



NEVADA DEPARTMENT OF TRANSPORTATION

**PROJECT
MANAGEMENT
GUIDELINES
“Second Edition”
2010**

WORKING DRAFT



PROJECT MANAGEMENT GUIDELINES

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2010

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PREFACE

NDOT's new Project Management Guidelines have been completed, endorsed and are ready for implementation. So, what do these new guidelines mean to NDOT employees and how will they help the Department utilize a matrix management organization to become more effective?

WHY WERE THE GUIDELINES DEVELOPED?

The new Project Management Guidelines, for the first time, establish a transparent, repeatable and accountable process for project delivery and satisfy the reporting requirements of NRS 408.133 and 244.637.

So why did we develop the guidelines? The answer is simple: to improve the way we deliver projects and improve performance. The bottom line is that if we do not work toward consistently improving our performance, someone else will dictate it.

HOW WILL THE GUIDELINES BE USED?

The guidelines will be used for development and delivery of the Department's Statewide Transportation Improvement Program. This includes all projects and all phases of project development (i.e.: planning through construction). Project managers will begin working with their project teams in developing and implementing Project Management Plans, the guiding document based upon Matrix Management principles and processes established in the Project Management Guidelines.

In support of the guidelines' implementation, several initiatives are underway. These include the development of specialized training, both internal and external, that will help users understand the new roles and responsibilities of working within the guidelines. Work performance standards will also be revised to reflect the guidelines' procedures and establish accountability; a review committee will be established to ensure updates are made as needed; and leadership support will be provided in understanding and implementing these new business practices, goals and objectives.

It needs to be pointed out that it is going to take time to become proficient at these changes in business practice. We need to be patient and have the understanding of the goals that we are striving for.

BECOMING A MATRIX MANAGEMENT ORGANIZATION

An ultimate goal of the Department is to function as a strong matrix organization. Some of the key elements of a matrix organization include empowered project teams, team-based decision making, team-based elimination of work/tasks/processes that fail to add value to project development and an empowered project manager to make timely decisions. By using these elements to become a matrix organization, the Department will benefit from improved communication, coordination and decision making resulting in efficient delivery of projects. These guidelines are an important step in that direction.

This has been a major undertaking for all involved and I want to thank everyone for their efforts and dedication toward the development and adoption of a new project management process that is based upon the Matrix Management model. I greatly appreciate the effort, commitment and support of the Matrix Implementation Team and am excited about the benefits this change will bring, from consistent and effective reporting and communication and effective decision making to, most importantly, a transparent, repeatable and accountable process for delivering our programs.

NEVADA DEPARTMENT OF TRANSPORTATION

PROJECT MANAGEMENT GUIDELINES

The Guidelines set forth in this document are intended to be followed to the fullest extent possible. It is recognized that guidelines cannot provide entirely complete and practical guidance applicable to all situations and cannot replace experience and sound judgment. As such, deviations from these Guidelines may, in some cases, be unavoidable or otherwise justifiable.

Procedure for Guideline Revisions

The guideline will be periodically revised or updated. For edits or updates, contact the Project Management Division at (775) 888-7321. All updates will be available on the Project Management Division SharePoint Portal which should be visited regularly for updated information.

Responsibility:

The Project Management Division is responsible for edits and updates to this document.

Temporary Revisions:

Temporary revisions will be issued by the Project Management Division to reflect updated/revised procedures. These will be reflected on dated errata sheet(s) posted on the Project Management Division SharePoint Portal.

Scheduled Revisions:

In October of each year, the Project Management Chief will review the guideline and errata sheets to determine if a revised edition of the guidelines is required. New editions will incorporate appropriate errata sheets.

Matrix Implementation Team Endorsement

Project Management Guidelines Endorsement Statement

“We endorse the Project Management Guidelines and are committed to actively supporting it. We accept responsibility for fulfilling any aspect of the plan that applies to us, including providing resources, actively participating, and effectively communicating. We know what to do and are prepared to act. Our endorsement is an active and positive statement that we are committed to fulfilling the responsibilities designated in these guidelines.”

Name	Title	Signature
Kent Cooper	Assistant Director of Engineering	
Robert Chisel	Assistant Director of Administration	
Rick Nelson	Assistant Director of Operations	
Tracy Larkin-Thomason	Assistant Director of Planning	
Mary Martini	District I Engineer	
Thor Dyson	District II Engineer	
Kevin Lee	District III Engineer	
Bill Hoffman	Chief Maintenance Engineer	
Gary Selmi	Chief Construction Engineer	
Dennis Taylor	Chief Program Development	
Christi Thompson	Chief Administrative Services	
Steve Cooke	Chief Environmental Services	
Fred Drees	Chief Safety/Traffic	
Mark Elicegui	Chief Bridge Engineer	
Reid Kaiser	Chief Materials Engineer	
Mike Lawson	Chief Traffic Information	
Russ Law	Chief Location Engineer	
Daryl James	Chief Road Design Engineer	
Amir Soltani	Chief Project Management	
Paul Frost	Chief Hydraulics Engineer	
Jon Bunch	Chief Right of Way Engineer	
Felicia Denney	Chief Financial Management	
Kimberly King	Human Resources Manager	
Jenica Finnerty	Senior Project Manager	
John Terry	Assistant Chief Project Management	

ACKNOWLEDGMENTS

These Guidelines represent the work and decisions of an internal implementation committee consisting of Department's functional unit managers and Director's Office. This team, through a number of meetings, reviewed and discussed internal and industry practices and lessons learned from other agencies in regards to a Matrix Organization. The collaborative effort and dedication of the team members is hereby recognized and appreciated:

Jim Souba, Former Assistant Director of Engineering
Thor Dyson, District II Engineer
Daryl James, Former Chief Road Design Engineer
Bill Hoffman, Chief Maintenance Engineer
Gary Selmi, Former Chief Construction Engineer
Dennis Taylor, Chief of Program Development Division
Christi Thompson, Administrative Services
Mary Martini, District I Engineer
Steve Cooke, Chief Environmental Services
Fred Drees, Chief Safety/Traffic
Kevin Lee, District III Engineer
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Amir Soltani, Project Management Chief
Kent Cooper, Assistant Director of Engineering
Robert Chisel, Assistant Director of Administration
Rick Nelson, Assistant Director of Operations
Tracy Larkin-Thomason, Assistant Director of Planning
Reid Kaiser, Chief Materials Engineer

Acronyms

CSS	Cost, Scope, and Schedule
CSSQ	Cost, Scope, Schedule, and Quality
FHWA	Federal Highway Administration
LPN	Linking Planning and NEPA
MPO	Metropolitan Planning Organization
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
PDC	Project Development Committee
PMD	Project Management Division
PMT	Project Management Team
PSR	Project Scoping Report
PST	Project Scoping Team
SAFETEA-LU	Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users
SPM	Senior Project Manager
STIP	Statewide Transportation Improvement Program
TIP	Transportation Improvement Program
USC	United States Code

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Section 1

1. Project Management

1.1. Introduction

The Project Management Guidelines provide Department staff with general instructions on their roles in managing, developing and delivering projects within a matrix model. It is intended to assist them as they perform their duties in advancing projects through the Department's project management process. The goals of the Project Management Guidelines are to:

- Implement an integrated approach toward project development and management.
- Ensure project development and management processes are repeatable and regularly evaluated for improvements in collaboration with the Department's functional units.
- Achieve efficiency in project team production and stakeholder communication.
- Establish principles and implement techniques to manage project risks proactively and capture latent opportunities.

The project management process follows the Project Management Institute's standards and is structured to support the Department's efforts to improve project development and delivery across Divisional (Planning, Engineering, Administration, Operations, and Districts) lines. The project management process is applicable to all phases of project development and transportation project delivery methods.

This section defines several key terms; provides an overview of Department's approach toward improving performance of project delivery, introduces project management processes including risk management, and provides general instructions on how to setup and deliver a successful project.

1.2. Definitions

1.2.1. Functional unit:

An organizational unit within the Department that provides one or more technical services.

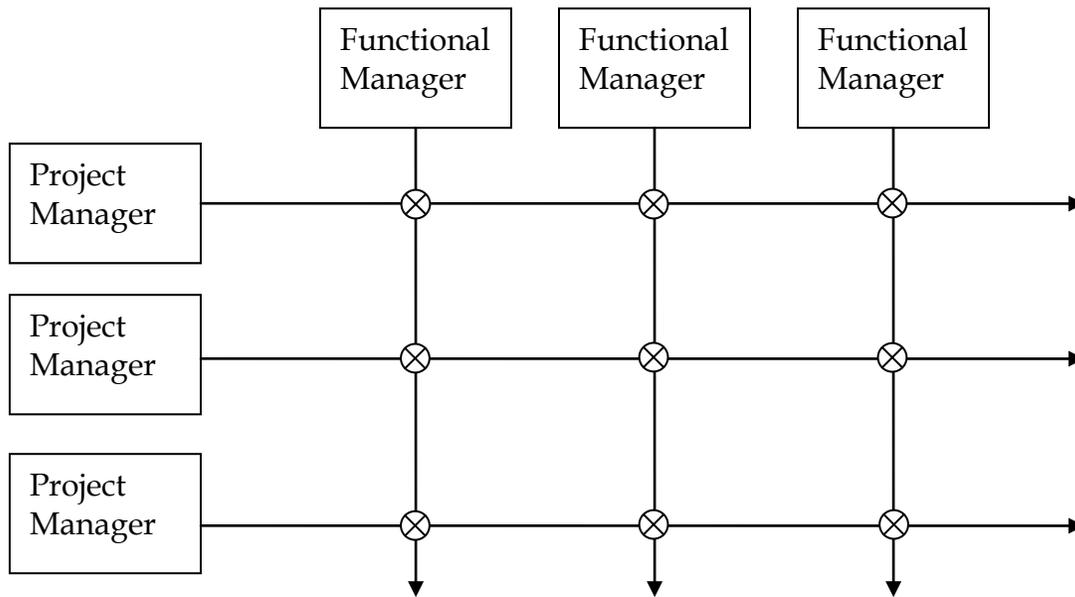
1.2.2. Functional Managers:

District Engineers, Division Heads, and Section Heads within the Department. Their primary responsibilities include setting statewide functional policy, procedure, and standards; providing technical support; and providing quality assurance for their functional unit.

1.2.3. Matrix Model:

Matrix management model can be defined as a network of interfaces between functional units and project managers. This multidisciplinary process defines the focus of authority and responsibility. It defines who works with whom on a project.

Figure 1 - Matrix Network



In figure 1, the vertical axes represent the vertical management chain and horizontal axes can be a process flow or a project. In a matrix model the vertical responsibilities as to how the task will be done and who will do it, is assigned to functional managers. Functional managers will set the standards (how will the task be done?), set the logistics (who will do the task?) and they manage their resources (who will do the task?). The horizontal responsibilities of what, when, why and budget and quality control is assigned to the project managers.

Benefits and key elements of a Matrix Management are improved communication, coordination, and decision making resulting in efficient delivery of projects. Through Matrix Management, the project teams and project managers are empowered to work together to plan, design, and monitor and deliver projects.

1.2.4. Operation:

Projects/tasks/processes/activities in support of sustaining a business. Operation related projects are not part of the scope of this charter.

1.2.5. Project:

A project is a temporary (has a beginning and a definite end) endeavor undertaken to create a unique product, service, or result. Within the context of this document, a project is defined as collective tasks/processes/activities in support of planning, designing, constructing, and maintaining transportation infrastructure.

1.2.6. Program:

A group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually.

1.2.7. Project Customers:

Project customers are those with a stake in the project. They are diverse, both internal and external to the Department, and include:

- Those to whom the work is committed.
- Those who are responsible for operating and maintaining the transportation system.
- Those who must approve the project.
- Those who are responsible for financial and other resources.
- Those to whom interim or finished work is passed next in the project process and who have professional responsibilities for meeting the technical standards.

1.2.8. Project Budget:

Budget is the anticipated cost of the project, including planning, environmental, preliminary design, final design, construction, and outsourcing costs.

1.2.9. Project Delivery Methods:

The type of transportation project delivery mechanism typically is determined based on the project risk factors, schedule, funding, and goals. Possible delivery mechanism may include:

- **Design-Bid-Build (DBB)** - Contract documents and detailed specifications are developed by the Department. Based on these documents, bids are solicited from contractors. The contract is awarded to the lowest responsive and responsible bidder.
- **Construction Manager/General Contractor (CMGC)** - The CMGC delivery method involves selection of a general contractor with suitable experience to serve as a construction manager to assist the owner and designer in the design of a project during preconstruction services and perform construction of the project after it is designed. The CMGC delivery system has aspects similar to traditional Design-Bid-Build (DBB) project delivery in that there are still two distinct phases: design and construction. There is a contract for construction services that is separate from the contract for preconstruction. However, for CMGC delivery the general contractor is obtained at the beginning of the design phase allowing for the contractor to offer expertise with regard to the schedule, budget, constructability, identification, evaluation and mitigation of risk.
- **Design-Build (DB)** - A project delivery method that combines two, usually separate services (engineering services and construction) into a single, fixed-fee contract. The design-build entity may be a single firm, a consortium, joint venture or other organization assembled for a particular project.
- **Design-Build-Operate-Maintain (DBOM)** - The DBOM model is an integrated partnership that combines the design and construction responsibilities of design-build procurements with operations and maintenance. This project delivery method transfers design, construction, and operation of a single facility or group of assets to a private sector partner. This project delivery approach is also known by a number of different names, including "turnkey" procurement, build-operate-transfer (BOT), and Design-Build-Operate (DBO).

- **Design-Build-Finance-Operate (DBFO)** – A project delivery approach in which responsibilities for designing, building, financing and operating are bundled together and transferred to private sector partners. The DBFO offers a great deal of variety in DBFO of contractual arrangements, especially to the degree in which financial responsibilities are actually transferred to the private sector. One commonality that cuts across all DBFO projects is that they are either partly or wholly financed by debt leveraging revenue streams dedicated to the project. Revenue sources may include user fees, lease payments, shadow tolls and/or vehicle registration fees. Future revenues are leveraged to issue bonds or other debt that provide funds for capital and project development costs. They are also often supplemented by public sector grants in the form of money or contributions in kind, such as right-of-way acquisition. In certain cases, private partners may be required to make equity investments as well.
- **Build-Own-Operate** – A private contractor constructs and operates a facility while retaining ownership. The private sector is under no obligation to the government to purchase the facility or take title.
- **Outsourced Service Contract** – The transfer to a private entity the responsibility for services typically performed by agency staff, such as engineering, construction oversight, and customer service.
- **Asset Management** – This type of delivery method allows a private entity to manage a transportation facility, typically for a long term through a single contract, under the assumptions that a private entity could more efficiently and cost effectively provide the services required.
- **Concession** - Long-term lease agreement that involves the lease of a publicly-financed facility to a private sector entity (concessionaire) for a specified time period. Under the lease, the private sector entity agrees to pay an upfront fee to the public agency in order to obtain the rights to collect the revenue generated by the facility for a defined period of time (usually from 25 to 99 years). In addition to the concession fee, the concessionaire operates and maintains the facility, which may include capital improvements.
- **Availability Concession** – Under this contracting mechanism, the private entity Developer assumes much of the upfront project development costs and receives payment once the project is available for use and/or is maintained at a pre-established level of service.
- **Transportation Facility Agreement (TFA)** – Through a TFA, the Department may enter into an agreement with a private entity to develop, construct, improve, maintain or operate, or any combination thereof, a transportation facility. Within the realm of a TFA may be an arrangement for the private entity to deliver the project or service by any of the methods stated above.

1.2.10. Project Management:

A set of principles, practices, and techniques applied to lead project teams, and control project cost, scope, schedule, and quality to the satisfaction of project customers.

1.2.11. Project Schedule:

Schedule is the anticipated length of time the project will take to develop and construct.

1.2.12. Project Sponsor:

Project sponsor is an individual that advocates and supports the project by providing funding, resources and political support.

1.2.13. Project Team:

The project team consists of the project manager, Department's technical managers, Department's technical staff and consultants performing technical tasks in support of achieving the project objectives. The project manager leads the project team to achieve project goals; manage risks and opportunities; manage project cost, scope, quality, and schedule; and resolve issues.

The project manager uses his/her understanding of the Project Description to assemble the project team. The project team should assess the technical needs of the project early in the project development phase and invite other technical staff to join the project team as necessary.

1.2.14. Project Quality:

Quality projects conform to customer requirements. These requirements are embodied in the project's cost, scope, and schedule (which include technical standards). Projects developed, designed, and constructed in accordance with applicable policies, procedures and standards and delivered within the cost, scope, and schedule are quality projects.

1.2.15. Technical Managers:

A technical manager in a functional area is responsible for producing a technical portion of a project, either directly or through consultant services. The technical manager will do the planning, arranging, and coordinating work necessary to ensure the production of their Division's portion of work.

1.3. Improving Performance

One of the Department's goals is to improve program (portfolio) and project performance and efficiency. One way to achieve this goal is by managing program and project risks. Risk and uncertainty associated with a transportation program are dependent on a number of elements including but not limited to available information, resource (staff and funding) availability, projects complexities, communication and political issues. Project level risks are generally associated with the project base which consists of scope, budget and schedule.

1.3.1. Improving Program (Portfolio) Performance

Within the context of these guidelines, program management is defined as organizing, managing and prioritizing transportation projects based on resource availability and schedules. The Department's approach toward optimizing program performance consists of the following initiatives:

- **Implementing new project delivery methods** – New delivery methods (Design-Build, Construction Manager/ General Contractor, etc.) will support prompt delivery of transportation projects, will improve resource allocations, and allows for better management of project risks. Please refer to the Pioneer Program Guidelines located at the [Project Management Division's SharePoint Portal](#).
- **Becoming a matrix organization** – Empowered project teams and effective project leadership will result in team-based elimination of tasks/issues/processes that fails to add value to project development. A flattened hierarchy (reduction in the number of decision makers) will result in effective decision making and faster delivery of projects. Refer to Section 1.2.3. for additional information.

1.3.2. Improving Project Performance

Performance can be measured in terms of cost and schedule to complete the project or a project phase (Figure 2). Overall performance of a transportation project is typically low when the project is advanced to the environmental phase quickly and with minimum effort. More often than not such projects have a poor scope definition, have under estimated costs and schedules, and their risks are not identified. As a result, the transportation project will perform poorly (cost overruns, schedule delays, scope creep, etc.) in subsequent delivery phases. Performance is further impacted due to an ad-hoc approach toward project risks. Such poor performance affects the Department's credibility with project stakeholders and with the public.

The Department's approach toward optimizing project performance consists of the following initiatives:

- **Implementing a formal scoping process** –A strengthened approach to developing a detailed understanding of proposed projects earlier in the project development process. This approach establishes confidence in project baselines ([refer to Section xxxxx](#)). A well defined project baseline is critical for assessing and managing project risks and uncertainties. Please refer to *Project Development and Scoping Guidelines* located on the [Project Management Division's SharePoint Portal under Project Management Tools](#).
- **Implementing a standard cost estimating approach during the planning phase** - Reliable and realistic project cost estimates are critical to a successful project planning and development process. The Department created the Cost Estimating Wizard which is a parametric cost estimating system. The method uses the most influential bid items that have the predominant impact on the project cost. Please refer to *Cost Estimating Wizard* located at <http://www.nevadadot.com/divisions/802/programdevelopment/default.asp>
- **Implementing Project Management Standards** – An integrated, consistent, repeatable project management approach will improve efficiency in decision making, team communication, scope management, risk management, change management and issue resolution processes. The Project management process is based on the Plan-Do-Check-Act framework. Through this process, project baselines and performance is continually monitored and corrective actions are taken to optimize performance. Refer to Section 3.1 for additional information.

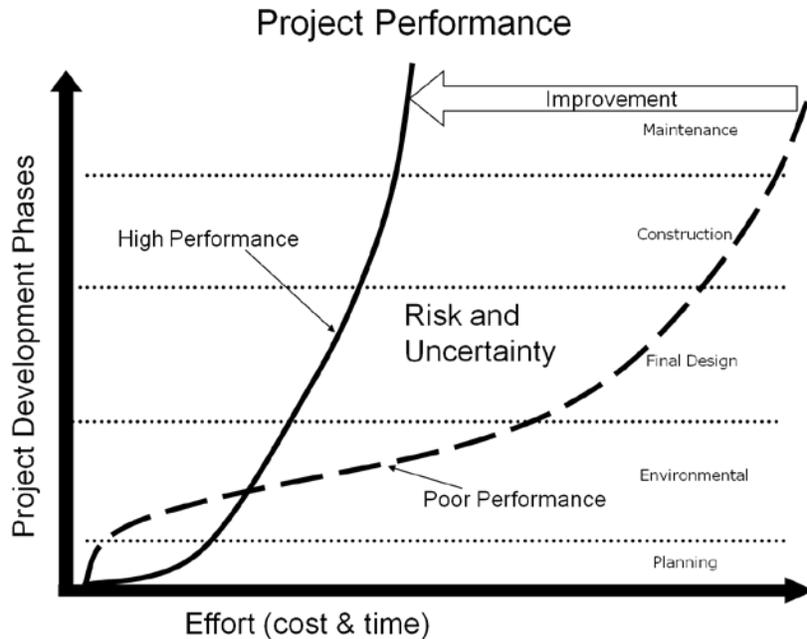


Figure 2

1.4. Project Baselines

Project baseline is defined as the anticipated schedule, cost and quality to deliver the project’s scope of work. This is based on available knowledge, experience, similar projects, available resources and does not include any consideration for unknowns. Adjusted project baselines include consideration for those unknowns as discussed in [Section 1.6](#). Adjusted values are determined through use of contingency factors or through risk analysis and are used to develop project allowances ([Section 1.7](#)).

