



1-10.1 Introductions and Definitions

For additional information (on Project Management in Design/Planning) see [FDM 2-1](#).

1-10.1.1 Originator

The Bureau of Project Development (BPD) is the originator of this section. Any questions or recommendations concerning this chapter should be directed to the BPD Proposal Management Section, DOT DTSD BPD Project Management mailbox. Terms and acronyms used in this section are defined in [FDM 2-1 Attachment 1.1](#) and [FDM 2-1 Attachment 1.2](#).

1-10.1.2 Overview

[FDM Chapter 2](#) includes policies, standards, procedural requirements and guidelines used to deliver highway improvement projects undertaken by the Wisconsin Department of Transportation's DTSD. Project management is using skills, knowledge, and resources to deliver the right project that meets the Division's and public's expectations for schedule, costs and serviceability.

DTSD's project management begins at program development and carries through facility construction project closure. Project management methodology is applied throughout the following major phases: Project Initiation, Design, and Construction are discussed in [FDM 2-15](#). Each of these phases includes one or more processes to complete one or more products, services, or projects.

1-10.1.3 Project Management Support

The DTSD provides support for project management through the Transportation Project Management System (TPMS) which is developed, implemented and maintained by the Division's Project Management Unit. The TPMS includes the applications, reports, training, processes, documentation, support, etc. that are needed to manage WisDOT improvement projects. DTSD's project management methodology is applying processes and procedures to advance projects through sequential phases that result in completing one or more products or services. This methodology includes application of knowledge and skills in managing the project plan, scope, schedule, costs, quality, team, communications, performance, risks and contracted services.

The Project Management Steering Committee (PMSC) is modal in representation and the sounding board for all important project management strategic directions and implementation efforts. The Project Management Unit supports the PMSC by developing, implementing, maintaining and evaluating the TPMS.

1-10.2 Program vs. Project Management

For additional information (on Project Management in Design/Planning) see [FDM 2-5](#).

1-10.2.1 Overview

Program management is the process of managing a group of related projects in a coordinated way. Program management provides well defined system goals that are met through the completion of a group of projects. Through oversight of the related projects, program management ensures the overall program goals are met.

Project management is the discipline of planning, organizing, securing, and managing resources to bring about the successful completion of specific project goals and objectives. A project is a well-defined sequence of activities that, when completed, result in a tangible product - a highway safety improvement, for example.

The goals of Program Management and Project Management are the same. The primary difference between program management and project management is in the number of projects considered in measuring success of each of the goals.

1-10.3 Program vs. Performance Management

For additional information (on Project Management in Design/Planning) see [FDM 2-10](#).

1-10.3.1 Overview

Performance management is a continuous process of asking what is important to the organization, how those activities can be monitored and identifying opportunities for improvement. All DTSD staff and management are involved in performance management. Each of us has a role to play in either direct project delivery or the management of a program. Likewise, each of us is responsible to ensure that we deliver a quality product as efficiently as possible.

As DTSD takes a new look at performance management, the division is emphasizing the structure needed to not only successfully identify potential improvement areas but to build this process of continuous improvement into the organization in a more structured manner. WisDOT staff can review performance measure information on the DOTNET at

<http://dotnet/dtsd/strategic/perfman/>

Project management plans are a key component to the performance management system. Accurate scope, schedule and budget information allows project teams to track progress, compare progress to benchmarks and inform the department of the project's progress. Monitoring and controlling these elements will lead to stable project delivery, a project that meets the intended needs and is delivered on time and at or below budget.

Performance measures and indicators are essential for a continuously improving organization. Process improvements that result from the feedback loop allow the division to increase quality, exhibit good stewardship and potentially reduce resource demand in some areas so they can be shifted to new tasks.

Questions about individual performance measures should be directed to your business area representative. Questions about project specific results should be directed to your management team.

1-10.4 Project Integration Management

For additional information (on Project Management in Design/Planning) see [FDM 2-15](#).

1-10.4.1 Overview

Project Integration Management is the practice of making certain every part of the project is coordinated. Project management is an integrative undertaking requiring each project process to be appropriately aligned and connected with the other processes to facilitate coordination. The project manager is responsible for this coordination. Corporate supported project management tools must be used to prepare the project plan, record, manage, and report project information.

The Project Management Plan includes documents of decisions regarding project scope, schedule, budget, quality, resources, communication, stakeholders, risks, and procurements. Once compiled the plan is placed under control and forms the basis for monitoring project work.

