**FINAL REPORT**

# Project Management Peer Review

December 2009

TBG120209212053MKE

# Contents

**Appendices**

## SECTION 1
# INTRODUCTION AND BACKGROUND

## 1.1 INTRODUCTION

The Minnesota Department of Transportation (Mn/DOT) has identified the goal of improving project management within the agency. As described below, this goal is the result of an ongoing series of Mn/DOT initiatives toward its Strategic Vision of becoming a "global leader in transportation."

This report summarizes the background, findings, and recommendations from a Mn/DOT Project Management Peer Review held in October 2009. Mn/DOT, in partnership with the University of Minnesota Center for Transportation Studies (CTS) and CH2M HILL organized and facilitated the Peer Review event.

### 1.1.1 MN/DOT'S STRATEGIC VISION

**Mn/DOT's Strategic Vision** is to be a global leader in transportation, committed to upholding public needs and collaboration with internal and external partners to create a safe, efficient, and sustainable transportation system for the future. The strategic directions associated with attaining this vision include safety, mobility, innovation, leadership and transparency. Mn/DOT and its Office of Project Scope and Cost Management (PSCM) identified the goal to improve project management within the agency and focus on creating, implementing, supporting, and sustaining a project management culture.

Project management is recognized as a critical connection between the Strategic Vision and implementation of its related commitments, especially given the current economic challenges faced by Mn/DOT and its partners.

### 1.1.2 BACKGROUND—BUILDING ON MN/DOT SUCCESSES

In recent years, Mn/DOT has successfully integrated a number of initiatives into the agency's project delivery practices, including: 1) Context Sensitive Solutions (CSS), 2) the Hear Every Voice public involvement process, 3) scoping processes, and 4) cost estimating/cost management. These initiatives have improved delivery of Mn/DOT projects while also enhancing external partner relationships through a more transparent program. A natural next step in this process of improvement is to examine project management at Mn/DOT, as it offers the opportunity to tie together the common elements of the initiatives described above.

*Creation of a Project Management Culture*

*In order to achieve the Strategic Vision of becoming a "global leader in transportation," Mn/DOT identified the goal to improve project management within the agency and focus on creating, implementing, supporting, and sustaining a project management culture.*

Project management encompasses the activities tied to project and program delivery, as well as the internal activities needed for an agency of the size and scope of Mn/DOT to operate efficiently and effectively. Risks and constraints to delivering projects on time, on budget, and within the committed scope can be efficiently managed through successful project management.

One objective of the goal to improve is to recognize the current state of project management within the agency through a Peer Review process. Mn/DOT senior management undertook this Peer Review in recognition of the importance of project management, and to benefit the agency's efforts to achieve the vision. The peer review sought input from project and senior managers from other state DOTs and organizations with similar missions to complete projects under schedule and budget constraints. These outside managers were brought in to evaluate Mn/DOT activities, share best practices, and provide fresh, external insights on addressing problems with managing projects.

To provide context for this objective, a white paper, entitled *Transportation Project Management Practices* was prepared by Mn/DOT in advance of the October 2009 Peer Review.

The Mn/DOT Project Management Peer Review is used to not only benchmark current practices, but also identify some of the best practices that are being used both internally and from external sources. The Peer Review process offers the opportunity to formally recognize those best practices and opportunities for improvement, setting a path forward for change. In conducting this Peer Review, Mn/DOT continues to position itself as a high-performing agency, building upon its history of reliable project delivery and anticipating the changing demands of a mobile public.

## 1.2   THE PEER REVIEW PROCESS

Mn/DOT's Office of Project Scope and Cost Management managed the Project Management Peer Review. Held over a four-day period, representatives from across the transportation industry (the Peer Review Panel) were brought in to provide their own perspectives on project management and to hear from a cross-section of Mn/DOT employees about how project management is handled within the agency.

### 1.2.1 PEER REVIEW SURVEY, PARTICIPANTS, AND INTERVIEWS

As a method of obtaining input from a wide variety of project management staff prior to the Peer Review, a survey was distributed within Mn/DOT in September 2009 asking questions about how the Mn/DOT project manager (PM) role functions. More than 180 staff responded to the survey. The results provided insights and context for

### Best Practices

*The Mn/DOT Project Management Peer Review is used to not only benchmark current practices, but also identify some of the best practices that are being used both internally and from external sources.*

participants of the Peer Review. Analysis of the results indicated that regardless of experience level, Mn/DOT staff has generally uniform views about the agency's project management practices. For example, more experienced staff did not demonstrate significant differences of opinion from junior staff. The survey serves as a baseline of information upon which future surveys of Mn/DOT staff may be compared.

More than 100 Mn/DOT employees representing all districts and many of the functional groups participated in interviews over the course of the Peer Review.

### Peer Review Panel

The Peer Review Panel members were selected based on their recognized background in the area of project management. The listed panel members participated in and led interviews of Mn/DOT staff:

- Pasco Bakotich, State Design Engineer—Washington DOT
- John Conrad, Highway Market Segment Director—CH2M HILL
- Sidonia Detmer, Project Management Office Assistant Director—Virginia DOT
- Tucker Ferguson, Director of Construction and Materials—Pennsylvania DOT
- George Jones, Program Management Improvement Team - Major Projects—FHWA
- Larry Langer, Assistant State Engineer—Arizona DOT
- Laurie McGinnis, Acting Director—Center for Transportation Studies, University of Minnesota
- Jim McMinimee, Director of Project Development and Chief Engineer—Utah DOT
- Tim Neuman, Vice President and Chief Highway Engineer—CH2M HILL
- Mike Paddock, Program Manager—CH2M HILL

### Steering Committee Participants

The Steering Committee provided overall project oversight. This group is responsible for championing the project management cultural shift and Mn/DOT's change management efforts.

- Tom Sorel, Commissioner—Mn/DOT
- Khani Sahebjam, Deputy Commissioner and Chief Engineer—Mn/DOT
- Mike Barnes, Division Director, Engineering Services—Mn/DOT
- Bernie Arseneau, Division Director, Policy, Safety and Strategic Initiatives—Mn/DOT
- Sue Mulvihill, Division Director, Operations—Mn/DOT
- Scott McBride, Metro District Engineer—Mn/DOT
- Lynn Eaton, District II Engineer—Mn/DOT

### Steering Committee

*The Steering Committee is responsible for championing the project management cultural shift and Mn/DOT's change management efforts.*

- Derrell Turner, Minnesota Division Administrator—FHWA

### *Project Team Participants*

The Project Team developed and implemented the peer review agenda, communicated with stakeholders, and advised the Steering Committee. Unless otherwise noted, Project Team participants are Mn/DOT employees.

- Mike Barnes, Division Director, Engineering Services
- John Griffith, PCMG Metro Representative
- Sue Mulvihill, Director, Operations Division
- Todd Broadwell, PCMG Greater MN Representative
- Mike Ginnaty, Director, PSCM Office
- Liz Benjamin, CMG Metro Representative
- Jean Wallace, PSCM Office
- Mark Waisanen, CMG Greater MN Representative
- Jim Weingartz, PSCM Office
- Greg Ous, Assistant Director, Operations Division and CMG Greater MN Representative
- Val Svensson, Pre-Letting Section, OTS
- Tom Styrbicki and Nancy Daubenberger, Bridge Office
- Jeff Brunner, Consultant Services Section
- Bonnie Wohlberg, Human Resources
- Jon Chiglo, Chapter 152/ARRA Program Manager
- Rick Kjonaas, State-Aid
- Jeff Perkins, D-4 Asst. Maintenance Eng.
- Kevin Kosobud, Office of Construction & Innovative Contracting
- Phil Barnes, Risk Management, PARI Office
- Gary Dirlam, OMG Representative
- Deb Ledvina, Ombudsman
- Ginny Crowson, External Partnering
- John Rindal, Information & Technology
- Tim Perry, Office of Civil Rights
- Romeo Garcia, FHWA Minnesota Division Office
- Chuck Gonderinger, SRF, ACEC Representative
- Ron Schreiner, Mortenson Construction, AGC Representative

### *Working Group*

This group, which included staff from CTS, CH2M HILL, and Mn/DOT, conducted and facilitated the peer review by developing the agenda, interviewing Mn/DOT project managers, and recording proceedings. The group consolidated findings and developed recommendations for implementing a project management culture within Mn/DOT.

- Jim Grothaus, CTS Project Manager
- Doug Abere, CH2M HILL
- Joe Barbeau, CTS

### *Findings and Next Steps*

*The Peer Review concluded with findings and recommended next steps, including input for Mn/DOT to use toward development of an implementation plan that will advance and increase the use of project management best practices across the organization.*

- Mike Barnes, Division Director, Engineering Services—Mn/DOT
- John Conrad, CH2M HILL
- Mike Ginnaty, Director, PSCM Office
- Laurie Gustafson, CTS
- Mary Gute, CH2M HILL
- Stephanie Malinoff, CTS
- Tim Thoreen, CH2M HILL
- Jean Wallace, PSCM Office
- Jim Weingartz, PSCM Office

### 1.2.2 PEER REVIEW DOCUMENTATION

The Peer Review concluded with findings and recommended next steps, including input for Mn/DOT to use toward development of an implementation plan that will advance and increase the use of project management best practices across the organization. The implementation plan will also outline additional initiatives to continue building toward a project management culture.

Peer Review participants listed in Section 1.2.1 were involved with developing and endorsing this Final Report, which summarizes the Mn/DOT Project Management Peer Review. Complete documentation of the Mn/DOT Project Management Peer Review is included in Appendix C, including a summary of the Peer Review proceedings. Biographies for Peer Review Panel members are included in Appendix A.

For more documentation from the Peer Review and the links to the project scoping and cost estimating initiatives at Mn/DOT, see this site: http://www.dot.state.mn.us/cost-estimating/peer-review/index.html.

## 1.3 MN/DOT'S ORGANIZATION AND PROJECT MANAGERS

Mn/DOT shifted to a decentralized approach to program delivery in the 1990s. Each district of Mn/DOT (shown in Exhibit 1) is responsible for managing its own project portfolio within annual fiscal boundaries established by Mn/DOT's centralized Office of Investment Management (OIM).

While the primary classifications for staff are consistent across Mn/DOT, each district and functional group has its own practices for identifying project managers. In Greater Minnesota districts where staff pool sizes are relatively smaller, the number of potential PMs may be limited. The decision will often be based on availability of staff. In some cases, this may lead to a project being led by a technical expert who takes on project management responsibilities as a duty in addition to his

or her usual responsibilities. This approach also results in greater use of PMs through multiple phases. Project managers in Greater Minnesota will often report directly to an assistant district engineer. Additionally, each functional group task or project can also have PMs assigned. Besides having different methods for identifying PMs, any one project may have multiple PMs assigned.

The Metro District is undergoing change in how it identifies and administers project management. Earlier this decade, Metro District created the area manager role, to serve as an external liaison responsible for tracking stakeholder issues into Mn/DOT projects. The area manager covers a geographic portion of the Metro District, with multiple area engineers reporting back. More recently, Metro has decided that each project will be owned at the principal engineer level, with either an area engineer or a design engineer serving as the PM. This results in a "matrix" organization which blends functional and project management characteristics.