Project baselines can successfully be defined through a multi-disciplinary approach that focuses on defining project scope, cost, schedule and quality process early during project development. The project baselines are then reassessed at major milestones and transition points. The *Project Development and Scoping Guidelines* identifies and recommends detailed project scoping be performed at three stages of project development with the input of the entire project team: project planning phase (Scoping Level I), Environmental Phase (Scoping Level II) and in the beginning of the Final Design Phase (Scoping Level III – also known as PDFS).

After conducting the scoping process and defining the project baselines, the project team should assess the impact of project related risks to the baselines.

1.4.1. Project Scope

Project scope (see project description –Section 3.4.1.1.) defines the purpose and need for the “product” or “outcome” that the project is intended to produce. However, project scope must be commensurate with the project knowledge, level of engineering and project uncertainties. For example, during the planning phase the project scope (description) should account for all

possible project outcomes and scenarios, e.g., enhance access and mobility within the I-15 corridor. During the final design phase, after project uncertainties and scenarios are addressed, the project scope (description) could become: widen northbound I-15 to improve traffic operations and safety.

Project team's scope of work (see Team's Mission Statement –Section 3.4.1.3.) identifies major activities, deliverables and milestones that must be performed to accomplish objectives of a project/project phase. The project cost and schedule estimates; and the quality process are established based on the scope of work.

Project scope should be defined at the end of the corridor/regional planning, and revisited at major project transition points (project planning to environmental, environmental to final design, etc.).

1.4.2. Project Schedule

Schedule is the anticipated length of time the project will take to develop and construct. The project manager, with the input of the project team, prepares a schedule to track project activities and deliverables for each phase of the project development. Project Schedule requires two primary inputs:

- A work breakdown structure which is a functional decomposition of the project tasks, and
- Task duration which is length of time to complete a project task.

For a complete list of work breakdown structure, task durations and deliverables for a Design-Bid-Build method of delivery (Environmental to end of Final Design), refer to the activity tables posted on the Project Scheduling and Management System (PSAMS) on NDOT SharePoint Site. To identify major milestones and deliverable list of innovative project delivery methods (Design Build, Unsolicited Proposals and Construction Manager/General Contractor) refer to NDOT's Pioneer Program Guidelines located on the [PM Division SharePoint Site at.....](#)

The primary input into a work breakdown structure is the project scope and team's scope of work. A work breakdown structure is created by breaking down the project into manageable components in terms of size, complexity and duration. Use the "work breakdown structure and deliverable list" spreadsheet to document project tasks and major deliverables. This spreadsheet is located on [PM Division SharePoint site under Project Management Tools](#). The intent of the spreadsheet is to assist project teams preparing work breakdown structure and also to create consistency in identifying project phases, tasks, etc.

Task duration estimate must be based on most likely length of time to accomplish that task. Depending on project needs and complexities, different methods can be used to account for risks and uncertainties associated with the tasks duration or project schedule. Two methods are presented in the PMG : a) applying buffers to project base schedule ([Section xxxx](#)), or b) performing risk analysis to determine the impact of risk to the project base schedule ([Section xxxx](#)).

At NDOT, the project schedule is typically prepared using Microsoft Office Project for the preconstruction phase and Primavera for the construction phase. For basic scheduling concepts and basic training on how to use MS Office Project (2003), refer to the [PM Division Share Point Site under Project Management Tools](#).

1.4.3. Project Budget

Budget is the anticipated cost of the project, including planning, environmental, preliminary design, final design, construction, and outsourcing costs. To ensure consistency with the STIP and Department's reporting requirements, separate budgets must be developed and tracked for project engineering, R/W, and construction. Engineering includes all costs from the start of planning to the end of final design (internal and consultants). R/W costs include appraisal, acquisition, relocation, demolition, engineering, legal, utility relocation, and railroad. Construction includes quantities, unit prices and construction engineering. To establish a budget, the project team must first define the project scope, team's scope of work and the project schedule.

1.4.3.1. Engineering and Consultant Budget

The project manager establishes a budget to cover and track internal and consultant costs for each phase of the project development. This budget must be developed with the input of the project team after establishing the scope of work. The project team uses the scope of work to develop a work breakdown structure (refer to Section 2.3.5) and identifies man-hour estimates for completion of each task. This estimate must be based on most likely level of effort to accomplish each task. Depending on project needs and complexities, different methods are used to account for risks and uncertainties associated with the project costs: a) applying a contingency factor to project base cost (Section xxxx), or b) performing risk analysis to determine the impact of risk to the project base costs (Section xxxx).

The "Project Man-Hour and Cost" spreadsheet, located on the [PM Division SharePoint site under Project Management Tools](#), is developed to assist the project team to prepare internal and consultant "base" man-hour estimates and budgets.

1.4.3.2. Right-of-Way and Construction Budget

The project team should use the "Cost Estimating Wizard" as a tool to develop project's base costs from planning phase up to 30% design. The project base costs must only include known project allowances (e.g., 10% for utilities relocation, 7% for construction engineering, etc.) and include no contingency factors for unknowns. After 30% design, the project "base" costs are based on known allowances, estimated quantities and unit prices. Depending on project needs and complexities, different methods are used to account for project risks and uncertainties associated with the project costs: a) applying a contingency factor to project base cost (Section xxxx), or b) performing risk analysis to determine the impact of risk to the project base costs (Section xxxx).

1.4.4. Project Quality

Quality projects conform to customer requirements. These requirements are embodied in the project's cost, scope, and schedule (which include technical standards). Projects developed, designed, and constructed in accordance with applicable policies, procedures and standards and delivered within the cost, scope, and schedule are quality projects.

Quality processes consist of two components, quality control (QC), and quality assurance (QA). QC includes regular checking and back-checking of the plans, specifications and estimate and

the processes required to ensure work from the various technical divisions and consultants is congruent. QA is the process of ensuring the QC plan has been followed and a further check that appropriate standards have been met. Responsibilities relevant to project quality are as follows:

- **Project Manager** - is responsible for the project quality process. The project manager must ensure that the project team has developed a quality control (QC) and quality assurance (QA) document. The project manager provides guidance and direction on the QA/QC plan, and ensures that the plan is implemented and executed properly.
- **Project Team** - is responsible for developing, implementing and executing the QA/QC plan. Unless a specific QA/QC is required or the project is consultant designed, the normal procedures within each division and section can be utilized.
- **Functional Divisions** - are responsible for the QA/QC of their technical contributions to the project.
- **Design Division**- On most projects, the Design Division is responsible for the cohesiveness of the plan set all the way to plan production. Design Division is also responsible for overall QA plan checks including adherence to standards.
- **QA Team (optional)** - On large, complex projects the department may have the need to assemble a QA team that will be responsible for the QA functions of the entire project. This may or may not replace normal procedures as outlined in the QA/QC plan.

The QA/QC plan is developed after the project/phase scope, schedule and cost is fully defined.

1.5. Project Management

The NDOT Project Management Guidelines (PMG) was developed to improve project delivery, improve team performance and to satisfy legislative mandated reporting requirements. The PMG defines a common approach for application of project management techniques that can be applied to all NDOT transportation projects. This structured approach will help project teams to think about project goals and risks; helps define, organize and plan their project; and guides project teams to monitor and control project performance from inception to completion.

However, project management is not just about procedures and techniques. Effective management is achieved by combining Project Management tools/techniques with sound application of PM principles.

1.5.1. Project Management Processes

For detailed information regarding project management processes, the reader is referred to “A Guide to the Project Management Body of Knowledge” published by the Project Management Institute.

The project management processes are divided into five groups (these are not project phases): Initiating Processes; Planning Processes; Executing Processes; Monitoring and Controlling Processes; and Closing Processes.

- **Initiating Processes:** Defines who is on the team and how and what they will contribute to completing the project or project phase.
- **Planning Processes:** The course of action required to attain the scope and objectives that the project was undertaken to address. The outcome of planning processes, along with the initiating processes, is the project management plan.
- **Executing Processes:** Obtains endorsement for the project management plan from the project team and upper management.
- **Monitoring and Controlling Processes:** Regularly measures and monitors progress to identify variances from the project management plan so that corrective action can be taken when necessary to meet project objectives.
- **Closing Processes:** Formalizes acceptance of the product, service or result and brings the project or a project phase to an orderly end.

The project manager uses the project management planning processes to develop the project management plan. The project management plan is the primary source of information for how the project will be planned, executed, monitored, controlled, and closed.

To standardize project management processes within the Department, project managers are required to prepare and upkeep a management plan for all their assigned projects. Project management plan [preparation guidelines](#) are included in Section 3.

1.5.2. Project Management Guiding Principles

Due to different project types and complexities, project management techniques and responsibilities should be tailored to the specific risks and opportunities of each project.

1. **Know your area of responsibility:** Understand and follow your role & responsibilities. Help others to understand how important everyone's role is in achieving the project's success.
2. **Prepare a project management plan to achieve the project goals and requirements:** Involve functional units, task owners and stakeholders in developing cost, scope, and schedule to ensure feasibility and buy-in. Do this in a group atmosphere. Ensure you have a reasonable and doable plan. Identify risks and plan actions to avoid, mitigate, monitor, and manage identified project risks.
3. **Establish functional and effective technical and stakeholder teams:** Establish healthy and productive technical and stakeholder teams to include:
 - a. Shared vision and goals.
 - b. Commitment through participation.
 - c. Clarity of team roles – establish clear ownership of tasks.
 - d. Clear, open and timely communications.
 - e. Trust among team members.
 - f. Timely feedback on issues.

- g. Effective leadership of the team.
4. **Track project, measure team's progress and communicate it widely:** Set project baselines and measures of progress and track them.
5. **Document and communicate important decisions and issues:** Provide regular progress reports to the Director's Office, Project Management Chief, functional managers, technical managers, technical staff and stakeholders.
6. **Be Proactive:** Apply these principles and solve problems effectively and in a timely manner. Exercise flexibility in the project approach and project plan based on new information. However, never lose sight of the project goals and objectives.
7. **Ensure Customer Satisfaction:** Pay attention to customer needs and requirements.
8. **Make Decisions:** Make decisions that are equitable and within your area of responsibility. Communicate the reason for tough decisions to your team widely. If necessary, follow the established [conflict resolution process](#).

1.5.3. Risk Management Process

Risk management is an integral part of project management process. The primary goal of risk management is to optimize project performance. By identifying project risks and anticipating potential problems early during project development, strategies can be implemented to manage project risks and thus improve project performance.

The risk management process consists of a series of steps which are applied at various times throughout project development. These steps consist of the following:

- **Structuring:** In this step the project "base" is adequately defined. The planned project scope, cost, schedule, and assumptions regarding project is defined and documented.
- **Risk Identification:** Risk and opportunities relative to the project "base" are identified with the input of the project team. This can be accomplished by following a "risk checklist" and/or through a brainstorming session. This list is maintained in a risk register and updated regularly as the project is developed.
- **Risk Assessment:** The relative severity of the risk (impacts to scope, budget, schedule, quality, etc.) is assessed and prioritized for management strategies.
- **Risk Analysis:** In this step the risk factors in conjunction with the base performance are used to determine total project performance. Typically, numerical models are used to calculate the total performance measure.
- **Risk Management Plan:** High priority risks are evaluated and strategies for risk management are developed. Adequate contingencies are established to account for residual risks.
- **Risk Management Implementation:** Involves implementing and monitoring progress of risk reduction activities as well as periodically reviewing and updating risks, risk management plan and established contingencies.

After project baselines are established, the PM with the input of the project team identifies, categorizes and documents all risks and opportunities that could impact the project's baselines (refer to Appendix B - summary of types or categories of risks). Risk assessment is then performed to adequately determine the significance of each risk (severity and consequence).

Risk analysis could be done qualitatively or quantitatively. **Qualitative Risk Analysis** assesses the impact and likelihood of the identified risks and develops prioritized lists of these risks for further analysis or direct mitigation. **Quantitative Risk Analysis** is numerical modeling of the probability that a project will meet its cost and time objectives. Quantitative analysis is based on a simultaneous evaluation of the impacts of all identified and quantified risks.

After risk assessment and analysis, the project team will identify actions in response to the project risks, concentrating on risks of most significance. Risk response actions may include: avoid, transfer, mitigate, share, exploit, enhance and accept. Strategies are then developed to implement the response actions.

1.5.4. Risk Management Planning

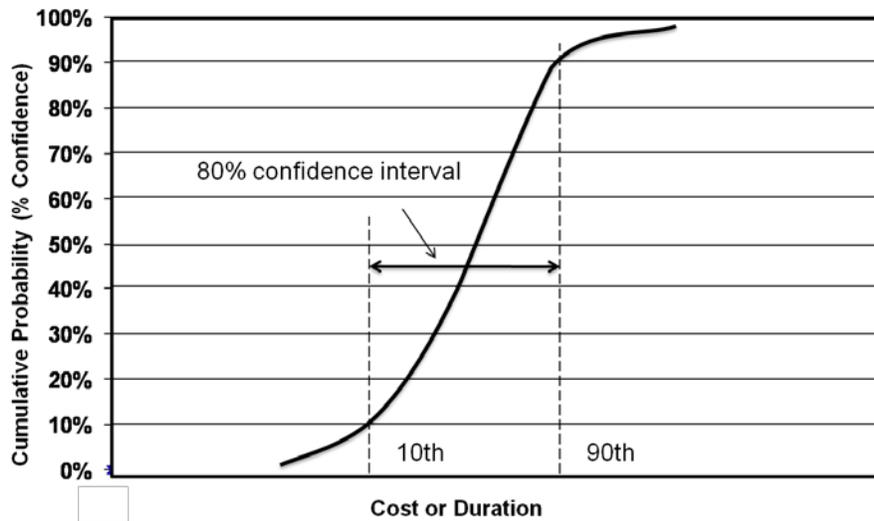
A risk management plan should be developed for all NDOT projects. In this section different tools are presented by reference that can be used to manage and analyze project risks. The project team should select and implement an appropriate method based on project needs and complexities.

- For projects up to \$100 million dollars, the "Risk Management Planning Spreadsheet", also known as risk register, should be used. This spreadsheet provides an easy way to identify, analyze, develop risk response and monitor and control the project risks. The spreadsheet uses **qualitative risk analysis** which provides a prioritized list of risks. The NDOT Management Planning Spreadsheet is posted on [PM Division's Sharepoint site under Project Management Tools](#).
- To perform **quantitative risk analysis** on projects up to \$100 million dollars, the project team should use the "NDOT Risk Tracking and Analysis Tool for Small and Medium Size Projects". This tool is located on the [PM Sharepoint site under Project Management Tools](#). The tool is designed to create and maintain a risk register and perform risk analysis on up to 24 major project risks. For **major projects** (>\$100 million) the project team is required to implement a facilitated probabilistic, risk based, integrated cost and schedule model. This approach is also known as Cost Estimate Validation Process (CEVP).
- For alternative delivery projects (Design-Build, Construction Management/General Contractor, etc.), with total estimated cost of up to \$100 million dollars, the project team should use the "**Guide for the Process of Managing Risk on Rapid Renewal Projects**". This tool is located on the [PM Sharepoint site under Project Management Tools](#).

When performing risk analysis, the project team must remove any conservatism and contingencies from project schedule and cost baselines. Conservatism and contingencies will be accounted for in the risk management process and in the adjusted project baselines.

Quantitative techniques using probabilistic models generate a probability distribution of project cost and schedule based on risk effects. The results are cost and schedule forecasts with a quantified confidence level (e.g., 70% probability of success), and a prioritized list of quantified

risks. The analysis should be conducted several times throughout project development typically after project scoping (level I, II & III).



Through risk management planning process, the project team identifies project risks/opportunities and develops actions to deal with individual risk/opportunity in order to optimize future project performance. Staff and resources are assigned to actionable items to deal with risks and opportunities. Through this process, the project team must develop strategies on how they will deal with each risk (what, when and how). Preferably the project team will avoid all the risks and concentrate on opportunities. If risk avoidance is not possible, the team should try to reduce the impact of risk.

1.6. Accounting for Risk in Project Cost and Schedule

Project baselines (Section 1.4) are established (predicted) based on available project knowledge. For example, engineering costs are developed based on anticipated scope, past experience and assumed delivery method; construction costs are developed based on an anticipated design, allocating allowances for known factors (e.g., 7% construction engineering), assumed quantities and unit costs; project schedule is developed based on an anticipated delivery method, probable milestones and past experience. However, as the project is developed, conditions may occur that will impact the base conditions for better (opportunities) or for worse (risks).

The traditional way of dealing with project unknowns is to establish contingency factors for cost and schedule. In this method, the project adjusted baseline is expressed as “base” plus “contingency”. The contingency value is based on judgment, experience and set of assumptions with unknown confidence. More often than not this method can under estimate and/or over estimate the actual scope, duration and cost.

Using risk analysis approach, the project adjusted baseline is defined as “base” plus “risk reserve”. In this approach the impact of individual risks are combined to determine project adjusted baseline based on a quantified confidence level (e.g., 70% probability of success). The risk reserve is the difference between the baseline and adjusted baseline.

The Department’s approach to account for risks in project cost and schedule consists of:

1. Develop the project base cost and schedule estimate during the scoping process.
2. For projects over \$25 million, develop and implement a risk management plan.
3. For projects up to \$100 million, account for identified project risks by establishing either a project contingency or a risk reserve.
4. For projects exceeding \$100 million, establish a risk reserve.
5. Manage the project to the base cost and base schedule.
6. Establish project controls to identify problems early and take corrective actions as necessary.

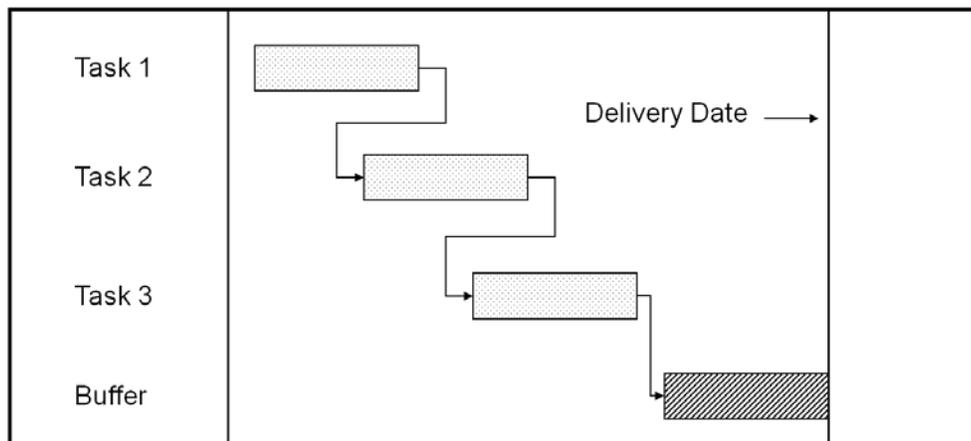
Contingencies/ risk reserve must be managed by the project manager and the project team to ensure it is not wasted and is used when it is needed. To minimize exhausting project contingencies/ risk reserve, project controls are established (Section xx) to ensure the project remains within the established cost and schedule. All efforts should be made by the project team to meet the established project base cost and schedule. Project teams *must not plan on using contingencies/ risk reserve* from onset of a project. It is the responsibility of the PM to keep track of contingencies/ risk reserve.

1.6.1. Schedule

To account for risk and uncertainties in project duration, a buffer can be established in the project schedule. The duration of the buffer is either estimated (contingency estimating), or is established through risk analysis (risk reserve). The buffer duration using contingency estimating is limited to a maximum of 30% of the base duration. The buffer duration (risk reserve) using risk analysis is the 85% confidence level minus the base duration. If the risk based buffer duration exceeds 30% of the base schedule, the project manager should seek approval of the Program Manager prior to finalizing the project schedule.

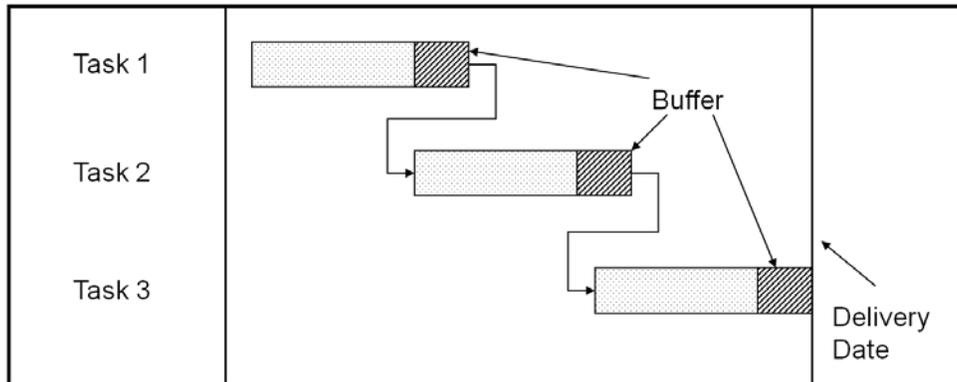
The project buffer is managed by the project team and allows the team to protect the project end date by managing risks associated with the schedule. The project team can add a buffer in the project schedule different ways:

1. In the project base schedule add the buffer as the last task of a project. Set up the buffer as lag duration between two tasks/milestones. Use a finish-to-start link with a lag for delays between tasks. For example the buffer can be added between 90% design and advertise date.



