | 4 or more pages |
| Basic Sheet 3  Purpose and Need  Alternatives-+ | 10-15 pages  1-2 supporting graphics | 15-25 pages  3-5 supporting graphics | 25 or more pages  6 or more supporting graphics |
| Basic Sheet 4  Traffic Summary Matrix | 1 page | 2 pages | 2 pages |
| Basic Sheet 5  Agency and Tribal Coordination | 2 pages | 2-3 pages | 3 or more pages |
| Basic Sheet 6  Alternatives Comparison Matrix | 1 page  2 alternatives | 1 page  3 or 4 alternatives | 1 page  Up to 6 alternatives |
| Basic Sheet 7  EIS Significance Criteria | 1 page | 1 page | 1 page |
| Basic Sheet 8  Environmental Commitments | 2 pages | 2-3 pages | 3 or more pages |
| Basic Sheet 9  Environmental Factors Matrix | 3 pages | 4-5 pages | 6 or more pages |
| Total Pages | 22 to 27 pages | 30 to 39 pages | 46 or more pages |

* + - * 1. 769.6.2 Environmental Report Factor Sheets

This activity task involves preparing a single factor sheet with information and graphics prepared under other tasks codes. As of May of 2016, 23 separate factor sheets are available for inclusion in Environmental Reports. The project team should identify which of the following factor sheets are applicable and then determine the anticipated level of effort (pages) associated with each.

Factor Sheets

* General economics A1
* Business A2
* Agriculture A3
* Community or residential B1
* Environmental justice B4
* Historic resources B5
* Archaeological sites B6
* Tribal coordination/consultation B7
* Section 4(f) and 6(f) or other unique areas B8
* Aesthetics B9

* Wetlands C1
* Rivers, streams and floodplains C2
* Lakes or other open water C3
* Groundwater, wells and springs C4
* Upland wildlife and habitat C5
* Coastal zones C6
* Threatened and endangered species C7
* Air quality D1
* Construction stage sound quality D2
* Traffic noise D3
* Hazardous substances or contamination D4
* Storm water D5
* Erosion control D6

This activity task includes responding to two sets of review comments from the Region and one set of review comments from Central Office. It also includes printing up to 10 copies of the factor sheets for distribution with the ER.

**Low** – Prepare a single factor sheet averaging 2 to 3 pages in length.

**Medium** – Prepare a single factor sheet averaging 4 to 5 pages in length.

**High** – Prepare a single factor sheet averaging 6 or more pages in length.

* + - * 1. 769.6.3 Environmental Report Appendices

This activity task includes collating existing information, prepared under other task codes, into appendices for the environmental report. The activity task includes responding to two sets of review comments from the Region and one set of review comments from Central Office. It also includes printing up to 10 copies of the appendices for distribution with the ER.

**Low** – Prepare set of appendices totaling 10 to 20 pages in length.

**Medium** – Prepare set of appendices totaling 20 to 50 pages in length.

**High** – Prepare set of appendices totaling 50 or more pages in length.

* + - 1. 769.7 Environmental Assessment

The following activity tasks involve drafting an EA and the supporting documentation. FDM Section 21-15-5 as well as 23 CFR 771.119 generally describes this process. This activity task does not include the analyses or data collection associated with the EA preparation.

* + - * 1. 769.7.1 Environmental Assessment Basic Sheets

This activity task involves preparing Basic Sheets 1 through 9 using information developed under other task codes. This activity task does not include the safety, traffic, and other analyses associated with developing the Purpose and Need. Much of these analyses are under Activity Task 313. Additionally, this activity task does not include the development or evaluation of alternatives, which can require considerable effort and should be individually scoped on a case-by-case basis.

This activity task includes responding to two sets of review comments from the Region, two sets of review comments from Central Office, and two sets of review comments from FHWA. It also includes printing up to 10 copies of the EA basic sheets for distribution. The following table lists the approximate content (pages) anticipated for each effort level.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low** | **Medium** | **High** |
| Basic Sheet 1  Project Summary | 1 page | 1 page | 1 page |
| Basic Sheet 2  Table of Contents, Abbreviations/Acronyms, Document Description | 1 page | 2-3 pages | 4 or more pages |
| Basic Sheet 3  Purpose and Need  Alternatives | 10-20 pages  1-5 supporting graphics | 20-40 pages  6-10 supporting graphics | 40 or more pages  10 or more supporting graphics |
| Basic Sheet 4  Traffic Summary Matrix | 1 page | 2 pages | 2 pages |
| Basic Sheet 5  Agency and Tribal Coordination | 2 pages | 2-3 pages | 3 or more pages |
| Basic Sheet 6  Alternatives Comparison Matrix | 1 page  2 alternatives | 1 page  3 or 4 alternatives | 1 page  Up to 6 alternatives |
| Basic Sheet 7  EIS Significance Criteria | 1 page | 1 page | 1 page |
| Basic Sheet 8  Environmental Commitments | 2 pages | 2-3 pages | 3 or more pages |
| Basic Sheet 9  Environmental Factors Matrix | 3 pages | 4-5 pages | 6 or more pages |
| Total Pages | 22 to 32 pages | 35 to 59 pages | 61 or more pages |

This activity task does not include review meetings, which are covered under another separate activity code.

* + - * 1. 769.7.2 Environmental Assessment Factor Sheets

This activity task involves preparing a single factor sheet with information and graphics prepared under other tasks codes. As of May of 2016, 23 separate factor sheets are available for inclusion in Environmental Assessments. The project team should identify which of the following factor sheets are applicable and then determine the anticipated level of effort (pages) associated with each.

Factor Sheets

* General economics A1
* Business A2
* Agriculture A3
* Community or residential B1
* Environmental justice B4
* Historic resources B5
* Archaeological sites B6
* Tribal coordination/consultation B7
* Section 4(f) and 6(f) or other unique areas B8
* Aesthetics B9

* Wetlands C1
* Rivers, streams and floodplains C2
* Lakes or other open water C3
* Groundwater, wells and springs C4
* Upland wildlife and habitat C5
* Coastal zones C6
* Threatened and endangered species C7
* Air quality D1
* Construction stage sound quality D2
* Traffic noise D3
* Hazardous substances or contamination D4
* Storm water D5
* Erosion control D6

The activity task includes responding to two sets of review comments from the Region, two sets of review comments from Central Office, and two sets of review comments from FHWA. This activity task does not include review meetings, which are covered under another separate activity code. The activity task also includes printing up to 10 copies of the factor sheet for distribution with the EA.

**Low** – Prepare a single factor sheet averaging 2 to 3 pages in length.

**Medium** – Prepare a single factor sheet averaging 4 to 5 pages in length.

**High** – Prepare a single factor sheet averaging 6 or more pages in length.

* + - * 1. 769.7.3 Environmental Assessment Appendices

This activity task includes collating existing information, prepared under other activity task, into appendices for the EA. The activity task includes responding to two sets of review comments from the Region, one set of review comments from Central Office, and one set from FHWA. It also includes printing up to 10 copies of the appendices for distribution with the EA.

**Low** – Prepare set of appendices up to 30 pages in length.

**Medium** – Prepare set of appendices totaling 30 to 60 pages in length.

**High** – Prepare set of appendices totaling 60 or more pages in length.

* + - * 1. 769.7.4 Environmental Assessment NOA, Dist, and Comment Period

This activity task involves the following tasks:

* Notice of Availability in accordance with 23 CFR 771.119 and FDM 21-10-25.
  + Develop Notice of Availability
  + Distribute the Notice of Availability to affected stakeholders, local officials, agencies, and libraries.
  + Publish the legal Notice of Availability in appropriate local newspapers
  + Make EA document web ready
  + Send the Notice of Availability to stakeholders. See FDM 21-10-25.
  + Distribute to community outreach organizations such as religious organizations, schools, public libraries, neighborhood houses, minority business associations etc. Central Office has a list of such organizations on a county-by county basis.

Note that the Notice of Availability often will include a notice of public hearing. See FDM Section 6-15

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low** | **Medium** | **High** |
| Prepare NOA | 1 | 1 | 1 |
| Distribute NOA  (# Stakeholders) | 20 to 50 | 50 to 150 | More than 150 |
| Distribute EA copies | 8 | 8 to 15 | More than 15 |
| Number of publishing’s  (# newspapers) | 1 | 2-3 | 4 or more |
| Make EA web ready | 1 | 1 | 1 |

* + - * 1. 769.7.5 Environmental Assessment Public Hearing

This activity task is associated with preparing for and conducting a public hearing in accordance with FDM Section 6-15. A public hearing typically includes:

* Publishing a legal notice of public hearing at least 3 times in appropriate local newspapers (Note: this notice can be combined with the Notice of Availability.)
* Making hearing arrangements, including court reporters
* Pre-hearing conferences
* Preparing a chairman’s packet
* Preparing exhibits
* Hearing exhibit review meeting, and corresponding revisions
* Creating a slideshow presentation
* Preparing a hearing handout and other materials
* Staffing the hearing
* Summarizing the comments from the hearing, including content and frequency
* Preparing hearing certification

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low** | **Medium** | **High** |
| Hearing Arrangements | 1 location | 1 location | 2 locations |
| Chairman’s packet | 1 | 1 | 1 |
| Exhibits | 0 to 8 | 9 to 20 | More than 20 |
| Slideshow | 1 | 1 | 1 |
| Exhibit review meeting and revisions | 1 | 1 | 1 |
| Hearing handout | 0 to 5 pages | 6 to 12 pages | More than 12 pages |
| Other materials (sign-in, comment sheets, etc.) | 1 | 1 | 1 |
| Staff attending | 2 | 3-4 | 5 or more |
| Number of Court Reporters | 1 | 2-3 | 4 or more |
| Number of interpreters | 0 | 1 | 2 or more |
| Summarize comments | 15 comments or less | 15 to 30 comments | More than 30 comments |
| Hearing certification | 1 | 1 | 1 |

* + - * 1. 769.7.6 Environmental Assessment Addendum A

This activity task entails completing the Addendum A form, and responding to comments obtained from the hearing. (Note - summarizing the comments is included in the hearing task code.) This activity task also includes responding to one set of Region comments/revisions.

**Low** – 0 to 15 comments

**Medium** – 15 to 30 comments

**High** – more than 30 comments

* + - * 1. 769.7.7 FONSI

This activity task entails circulating Basic Sheet 1 for signatures and transmitting Addendum A. Low, medium, and high efforts are the same.

* + - * 1. 769.7.8 Agency Meeting

This activity task involves coordinating and hosting agency meetings associated with the EA preparation, as well as the NEPA/404 merger process for environmental assessments. Services associated with this activity task include:

* Scheduling and making location arrangements for the agency meeting
* Preparing background materials and sending with meeting invitation
* Preparing a project presentation for use at the Agency meeting
* Conducting the Agency meeting
* Preparing minutes from the Agency meeting, and distributing them to participants

The following table provides a guide for understanding the level of effort for an agency meeting.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low** | **Medium** | **High** |
| Consultant staff attending | 1-2 | 2-3 | 3 or more |
| Agency staff attending | 6 or under | 7-10 | 11 or more |

* + - 1. 769.8 Environmental Impact Statement

This task category includes preparing a Draft Environmental Impact Statement (DEIS), Final Environmental Impact Statement (FEIS), Record of Decision (ROD), and supporting documents, such as a Coordination Plan and Impact Assessment Methodology. The general format for an EIS is discussed in FDM Section 21-15 as well as 40 CFR 1502 and 23 USC 139 (g).

Every project requiring an Environmental Impact Statement is unique and unlikely to easily fit into the “Low” “Medium” and “High” effort categories. Factors that contribute to the effort needed include project length, setting, complexity, level of controversy, and agency acceptance. The following paragraphs provide general guidance. Every EIS project needs to be scoped individually.

The following activity tasks do not include the safety, traffic, and other analyses associated with developing the Purpose and Need. These activity tasks do not include the development or evaluation of alternatives, which can require considerable effort and should be individually scoped on a case-by-case basis.

* + - * 1. 769.8.1 Prepare draft notice of intent to prepare an EIS

This activity task includes preparing a Notice of Intent for submittal in the Federal Register.

* + - * 1. 769.8.2 Identify lead, participating, and cooperating agencies

This activity task involves identifying agencies that have an interest in the project and sending invitations for them to become participating and/or cooperating agencies in accordance with 23 USC 139 (d). Effort levels for “low”, “medium” and “high” are the same.

* + - * 1. 769.8.3 Prepare Draft Coordination plan

This activity task involves preparing a Coordination Plan in accordance with 23 USC 139 (g) (1). This activity task includes:

* Addressing comments from two reviews by the Region, one review by Central Office, and one review by FHWA
* Distributing the coordination plan to affected state and federal agencies

**Low** – A Coordination Plan under 25 pages

**Medium** – A Coordination Plan ranging from 25 to 35 pages

**High** – A Coordination Plan more than 35 pages

* + - * 1. 769.8.4 Update Coordination plan

This activity task involves updating the Coordination Plan. This activity task includes:

* Revising and updating the Coordination Plan.
* Distributing the coordination plan to affected state and federal agencies

**Low** – A Coordination Plan under 25 pages

**Medium** – A Coordination Plan ranging from 25 to 35 pages

**High** – A Coordination Plan more than 35 pages

* + - * 1. 769.8.5 Prepare Draft Impact Assessment Methodology (IAM)

This activity task involves preparing an Impact Assessment Methodology report that describes how impacts will be measured, and what level of analysis will be used. It includes:

* Addressing comments from two reviews by the Region, one review by Central Office, and one review by FHWA
* Distributing the IAM report to affected state and federal agencies

**Low** – An IAM report under 20 pages

**Medium** – An IAM report ranging from 20 to 40 pages with one to two meetings with participating agencies to discuss the contents

**High** – An IAM report of over 40 pages with three or more meetings with participating agencies to discuss the contents

* + - * 1. 769.8.6 Agency Meeting

This activity task involves coordinating and hosting agency meetings associated with the EIS scoping, as well as the NEPA/404 merger process (Concurrence Pts 1, 2 and 3). Services associated with this activity task include:

* Scheduling and making location arrangements for the agency meeting
* Preparing background materials and sending with meeting invitation
* Preparing a project presentation for use at the Agency meeting
* Conducting the Agency meeting
* Preparing minutes from the Agency meeting, and distributing them to participants

The following table provides a guide for understanding the level of effort for an agency meeting. Every EIS will have at least 3 to 4 agency meetings associated with the concurrence points of the NEPA/404 merger process. Often additional agency meetings are also necessary.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low** | **Medium** | **High** |
| Consultant staff attending | 1-2 | 2-3 | 4 or more |
| Agency staff attending | 8 or under | 9-14 | 15 or more |

* + - * 1. 769.8.6 Prepare DEIS

This activity task involves the services listed in the following bullets in order to prepare and release a DEIS in accordance with 23 CFR 771.123

769.8.6.1 Purpose and Need

This activity task involves documenting a Purpose and Need section for the EIS document in accordance with FHWA’s elements of a Purpose and Need. (<https://www.environment.fhwa.dot.gov/projdev/tdmelements.asp>). This activity task does not include the safety, traffic, geometric, and other analyses associated with developing the Purpose and Need. Those efforts are covered under other activity tasks. This activity tasks does include:

* Drafting the Purpose and Need
* Conducting one meeting with WisDOT and FHWA staff to review the Purpose and Need
* Addressing up to three sets of comments from the Region and/or Central Office
* Addressing one set of comments from FHWA
* Readying the Purpose and Need for distribution to agencies

This activity task does not include review meetings, which are covered under another separate activity code. The following table provide guidance in estimating the amount of effort associated with documenting a Purpose and Need.

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose and Need | **Low** | **Medium** | **High** |
| Pages | Up to 15 pages | 15-25 pages | More than 25 |
| Supporting graphics | Up to 6 | 7 to 10 | More than 10 |

769.8.6.2 Alternatives

This activity task involves documenting an Alternatives section for the EIS document. The actual geometric development of alternatives is covered under another activity task. The section should describe the process used to develop, evaluate, and eliminate potential alternatives based on the Purpose and Need of the project. It should also include how alternatives were selected for detailed study, the reasons why some alternatives were eliminated from consideration and describe how the alternatives meet the need for the project and avoid or minimized environmental harm. It should be consistent with 23 CFR 771.111(f). This section should describe all reasonable alternatives at a comparable level of detail.

The documentation effort for the Alternatives section is highly variable and is dependent upon project length, setting, complexity, and number of alternatives and sub alternatives. This effort includes:

* Drafting the Alternatives section
* Conducting a meeting with WisDOT and FHWA staff to review the Alternatives section.
* Addressing up to three sets of comments from the Region and/or Central Office.
* Addressing one set of comments from FHWA.

This activity task does not include review meetings, which are covered under another separate activity code. The following table provides guidance in estimating the amount of effort associated with documenting an Alternatives section.

|  |  |  |  |
| --- | --- | --- | --- |
| Alternatives | **Low** | **Medium** | **High** |
| Pages | Up to 40 pages | 40 to 80 pages | More than 80 pages |
| Supporting graphics | Up to 20 | 20 to 30 | More than 30 |

769.8.6.3 Affected Environment

This activity task involves documenting an Affected Environment section for the EIS document. The Affected Environment section provides information on the existing resources and condition of the environment. The section focuses on the important issues to provide an understanding of the project area relative to the impacts of the alternatives. The Affected Environment should discuss, in accordance with the importance of the potential impacts, the existing social, economic, and environmental settings surrounding the project. It should also identify environmentally sensitive features in the project corridor. Some document authors chose to combine the Affected Environment section with the Environmental Consequences section to avoid duplication. This effort includes:

* Drafting the Affected Environment section
* Conducting meetings with WisDOT and FHWA staff to review the Affected Environment section.
* Addressing up to three sets of comments from the Region and/or Central Office.
* Addressing one set of comments from FHWA.

The following table provides guidance in estimating the amount of effort associated with documenting an Affected Environment section. This activity task includes two Region reviews, one Central office review, and one FHWA review of the EIS section. This activity task does not include review meetings, which are covered under another separate activity code.

|  |  |  |  |
| --- | --- | --- | --- |
| Affected Environment | **Low** | **Medium** | **High** |
| Pages | Up to 40 pages | 40 to 80 pages | More than 80 pages |
| Supporting graphics | Up to 20 | 20 to 30 | More than 30 |

769.8.6.4 Environmental Consequences

This activity task documents the impacts associated with the alternatives on the environment and describes the methods used to measure the impacts in accordance with 40 CFR 1502.16. The measurement of impacts, including the determination of indirect and cumulative impacts, environmental justice impacts, Section 4(f) analysis and evaluation, Section 106 impacts, are performed under other activity codes. This section also describes potential measures that could be taken to mitigate impacts. Documenting the environmental consequences of an action is highly variable and is dependent on the type and number of alternatives being considered as well as the environmental context of the project corridor.

The following table provides guidance in estimating the effort associated with documenting the environmental consequences section. This activity task includes two Region reviews, one Central Office review, and one FHWA review of the EIS section. This activity task does not include review meetings, which are covered under another separate activity code.

|  |  |  |  |
| --- | --- | --- | --- |
| Environmental Consequences | **Low** | **Medium** | **High** |
| Pages | Up to 110 pages | 110 to 200 pages | More than 200 pages |
| Environmental Consequences | **Low** | **Medium** | **High** |
| Pages | Up to 110 pages | 110 to 200 pages | More than 200 pages |

769.8.6.5 Executive Summary

This activity task prepares an Executive Summary of the EIS as recommended by 40 CFR 1502.12. EISs of low, medium, and high complexity generally have similar length Executive Summaries, ranging from 10 to 20 pages. This activity task includes two Region reviews, one Central office review, and one FHWA review of the Executive Summary. This activity task does not include review meetings, which are covered under another separate activity code.