Mn/DOT District Map

Mn/DOT has been using a software program called the Program and Project Management System (PPMS) for over 20 years. PPMS is used to schedule pre-construction tasks and milestones, track project progress, and schedule project letting for construction. Project costs are entered into PPMS, but are estimates only. As Mn/DOT continues to develop a total project cost program, the agency is concurrently conducting a needs assessment and study of alternatives to the current PPMS for improved cost accounting applications.
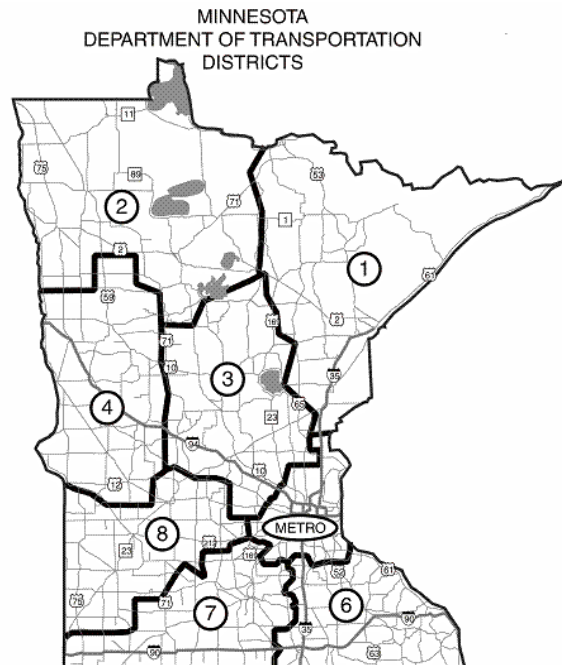
### Mn/DOT PM Best Practices

*The Peer Review Panel observed several project management best practices currently in place at Mn/DOT. The list below is representative of feedback the panel heard from Mn/DOT staff:*

- *The new early scoping process is successfully integrated into projects, with support for total project cost estimating;*

- *There is a strong project delivery focus and culture;*

- *Routine project reviews, formal scope amendments, and regular reports of reasons for schedule delay are established processes for managing project change;*

- *Training programs are recognized as providing value;*

- *Hear Every Voice and Context Sensitive Solutions are valuable resources; and*

- *Innovation is promoted across the agency — in contracting methods (e.g., design-build), use of resources, procedures, and project delivery.*

*These practices provide a foundation to build upon for future changes in Mn/DOT's project management culture.*

SECTION 2

# PEER REVIEW OBSERVATIONS: CURRENT PRACTICES

This section identifies the most important attributes of project management practice, based on results of the Peer Review. While Section 1 provides a baseline (by discussing the Mn/DOT organization and PM roles), the content here will summarize key observations—addressing Mn/DOT's current practices and identifying issues that might be considered for improvement. Therefore, the following content focuses on project management in the existing organization. Sections 3 and 4 address possible new directions.

Best practices and issues are addressed below in five subsections:

- Planning and Scoping (Section 2.1)
- Program and Project Delivery (Section 2.2)
- Functional Groups and Program Support (Section 2.3)
- Tools, Methods, Technology, and Training (Section 2.4)
- External Stakeholders and Project Resources (Section 2.5)

These subsections provide the Peer Review Panel's observations while confirming understanding of the organization—including Mn/DOT project management roles and issues.

## 2.1 PLANNING AND SCOPING

The Office of Investment Management (OIM) oversees statewide programming, including the development and compilation of a 20-year statewide plan, a 10-year Highway Investment Plan (HIP), and a four-year State Transportation Improvement Program (STIP). Under the new scoping program, a project cannot be entered into the STIP without completion of a scoping report, which establishes a cost and scope of the project.

With the ongoing initiatives described in Section 1, the cost estimate will become a total project cost figure, based on a more comprehensive accounting of project costs and risks. Mn/DOT staff generally expects that the scope of their projects will change over the four-year period of the STIP. The panel noted the preference would be to establish a project scope that does not change. However, one of the best practices described by Mn/DOT staff includes annual reviews of scoped projects and a formal process for documenting project changes. As total project cost is implemented, risk management accounting will become part of the ongoing project reviews.

Handoffs in the project manager role are regularly used on Mn/DOT projects, most notably at the transition from design to construction that occurs at project letting. In Greater Minnesota districts, the number of handoffs is generally lower than in the Metro district. This lack of defined parameters for when a project manager is assigned or when handoffs occur raises concern regarding the discontinuity in project knowledge. The project manager may not be prepared to understand project background or the reasons behind project decisions.

The Project Management Plan (PMP) is a tool that has been identified by the Federal Highway Administration (FHWA) and other state DOTs as valuable in managing and anticipating project transitions (see sidebar). PMPs are not regularly used on Mn/DOT projects, though they have been implemented on some complex projects, including the I-35W bridge replacement.

## 2.2 PROGRAM AND PROJECT DELIVERY

A project manager is assigned to each project when it is entered into the scoping process. As described above, that person does not always stay with the project through its duration. Factors for this may include the need to balance workload or perhaps the original project manager has changed positions. Changing of project managers can result in project delivery issues as hand-offs occur or ambiguity in who has project accountability or decision-making authority.

Workload leveling occurs at a squad leader level, and is based on the combination of experience and availability of staff. PPMS reporting of project status for a portfolio of projects helps determine who has availability and which of the functional groups will be prominently involved. The design project manager is not likely to know who the construction project manager will be until the project has progressed closer to the letting date. Likewise, the functional group project manager (e.g., the manager of an environmental documentation task in the project) may not be known until their activity formally begins on the project.

The new scoping process has encouraged earlier involvement of construction project managers. However, one of the concerns noted by Mn/DOT staff at the Peer Review is the lack of a clear definition of a project manager. For construction managers, the lack of clear roles and responsibilities sometimes prevents effective early involvement in a project. One area where this was identified as directly affecting projects is delay in the development of a construction staging plan; the effects of which are noticed by the public.

*Project Management Plans (PMPs)—Definitions and Requirements*

*FHWA requires states to develop PMPs for all Major Projects (i.e. projects with an estimated total cost of $500 Million or more); these plans are also reviewed and approved by FHWA. This tool is the foundation of well-managed projects.*

*The FHWA defines a PMP as a "roadmap" that lays out how a project will manage critical elements of scope, cost, schedule, quality, and federal requirements. It also documents project roles and responsibilities for participating parties. In short, the PMP helps all involved from state DOTs and the FHWA think through the project in a logical manner.*

*__PMP Benefits__ – In addition to defining how projects will be executed, monitored, and controlled, Washington DOT has found that developing PMPs provides several benefits, including:*

- *Alignment of team goals,*
- *Mutually understood project objectives,*
- *Clear identification of roles, responsibilities, and accountability for project deliverables, and*
- *Focus on project scope (less vulnerable to scope creep).*

The design-build process was noted as having many beneficial project management characteristics that could potentially be transferred to the more traditional project delivery program. Most notably, the design-build project manager is involved from beginning to end (or "cradle-to-grave") and is given authority to make key project decisions so as not to delay a project. An emphasis is placed on rapid resolution of issues to avoid escalation to higher levels.

When asked what skills or traits are especially important for project managers, several common themes emerged from Peer Review participants. The following was noted about good project managers:

- An ability to communicate well with a diversity of internal and external project stakeholders;

- Appreciation of the project from a "big picture" point of view, so that ambiguity in the project does not hinder progress or the resolution of conflict;

- Understanding of Mn/DOT project processes so that the implications of a decision are known; and

- Ability to work with and coordinate project change.

Notably, a specific technical expertise was not identified as essential for the project manager. However, technical background was identified as helpful in understanding project processes. These comments are especially relevant given the discussion of project manager responsibilities versus those of a "phase leader" described by other state DOT's involved in the Peer Review (and highlighted in the sidebar).

## 2.3 FUNCTIONAL GROUPS AND PROGRAM SUPPORT

Mn/DOT decentralized much of its program delivery functions from the Central Office to the districts in the 1990s. However, several Central Office functional groups and program support services still provide critical roles in delivery of the Mn/DOT program. PPMS is a key tool in the management of these functional groups' project involvement (i.e., their task). When properly used, PPMS provides functional groups with a timeframe for which their tasks need to be started and completed. These groups work in a highly collaborative environment to flexibly manage their workload and achieve their schedule milestones.

Functional group input during the Peer Review included reference to the relative instability of project managers in the design and project delivery portions of Mn/DOT. Comparatively high rates of project manager turnover in design and delivery have diminished procedural and institutional knowledge at the project point of contact. For the

functional groups, this has resulted in concerns about the ability to track and comply with project commitments (for example, a shift in roadway alignment to avoid sensitive environmental resources), which are often made early in project development.

Turnover in the project manager role is also indicative of a trend toward the assignment of management duties to less experienced Mn/DOT staff. While recognized as important for career development, the agency's lack of definition for the project manager position creates situations in which younger/less experienced employees are required to manage or direct the work of more experienced functional group staff. This can be problematic when differences of professional opinion emerge. The lack of a clear decision-making process or authority structure may result in undue project delays or technical decisions that do not match up with the rest of a project's context (e.g., external stakeholder requirements).

Some notable project management best practices that have been established within Mn/DOT come from the Information and Technology (IT) Program Office. This office uses a structured project development process and identifies clear roles and responsibilities for the project manager and the information architect. A monthly, dashboard-style report is prepared to summarize all IT projects with easily understood indicators (green, yellow, red) of project status on budget, schedule, scope, and overall "health" of the project. This report goes to all IT program staff. Additionally, the IT program relies heavily on approaches from the *Project Management Body of Knowledge* (PMBOK), a standard reference document from the Project Management Institute (PMI).

Mn/DOT's Office of Research Services has developed a universal lifecycle process and flowchart for the development and delivery of its projects. This is intended to create project processes and deliverables that consider the end users of the project's products (see Section C.4.27 in Appendix C). The lifecycle flowchart also helps identify project roles and responsibilities for each phase of the project. As with the IT Program Office, the universal lifecycle project processes used by the Office of Research Services are in close alignment with the project management approaches from PMBOK.

## 2.4 TOOLS, TECHNOLOGY, TRAINING, AND METHODS

### 2.4.1 TOOLS AND TECHNOLOGY

The Peer Review Panel noted that PPMS serves primarily as a scheduling tool. For that reason, it appears as though PPMS is more functional as a high-level review tool for managers of program delivery, while also providing benefits to functional groups in assessing staff

---

### Online Project Management Tools

***Utah DOT's*** *(UDOT) ePM is an Oracle database program and project management tool that requires minimal input from project managers; as described, it is intended as "a tool, not a task." This tool:*

- *Manages statewide and regional programs,*

- *Manages STIP projects,*

- *Manages contracts for consultant services,*

- *Tracks right-of-way acquisitions, and*

- *Provides data for management reporting.*

***PennDOT*** *uses Open Plan software for project scheduling. The agency has been gradually implementing this tool and is now at the point where all projects are entered into Open Plan.*

***WSDOT*** *has its own "Project Management On-Line Guide," which offers a linked information network to guide PMs through its five-step Project Management process.*

workload and availability. PPMS does not provide the capabilities needed for more advanced project management tools such as the calculation of earned value on a project.

Some groups within Mn/DOT have chosen to use other commercially available tools for ongoing project management. Design-build projects have been using Primavera software for closer tracking of project-specific schedules and identification of potential problems. Primavera also allows for tracking of project deliverables. The IT Program Office uses a combination of software tools for managing its portfolio of projects, including Innotas and Microsoft Project.

The Right-of-Way program at the Mn/DOT Office of Land Management has developed a management tool called REALMS (Real Estate and Land Management System). Staff reported the tool to be extremely effective in managing project documents, communication processes, and collaborative efforts. This centralized database continues to be updated according to program needs, as reflected by an ongoing conversion to GIS capabilities for data management.

## 2.4.2 TRAINING

Mn/DOT has a robust and active internal training department. For project management, three levels of training are made available to Mn/DOT staff and external partners:

- Essential Skills—an introductory program for new or potential project managers,

- Advanced Skills—advanced training for preconstruction program project managers, and

- Master Skills—a program for experienced project managers to strengthen management/interpersonal skills for complex projects.