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PROJECT MANAGEMENT

2. Divide the project buffer and apply it to phases of a project to account for risks associated with that phase.



The buffer must be carefully managed to ensure it is not wasted and it is available when needed. The project buffer must be used when risks are realized. If a substantial portion of a buffer is used, to avoid depletion of the buffer, the project team must develop strategies to accelerate the remaining schedule. For example the project team may work overtime, add additional staff or hire consultants to complete the task.

TABLE 1 - PROJECT COST/BUDGET CONTINGENCY				
	PROJECT Phase			
RISK/UNCERTAINTY	Planning	Environmental	Final Design	Construction
High	+45%	+40%	+30%	+15%
Medium	+35%	+30%	+20%	+10%
Low	+25%	+20%	+10%	+3%

For external reporting, the project schedule is reported as a range (start – finish). “Start” is the actual start date of the project or a project phase. “Finish” is the anticipated completion date of the project/phase with buffer included. Refer to Section 4.4 for additional guidelines for reporting project schedule ranges.

1.6.2. Budget/Cost

For projects with estimated total cost up to \$100 million, the project team can account for risks by establishing a contingency or a risk reserve. For projects over \$100 million, a risk reserve must be established.

1.6.2.1. Contingency Approach

Follow these steps to establish a project budget with contingency:

1. Establish a base cost estimate that includes known project cost allowances.

2. Identify project risks and perform a qualitative risk analysis.
3. Select an appropriate contingency factor (Φ) from Table 1 to account for risks and uncertainties associated with the project and/or the project phase. Table 1 is meant to be used as a guide only, and contains an element of subjective assessment of risk and uncertainty. Use the table with judgment based on personal knowledge of project details and project team input.
4. Review the contingency factor with the program manager (the appropriate division head in charge of the program that the project is being funded, e.g., the project management chief for capacity improvement projects, the roadway design chief for 3R projects, the structures division chief for bridge rehabilitation projects, etc.) and/or the project sponsor.
5. The project cost is “base” cost plus contingency ($Base\ Cost + (Base\ Cost * \Phi)$).
6. Update the project cost at major project transition points (e.g., environmental to final design, final design to construction) and/or when a formal cost estimate review is conducted (e.g., 60%, 90% design).
7. The project cost range is reported as “base” cost for low estimate and base plus contingency for high estimate ($Base\ Cost + (Base\ Cost * \Phi)$).

As the project is developed and project risks are reduced, the contingency factor should also be reduced. For example the project team may decide to use a 45% contingency factor for establishing their budgets during the project planning phase due to high level of project uncertainties. During the environmental phase of the same project, they may decide to use a 30% factor since they have accounted for or addressed a number of risks associated with the project.

1.6.2.2. Risk Reserve Approach

Follow these steps to establish a budget with a risk reserve:

1. Establish a base cost estimate that includes known project cost allowances.
2. Identify project risks and perform a quantitative risk analysis.
3. The risk reserve is the 85th percentile minus the base cost estimate.
4. Review the risk reserve with the program manager.
5. The project adjusted base cost is the base cost plus the risk reserve.
6. Update the project adjusted base cost at major project transition points by conducting a formal cost estimate review and risk analysis.
7. The project cost range is reported as “base” cost for the low estimate and adjusted base for the high estimate.

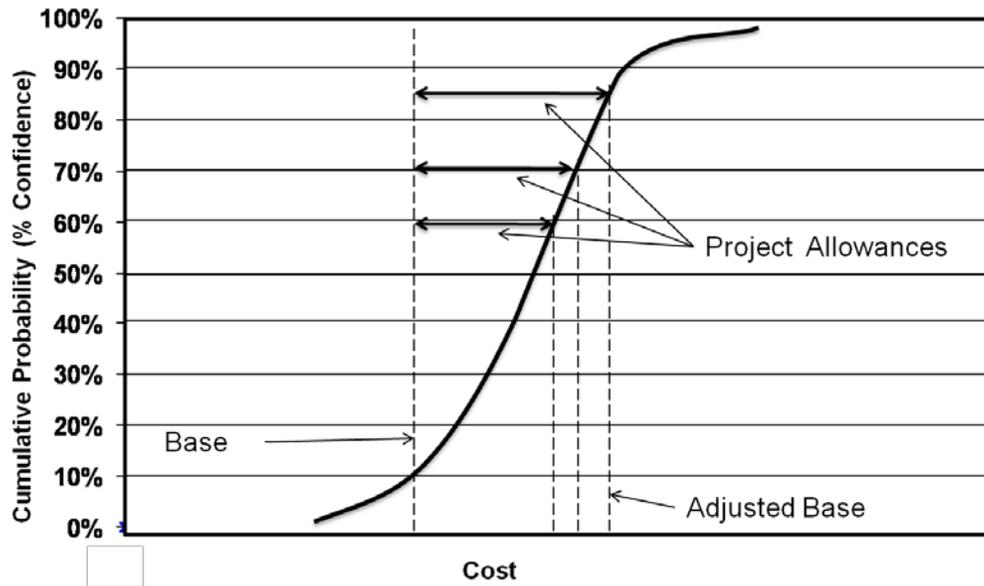
1.7. Project Controls - Allowances

Project controls are used to control/monitor usage of project contingency and/or risk reserve. Controls can be set as a percent of project contingency and/or risk reserve that can be utilized without prior approvals. At NDOT these controls are expressed as project allowances. Allowances provide flexibility to the project team in managing project risks and uncertainties. They can draw on project reserves to deal with realized risks without going through formal approval processes.

All efforts should be made by the project teams to deliver the project within established cost and schedule baseline. Project teams *must not plan on using project allowances* from onset of a project. They should avoid risks and concentrate on opportunities. If risk avoidance is not possible, the team should try to reduce the impact of risk.

Three controls (allowances) are defined and apply to all projects:

- **Project Team's Allowance:** Use of this allowance is at the discretion of the project team and the project manager.
- **Project Manager's Allowance:** Use of this allowance is at the discretion of the project manager and does not require the program manager's prior approval. The project team's allowance must be exhausted first prior to use of project manager's allowance.
- **Program Manager's Allowance:** Use of this allowance is at the discretion of the program manager and does not require the Director's Office's prior approval. The project team's allowance and the project manager's allowance must be exhausted first prior to use of program manager's allowance. The program manager's allowance is used to "program" the project and is reported for inclusion in the STIP. For cost and/or schedule increases exceeding the program manager's allowance, the program manager must follow NDOT's formal change management process (scope, budget, schedule change form) and seek approval of the Director's Office.



Allowances for Contingency Based Schedule:

- Project Team’s allowance: Base Schedule Duration * 0.15
- Project Manager’s allowance: Base Schedule Duration * 0.20
- Program Manager’s allowance: Base Schedule Duration * 0.30

Allowances for Risk Based Schedule:

- The Project Team’s allowance: base duration minus 60% confidence level.
- The Project Manager’s allowance: base duration minus 70% confidence level.
- The Program Manager’s allowance: base duration minus 85% confidence level.

Allowances for Contingency Based Budget:

- Project Team’s allowance: (0.60 * Contingency)
- Project Manager’s allowance: (0.10 * Contingency)
- Program Manager’s allowance: (0.15 * Contingency)

Allowances for Risk Based Budget:

- The Project Team’s Budget is set at 60% confidence level.
- The Project Manager’s allowance is set at 70% confidence level.
- The Program Manager’s allowance is set at 85% confidence level.

1.8. Project Team Operating Guidelines

This section defines the minimum standards on how project teams will govern themselves. The team may develop some or all of the following guidelines:

1.8.1. Accountability

The process of team members holding each other accountable for meeting the work performance expectations required of each team member to successfully fulfill their respective roles and responsibilities. [Organizational level](#) authority, roles, responsibilities and accountability of project team members are identified in Section 2.

Accountability in the balanced matrix organizational model is primarily accomplished through direct communication of the affected team members, to address the issues when expectations are not being fulfilled. When such direct communications do not adequately resolve the situation, the matter is addressed by the individuals involved through the respective organizational chains of command.

1.8.2. Work Performance Evaluation

The technical staff on the project team is responsible to both their technical manager and the project manager, and likewise the project manager is responsible to their team members and their direct supervisors. To ensure that work performance evaluations are an accurate reflection of performance, it is essential that the functional managers of the project managers and technical staff get the proper input. The process for work performance evaluations shall be as follows:

Project Managers: The functional manager shall request input from the project teams for each project manager when a performance evaluation is due. The exact manner in which this is accomplished will be left to the discretion of the functional manager, but the use of standardized performance evaluation input forms is encouraged. This input shall be used, to the extent deemed appropriate by the functional manager, in evaluating the performance of the project manager.

Technical Staff: The functional/technical manager shall request input from the other members of the project teams and the project manager when a performance evaluation is due. The exact manner in which this is accomplished will be left to the discretion of the functional/technical manager, but the use of standardized performance evaluation input forms is encouraged. This input shall be used, to the extent deemed appropriate by the functional/technical manager, in evaluating the performance of the technical staff member.

1.8.3. Issue Resolution Process

The purpose of this section is to outline the Project Issue Resolution Process (PIRP). The PIRP is intended to be used to resolve issues between functional divisions, between in-house technical staff and consultant staff and/or between functional divisions and the project manager. The project manager should always be included in the PIRP regarding any issue when the cost, scope, schedule and/or quality (CSSQ) are expected to be affected regardless of the level the issue has reached. All Level 2 and higher issues must be documented, and the project manager should track the issue resolution documentation. Issues should be resolved within the timeframe agreed upon in the project management plan. If necessary, level 1 and level 2 issues will be included in the project meeting minutes. The meeting minutes will contain action items for the resolution of issues within the project team according to the project management plan.

1.8.3.1. Level 1 - Technical Issues

Level 1 of the PIRP is the lowest level and generally takes place between functional units and/or with consultant staff. Discussions between affected parties should commence immediately once an issue is discovered and the issue should be resolved according to the project management plan. Most issues can and should be resolved at this level and generally without input from the project manager.

1.8.3.2. Level 2- Cost, Scope, Schedule, Quality, and Contractual Issues

Level 2 is intended to resolve issues elevated from Level 1 because of potential cost, scope, schedule, quality and/or contractual (local agency, consultants, etc.) issues. The project manager will be contacted and asked for an opinion on the issue and proposed resolution. If the project manager agrees with the proposed resolution no further action is necessary. If the project manager does not agree or proposes a different solution due to CSSQ and contractual issues, discussions should commence immediately and the issue resolved according to the project management plan or referred to Level 3, if necessary.

1.8.3.3. Level 3 - Technical, Cost, Scope, Schedule and Quality, and Contractual Issues

Level 3 shall be utilized upon failure to resolve an issue among project team members. At this level the project manager shall be informed of the issue and will take an active role in coordinating a resolution. Functional managers (Assistant Division Head, Division Head, etc. as per division procedures) from the respective functional units will communicate directly and in cases where CSSQ is affected the project manager will take part in those communications. The recommended time frame to resolve critical issues for this level is three days. If a functional manager is not available during the three day timeframe, the issue should be moved up to Level 4.

1.8.3.4. Level 4 - Policy Issues

Level 4 of the PIRP is the last step and generally should only be used in those cases when Departmental policy or questions of legality are concerned or staffs associated with Level 3 resolution are not available. In those rare instances when an issue cannot be resolved by the respective divisions at the division head level, issues may be elevated to the appropriate assistant director or directors if the issue is between divisions not under a single assistant director. The project manager will coordinate a resolution and make the assistant director(s) aware of any CSSQ concerns. If a resolution cannot be reached between two assistant directors or a departmental policy is involved, then the Director or Deputy Director may be asked to participate in the resolution. If a legal matter is at the core of the issue, the Assistant Attorney General may review the matter and render a recommendation. The recommended timeframe for this level is 1 week. In the event an assistant director is unavailable, the Director or Deputy Director can be involved, but generally only in matters that require immediate attention.

1.8.4. Team Meetings

The following sections are a guide only and are intended to “standardize” the way the Project Managers conduct and document team meetings. It is recognized that most meetings will not

include all of these topics. Team meeting frequency is developed and set as part of the project 's operation plan.

1.8.4.1. Meeting Preparation

The following steps should be followed prior to each meeting:

1. Prepare and distribute the meeting agenda three to five days prior to the meeting date. The meeting agenda should include a summary of the meeting goals/objectives and previous action items.
2. If team members are in Las Vegas, schedule a video-conference or tele-conference if possible.
3. Consider one-on-one meetings with functional units and stakeholders to coordinate and/or resolve complicated issues prior to the team meeting.
4. Bring audio/visual tools. Record the meeting if necessary.
5. Bring a copy of the action items from the last meeting.

1.8.4.2. Typical Meeting Agenda

Meeting agenda should include the following topics. Use the meeting agenda template on the Project Management SharePoint portal.

1. Introductions
2. Meeting goals/objectives
3. Overall project status report (Project Management Division)
 - a. Status of project
 - b. Update since last meeting
 - i. Progress
 - ii. Changes
 - c. Progress needed
 - d. Current schedule
 - e. Current cost estimate
4. Functional units status reports
 - a. Current tasks/goals and % complete
 - b. Information supplied
 - c. Information needed and required date
 - d. How is the schedule?
 - e. Any problems/risks?
 - f. Proposed solutions?

- g. Summarize risks, solutions and establish resolution plan
- 5. Action items
 - a. Status of last meeting's items
 - b. Summary of new items
- 6. Next meeting

1.8.4.3. Meeting Notes

Meeting notes are critical. The preparation and distribution of meeting notes is the responsibility of the Project Manager. Meeting notes should be a complete summary of what was discussed, agreed upon, etc. Try to avoid "he said, she said" type of comments and instead focus on the outcome and action items. The minutes should be distributed in a timely manner (2-3 days). Insert an action items status, with dates, responsible party, etc. Use the meeting Agenda and notes templates posted on the [Project Management SharePoint site under Project Management Tools](#).

Section 2

2. Roles and Responsibilities of Project Teams

2.1. Introduction

Project management involves planning, coordinating, tracking, and controlling all aspects of projects from inception through close out. Project management responsibilities include coordination and decision making necessary to advance a project.

The intent of this section is to provide the project teams with general instructions on their roles in managing, coordination, decision making and advancing projects within the context of a matrix organization.

2.2. The Project Team

The Project Team consists of Department's technical staff and consultants performing technical tasks in support of achieving the project objectives. The project team may include:

- Project Development Committee.
- A Project Manager or a Project Management Team.
- A Project Phase Lead.
- Functional Managers.
- Technical Managers.
- Technical Staff.
- Consultants.

The project manager leads the project team to achieve project goals, manage risks and opportunities, and resolve issues. *Project's technical managers, technical staff and consultants report to the project manager on all project related issues and tasks.*

2.2.1. Project Development Committee

The Project Development Committee (PDC) consists of the assistant director of engineering, planning, operations, and administration.

The Committee Produces:

- Standards for project development processes within the context of a matrix organization.
- Amendments to this section.

The Committee Is Accountable For:

- Providing leadership across the Department to ensure project teams are functioning within the context of a matrix organization.

The Committee Has Authority For:

- Holding the functional unit managers, project managers, and project teams accountable for project delivery.

- Revising programs and projects priorities.
- Resolving issues between functional units.

2.2.2. Project Management Chief

The Project Management Chief is responsible for leading project managers, the Pioneer Program, risk assessment, and managing projects assigned to the Project Management Division as a program.

The Project Management Chief Produces:

- Project Management Division's program goals, objectives, schedules, budget, and project listings.
- Division's program status and evaluation reports.
- Division's policies and procedures.
- Standards for development of the project management plan.

The Project Management Chief Is Accountable For:

- Negotiating and accomplishing the division's program goals within department's allocations.
- Monitoring and evaluating the division's program management process.
- Ensuring effective communication between project stakeholders, team-members, and project managers.
- Keeping the division's program current and in line with the Department's financial goals.
- Providing leadership and coordination across the program continuously to ensure program goals are being met.

The Project Management Chief Has Authority for:

- Managing the division's program.
- Approving and prioritizing projects during all production phases.
- Approval of project management plans.
- Assuring transfer of information from functional unit manager to functional unit manager across functional areas.

2.2.3. Project Managers

A Senior Project Manager (SPM), a Project Manager (PM) or a Project Management Team (PMT) will be assigned to all projects depending on their size, complexity, and level of risk. The project management team may consist of a senior project manager and one or more project managers.

All senior project managers are located within the Project Management Division. A project manager may be located within the Project Management Division or within other functional units. Typically technical managers within functional units are assigned project management

duties. Project Managers located within functional units other than the Project Management Division report to the functional managers for their activities related to the functional units operations, and to the Project Management Chief for their project status reporting.

Senior project managers and project managers have similar roles, responsibilities and duties with following distinctions:

- A senior project manager is assigned and leads major, complex and/or high risk projects.
- A project manager is assigned and leads other projects. They may also support senior project managers in their project management duties and tasks.

Project managers plan, monitor, coordinate, and evaluate project activities from the project initiation through post-construction review. Project management is their major activity and they are generally assigned several projects.

Throughout the project development process, the project manager monitors the progress of project development to ensure it is in accordance with the project management plan. The project manager is responsible for coordinating and communicating with the project team.

The Project Manager Produces:

- Projects that meet cost, scope, schedule, and quality requirements.
- Project management plans.
- Inter-local and Consultant Agreements.
- Project Status reports.

The Project Manager Is Accountable For:

- Overseeing project scoping and development planning.
- Monitoring, evaluating, and reporting the progress of a project.
- Ensuring the project team is well-organized and working well.
- Early identification and resolution of problems and issues.
- Identifying and managing project risks.
- Conducting regular project status and design reviews.
- Coordinating and communicating among project customers and technical teams.
- Managing the project to attain the project goals and achieve customers' satisfaction.
- Public and Stakeholder coordination involvement.
- Reporting project status to the Project Management Chief and the project team.
- Maintaining project files and records.

The Project Manager Has Authority For:

- Resolving and/or elevating project issues.
- Managing the project within the established cost, scope, schedule, and quality requirements.

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- To negotiate technical resource needs.
- Timely resolution of conflicts.
- Consultant procurement and negotiation.
- Providing input for evaluation of team members' performance.

2.2.4. Project Phase Lead

Project phase lead sets goals and objectives for a phase of a project development. They set milestones, quality standards and identify work products to be produced for a project phase.

The Project Lead Produces:

- Strategies for achieving goals and objectives of a project development phase.
- Project phase management plans.
- Status reports.

The Project Lead is Accountable For:

- Identifying and managing project phase risks and opportunities.
- Coordinating and communicating among project team and stockholders.
- Leading the project phase to attain the project goals and achieve customers' satisfaction.
- Stakeholder coordination during a project phase.
- Maintaining project files and records.
- Serving as an active member of the project team.

The Project Lead has the Authority For:

- Resolving and/or elevating project phase issues.
- Timely resolution of conflicts.
- Consultant procurement and negotiation.
- Setting and monitoring quality standards for a project phase.

2.2.5. Functional Managers

The Department's functional areas include a wide array of planning, engineering, administrative, contracting, construction management, and maintenance activities.

Functional managers are District Engineers, Division Heads and Section Heads within the Department. Their responsibilities include setting statewide functional policies, procedures, and standards; providing technical support; and providing quality assurance for their functional area. Quality assurance activities include project reviews, continuous evaluation and update of policies, procedures, and standards and assurance of compliance with those policies, procedures, and standards. Responsibilities also may include overseeing Federal or State programs and their related projects.

The Functional Manager Produces:

- Completed technical tasks within the project's cost, scope, schedule and quality requirements.
- Technical task production audits and evaluations for quality assurance (and quality control when appropriate) within their functional specialty.
- Timely and thorough reviews when requested.
- Project status reports.

The Functional Manager Is Accountable For:

- Optimum use of functional area resources (staff, equipment, and consultants).
- Leading the production of project tasks as identified in the project management plan.
- Maintaining quality of functional area products and processes.
- Providing functional area's assistance in project scoping, design, and construction.

The Functional Manager Has Authority For:

- Planning, allocating, and controlling functional resources.
- Committing technical task production resources to projects.
- Monitoring and auditing technical task production.
- Design exceptions and technical approvals.
- Leading functional area technical managers and technical experts.
- Developing and enforcing quality control and quality assurance procedures.

2.2.6. Technical Managers

A technical manager in a functional area is responsible for producing a technical portion of a project, either directly or through consultant services. The technical manager will do the planning, arranging, and coordinating work necessary to ensure the production of their Division's portion of work. Although technical managers work closely with project managers, their direct supervision comes from their functional manager.

Technical managers are expected to report the status of their work on a regular basis to the project manager. The information reported should reflect work accomplishments, work in progress, work plans for the next period, current issues, any help needed, work acceleration opportunities, and any work delivery challenges.

The Technical Manager Produces:

- Plans for technical tasks within project cost, scope, schedule, quality, and resource needs.
- Complete technical tasks as identified in the project management plan.
- Technical tasks status reports.