The PDS project manager must prioritize work to resolve competition for time and resources and keep the team focused on completing the project work. Project work must be monitored to verify the planned work is progressing in accordance with the approved project plan. Corrective action is implemented as needed to meet the project requirements.

Current accepted practice considers project management as a five step process which has a logical sense of flow. The five steps are:

1. Initiating
2. Planning
3. Executing
4. Monitoring and Controlling
5. Closing

Interwoven into these five steps are a number of knowledge areas. Each knowledge area is an identified part of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques. The current knowledge areas are:

- Change
- Scope
- Schedule
- Budget
- Quality
- Resources
- Procurement
- Communication
- Stakeholders
- Risk

The five step process and the knowledge areas are united and coordinated by applying project integration management knowledge and skills. The interrelationship between the five steps and the knowledge areas is shown on the Five Step Process and Knowledge Area Matrix in [FDM 2-15 Attachment 1.1](#). The interrelationship is discussed extensively in [FDM 2-20](#).

The Department is responsible for a wide variety of improvement project types, from a simple resurfacing project to an extremely complex "mega" project. The project management efforts needed to complete a particular project successfully also vary widely. The information in the following sections will focus on activities needed for a standard project. The activities would become more and more involved as the complexity of a project increases.

1-10.4.2 Processes in Project Integration Management

Following are the steps in the broad concept that PMBOK® calls the Project Integration Management Process.

1-10.4.2.1 Develop Project Overview

At WisDOT, the project overview:

- Formally authorizes the existence of a project
- Provides the project manager with authority to apply organizational resources to project activities
- Provides well-defined project start and project boundaries
- Creates a formal record of the project
- Validates alignment of the project to the strategy and ongoing work of the organization

1-10.4.2.2 Develop Project Management Plan

The project management plan is a summary of the various knowledge area plans discussed in [CMM 1-10.5](#) and includes Change Management discussed below in [CMM 1-10.4.2.5](#).

1-10.4.2.3 Direct and Manage Project Work

“The process of leading and performing the work defined in the project management plan.”¹

1-10.4.2.4 Monitor and Control Project Work

“The process of tracking, reviewing, and reporting project progress against the performance objectives defined in the project management plan.”¹

1-10.4.2.5 Change Management

Change Management is discussed below and in:

<http://dotnet/tpms/pmp/templates/index.htm>.

“Change Management is the 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 reviews all requests for changes or modifications to project documents, deliverables, baselines, or the project management plan and approves or rejects the changes.”¹

The primary changes during this Construction Process that are considered are changes to the scope, schedule, or budget baselines, although changes to communication, resources, procurement, quality, or risk management plans may also need discussion.

During construction, the changes being managed are usually contract modifications ([CMM 2-42](#)), cost reduction incentives ([CMM 2-44](#)), contract claims ([CMM 2-54](#)), incentive/disincentives ([CMM 2-34.1](#)), liquidated damages ([CMM 2-34.2](#)), and force account work ([CMM 2-46](#)). There may also be changes to the project schedule and budget, as well as the staff/consultant budget. It is possible that other change requests may also be considered. Approved changes are processed through the Contract Modification Process ([CMM 2-42](#)).

Project managers should follow the change management process in place in their Region.

1-10.4.2.6 Close Project

At WisDOT, closing a project consists of finalizing all activities across all processes to formally close the project or phase.

1-10.5 Project Management in Construction

For additional information (on Project Management in Design/Planning) see [FDM 2-20](#).

1-10.5.1 Scope Management

“Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project.”¹ For expanded definitions of the Scope Management process, see [FDM 2-20 Attachment 5.1](#).

Scope Management, Schedule Management ([CMM 1-10.5.2](#)), and Budget Management ([CMM 1-10.5.3](#)) are closely aligned and their respective plans are usually developed at the same time.

Inputs used by WisDOT to manage the scope are the plans, special provisions, and the executed contract. Another input is the contractor's progress schedule ([standard spec 108.4](#)). The contractor may also notify the engineer of possible revisions to the contract ([standard spec 104.2](#)) or propose Cost Reduction Incentives ([CMM 2-44](#)).