769.8.6.6 Cover Sheet, Table of Contents, Appendices, List of Preparers, Other

This activity task prepares and assembles the other components associated with an EIS as recommended by 40 CFR 1502.10 through 40 CFR 1502.17. (Note that Purpose and Need, Alternatives, Affected Environment, Environmental Consequences, and Executive Summary, are covered under other activity tasks.) The other components include the following:

* Cover Page and Abstract
* Table of Contents
* Index
* List of Preparers
* Agency Circulation List
* References
* Acronyms
* Aerial Photo Exhibit List
* Coordination

The first eight items in this list will have largely the same effort level for low, medium, and high complexity EISs. The amount of coordination can vary based on the complexity and controversy associated with the project. The effort level for the coordination documentation can also vary by how it is presented - some EISs only present letters and minutes with no summarization. Other EISs present these coordination items and develop narratives summarizing the coordination efforts and their results. This activity task includes two Region reviews, one Central office review, and one FHWA review of the listed items. The following table provides guidance in estimating the effort associated with compiling these EIS items

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low** | **Medium** | **High** |
| Cover Page and Abstract | 2 pages | 2 pages | 2 pages |
| Table of Contents | 4 to 10 pages | 4 to 10 pages | 4 to 10 pages |
| Index | 5 to 15 pages | 5 to 15 pages | 5 to 15 pages |
| List of Preparers | 2 to 6 pages | 2 to 6 pages | 2 to 6 pages |
| Agency Circulation List | 2 to 4 pages | 2 to 4 pages | 2 to 4 pages |
| Coordination | 10 to 20 pages | 20 to 50 pages | More than 50 pages |

769.8.6.7 DEIS Appendices

EISs have appendices and the number and length of them can vary substantially. Appendices often are published and bound in a separate volume from the EIS. This activity task collates the appendices, including providing separation tabs and page numbering.

|  |  |  |  |
| --- | --- | --- | --- |
| Appendices | **Low** | **Medium** | **High** |
| Pages | 50 to 150 pages | 150 to 300 pages | More than 300 pages |

769.8.6.8 Comment Review Meetings during DEIS Prep

This activity task involves comment review meetings, in addition to the comments listed in the previous activity tasks.

|  |  |  |  |
| --- | --- | --- | --- |
| Comment Review Meetings | **Low** | **Medium** | **High** |
|  | 1 Meeting | 2 Meetings | 3 Meetings |

* + - * 1. 769.8.7 DEIS Release and Comment Period

This activity task involves circulating the DEIS in accordance with 40 CFR 1502.19 and inviting agency comments in accordance with 40 CFR 1503.1.

769.8.7.1 Prepare and Publish Notice of Availability

This item involves preparing, publishing, and distributing a Notice of Availability for the DEIS. This notice typically also provides notice of the public hearing. Procedures are described in FDM 21-10-25 and FDM Section 6-5. Typically the notice is:

* Published in the federal register
* Published in the legal notices section in appropriate local papers.
* Sent to stakeholders. See FDM 21-10-25.
* Distributed to community outreach organizations such as religious organizations, schools, public libraries, neighborhood houses, minority business associations etc. Central Office has a list of such organizations on a county-by county basis.

The effort level is the same for low, medium, and high complexity EISs.

769.8.7.2 Print and Distribute DEIS to Agencies and Individuals

This activity task involves distributing the DEIS to affected agencies and individuals. The task is heavily dependent upon printing and shipping costs. The type of printing, the number of color graphics, the use of CDs for appendices also affect the effort and cost for this item. The task includes:

* Assembling the electronic document for transmission to the printer.
* Reviewing proof copies of the DEIS.
* The printing and binding cost of the DEIS.
* Developing the distribution list of addresses for the DEIS. This list typically includes affected state and federal agencies, local units of government, and libraries and other public viewing areas.
* Transmitting the DEIS to eNEPA (see item 769.8.7.2).
* Shipping the DEIS to stakeholder with appropriate cover letter and Notice of Availability.

Often 100 copies or more of the DEIS are needed, but the number is dependent upon the project scope and breadth. The following paragraphs provide a very rough estimate of the costs associated with printing and distributing a DEIS. It is based on total pages printed, which entails the number of pages in the DEIS multiplied by the number of copies printed.

|  |  |  |  |
| --- | --- | --- | --- |
| DEIS Print and Dist | **Low** | **Medium** | **High** |
| EIS pages x Number of copies | 15,000 to 40,000 pages | 40,000 to 60,000 pages | More than 60,000 pages |

769.8.7.3 Prepare Web Ready Document

This task entails providing a web-ready electronic DEIS for posting on the WisDOT web-page. It includes following WisDOT’s web-posting standards for titling, file sizes, key words, and search ability. It also includes providing appropriate bookmarking for easy navigation through the electronic document.

|  |  |  |  |
| --- | --- | --- | --- |
| Web Posting | **Low** | **Medium** | **High** |
| Number of pages in EIS, including appendices | Up to 450 pages | 450 to 700 pages | More than 700 pages |

769.8.7.4 Conduct DEIS Hearing

This activity task is associated with preparing for and conducting a public hearing in accordance with FDM Section 6-15. A public hearing typically includes:

* Publishing a legal notice of public hearing at least 3 times in the paper of record for the county and appropriate local newspapers. (Note: this notice can be combined with the Notice of Availability.)
* Making hearing arrangements, including court reporters
* Pre-hearing conferences
* Preparing a chairman’s packet
* Preparing exhibits
* Conducting exhibit review meeting, and corresponding revisions
* Creating a slideshow presentation
* Preparing a hearing handout and other materials
* Staffing the hearing

An EIS can have a considerable number of comments that require responses. Collecting and collating comments is under activity task 769.8.7.5. The following table provides guidance on the level of effort associated with a DEIS hearing.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low** | **Medium** | **High** |
| Hearing Arrangements | 1 location | 1 location | 2 locations |
| Chairman’s packet | 1 | 1 | 1 |
| Exhibits | 0 to 10 | 11 to 25 | More than 25 |
| Slideshow | 1 | 1 | 1 |
| Exhibit review meeting and revisions | 1 | 1 | 1 |
| Hearing handout | 0 to 5 pages | 6 to 12 pages | More than 12 pages |
| Other materials (sign-in, comment sheets, etc.) | 1 | 1 | 1 |
| Staff attending | 2 | 3-4 | 5 or more |
| Number of court reporters | 1 | 2 to 3 | More than 3 |
| Number of translators | 0 | 1 to 2 | More than 2 |

769.8.7.5 Collect and Categorize Comments

This item typically involves:

* Collecting comments from the public, including those presented at the hearing
* Summarizing the comments collected from the public into categories
* Calculating the frequency of each comment issue
* Providing a cross reference tag for agency comments and summarizing agency comments in a table

(Note that an agency letter can contain from 2 to 80 different comment issues, depending on the complexity and controversy associated with the project.)

The following table provides guidance on the level of effort associated with collecting and collating DEIS comments.

|  |  |  |  |
| --- | --- | --- | --- |
| Collect ad Categorize Comments | **Low** | **Medium** | **High** |
| Public Comments | Up to 20 comments | 20 to 80 comments | More than 80 |
| Agency comments and issues | Up to 30 | 30 to 50 | More than 50 |

769.8.7.6 Prepare Hearing Certification for FHWA

This activity task involves drafting a letter certifying the hearing for transmittal to FHWA in accordance with 23 CFR 771.111(h). A hearing certification often involves assembling:

* Affidavits of publication for hearing notice
* Summary of the hearing, including time, place, type of notification, staffing, number of attendees, number of exhibits, important comments made during the hearing, etc.
* Prints of the exhibits and slide show (may include photos)
* Transcript of the hearing
* Copies of all written statements
* Summary of comments
* Sign-in sheets

The hearing certification has similar effort levels for low, medium, and high complexity EISs.

* + - * 1. 769.8.8 Prepare FEIS and ROD

This set of activity tasks involves preparing a final environmental impact statement in accordance with 23 CFR 771.125 and record of decision in accordance with 40 CFR 1502.2 and 23 CFR 771.127. Typically an FEIS is a rerelease of the DEIS with revisions and responses to comments received during the availability period. It includes selecting a preferred alternative (if not already selected in the DEIS), responding to comments, and making revisions to the EIS document as appropriate in response to the comments received during the availability of the DEIS. With MAP 21 legislation it is preferred that the FEIS and ROD be combined and released together. However, in projects with high degrees of controversy, they can be released separately and sequentially.

The DEIS comment period can cause substantial revisions to the alternatives being considered and reanalysis of different portions of the document. This activity task does not include substantial document revisions - which must be scoped individually.

769.8.8.1 Respond to Comments

This activity task involves responding to comments received during the availability period for the DEIS. It includes the following:

* Preparing response to each individual comment (or comment category if similar comments are received.)
* Reviewing the responses with the Region
* Reviewing the responses with Central Office and FHWA
* Making minor textual revisions to the EIS text.

This activity task does not include review meetings, which are covered under another separate activity code.

Note: If major revisions are required to the EIS, the scope and fee must be developed separately.

The following table provides guidance on the level of effort associated with collecting and collating DEIS comments.

|  |  |  |  |
| --- | --- | --- | --- |
| Respond to Comments | **Low** | **Medium** | **High** |
| Public Comments | Up to 20 comments | 20 to 80 comments | More than 80 |
| Agency comments and issues | Up to 30 | 30 to 50 | More than 50 |

769.8.8.2 Document Environmental Commitments

This activity tasks includes documenting the environmental commitments associated with the project. Sometimes this item is included in an EIS section labeled Measures to Minimize and Mitigate Adverse Effects. A draft of this section can be included in the DEIS. The activity task includes:

* Developing and documenting measures to address agency comments regarding impacts to resource areas.
* Two reviews of these commitments with Region and Central Office staff
* One review of these commitments with FHWA

This activity task does not include review meetings, which are covered under another separate activity code.

|  |  |  |  |
| --- | --- | --- | --- |
| Commitments | **Low** | **Medium** | **High** |
| Commitments | 2 to 5 pages | 5 to 15 pages | More than 15 pages |

769.8.8.3 Prepare Record of Decision

This activity task includes documenting the selection of the Preferred Alternative, the basis for its selection, summarize minimization and mitigation measures, and document any required Section 4(f) approvals. (See 23 CFR 771.127)

* Documenting the Record of Decision
* One review with the Region, one review with Central Office, and one review with FHWA.

This activity task does not include review meetings, which are covered under another separate activity code.

|  |  |  |  |
| --- | --- | --- | --- |
| Record of Decision | **Low** | **Medium** | **High** |
|  | 10 to 20 pages | 20 to 40 pages | 40 pages |

* + - * 1. 769.8.9 FEIS Release and Comment Period

This activity task involves circulating the FEIS in accordance with 23 CFR 771.125. Typically the notification and distribution is the same as for the DEIS, except that comments are not requested and a hearing is not conducted.

769.8.9.1 Prepare and Publish Notice of Availability for FEIS

This item involves preparing, publishing, and distributing a Notice of Availability for the FEIS. Procedures are described in FDM 21-10-25 and FDM Section 6-5. Typically the notice is:

* Published in the federal register
* Published in the legal notices in appropriate local papers
* Sent to stakeholders. See FDM 21-10-25
* Sent to stakeholders that provided substantive comments on the DEIS or requested a copy

The effort level is the same for low, medium, and high complexity projects.

769.8.9.2 Print and Distribute FEIS to Agencies and Individuals

This activity task involves distributing the FEIS to affected agencies and individuals. As with the DEIS, the task is heavily dependent upon printing and shipping costs. The type of printing, the number of color graphics, the use of CDs for appendices also affect the effort and costs for this item. The tasks includes:

* Assembling the electronic document for transmission to the printer
* Reviewing proof copies of the FEIS
* The printing cost of the FEIS
* Developing the distribution list of addresses for the FEIS. This list typically includes affected state and federal agencies, local units of government, and libraries and other public viewing areas
* Transmitting the FEIS to eNEPA (see item 769.8.7.2)
* Shipping the FEIS to stakeholder with appropriate cover letter and Notice of Availability

Often 100 copies or more of the FEIS are needed. The following paragraphs provide a very rough estimate of the costs associated with printing and distributing a FEIS. It is based on total pages printed, which entails the number of pages in the FEIS multiplied by the number of copies printed.

|  |  |  |  |
| --- | --- | --- | --- |
| FEIS Print and Dist | **Low** | **Medium** | **High** |
| EIS pages x Number of copies | 15,000 to 40,000 pages | 40,000 to 60,000 pages | More than 60,000 pages |

769.8.9.3 Prepare Web Ready Document

This task entails providing a web-ready electronic FEIS for posting on the WisDOT web-page. It includes following WisDOT’s web-posting standards for titling, file sizes, key words, and search ability. It also includes providing appropriate bookmarking for easy navigation through the electronic document.

|  |  |  |  |
| --- | --- | --- | --- |
| Web Posting | **Low** | **Medium** | **High** |
| Number of pages in EIS, including appendices | 300 to 450 pages | 450 to 700 pages | More than 700 pages |

769.8.9.4 FEIS Comments

Comments are not requested with the publishing of an FEIS. Sometimes agencies provide comments on the FEIS and FHWA requires a response to those comments before approving a Record of Decision. This effort will be negotiated on a case-by-case basis.

769.8.9.5 Statute of Limitation Notice

This activity task involves preparing a statute of limitation notice for publishing in the Federal Register in accordance with 23 USC 139(l). The effort level is the same for low, medium, and high complexity documents.

* + - 1. 769.9 Prepare Project File for Administrative Record

AASHTO’s Practitioners Handbook provides a guide to preparing a project fill and an administrative record for a NEPA study. The general rule, as established by case law, is that the administrative record should contain “all documents and materials directly or indirectly considered by the agency” in making its decision. The project file typically:

* Is electronic and searchable
* Is bates numbered
* Has duplicate records removed
* Is keyed to a table that includes the topic of the material and the bates number.

The project file is the basis for the administrative record and can contain thousands of documents. OGC attorneys will review each document in the project file for relevance before assembling the administrative record.

It is highly advisable that the project file be kept current as the project progresses. Assembling the project file at the end of the project is labor intensive and often results in considerable duplication of records.

**Low** – The project file records have been kept current, are systematically named, and are in a readable electronic format. This task then involves cataloguing the records in a table and bates numbering the records.

**Medium** – The project file records are in a readable electronic format but may not have been kept current and are not systematically named. This task then entails collecting records from multiple agencies, culling duplicate records, and systematically naming them. Then the records can be catalogued in a table and bates numbered.

**High** – The project file records are in a combination of electronic and paper formats. This task then involves:

* Scanning paper documents
* Performing OCR recognition of scanned documents
* Systematically naming documents
* Culling duplicate records
* Cataloguing records in a table
* Bates numbering the records
  + - 1. 769.10 Carry Out Environmental Commitments

This can vary based on the extent of the commitments and should be determined on a case by case basis.

* + - 1. 769.11 Prepare Re-evaluation

This activity task involves preparing a re-evaluation in accordance with 23 CFR 771.29. It assumes form DT2095 7/2015 is used as a basis. The following describes the level of effort associated with each task

**Low**

* Form DT2095 is used
* Limited narrative is required.
* No re-analysis is required
* Document length ranges from 10 to 20 pages

**Medium**

* Form DT2095 is used
* Narrative is required.
* Some description of the re-analysis is required. (Note that the re-analysis task is covered under other activity codes)
* Document length ranges from 20 to 40 pages

**High**

* Form DT2095 is used as a basis, but substantial reformatting is required because of the level of re-analysis
* Substantial narrative is required to describe changes in conditions.
* The description of substantial re-analysis is required. (Note that the re-analysis task is covered under other activity codes)
* Document length ranges from 40 to 80 pages

The task includes responding to one set of review comments by the Region, one set of review comments by Central Office, and one set of review comments by FHWA.

* + - 1. 769.12 Revise Environmental Document

This can vary based on the extent of the revisions and should be determined on a case by case basis.

##### Structures (includes any CADD and plan review) *(7/28/16)*

###### 647 Develop Structure Survey Report *(7/28/16)*

* + - 1. 647.0 Includes development of the Structure Survey Report.

For all 647 series tasks assume that that services will be performed in the following percentages:

Entry Level: 10%  
 Project Engineer: 80%  
 Project Manager: 10%

* + - 1. 647.1 Conduct structures site review

Review of as built plans, inspection plans and other available information. Site visit: physical inspection of structure and surroundings, pictures and measurements (see lower tasks) of structure features. Does not include soils or survey efforts. Add 50% to level of effort for twin structures)

Entry Engineer (collecting information,) Project Engineer, Senior engineer (Site visit,) Project Manager (Site visit-complex projects)

**Low** – Small bridge, rural, low traffic, grade separation, replacement, overlays

**Medium** – Standard multi-span grade separation or stream crossing

**High** – Personal safety risk (traffic control component), high volume traffic, unique structure type, rehabilitations

* + - 1. 647.2 Prepare structure survey report

Includes four page report (DT1694, DT1696, DT1698) and attachments. Includes obtaining information, validating and compiling for submittal. Does not include sizing report, hydraulic report and soil investigation report. This includes electronic plan and supporting document submittal.

Entry engineer, project engineer, project management (review)

**Low** – Retaining wall, sign structure, noise wall, polymer overlay. Initial survey data is accurate.

**Medium** – routine river crossing or grade separation, concrete overlay, deck repair, deck replacement without widening

**High** – Complex rehab (steel,) widening, large river crossing. Additional survey data required; survey does not match as built. Increased coordination between different areas of expertise. Initial scope may not address current needs of structure (increased rehabilitation needs.)

Schedule impact: Steam crossing - before frozen. Thermography (if needed) request needs for be made. Deep snow inhibits survey.

###### 651 Structure Fabrication – Review and Oversight (WisDOT only)

* + - 1. 651.0 Scoping task

**Low** –

**Medium** –

**High** –

* + - 1. 651.1 Specialty - Shop inspection structural steel

**Low** –

**Medium** –

**High** –

###### 653 Structure Liaison Activities (WisDOT only)

**Low** –

**Medium** –

**High** –

###### 656 Design Structure *(9/13/16)*

Use the assumptions in the following table for all tasks associated with activity 656.