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- Information and assistance to the project manager for scoping projects.

The Technical Manager Is Accountable For:

- Cost, scope, schedule, and quality associated with the technical tasks.
- Professional/technical quality of work consistent with applicable policies, procedures, and standards.
- Adequate and timely notice to functional and project managers of any necessary changes to project cost, scope, schedule, and quality.
- Coordinating with the project team.
- Acquiring, managing, and coordinating consultant activities within their area of responsibility.
- Serving as an active member of the project team.

The Technical Manager Has Authority For:

- Negotiating and developing cost, scope, and schedule for projects.
- Technical and administrative decisions to accomplish technical tasks as identified in the project management plan.
- Providing input into evaluation of the project manager's performance.
- Assigning technical staff to the project team.

2.2.7. Technical Staff

The technical staff in a functional area is responsible for performing technical aspects of a project task. They also coordinate their project activities with the activities of other technical staff within other functional units and technical managers. Technical staff is expected to report the status of their work to the technical manager. The information reported should reflect work accomplishments, work in progress, work plans for the next period, current issues, any resources needed, work acceleration opportunities, and any work delivery threats. Technical staff can be authorized to perform the technical manager's project responsibilities in addition to their technical duties.

The Technical Staff Produces:

- Technical tasks completed based on established policy, procedures, standards, and as identified in the project management plan.
- Technical tasks status reports.
- Information and assistance to technical managers for scoping projects.

The Technical Staff Is Accountable For:

- Technical task's cost, scope, and schedule.
- Professional/technical quality of work consistent with applicable policies, procedures, and standards.
- Adequate and timely notice to technical and project managers of any necessary changes to project cost, scope, schedule, and quality.

- Assuring transfer of information from technical staff to technical staff across functional areas.
- Reviewing and coordinating consultants work.

The Technical Staff Has Authority For:

- Technical decisions to accomplish technical tasks as identified in the project management plan.

2.2.8. Consultants

Consultants provide technical expertise to the Department. They are responsible for performing technical aspects of a project task(s). They report the status of, and coordinate their task production activities/issues directly with the Department's project and technical managers when appropriate.

The Consultant Produces:

- Technical recommendations and solutions.
- Technical task(s), plans, and reports completed based upon established policy, procedures, standards, and as identified in the project management plan within the requirements of the consultant agreement.
- Technical task(s) status reports.
- Information and assistance to technical managers and project managers for scoping projects.
- Cost, schedule, and professional services estimates.

The Consultant Is Accountable For:

- Technical task's cost, scope, and schedule.
- Professional/technical quality of work consistent with applicable Departmental policies, procedures, and standards, and/or quality standards negotiated in the consultant agreement.
- Adequate and timely notice to technical and project managers of any necessary changes to project cost, scope, schedule, and quality, and changes to the consultant agreement.
- Assuring transfer of information from technical managers/staff to technical managers/staff across Department's functional areas.
- Compliance with all terms of the consultant agreement.

The Consultant Has Authority For:

- Technical decisions to accomplish technical task(s) within agreed upon consultant agreement.
- Developing and negotiating cost, scope, and schedule for technical task(s), plans, and reports production.

2.3. Roles and Responsibilities as Related to Project Development Phase and Delivery Method

NDOT's project development process typically consists of four major phases: planning, environmental studies, final design, and construction. These phases are not entirely distinct from each other. Many aspects overlap into other phases to ensure a well developed and executed project. This project development process is primarily based on federal and state laws and regulations, engineering requirements, and an internal NDOT review and approval process.

Project delivery is a process for organizing and financing design, construction, and maintenance of a transportation project.

This section provides a brief overview of the project development and delivery processes, and further defines roles/responsibilities of project teams as related to these processes.

2.3.1. Typical Transportation Project Development Process

2.3.1.1. Planning Phase

In this phase the project needs are analyzed and conceptual solutions are developed. Project descriptions, costs, and schedules are broadly defined. The planning phase typically addresses such issues as number of lanes, location and length of project, and general interchange and intersection spacing. The intent of this phase is to develop reasonable and feasible design alternatives, and to identify the best means to address risk and uncertainties in cost, scope, and schedule. Please refer to NDOT's Project Development and Scoping Guidelines for detailed information regarding "Project Development Checklist", Linking Planning & NEPA, and the Scoping process.

2.3.1.2. Environmental Studies Phase

Projects that require federal approval, change of access control on an access-controlled highway, or use federal funding are subject to the National Environmental Policy Act (NEPA) to address potential social, environmental, economic, and political issues. During this phase studies are conducted to define existing conditions, and identify likely impacts and mitigations resulting in the preferred design alternative being selected from among the various alternatives. In this phase the project scope is fully defined, preliminary designs are refined, right-of-way issues are identified, project costs and benefits are estimated, and risks are broadly defined. Finally, a preliminary project schedule is determined. At the conclusion of this phase, major projects are divided into smaller construction segments to address the project's social, environmental, economic and political issues as well as funding availability and constructability.

2.3.1.3. Final Design Phase

During this phase, the design of the selected alternative identified during the environmental studies phase is finalized. In this phase the project scope is finalized, detailed project design schedule and cost estimates are developed, and project benefits are fully determined. The right-of-way requirements are also determined and acquisition is initiated. Additionally, utilities relocation is initiated toward the end of this phase. At the end of this phase the project design and cost estimate are completed and the project is advertised for construction.

2.3.1.4. Construction Phase

During this phase projects are constructed based on the final design plans. Depending on the nature of the project, utilities relocation may occur during early stages of this phase. Typically, a detailed construction schedule, traffic control plans (traffic management plan for major projects), and environmental mitigation strategies are developed in consultation with the selected contractor.

2.3.2. Project Team's Responsibilities and Authority

The project team's authority and responsibilities vary depending on project delivery method and stage of project development. The intent of this section is to clarify these variations. Also, guidelines are provided for the project manager to establish project budget, schedule and scope.

For all project delivery methods, with the exception of the Design-Bid-Build, the project manager authority is as defined in Section 2.2.3. The project manager carries this authority from project inception (after completion of the planning phase) until transfer of the project to maintenance.

2.3.2.1. Project Team

Project teams typically consist of a project phase lead, project manager, core and support participants.

Project Phase Lead sets milestones, quality standards and identifies work products to be produced for a project phase. For example planning division is the project phase lead during the planning phase and construction division is the lead for the construction phase.

Project Manager manages the project within the established requirements in the Project Management Guidelines and developed by the project team, both core and support participants.

Core participants include Department's technical staffs that are directly involved in planning, designing, improving, constructing, and maintaining transportation infrastructure. These individuals work with the project manager to develop project scope, budget, costs, schedule, communication; reporting and quality requirements that meets project sponsor's expectations.

Support participants are Department staff that are involved in tasks and/or activities that sustain NDOT as a business and whose involvement in the project process is limited in time or scope. They ensure: Department operational activities are in support of project delivery and the project team can meet their objectives; and the project Core Participants and the project manager have the necessary tools to deliver a high quality project. Examples would include Information Services Technicians whose limited involvement would be establishing networks or computers.

2.3.2.2. Project Development - Planning Phase

This phase typically consists of two sub-phases: Systems/Corridor planning; and the planning level scoping process.

Systems/Corridor Planning

Planning division is the project lead during systems/corridor planning sub-phase. They control the scope, budget, and schedule of project activities in this sub-phase. As necessary they will form and manage a project team to assist them with their activities. The project manager, if assigned, acts as an advisor to the planning division. The project participants and the project manager assist the planning division to refine the purpose and need of the project, and develop a rough estimate of project options, costs, and schedule ranges.

Scoping Process

At the end of the systems/corridor planning phase (typically completion of the corridor study and beginning of the Environmental Study Phase), the project manager becomes the project lead. The PM will:

- Form a scoping team.
- Establishes a budget for the scoping process with the input of the team.
- Tracks project costs.
- Updates the project management plan from the planning phase.
- The team follows the Project Development and Scoping Guidelines to establish the project scope, cost, schedule, budget and resource needs.
- Works with the project team to identify funding sources for the project.

Project Team's Authority & Responsibilities

During the system/corridor planning sub-phase the project team resolves technical issues and refines project options, costs and schedule ranges.

During the scoping process the project team refines the project scope options, costs, and schedule ranges to establish a schedule and budget for the next phase of project development.

For both sub-phases, team members are responsible to report status of their tasks to the planning division project lead and the project manager as per the project management plan.

Project Manager's Authority & Responsibilities

During the system/corridor planning the project manager supports the planning division's activities. During the scoping process the project manager can approve scope, budget and schedule changes that do not impact the purpose and need of the project; supports commitments made during the system/corridor planning sub-phase; and is within his/her budget and schedule authority.

Project Lead's Authority & Responsibilities

The planning division project lead is responsible for: preparing a project management plan for system/corridor planning phase and project reporting.

2.3.2.3. *Project Development - Environmental Phase*

The project manager is the project lead. The following are typical steps the project manager should take during this phase:

- Form the project team.
- Program the project.
- Update the project management plan.
- If necessary procure consultants to supplement internal resources.
- Initiate agreements.
- With the input of the project team performs: Value Engineering/analysis, Cost Estimate Validation Process, Risk Analysis and Constructability review.
- Evaluate innovative contracting options.

Project Team's Authority & Responsibilities

The team has the authority to make technical decisions that are within the established project scope, budget, schedule and quality requirement; doesn't impact the purpose and need of the project, and supports commitments made during the planning phase.

Team members are responsible to report status of their tasks to the project manager and functional managers as per the project management plan.

Project Manager's Authority & Responsibilities

Project manager can approve scope, budget and schedule changes that does not impact the purpose and need of the project; supports commitments made during the planning phase; and is within his/her budget and schedule authority.

The project manager ensures that the project team updates the quality control (QC) and quality assurance (QA) document for this phase. The project manager provides guidance and direction on the QA/QC plan, and ensures that the plan is implemented and executed.

2.3.2.4. *Project Development - Final Design Phase*

The project manager continues to be the project lead. Regardless of the project delivery method the project manager should follow these steps:

1. Follows appropriate procedures for the selected delivery method.
2. Programs the project.
3. Updates the project management plan.
4. If necessary procures consultants to supplement internal resources.
5. Executes agreements.
6. With the input of the project team performs: Value Engineering/analysis, Cost Estimate Validation Process, Risk Analysis and Constructability review.

Project Team's Authority & Responsibilities

The team has the authority to make technical decisions that are: within the established project scope, budget, schedule and quality requirement; doesn't impact the purpose and need of the project, and supports commitments made during the planning and environmental phases.

Team members are responsible for reporting the status of their tasks to the project manager and functional managers as per the project management plan.

Project Manager's Authority & Responsibilities

Project manager can approve scope, budget and schedule changes that does not impact the purpose and need of the project; follows the requirements of the environmental document; supports commitments made during the planning and environmental phases; and is within his/her budget and schedule.

The project manager updates the quality control (QC) and quality assurance (QA) document for this phase. The project manager provides guidance and direction on the QA/QC plan, and ensures that the plan is implemented and executed.

2.3.2.5. Project Development - Construction Phase

For all project delivery methods, with the exception of the Design-Bid-Build, the project manager is the project lead. The project manager controls the project scope, budget, schedule and quality as outlined in these guidelines and further defined in Section 2.3.3.6 (project controls). The following defines authority and responsibilities for only Design-Bid-Build method of delivery.

Conventional Design-Bid-Build Construction Contracts

The majority of projects developed by the Department will be completed by conventional design-bid-build construction Contracts. Responsibility for the successful completion of a conventional construction contracts is transferred from the Engineering Project Manager to the Construction Project Manager (Resident Engineer) when the Contract is awarded to the Contractor. Responsibility for successful completion include maintaining project scope, construction budget, schedule and assuring quality defined by the Contract documents, the Construction Division's Construction Manual and current Policies and Procedures.

Resident Engineer's Authority & Responsibilities

The Resident Engineer is in immediate charge of the project within the authority and responsibilities as outlined below:

- Administrates the contract.
- Supervise the project construction acceptance Inspection and Testing staff and program.
- Documentation of construction quality control.
- Assures project construction quality.
- Facilitates review of required construction submittals by technical Divisions, Consultants or other agencies.

- Approval of contract required construction submittals except for Requests for Sublet, Subcontracts, Request to Utilize Service Provider and Water Well Waivers.
- Initiates Contract Change Orders relating to construction specification and site conditions; establishment of negotiated agreed unit prices for required items not contained in the original contract; and acceptance of material or work not conforming to contract requirements or as directed by the Chief Construction Engineer.
- Prepares, negotiates and recommends approval of all Contract Change Orders. Obtains Contractor signature and approval recommendations from the District Engineer, Engineering Project Manager, Technical Divisions as appropriate, and the Chief Construction Engineer
- Executes Letters of Authorizations for incidental construction work not included in the original Contract.
- Review and approval of the Preliminary Progress schedule and monthly updates.
- Approval of contractor payments.
- Monitors NEPA compliance.
- Monitor affirmative action and labor compliance.
- Reports project progress.
- Coordinate and update the Project Manager on construction progress, costs, conflicts, changes or other issues on a regular basis.
- Declares project completion and recommends acceptance to the District Engineer.

Project Manager's Authority & Responsibilities

- Reviews and recommends approval of all contract change orders.
- Requests Contract change orders for design, control of access revisions or overall project scope changes to the Chief Construction Engineer.
- Supports the Resident Engineer in public outreach efforts.
- Monitors compliance with environmental, design, and right-of-way commitments. Informs the Resident Engineer of non-compliance of commitments.
- Responsible for overall design quality.
- Provide guidance on design intent and stakeholder commitments to the Resident Engineer.
- Manages technical support for design related changes.
- Manages design of project scope changes.
- Monitors project costs.
- Monitors project schedule.
- Assists in coordination with project stakeholders.
- Preparation of Inter-local/Cooperative agreements.

Project Team's Authority & Responsibilities

Project team provides technical support to the Resident Engineer and the Engineering Project Manager.

Design-Build Construction Contracts

Responsibility for the successful completion of a design-build construction Contract is maintained by the Project Manager. The project manager is the direct representative of the Director of the Department of Transportation on design-build Contracts. Responsibility for successful completion includes maintaining project scope, design and construction budgets, schedules and assuring quality defined by the Contract documents and Department policies as outlined in this guideline and further defined in Section 2.3.3.6 (project controls).

Project Manager's Authority & Responsibilities

Project Manager can approve scope, budget and schedule changes in accordance with Department policies. They can also interpret the terms of the Contract on the Director's behalf. The Project Manager's responsibilities include those items listed above under conventional design-bid-build construction contracts for the Engineering and Construction Project Managers. The authority to implement Contract changes impacting construction operations at the project level will generally follow the same requirements and funding commitment limitations as on conventional Contracts and as described in the Construction Division's Construction manual.

Project Team's Authority & Responsibilities

The Project Team will include a Design Compliance Engineer and a Construction Compliance Engineer to supervise and manage the efforts the Design Compliance and Construction Compliance Monitors during the life of the design-build Contract. The team has the authority to make technical decisions, as provided by the Project Manager that are within the established project scope, budget, and schedule and quality requirement; doesn't impact the purpose and need of the project, and supports commitments made during the planning, environmental and final design phases.

Team members are responsible to report status of their tasks to their respective Compliance Engineer, Project Manager and functional managers as per the project management plan.

Section 3

3. Project Management Plan Guidelines

The project management plan is the primary source of information for how the project will be planned, executed, monitored, controlled, and closed. It is the responsibility of the project manager to prepare and update the project management plan in collaboration with the project team.

The project management plan defines the activities and processes that the project team will follow to meet the project goals. A project management plan does not replace NDOT's policies and formal processes. For example, a project team may develop and put into practice a project specific change management plan that defines individual responsibilities to report change. Such a process will complement (not replace) NDOT's formal process for change management (Scope, Budget, and Schedule Change Form).

The following sections provide project management practices that apply to most NDOT projects and, when applied, will enhance the chance of the project's success. The project team should decide on the level of thoroughness of each practice.

3.1. Project Management Processes

Project Management Processes are a set of interrelated activities that are performed by the project manager and project team to deliver a project or a project phase. These activities typically overlap, interact and are iterative. Project management processes can be divided into five groups: initiating, planning, executing, monitoring/controlling and closing.

The underlying concept for these processes is the Plan-Do-Check-Act framework: Plan what we are going to do, Do what we planned for, Check if we met our expectations, and Act on things that need to be changed. The project management planning processes correspond to the "plan" component. The executing processes correspond to the "do" component and the monitoring and controlling processes correspond to the "check and act" components. The initiating and closing processes are used to start and close a project or a project phase.

Please note that Project Management Processes are independent of Project Delivery processes and can be applied to a project (from planning to the end of construction) or a project phase (construction phase). For major projects, typically a PM is assigned to the project at the beginning of the Project Planning Phase and will remain with the project until the end of the construction phase. Following these guidelines, the PM will develop a project management plan for the planning phase, and will update the plan before start of the environmental phase, final design phase and construction phase to reflect changes in the scope of work, delivery methods, costs, schedules, risks, project team members, etc.

3.1.1. Initiation Processes:

The initiation process will define steps necessary to start a new project or a project phase. The PM uses these processes to define the project sponsor's expectations and define what he/she is tasked to perform: project scope, deliverables, boundaries, timeframes, and technical staff

needed to perform the work. The PM uses the information developed during the initiation to form and align the project team. The project team will review their assignment, define their responsibilities; agree on their operating guidelines, and prepare their mission statement. After completing the initiate and align processes, the team will start working on a plan to deliver their assignment.

3.1.2. Planning Processes:

The project team uses the planning processes to plan successful delivery of the project and/or project phase. The project manager, with collaboration of the project team, develops a project's: Budget, Schedule, Risk Management Plan, Communication Plan, Change Management Plan, and Quality Plan. The outcome of the planning processes is the project management plan. This plan is endorsed by the project team and upper management to gain their commitment and to identify and resolve any significant issues with the plan.

The project management plan should be updated on a regular basis and as necessary. Include timelines for the project management plan updates in the project schedule.

3.1.3. Executing Processes:

The Executing processes consist of actively managing the execution of the project in conformance with the endorsed project management plan. The project team is fully mobilized to deliver the project or project phase. Information regarding status of project deliverables is gathered and reported.

3.1.4. Monitoring & Controlling Processes:

The project team monitors project development and baselines to identify potential problems and to take corrective actions. If a potential problem jeopardizes the project objectives, appropriate project management planning processes are revisited, solutions identified, and the project management plan is updated.

3.1.5. Transition and Closing Processes:

The Transition and Closing processes are used to either transition the project to its next phase or to bring the project to an end. The project team may decide to implement certain elements of the transition process at appropriate intervals (lessons learned, rewards and recognition), or identify a transition process that is not anticipated within existing NDOT formal processes.

3.2. Project Management SharePoint Site

The Project team has the option of creating a project specific SharePoint site on NDOT server to facilitate communication and document management. To create an internal site, please contact the Administrative Assistant IV in the Project Management Division. Note that consultants, contractors and outside agencies do not have access to the internal site. To provide access to project stakeholders, the PM should consider creating a website on an outside server.

3.3. Project Management Plan Template

Guidelines and typical steps necessary to collect information to prepare a project management plan are discussed in Sections 3.2 to 3.10. Each section includes general discussions, guidelines, and typical steps describing how to collect needed information.

The project team is encouraged to use the project management template on the project management SharePoint site. This template reflects the minimum standards and guidance to manage NDOT projects. The project team has the flexibility to improve upon all elements of this plan depending on project complexities as they see fit. For Projects with total construction costs exceeding \$500 million dollars, at the completion of the environmental phase, a project management plan must be prepared following the FHWA's project management guidelines.

3.4. Initiate and Align Processes

The first step in each phase of every NDOT project is to Initiate and Align the Project Team.

Initiate and Align includes processes for developing a clear understanding of the purpose, vision, and goals of the project and using them to define the characteristics of successful performance of the project.

During this phase, the project sponsor, project manager and project team work closely to finalize the following:

- Project Description
- Team Mission/ Assignment and Mission statement
- Project team structure
- Project team's roles and responsibilities
- Major Milestones
- Boundaries
- Measures of success, and
- Operating Guidelines.

3.4.1. Initiate the Project

The project sponsor (Director's Office, Program Development, District Engineers, Division Heads, local public agency, legislation, etc.) initiates a project by providing the project description, team mission/assignment, major milestones, and boundaries to the project manager.

The PM uses his/her understanding of the project description to begin identifying technical division/resources that could be involved in the project and their roles and responsibilities. The project manager reviews and verifies the initial project description, team mission/assignment, major milestones, and boundaries through discussions with the project sponsor and primary functional unit managers (division heads and/or assistant division heads) that will be involved in delivering the project. With the input of the project sponsor, the PM also identifies Critical

Success Factors for the project. These factors describe what the project team must accomplish to fulfill its mission and to achieve project success (e.g., address stakeholders' needs, no change orders, on-time and within budget, etc.). These factors are used to determine team's measures of success.

3.4.1.1. Project Description

The Project Description is a formal statement that defines the purpose and need for the "product" or "outcome" that the project is intended to produce. The project sponsor provides the project description to the project manager. It is used to establish a common purpose and need of both the project and the phase among the members of the project team. Examples:

- Enhance access and mobility within the I-15 resort corridor.
- Widen northbound US 395 to improve traffic operations and safety.
- Widen the roadway to include one HOV lane and three general purpose lanes in each direction.