The scope management plan includes six processes:

Knowledge Area Processes (per PMBOK®)	Process Group (per PMBOK®)	FDM Reference
Plan Scope Management	Planning	FDM 2-20-5.3.1
Collect Requirements	Planning	FDM 2-20-5.3.2
Define Scope	Planning	FDM 2-20-5.3.3
Use WisDOT's WBS	Planning	FDM 2-20-5.3.4
Validate Scope	Monitoring and Controlling	FDM 2-20-15.3.1
Control Scope	Monitoring and Controlling	FDM 2-20-15.3.2

The information resulting from this management plan during construction may be stored in Project Tracking or Field Manager.

1-10.5.1.1 Plan Scope Management

“Plan Scope Management is the process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled.”¹

At WisDOT, the scope of the construction project is detailed in the plans, special provisions, and the executed contract. The plan for managing the scope is to ensure the plans, special provisions, and contracts are followed.

1-10.5.1.2 Collect Requirements

“Collect Requirements is the process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives.”¹

At WisDOT, the scope of the construction project is detailed in the plans, special provisions, and the executed contract. That information comprises the requirements.

1-10.5.1.3 Use WisDOT's WBS

The process of subdividing project deliverables and project work into smaller, more manageable components is simplified since the department already has a work breakdown structure (WBS).¹

At WisDOT, most of the standard projects do not need to use this process. This process will usually only be used on the high profile or mega projects, as they may have more unusual construction activities.

1-10.5.1.4 Validate Scope

“Validate Scope is the process of formalizing acceptance of the completed project deliverables.”¹

At WisDOT, the scope of the construction project is detailed in the plans, special provisions, and the executed contract. The objective of validating the scope is to reach a common understanding between the contractor and WisDOT on the extent of the work.

1-10.5.1.5 Control Scope

“Control Scope is the process of monitoring the status of the project scope and managing changes to the scope baseline.”¹

Project progress meetings are discussed in [CMM 2-18.3.1](#). The Progress Schedule, [CMM 1-65.2](#), the Project Tracking System [CMM 1-65.3](#), and Field Manager [CMM 1-65.8](#) provide valuable input at the progress meetings.

As part of the Control Scope process, the Region has a role in monitoring the status of all projects in the Program (See Program Monitoring discussions in Chapter 3 of the Program Management Manual.) For individual projects, changes in the scope need to be discussed in context of the impacts on a Program.

1-10.5.2 Schedule Management

“Schedule Management includes the processes required to manage the timely completion of the project.”¹ For expanded definitions of the Schedule Management process, see [FDM 2-20 Attachment 5.2](#).

Scope Management ([CMM 1-10.5.1](#)), Schedule Management, and Budget Management ([CMM 1-10.5.3](#)) are closely aligned and their respective plans are usually developed at the same time.

The schedule management plan includes seven processes:

Knowledge Area Processes (per PMBOK®)	Process Group (per PMBOK®)	FDM Reference
Plan Schedule Management	Planning	FDM 2-20-5.4.1
Define Activities	Planning	FDM 2-20-5.4.2
Sequence Activities	Planning	FDM 2-20-5.4.3
Estimate Activity Resources	Planning	FDM 2-20-5.4.4
Estimate Activity Durations	Planning	FDM 2-20-5.4.5
Develop Schedule	Planning	FDM 2-20-5.4.6
Control Schedule	Monitoring and Controlling	FDM 2-20-15.4.1

The information resulting from this management plan during construction may be stored in Project Tracking or Field Manager.

1-10.5.2.1 Plan Schedule Management

“Plan Schedule Management is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.”¹

At WisDOT, the schedule of the construction project is detailed in the plans, special provisions, and the executed contract. The plan for managing the schedule is to ensure the plans, special provisions, and executed contract are followed.

1-10.5.2.2 Select Activities

“Select Activities is the process of identifying and documenting the specific actions to be performed to produce the project deliverables.”¹

At WisDOT, most of the standard projects will not use this process. This process will usually only be used on the high profile or mega projects, as they may have more unusual construction activities.

1-10.5.2.3 Sequence Activities

“Sequence Activities is the process of identifying and documenting relationships among the project activities.”¹

At WisDOT, most of the standard projects will not use this process. This process will usually only be used on the high profile or mega projects, as they may have more unusual construction activities.

1-10.5.2.4 Estimate Activity Resources

“Estimate Activity Resources is the process of estimating the type and quantities of material, resources, equipment, or supplies required to perform each activity.”¹

At WisDOT, most of the standard projects will not use this process. This process will usually only be used on the high profile or mega projects, as they may have more unusual construction activities.