Mn/DOT has also developed the Critical Issues Program, which is open to people outside of Mn/DOT as well. This is a one-day course provided annually to expand on current issues and to supplement the skills project managers use routinely.

The trainings are not a prerequisite for being a project manager at Mn/DOT, nor does the training program lead to any sort of certification for project management. Employees, working with their supervisor during annual reviews, decide which training is appropriate.

Feedback provided by Mn/DOT staff during the Peer Review indicated that project management training for younger or newer Mn/DOT staff is effective—when they are able to attend one of the courses. Some of the design project managers described a disconnect between training offerings and staff availability to participate. More experienced project

## PM Training Programs

*Below are some approaches to training PMs from various state DOTs.*

***PennDOT*** *pays for project managers to take training and obtain certifications integral to the agency's PM selection process, according to three levels of classified PMs at PennDOT.*

***VDOT*** *has developed an extensive training program for project managers that includes:*

- *Transportation Construction Management Institute*

- *Project Management Development Program*

- *Transportation Project Management Institute*

*PMP certification is desirable, encouraged, and funded.*

*At* **WSDOT***, the Project Management Reporting System (PMRS) training program is intended for all WSDOT personnel participating in projects and/or activities associated with the agency's Capital Construction Program. Additionally, a "Project Management Academy" is offered as a four-day intensive class that gives an overview of the WSDOT project management processes.*

managers also noted that the training offerings do not seem to match up with their needs.

### 2.4.3 METHODS

By all accounts, the updated process for project scoping and cost estimating has been readily integrated into project development by Mn/DOT staff. This process has promoted the use of many ongoing practices that enable efficient project management. Project and program reviews are occurring at several levels and frequencies. The overall program review, which occurs three times every year, provides an opportunity for a broad understanding of how Mn/DOT is performing. As part of scoping, a formal amendment process is now in place to help manage project change and the implications it may have on the rest of the program. Additionally, Mn/DOT produces a quarterly *Reasons for Delay* report and an annual summary report, which are compilations of the factors involved in Mn/DOT project delays. Project managers are encouraged to be open about this reporting, as it provides an opportunity to understand organization-wide problems and develop appropriate solutions for them.

The Utilities group at Mn/DOT was recognized by the Peer Review Panel for making dramatic improvements in its methods over the past five years — reducing annual costs due to utility delays from over $3 million to less than $100,000. The current practices of the Utilities group warrant examination for improving project management processes at Mn/DOT, including how best to integrate external partners in project processes.

Most Mn/DOT projects will experience at least one transition in the project manager role. This transition typically occurs at the point when design (the **what** we are building stage) is ending and construction (the **how** we are building stage) begins. Those projects that create overlap between the "what" and "how" stages are often more successful. While there have been many cases of this happening, the smaller staff size of Greater Minnesota districts has enabled this buffered progression from one stage to the other more frequently. The smaller groups sometimes have no choice but to have greater continuity of staff. Occasionally, a cradle-to-grave project manager who stays on the project through its entirety (such as on design-build projects) has been employed to avoid this problem.

### 2.4.4 PERFORMANCE MEASURES

Mn/DOT has established a list of 16 performance measures to publicly evaluate the success with which it has delivered its program on an annual basis. This measurement and reporting is consistent with the strategic directions established by the commissioner, especially as a means toward transparency. This practice not only shows accountability

---

*Project Manager Assignment and Continuity*

*The examples provided below show how and for how long PMs are assigned to projects at various DOTs.*

*__UDOT "Cradle to the Grave" Model and Phase Leaders__ – UDOT PMs are responsible for projects from "cradle to grave" or from funding to one year into maintenance. This allows PMs to track construction and maintenance issues and increases the likelihood of fulfilling project commitments. PMs are primarily involved with managing scope, schedule, quality, and budget, rather than task delivery details.*

*UDOT uses Phase Leaders, or functional managers to assist with oversight of project phases (e.g., concept, environmental, design, or construction). The Phase Leader's focus on technical issues allows the PM to focus on PM responsibilities. Assigning a resident engineer to lead the inspection and oversight team during construction is an example of a Phase Leader.*

*__VDOT Range of Project Manager Assignments__ – Within VDOT, PMs can be dedicated to one project (full time) or dual-hat (part-time). PMs also may serve on a project from cradle-to-grave, or serve during certain phases. Factors considered when assigning PMs include: project category and requirements; experience, competencies and results; resources available; and succession planning.*

to the public, but it also helps build trust between the agency and all of its partners. These same themes of performance measurement, accountability, and trust were evident in regard to the generic Mn/DOT project manager during the Peer Review. In general, project managers at Mn/DOT do not have established performance measures to ground their work approaches. This has translated into diminished project manager accountability and authority for decision-making.

## 2.5 EXTERNAL STAKEHOLDERS AND PROJECT RESOURCES

Because transparency to the public is a strategic direction for Mn/DOT, work with external stakeholders will continue to gain in importance as a measure of a project's success. Mn/DOT's Hear Every Voice program offers a robust set of guidance, materials, and training for staff. The project manager's role in delivery of a public involvement plan or in partnership with stakeholders is often assumed to be significant. However, the process of determining who from Mn/DOT is involved and why is not always clear. The Metro District has established an organizational structure to help manage this concern through use of the area manager role described in Section 1.5. Separate from any one project, the area manager is responsible for external relationships for a geographical area. The area manager will provide input and assistance on any of the projects occurring within his or her geography.

The Peer Review Panel took note of Mn/DOT's ongoing work to improve risk and conflict management processes within the agency. These are central elements of project management and fundamental to a successful project management culture at Mn/DOT. The timing of this initiative and the development of a resource for PMs is appropriate, given the establishment of the project scoping process and continued interest in improving project management at Mn/DOT.

Many innovative methods for obtaining assistance of consultants or contractors on projects have been identified. A notable change for Mn/DOT has been the use of design-build contracting, which allows for a best value procurement process. One of the key factors for success in the Highway 10 project in Detroit Lakes was the use of innovative contracting that set incentives for completion of critical project components at important schedule milestones. The contractor also provided a community relations role in the project to meet personally with affected businesses.

Internally at Mn/DOT, work sharing and workload leveling is practiced between the districts and functional groups and is handled informally with no defined communications methods or measurements used to facilitate or manage doing "work for others." Specialized expertise is

### Performance Measures

**Dashboard Metrics** – *Several state DOTs described the use of "dashboard" gauges to publicly demonstrate performance against each agency's defined goals.*

**VDOT's** *performance expectations and measurements are linked to the agency's mission and delivery of the program. Public communication of both program performance and individual project performance is done through the VDOT Dashboard. This tool allows VDOT to transparently provide the public with real-time data about program and project performance.*

**UDOT** *uses multiple dashboards to reflect performance at both the executive and regional levels. These dashboards reflect real-time data and allow extensive opportunities to drill-down into the information. This information is frequently used at agency leadership review meetings.*

also applied—for example, the Metro Regional Traffic Management Center (RTMC) staff will advise and assist on ITS projects in Duluth, Rochester, or St. Cloud.

SECTION 3

# PROJECT MANAGEMENT CHALLENGES AND OPPORTUNITIES

Section 3 summarizes the important challenges and opportunities identified by the Peer Review Panel as Mn/DOT proceeds to enhance its project management practices. The top priorities and implementation issues are noted in Section 4.

Section 3 is built around the two major themes that Mn/DOT should address going forward:

- Developing a project management organization and culture (Section 3.1)

- Enhancing project management tools, technology, training, and methods (Section 3.2)

Section 3.3 concludes the discussion by addressing the need to set priorities.

## 3.1 DEVELOPING A PROJECT MANAGEMENT ORGANIZATION AND CULTURE

Goals related to strengthening project management in Mn/DOT's culture are fundamental to the Peer Review's purpose and the next steps. Based on the panel's findings, the four key organizational objectives are:

- Increase the organizational value of project management
- Define PM roles, responsibility, and authority
- Promote broad adoption of state-of-the-art practices
- Confirm organizational support

These objectives are discussed in detail below.

### 3.1.1 INCREASE THE ORGANIZATIONAL VALUE OF PROJECT MANAGEMENT

Mn/DOT exhibits exemplary project management in many parts of the organization; however, a sense of a project management culture does not touch all employees. Those who have clear project management assignments, and who work on teams where project management is emphasized, understand the promise of a project management culture—among the benefits are flexibility, individual development, and customer responsiveness.

To increase the organizational value of project management, Mn/DOT should consider the following actions:

- **Give PMs a better sense of when they are in the PM role**—The panel found that Mn/DOT PMs sometimes find themselves in the role as a collateral duty—not as a duty that was clearly defined and assigned from the beginning. Development of a project management organization and culture will require improved communications from leadership to ensure that PMs know and understand their project role.

- **Make a project-management-oriented career path a clear choice for Mn/DOT employees**—As discussed in Section 2, PMs are found throughout Mn/DOT's organizational structure; this does not necessarily need to be changed. However, more emphasis should be placed on the importance of staff accepting PM roles, as well as other project-specific roles—often in addition to other duties. Mn/DOT's culture and leaders should demonstrate that such roles are good career choices with great importance to the organization and opportunities for individuals. Project-specific contributions and success could, for example, be more formally considered in evaluations of *all* employees—to demonstrate linkage between good project performance, recognition, and advancement.

- **Articulate qualifications for project management roles; clarify core competencies**—Good communications and other "people skills" are clearly important competencies for PMs, in addition to knowledge of technical content or other subject areas. Understanding of internal and external stakeholders, and even proof of performance, might be prerequisites for larger or more complex project management assignments. While many with project management experience can agree to such competencies, Mn/DOT should evaluate and adjust its internal communications to make clear what attributes and prerequisites are considered when selecting a PM.

Section 3.1.2, below, will help to further define how Mn/DOT can develop a project management culture, in part, through an understanding of the PM role.

### 3.1.2 DEFINE PM ROLES, RESPONSIBILITY, AND AUTHORITY

Within Mn/DOT, the term project manager needs to be clearly defined—both generically and for specific projects. The white paper, developed early in the Peer Review process (noted in Section 1), provides possible definitions (see sidebar). To create a project management culture, Mn/DOT should further refine and share such definitions and related project management guidance.

Three important issues to consider include:

---

### *What is a Project Manager?*

*The Peer Review White Paper (noted in Section 1) includes several basic definitions of a PM, including the two noted below.*

*The Project manager:*

- *Is the person who heads up the project team and is assigned the authority and responsibility for conducting the project and meeting project objectives through project management.*

- *Is an individual or body with authority, accountability, and responsibility for managing a project to achieve specific objectives.*

*http://www.maxwideman.com/pmglossary/index.htm*

*Mn/DOT should further refine these definitions to fit within the agency's project management culture. Internal communications need to include these definitions, along with attributes and prerequisites that are considered when selecting a PM.*

---

- **PM job expectations, responsibilities, and authority must be documented and understood**—Expectations for PMs are often best communicated at the project-specific level, especially for large/complex projects. Organizationally, however, Mn/DOT will derive benefits from outlining typical roles for program leaders, PMs, and project team members. A well-integrated project management organization will then create a culture in which building and sustaining effective project teams is emphasized at all levels, but is understood to be a core competency for PMs. With support and consistency from top managers, PMs will also understand that they have the authority and tools to motivate team members, to make project-level decisions, and to manage ambiguity and risk. For more information, see also the discussions of chartering and Project Management Plans in Section 3.1.3, below.

- **Organizational role of projects must be enhanced**—A project can be simply defined as "…a temporary endeavor undertaken to create a unique product or service" [from the Project Management Institute (PMI), http://www.pmi.org]. Development of a project management culture demands an organization that is built around its projects. Effective project management organizations measure progress and performance, and thereby manage risk through groups or projects or portfolios. Organizations with effective project management systems in place address risk in ways that enhance their delivery process. In addition to identifying and recording risks, effective risk management involves identification, assessment, quantification, prioritization, and deliberate actions focused on the "big picture" objectives of the agency.