3.4.1.2. Project Title

Using the project description, the PM will develop a project title using the following nomenclature:

- Project: Route Type, Route Number, Name (if applicable), and Project limits or location
- Project Phase: Route Type, Route Number, Name (if applicable), Phase number (Roman numerical) , and phase limits or location
- Project/Phase/Package: Project Phase: Route Type, Route Number, Name (if applicable), Phase number (Roman numerical) , Package number (English numbering) and phase limits or location
- Example: I-15, Phase I, Package 1 from x to y .

3.4.1.3. Team Mission/Assignment

Team mission/ assignment is a short statement based on the project description that defines the overall actions that the project team will take to deliver their project and/or project phase.

- Complete corridor study, the environmental phase, construction, etc.

The project description and team mission is then used to develop project's scope of work. The scope of work is the basis of preparing project cost and schedule estimates; and the quality process.

3.4.1.4. Major Milestones

Milestones identify specific project elements and the dates by which they must be accomplished in order to consider the project or phase successful. The following major Milestones apply to all NDOT projects that follow the Design-Bid-Build method of delivery. The project manager and project sponsor should revise these milestones for other delivery methods. Please refer to the **Pioneer Program Guidelines (under development)** for major milestones associated with innovative delivery.

- Regional Planning / Corridor Study Complete
- Project Scoping Complete
- Begin Environmental/Preliminary Engineering
- Environmental Documentation Complete
- Right of Way Certification
- Documentation Date
- Advertisement Date
- Bid Opening
- Contract Award
- Contract Execution
- Construction
- Operationally Complete
- Final Contract Completion

3.4.1.5. Boundaries

Boundaries describe the limits of the project with regard to the project team's responsibilities and decision-making authority. They are the physical boundaries, as well as other operational parameters (such as funding, legal, and regulatory) delineating the project and its performance envelope. Typically at this stage the project sponsor sets initial physical, political and operational boundaries.

- Reconstruct concrete pavement from Jenica Drive to Hale Way.
- All work within existing right-of-way.
- Design improvements are from Milepost 23 to Milepost 56.
- Do not work in Cole River from January to April.
- Avoid Lorenzi property to avoid disputes and legal challenges.
- Follow Washoe County design standards for improvements beyond NDOT ROW.

3.4.1.6. Major Success Factors

Major success factors describe what the project team must accomplish to fulfill its mission and to achieve project success. They include outcomes that determine the success or failure of the work of the project team. These factors are developed by the project manager with the input of the project sponsor. Examples:

- Change orders less than 3% project construction cost.
- Project completed within schedule.

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- APWA project of the year award.
- Stakeholder acceptance.

3.4.1.7. Identify Technical Support

The project manager, based on the project description and his/her understanding of the scope of work, identifies the technical skills needed to accomplish the work. This step will aid the PM to identify and finalize project team members.

<input type="checkbox"/>	Agreement Services	<input type="checkbox"/>	Materials
<input type="checkbox"/>	Roadway Design	<input type="checkbox"/>	Legal
<input type="checkbox"/>	Structures	<input type="checkbox"/>	Public Information Office
<input type="checkbox"/>	Construction	<input type="checkbox"/>	Right-of-Way
<input type="checkbox"/>	Environmental	<input type="checkbox"/>	Safety/Traffic
<input type="checkbox"/>	FHWA	<input type="checkbox"/>	Civil Rights
<input type="checkbox"/>	District	<input type="checkbox"/>	Financial Management
<input type="checkbox"/>	ITS	<input type="checkbox"/>	Traffic Information
<input type="checkbox"/>	Hydraulics	<input type="checkbox"/>	Utilities
<input type="checkbox"/>	Local Agency	<input type="checkbox"/>	Landscape Architecture
<input type="checkbox"/>	Location	<input type="checkbox"/>	Other
<input type="checkbox"/>	Maintenance	<input type="checkbox"/>	Other

3.4.1.8. Aligning the Team

During this stage the PM assembles the project team and identifies if consultant support is needed.

During the team alignment workshop (first team meeting), the project description, team mission/assignment, major milestones, success factors, and boundaries are reviewed. The project team defines/refines their roles/responsibilities, develops team's mission statement, sets measures of success to assess their progress, and sets their operating guidelines. During this workshop the project team will start planning on how to deliver the project (budget, schedule, change management plan, risk management plan, quality plan, etc.).

3.4.1.9. Identify the Team

The PM works with functional unit managers (division heads) to identify schedule and commit appropriate resources to the project and/or project phase. The PM compiles relevant project team member contact information.

3.4.1.10. Team Mission Statement

The team's mission statement addresses specific work the team is assigned to perform and relates only to specific work deliverables and tasks needed to accomplish the mission

assignment provided by the sponsor. The PM should review the team's mission statement with the project sponsor.

The project manager and the project team collaboratively develop simple descriptions of the major activities the team will perform to produce the end product or outcome.

3.4.1.11. Roles and Responsibility

The definition, and mutual acceptance, of organizational and individual roles and responsibilities delineates "who will do what." Roles and responsibilities of project teams are defined in Section 2 and examples are provided in Appendix A. The project team should review provided examples and further define/refine their role and responsibilities to match the project needs.

3.4.1.12. Review Major Milestones

The project manager and the project team identify the risks, impacts, and implications of failure to meet each major milestone, and/or identify measures that must be achieved to meet the milestones.

3.4.1.13. Measures of Success

The project manager and project team will review the critical success factors and identify corresponding measures of success – those "indicators" that will provide an accurate indication of project team progress and performance in meeting each of the critical success factors, major milestones, deliverables, etc. Once measures of success have been identified, the team defines the specific indicators, signals, threshold values, etc., that will be monitored and reported in order to provide timely and accurate visibility of the likely outcome of each critical success factor.

3.4.1.14. Review Boundaries

The project manager and project team reviews the project sponsor's boundaries for specific limitations on the project and their performance. They validate provided boundaries and may identify new ones. New boundaries must be reviewed by the project sponsor.

Review the draft boundaries with the project sponsor:

- a. Validate each boundary parameter.
- b. Identify which parameters are fixed and which are flexible.
- c. Determine the acceptable range of variation for those parameters deemed flexible.
- d. Plan for change.
- e. Identify notification requirements and thresholds for early or advance warning when the need for changing or possibility of exceeding project boundaries is imminent.
- f. Identify the approvals needed to exceed or change the project boundaries.

- g. Define the process to follow in obtaining those approvals.

The project manager and project team review the boundaries with the project sponsor and incorporate them into the development of all project planning.

3.4.1.15. Team Operating Guidelines

Team Operating Guidelines describe how the project team will govern itself. They identify the functions most commonly performed by the team and guidelines to steer it within those functions. The team may develop some or all of the following guidelines:

- Team Decision-Making Process
- Team Meetings (structure, frequency, etc.)
- Communication (method, uses, frequency, protocols, etc.)
- Team performance measures
- Team issues and conflict management (refer to Section 2.4)

3.4.1.16. Review and verify

The final step of the initiate and align processes is to make sure that all items developed by the team are in alignment with the project sponsor's expectations.

3.5. Planning Processes

Planning processes define how the project team will deliver a project or a project phase. These processes will refine project objectives and develop a plan on how to achieve those objectives.

During this phase the project manager and project team work collaboratively to finalize the following:

- Project or project phase schedule
- Project or project phase Budget
- Risk management plan
- Communication plan
- Change Management plan
- Quality Plan, and
- Transition and closure plan.

The project management plan is the output of the planning processes. Changes during project development may impact parts of the project management plan. As such, the project management plan must be updated on regular basis to reflect changes and/or lessons learned.

3.5.1. Schedule

Schedule is the anticipated length of time to complete a project or a project phase. The PM and the project team work together to develop a work breakdown structure, a list of deliverables and a detailed project schedule using an appropriate scheduling tool/software (Refer to Section 2.3.2.7). In this section, the project team identifies:

- The complete project Work Breakdown Structure (WBS) and Deliverables list and the project schedule baseline.
- How often the project schedule will be updated and tracked.
- Target milestone and deliverable dates to measure the project performance on a yearly basis. For example, for every 12 consecutive months of project development, the PM and the project team will identify at least one major milestone and one major deliverable that will be used for project's performance measurement (did the team achieve the target dates).

As the project is progressed and schedule is tracked, target milestones are reviewed. If the schedule identifies delays in project performance base lines, the project team identifies and implements a recovery plan. The recovery plan may include performing overtime, adding additional staff, hiring consultants, reducing the project scope of work, etc. If the recovery plan was unsuccessful, the reasons for it are documented and necessary approvals are obtained. If the measure is ahead of the target, then reasons for faster delivery is identified and documented. Excess resources are released; overtime usage is stopped or reduced, etc.

3.5.2. Budget

Budget is the anticipated cost of the project and/or a project phase and includes engineering, ROW, construction and out sourcing costs. Refer to Section 1.6 and 1.7 of this manual for additional information regarding project budgets and allowances.

In this section, the project team identifies:

- The project budget baseline (engineering, ROW and construction).
- Basis for the project baseline estimates (method of estimating, man-hour estimates, construction estimate, etc.).
- The method the project engineering, ROW and construction budget will be tracked; and how often the project budget will be tracked and reported.
- The frequency and method for updating project engineering, ROW and construction budget.
- Target milestone and deliverable dates with established budgets to measure the project performance at least on yearly basis.

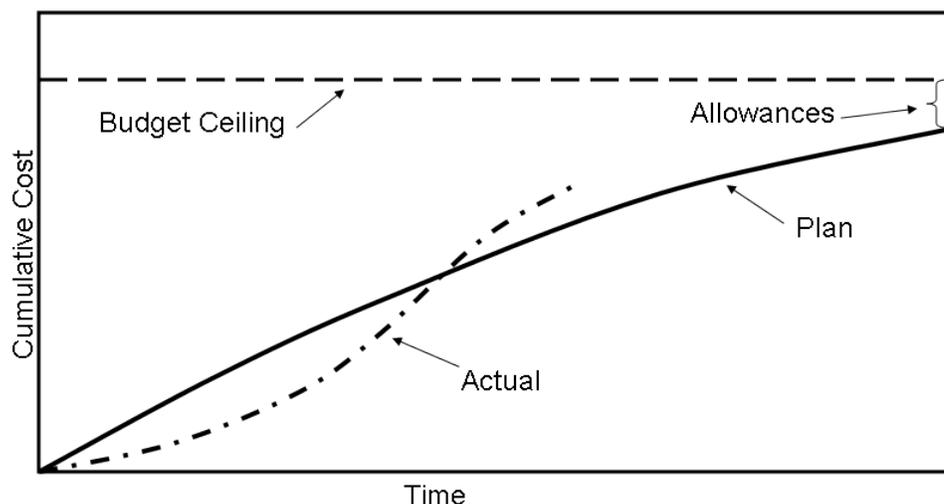
As the project is progressed and budget is tracked, target milestones/ deliverables with established budgets are reviewed. If tracked budget identifies over-expenditures, the project team identifies and implements a recovery plan. If risks are realized, the team works together to minimize the budget impact. If the project contingency or risk reserve must be used, they follow protocols established in the project management plan.

Project budget can be tracked by preparing a time-phased budget, breaking the overall budget goal into intervals (months, quarters, etc.). This provides a budget baseline for tracking actual costs against project controls (i.e., team's budget, etc.). When a project is complex, the PM is encouraged to use an Earned Value Management approach.

3.5.3. Risk Management Plan

The goal of the risk management process is to optimize project performance (scope, costs and schedule). Risk management process consists of a series of iterative steps which are applied at various times throughout project development. The outcome of these steps is the risk management plan.

A formal project risk management plan is: a detailed plan of action for the management of project risk. Project risk planning involves the thoughtful development, implementation, and monitoring of appropriate risk response strategies. It is the process to develop and document an organized, comprehensive, and interactive risk management strategy; determine the methods to be used to execute a risk management strategy; and plan for adequate resources. The project risk management plan may be specific in some areas and general in others. The key to this tool is its scalability. Every project should have a formal risk management plan, but the level of detail varies with the project complexity. Through this process the project team identifies:



- Risk identification and assessment activities and frequency
- Risk analysis method
- Risk management strategy/approach
- The budget contingency and/or risk reserve, project team's allowance, the project manager's allowance; and the program manager's allowance.
 - Protocols that the project team will follow in order to tap into contingency/risk reserve (who, what, when and how).

- The project schedule buffer, the project team's schedule/allowance, the project manager's schedule/allowance; and the program manager's schedule/allowance.
 - How the project buffer will be distributed (e.g., protected the end date or protect delivery date of major tasks).
 - Protocols that the project team will follow to use a portion of the project buffer.
- Risk response actions/allocation
- Risk monitoring and control

The PM with the input of the project team identifies, categorizes and documents all risks and opportunities that could impact the project's base performance measure. This should be done as soon as possible during project development. Appendix B includes a summary of types or categories of risks. Risk assessment objective is to adequately determine the significance of each risk (severity and consequence). This is done to determine impact of each risk and decide if additional steps are necessary to refine or reduce the risk. After risk assessment and analysis, the project team will identify actions that will optimize project performance.

3.5.4. Communication Plan

The project communication plan addresses the informational needs of the project team, stakeholders, the public, and the media. It focuses on two major facets of the project communication process:

- Project Working and Reporting Information.
- Public Information, including Community Outreach and Media Relations.

The process of developing plans for public information, community outreach, and media relations requires the involvement of a public information officer.

The project manager and the project team will collaborate to:

- Identify all project participants and stakeholders, including their functions and interests associated with the project and its performance.
- Identify the project-specific information needs of each participant and stakeholder. Using the list of project milestones, they identify the information produced from each deliverable and develop a draft communication matrix. This includes identifying the distribution, recipients, medium, frequency, and timing, etc., for the information from each deliverable.
- Review and adjust the draft communication matrix with the project team and the public information officer, and identify any constraints on communication with any participant or stakeholder, (organizational, contractual, legal, etc.).
- Review the draft communication matrix with the appropriate participants and stakeholders, including the information they will be receiving, its frequency, medium, etc. Verify its suitability and usefulness for their purposes and gain their endorsement.
- Using the communication matrix as a basis and the communication plan template as the outline, develop the draft communication plan for the project.

- Review the draft communication plan with the public information officer, project team, and management.

3.5.5. Change Management Plan

Develop a plan for identifying, quantifying, approving, and reporting changes to the project performance baseline; emphasize cost, scope, schedule, and quality. The change management plan is developed to address project specific changes within project allowances (budget and schedule) given to the project manager and the project team. Follow the NDOT formal change management process (scope, budget, schedule change form) for changes that fall outside the program manager's allowances.

PM allowances include cost and schedule as outlined in Sections 3.5 and 3.6 unless otherwise approved by the Program Manager.

The project manager and the project team will collaborate to:

1. Establish and document the project performance baseline: the point of departure for measuring project change.

Define and document the baseline components representing cost, scope, and schedule:

- Project milestones.
- Project baseline schedule.
- Project budget.
- Prior adjustments to the baseline.

Depending on the project, also define certain elements that document site and performance conditions: limits of work; geotechnical or other physical characteristics; periods of work; or other performance constraints, etc.

For each component of the baseline, identify the specific project thresholds that trigger the formal change management process.

2. Develop and document project-specific processes and instructions for the change management process and document them in the change management plan.
 - Identify, report, and track potential change issues.
 - Team and individual responsibilities for identifying and reporting all potential change issues.
 - Establishment and use of a single change issue tracking and management log.
 - Work with the Program Manager to establish change reporting thresholds and levels of authority.

- Review the Risk Management Plan and risk response strategies and determine requirements for managing risk-driven change.
- Analyze change impacts and develop response strategies and recovery plans.
- Identify endorsement requirements for changes to the project performance baseline.
- Update the project performance baseline.
- Develop guidance for documentation and incorporation of change in design or other product records.

NOTE: Districts and functional units may have formal processes and procedures in places for managing the change process, and compliance may be mandatory. Always review the appropriate procedures and consult with district/functional unit management before establishing specific project procedures.

3. Gain endorsement for the project-specific change management plan from appropriate functional units.
4. Review the plan with the project team and provide instructions on the specific responsibilities of each team member.

3.5.6. Quality Plan

Quality management includes all activities of project management that determine the project quality objectives and applicable standards, the responsibilities of project participants, and the requirements for quality assurance (QA) and quality control (QC).

Quality planning involves identifying which quality standards are relevant to the project and determining how to satisfy them. The activities of the quality planning process basically translate existing quality policy and standards into a project quality plan, and the project quality plan into a project quality compliance matrix for documenting performance and results.

The project manager and the project team will collaborate to:

1. Review each work element of the project milestones and determine the applicable quality standards for each process, product, and deliverable.
2. List each of the applicable standards with the appropriate work element in the draft quality plan.
3. Using the draft quality plan, review each work element and applicable standards with:
 - Performing Staff.
 - Verify understanding of assignment.
 - Verify understanding of specific quality standards and requirements.
 - Verify qualifications for performance.
 - Develop specific plans for performance and achievement of the quality standard.

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- Develop specific plans for documenting performance and results.
 - Verify the level of effort required, including budget and schedule.
 - Customer (as appropriate).
 - Review all proposed quality standards.
 - Review draft quality plan.
 - Review costs and benefits of areas where the value of required quality standards may be marginalized.
 - Identify specific reporting requirements.
 - Obtain endorsement.
4. Complete the quality compliance plan and review updating and reporting procedures with appropriate team members.

The purpose of the project quality plan is to document the project's quality standards and goals and to provide a baseline against which the QA/QC efforts of the project team may be compared. A project quality compliance matrix provides a convenient tool for documenting those planned efforts, their accomplishments, and their outcomes.

The steps described by this procedure are intended to meet certain objectives for quality management on NDOT projects, primarily:

Consistency – To develop and put into practice a consistent approach to meeting appropriate quality standards, objectives, and requirements on all NDOT projects.

Value – To establish and perform only those quality management activities that add value to NDOT projects.

Avoidance of Rework – To shift focus from review and correction of work performed to those activities that enhance the quality during the planning and performance of the work in order to minimize costly rework.

Responsibilities – To clearly establish responsibilities for meeting appropriate quality standards on all NDOT projects.

NOTE: The Quality Matrix in the Project Management Template identifies typical QA/QC items for Design-Bid-Build delivery. For other delivery methods adjust as appropriate. The Quality Control Matrix for construction must be developed after the contract is awarded.

3.5.7. Transition and Closure Plan

Transition and closure is the process of completing a major activity, phase, or the project itself. This includes transferring the completed work and remaining project responsibilities to others; completing document archiving; and closing out the administrative and financial processes associated with the activity, phase, or project.

Transition and closure planning begins with the development of the transition and closure plan. It outlines the points in the project at which formal NDOT transition and closure activities will take place; the requirements of the transition; the responsible organization; and the process steps that will be taken to accomplish an efficient and effective transition. For processes that do not fit into NDOT formal transition and closing processes, the project team should determine what practices are most appropriate and/or decide on the level of thoroughness of each practice.

Elements of the transition and closure plan are implemented at appropriate intervals prior to the full completion of the work of the activity or phase (lessons learned, preparing no-longer-needed files for archiving, etc.). All transition and closure activities are completed before the activity, phase, or project is deemed complete and the project manager is released from responsibility for the project.

All transition activities should be linked to the appropriate project milestones and activities for tracking and status monitoring. This provides an effective method to ensure they are not overlooked.

3.5.7.1. Establish the Transition Points

Identify the major activities and milestones of the project that will require a formal transition process. Other transition points may be more obscure and associated with the project type, or specific to the project itself. Consider the following criteria:

- Delivery and acceptance of major elements of work.
- Transfer of responsibility for all or a major portion of the project.
- Major changeover of project staff, resources, or location of performance.

3.5.7.2. Acceptance of Work

Develop the acceptance criteria, including an acceptance checklist, for each major activity or deliverable. Identify responsible parties for each activity or deliverable to be accepted – who will develop/deliver the element and who will accept the work. Identify activities and responsibilities involved in the completion and acceptance process. Develop a transition and/or closure schedule for the specific transition event or incorporate transition or closure activities into the project performance schedule.

Examples:

- Traffic Management Plan
- Geometric Approval
- Bridge Type Selection Report
- PS&E
- Final Walk Through

3.5.7.3. Demobilization

Identify all of the activities, steps, and requirements for demobilizing and returning (or terminating) facilities, equipment, and services as they are acquired.

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Establish roles, responsibilities, budgets, and schedules for all of the activities involved in demobilizing the facilities, equipment, and services associated with each transition event (or when they are no longer needed), and include them in the Transition and Closure Plan as they are acquired.

Examples:

- Securing computers to return to Vendor
- Handing over office space
- Returning testing equipment
- Closing agreements

3.5.7.4. Lessons Learned

Establish specific project team activities and responsibilities for identifying, documenting, reporting, and compiling lessons learned. During the course of the project, and as each transition point is reached, compile and report the complete lessons learned file for the appropriate area or phase of the work.

Lessons learned should be a standing agenda item at project status meetings.

3.5.7.5. Archiving

Review current archiving requirements with functional units to determine the specific archiving requirements for the project.

Develop specific instructions for the project team on record keeping, document management and preparation for archiving during the course of the project. Include instructions for maintaining files; sequestering original documents; dates and project information on documents; copying documents; and the maintenance of document logs.