1-10.5.2.5 Estimate Activity Durations

“Estimate Activity Durations is the process of estimating the number of work periods needed to complete individual activities with estimated resources.”¹

At WisDOT, most of the standard projects will not use this process. This process will usually only be used on the high profile or mega projects, as they may have more unusual construction activities.

1-10.5.2.6 Develop Schedule

“Develop Schedule is the process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model.”¹

At WisDOT, the Region PDS Project Manager (Design) created the preliminary construction schedule showing the estimated contract time (See [FDM 19-10-30](#) for a discussion of Contract Time for Completion). This estimated time was included in the bidding documents and the successful contractor must comply with that time requirement. The Develop Schedule process involves reviewing the contractor’s schedule of operations for compliance with the contract documents. When the contractor’s schedule is approved, the PDS Project Manager (Construction) can prepare a schedule for contract administration by WisDOT staff and/or consultant staff.

1-10.5.2.7 Control Schedule

“Control Schedule is the process of monitoring the status of project activities to update project progress and manage changes to the schedule baseline to achieve the plan.”¹

The Control Schedule sub-process involves reviewing the contractor's approved schedule of operations against the actual progress. When the contractor's progress is not in line with the approved schedule, the contractor should initiate corrective action. The PDS Project Manager (Construction) also acts to bring the progress back in line with the schedule or require a revised schedule. Changes to the approved schedule may result in changes to the WisDOT schedule for contract administration.

1-10.5.3 Budget Management

"Budget Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget."¹ For expanded definitions of the Budget Management process, see [FDM 2-20 Attachment 5.3](#).

Scope Management ([CMM 1-10.5.1](#)), Schedule Management ([CMM 1-10.5.2](#)), and Budget Management are closely aligned and their respective plans are usually developed at the same time.

The budget management plan includes four processes:

Knowledge Area Processes (per PMBOK®)	Process Group (per PMBOK®)	FDM Reference
Plan Budget Management	Planning	FDM 2-20-5.5.1
Estimate Costs	Planning	FDM 2-20-5.5.2
Determine Budget	Planning	FDM 2-20-5.5.3
Control Costs	Monitoring and Controlling	FDM 2-20-15.5.1

The information resulting from this management plan during construction may be stored in Project Tracking or Field Manager.

1-10.5.3.1 Plan Budget Management

"Plan Budget Management is the process that establishes the policies, procedures, and documentation for planning, managing, expending, and controlling project costs."¹

At WisDOT, budget management is more concerned with the monitoring the cost to construct the improvement project. This is done by watching for potential changes to the scope or schedule. The other component costs of the project (delivery and non-delivery) are also managed, just not to the extent as the construction cost. The delivery cost (cost of in-house and/or consultant staff to administer the construction contract) is dependent on the time the contractor takes to complete the work under the contract.

1-10.5.3.2 Estimate Costs

"Estimate Costs is the process of developing an approximation of the monetary resources needed to complete project activities."¹

At WisDOT, the cost of in-house and/or consultant staff to administer the construction contract is estimated based on previous similar construction contracts.

1-10.5.3.3 Determine Budget

"Determine Budget is the process of aggregating the estimated costs of individual activities or work packages to establish an authorized Budget baseline."¹

As noted above, budget management at WisDOT is more concerned with monitoring the cost to construct the improvement project. The other component costs of the project (delivery and non-delivery) are also managed, just not to the extent as the construction cost. The overall project budget is the sum of the money expected to be paid to the contractor under the contract, the delivery costs, and non-delivery costs.

1-10.5.3.3 Control Costs

"Control Costs is the process of monitoring the status of the project to update the project costs and managing changes to the budget baseline."¹

The Control Costs process involves monitoring the two main items: contract costs and delivery costs. The contract costs are monitored by reviewing the contractor's status of work complete against the time elapsed (See discussion of Field Manager in CMM 1-65.8 for this information). When the contractor's work complete is not in line with the time elapsed, the PDS Project Manager (Construction) needs to advise the contractor of the discrepancy and ask for an explanation of the difference. Cost can also be reviewed with over runs/under runs on items performed, and Change Orders. The delivery costs are monitored by reviewing in-house and/or consultant hours against the earlier estimates.