|  |  |  |
| --- | --- | --- |
| **Preliminary & Final Design - Box Culverts** | | |
| **LOW** Level of Effort Factors | **MED** Level of Effort Factors | **HIGH** Level of Effort Factors |
| Stream Crossing | Pedestrian Crossing |  |
| No Skew (0°) | Low Skew | High Skew |
| Flat Grade | Moderate Grade | Steep Grade |
| No Staging | Typical Staging (2 Stages) | Complex Staging (> 2 Stages) |
|  |  | Top Slab is Driving Surface |
|  |  | Environmental Issues |
|  |  | AOP Requirements |
|  | Box Extensions |  |
| Stream Diversion Line Item: | | |
| No Stream Diversion | Simple Stream Diversion | Complex Stream Diversion |
|  | | |
| Box Culverts:   * Simple diversion channel – one sheet with plan detail and one cross-section * Complex diversion channel – diversion channel alignment, multiple cross-sections, etc. * Stream diversion effort is not included in structures tasks – see roadway section for more information | | |
|  | | |
| **Preliminary & Final Design - New Bridges** | | |
| **LOW** Level of Effort Factors | **MED** Level of Effort Factors | **HIGH** Level of Effort Factors |
| Structure Type Set | Structure Type Alternative Comparison (2 Types) | Structure Type Alternative Comparison (> 2 Types) |
| A1 or A5 Abutments | A3 or A4 Abutments | Full Height, and A3 or A4 Abutments Behind MSE Walls |
| Simple Pier (Pile Encased, Pile Bents) | Moderate Pier (Multi-Column, Hammerhead) | Complex Pier (Straddle Bent, Integral Pier Cap, Tall Piers > 30’) |
| Driven Pile Foundation Support | Spread Footings | Drilled Shaft Foundations |
| No Deck Joints | Strip Seal Expansion Joints | Modular Expansion Joints |
| Non-laminated Elastomeric Bearing Pads | Laminated Elastomeric or Steel Bearings | HLMR Bearings |
| No Aesthetics | Moderate Aesthetics (Standard Formliner, Staining, etc.) | High Aesthetics (Custom Formliner, Lighting, etc.) |
| Balanced/Repeatable Span Arrangements | Irregular Span Arrangements | Highly Irregular Span Arrangements (Unique Spans) |
| No Staging | Typical Staging (2 Stages) | Complex Staging (> 2 Stages) |
| Constant Superstructure Width |  | Tapered Superstructure Width |
| Linear, Parallel Framing (Tangent Alignment) | Linear, Parallel Framing (Horizontal Curve Alignment) | Curved or Tapered Framing (Horizontal Curve Alignment) |
| Constant Skew |  | Variable Skew |
| No Skew (0°) | Low Skew (< 30°) | High Skew (> 30°) |
| Constant Deck Cross-Slope | Cross-Slope Change on Bridge |  |
| No Sidewalks | At Grade, Barrier Separated Sidewalks | Raised Sidewalks or Medians |
| No Utilities | Bridge Mounted Utilities or Lighting |  |
| Standard Parapets or Railings | Custom Railings | Environmental/Historical Railing Issues |
| No Sign Structure Connections | Substructure Mounted Sign Structure | Superstructure Mounted Sign Structure |
| Rural | Semi-Urban | Urban |
|  | | |
| Bridges:   * Medium level of complexity involves 5 or less items listed under “MED” in the table above * If more than 5 items listed under “MED” in the table above are encountered, contact BOS to aid in determining the level of complexity * High level of complexity involves more than 5 items listed under “MED” (pending discussions with BOS as noted previously) or 2 or more of the items listed under “HIGH” in the table above * If more than 5 items listed under “HIGH” in the table above are encountered, contact BOS to aid in determining the level of complexity, which may include structures outside the normal range of scoped hours | | |
|  | | |
| **Preliminary & Final Design - Bridge Rehabilitations – Deck Overlays** | | |
| **LOW** Level of Effort Factors | **MED** Level of Effort Factors | **HIGH** Level of Effort Factors |
| No Joint Repair | Joint Repair |  |
| Concrete Slab, P/S Girder | Multi-Span Conc Slab or P/S, Single Span Steel Girder | Multi-Span Steel Girder |
|  | | |
| Deck Overlays   * All criteria applied to new bridge design/rating will apply equally to deck overlay ratings. * Rating assumes 2 design sections (int/ext girder lines or slab sections). | | |
|  | | |
| **Preliminary & Final Design - Retaining Walls** | | |
| **LOW** Level of Effort Factors | **MED** Level of Effort Factors | **HIGH** Level of Effort Factors |
| Simple Geometry | Variable Geometry |  |
| Height < 24’ | Height > 24’ |  |
| Standard Coping | Moment/Anchor Slab | Custom Moment/Anchor Slab to Accommodate Attachments |
| No Staging | Typical Staging (2 Stages) | Complex Staging (> 2 Stages) |
| Contractor-Designed Wall Type | Moderate SE-Designed Wall Type (Soldier Pile, etc.) | Complex SE-Designed Wall Type (CIP Cantilever, Secant Pile, etc.) |
| One Wall Alignment | * 1. Wall Alignments | > 3 Wall Alignments |
| Stand-alone Wall | Wrap-around Abutment Details | Complex Abutment Details |
| Length < 100 ft | Length > 100 ft |  |
| 1 Design Section | 2-3 Design Sections | 4+ Design Sections |
| Rural | Semi-Urban | Urban |
|  | | |
| Retaining Walls   * Medium level of complexity involves 3 or less items listed under “MED” in the table above * If more than 3 items listed under “MED” in the table above are encountered, contact BOS to aid in determining the level of complexity * High level of complexity involves more than 3 items listed under “MED” (pending discussions with BOS as noted previously) or 2 or more of the items listed under “HIGH” in the table above * If more than 2 items listed under “HIGH” in the table above are encountered, contact BOS to aid in determining the level of complexity, which may include structures outside the normal range of scoped hours * CIP walls approaching the “High” level should require more conversation with BOS prior to setting final scope. | | |

**\*Economy of scale for all structure types needs to be given due consideration when scoping projects**

Outliers where the spreadsheet and assumptions above do not apply:

* Highly variable width and/or flared and/or complex framing
* Horizontal Curvature (requires curved girder analysis cross framing to be designed as primary members)
* Unique foundations and or challenging subsurface condition
* Long span (spans > 180 feet)
* Tall piers (height > 50’)
* Tub girders
* Full scale study of unique structure types
* ABC Structures
* Major Water Crossings
* 3-Sided Box Structures
  + - 1. 656.1 Preliminary design

For all 656.1 series tasks assume that that services will be performed in the following percentages:

Entry Level: 20%  
 Project Engineer: 70%  
 Project Manager: 10%

* + - * 1. 656.1.1 Box Culvert (cast in place concrete)

656.1.1.1 Single Cell

656.1.1.1.1 BOS

656.1.1.1.2 Consultant

656.1.1.2 Two Cell

656.1.1.2.1 BOS

656.1.1.2.2 Consultant

* + - * 1. 656.1.2 Prestressed concrete slabs and boxes
        2. 656.1.3 Prestressed concrete girders

656.1.3.1 Single span

656.1.3.2 Additional Span(s)

* + - * 1. 656.1.4 Concrete slab

656.1.4.1 Single span

656.1.4.2 Additional Span(s)

* + - * 1. 656.1.5 Steel plate girders

656.1.5.1 Single span

656.1.5.2 Additional Span(s)

* + - * 1. 656.1.6 Retaining wall

656.1.6.1 Cast in place concrete

656.1.6.2 Modular block (no MSE)

656.1.6.3 MSE

656.1.6.4 Wire face with tip-up precast panel

656.1.6.5 Post and panel, Soldier pile

656.1.6.6 Sheet pile

* + - * 1. 656.1.7 Sign bridge
        2. 656.1.8 Noise wall
        3. 656.1.9 Rigid frame
        4. 656.1.10 Rehabilitation

656.1.10.1 Box culvert single cell extension

656.1.10.1.1 BOS

656.1.10.1.2 Consultant

656.1.10.2 Box culvert multi cell extension

656.1.10.2.1 BOS

656.1.10.2.2 Consultant

656.1.10.3 Deck overlay

656.1.10.4 Deck replacement (w/o widening)

656.1.10.5 Widening (w/deck replacement)

656.1.10.6 Widening (w/ or w/o deck replacement)

656.1.10.7 Superstructure replacement

* + - * 1. 656.1.11 Structure alternative development
      1. 656.2 Final design

For all 656.2 series tasks assume that that services will be performed in the following percentages:

Entry Level: 30%  
 Project Engineer: 60%  
 Project Manager: 10%

* + - * 1. 656.2.1 Box Culvert (cast in place concrete)

656.2.1.1 Single Cell

656.2.1.1.1 BOS

656.2.1.1.2 Consultant

656.2.1.2 Two Cell

656.2.1.2.1 BOS

656.2.1.2.2 Consultant

* + - * 1. 656.2.2 Prestressed concrete slabs and boxes
        2. 656.2.3 Prestressed concrete girders

656.2.3.1 Single span

656.2.3.2 Additional Span(s)

* + - * 1. 656.2.4 Concrete slab

656.2.4.1 Single span

656.2.4.2 Additional Span(s)

* + - * 1. 656.2.5 Steel plate girders

656.2.5.1 Single span

656.2.5.2 Additional Span(s)

* + - * 1. 656.2.6 Retaining wall

656.2.6.1 Cast in place concrete

656.2.6.2 Modular block (no MSE)

656.2.6.3 MSE

656.2.6.4 Wire face with tip-up precast panel

656.2.6.5 Post and panel, Soldier pile

656.2.6.6 Sheet pile

656.2.7 Sign bridge

656.2.8 Noise wall

656.2.9 Rigid frame

* + - * 1. 656.2.10 Rehabilitation

656.2.10.1 Box culvert single cell extension

656.2.10.1.1 BOS

656.2.10.1.2 Consultant

656.2.10.2 Box culvert multi cell extension

565.2.10.2.1 BOS

565.2.10.2.2 Consultant

656.2.10.3 Deck overlay

656.2.10.4 Deck replacement (w/o widening)

656.2.10.5 Widening (w/deck replacement)

656.2.10.6 Widening (w/ or w/o deck replacement)

656.2.10.7 Superstructure replacement

* + - * 1. 656.2.11 ESubmit

###### 657 Draft Structure Plan *(9/13/16)*

Includes preliminary draft plan which typically includes 2-5 sheets and includes final plan set.

Includes time to check plans and make revisions. One third of total effort is for checking.

* + - 1. 657.1 Box Culvert (cast in place concrete)

Hydraulic box culvert. Does not include pedestrian crossing or drivable surface.

**Low** – 5-6 Sheets

**Medium** – 7-8 Sheets

**High** – 9-10 Sheets

* + - 1. 657.2 Prestressed concrete slabs and boxes

Contact BOS regarding the effort to draft each sheet.

**Low** – 10-12 Sheets

**Medium** – 13-25 Sheets

**High** – 26-35 Sheets

* + - 1. 657.3 Prestressed concrete girders

**Low** – 12-15 Sheets

**Medium** – 16-40 Sheets

**High** – 41-70 Sheets

* + - 1. 657.4 Concrete slab

**Low** – 10-12 Sheets

**Medium** – 13-25 Sheets

**High** – 26-35 Sheets

* + - 1. 657.5 Steel plate girders

**Low** – 15-25 Sheets

**Medium** – 26-40 Sheets

**High** – 41-70 Sheets

* + - 1. 657.6 Retaining wall
         1. 657.6.1 Cast in place concrete

**Low** – 7-8 Sheets

**Medium** – 9-13 Sheets

**High** – 14-20 Sheets

* + - * 1. 657.6.2 Modular block (no MSE)

**Low** – 4-5 Sheets

**Medium** – 6-8 Sheets

**High** – 9-10 Sheets

* + - * 1. 657.6.3 MSE

**Low** – 4-5 Sheets

**Medium** – 6-12 Sheets

**High** – 13-18 Sheets

* + - * 1. 657.6.4 Wire face with tip-up precast panel

**Low** – 6-7 Sheets

**Medium** – 8-14 Sheets

**High** – 15-20 Sheets

* + - * 1. 657.6.5 Post and panel, Soldier pile

**Low** – 4-5 Sheets

**Medium** – 6-12 Sheets

**High** – 13-18 Sheets

* + - * 1. 657.6.6 Sheet pile

**Low** – 4-5 Sheets

**Medium** – 6-10 Sheets

**High** – 11-16 Sheets

* + - 1. 657.7 Sign bridge

**Low** –

**Medium** –

**High** –

* + - 1. 657.8 Noise wall

**Low** –

**Medium** –

**High** –

* + - 1. 657.9 Rigid Frame
      2. 657.10 Rehabilitation
         1. 657.10.1 Box culvert extension

**Low** – 5-6 Sheets

**Medium** – 7-8 Sheets

**High** – 9-10 Sheets

* + - * 1. 657.10.2 Deck overlay

Contact BOS regarding the effort to draft each sheet.

* + - * 1. 657.9.3 Deck replacement (w/o widening)

Contact BOS regarding the effort to draft each sheet.

* + - * 1. 657.9.4 Widening (w/deck replacement)

Contact BOS regarding the effort to draft each sheet.

* + - * 1. 657.9.5 Widening (w/ or w/o deck replacement)

Contact BOS regarding the effort to draft each sheet.

* + - * 1. 657.9.6 Superstructure replacement

Contact BOS regarding the effort to draft each sheet.

###### 658 Design Structure Hydrology and Hydraulics

The following general assumptions apply to all tasks in activity 658.

* Flow regulated or controlled by hydraulics are deemed as outliers. May need to contact BOS to aid in determining the level of complexity and effort required.
* Narrow Flood Plain < 4x Bridge Length
* Wide Flood Plain > 4x Bridge Length
* Old FIS engineering study = One compiled prior to 1988

New crossing involving FEMA coordination are deemed as outliers.

* + - 1. 658.0 Includes design activities related to hydrology and hydraulics on project.
      2. 658.1 Hydrology Computations & Documentation

**Low** – Rural watershed

**Medium** – Recent (after 1988) flood insurance study exists

**High** – Urban water shed or regulatory flood flows are outdated

* + - 1. 658.2 Hydraulics Computations, Modeling & Report

**Low** – Single span bridge with a narrow flood plain, straight channel and low skew (<20°)

**Medium** – Multi-span bridge and/or bridge with high skew (>20°), recent (after 1988) flood insurance study exists

**High** – Wide flood plain, meandering channel or outdated (after 1988) flood insurance study

* + - 1. 658.3 Scour Computations & Evaluation

**Low** – Single span bridge or box culverts

**Medium** – Multi-span bridge or non-cohesive soils

**High** – Rock, cohesive soils, pressure flow conditions or misaligned substructures

* + - 1. 658.4 Hydrology and Hydraulics for Temporary Structures

See assumptions in 658.1 - 658.3.

###### 659 Review In-House Structure Plan (WisDOT only)

**Low** –

**Medium** –

**High** –

###### 779 Review Consultant Structure Plan (WisDOT only)

* + - 1. 779.0 Includes review of final structure plan from consultant

**Low** –

**Medium** –

**High** –

* + - 1. 779.1 Specialty - Complex structural analysis

**Low** –

**Medium** –

**High** –

##### Traffic Operations *(9/15/16)*

###### 313 Analyze Traffic Data/Forecast *(8/26/16)*

* + - 1. 313.0 Conduct analysis of traffic data and forecasting/projections.
      2. 313.1 Review local land use and transportation plans

Determine how land use plan effects traffic patterns for a site or in a corridor. Potential impacts on access, trip generation and trip distribution. Potential project schedule impacts may occur if local plans are in the act of revising/adding.

**Low** – procedural, only gathering and compiling

**Medium** – reviewing plan for specific impacts

**High** – reviewing all plan aspects, generally done for corridor study

* + - 1. 313.2 Process crash data-analyze crash trends (per road segment)

Document crash rates and patterns. Summarize crash data and document findings. Includes pulling crash data.

**Low** – Procedural only. Gathering and compiling initial crash data and computing rates

**Medium** – Potential issues found. Creating crash diagram. Level of effort varies depending on number of crashes

**High** – Summarizing crash reports (MV 4000). Include potential use of Highway safety manual. Documentation in separate technical memo

* + - 1. 313.3 Process crash data-analyze crash trends (per intersections)

Document crash rates and patterns. Summarize crash data and document findings. Includes pulling crash data. Includes roundabouts, J turns, U turns, and DDI.

**Low** – procedural only - gathering, compiling initial crash data and computing rates

**Medium** – potential issues found, creating crash diagram. Effort varies depending on number of crashes

**High** – summarizing crash reports (MV 4000). Include potential use of Highway safety manual, documentation in separate technical memo

* + - 1. 313.4 Certified traffic for preferred alternative

WisDOT only task. ***LOE TBD by WisDOT***

**Low** –

**Medium** –

**High** –

* + - 1. 313.5 Traffic operations modeling (Microscopic)

Primarily intersection focused. Programs used: highway capacity software, Synchro, Sidra, Paramics, Vissim. Unit is geometric design per peak time period.

**Low** – single isolated intersection

**Medium** – linear corridor, one coordination plan

**High** – network with crossing arterials. Time is highly variable depending on project and number of alternatives created

* + - 1. 313.6 Transportation demand modeling (Macroscopic)

Applying regional model to develop daily and peak period transportation forecasts. Assumes application of validated model approved for use.

**Low** – site specific

**Medium** – corridor or subarea

**High** – regional application with arterials and interchanges

* + - 1. 313.7 Conduct road safety audit

**Low** – single isolated intersection

**Medium** – linear corridor, one coordination plan

**High** – network with crossing arterials.

* + - 1. 313.8 Traffic projection and traffic forecast

Includes time to determine factors (K, directional, vehicle classification). Includes time to fill out forecast request form and correspondence.

**Low** – one to two roadways, no intersections

**Medium** – one to two roadways with up to five intersections

**High** – more than two roadways and five intersections

* + - 1. 313.9 Determine time of day peak characteristics (peak hour factors)

All have same level of effort

**Low** – N/A

**Medium** – N/A

**High** – N/A

* + - 1. 313.10 Determine directional composition of traffic flow (directional distribution)

All have same level of effort

**Low** – N/A

**Medium** – N/A

**High** – N/A

* + - 1. 313.11 Develop and document Intersection Control Evaluation (ICE) report

Understand existing conditions, identify potential alternatives, evaluate each alternative, analyze traffic operations, safety, right of way impacts, environmental concerns, multimodal opportunities, concept design feasibility, construction cost estimates.

**Low** – Limited traffic and design data is needed.

**Medium** – Multiple alternatives with little or no data is available and would need to be collected.

**High** – Multiple alternatives including complex concept design. Little or no data is available and would need to be collected.

###### 347 Collect Traffic Field Data *(8/26/16)*

* + - 1. 347.0 Conduct and review traffic counts and other traffic data collection
      2. 347.1 Complete directional counts on roadways and ramps (ADT Counts)

ADT count data collection only (no speed or vehicle class info) using pneumatic tube or other comparable technology. Effort is to prepare for count, set up & take down equipment, submit for processing and review for accuracy. Does not include travel time, mileage, reimbursable and direct expenses, or processing fees that may be assessed by vendor.

Staff: Field technician, entry engineer

**Low** – two-lane rural or urban low speed set-up (single tube, single box)

**Medium** – four-lane urban low speed set up (two tubes, one box or two boxes, one tube each)

**High** – High speed multi-lane or high volume set up. Typically requires a more complex set up and multiple pieces of equipment. May require significant traffic control. Two staff members may be needed for safety or other reasons.

* + - 1. 347.2 Complete vehicle classification counts

Vehicle class data collection for roadway segments using pneumatic tube or other comparable technology. Effort is to prepare for count, set up & take down equipment, submit for processing and review for accuracy. Does not include travel time, mileage, reimbursable and direct expenses, or processing fees that may be assessed by vendor.

Staff: Field technician, entry engineer

**Low** – two-lane rural or urban low speed set-up (Two tubes, single box)

**Medium** – four-lane urban low speed set up (two boxes, two tubes each)

**High** – High speed multi-lane or high volume set up. Typically requires a more complex set up and multiple pieces of equipment. May require significant traffic control. Two staff members needed for safety or other reasons.

* + - 1. 347.3 Complete speed data collection

Vehicle speed data collection for roadway segments using pneumatic tube or other comparable technology. Effort is to prepare for count, set up & take down equipment, submit for processing and review for accuracy. Does not include travel time, mileage, reimbursable and direct expenses, or processing fees that may be assessed by vendor.

Staff: Field technician, entry engineer

**Low** – two-lane rural or urban low speed set-up (Two tubes, single box)

**Medium** – four-lane urban low speed set up (two boxes, two tubes each)

**High** – High speed multi-lane or high volume location. Typically requires alternative data collection methods or equipment such as manual collection with radar detection or use of speed trailers.

* + - 1. 347.4 Turning movement counts at intersections
         1. 347.4.1 Automated turning movement counts at intersections

Assumes counts are collected and processed by means of cameras or other comparable technology, and that no manual counting (live or by video) is done. Effort is to prepare for count, set up & take down equipment, submit for processing and review for accuracy. Does not include travel time, mileage, reimbursable and direct expenses, or processing fees that may be assessed by vendor.

Staff: Field technician, entry engineer

**Low** – Single equipment set-up, non-roundabout intersection

**Medium** – Double equipment set-up, non roundabout intersection or small single lane roundabout

**High** – Multilane or large single lane roundabout with pedestrian/bike counts needed. Any intersection where 3 or more equipment setups required.

* + - * 1. 347.4.2 Manual turning movement counts at intersections

Assumes intersection turning movement counts that are collected and processed manually (live or by recorded video). Effort is to prepare for count, complete the count and summarize the data. Does not include travel time, mileage, reimbursable and direct expenses.

Staff: Field technician, entry engineer

**Low** – Low volume intersection, (single staff person/round of watching video)

**Medium** – Standard intersection collection (two staff people/rounds of watching video)

**High** – High volume or heavy pedestrian/bike counts, or longer duration counts where additional staff may be necessary to relieve counters for short time periods or to complete split counts (3 or more staff/rounds of watching video)

* + - 1. 347.5 Control and continuous counts

Review and obtainment of available count information, including continuous count (ATR) data from DOT or other sources.

Staff: entry engineer

**Low** – Obtain info for a single location or intersection, traditional variations in traffic (Not a seasonal factor group 5 or 6)

**Medium** – Information requested for 2-4 locations or intersections, traditional variations in traffic (Not a seasonal factor group 5 or 6)

**High** – five or more locations or intersections with a high variation of seasonal traffic (seasonal factor groups 5 or 6)

* + - 1. 347.6 Complete field signal timing data study

Manual collection and verification of existing signal timing. Effort is to prepare for study, collect existing timing plans or documents, complete the study and summarize the data. Does not include travel time, mileage, reimbursable and direct expenses.

Staff: Field technician, entry engineer

**Low** – 2-4 phase signal

**Medium** – 4-8 phase signal

**High** – complex or unique signal phasing or geometry, interchange phasing.

* + - 1. 347.7 Complete traffic gap study

Manual collection of traffic gap data. Effort is to prepare for collection, complete the data collection and summarize the data. Does not include travel time, mileage, reimbursable and direct expenses.