Based on transition events, develop file structures that provide the capability of preparing the appropriate files for archiving as each transition event is achieved.

3.5.7.6. Financial Closure

Establish requirements and specific procedures for financial closure of the activity, phase, or project.

3.6. Project Team Endorsement

Endorsement is the process of gaining commitment to the successful execution of the project management plan. The endorsement process can also be termed “Partnering” when the project team is extended beyond NDOT to include other state entities, consultants, or contractors.

The process of gaining the commitment of project team members to the project management plan can be as simple as a discussion of their assignment and their commitment to perform that assignment, or as formal as a workshop session with all team members, which culminates in a formal, signed document committing to the plan. In all cases, the desired result is the team

members' understanding of the plan, their role in its execution, and their specific commitment to perform their responsibilities according to the plan.

The endorsement process can unify a group of individuals and transform them into a team. The following steps should be followed:

1. **Identify the Participants:** The project team is comprised of all project participants required to deliver the project. This includes those directly engaged by the project, consultants, contractors, and other organizations or agencies.
 - Review the project management plan, particularly the work breakdown structure and responsibilities, to identify all resources needed to complete the project.
 - Identify those project team members whose specific commitment to the project management plan is appropriate.
 - Endorsement is easy when the participants have been included in the development of the project management plan.
2. **Establish Endorsement Methods:** Identify the appropriate methods for gaining commitment from each participant— individual discussions, group meetings, etc.

Formal Meeting: Participants review and sign-off on the project management plan. The use of a formal endorsement meeting provides a team-building opportunity where participants can discuss their assignments; discuss the inter-relationships of their assignments with other assignments; develop their working relationships; and open the channels of communication.

Prior to the meeting, the project manager should:

- Coordinate with the project team.
- Coordinate with local agencies, cities, counties, etc.
- Distribute the project management plan for review.

The endorsement meeting should be held as soon as possible after completion of the project management plan.

- Use the project management plan as the structure for the meeting agenda.
- Discuss the team mission; roles and responsibilities; schedule; and resources to complete major deliverables.
- Discuss any outstanding issues.
- Review Change Management, Risk Management, Communication, Quality, and Transition/Closure Plans.
- Have a method for signifying commitment: signature on the Project Team Endorsement or a suitable substitute for documenting commitment.

Individual Discussions: A second approach is to conduct individual discussions and sign-offs with each predetermined project participant. The same principles used to conduct an organized session with a group apply here, except that it is less formal.

Distribute and Return: A third – and less desirable – approach is to distribute portions of the plan, either electronically or by hard copy, to select project participants and ask for their endorsement. It is important, if using this technique, to attach a cover letter that clearly states what is being requested, with directions for providing comments.

Often project management plans are all-inclusive documents that overwhelm rather than inform the reader. They can be much more informative if they are transmitted with instructions that clearly focus readers on the portions of most relevance to them. In some cases, only part of the project work plan needs to be transmitted, reviewed, and endorsed by project participants.

Tailor the format of the endorsement process to be a team “motivator.” Take steps to make the meeting fun; e.g., take a picture of the team members.

As with any project, there will always be turnover and change. An endorsed plan can be a great tool for returning to center line for the project or communicating the agreements for the project delivery to new team members.

Don’t let the endorsement process get stale. Make it part of the work planning process, not a separate task.

3.7. Management Endorsement

Management includes those individuals who have responsibility and authority for resources defined in the project management plan. Gaining managements’ understanding of the project management plan, particularly resource requirements, assumptions, schedule, and issues, leads to gaining their commitment to the project. It also provides the baseline of understanding needed to balance their total resource requirements to avoid “over commitment.”

The commitment of the management of all planned resources is essential to ensure that the right resources will be available when they are needed to support execution of the project management plan. The following steps should be followed:

1. Identify the Required Endorsements: Endorsement by management results in a specific commitment of support for the project management plan and the resources necessary to successfully deliver it. This may include the Director, Deputy Directors, Assistant Directors, the Program Manager, key division heads and/or other organizations. Endorsement is not a one-time occurrence for most projects. The project team should gain new endorsement any time there are major changes to the project management plan – scope, schedule, budget, sponsor, or team members.
 - Review the project management plan and identify all organizational resources needed to complete the project.
 - Review the project baselines (scope, schedule, costs) and identify the timing and levels of involvement for resources.

- Identify the appropriate functional managers (division heads) controlling all needed resources.
2. Establish a Schedule for the Endorsement Process: The commitment of the project team is required before the endorsement of management is sought. Obtaining management's commitment as soon as possible will allow a smoother start to project delivery.

The first choice is to obtain management endorsement in a meeting when all the necessary management staff can attend, discuss the required commitments, and share their observations on the plan and its execution.

If a meeting is not possible, management commitment is gained individually or in groups and the resulting endorsements are sent to all participating managers by memo.

3. Obtain Management Endorsement: The purpose of formal endorsement is to acquaint and inform the managers with the requirements, quantity, and timing for the resources being committed, and to document that commitment.

It is highly recommended that documentation of the agreement be made and shared among managers and the team. The main consideration should be the level of commitment required and the need to document that commitment. The most direct method is to have the manager sign the project management plan, the cover letter, or the Management Endorsement.

Prior to the meeting, the Project Manager should have the following complete:

- Coordination with local agencies, cities, counties, etc.
- Team-endorsed project management plan.

The endorsement meeting should be held as soon as possible after team endorsement.

- Use the project management plan as the structure for the meeting agenda.
- Discuss team mission; roles and responsibilities; schedule; and resources to complete major deliverables.
- Discuss any outstanding issues.
- Review Change Management, Risk Management, Communication, Quality, and Transition/Closure Plans.

A rule-of-thumb is that those responsible for the resources should endorse the Project Management Plan. If higher levels of management commitment are needed, they should be identified by those committing the resources.

Having managers visibly endorse the project management plan is a team motivator – use it!

3.8. Executing Processes

The project management plan is implemented to achieve project objectives. Activities include but are not limited to:

- Project resources are mobilized and managed to complete assigned tasks and responsibilities.
- Inter-local agreements are initiated and finalized.
- Consultant/contractor procurement processes are started and completed.
- Work on project deliverables are started and completed.
- Reporting processes are followed.
- Communication, quality, change management and risk management processes are initiated, updated and followed.
- Team members are assigned to assist with different elements of the project management plan, e.g., change coordinator/manager, risk coordinator/manager, communication coordinator/manager, etc.

3.9. Controlling and Monitoring Processes

The project team monitors the progress of project baselines (scope, schedule and cost/budget) and takes corrective actions as necessary. Steps include:

3.9.1. Monitor Performance:

The project team must verify that the products being produced meet established requirements, standards, specifications and policies. The project Quality Plan should be frequently reviewed to verify that quality management actions are being performed as planned and with the results expected. As a part of assessing project performance against the performance baseline, the project team verifies the following:

- Actual Work Completed
- Actual Schedule Consumed
- Actual Costs/Budget Consumed

3.9.1.1. *Identify Variances and their Sources*

Review each component of the baseline and identify any significant differences between planned and actual performance. For each variance, determine the severity of impact and its source; i.e., the reasons why there was a variance and the conditions that led to it.

3.9.1.2. *Forecast Performance*

Before determining a course of action to correct a variance, evaluate the baseline for the remainder of the project and determine the probable outcome at completion for each component. The re-evaluation of the work to be completed provides the understanding needed to develop and integrate recovery plans.

3.9.1.3. *Manage Variances*

Understanding the severity of the variance and its impact on the remainder of the work, the project team must decide how to adjust performance and conditions to avoid further impact and to recover from the variance.

Recovery Plans should be developed in the context of the remaining work. For example, directing resources to complete work that has fallen behind schedule should not create resource problems with work yet to be completed; adding resources will impact the budget for completing the work (hence, budgets must be adjusted). Use the Performance Baseline to “test” the impact of Recovery Plans. Adjust the Performance Baseline.

3.9.1.4. *Endorsement*

Obtain endorsement of the project team and stakeholders for adjusted performance baselines.

3.9.2. **Monitor and Control Potential Risk Events:**

Team members are assigned to monitor and track each risk event according to the Risk Management Plan. Risk ratings and prioritization may change over the life of the project; changes may require additional analysis. Identify and report changes in probability of occurrence and potential impact.

3.9.2.1. *Identify and Evaluate New Risk Elements:*

- Charge team members with the responsibility to continuously review project work and conditions and to identify new risk events.
- Add new risk events to the **Project Management Plan** and evaluate their probability of occurrence, potential impact, and timing.
- Identify appropriate triggers.
- Establish preliminary response strategies and monitor and control each new risk event.

3.9.2.2. *Implement the Risk Management Plan when Risk Events Occur*

As Risk events reach the “imminent” stage:

- Review the planned response actions for appropriateness given current estimates of impacts and available resources.
- Use the Change Management process to enact and implement response actions and adjust the Project Performance Baseline – scope, schedule, and budgets – accordingly.
- Make appropriate assignments and track performance of the response actions.
- Monitor the effectiveness of each response action and adjust actions accordingly.
- Document each risk event and response action implemented as a basis for future actions and as a reference for reporting Lessons Learned.

3.9.2.3. Manage Risk Response Resources

- Contingency Funds are the “last resort” and are used only after all other means for abatement, avoidance, or mitigation of risks have been exhausted.

3.9.3. Identify and Manage Potential Change Issues:

Make potential risks and change issues a “standing” agenda item and have an open dialogue about risks and changes at all team meetings; it encourages responsibility for this process.

Develop and maintain a Change Issue Log identifying and tracking each potential change issue – *whether it is a “proven” change or not*. The issue log within PSAMS under the “Project Zone” tab can be used, or an issue log can be created in the project’s SharePoint site.

Each potential change issue should be treated with high priority until its significance to the project is determined. Often – *particularly in the design phase* – potential change issues turn out to be “evolving design details” that are perceived as changes in scope or conditions. Although not generally considered a change, it is important to track and document these reports in order to avoid duplication of effort or their incorporation into other potential change issues.

3.9.3.1. Administer the Change Management Process:

- For each “real” change issue, analyze the nature and scope of the change and establish a formal change description.
- Evaluate and quantify the impact of the change on the project work and performance conditions, including changes required to complete current and future work product(s).
- Evaluate and quantify the impact of the change on the Project Performance Baseline (scope, schedule, and budgets – *including contingency budgets*) and potential risk.

3.9.3.2. Develop Mitigation/Recovery Strategies:

- Analyze the change for alternative actions to minimize the negative impacts and maximize the benefit of the change – including the “no action” option.
- Formally establish the scope of the change and direction for incorporating the changed work and conditions.
- Formally establish the required adjustments to the Project Performance Baseline – scope, schedule, budgets, and Risk Management Plan.
- Solicit input and provide appropriate notifications to all team members – especially those whose performance is directly affected by the change.

3.9.3.3. Obtain the appropriate Endorsements/Approvals and Distribute:

- Notify and consult with program manager and Director’s Office.

- Process a formal notice of change to the project team and Contract Change Orders as appropriate. Note: Consultants and Contractors may not proceed with—*or get paid for*—changed work until their Contract Scope of Work, Contract Amounts, and Schedules have been formally changed through the Agreement amendment and/or Contract Change Order process.

3.9.3.4. Update Performance Baselines

- **Work Breakdown Structure** – Determine appropriate methods for incorporating the changed work as separate from the original baseline scope of work.
- **Schedule** – Integrate the appropriate logic, duration, and resource revisions to accommodate the changed scope while maintaining visibility of the original baseline schedule.
- **Budgets** – Make the appropriate budget adjustments including transfers from contingency budgets to work budgets.

3.9.3.5. Communicate Change

- Communicate change per the Project Management Plan

3.10. Closing Processes

The project team performs the activities described in the **Transition and Closure Plan** at appropriate times during the course of the phase or project as transition events dictate.

Certain activities (Lessons Learned, Rewards and Recognition, etc.) are employed continually throughout the project. The transition event signifies the completion of the continuous aspect of these elements for the phase or activity. Other transition activities are timed to effectively coincide with the transition event; the acceptance of completed work, the demobilization of staff and facilities, etc., are all triggered by the completion of the transition event.

The inclusion of Transition and Closure activities in budgets and schedules provides the project team with the visibility needed to determine when transition activities should be performed and when they should be completed.

3.10.1. Reviewing and Refining

Continuously review the activities associated with each transition event and refine the Transition and Closure Plan and responsibilities for its performance accordingly.

For portions of the Transition and Closure Plan left in a “preliminary” stage at the beginning of the project, particularly the staff demobilization activities, review work progress and complete the transition planning early enough to avoid any potential impact of uncertainty on the staff.

3.10.2. Acceptance of Work

As the work leading up to the transition event proceeds, maintain contact with and report progress and changes to those involved in the acceptance process.

As completion of the work to be accepted nears, review the acceptance criteria and checklist, and establish detailed scheduling of all acceptance activities, including preliminary checkout and review and acceptance of quality reports. In general, complete all pre-acceptance activities as soon as practicable.

Establish a date and procedures for formal acknowledgement of the acceptance of the work. Acceptance acknowledges the transfer of responsibility and should be formally acknowledged in writing.

3.10.3. Demobilization

Completion of the work associated with a transition event generally leads to the reassignment of staff; the return or transfer of unneeded facilities and equipment; and the cancellation of unneeded services.

As the work progresses, refine and complete plans for demobilizing staff, facilities, equipment, and services. Be particularly attentive to plans for reassigning staff.

In all cases, keep communication with affected staff members clear, and provide appropriate advance notice of changes to those affected. Use caution in verifying that all of the work product has been completed and is acceptable (see Acceptance of Work above). Do not overlook follow-up work needs, Lessons Learned, and archiving activities. Also, with the Rewards and Recognition process, keep in mind that those who make early contributions to the project's success frequently miss out on the recognition of their work when the project is completed.

As the completion of work renders facilities, equipment, and services unneeded, expedite their cancellation, return, or transfer to other uses in accordance with the Transition and Closure Plan. It is generally more efficient to establish those plans for each element of facilities, equipment, and services, and to plan their "demobilization" requirements, activities, and costs at the time they are acquired.

3.10.4. Financial Closure

Review the requirements and specific procedures for the financial closure of the activity, phase, or project with the Program Manager, Agreement Services, Project Accounting and Financial Management.

Section 4

4. Project Reporting

4.1. Introduction

It is the responsibility of the project manager to monitor, control and report status of the project performance including project's scope, schedule, cost and quality. This reporting will be done verbally during meetings (status meetings, staff meetings, team meetings, etc.) and in writing. This section provides guidance for reporting project status.

The intent of the Project Summary Report is to provide an overview of project status to the Department's upper management, project stakeholders, and State Legislators in fulfillment of 2007 AB 595 requirements. The intent of the Monthly Project Status Report is to provide detailed account of project status to the project team and identify/resolve major issues that impact the project. These reports are located on the NDOT [Project Schedule and Management System \(PSAMS\)](#).

4.2. Frequency of Update

Complete the Monthly Project Status Report and the Project Summary Report for all projects. Project managers must complete these reports by the first Friday of each month. Project Summary Reports will be reviewed and approved by the functional managers of appropriate divisions by the second Friday of each month. Once approved, the summary report is posted on the NDOT website.

4.2.1. Major Project Status Report

There are project status reporting requirements in 2007 Assembly Bill 595: any current or proposed highway projects (Sec 47.2), highway projects using NRS 244A.637 (Las Vegas Convention and Visitor Authority) funding (Sec 55.3), and highway projects identified by the 2006 Blue Ribbon Task Force Report and other super or mega (major) projects (Sec 55.5). In addition to the above, the Department will include a report for capacity projects with an estimated cost of \$25 million or more. For more information regarding these reporting requirements, and list of projects, please refer to the latest version of the Department's Performance and Major Projects Annual Report.

For projects meeting 2007 AB 595 requirements, Project Summary Reports on PSAMS must be completed and approved by appropriate program manager in charge of the project by the second Friday of the following months: March, June, September, and December. The Project Management Division will include these reports in the Department's quarterly report to the Legislative Counsel Bureau. The Project Management Division also submits an annual Major Project Report to the Department's Performance Analysis Section by the end of June each year. The major project report will be included in the Department's Performance and Major Projects Annual Report.

4.3. Responsibility

It is the responsibility of the project manager to monitor, evaluate, and report the progress of a project using the project management guidelines. It is the responsibility of technical managers

to report status of their technical tasks' cost, scope, schedule, and quality to the project manager on a monthly basis. The information reported should reflect work accomplishments, work in progress, work plans for the next period, current issues, help needed, work acceleration opportunities, and work delivery threats.

4.4. Project Summary Report Preparation Guide

Typically major transportation projects are broken into smaller phases after completion of the environmental phase to address funding and constructability issues. These phases, with their appropriate funding source(s), are identified in a project finance plan. For these projects, always create and update only one Summary Report during the planning and environmental phases. Once all project phases are identified (completion of finance plan), then create and update a status form for each phase. Note that a project phase may also be broken into smaller packages for budgeting, scheduling, and constructability issues. In that case create a Summary Report for each package.

The summary report is designed to address all reporting requirements in the 2007 AB 595 and will be posted on NDOT internet for public view. Follow these guidelines to the fullest extent possible. Information in the Summary reports must be clear and to the point. Do not use abbreviations, difficult technical terms, and any other information that is for NDOT internal use. All fields in the report must be completed. Do not modify titles/headings of required fields and/or add new ones. The form is designed for reporting status of projects, not programs.

Project Title/Name: Use the following nomenclature:

- Project: Route Type, Route Number, Name or Title (if applicable), and Project limits or location
- Project Phase: Route Type, Route Number, Name or Title (if applicable), Phase number (Roman numerical) , and phase limits or location
- Project/Phase/Package: Project Phase: Route Type, Route Number, Name or Title (if applicable), Phase number (Roman numerical) , Package number (English numbering) and phase limits or location

Project Sponsor: Name of sponsoring agency (NDOT, Washoe RTC, etc.). If multiple agencies are sponsoring a project, only list major public agencies.

Project Manager: If NDOT is managing the project directly (in-house or through consultants), then list the name and phone number (with area code) of NDOT PM. If a local agency is directly managing the project then: list both the name and phone number of the local agency's & NDOT's project managers.

Project Description:

The project description must be consistent with the EA or EIS (Widen US 395 to improve traffic operations and improve safety). If the Summary Report is for a project phase/package, make reference to the main project (this is the first phase of the US 95 Northwest project). Identify major project/phase/package elements in this section (reconstruct the bridge over the Truckee River). For linear projects, indicate the project/phase/package length/ delivery method (if alternative delivery method is used) on the last bullet (Project Length: 2.3 Miles).

Project Photo: Post a project related photograph. Use a .JPG format.

Location Map: Use a .JPG format and clearly identify (circle, arrows, etc.) project limits/boundaries. Do not use proprietary software to copy and identify project location.

Schedule (DBB): Follow the guidelines in **Section 2.3.2.7** to develop the project schedule. Report the status of the four major phases of a project development: planning, environmental, final design, and construction. The planning phase may include corridor studies and the scoping process. The environmental phase includes preliminary engineering. For Preservation and Local Public Agency (LPA) projects, report Final Design and Construction phases only and list the date of the Categorical Exclusion in the Environmental phase.

Once project/phase schedule baseline and ranges are established, the PM must not report changes to these values unless: the project schedule is updated by the project team at a major transition point (end of planning, end of environmental, end of 60% design, etc) and the baseline changes are approved by the program manager.

Adhere to the following guidelines:

Planning phase:

Provide a range for anticipated start and completion of the phase (Planning: 2009-2010). Report future phases as To Be Determined (Environmental: TBD, Final Design: TBD, etc.). When the planning phase is at 60% completion, report anticipated year of completing the phase (Planning: Complete in 2010) and report a range to start and complete the Environmental phase (Environmental: 2010 – 2013). When planning phase is 90% complete, report the quarter and year of completing the phase (Planning: Complete 2nd quarter 2010). At 100% level, report the planning phase as complete (Planning: Complete) and continue reporting a range to start and complete the Environmental phase.

Environmental phase:

Provide a range for anticipated start and completion of the phase (Environmental: 2010-2011). Report future phases as To Be Determined (Final Design: TBD, Construction: TBD). When the Environmental phase is at 60% completion, report anticipated year of completing the phase (Environmental: Complete in 2011) and report the anticipated start and completion date of the Final Design phase (Final Design: 2012-2014). When Environmental phase is 90% complete, report the quarter and year of completing the phase (Environmental: Complete 4th quarter 2012). At 100% level, report the Environmental phase as complete (Environmental: Complete) and continue reporting a range to start and complete the Final Design phase.

Final Design phase:

When the Final Design phase is at 60% completion, report anticipated year of completing the phase (Final Design: Complete in 2014) and report anticipated year of advertise date (Advertise: 2014) if funds are available. When Final Design is 90% complete, report the quarter and year of completing the phase (Final Design: complete 3rd quarter 2014) and report the quarter and year of advertise date (Advertise: 4th quarter 2014) if funds are available. At 100% complete design (Documentation Date), report the phase as complete (Final Design: Complete) and report anticipated month and year of advertise date (Advertise: November 2014) and anticipated quarter and year to begin construction (Construction: Begin first quarter 2015) and anticipated quarter and year of completing construction (Construction: Complete 3rd quarter 2017).