- **Various PM levels of experience must be defined and calibrated to project characteristics, including risks**—Mn/DOT might gain insight into methods for mentoring and development of PMs through examples and input from other states and consultants. Like Mn/DOT, these organizations routinely address a wide range of experience in their PMs and will often refer to job descriptions at various levels. Of course, leaders must understand that there are no perfect systems to match PMs to projects; however, the objective is *always* to get good results while managing risks. For complex and challenging projects, the entire project team must be addressed—not just the PM. Again, see the discussion of chartering and Project Management Plans in Section 3.1.3, below.

### 3.1.3 PROMOTE BROAD ADOPTION OF STATE-OF-THE-ART PRACTICES

As discussed in Section 2, many examples of best industry practice are found within Mn/DOT—for example:

- Context Sensitive Solutions (CSS) and Hear Every Voice
- Right-of-way and utility coordination methods
- Innovative contracting, including design-build

Success in these areas proves that excellence in project management is already a part of how Mn/DOT does business. Wider organizational improvements, however, must include the broad adoption and connection of such practices to more projects.

From a project management perspective, most innovative project delivery approaches have *advanced project planning* at their foundation—methods used to anticipate and manage project risks. Some basic tools and techniques that PMs and teams can use for up-front planning of any project include:

- **Project Management Plan (PMP)**—According the *PMBOK Guide, 4th Edition*, a Project Management Plan, or PMP, is a formal, approved, document that defines how the project is to be executed, monitored, and controlled. A Project Management Plan is easily scalable to the project, but it typically defines project team members, roles, and the approach to be used to deliver the scope of the project. In many cases, the planned methods or approaches may include connected sub-processes or techniques, such as CSS methods, to achieve desired outcomes.

- **Project Team Chartering**—For projects that will require the regular involvement of many team members, best practice should include a Team Charter, or chartering of the team. Ultimately, a Team Charter should be established in writing to define the team's mission and objectives. A charter typically includes a statement of mission, objectives, or statement of work; background; authority, and related boundaries (scope, constraints, resources, and schedule); team member roles or ownership areas; and interface/reporting responsibilities. The act of team chartering is a group-oriented best practice that Mn/DOT should consider encouraging in the early stages of a project. When many team members understand that they are meeting to agree on individual and team project delivery responsibilities, as they should do in chartering, the potential for project success is greatly increased. Similarly, complex projects may require "re-chartering" as part of change management.

### 3.1.4 CONFIRM ORGANIZATIONAL SUPPORT

The last ingredient suggested toward Mn/DOT's development of a project management organization and culture is broad support throughout the organization. The panel found that this needed element is now in place at Mn/DOT, which reinforces the appropriate timing of the Peer Review and the good potential for continued support during change management and implementation. The Mn/DOT Steering

> ### *PMPs and Project Team Chartering*
>
> *Project Management Plans and project team charters are among the basic, scalable tools and techniques that PMs and teams can use for up-front planning of any project.*
>
> *FHWA's **Interim Major Project Guidance** and oversight framework provides direction on the development of the PMP. Another useful resource is the **NCHRP Web-Only Document 137: Guidance for Transportation Project Management**; this includes a PMP checklist.*

Committee will be in the role of monitoring for organizational support in the future and should model proven project management techniques to facilitate organizational change.

## 3.2 ENHANCING PROJECT MANAGEMENT TOOLS, TECHNOLOGY, TRAINING, AND METHODS

The following discussion is organized into two topic areas:

- Project management tools and training
- Process improvements and performance measures

These two topics help to provide more details in how Mn/DOT could proceed toward its goals for enhanced project management.

### 3.2.1 BUILDING ON BEST PRACTICES—PROJECT MANAGEMENT TOOLS AND TRAINING

*Integration of a New Project Status/Control Tool*

As noted previously, project management tools and templates should be flexible and scalable. The project management tools employed by Mn/DOT should also address the need to manage tasks and resources at many levels, from small projects to complex "mega" projects. Project management tools should also provide staff with flexibility in analysis and reporting—to understand status and performance at the task, project, or program level.

As discussed often during the Peer Review process, Mn/DOT's leadership has already decided that PPMS is not the right enterprise-wide project management and project controls software for the future. In particular, the organization is now moving into more rigorous management of costs on a project level. While PPMS currently helps Mn/DOT to define projects and track them for programming and scheduling purposes, it lacks strength at a project level, particularly for tracking and management of total project costs. Clearly, the action item for Mn/DOT is to transition from PPMS to a new software tool; the details of this action are beyond the scope of this report.

As Mn/DOT proceeds into an enhanced project management culture, many other tools and templates could also be considered. Typically, such tools focus on schedule or budget management, staffing, and work planning; also, many good tools and templates are already being used by Mn/DOT's project managers. The challenge is to improve methods for finding and sharing proven tools and approaches for greater benefit—an initiative sometimes called knowledge management. Communities of practice, which can be supported by web tools, provide examples of knowledge management.

---

### Project Controls, Tools, and Knowledge Management

*Many good tools and templates are already being used by Mn/DOT's project managers. The challenge is to improve methods for finding and sharing proven tools and approaches for greater benefit—an initiative that is sometimes called knowledge management. Below are examples of knowledge management from other state DOTs.*

*WSDOT provides an on-line tool that includes guidance and means for PM activities on projects. The site has activity guides that provide definition, directions, guidelines, and samples and templates for performing each element of WSDOT's five-step PM process. Process maps describe the sequence and flow of activities within each step.*

*VDOT has established a Lessons Learned database and created Communities of Practice (CoPs), which capture institutional knowledge and provide a venue for PMs and other practitioners to share best practices. Agency leadership reviews these best practices to continuously shape and impact the agency's policies and procedures.*

*Revised Project Management Training Framework*

Mn/DOT has historically demonstrated a significant commitment to training. The results of the Project Management Peer Review, as summarized in this report, suggest that Mn/DOT should re-evaluate its existing project management training portfolio. A revised training framework should offer a comprehensive and relevant curriculum to PMs at novice, intermediate, and expert levels.

The panel found that the need for revised curriculum may be especially felt at higher levels. Specifically, many senior Peer Review interviewees indicated that they had not received training in project management for years and that relevant curricula were not offered. Going forward, Mn/DOT should consider revised training to fit the other objectives and initiatives discussed herein, to address project management skills and objectives at both the project and portfolio levels.

### 3.2.2 PROCESS IMPROVEMENTS AND PERFORMANCE MEASURES

*Improving Project Handoffs and Other Processes*

The Peer Review Panel often received input on the value of integrated project teams in which the construction and maintenance phases of the project are anticipated early, during preliminary design. Whether multiple PMs were involved in the project delivery process or not, the best outcomes are typically achieved by anticipating handoffs from design to construction well in advance. Practices that should be promoted to improve project performance and transitions include:

- Set and communicate unique project goals and objectives early in the project, to enhance teamwork and project understanding.

- Involve construction staff in project design early, to integrate the "what" of design with the "how" of construction.

Other Mn/DOT processes that warrant consideration include those that involve early project scoping, utilizing consultants, tracking project details, and leveraging lessons learned. Process improvement actions to consider include these:

- Continue to build on the early project scoping and cost estimating initiatives; for example, establish and properly qualify baseline project schedules and cost estimates and build understanding among staff on how best to communicate this information.

- Track and keep project commitments (e.g., environmental) through each project management handoff.

- Look at processes and dollar limits for using outside consultants and contractors to help stay on schedule; for example, examine whether contracting rules and procedures may inhibit completion of

### Project Management Transitions and Handoffs

*Whether or not multiple PMs are involved during various phases of project delivery, the best outcomes are typically achieved by anticipating handoffs from design to construction well in advance.*

*PMPs should address the issue of transitions and handoffs. "Green sheets" are also useful to project managers during later project phases; these sheets track environmental mitigation commitments made during earlier project phases.*

*PennDOT has developed a structured approach toward handing off project management responsibilities at the end of discrete project phases (planning, design, construction, and maintenance). This enables efficient transfer of project knowledge.*

relatively small maintenance projects, small design tasks, or stakeholder communications.

- Develop resource and knowledge management systems and networks to help PMs understand how they can efficiently get additional help and resources—for example, through technical information exchanges (e.g., communities of practice), through internal Mn/DOT workload leveling efforts, or through external resources.

- Integrate project lessons learned into future process improvements (e.g., construction and maintenance feedback into design for the next project).

### Project Management and Measuring Mn/DOT's Performance

As noted in Section 2, Mn/DOT has established a list of 16 performance measures to publicly evaluate the success with which it has delivered its program on an annual basis. The information accumulated around these performance measures is now being made available on Mn/DOT's Web site in annual performance reports and summary scorecards.[1] As stated on the Web page:

### *"What Gets Measured, Gets Managed"*

The posting of performance measurement information will do much to achieve a level of transparency for Mn/DOT, consistent with its strategic directions.

The actions Mn/DOT should consider in this area will include review of performance measures with many stakeholders, including project managers, external partners, and political leaders. Project managers and others involved in program delivery should specifically be consulted regarding performance measurement and many at Mn/DOT should become more keenly aware of how their roles impact on selected metrics. Very simple and dynamic displays of selected performance measures should also be considered, which can further reinforce the linkage to how project managers and others at Mn/DOT do their jobs.

---

### *Measuring Performance*

*Project managers and others involved in program delivery should specifically be consulted regarding performance measurement. Those not in PM roles at Mn/DOT should also become more keenly aware of performance measures and how their roles impact on selected metrics.*

*As shared in Section 2, various state DOTs effectively use dashboard metrics to demonstrate performance against stated goals. These tools are used to share performance both internally and externally. VDOT uses the dashboard to share performance with the public. UDOT also shares information with the public in a similar manner, but also provides opportunities to drill-down into the data. This information is frequently used at agency leadership review meetings (see Section 2).*

---

[1] See: http://www.dot.state.mn.us/measures/performancereports.html

## 3.3 SETTING PRIORITIES FOR CHANGE

### 3.3.1 MN/DOT PROJECT TEAM INPUT

Mn/DOT's Peer Review Project Team met on November 19, 2009, to discuss and rank proposed action items aimed at enhancing project management, as discussed above. The priorities and rankings identified at that meeting are provided in the box below.

---

### Mn/DOT Project Team Input on Challenges and Opportunities

This list was presented to the Project Team in no particular order, but in an order very different from what is shown here. A ranking exercise designed to find relative priorities yielded results in order of priority as below.

*TOP PRIORITIES*
- Establish qualifications for PM roles; clarify core competencies
- Develop resource/knowledge management systems and networks
- Include specific tools for risk management in PM, such as tools for conflict management and early identification of issues
- Integrate project lessons learned; enhance closeout
- Define PM job expectations, responsibilities, and decision-making authority
- Promote or require the use of project management plans and team charters; encourage broad use of strong project t management practices

*MODERATE PRIORITIES*
- Replace PPMS with new project status/control tools; make effective use of such tools across Mn/DOT
- Revise the project management training framework; make it effective for PMs and leaders at all levels
- Define and calibrate various PM levels of experience to project characteristics
- Make a PM-oriented career path a clear choice for Mn/DOT employees

*OTHER PRIORITIES*
- Improve project handoffs and other life-cycle processes
  - Reference baseline schedules and cost estimates
  - Involve construction staff early
  - Track and keep project commitments
- Give PMs a better sense of when they are in the PM role
- Refine the use of performance measures
  - Establish and emphasize the key Mn/DOT-wide performance measures
  - Educate PMs and others on their performance roles
- Check again for organizational support before implementing project management changes
- Improve processes and change dollar limits for using consultants or contractors to help deliver work

---

### 3.3.2 PANEL AND STEERING COMMITTEE INPUT

In late November and December 2009, members of the Peer Review Panel and the Mn/DOT Steering Committee provided additional input on change management priorities, with reference to the list displayed above and the *Draft Final Report*. The results of this input are reflected in Section 4, which highlights the Peer Review Panel's recommendations and Mn/DOT's next steps.