Staff: Field technician, entry engineer

**Low** – two lane residential or rural low volume street.

**Medium** –two lane suburban or urban street (collector) or two-lane high speed rural road.

**High** – Urban arterial or 4-lane or greater facility.

* + - 1. 347.8 Complete traffic delay study

Collection of traffic control delay data at controlled intersection (typically a signal). Collection is completed per approach or per lane. Effort is to prepare for collection, complete the data collection and summarize the data. Does not include travel time, mileage, reimbursable and direct expenses.

Staff: Field technician, entry engineer

**Low** – Single lane, low volume approach

**Medium** – N/A

**High** – multi-lane approach or complex signal phasing. Two staff required.

* + - 1. 347.9 Collect queue data

Collection of traffic queue data at controlled intersection (typically a signal). Collection is completed per approach or per lane. Effort is to prepare for collection, complete the data collection and summarize the data. Does not include travel time, mileage, reimbursable and direct expenses.

Staff: Field technician, entry engineer

**Low** – One or two lane approach

**Medium** – N/A

**High** – 3 or more approach lanes.

* + - 1. 347.10 Collect lane utilization data

Collection of hourly per lane traffic volumes at a designated location. Collection is completed per multilane movement. Effort is to prepare for collection, complete the data collection and summarize the data. Does not include travel time, mileage, reimbursable and direct expenses.

Staff: Field technician, entry engineer

**Low** – Two lane count

**Medium** – N/A

**High** – 3 or more lane count

* + - 1. 347.11 Collect occupancy data

Collection of vehicle occupancy data at a designated location. Effort is to prepare for collection, complete the data collection and summarize the data. Does not include travel time, mileage, reimbursable and direct expenses. Collection requirements are based on obtaining sufficient sample size data and not on amount of time, so lower volume locations may require more “effort” to obtain a sufficient sample size.

Staff: Field technician, entry engineer

**Low** – moderate to high volume location where sufficient sample data can be obtained in a short period of time.

**Medium** – N/A

**High** – low volume counts where obtaining sufficient sample size takes longer due to lack of vehicles.

* + - 1. 347.12 Complete travel time study

Collection of travel times along a designated corridor or roadway segment. Many different data collection methods exist, including technology based (Bluetooth, GPS, cellular, video) or manual based (test vehicle, observed vehicle). Effort to complete will depend on the methodology utilized, required sample size, number of staff required, length of corridor, and number of checkpoints.

Effort is to prepare for the study; set up & take down equipment; process, compile and review for accuracy.

Staff: Varies based on methodology selected.

**Low** –

**Medium** –

**High** –

* + - 1. 347.13 Complete origin-destination study

Collection of origin-destination data along a designated corridor, roadway segment or street network. Can be highly labor intensive without use of technology. Many different data collection methods exist, including technology based (Bluetooth, GPS, cellular, video) or manual based (license plate checks, postcard survey). Effort to complete will depend on the methodology utilized, required sample size, number of staff required, study area size, and traffic volume at the checkpoints.

Effort is to prepare for the study; set up & take down equipment; process, compile and review for accuracy.

Staff: Varies based on methodology selected.

**Low** –

**Medium** –

**High** –

###### 785 Design Traffic Signal *(8/26/16)*

* + - 1. 785.0 Prepare or review signal plans.
      2. 785.1 Prepare, submit, review signal warrant

Submit warrant analysis forms and or reports based on complexity of the project. Complete warrant form as outlined in TSDM. Time does not include collecting volume or crash data, which should be gathered under a separate effort. Hours should include all entire effort to develop, review and approve of report

Staff: Entry/Tech – Review by Traffic Engineer

**Low** – simple volume only quick warrant check

**Medium** – evaluate most common warrants including crash analysis

**High** – evaluate all warrants with detail information

* + - 1. 785.2 Traffic analysis
         1. 785.2.1 Analyze and determine signal phasing

Provide signal phasing for intersection to make the intersection operates as indicated on the plans. Hours should include time to prepare, review and coordinate with the Regional Signal Engineer.

Staff:Traffic Engineer

**Low** – Simple isolated intersection, 2-4 phases, little or no pedestrian phasing

**Medium** – Average/common intersection with 4-8 Phases, some pedestrian phases

**High** – Highly complex intersection, 8+phases, overlaps, complex interchanges with single controller

* + - * 1. 785.2.2 Analyze and determine intersection timing data

Provide basic signal timing for a fully actuated traffic signal this timing should include all yellow, red, minimum, maximum, special detection settings, and any other special timing needs to make the intersection operate as indicated on the plans. Hours should include time to prepare, review and coordinate with the Regional Signal Engineer.

Staff:Traffic Engineer

**Low** – Simple isolated intersection, 2-4 phases, little or no pedestrian phasing

**Medium** – Average/common intersection with 4-8 Phases, some pedestrian phases

**High** – Highly complex intersection, 8+phases, overlaps, nearby intersections

* + - * 1. 785.2.3 Analyze and determine coordination timing data

Provide traffic signal timing for a fully coordinated traffic signal system. Timing should include all yellow, red, minimum, maximum, special detection settings, cycle, split, offset, and any other special timing needs to make the coordinated system operate as indicated on the plans. Hours should include time to prepare, review and coordinate with the Regional Signal Engineer.

Staff:Traffic Engineer

**Low** – Simple 2-3 signal system with lower volume traffic

**Medium** – 3-6 signals

**High** – Highly complex signal system with 6+ signals with high volumes, crossing coordinated systems

* + - 1. 785.3 Traffic signal plan details
         1. 785.3.1 Develop signal equipment layout

Complete signal equipment plan for both above and below ground equipment. Traffic signal equipment should include overhead street lights that are associated with the traffic signal. Hours should include time to prepare, review and coordinate with the Regional Signal Engineer and Project Manager.

Staff = Traffic Engineer

**Low** – Basic, small Intersection, rural little or no pedestrian equipment 2 – 4 phases

**Medium** – More complex intersection, urban area, some utility conflicts, pedestrian phasing 4-8 phases

**High** – Complex intersection with, urban area, many utility conflicts, 8+ phases, overlaps, special equipment

* + - * 1. 785.3.2 Develop cable routing

Determine the proper cabling, cable size and number of conductors and verify conduit fill. Hours should include time to prepare, review and coordinate with the Regional Signal Engineer and Project Manager.

Staff = Traffic Engineer

**Low** – The level of cable routing effort varies with the number of poles and heads in the intersection. Simple 2 – 4 phase intersection, most lane groups are single lane

**Medium** – Larger 4 – 8 phase intersection, some two lane approaches

**High** – Very large 8 phase intersection with dual and triple lane approaches

* + - * 1. 785.3.3 Develop sequence of operations

Determine the proper intersection phasing, interconnection type and detection needs. Complete the sequence of operations sheet ready for inclusion in plan. Hours should include time to prepare, review and coordinate with the Regional Signal Engineer and Project Manager.

Staff: Traffic Engineer

**Low** – Simple 2 – 4 phase intersection

**Medium** – Larger 4 – 8 phase intersection with standard phasing and standard detection

**High** – Highly complex intersection with complex phasing, overlaps and significant amount of detection

* + - 1. 785.4 Develop quantities and estimate

Complete all quantities for all signal items, include all time to establish, review and coordination to insert sheets into plan set. Time also includes complete estimate for all electrical items be placed in plan. Hours should include time to prepare, review and coordinate with the Regional Signal Engineer and Project Manager.

Staff: Entry/Tech – Review by Traffic Engineer

**Low** – Simple intersection 6 – 8 poles

**Medium** – 8 – 12 poles

**High** – 12 + poles

* + - 1. 785.5 Develop PSE special provisions

Complete all special provisions for all signal items, include all time to prepare, review and to insert into plan set. Include a list of necessary SDD as well as any special construction details necessary to complete the signal design. Hours should include time to prepare, review and coordinate with the Regional Signal Engineer and Project Manager.

Staff: Entry/Tech – Developed and review by Traffic Engineer

**Low** – Simple intersection, isolated intersection, no SPV items

**Medium** – Larger intersection with some SPV items, intersection part of a system

**High** – Highly complex intersection with complex phasing, in a large connected system, increased amount of SPV items

* + - 1. 785.6 Determine existing signal inventory and complete signal removal plan

Complete traffic signal removal plan, quantities, details and specials for submittal into the plan. Hours should include time to prepare, review and coordinate with the Regional Signal Engineer and Project Manager.

Staff: Entry, Tech - Review by Traffic Engineer

**Low** – Simple intersection 6 – 8 poles, complete removal

**Medium** – 8 – 12 poles, complete removal

**High** – 12 + poles, complete or partial removal of equipment

* + - 1. 785.7 Complete traffic signal communication design

Complete signal communications plan, quantities, details and specials for submittal into the plan. Hours should include all time to prepare, review and coordination with Regional Signal Engineer and Project Manager.

Staff = Traffic Engineer/ITS Engineer

**Low** – Isolated signal system, 2-5 signals

**Medium** – Integrating into and exiting system and adding 2-5 signals

**High** – More complex system, 5+ signals, Integration into WisDOT fiber network

* + - 1. 785.8 Railroad preemption plans

Complete railroad pre-emption plan, quantities, details and specials for submittal into plan. Will include coordination with railroad and calculation of needed advanced pre-emption time if needed. Hours should include all time to prepare, review and coordination with Regional Signal engineer and Project Manager.

Staff = Traffic Engineer

**Low** – Single grade crossing one approach

**Medium** –

**High** – Multiple grade crossings on different approaches

* + - 1. 785.9 Temporary signals
         1. 785.9.1 Develop signal equipment layout

Complete temporary signal plan, quantities, details and specials for submittal into the plan. Plans should include multiple head layouts if the traffic control plans require. Hours should include all time to prepare, review and coordination with Regional Signal Engineer and Project Manager.

Staff = Traffic Engineer

**Low** – Simple two phase signal, used at one lane two way operation at bridges

**Medium** – 2-4 phase intersection temporary signal with detection 2-4 stage changes with head configuration changes

**High** – 4-8 Phase signal with detection, possible interconnection with other signals, highly complex urban multi-stage project with 4+stage changes to head configuration

* + - * 1. 785.9.2 Develop sequence of operations

Determine the proper intersection phasing, interconnection type and detection needs. Complete the sequence of operations sheet ready for inclusion in plan. Hours should include time to prepare, review and coordinate with the Regional Signal Engineer and Project Manager.

Staff = Traffic Engineer

**Low** – Simple 2 – 4 phase intersection

**Medium** – Larger 4 – 8 phase intersection with standard phasing and standard detection

**High** – Highly complex intersection with complex phasing, overlaps and significant amount of detection

* + - * 1. 785.9.3 Analyze and determine intersection timing data

**Low** –

**Medium** –

**High** –

* + - * 1. 785.9.4 Analyze and determine coordination timing data

**Low** –

**Medium** –

**High** –

###### 788 Develop Traffic Control and Staging *(8/26/16)*

* + - 1. 788.0 Traffic Control and Construction Staging
      2. 788.1 Develop/Coordinate/Review Transportation Management Plan (Type 1, 2, 3, 4).
         1. 788.1.1 Identify work restrictions (special events or holidays)

Review special events during construction that may require restriction on project work activities if capacity is necessary for traffic flow. Review holidays that occur during scheduled construction duration which would require greater capacity through work zone to maintain traffic flow. Greater impacts on recreational corridors.

**Low** – One occurrence

**Medium** – Two to four occurrences

**High** –More than four occurrences and having regional significance

* + - * 1. 788.1.2 Work hour restrictions-lane closure evaluation

Evaluate reduced capacity and traffic volumes that would occur as a result of lane closures or reductions. Evaluate capacity on an hourly basis.

**Low** – Rural or low traffic volume corridors

**Medium** – Urban arterial corridors with limited diversion anticipated.

**High** – Complex multi-lane urban arterial corridors, freeways and expressways. Lane closures, travel lane width reductions and/or night work expected. Significant route diversion with anticipated impacts to adjacent land uses.

* + - * 1. 788.1.3 Work zone capacity traffic analysis (LOS-delay-queue)

Similar to Task 788.1.2 but more focus on intersection capacity. Length of construction zone, alternate route availability, TMP and highway type, and surrounding land uses weigh on complexity of effort.

**Low** – Type 1 TMP, affecting individual intersections and analyzed using Synchro/HCS.

**Medium** – Type 2 TMP, affecting arterial corridors and analyzed using SimTraffic or Synchro/HCS.

**High** – Type 3 & 4 TMPs, affecting regional and long distance travel. Typically complex multilane urban arterial, expressway and freeway corridors analyzed at a system level using microsimulation. Significant public and agency coordination and review.

* + - * 1. 788.1.4 Detour route evaluations

Vertical clearance-travel time-improvements needed; surface and shoulder condition-corridor; and intersection capacity. Likely completed in conjunction with Task 788.1.3, with traffic evaluation conducted on detour route(s).

**Low** – Not applicable/likely to be completed as a low effort task.

**Medium** – Likely Type 2 TMP. Affecting arterial corridors and analyzed using SimTraffic or Synchro/HCS.

**High** – Likely Type 3 & 4 TMPs. Typically complex multilane urban arterial, expressway and freeway corridors analyzed at a system level using microsimulation. Significant public and agency coordination and review required.

* + - * 1. 788.1.5 Temporary pedestrian accommodations

All temporary pedestrian accommodations in work zone to be completed to ADA standards. Provide safe pedestrian access to land uses in urban settings. TMPs include statement to accommodate pedestrian needs and applies to all locations with limited variability. Design of facilities further addressed in traffic control plans.

**Low** – Few peak period pedestrian crossings at intersections

**Medium** – Moderate peak period pedestrian crossings at intersections

**High** – High number if peak period pedestrian crossings at intersections

* + - * 1. 788.1.6 OSOW accommodations (clear lane width determination)

Work zone accommodations for Oversized, Overweight vehicles usually encountered on State Trunk Network routes designated for OSOW use. In addition to clear lane width determination, may consider signal phase changes at intersections and temporary removal of parking in urban settings.

**Low** – OSOW accommodations unlikely to occur on a low level effort.

**Medium** –Urban settings where work zone may be subject to occasional OSOW use, but frequent OSOW vehicle use not expected.

**High** – Regular OSOW use anticipated on designated truck routes. High level effort may also require changes in work zone staging plan upon notification of permit issuance. Traffic engineer working closely with design engineer to address anticipated impacts of OSOW vehicle use.

* + - * 1. 788.1.7 Alternate route evaluations

Vertical clearance-travel time-improvements needed; surface and shoulder condition-corridor; and intersection capacity. High traffic volumes may limit alternate routing options. If using other jurisdictional roadways, likely includes intergovernmental discussions and MOUs. Significant coordination required.

**Low** – Limited distances on rural corridors.

**Medium** – Urban arterial routes with signalized corridors.

**High** – Complex urban arterial and expressway/freeway routes.

* + - * 1. 788.1.8 Temporary transit accommodations

Work zone accommodations for transit vehicles providing local service. Typically encountered on urban arterials and collectors. May require relocation of passenger loading pads, shelters and bus pull-outs.

**Low** – Limited stop locations in residential areas

**Medium** – Moderate stop locations in outlying business/commercial employment areas

**High** – Numerous stop locations in CBD or CBD fringe areas

* + - * 1. 788.1.9 Temporary ITS

Includes the development of temporary ITS plans but excludes actual design of devices to be deployed (*see 832 – Design ITS*).

**Low** – ITS deployment not applicable with low level traffic control and staging work efforts.

**Medium** – Corridor spot treatments, simple ITS plan. May feature PCMS/PDMS or intersection cameras at 1 or 2 locations.

**High** – Complex, multi-lane urban corridors, freeways and/or expressways. Features ITS system plan with equipment specs and coordination with BTO STOC.

* + - 1. 788.2 Develop incident management plan

Incident management plan typically includes coordination with emergency responders and law enforcement.

**Low** – Rural route using Google maps with field review. Determination of who to contact, responding agencies, and approved detour options. Minor law enforcement review and stakeholder outreach.

**Medium** – Urban arterial routes and includes low-level activities above, with increased local law enforcement review and stakeholder outreach.

**High** – Complex urban/rural arterials, expressways and freeway routes, including major and mega-projects. High level of law enforcement and stakeholder coordination and planning required.

* + - 1. 788.3 Detour plan and signing

Includes map and standard sign layout of the detour. Hours are work hours per detour.

**Low** – Mapping and up to twelve signs.

**Medium** – Mapping and thirteen to 24 signs.

**High** – Mapping and more than 24 signs.

* + - 1. 788.4 Traffic control plan

Signing and marking, not necessary for TMP.

**Low** – Rural collectors or minor arterials

**Medium** – Rural principal arterials and suburban arterials with no or very limited access control

**High** – Built-up, dense urban arterial corridors, and expressways and freeways

* + - 1. 788.5 Traffic control staging plans

Effort typically led by design engineer and needed for TMP

**Low** – Few stages required. Similar to 788.4, but with more detail on plan sheets and attention to project schedule critical path factors

**Medium** – Moderate number of stages required. Similar to 788.4, but with more detail on plan sheets and attention to project schedule critical path factors

**High** – High number of stages required. Similar to 788.4, but with more detail on plan sheets and attention to project schedule critical path factors. High levels of agency review and coordination, and substantial traffic analysis required.

* + - 1. 788.6 Pedestrian/bike/snowmobile detour

Description of the detour with specific items identified such as channelizing or fencing with a map.

**Low** – Detour of less than one mile. No specific accommodations identified.

**Medium** – Detour of more than one mile. No specific accommodations identified.

**High** – Detour of more than one mile. Route accommodations identified with need for detour.

###### 819 Design Signing and Pavement Marking *(9/15/16)*

* + - 1. 819.0 Includes tasks related to signing information, recommendations, plans and/or review for design (SPO); and field work on improvement projects (review of existing sign locations and conformance to current standards and guidelines.) Includes review of current policies and guidelines
      2. 819.1 Prepare Type 1 and/or Type 2 guide sign alternatives

This step occurs early in the process and helps determine if the proposed geometry will work and identify potential right-of-way issues. Includes correspondence between the DOT and consultant. Could include meetings. This mainly occurs when projects includes interchanges.

Project Engineer, Traffic Engineer, CADD technician

**Low** – conventional diamond or cloverleaf interchange, pavement preservation type projects (maintenance-like activity, shoulder work, beam guard, asphalt/concrete repair, maintenance crossover)

**Medium** – system interchanges with optional exit lanes, aux lanes

**High** – complex /system interchanges, DDIs, Single point, new interchange types

* + - 1. 819.2 Develop sign plan details
         1. 819.2.1 Inventory existing signs

Reviewing and documenting existing signing (includes possible site visit and/or photolog review) and reviewing existing/current policies

Traffic engineer (project and entry)

**Low** – resurface or roadway maintenance, no changes in alignment, rural freeway/conventional highway

**Medium** – reconstruct or pavement replacement, minor alignment changes, non-freeway intersections, suburban areas

**High** – reconstruct or major roadway realignment, complex freeway interchanges and complex intersections, expansions (BTO typically involved with review and comments), typically urban project

* + - * 1. 819.2.2 Develop sign removal plans

This task does NOT include CADD work

Traffic engineer (project and entry)

**Low** – resurface or roadway maintenance, no changes in alignment, rural freeway/conventional highway with only Type 2 signs

**Medium** – suburban project, reconstruct or pavement replacement, minor alignment changes, non-freeway intersections, type 2 signs and replacing existing type 1 signs, minor type 1 sign changes

**High** – typically urban project, reconstruct or major roadway realignment, complex freeway interchanges, expansions (BTO typically involved with review and comments), new and/or changes to type 1 and type 2 signs

* + - * 1. 819.2.3 Develop permanent sign plans

Includes Type 1, Type 2, regulatory, and warning signs (This task does NOT include CADD work)

Traffic engineer (project and entry)

**Low** – resurface or roadway maintenance, no changes in alignment, rural freeway/conventional highway with only Type 2 signs

**Medium** – suburban project, reconstruct or pavement replacement, minor alignment changes, non-freeway intersections, type 2 signs and replacing existing type 1 signs, minor type 1 sign changes

**High** – typically urban project, reconstruct or major roadway realignment, complex freeway interchanges, expansions (BTO typically involved with review and comments), new and/or changes to type 1 and type 2 signs

* + - * 1. 819.2.4 Develop signing plates

Completed by WisDOT only

CADD technician (senior)

**Low** – Resurface or roadway maintenance, no changes in alignment, Replacing existing signs, no new signs

**Medium** – reconstruct or pavement replacement, minor alignment changes, non-freeway intersections, type 2 signs and replacing existing type 1 signs, minor type 1 sign changes

**High** – reconstruct or major roadway realignment, freeway interchanges, expansions (BTO typically involved with review and comments), new and/or changes to type 1 and type 2 signs

* + - 1. 819.3 Develop pavement marking plan details

NOTE: does not include the actual “design” of the no passing zone – that is taken care of in design process

Traffic Engineer (entry and project engineer), CADD technical

**Low** – same as existing markings, no change in location (would likely be SDDs and quantities, minor intersection details)

**Medium** – alignment changes (possible locating of new no passing zones), new at-grade intersections, single-lane RAB, standard diamond and cloverleaf interchanges

**High** – expansion projects, complex interchanges (DDIs, SPIs, “new innovative interchanges”), with C-D roads, (would likely include separate marking plan), (possible locating of new no passing zones), multi-lane RABs, J-turn intersections

###### 830 Design Street Lighting *(6/6/16)*

* + - 1. 830.1 Improvement Project Operational Improvement - Lighting Plan & Inspection

Task includes scoping and planning for a lighting improvement project and/or impacts from a roadway improvement project. Efforts based on: Reviewing as-built plans, conducting site visits, evaluating illumination levels, inspecting electrical components, inspecting poles and other hardware, evaluating underground wiring and conduit systems, preparing cost estimates and improvement concepts.