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Construction phase:

When the project is awarded, report anticipated month and year to begin construction and anticipated quarter and year of completion (Construction: Start March 2015 - complete 3rd quarter 2017). At 90% completion, report anticipated month and year of completion (Construction: complete September 2017).

Examples:

1. Project environmental phase is 90% complete:
 - Planning: Complete
 - Environmental: Complete 3rd quarter 2010
 - Final Design: TBD
 - Construction: TBD

2. Project is at 100% final design:
 - Planning: Complete
 - Environmental: Complete
 - Final Design: Complete
 - Advertise: September 2012
 - Construction: Start 1st quarter 2013- complete, 4th quarter 2016

Schedule (DB):

Planning

Environmental

Procurement (RFP - award)

Final Design/Construction

Project Benefits: Use what has been identified in the project's purpose and need statements and other identified benefits as the project is being developed. Refer to provided examples (Appendix B), and use them appropriately.

Project Costs (DBB): Follow guidelines in [Section 2.3.2.6](#) to estimate project costs/budget. Report project costs as a range (engineering, R/W, and construction). Note that the base (low) and contingency (high) budget represent the project's engineering cost range (e.g., \$100 - \$125 M). Round all numbers to the nearest half million. If project costs are less than one million, then round numbers to the nearest \$100 thousand.

Once project/phase schedule baseline and ranges are established, the PM must not report changes to these values unless: the project costs are updated by the project team at a major transition point (end of planning, end of environmental, end of 60% design, etc) and the baseline changes are approved by the program manager.

Example:

The project costs were developed during the planning phase:

Project Cost Range (Planning Phase Cost Estimates):

Engineering: \$1.0 - \$1.5 M
Right-of-Way: \$2.0 - \$2.5 M
Construction: \$20 - \$26 M

Total Project Cost: \$23 - \$30 M

NOTE: To ensure consistency with the STIP, track engineering, R/W, and construction costs separately. Engineering includes all costs from the start of planning to the end of final design (internal and consultants). R/W costs include appraisal, acquisition, relocation, demolition, engineering, legal, utility relocation, and railroad.

Project Risks: Provide a brief explanation of major risks. Refer to provided examples in Appendix B. Note that these examples are provided primarily for the PM to identify and manage internal project risks. For the summary report only identify high level risks and their potential impacts to the project.

Examples:

- Complex right-of-way and utilities issues may impact schedule and cost.
- Project completion will depend on the availability of funding.
- Environmental requirements may delay project schedule.

What changed since last update? If there has been no significant change to the project scope, budget and schedule (as compared to the last report), report “no change”. Do not report changes or progress of day-to-day project tasks/activities. Briefly report on major and significant scope, schedule and cost changes.

Examples:

1. First time reporting:

Scope - No change (initial report)

Schedule - No change (initial report)

Cost - No change (initial report)

2. Adding a new interchange to the Project:

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- Scope: At the request of the City, a new interchange will be constructed at First Street.
- Schedule: Project schedule is delayed by 1-2 years to accommodate design of the new interchange.
- Cost: Increased by \$50 - \$60 million due to addition of the new interchange.

Project Costs (DB):

Engineering: (internal cost + Procurement support costs + contract administration/CE)

ROW: Only NDOT ROW costs

Contract (final design + Construction)

Financial Fine Points (Key Assumptions): Report the total expended project costs. For local agency projects, only report on NDOT incurred costs.

Always consult with Financial Management, Accounting, and Program Development Divisions. Provide a brief explanation of financial issues.

Inflation escalation (4%) is to 20xx, approximate mid-point of construction.

Additional federal/state funds needed to complete the project

% project funding is from 2007 AB 595, % federal, etc.

Examples:

1. The Environmental phase for the US 95 Northwest project is complete. NDOT Director has approved the project finance plan identifying five project phases. Phase 1 is currently under design:
 - Total funding expended for Phase 1: \$795,000
 - Total funding expended for US 95 Northwest Environmental Studies (all phases): \$5 M.
 - Inflation escalation (4%) to midpoint of Construction in 2010.
 - Funding source:
 - AB 595 – full funding not available until 2011
 - \$12 million Federal
 - \$1 million State
 - \$120 - \$152 million unidentified.
2. City is advertising, awarding and administrating a project. NDOT's construction contribution is \$2 million.
 - Total funding expended (NDOT contribution): \$500 K
 - Inflation escalation (4%) to midpoint of Construction in 2010

- Funding source:
 - \$10 million local STP
 - \$2 million NDOT

Status Bars (DBB):

Show status bars for the four major phases of the project (planning, environmental, final design & construction) and the Right-of-way acquisition process (as required by 2007 AB 595).

- During planning phase show only a status bar for % complete planning.
- During environmental phase show only a status bar for % complete environmental.
- During the Final Design Phase show status bars for %complete Final Design phase and % complete R/W acquisition. Note: Report only status of the R/W acquisition process based on input of the R/W technical manager. Typically project design effort is up to 15% during planning phase and up to 30% by end of NEPA process. After NEPA, use a design level based on input of the project team.
- During the Construction phase, only show a status bar for the % complete construction.

Status bars (DB):

Planning

Environmental

Procurement

Final Design/Construction

Date

Show month and year of when the report was last updated (March 2010).

4.5. Monthly Project Status Report Preparation Guide

Changes and/or issues reported in this form should be at the project manager or Division level. Report programmed and/or estimated expenditures using Discoverer. The PM uses this form to report progress of project baselines each month. These include:

- Activities, milestones and deliverables completed for the previous month and those scheduled for the upcoming month. Schedule and contingency/risk reserve status, and if the project is on target for the schedule performance measures.
- Project expenditures including internal and consultants, budget and contingency status, and if the project is on target for the cost performance measures.
- Update on funding sources and status of goals that must be met or used to obligate project funds.

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- Status of the quality process and QA/QC activities (what has happened and where you are on the plan activities).
- Status of approved changes, impacts of new changes, etc.
- Report/update on major project issues (progress since last report), and
- Status of risk management activities and steps taken to mitigate major risks.

4.6. Reporting Forms

The monthly project status report form and the project summary report are located on the NDOT [Project Schedule and Management System \(PSAMS\)](#).

PROJECT TITLE/NAME Project Sponsor: Project Manager:		Project Photo	
Project Description: <ul style="list-style-type: none"> • 	Schedule: Planning: Environmental: Final Design: Construction:	Location Map	
	Project Cost Range (Cost estimates are appropriate for anticipated year of completing each phase): Engineering: Right-of-Way: Construction: Total Project Cost:		
Project Benefits: <ul style="list-style-type: none"> • 	What's Changed Since Last Update? <ul style="list-style-type: none"> • Scope - • Schedule - • Cost - 		
	Financial Fine Points: <ul style="list-style-type: none"> • Total funding Expended: 		
Project Risks: <ul style="list-style-type: none"> • 			
% Design Complete	0 50 100 	March 2010	
% R/W Complete	0 50 100 		

Section 5

5. Agreement Preparation Guidelines

5.1. Agreement Preparation

This section sets forth procedures and practices for a project manager to prepare cooperative and/or inter-local agreements between the Department and local public agencies.

Project managers have the responsibility to plan and coordinate timely completion of agreements. Department functional managers and project stakeholders shall be contacted for input on agreement terms. Said terms of the agreement shall be identified early in the project development phase and finalized prior to programming of the project or any work on the project. This requires input of Department functional managers and project stakeholders. Typically the work is coordinated with the:

- Director's Office.
- Attorney General.
- Program Development.
- Agreement Services.
- Financial Management.
- Project Accounting.
- R/W Division.
- Federal Highway Administration.
- Districts.
- Project planning, design, and construction team.
- Project sponsor.
- Local Agency.

Project sponsor and third party information shall be forwarded to Project Accounting prior to negotiating terms of the agreement. As early as possible, terms and conditions of the agreement between the Department and the project sponsor shall be identified. Agreement negotiated terms typically include, but are not limited to, identification of the lead agency, technical standards for the project, funding participation, payment schedule, project schedule, design responsibility, construction responsibility, and maintenance responsibility. Agreement negotiated terms and conditions may change during the project development process.

For all projects, an agreement must be fully executed before any work is done by the Department, e.g. prior to any work being done on the project and prior to programming the project for any phase of work. As necessary, create a work order or job authorization number to track incurred costs by the Department.

For developer funded projects, agreements shall state that the Department will be compensated for incurred design and review costs if the project is not awarded for construction. This can be accomplished by requiring a Letter of Credit to be used as a deposit. All funds must be received prior to starting any work.

5.2. Funding Participation

Agreements must accurately describe the funding participation of each agency during the project development process. The agreement must clearly identify:

- The funding source(s) – e.g. Federal, state, local, etc.
- Applicable program – e.g. Safety, CMAQ, etc.
- Limitations – e.g. Maximum available, sunset date, etc.
- Percentage match – e.g. 95% Federal, 5% local match.
- Deposit schedule – e.g. Schedule for the deposit via a Letter of Credit must be defined prior to advertisement, or at end of construction, or after specific year, or otherwise.
- Frequency of billing (invoices) – e.g. Monthly, yearly, billed at completion, or otherwise.
- When funds will be available – e.g. Federal fiscal year 2009, etc.

Coordinate this activity with Financial Management, Project Accounting, and Program Development prior to seeking the Director's Office input. To use federal funds, the project funding source and amount must match the Statewide Transportation Plan.

The local public agency/developer will be required to pay the appraised value of the control of access.

Fees associated with review and acceptance of the project may be waived by the Department and local agency.

5.3. Project Management & Project Administration

For projects on Interstate routes and US routes within urban limits, administration of the project is NDOT's normal position; however, NDOT will consider allowing administration by a local public agency if we can agree to certain terms in an agreement between the two parties. Please coordinate with the Director's Office regarding the agreement's terms.

When the Department is administrating the project: the Department will design, award, advertise and administer the project. The project team must follow the Department's project development processes and project management policies, procedures, and guidelines. The Department project manager is responsible for the project cost, scope, schedule, and quality requirements.

For other systems, the project sponsor can administer the project. In such cases, the Department project manager is responsible for forming an internal project team to review technical submittals, establish communication protocols, and prepare the inter-local agreement. The Department project manager must identify submittal requirements (traffic report, drainage report, etc.) and develop a project schedule with input of the Department's project team and the project sponsor. The complete project schedule is typically not set forth in the agreement.

However, as appropriate, major milestones should be identified that may impact project funding.

Throughout the project development process, changes to the initial cost, scope, and schedule shall be communicated with the project sponsor and the project team. This communication applies to before and after execution of the agreement.

5.4. Technical Standards

Department technical standards will be used on all projects located on Interstate and U.S. routes within urban limits.

For other systems, the local agency's technical standards and procedures can be used. In such cases, the Federal and State policies, standards, processes, and procedures are still required to be followed during all phases of the project development and construction. The following guidelines shall be used in preparing the Plans, Specifications, and Estimate (PS & E) package:

- If the Department is preparing the PS & E documents, use the Department's technical standards and format.
- If the local public agency is preparing the PS & E documents, the technical standards will depend on who will Award, Advertise, and Administer (AAA) the project construction:
 - If the Department is awarding, advertising and administering the contract, use Department's standards and format.
 - If the local public agency is awarding, advertising, and administering the contract, use of the NDOT technical standards is still preferred; however it can be negotiated with the agency and included in the agreement. Refer to the Technical Requirements and Exceptions section for additional information.

Typically Department standards should be used when improvements are located on Department right-of-way and will be maintained by Department. Any exceptions must be coordinated with the appropriate Divisions and District. Local public agency standards may be used on projects located within Department right-of-way if the local public agency is going to maintain the improvements. The local public agency may use its standards on project elements located outside of Department right-of-way.

5.4.1. Asphalt and Concrete

Asphalt and concrete specifications for improvements within Department right-of-way must meet Department requirements.

5.4.2. Access Management

The Local Agency must follow Department's "Access Management System and Standards" (<http://www.nevadadot.com/business/forms/>). Exceptions to the standards must be approved by the appropriate District Engineer or the Department's Traffic Safety Division.

5.4.3. Structures

All structures located on a federal-aid highway and public highways other than those functionally classified as local roads or rural minor collectors must be designed to Department standards. All other structures may be designed to standards less than the Department's, but the design will be consistent with the roadway the structure carries with respect to loadings and width when considering 20-year traffic projections. For all bridges over waterways, the bridge foundations must be designed according to Department standards.

5.4.4. Landscaping & Aesthetics

Landscaping and/or aesthetic treatments shall comply with the Department's Landscape and Aesthetic Master Plan, A Pattern and Palette of Place, and the applicable Landscape and Aesthetic Corridor Plan. All materials shall be regionally appropriate and plantings shall be drought tolerant. Palm trees may be considered when an appropriate species and watering schedule that eliminates or reduces watering during winter months is used. For capacity improvement projects up to three percent (3%) of the construction costs within Department right-of-way shall be applied towards landscape and aesthetics.

The agreement must clearly identify the party responsible for right-of-way acquisition and utilities and bill board relocations. If any portion of R/W work is performed by the cooperative agency, ensure that:

1. The Uniform Relocation Act and Department R/W manual is followed,
2. The Department's R/W setting process is followed,
3. The R/W plans follow Department standards,
4. The just compensation is set by the Department, and
5. If the local agency is acquiring right-of-way for the project, the local agency will certify to the Department that they have followed the Uniform Relocation Act of 1970.

5.4.5. Construction

On the Interstate system, the Department will advertise, award, and administer the contract. For other systems within Department right-of-way, and if a local agency is advertising, awarding, and administering the contract, include the following in the agreement:

1. The local public agency must submit an Occupancy Permit Application (the Department shall waive the fees),
2. The Department will review and approve submittals and deliverables,
3. The local public agency must follow Department's technical specifications, materials testing frequencies, and the certification acceptance process, and
4. The Department will review and approve change orders.

5.4.6. Maintenance Responsibilities

Coordinate with the appropriate District Office regarding maintenance issues as early as possible. Maintenance agreements are stand alone covering a long-term period and should not

be combined with agreements that have termination dates. Consult with the appropriate District Office and Project Accounting if this situation cannot be avoided.

If NDOT Maintenance responsibility extends beyond NDOT Right of Way, the agreement must include specific language about NDOT permit responsibilities, coordinated with the appropriate District Office.

All Maintenance agreement summaries must include the appropriate NDOT District Engineer, Maintenance and Operations Division, and the Roadway Systems Division for receipt of copies of the final agreement.

Note the following requirements and exceptions:

Interstate Facilities: Department will maintain facilities; however the following are potential exceptions:

- Enhanced landscaping.
- Signals and signal repairs.
- ITS devices.
- Non-freeway lighting.
- Multi-use paths.
- Regional drainage facilities.
- Park-and-ride.

System/System and System/NDOT Service: Department will maintain facilities, however with the following exceptions:

- Enhanced landscaping.
- Signals and signal repairs in excess of \$1,500.
- Non-freeway lighting.
- Multi-use paths.
- Regional drainage.

System/Local Service:

Department will maintain the following:

- Structures (approach slabs and bridge deck could be exceptions).
- Superstructure.
- Approach slabs.
- Deck and riding surface.
- Freeway.
- Ramps.
- Drainage.

SECTION 5
AGREEMENT PREPARATION GUIDELINES

- Base landscape.

The local public agency will maintain the following:

- Arterial roadway surface.
- Signals.
- Arterial roadway lighting.
- Arterial sidewalk.
- Multi-use trails.
- Local arterial storm drain.
- Enhanced landscaping, including irrigation costs.
- Regional drainage.

5.4.7. Intelligent Transportation System

Coordinate with the Headquarters Maintenance Divisions regarding ITS design, devices, and issues.

Section 6

6. Project Management Uniform Filing System

6.1. Overview

These guidelines were developed to provide a directory and instructions for Project Management records with the intent of making working records accessible to project managers (PMs) and providing a uniform directory in which all divisions within the Department may access project data more efficiently.

6.2. Management and Responsibility of Filing System

The Department's Record Management Section (i.e., Central Records) located in the Administrative Services Division, Carson City will be the central depository for all original documents and data, regardless of the media, generated on the project.

In accordance with current NDOT and division retention schedules, working copies and files will be maintained by Project Managers, administrative staff, and the originating divisions.

All documents and files created or maintained by staff or consultants related to any project undertaken with state or federal funds and regardless of the purpose or form should be considered public record subject to applicable statutes regarding filing, retention, archiving, destruction and dissemination to the media or the public.

For more information on managing public records requests, restricted records, retention schedules, and filing systems in general, contact the NDOT Records Officer, Record Management Section, Administrative Services Division.

6.3. Filing Strategy

Many letters and reports cover more than one project issue. Consequently, items will be classified and filed according to the source that generated them, rather than by subject. Filing by subject area would result in extensive duplication of materials because correspondence and reports would have to be updated for all relevant subject areas.

The PM should use personal discretion when creating sub-categories for filing purposes. Major projects generate enough correspondence in some categories to require creation of subcategories. No master index is required, as the categories in the PM Uniform Filing System provide adequate identification for timely retrieval.

Projects that are staged into separate contracts for construction or split from larger projects into more manageable segments should stand on their own: a PM's project file should be assembled for each segment or project phase. It is recommended to break out or duplicate material at an early date, for use as a working file for the PM, and as a source for subsequent files.

6.3.1. Project History Files

A Project History File (the permanent file) will be compiled by the Records Management Section. This file consists of all original project development and final construction records. These are to include all letters, memos, reports, etc. that document project decisions, or that would be useful to develop a subsequent project.

All original documents should be filed and/or copied to the Records Management Section for inclusion into the Project History File. The Legal Division has approved these designated items, and the file should not be cluttered with routine records not officially designated for inclusion.

When construction of the project is complete and 3 years from the final contractor payment, the PM should initiate assembly of the documents to be included into the Project History File by transmitting designated records to the Records Management Section.

6.3.2. Electronic Files

All individual electronic files must be maintained and preserved in accordance with current Department retention schedules. Until further guidance is provided by the Department or the State, pertinent documents should be printed and maintained within the paper files.

6.4. Explanation of Record Series

All Division file folders will be annotated with the complete Record Services and Record File number and title as indicated below. Record Series always start with the organizational code C015 followed by the Record Series and Record File number (e.g., C015-111.01). Record Series and Record Files pertinent to one specific project should also be annotated at the end of the file number with the five-digit project number in parentheses [e.g., C015-111.01 (75061)].

Record Series C015-100 covers project control.

Record Series C015-200 is a resource file covering the project Approval process. The file should contain only the specified documents and should not be cluttered with routine correspondence. All routine correspondence leading to the various project approval documents should be filed in Record Series C015-300 and C015-400, as applicable.

Record Series C015-300 should contain correspondence between all external sources.

Record Series C015-400 is a source file to contain interdepartmental correspondence.

Record Series C015-500 should contain all plans and calculations for design. Preliminary studies and plans should be filed in Record Series C015-200. All other plans, whether filed in flat drawers or rolled and placed in bins, are labeled with the appropriate Record Series C015-500 breakdown.

Record Series C015-600 covers miscellaneous items and is self explanatory.

6.5. Oversized Materials

Attachments to letters that are too bulky for filing in regular files are referenced to the latter by date and category breakdown and then filed in separate envelopes or bins with the appropriate index label.