SECTION 4

# PANEL RECOMMENDATIONS AND NEXT STEPS

The information included in Sections 1-3 of this report will help Mn/DOT leadership identify specific considerations for organizational improvements. Upon completion of the October 2009 Peer Review and initial draft of this report, the Mn/DOT Peer Review Project Team provided input through a prioritization of action items (see Section 3.3.1). The input was reviewed by the Peer Review Panel before making their final recommendations, which are described in Section 4.1 below.

Organizational change must be implemented within a properly managed framework; initiatives must be prioritized and sequenced. This section focuses on top priority actions identified by the Peer Review Panel, and the proposed schedule and status of implementation. The Mn/DOT Steering Committee reviewed the recommendations of the Peer Review Panel in December 2009 and confirmed the next steps to be taken as listed in Section 4.2.

## 4.1 PEER REVIEW PANEL RECOMMENDATIONS

Building on the proposed priority actions established by the Peer Review Project Team (see Section 3.3), the Peer Review Panel developed a set of recommendations at a meeting on November 20, 2009. These recommendations underscore the values of collaboration, trust, transparency, and accountability that are part of the Strategic Vision for Mn/DOT (see Section 1.1). Project management is recognized as a critical connection between this vision and implementation of its related commitments, especially given the current economic challenges faced by Mn/DOT and its partners.

The panel found connections between several of the priorities set by the Project Team. Their interrelatedness makes it difficult to develop hard-line prioritization that relates directly to a timeline of next steps. For example, Project Management Plans (PMPs) should be promoted or required. The panel agreed with this priority and took it a further, noting that using PMPs will also move the agency toward meeting a variety of priorities, including improving the process of PM handoff from one project phase to the next.

### 4.1.1 ENHANCE MN/DOT PROJECT MANAGER ROLE AND DEFINITION

As noted in Section 3.1.2, Mn/DOT should more clearly define the qualifications and core competencies needed to serve as a Mn/DOT project manager. The panel agreed with this idea and generated these related recommendations:

- **Enhance the role and definition of the Mn/DOT project manager**. Doing so will result in many benefits, including a shared understanding of PM responsibilities and authority.

- **Define and communicate the Mn/DOT project management organizational structure and performance measures**. This approach would yield a simplified and clarified decision-making process for PMs, which would improve PM credibility—both internally and externally.

- **Recognize leadership skills as a core competency to project management.** Increased emphasis on a project management culture requires the cultivation of key skills for PMs. This report describes several key skills necessary for project management.

- **Describe successful project handoffs and define expectations in the transitions**. When the cradle-to-grave project management approach is not used, a plan for managing the handoff from an outgoing PM to the incoming PM needs to be developed early in project development. This is especially important for the tracking of project commitments made during early stages of a project.

### 4.1.2 CONTINUE BUILDING ON SUCCESSFUL INITIATIVES

Even before the Peer Review, Mn/DOT had started implementation of initiatives intended to enhance project management practices. The panel recommends that Mn/DOT continue building on these successful initiatives:

- **Broadly establish use of Project Management Plans**. The PMP contains all important project processes and will address many of the priorities described in this report.

- **Continue to integrate risk and conflict management tools into project management activities**. The Project Team placed emphasis on this topic at its November 2009 meeting about Peer Review findings. The Project Team noted that it is necessary to be especially mindful of risks on projects that are not the agency's most complex or prominent, but that are complex nonetheless.

### 4.1.3 ACCELERATE IMPLEMENTATION OF TOOLS, TECHNOLOGIES, AND TRAINING METHODS

While Mn/DOT does have project management tools and training in place, the panel provided the following recommendations to improve functionality and further enhance the agency's project management practices:

- **Replace PPMS with new tools to track project status across Mn/DOT**. An agency-wide tool is necessary; however, the tools used by specific groups (e.g., Right-of-Way's use of REALMs) can also have substantial supplementary impacts on work efficiency and communications.

- **Establish flexible/scalable PM tools and templates**. Some projects may only require a brief PMP. Providing the PM with flexibility in developing a PMP will help ensure the tool is successfully integrated into the project culture.

- **Emphasize cost accounting of Mn/DOT pre-construction efforts, including tools to track project costs**. This is an essential element to project management and will enable project management processes such as earned value accounting.

- **Re-structure Mn/DOT's project management training framework, making it effective for all project managers**. The organizational value on training PMs is apparent. As such, a dedicated effort is needed to review current training, identify future needs, and resolve any gaps in the existing training system.

- **Begin training in line with PMBOK, emphasizing Project Management Plans**. This will provide a common language from which to build upon.

## 4.2 NEXT STEPS

The development of a project management culture at Mn/DOT will require a series of implementation steps. With completion of this Peer Review process, the Office of Project Scope and Cost Management will retain responsibility for Mn/DOT's change management process. Direction will continue to come from the Project Management Peer Review Steering Committee.

### 4.2.1 STRATEGIC INITIATIVES AND MN/DOT'S PROJECT MANAGEMENT PRACTICE

The Peer Review process has confirmed that there is organizational support for enhancing the agency's project management practices. This

---

### Ongoing Mn/DOT Cost Accounting Initiatives

*Mn/DOT's recently formed a Cost Management (CM) Systems Task Force in response to the CE/CM initiative implementation plan. The group's goal is to examine existing systems and identify needs to effectively track and manage total project cost estimates and actual project costs.*

*Mn/DOT is also examining ways to improve project bundling. This effort is intended to address the current disconnects between the accounting mechanisms for smaller discrete parts of each project and how those roll up into State Project Numbers.*

*At present, one Mn/DOT construction project may have several State Project Numbers (SP) assigned. For example, a simple bridge replacement project will have separate SPs for the bridge and for the grading work. For each SP, there can also be multiple job numbers that employees charge time to and which is used to pay expenditures.*

*Finally, the Office of Project Scope and Cost Management is also working in conjunction with the Operations Division on an effort to track preconstruction engineering costs.*

effort was useful in setting priorities for implementation. The project will increasingly form the basis for organization at Mn/DOT. Projects will have a recognized PM who provides leadership and direction to the project team. This increased emphasis on the PM will also require a closer look at how projects are bundled into "portfolios" and managed at a higher level according to an agency-wide project management culture.

Under the current Mn/DOT project practices, decision-making processes can be complicated and unclear. The initiative to improve project management will result in a better understanding of project authority, and should result in a shortened path to project decisions.

As noted by the Peer Review Panel, Mn/DOT is actively engaged in project management process enhancements, including the following:

- This Peer Review marks a formal first step in Mn/DOT's ongoing change management process. A similar process was used successfully by Mn/DOT in the development of its early scoping and cost estimating initiatives.

- Risk management and conflict management are key initiatives that have been endorsed by the Mn/DOT Project Team through the input they provided during the Peer Review.

- Pre-construction cost estimates are getting increased attention by Mn/DOT as an important part of total cost estimating; this will be integral to allowing complete project management processes and an increased level of transparency to the public.

- Mn/DOT is examining the resources available to apply to its change management process. The priorities established by the Peer Review will assist in targeting those resources most effectively. Potential resources include the Pre-Construction Managers Group and Construction Manager Group (PCMG and CMG, respectively), and consultation with Human Resources, Training, and Research Services groups.

- Chapter 152 projects offer an opportunity to pilot the use of PMPs on Mn/DOT projects. The findings from those efforts will be used to refine templates and procedures for PMs.

## 4.2.2 WORK PLAN AND SCHEDULE

The Peer Review Steering Committee and the Project Team (see Section 1.2) will continue to work with the Office of Project Scope and Cost Management, as this office continues to lead the collaborative effort focused on improving Mn/DOT's project management practices. In keeping with the Peer Review Panel's recommendations, Mn/DOT will implement the following actions in 2010:

- **Clarify the authority and responsibilities of PMs.** This documentation is integral to completion of all following action items in 2010.

- **More broadly establish the use of PMPs**. Use of PMPs will move beyond the most complex projects and into more typical Mn/DOT project types in which related project issues are noted to occur with greater frequency. A mentorship program leveraging the expertise of experienced project managers may be used to facilitate this process.

- **Pilot team charters**. The team charter becomes an important part of a PMP, establishing the requirements that satisfy stakeholder needs and expectations. The charter will help provide a common objective for all project participants.

- **Complete project-level risk management plans**. This effort is an ongoing area of emphasis at Mn/DOT and is in line with recommendations from the Peer Review Panel.

- **Update training for PMs**. Initial input from staff indicated some gaps in training for more experienced PMs. A review of the program and plans for updating the training will be developed.

- **Explore PM core competencies**. As part of identifying potential and developing future PMs, further review of the key skills necessary for effective project management at Mn/DOT will be conducted. The Office of Project Scope and Cost Management will coordinate with the Office of Human Resources, which is in the process of revising the individual competencies framework for Mn/DOT staff. The revised competencies will align with Mn/DOT's Strategic Vision.

- **Explore project management and other career tracks with Human Resources.** Existing employee classifications appear adequate for implementation of project management changes. However, the development of a project management culture at Mn/DOT may have long-term career track implications (for both PMs and non-PMs) that need further consideration.

- **Develop an Implementation Plan for long-term sustained change**. This document will provide an overview of anticipated events and milestones beyond 2010.

### 4.2.3 LONG-TERM VISION

For continued reference, Mn/DOT developed the following objective statement for the Project Management Peer Review:

> ___Mn/DOT's Strategic Vision___ *is to be a global leader in transportation, committed to upholding public needs and collaboration with internal*

---

*Enabling Sustained Change at Mn/DOT*

*Several "key enablers" must be in place in order to sustain change over the long term and develop a functioning project management culture.*

*An Implementation Plan will be used to guide the change process for project management at Mn/DOT. This plan will identify several elements that need to be in place to implement and sustain change, including:*

- *Resources,*

- *Training,*

- *Incentives,*

- *Communications,*

- *A Case for Change,*

- *Vision,*

- *Processes,*

- *Skills,*

- *Action Plans, and*

- *Accountability.*

*and external partners to create a safe, efficient and sustainable transportation system for the future.*

*In alignment with the Strategic Vision, project management is viewed as a key element to successfully implementing the Strategic Directions of Safety, Mobility, Innovation, Leadership and Transparency. Therefore,* **Mn/DOT's Goal** *is to improve project management and focus on creating, implementing, supporting, and sustaining a project management culture.*

*One objective of this goal is to recognize the current state of project management within Mn/DOT through a peer review process. The Mn/DOT Project Management Peer Review is a benchmarking opportunity that will identify the state of the practice and opportunities for improvement for project management within Mn/DOT, and it will identify best practices both internally and from external sources.*

Completion of this report signifies achievement of the final paragraph of this objective statement. This report marks the end of the Peer Review.

Mn/DOT is committed to sustaining the changes that have been identified in this report. The priorities for 2010 listed in Section 4.2.2 build the foundation for long-term change toward a project management culture. To help manage this long-term process, the Office of Project Scope and Cost Management will develop an Implementation Plan to serve as a guide for future Mn/DOT actions and communications.

The employee project management survey conducted in September 2009 serves as a baseline for Mn/DOT staff attitudes about project management within the agency. Mn/DOT will re-use this survey in the future to evaluate the impact of the actions described in this report.