The construction cost estimate is updated at least twice during the construction process:

- Life cycle 40 – After the project is awarded, and
- Life cycle 50 – When the construction is complete

1-10.5.4 Communication Management

“Communication Management includes the processes that are required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and the ultimate disposition of project information.”¹ For expanded definitions of the Communication Management process, see [FDM 2.20, Attachment 5.6](#).

Communication Management and Stakeholder Management ([CMM 1-10.5.5](#)) are closely aligned.

The communication management plan includes three processes:

Knowledge Area Processes (per PMBOK®)	Process Group (per PMBOK®)	FDM Reference
Plan Communication Management	Planning	FDM 2-20-5.8.1
Manage Communication	Executing	FDM 2-20-10.5.1
Control Communication	Monitoring and Controlling	FDM 2-20-15.7.1

The information resulting from this management plan during construction may be stored in Project Tracking or Field Manager.

1-10.5.4.1 Plan Communication Management

“Plan Communications Management is the process of developing an appropriate approach and plan for project communications based on stakeholder's information needs and requirements, and available organizational assets.”¹

At WisDOT, the Plan Communication Management process started as part of the Design function is continued into this Construction function. An important part of the process is considering the information in the R/W commitments to Project Manager supplied by the Technical Services Section - Real Estate.

1-10.5.4.2 Manage Communication

“Manage Communication is the process of creating, collecting, distributing, storing, retrieving, and the ultimate disposition of project information in accordance to the communications management plan.”¹

At WisDOT, the communication processes are discussed in [CMM 2-18.3](#) – Project Communication and 2-20 – Public Relations. The project manager should work with the Region Communication Manager (RCM) to ensure that effective consistent communication is provided to internal and external stakeholders.

1-10.5.4.3 Control Communication

“Control Communication is the process of monitoring and controlling communication throughout the entire project life cycle to ensure the information needs of the project stakeholders are met.”¹

As noted above, the communication processes are discussed in [CMM 2-18.3](#) – Project Communication and 2-20 – Public Relations. The project manager should work with the Region Communication Manager (RCM) to ensure that effective consistent communication is provided to internal and external stakeholders.

1-10.5.5 Stakeholder Management

“Stakeholder Management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.”¹ For expanded definitions of the Scope Management process, see [FDM 2.20, Attachment 5.1](#).

Stakeholder Management and Communication Management ([CMM 1-10.5.4](#)) are closely aligned.

The stakeholder management plan includes four processes:

Knowledge Area Processes (per PMBOK®)	Process Group (per PMBOK®)	FDM Reference
Identify Stakeholders	Initiating	FDM 2-20-1.3.1
Plan Stakeholder Management	Planning	FDM 2-20-5.11.1
Manage Stakeholder Engagement	Executing	FDM 2-20-10.7.1
Control Stakeholder Engagement	Monitoring and Controlling	FDM 2-20-15-10.1

The information resulting from this management plan during construction may be stored in Project Tracking or Field Manager.

1-10.5.5.1 Identify Stakeholders

“Identify Stakeholders is the process of identifying the people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project, analyzing: and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.”¹

At WisDOT, the initial interaction with stakeholders is done as part of the programming process and continues in the Design function. An important document used to track those interested in the project is the Stakeholder Register. When the project responsibility shifts to BPD – Construction the register should be reviewed to see if additional entries are needed. One primary source of potential new stakeholder is the R/W commitments to Project Manager supplied by the Technical Services Section - Real Estate.

1-10.5.5.2 Plan Stakeholder Management

“Plan Stakeholder Management is the process of developing appropriate management strategies to effectively engage stakeholders throughout the project life cycle, based on the analysis of their needs, interests, and potential impact on project success.”¹

At WisDOT, the Plan Stakeholder Management process started as part of the Design function is continued into this Construction function. An important part of the process is considering the information in the R/W commitments to Project Manager supplied by the Technical Services Section - Real Estate.

1-10.5.5.3 Manage Stakeholder Engagement

“Manage Stakeholder Engagement is the process of communicating and working with stakeholders to meet their needs/expectations, address issues as they occur, and foster appropriate stakeholder engagement in project activities throughout the project life.”¹

At WisDOT, the communication processes are discussed in [CMM 2-18.3](#) – Project Communication and 2-20 – Public Relations. The project manager should work with the Region Communication Manager (RCM) to ensure that effective consistent communication is provided to internal and external stakeholders.