PROJECT MANAGEMENT UNIFORM FILE SYSTEM	
RECORD SERIES	RECORD FILE
100 PROJECT CONTROL	
110 EXPENDITURES	
111 Expenditure Reports	111.01 Planning Phase
	111.02 NEPA Phase
	111.03 Preliminary Design Phase
	111.04 Final Design Phase
	111.05 Construction Phase
	111.06 Other phases and costs as needed.
120 DESCRIPTION	
121 Project Description	121.01 Project Description and method of determination
130 PROGRAMMING AND PROGRESS	
131 Programming Papers	131.01 Project Reference Number for each/all phases
132 PSAMS	132.01 PSAMS milestone dates
	132.02 Schedule Calculations
	132.03 Log of Approved Schedule Change Forms
133 Progress Reports	133.01 Monthly Progress Reports
134 Project Schedule	134.01 Log of Monthly Project Schedule Updates
135 Project Guideline Forms	135.01 Log of Monthly Project Guideline Forms
136 Project Calendar	136.01 Log of Project Calendars
137 Project Development Checklist	137.01 Project Development Checklist
138 Preliminary Risk Assessment	138.01 Preliminary Risk Assessment
140 PROJECT COST ESTIMATES	
141 Project Cost Estimates	141.01 Log of Engineers Estimates
	141.02 Log of Preliminary Agreement Estimates
	141.03 Log of Agreement Estimates
	141.04 Cost Estimate Backup Data
142 Project Cost Increases	142.01 Log of Approved Scope and Budget Change Forms
	142.02 Log of Change Orders
143 Miscellaneous Project Estimates	143.01 Study Estimates for Project Alternatives
200 PROJECT APPROVAL PROCESS	

SECTION 6
PROJECT MANAGEMENT UNIFORM FILING SYSTEM

210 PRELIMINARY STUDIES	
211 Project Initiation	211.01 Feasibility, Justification or Concept Report
	211.02 Approvals to Proceed
212 Project Authorization	212.01 STIP
	212.02 Concept Approval
	212.03 Approved Scope Budget Change Forms
	212.04 Approval to Stop Work
213 Planning Studies	213.01 Notice of Intent to Study Documents
	213.02 Corridor or Route Location Studies
214 Alternatives	214.01 Preliminary Plan and Profile Studies of Alternatives
	214.02 Impacts of Alternatives
	214.03 Approval of Alternatives
220 PROJECT MANAGEMENT TEAM	
221 PMT Assignments	221.01 List of Assigned Team Leaders
222 Project Category Assignment	222.01 Determination of Category, Major/Categorical Exclusion, Significant/Non-Significant
223 PMT Meeting Minutes	223.01 Monthly Progress Meeting Minutes/Summary
	223.02 Approved PDFS Memo
	223.03 Other Approval Memo's by PMT
230 ENVIRONMENTAL	
231 Draft Environmental Document	231.01 Environmental Assessment
	231.02 Circulated Draft and Cover Letter
	231.03 Written NOI of EIS Preparation
	231.04 Published Technical Reports
	231.05 Floodplain Evaluations
	231.06 Draft 4(f) Documents
	231.07 Approval to Circulate
	231.08 Mailing List
232 Final Environmental Document	232.01 Distributed Final and Cover Letter
	232.02 Approval to Distribute
	232.03 Findings and Notice of Determination
	232.04 Record of Decision or FONSI
	232.05 Mailing List
233 Public Notices	233.01 Public Notices from Newspaper
	233.02 Copy of Federal Register Entry
240 PROJECT APPROVAL	
241 Project Instructions/Plan	241.01 Copies of Project Instructions
	241.02 Project Management Plan
	241.03 Project Financial Management Plan
243 Preferred Alternative	243.01 Preferred Alternative Selection
244 Design Standard Exceptions	244.01 Documentation of Exceptions from Mandatory Design Standards
	244.01 Documentation of Exceptions from

SECTION 6
PROJECT MANAGEMENT UNIFORM FILING SYSTEM

	Advisory Design Standards
245 Change in Access Report	245.01 Copy of Change in Access Request
	245.02 Copy of FHWA Approval
250 PUBLIC HEARING PROCESS	
251 Pre-Hearing Meetings	251.01 Initial Meeting Documentation
	251.02 Scoping Meeting Documentation
	251.03 Informational Meetings or other Pre-Hearing Documents
252 Public Hearing Notices	252.01 Public Hearing Notices from Newspaper
253 Record of hearing	253.01 Copies of Transcript, comments, etc.
	254.02 Record of Hearing
260 PROJECT AGREEMENTS	
261 Cooperative Agreements	261.01 Copies of Cooperative Agreement
	261.02 Draft Agreements
	261.03 Agreement Approvals from Directors Office
	261.04 Invoices/Final Audit
262 Interlocal Agreements	262.01 Copies of Interlocal Agreement
	262.02 Draft Agreements
	262.03 Agreement Approvals from Directors Office
	262.04 Invoices/Final Audit
263 Developer Agreements	263.01 Copies of Developer Agreement
	263.02 Draft Agreements
	263.03 Agreement Approvals from Directors Office
	263.04 Invoices/Final Audit
264 Maintenance Agreements	264.01 Copies of Maintenance Agreement
	264.02 Draft Agreements
	264.03 Agreement Approvals from Directors Office
	264.04 Invoices/Final Audit
265 Miscellaneous Agreements	265.01 Copies of Misc. Agreement
	265.02 Draft Agreements
	265.03 Agreement Approvals from Directors Office
	265.04 Invoices/Final Audit
270 PERMITS	
271 State Agency Permits	271.01 Copies of Executed State Agency Permits
272 Federal Agency Permits	272.01 Copies of Executed Federal Agency Permits
273 Local Agency Permits	273.01 Copies of Executed Local Agency Permits
274 Encroachment Permits	274.01 Copies of Executed Encroachment Permits
300 EXTERNAL PROJECT DESIGN CORRESPONDENCE	

SECTION 6
PROJECT MANAGEMENT UNIFORM FILING SYSTEM

310 FEDERAL AGENCY CORRESPONDENCE	
311 Federal Agencies	311.01 Letters to and from Federal Agencies
	311.02 Letters Affecting Project Decisions
320 STATE AGENCY CORRESPONDENCE	
321 State Agencies	321.01 Letters to and from State Agencies
	321.02 Letters Affecting Project Decisions
330 LOCAL AGENCY CORRESPONDENCE	
331 Cities	331.01 Letters to and from various Cities
	331.02 Letters Affecting Project Decisions
332 Counties	332.01 Letters to and from various Counties
	332.02 Letters Affecting Project Decisions
333 RTC's, Area Wide Agencies	333.01 Letters to and from various Area Wide Agencies
	333.02 Letters Affecting Project Decisions
334 Other Agencies or Special Districts	334.01 Letters to and from various Agencies or Special Districts (school districts, NAB's, CAB's, assessment districts, etc)
	334.02 Letters Affecting Project Decisions
340 ELECTED OFFICIALS CORRESPONDENCE	
341 Elected Officials	341.01 Letters to and from Elected Officials
	341.02 Letters Affecting Project Decisions
350 PUBLIC CORRESPONDENCE	
351 Individuals	351.01 Letters to and from Individuals
	351.02 Letters Affecting Project Decisions
352 Private Groups	352.01 Letters to and from Private Groups
	352.02 Letters Affecting Project Decisions
360 MEMOS TO FILE (EXTERNAL)	
361 Phone Call Documentation	381.01 Phone Call Documentation
	381.02 Phone Call Documentation Affecting Project Decisions
362 Informal Meetings/Discussions	362.01 Notes of Informal Meetings
	362.02 Notes Affecting Project Decisions
363 FHWA Reviews	363.01 Notes of Reviews
	363.02 Notes Affecting Project Decisions
364 NHP Reviews	364.01 Notes of Reviews
	364.02 Notes Affecting Project Decisions
365 Other Agency Reviews	365.01 Notes of Reviews
	365.02 Notes Affecting Project Decisions
400 INTERDEPARTMENTAL PROJECT DESIGN CORRESPONDENCE	

SECTION 6
PROJECT MANAGEMENT UNIFORM FILING SYSTEM

400 STRUCTURES	
401 Structures Correspondence	401.01 Memos to and from Structures
	401.02 Bridge Type Selection Report
410 DRAINAGE	
411 Drainage Correspondence	411.01 Memos to and from Hydraulics
	411.02 Preliminary Drainage Report
	411.03 Final Drainage Report
	411.04 Temporary and Permanent Erosion Control Reports/Correspondence
420 ENVIRONMENTAL	
421 Environmental Correspondence	421.01 Memos to and from Environmental Services
430 LANDSCAPING	
431 Landscaping Correspondence	431.01 Memos to and from Landscaping
440 LOCATION	
441 Location Correspondence	441.01 Memos to and from Location
442 Survey Data	442.01 Aerial monuments, bench marks, etc.
450 MATERIALS	
451 Materials Correspondence	451.01 Memos to and from Materials
	451.02 Geotechnical Reports
	451.03 Structural Design Recommendation
	451.04 Theoretical Applications
	451.05 Miscellaneous Reports
460 OPERATIONS	
461 District Maintenance Correspondence	461.01 Memos to and from District Maintenance Operations
462 Headquarters Maintenance Correspondence	462.01 Memos to and from Headquarters Maintenance Operations
463 District Construction Correspondence	463.01 Memos to and from District Construction Operations
464 Headquarters Construction Correspondence	464.01 Memos to and from Headquarters Construction
	464.02 Constructability Reports
	464.03 Project Closeout Correspondence
	464.04 Claims Correspondence
465 District Traffic Correspondence	465.01 Memos to and from District Traffic Operations
466 Headquarters Traffic Correspondence	466.01 Memos to and from Headquarters Traffic Operations
470 RIGHT-OF-WAY	
471 Right-of-Way Correspondence	471.01 Memos to and from Right-of-Way
	471.02 Right-of-Way Setting Memo
472 Utilities Correspondence	472.01 Memos to and from Utilities
473 Railroad/Utility Agreements	473.01 Utility Agreements with any utility companies, railroads, etc.

SECTION 6
PROJECT MANAGEMENT UNIFORM FILING SYSTEM

474 Utility Relocation Plans	474.01 Relocation plans for gas, power, telephone, etc.
475 Determination of Liability	475.01 Study of utility/non-utility prior rights
476 Right-of-Way Contracts	476.01 Contracts, obligations, etc.
477 Right-of-Way Maps	477.01 Parcel, ownership, excess parcel maps, etc.
478 Resolution Measures	478.01 Records to document resolution of necessity or mitigation measure
480 ROADWAY DESIGN	
481 Roadway Design Correspondence	481.01 Memos to and from Roadway Design
	481.02 PDFS/Scoping Reports
	481.03 Resolution of Support
	481.04 FAA Form
	481.05 Tree Memo
	481.06 Design Recommendation
	481.07 Geometric Approval
490 TRAFFIC	
491 Traffic Correspondence	491.01 Memos to and from Traffic Planning
492 Traffic Forecasts	491.02 Present and design year ADT, peak hour, B/C Analysis, etc.
493 Traffic Warrants	493.01 Signal warrants, median barrier rail warrants, lighting warrants, etc.
495 MEMOS TO FILE	
496 Phone Call Documentation	496.01 Phone Call Documents
	496.02 Phone Call Documentation Affecting Project Decisions
497 Informal Meetings/Discussions	497.01 Notes from Informal Meetings
	497.02 Notes Affecting Project Decisions
500 CONTRACT PREPARATION	
510 CONTRACT PLANS	
511 Roadway Design Plans	511.01 Contour Mapping, skeletons, contour grading, interchanges, intersections, profiles, super elevations, guardrail reviews, ADA issues, etc.
512 Drainage	512.01 Drainage plans, profiles, structure lists, etc.
513 Traffic	513.01 Signing, Striping, Electrical Plans
514 Traffic Control	514.01 Staging, phasing and detour plans for traffic control, etc.
515 Right-of-Way Plans	515.01 R/W plans, easements, material sites, fencing limits, utilities, etc.
516 Erosion Control	516.01 Erosion Control details and locations
517 Structures	517.01 Final Structure Plans
518 Landscape and Aesthetics	518.01 Final Landscape and Aesthetic Plans
519 Special Details	519.01 Structure lists, survey monuments, etc.
520 PS&E PROCESSING	

SECTION 6
PROJECT MANAGEMENT UNIFORM FILING SYSTEM

521 Processing Memo	521.01 Copy of Processing Memo
522 Preliminary Estimate of Costs	522.01 IFS Preliminary Cost Estimate Printout
	522.02 Final Engineers Estimate
523 Special Provisions	523.01 Intermediate Design Special Provisions
	523.02 Preliminary Design Special Provisions
	523.03 Draft Final Design Special Provisions
	523.04 Specification Review Meeting Minutes
	523.05 Final Draft of Special Provisions
524 Resident Engineer Information	524.01 Copies of working data for Resident Engineer
525 Supplemental Notices	525.01 Log of Supplemental Notices
526 Requests for Information	526.01 Log of RFI's
527 Bid Review and Analysis	527.01 Findings of Bid Review and Analysis
528 Contractor Requests	527.01 Value Engineering Proposals, etc.
600 PROJECT MISCELLANEOUS	
610 SPECIAL STUDIES	
611 Bicycle	611.01 Completed Studies and/or Reports
612 HOV Report	612.01 Completed Studies and/or Reports
613 Value Engineering	613.01 Completed Studies and/or Reports
614 Misc. Reports	614.01 Completed Studies and/or Reports
620 PROJECT SAFETY	
621 Safety Analysis	621.01 Completed Studies and/or Reports
622 Safety Recommendations	622.01 Completed Studies and/or Reports
623 Safety Audits	623.01 Completed Studies and/or Reports
630 PHOTOGRAPHS	
631 Project Photos	631.01 Pre-Construction Project Photos
632 Project Photo Renderings	632.01 Copies of Photo Renderings
633 Video Simulations	633.01 Copies of Video Simulations
640 PROJECT WEBSITE	
641 Project Website	641.01 Project Website Link/Correspondence

Appendix A

7. Example Roles and Responsibilities

7.1. Project Management

- Coordinate all cost, scope, and schedule issues.
- Coordinate with outside entities and NDOT Management.
- Provide leadership and direction to the Project team.
- Develop project management plan.
- Maintain the project schedule and budget.

7.2. Roadway Design

- Coordinate technical issues and incorporate products from other technical groups into the plans and estimate.
- Design oversight; including meeting all applicable standards, policy and procedures.
- Provide technical advice regarding individual design elements.
- Develop and provide project information as needed by other divisions.
- Update the project team on technical decisions/recommendations of NDOT management.
- Create and maintain a Design Report.
- Prepare project geometric certification.
- Act as an advocate for the Roadway Design Division by communicating concerns/issues between the project team and the Roadway Design Division.

7.3. Hydraulics

- Provide technical hydraulic design guidance.
- Prepare hydraulic design plans and estimate.
- Prepare and maintain the Drainage Report.
- Ensure design meets all Drainage Manual and other applicable standards, policies, and procedures.
- Act as an advocate for the Hydraulics Division by communicating concerns/issues between the project team and the Hydraulics Division.

7.4. Bridge

- Provide information related to all structures (bridges, RCBs, sign structures, etc.).
- Provide guidance for the design or modification of structural elements.
- Prepare the structural design plans and estimate.
- Ensure design meets all applicable standards, policies, and procedures.

- Act as an advocate for the Bridge Division by communicating concerns/issues between the project team and the Bridge Division.

7.5. Traffic

- Provide technical guidance on traffic related issues.
- Prepare traffic design plans and estimate (signs, signals, lighting).
- Create and maintain the Change in Access Report and the Traffic Report.
- Coordinate with Roadway Design, construction and others on traffic control and striping plans.
- Ensure design meets all applicable standards, policies and procedures.
- Act as an advocate for the Traffic Division by communicating concerns/issues between the project team and the Traffic Division.

7.6. Safety

- Provide technical guidance on safety related issues.
- Provide crash data.
- Schedule and coordinate the Roadside Safety Review.
- Act as an advocate for the Safety Division by communicating concerns/issues between the project team and the Safety Division.

7.7. Right of Way

- Provide technical guidance on right of way issues.
- Provide right of way verification.
- Prepare right of way documents and plans.
- Prepare project right of way certification.
- Act as an advocate for the Right of Way Division by communicating concerns/issues between the project team and the Right of Way Division.

7.8. Materials

- Provide technical guidance on Materials and Geotechnical related issues.
- Prepare and maintain the geotechnical report.
- Provide material site recommendation, materials specifications, and theoretical information.
- Act as an advocate for the Materials Division by communicating concerns/issues between the project team and the Materials Division.

7.9. Environmental

- Provide environmental documentation and applicable permits.
- Coordinate any mitigation to address environmental impacts.

- Communicate with the appropriate State, Local, and Federal agencies to obtain the appropriate permits required.
- Coordinate public meetings required by NEPA.
- Prepare the project environmental certification.
- Act as an advocate for the Environmental Division by communicating concerns/issues between the project team and the Environmental Division.

7.10. Construction

- Provide constructability and traffic control technical assistance.
- Develop working days, damages, etc. for the special provisions.
- Act as an advocate for the Construction Division by communicating concerns/issues between the project team and the Construction Division.

7.11. Location

- Provide mapping, aerials and survey, and alignment data to the project team.
- Prepare location control sheets for inclusion in contract plans.
- Act as an advocate for the Location Division by communicating concerns/issues between the project team and the Location Division.

7.12. Maintenance

- Provide technical maintenance information.
- Act as an advocate for the Maintenance Division by communicating concerns/issues between the project team and the Maintenance Division.

7.13. Specifications

- Prepare special provisions.
- Coordinate project review meetings and deliver final plans, special provisions, and estimates to Administrative Services Division.
- Attend traffic control and constructability meetings.
- Act as an advocate for the Specifications Section by communicating concerns/issues between the project team and the Specifications Section.

7.14. Traffic Information

- Provide technical traffic operations information.
- Provide traffic data and projections.
- Act as an advocate for the Traffic Information Division by communicating concerns/issues between the project team and the Traffic Information Division.

7.15. District

- Provide guidance and advice during the design phase to the project team on constructability and maintainability issues.
- Provide input to the design team regarding the project elements that the District would like to see included or addressed in the project.
- Assign staff to review and comment on 30%, 60% and 90% plan reviews.
- Act as an advocate for the District office by communicating concerns/issues between the project team and the District office.

Appendix B

8. Sample Project Benefits and Risks

8.1. Sample Benefits

The benefits listed here serve to counterbalance the costs, risks, and uncertainty of the project and explain to the reader why we are doing the project in the first place. Initially these should be derived from the project purpose and need statement, but feel free to go beyond that and use more subjective and positive points. Be careful not to change the project purpose and need. Remember to state benefits that can be backed up and to qualify statements as necessary (i.e. expected to, anticipated, preliminary, proposed), especially when in NEPA. The following are examples of project benefits:

- Improve capacity
- Improve operations
- Improve safety
- Improve access
- Meet stakeholder/public expectations
- Improve quality of life
- Support economic development
- Reduce trip times
- Reduce vehicle emissions
- Reduce idling
- Provide pedestrian and bicycle access
- Improve mobility
- Meet ADA standards
- Reduce maintenance costs
- Beautify roadway, neighborhood, structure, etc.
- Improve or protect environment
- Improve water quality
- Meet driver expectations
- Improve driver comfort
- Increase clearance
- Reduce erosion

8.2. Sample Risk Elements (Adapted from Washington DOT):

8.2.1. Technical Risks

- Design incomplete

- Right of Way analysis in error
- Environmental analysis incomplete or in error
- Unexpected geotechnical issues
- Change requests because of errors
- Inaccurate assumptions on technical issues in planning stage
- Surveys late and/or surveys in error
- Materials/geotechnical/foundation in error
- Structural designs incomplete or in error
- Hazardous waste site analysis incomplete or in error
- Need for design exceptions
- Consultant design not up to Department standards
- Context sensitive solutions
- Fact sheet requirements (exceptions to standards)
- Others

8.2.2. External Risks

- Landowners unwilling to sell
- Priorities change on program
- Inconsistent cost, time, scope, and quality objectives
- Local communities pose objections
- Funding changes for fiscal year
- Political factors change
- Stakeholders request late changes
- New stakeholders emerge and demand new work
- Influential stakeholders request additional needs to serve their own commercial purposes
- Threat of lawsuits
- Stakeholders choose time and/or cost over quality
- Others

8.2.3. Environmental Risks

- Permits or agency actions delayed or take longer than expected
- New information required for permits
- Environmental regulations change
- Water quality regulations change
- Reviewing agency requires higher-level review than assumed

APPENDIX B
SAMPLE PROJECT BENEFITS AND RISKS

- Lack of specialized staff (biology, anthropology, archeology, etc.)
- Historic site, endangered species, wetlands present
- EIS required
- Controversy on environmental grounds expected
- Environmental analysis on new alignments is required
- Formal NEPA/404 consultation is required
- Formal Section 7 consultation is required
- Section 106 issues expected
- Project in an area of high sensitivity for paleontology
- Section 4(f) resources affected
- Project on a Scenic Highway
- Project in a floodplain or a regulatory floodway
- Project does not conform to the state implementation plan for air quality at the program and plan level
- Water quality issues
- Negative community impacts expected
- Hazardous waste preliminary site investigation required
- Growth inducement issues
- Cumulative impact issues
- Pressure to compress the environmental schedule
- Others

8.2.4. Organizational Risks

- Inexperienced staff assigned
- Losing critical staff at crucial point of the project
- Insufficient time to plan
- Unanticipated workload
- Delay getting approvals, decisions
- Functional units not available, overloaded
- Lack of understanding of complex internal funding procedures
- Not enough time to plan
- Priorities change on existing program
- New priority project inserted into program
- Inconsistent cost, time, scope and quality objectives

- Others

8.2.5. Project Management Risks

- Project purpose and need is poorly defined
- Project scope definition is poor or incomplete
- Project cost, scope, schedule, objectives, and deliverables are not clearly defined or understood
- No control over staff priorities
- Too many projects
- Consultant or contractor delays
- Estimating and/or scheduling errors
- Unplanned work that must be accommodated
- Communication breakdown with project team
- Pressure to deliver project on an accelerated schedule
- Lack of coordination/communication
- Lack of upper management support
- Change in key staffing throughout the project
- Inexperienced workforce/inadequate staff/resource availability
- Local agency issues
- Public awareness/support
- Agreements

8.2.6. Right of Way Risks

- Utility relocation may not happen in time
- Freeway agreements
- Railroad involvement
- Objections to Right of Way appraisal take more time and/or money
- Others

8.2.7. Construction Risks

- Inaccurate contract time estimates
- Permit work windows
- Utility
- Surveys
- Buried man-made objects/unidentified hazardous waste
- Others

8.2.8. Regulatory Risks

- Water quality regulations change
- New permits or new information required

Appendix C

9. References

For more information on the topics contained within these guidelines see:

1. Washington DOT Project Management website
<http://www.wsdot.wa.gov/Projects/ProjectMgmt/default.htm>
2. *A Guide to the Project Management Body of Knowledge Third Edition* (2004). Newtown Square, PA: Project Management Institute, Inc.
3. *Scholtes, P. R., Joiner, B. L., Streibel, B. J.* (2003). *The Team Handbook*. Madison, WI: Oriel Inc.