Staff: technician, project engineer, project manager, electrical engineer

**Low** – Basic roadway project with little or no existing lighting. May include standard-type lighting implemented with an improvement project.

**Medium** – Moderate complexity roadway project with existing lighting systems and proposed lighting improvements. May include multiple types of lighting, decorative lighting, staged construction and utility conflicts.

**High** – Complex major projects with freeway lighting, extensive electrical systems, multiple cabinets, multiple types of lighting, temporary lighting and lighting control systems.

* + - 1. 830.2 Determine potential locations for lighting

Task includes evaluating and compiling documentation for implementing lighting with an improvement project. Efforts based on: Complete traffic evaluation, complete safety analysis, classify roadway segments and determine illumination levels, complete alternatives analysis and cost estimates.

Staff: technician, project engineer, project manager, electrical engineer

**Low** – Basic roadway project with little or no existing lighting. May include standard-type lighting implemented with an improvement project.

**Medium** – Moderate complexity roadway project with existing lighting systems and proposed lighting improvements. May include multiple types of lighting, decorative lighting, staged construction and utility conflicts.

**High** – Complex major projects with freeway lighting, extensive electrical systems, multiple cabinets, multiple types of lighting, temporary lighting and lighting control systems.

* + - 1. 830.3 Complete Lighting Investigation Report

Task includes completing a Lighting Investigation Report for implementing lighting with an improvement project. Efforts based on: Prepare forms and required documentation, prepare exhibits, compile appendix data and prepare a completed Lighting Investigation Report.

Staff: technician, project engineer, project manager

**Low** – Basic roadway project with standard-type lighting implemented with an improvement project.

**Medium** – Moderate complexity roadway project with existing lighting systems and proposed lighting improvements. May include multiple types of lighting, staged construction and utility conflicts.

**High** – Complex major projects with freeway lighting, extensive electrical systems, multiple cabinets, multiple types of lighting, temporary lighting and lighting control systems.

* + - 1. 830.4 Complete lighting permit forms (preliminary and final)

Task includes completing lighting permit forms (preliminary and final) for implementing lighting with an improvement project. Efforts based on: Prepare forms and required documentation, prepare exhibits, compile appendix data and prepare completed lighting permit forms.

Staff: technician, project engineer, project manager

**Low** – Basic roadway project with standard-type lighting implemented with an improvement project.

**Medium** – Moderate complexity roadway project with existing lighting systems and proposed lighting improvements. May include multiple types and/or non-standard type lighting.

**High** – Complex projects with decorative lighting, extensive electrical systems, multiple cabinets, multiple types of lighting, temporary lighting and lighting control systems.

* + - 1. 830.5 Determine existing lighting inventory and complete lighting removal plan

Task includes preparing a base-map of existing lighting systems and design for the removal with an improvement project. Efforts based on: Reviewing as-built plans, conducting site visits, inspecting electrical components, inspecting poles and other hardware, evaluating underground wiring and conduit systems, evaluating impacts, and for preparing plans, specifications and estimates for construction.

Staff: technician, project engineer, project manager, electrical engineer

**Low** – Basic roadway project with existing lighting being removed or partially removed as part of an improvement project.

**Medium** – Moderate complexity roadway project with multiple types of existing lighting, staged construction and utility conflicts.

**High** – Complex major projects with existing freeway lighting, extensive electrical systems, multiple cabinets, multiple types of lighting and temporary lighting.

* + - 1. 830.6 Complete street lighting layout and equipment design

Task includes completing illumination design, lighting layout and lighting equipment design (poles, bases, arms) for an improvement project. Efforts based on: Computer modeling and rendering, light locating, CAD drafting, and for preparing plans, specifications and estimates for construction.

Staff: technician, project engineer, project manager

**Low** – Basic roadway project with standard-type lighting implemented with an improvement project.

**Medium** – Moderate complexity roadway project with multiple types of lighting and/or decorative lighting.

**High** – Complex major projects with freeway lighting, tunnel lighting, underpass lighting, interchanges, multiple types of lighting and high mast lighting.

* + - 1. 830.7 Complete street lighting electrical design

Task includes completing electrical design (conduit, pull boxes, junction boxes, wiring), for cabinet design, metering design and control system design for an improvement project. Efforts based on: Infrastructure design (conduit, pull boxes, junction boxes), circuiting, load calculations, voltage drop calculations, develop cabinet, metering and control systems, CAD drafting, and for preparing plans, specifications and estimates for construction.

Staff: technician, project engineer, project manager, electrical engineer

**Low** – Basic roadway project with standard-type lighting implemented with an improvement project.

**Medium** – Moderate complexity roadway project with multiple types of lighting and/or decorative lighting.

**High** – Complex major projects with freeway lighting, tunnel lighting, underpass lighting, interchanges, multiple types of lighting and high mast lighting.

* + - 1. 830.8 Temporary lighting

Task includes completing lighting and electrical design to maintain a temporary lighting system for construction staging of an improvement project. Efforts based on: Illumination design, electrical design, CAD drafting, and for preparing plans, specifications and estimates for construction.

Staff: technician, project engineer, project manager, electrical engineer

**Low** – Basic roadway project with standard-type lighting implemented with an improvement project.

**Medium** – Moderate complexity roadway project with multiple types of lighting and/or decorative lighting.

**High** – Complex major projects with freeway lighting, tunnel lighting, underpass lighting, interchanges, multiple types of lighting and high mast lighting.

###### 832 Design ITS *(8/26/16)*

ITS design level of effort generally determined by looking at key project indicators, for example:

Site Conditions:  Is this a straight section of roadway or at a complex interchange?

Power availability:  Is solar power an option?  Is power ready available at the site?  Does power need to be brought to the location?

Communications:  Cellular communications is typically easiest.  Is Fiber Optic design needed (and therefore communications schematics and splicing diagrams)?

Project Type:  Is this a standalone ITS project or is coordination within a large/complex roadway reconstruction project with bridges, retaining walls, etc. required?

* + - 1. 832.1 Design Traffic/Vehicle Detection Components – Interchange

**Low -** Interchange with simple geometrics (diamond or similar). Existing power at interchange. Cellular communications.

**Medium -** Interchange with simple geometrics (diamond or similar). No existing power at interchange but available nearby and can be brought to interchange. Fiber optic communications.

**High -** Complex interchange. No existing power at interchange but available nearby and can be brought to interchange. Fiber optic communications

* + - 1. 832.2 Design Traffic/Volume Detection Components – Mainline

**Low -** Straight section of roadway (no significant vertical or horizontal curves). Existing power. Cellular communications

**Medium -** Straight section of roadway (no significant vertical or horizontal curves). No existing power but available nearby. Fiber optic communications

**High -** More complex section of roadway (significant vertical or horizontal curves). No existing power but available nearby. Fiber optic communications

* + - 1. 832.3 Design Traffic/Volume Detection Components – Bluetooth

**Low -** Straight section of roadway (no significant vertical or horizontal curves). Solar power. Cellular communications.

**Medium -** Straight section of roadway (no significant vertical or horizontal curves). Hard-wired power. Fiber optic communications

**High -** More complex section of roadway (significant vertical or horizontal curves). No existing power but available nearby. Fiber optic communications.

* + - 1. 832.4 Design CCTV Camera Components

**Low -** Power readily available. Cellular communications.

**Medium -** Power coordination required to bring power to site. Fiber optic communications.

**High -** Power coordination required to bring power to site. Fiber optic communications. Coordination with large roadway reconstruction project.

* + - 1. 832.5 Design Dynamic Message Sign – Roadside

**Low -** Rural area with adequate right-of-way. Power readily available. Cellular communications.

**Medium -** Rural/urban area with less right-of-way. Power coordination required to bring power to site. Fiber optic communications.

**High -** Urban area with minimal right-of-way. Power coordination required to bring power to site. Fiber optic communications.

* + - 1. 832.6 Design Dynamic Message Sign – Overhead

**Low -** Power readily available. Cellular communications.

**Medium -** Coordination with large roadway project. Power coordination required to bring power to site. Fiber optic communications

**High -** Coordination with large roadway project. Power coordination required to bring power to site. Fiber optic communications. Adverse soil conditions. Non-standard DMS structure (butterfly).

* + - 1. 832.7 Design Fiber Regeneration Hut

**Low -** Rural area with adequate right-of-way. Up to four fiber optic cables connecting at this location.

**Medium -** Urban/rural mix. Coordination with roadway construction. Up to six fiber optic cables connecting at this location.

**High -** Urban/rural mix. Large interchange. Coordination with roadway construction. Up to eight fiber optic cables connecting at this location.

* + - 1. 832.8 Design Fiber Optic Communications

**Low -** Rural area with adequate right-of-way

**Medium -** Urban/rural mix. Coordination with roadway construction

**High –** Urban. Coordination with roadway construction.

##### Real Estate, Railroads and Utilities *(7/28/16)*

###### 247 Manage Real Estate Relocation *(6/15/16)*

* + - 1. 247.0 Includes activities related to acquisition stage relocation plan and relocation assistance.

Conceptual stage relocation plan document is written as part of environmental document and reviewed.

Report is written by staff engineers and reviewed by an advanced real estate agent.

Criteria for “Low,” “Medium,” and “High” are the same for 247.1, 247.2, 247.3.

• Complexity is a function of time necessary to accomplish the task or the increased difficulty (things outside agency control) preventing the task from being done in a standardized amount of time.

• There are significant challenges in estimating the number of hours to accomplish and complete a relocation as there are two years of claim period after a person vacates.

• Some relocations that would typically fall into the “low complexity” category have the potential to reach the hours identified in “high complexity” relocations. While this variation is not typical, it was not considered in reaching the upper limit of the number of hours under low complexity.

• There is an overlap of time that can occur with multiple relocations on a project with same complexity and types. As a result, time efficiencies are likely. For example, if an 8-unit apartment building has similar characteristics and household sizes, then searching for comparables would be a consolidated effort as the same comps could be utilized. So, rather than eight different searches, there would only be one search, providing a lower number of hours for this task.

• Travel time/mileage, attorney involvement and unexpected circumstances including uncooperative displacee(s) have not been included in these estimates.

**Residential:**

**Low** –

- Tenant or owner occupied, single family unit

- Typical 2-3 bedroom home

- Available comparable properties with one, two or three bedrooms

**Medium** – (any one of the following would qualify)

- Large or extended families/households requiring 4 or more bedrooms

- Presence of low income residents (requires additional considerations)

- A multi-tenant building

- Special features at subject property

- Early acquisition, hardship, protective purchase

**High** – (any one of the following would qualify)

- Rental market scarcity for comparable housing

- Mobile home or trailer park relocations

- Known controversy with a relocation

- Displaced persons have known handicap, medical, special needs or other ADA requirements for relocation consideration

**Non-Residential:**

**Low** –

- Relocation of a family-run business

- Single ownership, small building less than 4,000 SF

- No anticipated zoning restrictions or complex licensing necessary for a business to relocate

- Ample comparable properties available

**Medium** – (any one of the following would qualify)

- Rural areas where comparable properties may be scarce

- Larger (than a family run business) operations

- Larger tracks of land

- Special relocation considerations such as mixed use or multiuse properties

- Landlord (property owner) and business operator (tenant) are the same person(s)

**High** – (any one of the following would qualify)

- Anticipated large inventory of personal property

- Multiple ownership types for the business, if known

- Franchised businesses

- Multiple entities (e.g. utilities, railroads, airports, cell tower, billboards) involved in relocation

- Special zoning or complex licensing is anticipated to relocate to replacement location

- Known concerns or complex circumstances (e.g. specific type of commercial use, utility usage, building requirements, mining operations)

- Functional replacements (owned by a government, e.g. county salt shed, fire station, town hall)

* + - 1. 247.1 Conceptual Plan - Relocation (environmental document)

Includes the following tasks: Windshield survey, plan review conducted for entire project corridor, Data gathering/market review/search for comparables, Write report's relocation element

* + - * 1. 247.1.1 Residential
        2. 247.1.2 Non-Residential
      1. 247.2 Relocation Plan (at acquisition stage)

Includes the following tasks: "preparation - project data collection, driving project, phone calls, file prep", Paperwork and READS, personal interviews, compile information, meeting time, gather parcel/ project data, write report, Review, revision, approval

* + - * 1. 247.2.1 Residential
        2. 247.2.2 Non-Residential
      1. 247.3 Relocation Assistance to Displaced Person

Includes the following tasks: "Ongoing Coordination with Project Team, DOT Attorney, region managers, BTS staff, others"; Initiation of Negotiations - prepare relocation package; Present relocation package; Provide comparable properties at regular intervals; Property showings; Attend closings; Prepare for complex moves (3rd Party); Provide assistance to prepare relocation claims; Vacancy inspections; DSS inspections (residential only); Anticipated complications; Prepare case reports; Maintain relocation file (READS}

* + - * 1. 247.3.1 MOVE ONLY with No Displaced Persons

No displaced persons. Moving personal property only.

**Low** –

- An established payment “schedule” for personal property moves is available for many types of personal property move only situations. The schedule provides significant time efficiencies.

- Moving estimates may be needed for certain moves, including billboard moves.

- Realignment of a billboard on same parcel

- Relocation of a billboard to new location

* + - * 1. 247.3.1 Residential
        2. 247.3.2 Non-Residential
      1. 247.4 Demolition/razing contracts

Done by real estate section, or during construction stage

Typically done by consultants for local program projects, typically done by WisDOT staff for state projects

**Low** – Single family residential

**Medium** – Small commercial, multi family

**High** – Larger commercial facility, specialty commercial (gas station)

###### 254 Develop Real Estate Appraisal *(6/15/16)*

* + - 1. 254.0 Includes activities related to real estate appraisal preparation and appraisal review.
      2. 254.1 Prepare and review real estate appraisal

Includes time to write appraisals and review appraisals. Time for site clearance is noted below as: “*Acquisitions with improvement may require an extra xx hours.*” Full [parcel descriptions](http://apwmad0p4145:37108/dtsdManuals/re/re-staffresources/parceltypedefs.docx).

**Low** – A relatively simple acquisition where highest and best use is obvious and land value is readily determined from comparable sales. Acquisitions with improvement may require an extra two hours.

Also requires up to nine total hours of project management for managing scope and schedule (887,) delivery cost (888,) quality (890) and possibly consultant selection (883.)

**Medium** – Standard Format Appraisal Report acquisitions where land values are difficult to establish because the highest and best use is not readily ascertained. Acquisitions with improvement may require an extra 20 hours.

Also requires up to 18 total hours of project management for managing scope and schedule (887,) delivery cost (888,) quality (890) and possibly consultant selection (883.) Allow up to seven hours for staff management/supervision. Projects with improvements up to 24 *total* project management hours.

**High** – Complicated acquisitions from farm, business, manufacturing, or unique special purpose properties where the acquisition severely affects the site and/or improvements, requiring a detailed before and after analysis. Acquisitions with improvement may require an extra 20 hours. Signs and outdoor advertising

Also requires up to 24 total hours of project management for managing scope and schedule (887,) delivery cost (888,) quality (890) and possibly consultant selection (883.) Allow up to seven hours for staff management/supervision.

* + - 1. 254.2 Specialty - Real estate appraisal services right of way projects

**Low** –

**Medium** –

**High** –

* + - 1. 254.3 Specialty - Real estate appraisal review services

**Low** –

**Medium** –

**High** –

* + - 1. 254.4 Specialty - Eminent domain real estate services

**Low** –

**Medium** –

**High** –

###### 253 Nominal Parcel Acquisition *(6/28/16)*

* + - 1. 253.0 Purchase of nominal parcel acquisition
      2. 253.1 Purchase of nominal parcel acquisition with appraisal

Activity also requires up to seven total hours of project management for managing scope and schedule (887,) delivery cost (888,) quality (890) and possibly consultant selection (883.)

**Low** – Non-complex acquisitions with a value of $10,000 or less that may be acquired with an appraisal.

**Medium** – N/A

**High** – N/A

* + - 1. 253.2 Purchase of nominal parcel acquisition without appraisal

Activity also requires up to seven total hours of project management for managing scope and schedule (887,) delivery cost (888,) quality (890) and possibly consultant selection (883.)

**Low** – Non-complex acquisitions with a value of $10,000 or less that may be acquired without an appraisal if the property owner agrees or with a Short Format Summary Appraisal Report

**Medium** – N/A

**High** – N/A

###### 256 Parcel Acquisition (greater than $10k) *(6/17/16)*

* + - 1. 256.0 Includes negotiation of real estate agreement (except nominal parcel).
      2. 2256.1 Purchase of parcel

**Low** – Projects of intermediate complexity.

**Medium** – Major projects.

**High** – Major projects.

###### 265 Litigate Real Estate *(6/17/16)*

* + - 1. 265.0 Includes activities related to Real Estate litigation.

Due the highly complex and project specific nature of this activity reasonably accurate estimates cannot be given here. Contact your real estate section if you believe your project may have litigation. Done only by WisDOT staff. Consider this task for new alignments, approximately 30% of parcels will be litigated. Dense commercial areas close to existing alignment have higher risk. Approximately 10% of all parcels will be litigated. Done by advanced real estate specialist.

###### 746 Coordinate Utilities *(8/18/16)*

* + - 1. 746. 0 Includes Prepare and maintain TUMS or DT 1079 form, SMA Review, Plan/attend/document utility meetings, Create Utility Coordination Task List and/or review utility coordination contract, PMP, 1077 Process, Field survey and compare to system maps, Review base and preliminary right of way plats and establish utility projects in FIIPS, DSR Review, Identify potential utility conflicts, 1078 Project Plan Process, 1078 Compensable Process, Plan Changes, Reviews of utility work plans, Create or review utility special provisions, Execute utility agreements, Work plan approval and start work notice process, Permitting process, PS&E Review, Post PS&E Activities, Construction Support, and Utility invoicing.

Hours listed for the Effort Needed are based on the average effort to complete the low, medium, and high efforts as defined. Travel time is not included in any of the hours. BTS utility unit time is not included in hours. Effort Needed and Staff Expectation does not include a break-down for the hours required for the position classifications listed and hours or position classifications for the other WisDOT functional areas. Staff Expectation includes the position classifications that are most likely to complete the Activity Task Description, but it should not be construed to require the effort of all position classifications listed as the selection of the position classification will be based upon the complexity of the work required for the project.

* + - 1. 746.1 Prepare and maintain TUMS or DT1079 form

**Low** – Five or less facility owners, with two or less of those being compensable.

**Medium** – Ten or less facility owners, with four or less of those being compensable.

**High** – More than ten facility owners, with more than four of those being compensable.

**Staff Expectations**: Civil Engineering Technician – Entry and Mid

* + - 1. 746.2 SMA Review

Includes the following: review project ID's and categories; review funding percentages for each party; review funding source; review SMA language for any other items that affect utility coordination.