1-10.5.5.4 Control Stakeholder Engagement

“Control Stakeholder Engagement is the process of monitoring overall project stakeholder relationships and adjusting strategies and plans for engaging stakeholders.”¹

As noted above, the communication processes are discussed in [CMM 2-18.3](#) – Project Communication and 2-20 – Public Relations. The project manager should work with the Region Communication Manager (RCM) to ensure that effective consistent communication is provided to internal and external stakeholders.

1-10.5.6 Resource Management

“Resource Management includes the processes that organize, manage, and lead the project team.”¹ For expanded definitions of the Resource Management process, see [FDM 2-20 Attachment 5.5](#).

The resource management plan includes four processes:

Knowledge Area Processes (per PMBOK®)	Process Group (per PMBOK®)	FDM Reference
Plan Resource Management	Planning	FDM 2-20-5.7.1
Acquire Project Team	Executing	FDM 2-20-10.4.1
Develop Project Team	Executing	FDM 2-20-10.4.2
Manage Project Team	Executing	FDM 2-20-10.4.3

The information resulting from this management plan during construction may be stored in Project Tracking or Field Manager.

1-10.5.6.1 Plan Resource Management

“Plan Resource Management is the process of identifying and documenting project roles, responsibilities, required skills, reporting relationships, and creating a *resource* management plan.”¹

At WisDOT, for most improvement projects, the resources are assigned based on the staffs that were needed to complete similar projects in the past. If there are not enough in-house resources available, consultant staff are obtained as discussed in the Procurement Management Plan ([CMM 1-10.5.7](#)).

1-10.5.6.2 Acquire Project Team

“Acquire Project Team is the process of confirming human resource availability and obtaining the team necessary to complete project activities.”¹

At WisDOT, the project team is generally assigned, with the number and skills of the team members determined based on previous similar projects.

1-10.5.6.3 Develop Project Team

“Develop Project Team is the process of improving competencies, team member interaction, and overall team environment to enhance project performance.”¹

At WisDOT, the project team usually has the needed competencies and there is minimal development needed.

1-10.5.6.3 Manage Project Team

“Manage Project Team is the process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance.”¹

At WisDOT, the project manager monitors performance and then provides information about each team member’s performance to his/her supervisor.

1-10.5.7 Procurement Management

Broadly defined, Procurement Management includes the processes necessary to purchase or acquire goods or services needed from outside the project team. At WisDOT, procuring engineering services is allowed under Chapter 84 of the Wisconsin Statutes. WisDOT’s procurement policies and procedures are described in [FDM Chapter 8](#).

Note: Sometimes services are supplied by municipal staffs. Those can be design engineering services and/or construction inspection services. However, the process to procure those services is discussed in [FDM 3-20, Attachment 11.1](#) – A Policy on Construction of State and Federal-Aid Highway Projects by Forces and Equipment of Counties or Other Local Governmental Units. The process to procure services by consulting firms is discussed below.

The procurement management plan includes four processes:

Knowledge Area Processes (per PMBOK®)	Process Group (per PMBOK®)	FDM Reference
Plan Procurement Management	Planning	FDM 2-20-5.10.1
Conduct Procurements	Executing	FDM 2-20-10.6.1
Control Procurements	Monitoring and Controlling	FDM 2-20-15.9.1
Close Procurements	Closing	FDM 2-20-20.3.1

The information resulting from this management plan during construction may be stored in Project Tracking or Field Manager.

1-10.5.7.1 Plan Procurement Management

“Plan Procurement Management is the process of documenting project procurement decisions, specifying the approach, and identifying potential *consultants*.”¹

At WisDOT, the plan procurement management process is briefly discussed as part of the consultant contract process overview (in [FDM 8-1-1](#)) and consists of two steps:

A project is identified as requiring consultant staff (Item 1.) and

Funding is approved for the consultant portion of the project (Item 2.).

The process is further discussed in PMM 06-05-10 – Managing Consultants.

At the conclusion of this process, the procurement management plan is in place. For almost all of the projects that require consultant services during construction, [FDM Chapter 8](#) details that plan.

1-10.5.7.2 Conduct Procurements

“Conduct Procurements is the process of obtaining *consultant* responses, selecting a *consultant*, and awarding

a contract.”¹

At WisDOT, the conduct procurements process is discussed in the following FDM sections:

- [FDM 8-1](#) – Introduction
- [FDM 8-5](#) – Securing Consultant Services
- [FDM 8-10](#) – Contract Negotiation
- [FDM 8-15](#) - Contracts
- [FDM 8-20](#) – Contract Procedures

At the conclusion of this process, the consultant contract to provide an engineering and/or inspection service is in place.