# Appendix A:

Panel Member and Speaker Bios and Interviewee List

# APPENDIX A

# PANEL MEMBER AND SPEAKER BIOS AND INTERVIEWEE LIST

## PANEL MEMBER BIOS

### PASCO BAKOTICH
#### STATE DESIGN ENGINEER, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
#### BAKOTIP@WSDOT.WA.GOV

Mr. Bakotich is the Washington State Department of Transportation State Design Engineer. He directs and manages the activities of the Headquarters' Design Division which includes: roadway design, hydraulics, utility and railroad coordination, right of way acquisition, computer aided engineering support, strategic analysis and estimating, and consultant services offices. The division provides technical expertise statewide and partners with Federal Highways Administration (FHWA) regarding policy, standards, and financial participation in transportation projects. A primary responsibility is to provide and ensure statewide consistency in the design of transportation projects.

Throughout his 23 years at the WSDOT, Mr. Bakotich has served in a variety of key department positions, including, Project Engineer, Project Development Engineer, Assistant Planning Engineer, and Assistant Region Administrator.

Mr. Bakotich earned a Masters of Engineering Management and a BS in Civil Engineering, both degrees from Saint Martin's University (Lacey, Washington). Mr. Bakotich is a registered professional engineer in the state of Washington.

### JOHN CONRAD
#### HIGHWAY MARKET SEGMENT DIRECTOR, CH2M HILL
#### JOHN.CONRAD@CHM2.COM

Mr. Conrad recently joined CH2M HILL as Highway Market Segment Director with the Transportation Business Group. He is working out of the Tacoma, Washington office. John brings extensive transportation experience to CH2M HILL, including 30 years with the Washington State Department of Transportation (WSDOT). Most recently he was the WSDOT chief engineer and assistant secretary for Engineering and Regional Operations. John directed the agency's highway design, environmental, construction, traffic operations, maintenance, and research programs. He was also responsible for the management and delivery of the $10 billion Nickel and Transportation Partnership highway construction programs, approved by the Washington State Legislature in 2003 and 2005.

While at WSDOT, John also was assistant secretary for Field Operations Support. He directed the highway construction, materials, traffic, and maintenance programs, and the employee safety, equipment, and capital facilities programs. He also was chief maintenance

engineer for WSDOT, along with various other positions in the areas of traffic engineering, traffic operations, and maintenance. John worked as a civil engineer with the Kansas Department of Transportation for more than 8 years before joining WSDOT.

John is active in the American Association of State Highway and Transportation Officials. He has a bachelor's degree in civil engineering from University of Nebraska, and a master's degree in transportation planning from Kansas State University. He is a registered professional engineer in the states of Washington and Kansas.

## SIDONIA DETMER
### PROJECT MANAGEMENT OFFICE ASSISTANT DIRECTOR, VIRGINIA DEPARTMENT OF TRANSPORTATION
SID.DETMER@VDOT.VIRGINIA.GOV

Sidonia Detmer is the Project Management Office (PMO) Assistant Director for the Virginia Department of Transportation (DOT) in Richmond, Virginia.  Detmer is responsible for directing, developing, and implementing statewide project management policy, procedures, processes, tools, techniques, and training.  She is responsible for leading project management related statewide process improvements, research of best practices, and integration of project management policies, procedures, and innovative tools.  Prior to joining PMO, she led complex analyses and deployment of improvements in project & program management, project development processes, and performance measurement. Detmer has served with Virginia DOT, in project development, management, and performance measurement, for 15 years.  She is a graduate of the Virginia Commonwealth University and holds a Bachelors of Science Degree in Operations Research.  Ms. Detmer is a certified Project Management Professional, and is a member of the Project Management Institute.

## GEORGE JONES
### FEDERAL HIGHWAY ADMINISTRATION
GEORGE.JONES@DOT.GOV

Mr. Jones has been with FHWA for over 19 years. He's served in four division offices, the National Highway Institute, the Headquarters Pavement Division and Highway Operations, and in Eastern Federal Lands.  George is currently working with the Program Management Improvement Team and is assigned to two major projects: The New Mississippi River Bridge Project between Missouri and Illinois and the Louisville-Southern Indiana Ohio River Bridge Project between Kentucky and Indiana.  Mr. Jones has a Bachelors of Science in Education and a Bachelors of Science in Civil Engineering from the University of Arkansas, a Masters of Science in Engineering from the University of Illinois, and a Masters Certification in Project Management from ESA through George Washington University.

## TUCKER FERGUSON

### DIRECTOR OF CONSTRUCTION AND MATERIALS, PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

HFERGUSON@STATE.PA.US

Tucker Ferguson is the Director for Construction and Materials for the Pennsylvania Department of Transportation (PennDOT) in Harrisburg, PA.  He is responsible for management, direction and administration of all highway and bridge construction quality assurance acceptance and administrative functions for construction contracts and materials used on Department projects.

Mr. Ferguson has been with PennDOT for over 19 years, and most recently served as the Acting District Executive for Engineering District 5-0 in Allentown.  He's also served as the statewide director for the Bureau of Maintenance and Operations, where he was responsible for management, direction and administration of all highway and bridge maintenance programs and policies, as well as a previous period as the director for construction.  In that capacity, he served on a special assignment to coordinate the pyritic rock remediation on Interstate 99 in District 2-0, to coordinate the acquisition of the DEP permits for both the immoveable and moveable pyritic material.  He has worked in the Bureau of Highway Safety and Traffic Engineering, previously in the Bureau of Maintenance and Operations as the new technology implementation manager, as well as a design engineer and construction inspector in the private sector.

Originally from Altoona, PA, he is a graduate of the University of Pittsburgh at Johnstown, where he received his Bachelor of Science degree in Civil Engineering Technology.  He is a registered professional engineer in the state of Pennsylvania, and has serve on several AASHTO technical committees and task forces.

He resides in Newberry Township in York County, with his wife Lisa, and 2 sons, Adam and Zach.

## LARRY L. LANGER P.E.

### ASSISTANT STATE ENGINEER, ARIZONA DEPARTMENT OF TRANSPORTATION

LLANGER@AZDOT.GOV

Mr. Langer is an Assistant State Engineer for the Arizona Department of Transportation. He is the manager of the Valley Project Management Group, the group that is responsible for planning and final design of the MAG (Phoenix Urban Area) Regional Transportation Plan Freeway Program.

Mr. Langer began his career with ADOT in 1974 as an Engineer-in-Training. After the EIT program he spent six years as a project engineer in Traffic Engineering and then four years as a team leader in Highway Design. In 1985 he joined the newly formed Urban Highway Section as a Project Manager overseeing the planning and design of the 55 mile long Loop 101 freeway in the Phoenix Urban Area.  In 1992 Mr. Langer became the group manager for the Urban Highway Section (now Valley Project Management) overseeing the planning and design of all major projects within the Phoenix urban area.

In 1997 Mr. Langer joined a national consulting firm as a Senior Project Manager, serving as project manager for four large freeway projects and design manager for two design-build projects. He also worked on design-build projects in Rome, Italy, and Calgary, Canada.

Mr. Langer returned to ADOT and his current position in 2007. He has a BS in civil engineering from Arizona State University and is a registered Professional Engineer and Land Surveyor in Arizona.

## LAURIE G. MCGINNIS
### ACTING DIRECTOR, CENTER FOR TRANSPORTATION STUDIES
MCGIN001@UMN.EDU

Ms. McGinnis is currently the acting director at the University of Minnesota Center for Transportation Studies. She works closely with faculty and staff, funding organizations, and the Center's advisory committees to coordinate research conducted by academic departments, deliver technical assistance and training activities, and oversee the development of information products and services that support the Center's programs.

Nationally, Laurie is active in the Transportation Research Board where she recently completed a six-year term as Chair of the Committee on the Conduct of Research. She is also a member of Women's Transportation Seminar (WTS) where she serves on the International Advisory Board.

Prior to her work with the University, Laurie was a project manager and bridge designer at HNTB where she participated in the design of several bridges for state and local agencies. Laurie holds a BS degree in Civil Engineering from the University of Wisconsin, a Master of Public Affairs and Master of Business Administration degrees from the University of Minnesota, and is a registered professional engineer in Minnesota and Wisconsin.

## JAMES MCMINIMEE P.E.
### DIRECTOR OF PROJECT DEVELOPMENT AND CHIEF ENGINEER, UTAH DEPARTMENT OF TRANSPORTATION
JMCMINIMEE@UTAH.GOV

Jim is currently the Director of Project Development at the Utah Department of Transportation.  Jim has been with UDOT for 25 years.  The Project Development Division at UDOT is Design Construction, Right of Way, Environmental, Structures, Engineering Services and Research.  Jim and Project Development have been a part of many of the innovative initiatives UDOT has undertaken.  Since 2002 UDOT has implemented Design-Build and Construction Manager/General Contractor (CM/GC) contracting, Accelerated Bridge Construction, implementation of the Transportation Technician program and implementation of the GPS Network.  The Project Development Division is also responsible for engineering policy and business strategy for the Department.

Project Development oversees statewide policies and procedures for Project Management. One of the significant initiatives in Project Management is the implementation of Innovative Contracting.  Innovative Contracting includes Design Build and CMGC.  UDOT has contracted approximately 25 Design Build projects and approximately 20 CMGC projects.

During his career Jim and his teams have received numerous awards. Examples are the Utah Governor's Award for Quality Customer Service, the Utah Research Advisory Council's Trailblazer Award for Lifetime Research Implementation, the 2007 AASHTO President's Award for Research implementation on Accelerated Bridge Construction and most recently the 2008 AASHTO President's Award for implementing Self Propelled Modular Transporters (SPMT's) as well as an International Road Federation award for implementing SPMTs. Mr. McMinimee was recognized by Engineering News Record as one of the Top 25 National Newsmakers in 2008.

Recently AASHTO has cited Utah Project Development with two best practices in a domestic Scan on Program Delivery, one for their Program Management System called ePM, and the other for UDOT's streamlined consultant selection process.

Before coming to Project Development in 2001, Jim served as the Region Two Director in Salt Lake City for six years. During Jim's administration, Region Two completed the I-15 design-build reconstruction and also completed the construction and staffing of the Traffic Operations Center. He also served as the Director of Olympic Operations during the 2002 Olympic Winter Games in Salt Lake City. Additionally, Jim has over 10 years combined experience in Materials and Central Maintenance Operations at UDOT.

Jim received his BS in Civil Engineering from the University of Utah and is a licensed PE with the State of Utah.

## TIM NEUMAN
### VICE PRESIDENT AND CHIEF HIGHWAY ENGINEER, CH2M HILL
TIM.NEUMAN@CH2M.COM

Mr. Neuman is Vice President and Chief Highway Engineer for CH2M HILL. He has 33 years of experience in the planning and design of major highways, freeways, and over 300 interchanges across the U.S. for more than 20 state DOTs. Mr. Neuman is also a nationally recognized expert in highway safety and traffic operations related to geometric design. He has led or participated in many significant research projects for AASHTO through the National Cooperative Highway Research Program (NCHRP) and for the Federal Highway Administration (FHWA). He was principal investigator and primary author of NCHRP Report 480, 'A Guide to Best Practices for Achieving Context Sensitive Solutions' and also served as technical editor for AASHTO on 'A Guide to Achieving Flexibility in Highway Design.' He assisted in development and delivery of elements of CH2M HILL's two-day course on Context Sensitive Solutions offered nationally to transportation agencies through the FHWA. Mr. Neuman has served as senior consultant, technical director or project manager for planning and preliminary design studies for major freeway corridors and interchanges across the country, including most recently the I-395/Anacostia Freeway/11th Street Bridges project in the District of Columbia, I-70/I-75 system interchange in Montgomery County, Ohio; Marquette Interchange in Milwaukee, WI, I-74 in the Quad Cities (Iowa and Illinois); I-75/M 59 system interchange in Oakland County, MI and I-94 freeway corridors in Kenosha, Racine and Waukesha Counties, WI.