Must have local cost share in the project.

**Low** – One SMA with no compensable utilities.

**Medium** – One SMA with compensable utilities, non-freeway.

**High** – Multiple SMAs with compensable utilities, a designated freeway project, or other items that affect utility coordination.

**Staff Expectations**: Civil Engineer – Project and Project Manager; Civil Engineering Technician - Senior

* + - 1. 746.3 Plan/attend/document utility meetings

Includes the following: OPM; 30/60/90 Review Meetings; Utility Coordination (UC) Meetings.

**Low** – Attending the OPM and Design review meetings, no UC meetings needed.

**Medium** – Attending the OPM and Design review meetings, four or less UC meetings.

**High** – Attending the OPM and Design review meetings, more than four UC meetings.

**Staff Expectation**: Civil Engineer – Entry, Project, and Project Manager; Civil Engineering Technician – Mid and senior

* + - 1. 746.4 Create Utility Coordination Task List and/or review utility coordination contract

Includes the following: task list for utility coordination that is part of consultant design contracts.

This does not include separate utility coordination contracts for Major/Mega projects or utility coordination contract for consultant utility coordinator in region office.

This task is not required for internal WisDOT projects.

**Low** – Do not anticipate plan revisions and no compensable utilities.

**Medium** – Do not anticipate plan revisions, but includes compensable utilities.

**High** – Plan revisions likely and compensable utilities.

**Staff Expectation**: Civil Engineer – Project and Project Manager; Civil Engineering Technician – Senior

**Note:** This is a WisDOT task.

* + - 1. 746.5 PMP

Includes the following: reviewing the start date, end date, and duration of the utility coordination tasks within the project schedule; review and comment on any schedule revisions.

**Low** – Five or less facility owners, with two or less of those being compensable. No schedule revisions.

**Medium** – Ten or less facility owners, with four or less of those being compensable. One schedule revision.

**High** – More than ten facility owners, with more than four of those being compensable. More than one schedule revision.

**Staff Expectation**: Civil Engineer – Project and Project Manager; Civil Engineering Technician – Senior

**Note:** This is a WisDOT task.

* + - 1. 746.6 1077 Process

Includes the following: obtain copy of CDR; create DT1077 letter; create DT1077 Proposed Highway Improvement Notice; create DT1077 project overviews or maps; create list of other utility contact people; send 1077 packet to utilities; track receipt of acknowledgements; track receipt of system maps.

**Low** – Five or less facility owners.

**Medium** – Ten or less facility owners.

**High** – More than ten facility owners.

**Staff Expectations**: Civil Engineering Technician – Entry and Mid

* + - 1. 746.7 Field survey and compare data to system maps

Includes the following: assist with resolution of utility field survey issues; compare survey data to system maps to ensure all facilities are surveyed.

This does not include coordination with Diggers Hotline; repeat coordination with Diggers Hotline; field survey; and resurvey. These items are accounted for in 723 – Conduct and Process Existing Field Survey.

When there is no excavation as defined by SS 182.0175(1)(b), this task is not required.

**Low** – Improvement types like pavement replacement (rural). Also includes resurfacing, bridge rehabilitation, or bridge replacement with three or less spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**Medium** – Improvement types like reconditioning and pavement replacement (urban). Also includes resurfacing, bridge rehabilitation, or bridge replacement with more than three spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**High** – Improvement types like expansion and reconstruction.

**Staff Expectations**: Civil Engineering Technician – Entry and Mid

* + - 1. 746.8 Review base and preliminary right of way plats and establish utility projects in FIIPS

Includes the following: limited review of title work; identify that required comp and non-comp utilities are shown correctly; compare utilities shown to system maps; review interest table; review land rights information; coordinate utility project ID's and estimates with FIIPS coordinator.

This task is for utility review of the plat. Actual development of the plat is accounted for in 745 – Develop Transportation Project Plat.

Only applies to projects with right of way acquisition.

**Low** – Six or less right of way parcels.

**Medium** – Twenty or less right of way parcels.

**High** – More than twenty right of way parcels.

**Staff Expectations**: Civil Engineer – Project and Project Manager; Project Surveyor; Civil Engineering Technician – Senior

**Note:** WisDOT Staff completes the coordination of utility project ID and estimates with FIIPS coordinator.

* + - 1. 746.9 DSR Review

**Low** – Projects not having any environmentally sensitive areas, areas of historical or archaeological significance; impacts to tribal lands; contaminated sites; real estate commitments; or other project impacts that affect utilities. Projects that do not have high cost utilities.

**Medium** – Projects that have a few environmentally sensitive areas, areas of historical or archaeological significance; impacts to tribal lands; contaminated sites; real estate commitments; or other project impacts that affect utilities. Projects that have a few high cost utilities.

**High** – Projects that have several environmentally sensitive areas, areas of historical or archaeological significance; impacts to tribal lands; contaminated sites; real estate commitments; or other project impacts that affect utilities. Projects that have several high cost utilities.

**Staff Expectations**: Civil Engineer – Project and Project Manager; Civil Engineering Technician - Senior

* + - 1. 746.10 Identify potential utility conflicts

Includes the following: review 70% project plan to ensure all work that affects utilities is part of this plan; follow each utility from beginning to end of project to identify potential conflicts; create list or exhibit for utility companies that show these potential conflicts.

**Low** – Improvement types like pavement replacement (rural). Also includes resurfacing, bridge rehabilitation, or bridge replacement with three or less spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**Medium** – Improvement types like reconditioning and pavement replacement (urban). Also includes resurfacing, bridge rehabilitation, or bridge replacement with more than three spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**High** – Improvement types like expansion and reconstruction.

**Staff Expectation:** Civil Engineer – Entry and Project; Civil Engineering Technician – Mid and Senior

* + - 1. 746.11 1078 Project Plan Process

Includes the following: review plan to make sure all required sheets included; create DT1078 letter; create DT1078 Project Plan Transmittal; create project overviews or maps; create synopsis of work to be completed; insert locations of environmentally sensitive areas; insert locations of historical or archaeological significance; insert locations of contamination; insert list of potential utility conflicts; create list of other utility contact people; create list of real estate commitments; create list of buildings to be razed and the timeline; prepare DT2236 form; send 1078 packet to utilities; track receipt of acknowledgements; track receipt of work plans.

**Low** – Five or less facility owners.

**Medium** – Ten or less facility owners.

**High** – More than ten facility owners.

**Staff Expectations**: Civil Engineering Technician – Entry and Mid

* + - 1. 746.12 1078 Compensable Process

Includes the following: prepare utility agreements; assist with 3-step agreement letter process; verify utilizing correct plat sheets; create legal descriptions; prepare release of rights (QCD, COR, TCE); create parcel exhibits showing compensable utilities.

Only applies to projects with right of way acquisition.

**Low** – Two or less compensable utilities.

**Medium** – Four or less compensable utilities.

**High** – More than four compensable utilities.

**Staff Expectation:** Civil Engineer – Project and Project Manager; Project Surveyor; Civil Engineering Technician – Senior

* + - 1. 746.13 Plan changes

Includes the following: review revised project plan to ensure all work that affects utilities is part of this plan; follow each utility from beginning to end of revised plan sheets to identify potential conflicts; create list or exhibit for utility companies that show these potential conflicts; create Revised DT1078 letter; create Revised DT1078 Project Plan Transmittal; create synopsis of plan changes; update list of environmentally sensitive areas; update list of locations of historical or archaeological significance; update list of locations of contamination; insert list of potential utility conflicts; update list of other utility contact people; update list of real estate commitments; update list of buildings to be razed and the timeline; prepare DT2236 form; send revised 1078 packet to utilities; track receipt of acknowledgements; track receipt of work plans.

Only applies to projects that have plan changes which affect utilities.

**Low** – Five or less facility owners.

**Medium** – Ten or less facility owners.

**High** – More than ten facility owners.

**Staff Expectation:** Civil Engineer – Entry and Project; Civil Engineering Technician – Mid and Senior

* + - 1. 746.14 Reviews of utility work plans

Includes the following: review work plan to ensure it is compatible with permit requirements, to ensure it is compatible with improvement plans and construction schedule, and to ensure the reasonableness of relocation scheme; resolve conflicts among various work plans; review and revise compensable agreements (agreement, release of rights, estimate summary, calculation of compensability); reasonableness of cost for compensable work (DT1850 is helpful).

**Low** – Five or less facility owners.

**Medium** – Ten or less facility owners.

**High** – More than ten facility owners.

**Staff Expectation:** Civil Engineer – Entry and Project; Civil Engineering Technician – Mid and Senior

**Note:** Compensable tasks are WisDOT staff only.

* + - 1. 746.15 Create or review utility special provisions

**Low** – Improvement types like pavement replacement (rural). Also includes resurfacing, bridge rehabilitation, or bridge replacement with three or less spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**Medium** – Improvement types like reconditioning and pavement replacement (urban). Also includes resurfacing, bridge rehabilitation, or bridge replacement with more than three spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**High** – Improvement types like expansion and reconstruction.

**Staff Expectation:** Civil Engineer – Entry and Project; Civil Engineering Technician – Mid and Senior

* + - 1. 746.16 Execute utility agreements

Includes the following: sending agreements to Bureau of Technical Services, Utility & Access Unit (BTS); coordination of revisions; updating FIIPS; checking EAPS for encumbrances.

Only applies to projects with right of way acquisition.

**Low** – All submittals to BTS are Comp Waived Packets.

**Medium** – Submittals to BTS include agreements for overhead facilities and Comp Waived Packets.

**High** – Submittals to BTS include agreements for underground facilities, agreements for overhead facilities, and Comp Waived Packets.

**Staff Expectation**: Civil Engineer – Project and Project Manager; Civil Engineering Technician – Senior

**Note:** This is a WisDOT task.

* + - 1. 746.17 Work plan approval and start work notice process

Includes the following: sending work plan approval letters/emails; insert copy of the special provision, insert the approved work plan, updates to items like real estate commitments, create list for the status of real estate acquisition; send Start Work Notice.

**Low** – Five or less facility owners.

**Medium** – Ten or less facility owners.

**High** – More than ten facility owners.

**Staff Expectations**: Civil Engineering Technician – Entry and Mid

* + - 1. 746.18 Permitting Process

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Includes the following: review and coordinate so utility permit ~~so~~ complies with work plan, policy, and administrative code; provide preconstruction utility relocation assistance (survey, field meetings, etc.); manage utility relocations.

**Low** – Improvement types like pavement replacement (rural). Also includes resurfacing, bridge rehabilitation, or bridge replacement with three or less spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**Medium** – Improvement types like reconditioning and pavement replacement (urban). Also includes resurfacing, bridge rehabilitation, or bridge replacement with more than three spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**High** – Improvement types like expansion and reconstruction.

**Staff Expectation:** Civil Engineer – Entry and Project; Civil Engineering Technician – Mid and Senior

**Note:** This is a WisDOT task, except for oversight of utility relocation.

* + - 1. 746.19 PS&E Review

Includes the following: verify correct Diggers Hotline logo in plan, verify correct utility general note in plan, verify correct utility contacts in plan; prepare and/or review Utility Status Report; review utilities article of the Special Provisions.

**Low** – Improvement types like pavement replacement (rural). Also includes resurfacing, bridge rehabilitation, or bridge replacement with three or less spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**Medium** – Improvement types like reconditioning and pavement replacement (urban). Also includes resurfacing, bridge rehabilitation, or bridge replacement with more than three spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**High** – Improvement types like expansion and reconstruction.

**Staff Expectation:** Civil Engineer – Entry and Project; Civil Engineering Technician – Mid and Senior

**Note:** This is a WisDOT task.

* + - 1. 746.20 Post PS&E activities

Includes the following: send final plans to utilities; monitor utility relocation schedules and progress between Work Plan Approval/Start Work Notice and Pre-Construction Meeting; addendum.

**Low** – Five or less facility owners.

**Medium** – Ten or less facility owners.

**High** – More than ten facility owners.

**Staff Expectation:** Civil Engineer – Entry and Project; Civil Engineering Technician – Mid and Senior

* + - 1. 746.21 Construction support

Includes the following: pre bid meetings; preconstruction meetings; assist with utility coordination during construction; assist with resolution of conflicts during construction; coordinate Second Moves.

**Low** – Improvement types like pavement replacement (rural). Also includes resurfacing, bridge rehabilitation, or bridge replacement with three or less spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**Medium** – Improvement types like reconditioning and pavement replacement (urban). Also includes resurfacing, bridge rehabilitation, or bridge replacement with more than three spot improvements like culvert pipe, sign replacement, guardrail, intersection, or similar project components.

**High** – Improvement types like expansion and reconstruction.

**Staff Expectation**: Civil Engineer – Entry, Project, and Project Manager; Civil Engineering Technician – Mid and Senior

* + - 1. 746.22 Utility invoicing

Includes the following: review and approve invoices; coordinate Utility Agreement Change Orders (UACO); close out utility projects.

Only applies to projects with right of way acquisition.

**Low** – No invoices, no UACO, and limited close out required.

**Medium** – Invoice for overhead facility, one or less UACO, and minor close out required.

**High** – Invoices for overhead and underground facilities, two or less UACO, and some close out required.

**Staff Expectation:** Civil Engineer – Entry and Project; Civil Engineering Technician – Mid and Senior

**Note:** This is a WisDOT task.

###### 847 Coordinate Railroad *(6/15/16)*

* + - 1. 847.0 Includes activities related to project submittal, railroad coordination meeting, signatures from local agencies, signed agreement (WisDOT and Governor). Project Management: all programming and design related meetings, Federal Railroad Certification, RR special provision preparation, pseTrak sign offs, reporting and 17-60-45 letter. Railroad Project Management: Scope RR project, load RR project, change management process for RR project, start notice RR project.

***Track carrying structures are not included in this estimating tool.***

* + - 1. 847.1 Complete railroad safety training or notification to enter railroad right of way

Training may take place outside of project time if previously acquired. Many types of personnel could be involved depending on task. Consultant effort is based on hours per person involved. RRC efforts based on criteria below. Letter will be sent to RR informing them of entry.

**Low** – Typical field review staying on highway right of way

**Medium** – Survey crew entering to do surveys

**High** – Soil borings

* + - 1. 847.2 Railroad project submittal package

Normal projects have one submittal per project per railroad. Major projects, UP and BNSF railroad grade separations will have multiple submittals. Typically separate submittal for each grade separation.

Task includes; at grade crossing report, project summary, photos, plans.

**Low** – at grade without any anticipated RR work

**Medium** – at grade with anticipated RR work.

**High** – New or alteration of grade separations\multiple crossings\multiple railroads

* + - * 1. 847.2.1 For grade separated crossing

See description above

* + - * 1. 847.2.2 For at grade crossing

See description above

* + - 1. 847.3 Complete OCR process

Hearings are required when there is an alteration of the crossing including changing the number of traffic lanes, raise or lower grade by 9” or more, establishing new crossings, adding multi use paths, eliminating crossings when an agreement cannot be reached with the roadway authority, or when the Department and Railroad cannot come to agreement.

Write & review petition for hearing or determination, write and or review (testimony, rebuttal and surrebuttal), attend prehearing, attend hearing, review (proposed, interim, final and supplemental) orders and communicate as needed related to each of these items.

**Low** – Determination of adequacy of warning devices and determination for reduced (vertical or horizontal) clearance. No hearing is needed.

**Medium** – Hearing is needed for a more complex at grade alteration or new crossing with geometric changes and minimal controversial issues. Hearing for grade separated railroad crossings with minimal controversial issues. A description for “Low” with medium controversial issues would be a medium.

**High** – Description for medium plus multiple new or altered at grade or grade separated railroad crossings. Hearing to order the Department to build the bridge over a railroad if the railroad doesn’t agree to sign the stipulation. Also, if controversial issues are high it could bump any project type to this level. Multiple RR companies within project limits.

* + - * 1. 847.3.1 For grade separated crossing

See description above

* + - * 1. 847.3.2 For at grade crossing  
             
           See description above
      1. 847.4 Coordinate traffic signal preemption plans

Does not apply to grade separated crossings.

**Low** – Checking on existing preemption, no track crossing

**Medium** – Revised or new single track preemption crossing

**High** – Multi track or multi road crossing; or UP or BNSF

* + - 1. 847.5 Acquire railroad real estate

**Low** – Verify existing right of way.

**Medium** – RR right of way needed at a crossing.

**High** – Longitudinal acquisitions or any UP or BNSF right of way.

#### Construction Management

Entry level engineering and engineering technician are often used interchangeably for construction inspection and document checking tasks.

##### Post-PSE/Pre-Award *(6/21/16)*

###### 790 Manage Post-PSE and Pre-Let *(6/21/16)*

* + - 1. 790.0 Includes activities related to post-PS&E corrections and development of addenda.
      2. 790.1 Prepare addendum development form and addendum form

Includes phone calls (communication) to project manager, supervisor, functional areas, risk management teams. Includes analysis and how to proceed. This does not include any re-design time.

Project manager, WisDOT proposal management, QC personnel (advanced engineer)

**Low** – missed construction items, incorrect grade that can be adjusted in field, bid it as you see it alternative

**Medium** – fill out forms and process, change needs to be made that is not high complexity

**High** – any structural, pavement, profile change. Special provision changes, anything unknown up until the end of project, political considerations, fill out forms and process

* + - 1. 790.2 Respond to contractor inquires prior to let

Includes receiving phone calls, correspondence, memos, coordinate answer with proper personnel, posting answer on HCCI site

Project manager

**Low** – N/A

**Medium** –

**High** –

* + - 1. 790.3 Respond to BPD requests (engineer's estimate justification, etc.)

Includes researching and developing justification, coordination and communication

Project manager, PDS Chief

**Low** – 4 items or less

**Medium** – 8 items or less

**High** – more than 8 items

* + - 1. 790.4 Pre-letting meeting

**Low** –

**Medium** –

**High** –

* + - 1. 790.5 Manage letting

**Low** –

**Medium** –

**High** –

##### Post-Let Pre-Construction Project Management *(7/12/16)*

###### 791 Manage Construction Start *(7/12/16)*

* + - 1. 791.0 Includes coordination, preparation for meetings and reviews (pre-construction, utility, public and business meetings, workshops, erosion control implementation plan)
      2. 791.1 Develop construction outreach meetings

Includes time to plan and prepare meeting materials, attend meeting, prepare meeting minutes and update meeting materials. Also includes review of plan and special provisions, erosion control plan, quality control assurance plans, traffic mitigation plan and schedule.

**Low** –

**Medium** –

**High** –

* + - 1. 791.2 Set up field office and materials testing arrangements (coordinate computer application set up)

**Low** –

**Medium** –

**High** –

* + - 1. 791.3 Set up of lane closure system (STOC coordination)

**Low** –

**Medium** –

**High** – High traffic urban

##### Contract Administration *(8/1/16)*

###### 271 Perform Construction Surveying *(6/21/16)*

* + - 1. 271.0 Construction Surveying - includes construction staking, quantity measurement, as-built development, and digital file storage for archive.
      2. 271.1 Initial preparation/checking

Hours are for 1 mile of total roadway (mainline, ramps, side roads) – assumes that work includes alignment/profile review, plan review, control calibration, bench loop (2-man crew)

Staff – field survey crew chief, project surveyor, technician

**Low** – resurfacing with isolated intersection grading or beam guard updates, reconditioning, bridge rehab project

**Medium** – 2-lane rural reconstruction project, possible overpasses

**High** – urban or multi-lane rural reconstruction, major/expansion project, roundabouts

* + - 1. 271.2 Perform construction staking

Hours are for 1 mile of total roadway (mainline, ramps, side roads) – assumes construction contract includes standard staking items so this activity is just for checking of contractor staking (includes subgrade/aggregate/pavement, culvert/storm sewer, 1-2 bridges per mile, supplemental control, utility relocations)

Staff – field survey crew chief, project surveyor, technician

**Low** – resurfacing with isolated intersection grading or beam guard updates, reconditioning, bridge rehab project

**Medium** – 2-lane rural reconstruction project, possible overpasses

**High** – urban or multi-lane rural reconstruction, major/expansion project, roundabouts

* + - 1. 271.3 Survey quantity measurements/computation

Hours are for 1 mile of total roadway (mainline, ramps, side roads) – assumes that measurements are needed for earthwork, borrow, landscaping, pavement, fencing; quantity computations for all items are included in these hours

Staff – field survey crew chief, project surveyor, technician

**Low** – resurfacing with isolated intersection grading or beam guard updates, reconditioning, bridge rehab project

**Medium** – 2-lane rural reconstruction project, possible overpasses, borrow sites < 5 acres

**High** – urban or multi-lane rural reconstruction, major/expansion project, roundabouts, borrow sites > 5 acres or may need boat

* + - 1. 271.4 Develop as built

Hours are for 1 mile of total roadway (mainline, ramps, side roads) – hours include work for ITS (WisDOT facilities only) and bridge cap elevations; additional hours may be warranted due to significant field changes but this is unknown at time of contract scoping

Staff – field survey crew chief, project surveyor, technician

**Low** – resurfacing with isolated intersection grading or beam guard updates, reconditioning, bridge rehab project

**Medium** – 2-lane rural reconstruction project, possible overpasses

**High** – urban or multi-lane rural reconstruction, major/expansion project, roundabouts, multiple structures

* + - 1. 271.5 Digital file storage for archive

Hours are for 1 mile of total roadway (mainline, ramps, side roads)

Staff – field survey crew chief, project surveyor, technician

**Low** – resurfacing with isolated intersection grading or beam guard updates, reconditioning, bridge rehab project

**Medium** – 2-lane rural reconstruction project, possible overpasses

**High** – urban or multi-lane rural reconstruction, major/expansion project, roundabouts

###### 826 Complete Construction Finals *(7/12/16)*

* + - 1. 826.0 Final documentation and checking of all project records including contractor payments and evaluations

Level of effort for completing construction finals assumed to be the total hours necessary to complete the respective finals task.