1-10.5.7.3 Control Procurements

“Control Procurements is the process of managing procurement relationships, monitoring contract performance, and making changes and corrections to contracts as appropriate.”¹

At WisDOT, the process is discussed in [CMM 2-16](#) – **Consultant Contracts for Construction Services**

The control procurement process is also discussed in the following FDM section:

- [FDM 8-25](#) – Contract Management

During this process, possible changes to the procurement management plan may come up. This could be in response to a potential contract amendment ([FDM 8-25-15](#)), resolving a conflict ([FDM 8-25-20](#)), or responding to a claim or dispute ([FDM 8-25-25](#)). Any possible changes should be discussed as part of the Change Management process ([CMM 1-10.4.2.5](#), above). Results of that process should be documented.

1-10.5.7.4 Close Procurements

“Close Procurements is the process of completing each executed consultant contract.”¹

At WisDOT, the close procurement sub-process is briefly discussed as part of the consultant contract process overview (in [FDM 8-1-1](#), paragraph 1.2) and consists of two steps:

- The WisDOT Project Manager evaluates the performance of the consultant upon completion of the contract (Item 10 (see [FDM 8-25-5](#))) and
- Final contract costs are audited if the contract meets the necessary criteria (Item 11 (see [FDM 8-25-30](#)))

1-10.5.8 Risk Management

“Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project.”¹ For expanded definitions of the Risk Management process, see [FDM 2-20, Attachment 5.7](#).

The risk management plan includes six processes:

Knowledge Area Processes (per PMBOK®)	Process Group (per PMBOK®)	FDM Reference
Plan Risk Management	Planning	FDM 2-20-5.9.1
Identify Risks	Planning	FDM 2-20-5.9.2
Perform Qualitative Risk Analysis	Planning	FDM 2-20-5.9.3
Perform Quantitative Risk Analysis	Planning	FDM 2-20-5.9.4
Plan Risk Responses	Planning	FDM 2-20-5.9.5
Control Risks	Monitoring and Controlling	FDM 2-20-15.8.1

The information resulting from this management plan during construction may be stored in Project Tracking or Field Manager.

1-10.5.8.1 Plan Risk Management

“Plan Risk Management is the process of defining how to conduct risk management activities for a project.”¹

At WisDOT, the Plan Risk Management process started as part of the Design function is continued into this Construction function. An important part of the process is considering the information existing risk register.

1-10.5.8.2 Identify Risk

“Identify Risks is the process of determining which risks may affect the project and documenting their characteristics.”¹

At WisDOT, the existing risk register prepared as part of the Design function should be reviewed to see if some of the previously identified risks may still be present. It is possible that new risks may need to be added,

especially on projects that include construction on new R/W or near environmentally sensitive areas.

1-10.5.8.3 Perform Qualitative Risk Analysis

“Perform Qualitative Risk Analysis is the process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact.”¹

At WisDOT, most of the standard projects have few risks. This process and the following Perform Quantitative Risk Analysis process will usually only be used on the high profile or mega projects.

1-10.5.8.4 Perform Quantitative Risk Analysis

“Perform Quantitative Risk Analysis is the process of numerically analyzing the effect of identified risks on overall project objectives.”¹

At WisDOT, most of the standard projects have few risks. This process and the previous Perform Qualitative Risk Analysis process will usually only be used on the high profile or mega projects.

1-10.5.8.5 Plan Risk Responses

“Plan Risk Responses is the process of developing options and actions to enhance opportunities and to reduce threats to project objectives.”¹

At WisDOT, the risk register updated for the Construction function should be reviewed to develop options.

1-10.5.8.6 Control Risks

“Control Risks is the process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.”¹

At WisDOT, if an identified risk occurs, the options previously developed should be implemented.

1-10.5.9 Quality Management

“Quality Management includes the processes and activities that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken.” For expanded definitions of the Quality Management process, see [FDM 2.20, Attachment 5.4](#).

NOTE: The Quality Management Plan discussed in this Section should not be confused with WisDOT’s Quality Management Program (QMP) during construction. The QMP (see CMM 8-30) provides references, procedures, and examples for inspection, sampling, testing, and documentation of various construction materials and methods. The primary goals of the QMP are to provide consistent construction quality, ensure effective use of personnel, and maintain cooperation throughout all phases of the work.