## MIKE PADDOCK
### PRINCIPLE PROJECT MANAGER, CH2M HILL
MIKE.PADDOCK@CH2M.COM

Mike Paddock is a civil engineer who specializes in the management and design of urban and rural roadways, freeways and interchange design. He also has experience in pavement design and right-of-way plat preparation. Mr. Paddock has been responsible for several Interstate and roadway projects including major system interchanges, rural arterial reconstruction, urban arterial reconstruction, interchange design, and services during construction. He also has experience serving on a value engineering projects.

Mike served as the CH2M HILL Project Manager responsible for project schedule, alternative design, preliminary design, and environmental assessment for the Marquette Interchange. This $1 billion project studies 12 miles of urban freeways. The Marquette Interchange consists of a system interchange of Interstate Highway I-94, I-43 and I-794. Additionally, Mike was the Program Manager for the final design and construction services for the completion of the West Richmond Bypass referred to as VA 288. This $236-million design-build project included 12 miles of urban freeway and a major bridge crossing of the James River.

Mr. Paddock also serves on the Wisconsin Highway Research Steering Committee that manages the pavements, structures and geotechnical research performed by the Wisconsin Department of Transportation.

## KENDALL GRIFFITH
### DIRECTOR OF OPERATIONS, MINNEAPOLIS OFFICE, MORTENSON CONSTRUCTION
KENDALL.GRIFFITH@MORTENSON.COM

Mr. Griffith is the Director of Operations for the Minneapolis office of Mortenson Construction, overseeing the project management teams for all of the commercial construction work that Mortenson performs in Minnesota, Iowa, and the Dakotas. His most recent work has included the new TCF Bank Stadium and Twins Ballpark projects in Minneapolis.  Previously, Mr. Griffith served as Project Manager overseeing projects for Mortenson in the Twin Cities metropolitan area. Some of his work included the Walker Art Center and McNamara Alumni Center.  Kendall has been with Mortenson Construction for 17 years.

Mr. Griffith is a LEED-Accredited graduate of Iowa State University, with a Bachelor of Science degree in Construction Engineering.

# INTERVIEWEE LIST

## TOOLS (PPMS), SYSTEMS AND TRAINING
**MONDAY, 10/5/09, 1:00 P.M.**
- Jim Weingartz
- Norm Plasch

## PLANNING
**TUESDAY, 10/06/09, 2:30 P.M.**
- Denny Johnson
- Steve Voss
- Brian Isaacson

## SCOPING AND EARLY PROJECT DEVELOPMENT
**MONDAY, 10/5/09, 2:30 P.M.**
- Greg Ous
- Terry Humbert
- Nancy Sannes
- Fausto Cabral
- Bridget Miller
- Susann Karnowski

## METRO DISTRICT MATRIX ORGANIZATION
**TUESDAY, 10/6/09, 7:45 A.M.**
- Tom O'Keefe
- Tim Quinn

## CONTEXT SENSITIVE SOLUTIONS AND HEAR EVERY VOICE
**TUESDAY, 10/06/09, 8:30 A.M.**
- Scott Bradley
- Vanessa Levingston

## MN/DOT CROSSTOWN: I-35W/HWY. 62 RECONSTRUCTION PEER REVIEW
**TUESDAY, 10/6/09, 9:30 A.M.**
- Jean Wallace
- Greg Ous
- Jeff Perkins
- Scott Bradley
- Scott McBride
- John Griffith
- Terry Zoller

## DISTRICT 4, HWY. 10 PROJECT
**TUESDAY, 10/6/09, 11:15 A.M.**
- Mike Ginnaty
- Jeff Perkins
- Tom Lundberg
- Shiloh Wahl

## ENVIRONMENTAL
**TUESDAY, 10/6/09, 1:30 P.M.**
- Jennie Ross
- Brian Kamnikar
- Paul Munsterteiger
- Milt Wilson
- Jarrett Hubbard
- Paul Voigt
- Joe Hudak
- Rick Dalton

## UTILITIES
**TUESDAY, 10/6/09, 1:30 P.M.**
- Marilyn Remer
- Brian Larson
- Tom Lundberg
- Marc Flygare
- Al Rice
- Curt Fakler
- Tony Wagner
- James Zigman

## METRO DISTRICT DESIGN PROJECT MANAGERS
**TUESDAY, 10/6/09, 2:45 P.M.**
- Tim Dockter
- Harvey Scheffert
- Glen Ellis
- Tim Quinn
- Marc Goess
- Joey Lundquist

## GREATER MN DISTRICT DESIGN PROJECT MANAGERS
**TUESDAY, 10/6/09, 2:45 P.M.**
- Tom Lundberg
- Rolin Sinn
- Tony Wagner

## TRAFFIC
**WEDNESDAY, 10/7/09, 8:00 A.M.**
- Mike Weiss
- Tom Swenson
- Chad Hanson,
- Jon Henslin
- Brad Estochen
- Heather Lott
- Mike Gerbensky

## BRIDGE AND HYDRAULICS
**WEDNESDAY, 10/7/09, 8:00 A.M.**
- Tom Styrbicki
- Nancy Daubenberger
- Paul Kivisto
- Keith Farquhar
- Petra Dewall
- Paul Jurek
- Jim Stoutland
- Scott Morgan
- Perry Collins
- Ruth Betcher

## RIGHT OF WAY
**WEDNESDAY, 10/7/09, 9:30 A.M.**
- John Isackson
- Joe Pignato
- Brian Bausman
- Jamie Hukriede
- Mark Trogstad-Isaacson

## MATERIALS
**WEDNESDAY, 10/7/09, 9:30 A.M.**
- Rod Garver
- Graig Gilbertson
- John Hager
- Shelly Pedersen
- Gary Person
- Dave Van Deusen

## CONSTRUCTION
**WEDNESDAY, 10/7/09, 11:00 A.M.**
- J.T. Anderson
- Trudy Kordosky
- Chad Fowlds
- Dave Johnston
- Michael Beer
- Terry Ward
- Tom Ravn
- Joel Williams'

## DESIGN BUILD PROJECTS AND PROCESS
**WEDNESDAY, 10/7/09, 1:15 P.M.**
- Jay Hietpas
- Jon Chiglo
- Terry Ward

### RISK MANAGEMENT AND CONFLICT MANAGEMENT
**WEDNESDAY, 10/7/09, 2:45 P.M.**
- Jean Wallace (for Phil Barnes)
- Deb Ledvina

### MAINTENANCE AND OPERATIONS
**WEDNESDAY, 10/7/09, 3:45 P.M.**
- Dave Redig
- Gordy Regenscheid
- Jim Stoutland
- Trudy Elsner
- Roger Hille

### REGIONAL TRAFFIC MANAGEMENT CENTER (RTMC) AND INTELLIGENT TRANSPORTATION SYSTEMS (ITS)
**WEDNESDAY, 10/7/09, 3:45 P.M.**
- Ray Starr
- Jon Jackels
- Sue Sheehan
- Jim Kranig
- Brian Kary

*NOTE: The following interviews were conducted after the Project Management Peer Review*

### INFORMATION TECHNOLOGY (IT)
**TUESDAY, 10/27/09**
- Kay McDonald
- John Rindal

### OFFICE OF TECH SUPPORT
**FRIDAY, 11/6 & MONDAY, 11/9**
- Jim Rosenow
- Tim Swanson
- Dawn Thomspon
- David Larson
- Minnie Milkert

### OFFICE OF INVESTMENT MANAGEMENT
**FRIDAY, 11/6**
- Abby McKenzie
- Peggy Reichert
- Bob Hofstad
- Duane Leurquin

### FREIGHT, RAIL AND WATERWAYS
**MONDAY, 11/9**
- Susan Aylesworth
- Tim Spencer
- Janelle Collier
- Julie Carr
- Paul Delarosa
- Rick VanWagner

### AERONAUTICS
**TUESDAY, 11/10**
- Gene Scott
- Michael Ferry
- Kathy Vesely

### CIVIL RIGHTS
**THURSDAY, 11/12**
- Ashanti Payne
- Mike Plumley
- Kelly Arneson

### RESEARCH SERVICES
**THURSDAY, 11/12 & TUESDAY, 11/17**
- Deb Fick
- Clark Moe
- Cory Johnson

### TRANSIT
**WEDNESDAY, 11/18**
- Mike Schadauer
- Thomas Gottfried
- Bryan Dodds

# Appendix B:

Detailed Agenda

**Mn/DOT Project Management Peer Review**
**Monday, October 5, 2009 – Thursday, October 8, 2009**
**Mn/DOT Waters Edge**
**Roseville, Minnesota**

**PEER REVIEW FINAL AGENDA**

**Monday, October 5**
**Mn/DOT Waters Edge**

**7:45  Shuttle Departs Radisson Lobby** *(panel members only)*

**8:00  Registration and Continental Breakfast** – *Room AC*

**8:30  Welcome, Introductions, and Overview** – *Room AC*
Moderator: Jean Wallace, Office of Project Scope and Cost Management, Mn/DOT

Speakers:
- "Project Management: Building Upon Success"
  Mike Barnes, Director, Engineering Services Division, Mn/DOT
- "Delivering 21st Century Transportation Solutions"
  Tom Sorel, Commissioner, Mn/DOT

**9:15  Project Management Peer Review Presentations** – *Room AC*
Moderator: Jean Wallace
Speakers:
     George Jones, Federal Highway Administration
     Jim McMinimee, Utah Department of Transportation
     Sidonia Detmer, Virginia Department of Transportation

**10:15  Break** – *Room AC*

**10:45  Project Management Peer Review Presentations, Con't.** – *Room AC*
Moderator: Jean Wallace

Speakers:
     Kendall Griffith, Mortenson Construction
     Larry Langer, Arizona Department of Transportation
     Tucker Ferguson, Pennsylvania Department of Transportation

**11:45  Q&A on Project Management** – *Room AC*

**12:00  Lunch and and Informal Discussion with Panel Members** – *Room AC*

**12:45  Large Group Adjourns**

**1:00  Group Interview** – *Room 176*
- Tools (PPMS), Systems, and Training

**2:15  Break** – *Room 176*

**2:30  Concurrent Interviews** – *Rooms 176 and 148*
*(Panel Members will be separated into two groups when conducting Concurrent Interviews)*
- Planning
- Scoping and Project Development

**4:00  Peer Review Panel Debrief** – *Room 176*

**5:00  Panel Members - Shuttle Departs Mn/DOT for Radisson**

<u>**Tuesday, October 6**</u>
**Mn/DOT Waters Edge**

**7:15  Panel Members - Shuttle Departs Radisson Lobby**

**7:30  Breakfast Available** – *Room 176*

**7:45  Group Interview** – *Room 176*
- Metro District Matrix Organization

**8:30  Group Interview** – *Room 176*
- Context Sensitive Solutions
- Hear Every Voice – Public & Stakeholder Participation

**9:30  Group Interview** – *Room 176*
- Mn/DOT Crosstown Peer Review Discussion

**11:00  Break** – *Room 176*

**11:15  Group Interview** – *Room 176*
- District 4 - TH 10 Case Study

**12:15  Lunch** – *Room AC*

**1:30  Concurrent Interviews** – *Rooms AC and 323*
- Environmental
- Utilities

**2:30  Break** – *Room AC*

**2:45** **Concurrent Interviews** – *Rooms AC and 323*
- Metro District Design Project Managers
- Greater MN District Design Project Managers