For tasks that are dependent on the number of items to administer it was assumed that Low would be less than 50 items generally rural, Medium would be 50-200 items, and High would be in excess of 200 items to administer.

* + - 1. 826.1 Check all entries and source documents

Includes checking that all source documents are accurate and referenced correctly to closeout the job. Verifying all math is checked, computations are performed per contract requirements.

Staff – Entry Level Engineer, Project Engineer

**Low – Projects** with relatively few items to administer. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Projects** with a moderate number of items to administer. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, and urban intersections

**High - Projects** with an extensive number of items to administer. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 826.2 Explanation of Variation

Includes examining items that vary in excess of 5% of the plan quantity and reporting the source of the variation. The level of effort depends largely on the accuracy of the plan quantities.

Staff – Project Engineer, Project Leader

**Low – Typically** projects with low complexity, minimal constructability concerns, and little or no staging. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Typically** projects with moderate complexity, some constructability concerns, and minor staging. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High - Typically** projects with high complexity, constructability concerns, and significant staging. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 826.3 Close out items in FM

Includes verifying that all source documents were correctly transferred into Fieldmanager and payments made reflect actual reported quantities. Project Leader signs off on Fieldmanager items.

Staff – Project Engineer, Project Leader

**Low – Projects** with relatively few items to administer. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Projects** with a moderate number of items to administer. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High - Projects** with an extensive number of items to administer. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 826.4 FIT entries

Entering of all project tracking dates, maintenance information, structure information

Staff – Project Engineer

**Low – Projects** typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Projects** typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High - Projects** typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 826.5 Prepare As-Built Plans

Identifying, recording, and transferring all plan changes to the as-built record. Includes noting all plan changes in required PDF format.

Staff – Entry Level Engineer, Project Engineer

**Low – Projects** typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Projects** typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High - Projects** typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 826.6 Settle Quantity Discrepancies

Includes activities required to resolve contractor quantity disputes. This could include some or all of the following: additional computation, review or records, investigation of contractor supplied information, phone calls, meetings with contractors. The level of effort for this varies significantly by specific project, but in general the more complex a project the more likely this effort will be substantial. These numbers may vary depending on contract.

Staff – Project Engineer, Project Leader

**Low – Projects** typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Projects** typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High - Projects** typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 826.7 Complete Evaluations (DQI, Contractor Performance)

Meet with contractor to perform DQI. Complete all contractor performance ratings including Fieldmanager report and project report. The level of effort is directly influenced by the number of subcontractors involved in the project.

Staff – Project Leader

**Low – Projects** typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Projects** typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High - Projects** typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 826.8 CQI Walkthrough

This is a one-time event per contract which may include multiple project IDs that includes a review of the project with the Department and the maintaining authority if it is a local roadway.

Staff – Project Leader

**Low – Projects** typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Projects** typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High - Projects** typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 826.9 Prepare/organize accounting finals for submittal

Includes checking that all required project documents are included in final submittal, organized for delivery as required

Staff – Entry Level Engineer, Project Engineer

**Low – Projects** with relatively few items to administer. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Projects** with a moderate number of items to administer. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High - Projects** with an extensive number of items to administer. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 826.10 DT 1310 Certification of Materials used on Highway Projects

Includes only time to prepare DT1310 using information gathered in 852.10.

Staff –Project Engineer, Project Leader

**Low – Projects** with relatively few items to administer. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Projects** with a moderate number of items to administer. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High - Projects** with an extensive number of items to administer. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 826.11 Update finals after Department review

Includes correction of issues identified in the finals checking process. The level of effort can vary considerably, but is typically reflective in the complexity of the project.

Staff – Project Engineer, Project Leader

**Low – Projects** with relatively few items to administer. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – Projects** with a moderate number of items to administer. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High - Projects** with an extensive number of items to administer. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

###### 852 Evaluate Construction Material *(8/1/16)*

* + - 1. 852.0 Tasks involved with the evaluation of construction materials, including quality control, material records, plant review, etc.

This work shall include the initial project start-up:

* Producing E-guide for contractor
* Source of Material reviews
* Quality Test reviews/initial material sampling for pre-approval

**Low:** Small project with minimal pay items, only a few areas of work – i.e. mill and overlay, concrete base patching, maintenance projects

**Medium:** Project has over 80 pay items or multiple areas of work, special material considerations, and extensive shop drawings/test reports to review. – e.x. grading and paving project, concrete pavement repair projects, small structure project.

**High:** Project has many pay items, large quantities of material placement, detailed special provisions, staged construction requiring extensive lot breakdowns, multiple contractors. – e.x. Expansion projects, grading and paving, large structures, MSE walls, urban reconstructions, etc. All night work projects should be considered high level of effort due to the inherent dangers and coordination of engineering staff with stakeholders during daytime non-working hours of contractors.

\*\*General notes for 852 tasks\*\*

The proposed staff for all work involved in this category will include the following:

Project Manager (general oversight)

Project engineer (issue resolution)

Engineer (review of documents/submittals and daily material observation and testing)

Technician (review of documents/submittals and daily material observation and testing)

\*Note that Engineer and Technician level staff will be involved in dispute resolution/non-conforming material issues

* + - 1. 852. 1 Evaluate Structure Materials

This work shall include:

* QMP Submittal Review
* Monitoring Daily Concrete Pours – This involves monitoring nonconforming materials, lot totals, reviewing 4-pt running average charts, reviewing MRS entries by the contractors, etc.
* QV Testing – This is required testing that needs to be completed by the department or department’s representative per the QMP items.
* Non- Concrete Material Items – This requires the collection of piling certs, bar steel certs, girders, diaphragms, expansion devices, sampling of structure backfill, etc
* Bolt Testing and submittals –

**Low:** Small box culverts, retaining walls, and bridge structures that require minimal staging and are not staged construction.

**Medium:** This level of effort is required for structures that are required to be constructed in stages that result in additional lots and testing. Bridge structures that require the review of shop drawings for structural steel, concrete girders, expansion devices, etc.

**High:** Projects that include unique components. For example tub girder installation, drainage/ fire components, oversized expansion devices for conduit, CSD components, etc.

* + - 1. 852.2 Evaluate Concrete Pavement Materials

This work shall include:

* QMP Submittal Review
* Monitoring of daily pours – This involves monitoring nonconforming materials, lot totals, reviewing 4-pt running average charts, reviewing MRS entries by the contractors, etc.
* Roundabout Submittals
* Nonconcrete Submittals – Dowel bars, tie bars, cure, epoxy coatings, dowel bar epoxy, etc.
* QV Testing – This is required testing that needs to be completed by the department or department’s representative per the QMP items.

**Low:** Non-staged construction, bridge approach work, ancillary only contracts.

**Medium:** This level of effort is required for projects that are required to be constructed in stages that result in additional lots and testing. Most projects will include ancillary items and QMP pavement items

**High:** Projects that include unique components. For example roundabouts staged with numerous mix design submittals, staged urban reconstructions, multi-lane freeway systems.

* + - 1. 852.3 Evaluate Ancillary Concrete Items

This work shall include:

* QMP Submittal Review
* Monitoring Daily Concrete Pours – This involves monitoring nonconforming materials, lot totals, reviewing 4-pt running average charts, reviewing MRS entries by the contractors, etc.
* QV Testing – This is required testing that needs to be completed by the department or department’s representative per the QMP items.

**Low:** Minimal ancillary items – 2 or less.

**Medium:** Multiple ancillary items that will require testing and cannot be accepted based upon certified plant/producer.

**High:** Projects that include many unique components. Projects that have over 4 ancillary items and require extensive QV Testing by the Department.

* + - 1. 852.4 Evaluate HMA Pavement Materials

This work shall include:

* QMP Submittal Review
* Monitoring Daily Production Testing – This involves monitoring nonconforming materials, lot totals, reviewing 4-pt running average charts, reviewing MRS entries by the contractors, etc.
* QV Testing – This is required testing that needs to be completed by the department or department’s representative per the QMP items.
  + Tack Coat
  + AC
  + Density Testing – Verify contract requirements for frequency
    - Include time for correlation testing and on-site dispute resolution for non-conforming tests
* IRI Ride QMP submittal review and review of data provided by contractor

**Low:** This level of project will require the number of paving days to be determined and then add an additional 4 days for project start-up and close out. See projects outlined in 852.0 for guidance.

**Medium:** This level of project will require the number of paving days to be determined and then add an additional 6 days for project start-up and close out. See projects outlined in 852.0 for guidance.

**High:** Projects that include many mix designs and staged construction. Staged construction will need to be reviewed to see how the lot determinations will be set-up by the contractor. Multi-year contracts may also involve numerous aggregate sources and revisions to mix designs. These projects will require the number of paving days to be determined and then add an additional 10-14 days for project start-up and close out.

* + - 1. 852.5 Evaluate Aggregate/Base Course Materials

This work shall include:

* QMP Submittal Review
* Monitoring Daily Production Testing – This involves monitoring nonconforming materials, lot totals, reviewing 4-pt running average charts, reviewing MRS entries by the contractors, etc.
* QV Testing – This is required testing that needs to be completed by the department or department’s representative per the QMP items.
  + Density Testing – Verify contract requirements for inclusion and frequency of testing
    - Include time for correlation testing and on-site dispute resolution for non-conforming tests
    - No time is included in the level of effort if QMP Base Density Testing is required. This work will require dedicated staff to be present while contractors are placing base aggregates

**Low:** This level of project will require the number of placement days to be determined and then add an additional 3 days for project start-up and close out. See projects outlined in 852.0 for guidance.

**Medium:** This level of project will require the number of placement days to be determined and then add an additional 5-7 days for project start-up and close out. See projects outlined in 852.0 for guidance.

**High:** Projects that include staged construction. Staged construction will need to be reviewed to see how the lot determinations will be set-up by the contractor. Multi-year contracts may also involve numerous aggregate sources. These projects will require the number of placement days to be determined and then add an additional 8-12 days for project start-up and close out.

* + - 1. 852.6 Evaluate Electrical/ITS Materials

This work shall include:

* Shop Drawing Submittal Review
* Reviewing proper materials are delivered to site, gathering serial/heat numbers
* Reviewing O&M submittals and all field testing reports to ensure results meet the specifications of the contract

**Low:** Electrical/ITS level of efforts will vary greatly by contract. See projects outlined in 852.0 for guidance.

**Medium:** Electrical/ITS level of efforts will vary greatly by contract. See projects outlined in 852.0 for guidance.

**High:** Electrical/ITS level of efforts will vary greatly by contract. See projects outlined in 852.0 for guidance.

* + - 1. 852.7 Evaluate Pipe Culvert & Storm Sewer Materials

This work shall include:

* Shop Drawing Submittal Review – Material info only, does not include plan detail reviews
* Reviewing proper materials are delivered to site, gathering serial/heat numbers
* Monitoring backfill material and quantities to ensure proper testing frequency

**Low:** Pipe Culvert & Storm Sewer Materials level of efforts will vary greatly by contract. See projects outlined in 852.0 for guidance.

**Medium:** Pipe Culvert & Storm Sewer Materials level of efforts will vary greatly by contract. See projects outlined in 852.0 for guidance.

**High:** Pipe Culvert & Storm Sewer Materials level of efforts will vary greatly by contract. See projects outlined in 852.0 for guidance.

* + - 1. 852.8 Evaluate MSE/Noise Wall Materials

This work shall include:

* Shop Drawing Submittal Review
* Reviewing QMP plans for wall testing of backfill material and compaction
* Monitor daily placement, QC test results, etc.
* Monitoring backfill material and quantities to ensure proper testing frequency
* QV material sampling and proctors
* QV soil density testing

**Low:** Single wall with heights than 5 feet

**Medium:** Multiple walls with heights ranging from 5-10 feet

**High:** Multiple walls, staged construction with heights greater than 10 feet

* + - 1. 852.9 Review Miscellaneous Project Material Submittals

This work shall include:

* Reviewing all items addressed in the project E-Guide
* Shop Drawing Submittal Review
  + Erosion Control
  + Plantings/Trees
  + Fencing
  + Traffic Control/Pavement Marking
  + Beamguard
  + Temporary Shoring
  + Overhead Sign Supports

**Low:** See projects outlined in 852.0 for guidance.

**Medium:** See projects outlined in 852.0 for guidance.

**High:** See projects outlined in 852.0 for guidance.

* + - 1. 852.10 Material Finals

This work shall include:

* Reviewing all items addressed in the project E-Guide
* QMP review of final results to ensure proper frequency and characteristics
* Entering all 155 Reports
* Creating 905 Material Diaries
* Reviewing Non-Conforming materials and providing project leader with information to assess material deductions
* Reviewing items for material Incentives/Disincentives

**Low:** See projects outlined in 852.0 for guidance.

**Medium:** See projects outlined in 852.0 for guidance.

**High:** See projects outlined in 852.0 for guidance.

###### 853 Evaluate Work Operations *(7/12/16)*

* + - 1. 853.0 Includes activities involving the evaluation of work operations and vendor performance.

Project duration does not necessarily relate to project complexity.

* + - Short duration projects less than 50 contractor production days
    - Medium duration projects 50 -75 contractor production days
    - Long duration projects more than 75 contractor production days
      1. 853.1 Inspect work operations

Working day is defined as a contractor working day that mandates inspection with normal construction timelines, if there is day and night work on the same calendar day, this would constitute 2 working days

**Low –** 8 hr/working day – typically bridge/structure inspection, LFA work

**Medium –** 10hr/working day – typically when inspecting everything except paving, underground, and grading contractors

**High –** 12hr/working day – typically when inspecting grading, paving, and underground contractors

* + - 1. 853.2 General construction engineering

Project Leader, APL, and/or key staff time administering project changes, redesign, establishing layout (grades, profile changes, etc)

**Low –** bridge/structure projects, 1 hour per working day for key staff

**Medium –** recondition projects, 2 hours per working day for key staff

**High –** reconstruction projects, complex recondition, complex structure projects 4-12 hours per day per key staff

* + - 1. 853.3 General field inspection

Floating inspection from the PM and Project Leader

**Low –** bridge/structure projects, 2 hour per working day; PM 8 hour/week for weekly site visit

**Medium –** recondition projects, 4-5 hours per working day; PM 8 hour/week for weekly site visit

**High –** reconstruction projects, complex recondition, complex structure projects 4-12 hours per working day; PM 16-24 hour per week

* + - 1. 853.4 Respond to contractor RFI's

Staff: Project Leader

**Low** – If project staff can answer, the amount of time is on the low end. If it is a simple question, but needs to be run through BOS, Traffic, etc., staff has hours with coordination. The information is available.

**Medium** – Change may necessary and research involved to answer question.

**High** – Extensive changes usually require multiple submittal iterations from the contractor, just so all the information is there. Meetings are held with BOS, Traffic, etc. to get input. After that, field work may be required and engineering staff generally updates plan sheets with the changes for all field staff to have and for the as-builts.

* + - 1. 853.5 Prepare DIN's

**Low** – The project control team usually puts together the document, so engineering staff time is minimal. The designer then has a variable amount of time needed depending on complexity. If they get reimbursed or how much they get reimbursed is spelled out on the document.

**Medium** – Change may necessary and research involved to answer question.

**High** – This is probably on the high end as far as we have encountered

* + - 1. 853.6 Review contractor proposed CRI's

**Low** – Even simple submittals take effort to review. Many times, the initial CRI is altered and re-submitted.

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**Medium** – Change may necessary and research involved to answer question.

**High** – Multiple staff are involved and coordination with designer is required. Designer or field staff will need to produce revised plan sheets

###### 881 Manage Construction Contract Accounting *(7/12/16)*

* + - 1. 881.0 Tasks involved with updating FieldManager and other project records

Level of effort for completing construction contract accounting assumed to be the total hours necessary per week to complete the respective accounting task unless otherwise noted in the individual task assumptions.

* + - 1. 881.1 FM/FIT initial contract info entry

Includes entry of staff information, contractor information, ECIP approval and revision dates, initial contract dates, item affiliation with contractors in Fieldmanager.

Staff – Project Leader

This is a one-time level of effort. The level of effort for this task is relatively consistent across projects. High level projects may require slightly more time to assign all items to applicable contractors in FM.

* + - 1. 881.2 Quantity measurement/computation

Includes the physical measurement for items to be paid; recording measurements and computing final numbers to be submitted for review and payment.

Staff – Entry Level Engineer, Project Engineer

**Low** – Assumed to be projects with relatively few bid items to administer. Complexity of work and construction cost generally expected to be low. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium** – Assumed to be projects with a range of bid items totaling 100-200 to administer. The complexity of the work and construction cost expected to be medium in scope. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High** – Over 200 items to administer. The work is generally expected to be complex and construction costs relatively high. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 881.3 Ticket entry into pantry sheets

Includes collecting tickets and entering quantities into required pantry sheets; for computing any application or placement rates as required for asphalt materials.

Staff – Project Engineer

**Low –** Assumed to be projects with relatively few bid items to administer. Complexity of work and construction cost generally expected to be low. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium –** Assumed to be projects with a range of bid items totaling 100-200 to administer. The complexity of the work and construction cost expected to be medium in scope. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High –** Over 200 items to administer. The work is generally expected to be complex and construction costs relatively high. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 881.4 Quantity checking and entry into FM

Includes checking computation accuracy and compliance with measurement specifications; and for organizing and entering quantity and reference data into FM for payment.

Staff – Project Engineer

**Low –** Assumed to be projects with relatively few bid items to administer. Complexity of work and construction cost generally expected to be low. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium –** Assumed to be projects with a range of bid items totaling 100-200 to administer. The complexity of the work and construction cost expected to be medium in scope. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High –** Over 200 items to administer. The work is generally expected to be complex and construction costs relatively high. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 881.5 FM/FIT steps to create estimate (diary consolidation)

Includes consolidating diaries prior to estimate; and for checking postings to ensure their accuracy.

Staff – Project Engineer

**Low –** Assumed to be projects with relatively few bid items to administer. Complexity of work and construction cost generally expected to be low. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium –** Assumed to be projects with a range of bid items totaling 100-200 to administer. The complexity of the work and construction cost expected to be medium in scope. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High –** Over 200 items to administer. The work is generally expected to be complex and construction costs relatively high. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 881.6 Print estimate/diaries to binder

Includes generating and printing the estimate and diaries to file within the project records.

Staff – Project Engineer

The level of effort for this task is relatively consistent across projects. High level projects may require slightly more time to compile everything required.

* + - 1. 881.7 Cost Tracking Updates

Includes the tracking of the current and anticipated item overruns/underruns; for updating tracking spreadsheet with estimated quantities; for tracking and entering anticipated change order costs; and for distinguishing DBE items to track projected DBE percentage.