The MAPSS Performance Improvement program is well established at WisDOT. The following performance measures are monitored in the construction process:

- On-Time Performance
- On-Budget Performance

Additional DTSD performance measures, although not part of the MAPSS program, are also monitored in the construction process:

- Construction Quality Index (CQI) – see [CMM 1-70.3.2](#)
- Finals Tracking
- Unprogrammed Costs
- Explanation of Variation for individual items.
- Design Quality Index (DQI) ([CMM 1-70.3](#))

Several other quality efforts are discussed in the CMM:

- Contractor Performance Evaluations ([CMM 1-70.1](#))
 - Rating of Prime Contractors
 - Rating of Subcontractors
- Consultant Performance Evaluations ([CMM 1-70.2](#))

The reporting on the above performance measures and quality efforts are typically completed after construction operations are finished – although notes on drafts of those reports as influencing factors occur would simplify the completion later. However, there are several activities that occur while construction operations are in progress that contribute to the Quality Control sub-process.

- [CMM 1-60](#) – Construction Inspection
 - “All portions of the work and materials are inspected to obtain acceptable work in accordance with the requirements of the contract. It is the duty of the inspection forces to determine that the work is performed in accordance with the specified requirements.” Proper inspection assures quality construction.
- [CMM 1-65](#) – Contract Records
 - [CMM 1-65.2](#) – The Project Schedule prepared by the contractor and approved by WisDOT is used in “...identifying...a rate of progress that will not result in completion within the contract time” (Figure 2).

- Problems with meeting the contract time can be addressed early in the project.
- [CMM 1-65.3](#) – Project Tracking System which allows the project engineer to “...report project specific, contract specific and performance measure information.
 - [CMM 1-65.5](#) – Field Information Tracking System where “structures, field office, staff, acceptance dates, performance measures and various field reports are required and entered...”
 - [CMM 2-26](#) – Preconstruction Meeting
 - “The preconstruction meeting is a vitally important meeting in which department personnel, consultants, and contractor’s staff have the opportunity to become acquainted and begin the process of creating the team that will build the project. Some of the primary goals of the preconstruction meeting include:
 - Establish lines of authority and communication
 - Clarify responsibilities of contractor’s personnel, department personnel, consultants, subcontractors, and suppliers
 - Identify potential issues and the process for resolution
 - Resolve potential sources of misunderstanding
 - Plan and discuss detailed arrangements necessary for a successful project.”
 - The Model Preconstruction Meeting Agenda (Figure 2) includes a discussion of scheduling regular progress meetings that will be held during construction.
 - The importance of holding progress meetings is emphasized in the Timely Decision Making report (May 2013) where it suggests weekly progress meetings to “...review construction progress and future work activities, identify potential delays as early as possible for mitigation planning, raise issues and bring them to resolution, and make subsequent action assignments when appropriate”. All of these discussion topics allow the project engineer to control the quality of the construction project.
 - [CMM 2-36](#) – Intermediate/Tentative/Final Estimates

The quality management plan includes three processes:

Knowledge Area Processes (per PMBOK®)	Process Group (per PMBOK®)	FDM Reference
Plan Quality Management	Planning	FDM 2-20-5.6.1
Perform Quality Assurance	Executing	FDM 2-20.10.3.1
Control Quality	Monitoring and Controlling	FDM 2-20.15.6.1

The information resulting from this management plan during construction may be stored in Project Tracking or Field Manager.

1-10.5.9.1 Plan Quality Management

“Plan Quality Management is the process of identifying quality requirements and/or standards for the project and its deliverables, and documenting how the project will demonstrate compliance with relevant quality requirements and/or standards.”¹

At WisDOT, the Plan Quality Management process started as part of the Design function is continued into this Construction function. The information above is part of the plan.

1-10.5.9.2 Perform Quality Assurance

“Perform Quality Assurance is the process of auditing the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used.”¹

The information provided above is part of the Perform Quality Assurance process.

1-10.5.9.3 Control Quality

“Control Quality is the process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes.”¹

The information provided above is part of the Control Quality process.

1-10.5.9 References

1. Project Management Institute. *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)* - Fifth Edition. (2013). Copyright and all rights reserved. Material from this publication has been reproduced with the permission of PMI.