Staff – Project Engineer/Project Leader

**Low –** Assumed to be projects with relatively few bid items to administer. Complexity of work and construction cost generally expected to be low. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium –** Assumed to be projects with a range of bid items totaling 100-200 to administer. The complexity of the work and construction cost expected to be medium in scope. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High –** Over 200 items to administer. The work is generally expected to be complex and construction costs relatively high. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 881.8 Research quantity discrepancies (plan vs. measured)

Includes tracking of quantities through the miscellaneous quantity tables within the plan and plan details to determine possible overruns/underruns and/or reasons for discrepancies between the plan amount and measured amount.

Staff – Project Engineer/Project Leader

**Low –** Assumed to be projects with relatively few bid items to administer. Complexity of work and construction cost generally expected to be low. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium –** Assumed to be projects with a range of bid items totaling 100-200 to administer. The complexity of the work and construction cost expected to be medium in scope. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High –** Over 200 items to administer. The work is generally expected to be complex and construction costs relatively high. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 881.9 Other project records (Erosion control reports, Traffic Control reports)

Includes field inspection of project erosion control measures and needs; for documenting inspections within the required erosion control diary form; for drafting and sending erosion control orders to force corrective action; for final inspection to confirm completion of erosion control orders. Also includes inspection of project traffic control devices; for drafting and submitting a weekly traffic control report with current conditions and potential actions to be taken; for final inspection confirming any necessary corrective actions were completed.

Staff – Project Engineer

**Low** –Complexity of work and construction cost generally expected to be low. Projects typically expected to fall into this category would be resurfacing projects, small bridge projects, simple rehab projects

**Medium – The** complexity of the work and construction cost expected to be medium in scope. Projects typically expected to fall into this category would be 2-lane rural reconstruction projects, medium sized bridge projects, urban intersections

**High –** The work is generally expected to be complex and construction costs relatively high. Projects typically expected to fall into this category would be urban reconstructs, multi-lane rural reconstructs, major projects, roundabouts

* + - 1. 881.10 Contract Modifications (Contractor)
         1. 881.10.1 Engineer Rough Order of Magnitude (ROM)

Includes evaluating and developing an initial estimate for potential change order work to be completed. This may involve researching historical labor or equipment rates, material costs, average bid unit prices for similar work, and developing an estimated work plan to complete the additional work.

Staff – Project Engineer, Project Leader

Level of effort reasonably consistent for ROMs. In general, the number increases with the size of project. So assume more effort per week for High level projects.

* + - * 1. 881.10.2 CM Negotiation

Includes the evaluation of the contractor submitted costs compared to the engineer’s initial ROM. This could include some or all of the following: additional computations, review or rates or material costs, investigation of contractor supplied costs and anticipated work force and operations, phone calls, meetings with contractors. The level of effort for this varies significantly by the type of work to be completed and how complex it may be. In general, the more complex a project, the more likely this effort will be substantial.

Staff – Project Leader

**Low** – Complexity of work and construction cost generally expected to be low. Contract changes usually small in scale and easily negotiated. Examples would be small structures with minimal approach work, small rehab and repair projects, rural intersections.

**Medium** –The complexity of the work and construction cost expected to be medium in scope. Contract changes increasing in scope and complexity. Negotiation often required to obtain equitable solutions. Examples would be small urban reconstructs, staged projects, medium structures with approach work.

**High** –The work is generally expected to be complex and construction costs relatively high. Changes costly and impactful to schedules. Intensive negotiation often required to obtain solutions. Examples would be medium and large urban projects, expansion projects, projects with complex staging, large structures.

* + - * 1. 881.10.3 WAF

Includes drafting the WAF for the anticipated change order work to be completed, submittal to the PM for review, completing any necessary revisions and final distribution to the contractor.

Staff – Project Engineer, Project Leader

Level of effort reasonably consistent for all WAFs. In general, the number increases with the size of project. So assume more effort per week for High level projects.

* + - * 1. 881.10.4 AJR

Includes developing a justification for the change order and summarizing any possible alternatives or consequences of non-response to the CM. The justification of the price must be summarized and evaluation of schedule impact and impact on other contracts or entities must be completed. Must develop a new contract item for the change order work to be completed and show quantities and price to show the total estimated change order amount. The draft AJR must be submitted to the PM for review and signature and any necessary corrections made. For project designated as an elevated risk contract by FHWA, AJR’s must be submitted and signed approval obtained by FHWA representative.

Staff – Project Engineer, Project Leader

Level of effort reasonably consistent for all AJRs. In general, the number increases with the size of project. So assume more effort per week for High level projects.

* + - * 1. 881.10.5 Write/review/process CM

Includes drafting the contract modification for both standard and non-standard items and creating new items to be added to the contract. A draft must be submitted for review prior to generating the CM and obtaining final signatures. Final copy to be submitted and approved by contract specialist where appropriate information is submitted through Fieldmanager.

Staff – Project Engineer, Project Leader

Level of effort reasonably consistent for all contract modifications. In general, the number increases with the size of project. So assume more effort per week for High projects.

* + - * 1. 881.10.6 Filing of all CM source documentation

Includes filing of source documentation such as engineer ROM, supporting documentation to develop ROM, price negotiation details including emails or diaries for phone conversations, final approved WAF and AJR’s, and the signed and completed change order.

Staff – Project Engineer

Level of effort reasonably consistent for filing contract modification documentation. In general, the number increases with the size of project. So assume more effort per week for High projects.

* + - * 1. 881.10.7 Claims

Staff – Project Leader

**Low** – No claims submitted. No way to determine this at scoping. Claim is less likely on a low complexity project

**Medium** – Straight forward claim submitted. Resolved with relatively low level of effort. No way to determine this at scoping.

**High** – Complex claim submitted. Requires extensive research, reporting and multiple meetings to resolve. Not common. No way to determine at scoping.

###### 885 Enforce Labor Provisions *(6/21/16)*

* + - 1. 885.0 Includes activities to ensure contract requirements are met.
      2. 885.1 Sublet approval (DT 1925)

Typically one time task

**Staff:** Equal rights officer

**Low** – Resurface, small structure; few subcontractors

**Medium** – Recondition, rural reconstruct

**High** – Urban, large reconstruct; complex project with numerous subcontractors

* + - 1. 885.2 Precon preparation and attendance

Typically one time task

**Staff:** Equal rights officer

**Low** – Resurface, small structure; few subcontractors

**Medium** – Recondition, rural reconstruct

**High** – Urban, large reconstruct; complex project with numerous subcontractors

* + - 1. 885.3 Assist contractor with worker classification and reporting (CRCS)

Performed at random times

**Staff:** Equal rights officer

**Low** – Resurface, small structure; few subcontractors

**Medium** – Recondition, rural reconstruct

**High** – Urban, large reconstruct; complex project with numerous subcontractors

* + - 1. 885.4 Wage interviews and/or project staff

May be performed randomly or not at all

**Staff:** Equal rights officer

**Low** – Resurface, small structure; few subcontractors

**Medium** – Recondition, rural reconstruct

**High** – Urban, large reconstruct; complex project with numerous subcontractors

* + - 1. 885.5 Weekly payroll review

Performed continually throughout construction duration; addresses non-compliance (wage and prompt payment)

**Staff:** Equal rights officer and/or project staff

**Low** – Resurface, small structure; few subcontractors

**Medium** – Recondition, rural reconstruct

**High** – Urban, large reconstruct; complex project with numerous subcontractors

* + - 1. 885.6 Payroll clear date process and payroll audits

**Staff:** Equal rights officer

**Low** – Resurface, small structure; few subcontractors

**Medium** – Recondition, rural reconstruct

**High** – Urban, large reconstruct; complex project with numerous subcontractors

#### Program Management

##### Policy Development and Program Controls

###### 855 Program and Policy Development

* + - 1. 855.1 Develop transportation program and policy

**Low** –

**Medium** –

**High** –

* + - 1. 855.2 Manual development and updates (FDM, CMM, etc.)

**Low** –

**Medium** –

**High** –

* + - 1. 855.3 Standards and specification development and updates (STD Spec, STSP, Region SPV)

**Low** –

**Medium** –

**High** –

* + - 1. 855.4 Process reviews and process improvements

**Low** –

**Medium** –

**High** –

* + - 1. 855.5 Prepare STIP and TIP

**Low** –

**Medium** –

**High** –

###### 863 Program Controls

* + - 1. 863.0 Includes tasks involving budget and cost management, schedule management, issue management, and project and document management.
      2. 863.1 Performance measurement management

**Low** –

**Medium** –

**High** –

* + - 1. 863.2 Report development and updates

**Low** –

**Medium** –

**High** –

* + - 1. 863.3 Report processing and review (Production, Health, Scheduling, Finals, etc.)

**Low** –

**Medium** –

**High** –

* + - 1. 863.4 Update project tracking applications (ex FIIPS, FOS, PeopleSoft)

**Low** –

**Medium** –

**High** –

* + - 1. 863.5 Project audits (LAB)

**Low** –

**Medium** –

**High** –

* + - 1. 863.6 Document management

**Low** –

**Medium** –

**High** –

##### Systems Planning

###### 211 Statewide System Plans

**Low** –

**Medium** –

**High** –

###### 214 Corridor Study (Major Highway)

**Low** –

**Medium** –

**High** –

###### 249 Corridor Study (Other Highway)

**Low** –

**Medium** –

**High** –

###### 250 84.25 Access Control Project New/Update

**Low** –

**Medium** –

**High** –

###### 251 84.295 Statutory Expressway/Freeway

**Low** –

**Medium** –

**High** –

###### 252 Conceptual Land Division Review Activities

**Low** –

**Medium** –

**High** –

###### 257 Formal Land Division Review Activities

**Low** –

**Medium** –

**High** –

###### 263 Land Division TIA Review

* + - 1. 263.1 Determine land divisions

**Low** –

**Medium** –

**High** –

###### 269 Functional Class Routine Activities

**Low** –

**Medium** –

**High** –

###### 280 Census Review - (Urban Boundary Change)

**Low** –

**Medium** –

**High** –

###### 281 Jurisdictional Transfers on Non-State Roads

**Low** –

**Medium** –

**High** –

###### 282 Jurisdictional Transfers per STH Change Statute 84.02(3)

**Low** –

**Medium** –

**High** –

###### 283 Jurisdictional not Associated with any Relocation Project 84.02(8)

**Low** –

**Medium** –

**High** –

###### 284 Comprehensive Plan Involvement

**Low** –

**Medium** –

**High** –

###### 285 MPO and RPC Planning Liaison Activities

**Low** –

**Medium** –

**High** –

###### 286 Miscellaneous Land Use Studies

**Low** –

**Medium** –

**High** –

###### 287 Corridor Planning (Non-statutory Access Management Plans)

**Low** –

**Medium** –

**High** –

###### 288 Non-Highway Special Studies

**Low** –

**Medium** –

**High** –

###### 289 Public Transit Coordination and Outreach

**Low** –

**Medium** –

**High** –

###### 296 Park and Ride Lot and Commuter Center Management & Coordination

**Low** –

**Medium** –

**High** –

###### 297 Bike and Pedestrian Coordination and Outreach

**Low** –

**Medium** –

**High** –

###### 299 Coordination of Rail and Harbor Activities

**Low** –

**Medium** –

**High** –

###### 300 State Highway Program Development

**Low** –

**Medium** –

**High** –

###### 314 STN Activities

**Low** –

**Medium** –

**High** –

###### 340 Program Level Scoping

**Low** –

**Medium** –

**High** –

###### 348 Local Program Management and Implementation

**Low** –

**Medium** –

**High** –

###### 349 State Program Management and Implementation

**Low** –

**Medium** –

**High** –

###### 687 Rideshare Coordination and Outreach

**Low** –

**Medium** –

**High** –

##### Systems Operations

###### 227 Roadside Facilities

**Low** –

**Medium** –

**High** –

###### 228 Bridge Maintenance

**Low** –

**Medium** –

**High** –

###### 231 Accident Damage Administration

**Low** –

**Medium** –

**High** –

###### 275 Bridge Inspection

* + - 1. 275.0 Scoping task
      2. 275.1 Specialty - Underwater dive bridge inspection

**Low** –

**Medium** –

**High** –

* + - 1. 275.2 Specialty - Bridge sign and signal inspection

**Low** –

**Medium** –

**High** –

* + - 1. 275.3 Specialty - Bridge deck survey structure inspection

**Low** –

**Medium** –

**High** –

* + - 1. 275.4 Specialty - Structure nondestructive evaluations and structure inspection

**Low** –

**Medium** –

**High** –

* + - 1. 275.5 Specialty - In plant QV inspection at prestress plants

**Low** –

**Medium** –

**High** –

* + - 1. 275.6 Specialty - Quality verification of precast concrete and metal drainage

**Low** –

**Medium** –

**High** –

###### 322 Inventory or Data Gathering

**Low** –

**Medium** –

**High** –

###### 332 Outdoor Advertising

**Low** –

**Medium** –

**High** –

###### 333 Adopt-A-Highway

**Low** –

**Medium** –

**High** –

###### 334 Utility Permits

**Low** –

**Medium** –

**High** –

###### 335 Driveway and Street Connection Permits

**Low** –

**Medium** –

**High** –

###### 338 Work on Right-of-Way Permits

**Low** –

**Medium** –

**High** –

###### 520 Crash Investigation

**Low** –

**Medium** –

**High** –

###### 648 Automation, Policy, and Standards Development

**Low** –

**Medium** –

**High** –

###### 649 Bridge Management and Asset Management

**Low** –

**Medium** –

**High** –

###### 650 Bridge Load Rating

**Low** –

**Medium** –

**High** –

###### 652 Bridge OSOW Permits Analysis and Review

**Low** –

**Medium** –

**High** –

###### 684 Sign & Miscellaneous Permits

**Low** –

**Medium** –

**High** –

###### 685 Diggers Hotline Administration

**Low** –

**Medium** –

**High** –

###### 686 Ancillary Structure Inspection

* + - 1. 686.0 Scoping task
      2. 686.1 Specialty - Sign, signal and ancillary structure inspection

**Low** –

**Medium** –

**High** –

###### 688 Bridge Maintenance & Operations-Operational Bridges

**Low** –

**Medium** –

**High** –

###### 689 Bridge Maintenance & Operations-Ferry

**Low** –

**Medium** –

**High** –

###### 690 Bridge Maintenance and Operations - Ancillary Structures

**Low** –

**Medium** –

**High** –

###### 691 Roadway Maintenance-Pavement & Shoulder

**Low** –

**Medium** –

**High** –

###### 692 Roadway Maintenance-Culverts

**Low** –

**Medium** –

**High** –

###### 693 County Budget Development & Oversight

**Low** –

**Medium** –

**High** –

###### 694 Winter Maintenance Field Monitoring

**Low** –

**Medium** –

**High** –

###### 695 Winter Chemical Oversight

**Low** –

**Medium** –

**High** –

###### 696 Roadside Maintenance-Encroachments

**Low** –

**Medium** –

**High** –

###### 697 Roadside Maintenance-Drainage & Slopes

**Low** –

**Medium** –

**High** –

###### 698 Roadside Maintenance-Vegetation Management

**Low** –

**Medium** –

**High** –

###### 738 Lighting Design (non-improvement work)

**Low** –

**Medium** –

**High** –

###### 739 Contacts & Response to Inquiries

**Low** –

**Medium** –

**High** –

###### 800 COMPASS

**Low** –

**Medium** –

**High** –

###### 801 Improvement Project Operational Involvement-Roadway Maintenance

**Low** –

**Medium** –

**High** –

###### 802 Improvement Project Operational Involvement-Bridge Maintenance

**Low** –

**Medium** –

**High** –

###### 804 Traffic Engineering Studies

**Low** –

**Medium** –

**High** –

###### 805 Traffic Regulations & Declarations

**Low** –

**Medium** –

**High** –

###### 806 Electrical Facility Locates

**Low** –

**Medium** –

**High** –

###### 807 Improvement Project Operational Involvement-Traffic General

**Low** –

**Medium** –

**High** –

###### 808 Traffic Signal/Beacon-Design & Review (non-improvement work)

**Low** –

**Medium** –

**High** –

###### 809 Traffic Signal/Beacon Operational Review-Engineering

**Low** –

**Medium** –

**High** –

###### 810 Traffic Signal/Beacon Maintenance & Installation

**Low** –

**Medium** –

**High** –

###### 811 Signal/Lighting Inventory Data Management

**Low** –

**Medium** –

**High** –

###### 812 Improvement Project Operational Involvement-Traffic Signal/Beacon

**Low** –

**Medium** –

**High** –

###### 813 Sign Program Management

**Low** –

**Medium** –

**High** –

###### 814 Sign Plan Design (non-improvement work)

**Low** –

**Medium** –

**High** –

###### 815 Sign Inventory Data Management

**Low** –

**Medium** –

**High** –

###### 817 Sign Installation Review & Oversight

**Low** –

**Medium** –

**High** –

###### 818 Engineering Evaluation of Sign Needs/Requests

**Low** –

**Medium** –

**High** –

###### 820 Pavement Marking Program Management

**Low** –

**Medium** –

**High** –

###### 821 Pavement Marking Plan Design (non-improvement work)

**Low** –

**Medium** –

**High** –

###### 822 Pavement Marking Inventory Data Management

**Low** –

**Medium** –

**High** –

###### 828 Lighting Equipment Installation & Maintenance

**Low** –

**Medium** –

**High** –

###### 829 Lighting Permits

**Low** –

**Medium** –

**High** –

###### 835 ITS Activities

**Low** –

**Medium** –

**High** –

###### 838 Incident Response

**Low** –

**Medium** –

**High** –

###### 867 Traffic Signal System Program Delivery (admin of "stand-alone" only)

**Low** –

**Medium** –

**High** –

###### 868 Implements of Husbandry

**Low** –

**Medium** –

**High** –

##### Technical Services

###### 239 Materials Research

* + - 1. 239.0 Scoping task
      2. 239.1 Specialty - WisDOT qualified labs inspection

**Low** –

**Medium** –

**High** –

###### 259 R/E Technical User Groups

**Low** –

**Medium** –

**High** –

###### 260 Property Management

**Low** –

**Medium** –

**High** –

###### 262 Surplus Land Sales

**Low** –

**Medium** –

**High** –

###### 991 Tribal Meetings

**Low** –

**Medium** –

**High** –

###### 992 Tribal Relations

**Low** –

**Medium** –

**High** –

###### 990 Office of Business Opportunity and Equity Compliance

* + - 1. 990.0 Scoping task
      2. 990.1 Specialty - Loan mobilization program

**Low** –

**Medium** –

**High** –

* + - 1. 990.2 Specialty - Outreach and marketing

**Low** –

**Medium** –

**High** –

* + - 1. 990.3 Specialty - Technical assistance

**Low** –

**Medium** –

**High** –

* + - 1. 990.4 Specialty - Legal assistance

**Low** –

**Medium** –

**High** –

#### General

##### General

###### 101 Work time

###### 104 Supervision

###### 121 Training

###### 122 Meetings and conventions

###### 123 Travel time

###### 129 Approved Professional Development Time

###### 132 Vacation - In Lieu of Sick Leave

###### 133 Legal Holiday - In Lieu of Sick Leave

###### 134 Personal Holiday - In Lieu of Sick Leave

###### 135 Vacation - FMLA

###### 136 Legal Holiday - FMLA

###### 137 Personal Holiday - FMLA

###### 138 Sick - FMLA

###### 139 Termination/Sabbatical - FMLA

###### 140 Absence without Pay - FMLA

###### 141 Comp Time Taken - FMLA

###### 150 Vacation Without Pay (Crafts)

###### 151 Vacation

###### 153 Legal Holiday

###### 154 Jury Duty

###### 155 Military Leave - Annual Training

###### 157 Personal Holiday

###### 161 Sick - Employee Illness

###### 163 Sick - Family Illness

###### 165 Sick - Death in Family

###### 167 Exam and Interview Time

###### 169 Termination/Sabbatical

###### 174 Sick - Employee/Family Medical Appt

###### 181 Compensatory Time Taken

###### 151 Vacation

###### 153 Legal Holiday

###### 154 Jury Duty

###### 155 Military Leave - Annual Training

###### 157 Personal Holiday

###### 163 Sick - Family Illness

###### 165 Sick - Death in Family

###### 167 Exam and Interview Time

###### 169 Termination/Sabbatical

###### 174 Sick - Employee/Family Medical Appt

###### 181 Compensatory Time Taken