**4:15** **Peer Review Panel Debrief** – *Room AC*

**5:30** **Panel Members - Shuttle Departs Mn/DOT for Radisson**

**Wednesday, October 7**
**Mn/DOT Waters Edge**

**7:15** **Panel Members - Shuttle Departs Radisson Lobby**

**7:30** **Breakfast Available** – *Room AC*

**8:00** **Concurrent Interviews** – *Rooms AC and 323*
- Traffic
- Bridge and Hydraulics

**9:00** **Break**

**9:30** **Concurrent Interviews** – *Rooms AC and 323*
- Right of Way
- Materials

**10:45** **Break** – *Room AC*

**11:00** **Group Interview** – *Room AC*
- Construction

**12:15** **Lunch** – *Room AC*

**1:15** **Group Interview** – *Room AC*
- Design Build Projects and Process

**2:30** **Break** – *Room AC*

**2:45** **Group Interview** – *Room AC*
- Risk Management and Conflict Management

**3:30** **Break** – *Room AC*

**3:45** **Concurrent Interviews** – *Rooms AC and 176*
- Maintenance and Operations

- Regional Transportation Management Center and Intelligent Transportation Systems

**4:30    Adjourn Interviews**

**4:45    Panel Members - Shuttle Departs Mn/DOT for Radisson**

**6:00    Peer Review Panel Working Dinner and Debrief**


**Thursday, October 8**
**Mn/DOT Waters Edge**

**7:15    Panel Members - Shuttle Departs Radisson Lobby**

**7:30    Registration and Continental Breakfast** – *Room AC*

**8:00    Peer Review Presentations** – *Room AC*
Moderator: Jean Wallace

Speakers:
- Pasco Bakotich, Washington State Department of Transportation
- Tim Neuman and Mike Paddock, CH2M Hill

**8:45    Peer Review Panel Summary Presentation** – *Room AC*
Moderator: Jean Wallace, Office of Project Scope and Cost Management

Speakers:
- Jim McMinimee, Utah Department of Transportation
- Sidonia Detmer, Virginia Department of Transportation
- Larry Langer, Arizona Department of Transportation
- Tucker Ferguson, Pennsylvania Department of Transportation
- Pasco Bakotich, Washington State Department of Transportation
- Laurie McGinnis, Center for Transportation Studies
- George Jones, Federal Highway Administration
- John Conrad, Tim Neuman, Mike Paddock CH2M Hill

**9:30    Break** – *Room AC*

**10:00   Group Polling Exercise** – *Room AC*

**10:30   Open Discussion with Panel Members** – *Room AC*

**11:30   Lunch and Adjournment** – *Room AC*

# Appendix C:

Detailed Summary Document

# Detailed Event Summary

## C.1 PROJECT MANAGEMENT: BUILDING ON SUCCESS

**Mike Barnes, Engineering Services Division Director, Mn/DOT**

The Project Management Peer Review processes will help Mn/DOT leadership evaluate the state of project management along with best practices. In addition, we need to evaluate cost-effective solutions such as choosing more good projects rather than a few great projects, to fulfill the state's transportation needs.

The cost estimating/cost management procedures and manual look at the total project cost management to help us better manage project costs and deliver projects on time and on budget. The Cost Risk Assessment and Value Engineering (CRAVE) workshops have helped project managers quantify risks and opportunities of the Chapter 152 bridge program.

These key initiatives support Mn/DOT's vision and support project management. However, there have been questions regarding how to fully integrate project management: 1) Have we clearly identified project management roles, responsibilities, and accountability?; and 2) Do we provide effective tools and training to support project management?

The peer review process will help answer these questions. A steering committee, project team, and a working group with external experts from the University of Minnesota Center for Transportation Studies, the consulting firm, CM2MHILL, and experts from the Federal Highway Administration and other state DOTs have been organized for the peer review. We've also conducted employee surveys, conducted a literature search, and developed a white paper. The white paper identifies definitions and industry trends on roles, training, tools, and project delivery process.

To begin, members of the peer review panel will share their project management experiences. Then, Mn/DOT functional groups will share their project management experiences with the panel. The peer reviewers will provide Mn/DOT feedback on what they learn from the interview and make recommendations to improve project management.

The peer review is not the end but the beginning. The peer review recommendations will become part of an implementation plan for all of us to work on. The plan will establish a vision, define necessary skills for change, determine incentive needs, evaluate progress, and outline needed resources.

## C.2 DELIVERING 21ST CENTURY TRANSPORTATION SOLUTIONS

**Tom Sorel, Commissioner, Mn/DOT**

The peer review process is designed to build on successes such as Context Sensitive Solutions, Hear Every Voice, a new scoping process, and cost estimating/cost management practices. However, the missing element is project management. It's not that we haven't

done a good job in delivering and managing projects, but this will offer us the opportunity to learn from others, be introspective, build on our successes, look at the gaps that we might have, and develop some processes that are transformational for us and that will sustain us into the future.

Risk management is a very important topic for us. We now have risk management expertise in the department and have been using it for making various decisions. We need to take special note of the role that risk management plays in project management

There is also a strong role for conflict management to play in project management. We need to develop a model for predicting conflict early on in project development to identify the elements of conflict and look at how it changes in each phase so we can mitigate it. We have talked with William Mitchell [Law school] about how it can help us develop a prediction model.

This process requires us to be introspective on what a project is. We have many projects besides just construction project delivery in Mn/DOT. We'll learn a lot about project management that will be transferable to other types of projects.

As the mega-project leader for FHWA, I met with people from the General Accounting Office and the Inspector General's Office, who were concerned about scope creep and cost overruns. When those projects go awry, it truly defines that agency. In the end, they all came to the conclusion that the lack of strong project management was the cause. I worked closely with Congress and oversight agencies to develop project management plan guidance. That brought all elements of project management together in one spot. When we talk about project management plans on these projects, it really comes down to public trust. Strong project management skills and project management plans enhance public trust.

Our projects may start to get more complex as we start to look at things like public-private partnerships. This introduces a whole new element to project management and we have to be prepared to deliver those. We will also be going to the legislature this session for authority to utilize delivery methods like Design-Build-Operate-Maintain.

This process is valuable. Conducting a peer review is appropriate and brings in an independent viewpoint. This offers us the chance to be introspective and share our experiences and learn from others.

## C.3 PEER REVIEW PRESENTATION SUMMARIES

### C.3.1 GEORGE JONES, FEDERAL HIGHWAY ADMINISTRATION

For the past several years the FHWA has been emphasizing the importance of project management as a means to control cost escalation of large projects. Some DOTs have implemented project management programs for all projects. Each program is a little different. The foundation for a well-managed project is the project management plan (PMP).

In January of 2006 the FHWA introduced the *Interim Major Project Guidance* and oversight framework. Within that document was the guidance on the development of the PMP. The

guidance clearly defines expectations. States will develop the PMP as well as the initial financial plan and annual updates and perform independent cost validations.

The PMP lays out how a project will manage the critical elements of scope, cost, schedule, quality, and the federal requirements. It also spells out the specific roles and responsibilities of all the parties involved in the project.

FHWA views project management as a collection of processes that describe how to initiate, plan, execute, monitor/control, and close out a project. Project management strategies control scope creep, cost escalation, schedule delays, and quality of the project. The PMP also defines how communications will flow, what staffing will be required, and what procurement and contracting process will be used. Additionally, it defines risks and establishes a plan for managing risks. In other words, the PMP helps everyone from the DOT and the FHWA think through the project in logical manner.

## C.3.2 JAMES MCMINIMEE, UTAH DEPARTMENT OF TRANSPORTATION

In the 1990s, the Utah Department of Transportation (UDOT) got a lot of scrutiny about the ability and inability to build projects, so it turned to project management to build credibility. This decision was driven by a response to audits and as a way to improve delivery of the program. Now, project delivery speed is a big driver. At same time, UDOT leadership decentralized project management and roadway design to get projects closer to communities. Roadway design work was done in the regions and they did not use many consultants.

Today, UDOT is a different organization. It uses consultants for most work and matches projects with legislative tempo—how fast the legislature wants the project delivered, and how long legislators are in office. UDOT is driven by the need for speed and looks for process improvements to speed up projects. UDOT is pioneering the idea that user costs are a part of project costs. This new paradigm yields projects with lowest societal costs.

Project managers are responsible for scope, schedule, quality, and budget. They work on projects from cradle-to-grave and until one year into maintenance, in order to inform the project from construction phase to the maintenance phase, and then back to design phase. Under this model, project managers have better chances of fulfilling commitments.

Project managers use teams such as experts to design pieces, use functional managers to monitor and direct workforce, and functional managers are responsible to follow process.

The project manager works under a consultant model in which the project manager negotiates hours, budget, and schedule. Project manager involvement is limited to problems, and project managers work at the project level to help designers choose solutions to these problems.

The consultant model works well for projects designed by UDOT personnel. However, the situation is different now because 92 percent of design is outsourced to consultants. The project manager's job is much harder with mixed teams of UDOT and consultants. The need to use consultants at all drives project managers' desires to use full service consultants for turnkey project management. In this time of more consulting, functional managers work with project managers on defining scope for specialty service, and they help with evaluation

of RFPs and negotiations. UDOT management wishes that they had recognized that widespread consultant use and had planned project manager roles, responsibilities and procedures accordingly. They need to look at how to sustain expertise. UDOT calls this concept "preserving core competency." It is important that UDOT preserves the ability to design in house. UDOT's project manager model places great freedom to choose consultants with the project manager. What is easier for project management may not be good for UDOT.

As project manager project workloads increased, UDOT added a phase leader to the process. A phase leader is a functional manager designated to help the project manager oversee part of project such as a defined project delivery phase (concept/environmental, design, or construction.). The phase leadership role allows the project manager to focus more on project scope, schedule, budget, and quality and less on technical issues. A good example of the phase leadership role is assigning a resident engineer during the construction phase to lead the inspection and oversight team.

UDOT also instituted a senior program manager who is responsible for delivering a region program, organizing Quarterly Region Program update meetings, and reviewing status of program with senior leaders. This was a very good adaptation, and has further helped with program delivery.

UDOT uses multiple dashboards to manage performance at the executive level and region level with real-time data and extensive drill-downs. The dashboards are used at leadership review meetings.

UDOT developed the ePM system, which was built in house and is used as a tool not a task. As a result, data quality has gotten better as data is used more. ePM manages statewide and regional programs; manages STIP projects including activities, resources, budgets, and actual costs; manages contracts for consultant services; tracks right-of-way acquisitions; and provides data for management reporting.

Project managers have autonomy to manage the project. They experience daily conflict, such as value engineering decisions, but it is a healthy part of process improvement, and project managers have gotten good at not taking it personally. The program balances individuality versus organizational responsibility and stresses that innovation is good and to consider program implications. The autonomy for project managers is an important incentive and they get lots of support.

### C.3.3 SIDONIA DETMER, VIRGINIA DEPARTMENT OF TRANSPORTATION

Program delivery within the Virginia Department of Transportation (VDOT) is decentralized to the districts. The central office supports districts in implementation by: developing statewide policies, managing statewide programs, and providing specialized technical expertise. Dedicated project managers reside in districts' Project Management Office (PMO). Project managers, who work on design and management of projects, report to functional managers.

The PMO was established in 2001 with the objective to establish expectations and standards and improve project team performance. The PMO has outlined clear expectations for project managers: the project manager is either the person that accomplishes the task or ensures

that someone on the team accomplishes the task. The PMO provides a support structure for project managers responsible for managing scope, schedule, budget, and quality, and developed streamlined and standardized processes including providing a structure for using project management tools and techniques.

Depending on the project category (CatI representing turn-key simple projects to CatV mega projects), dedicated (project manager but not the PE of Record) and dual-hat role (project manager and the PE of Record), project managers are assigned. Project managers can have a cradle-to-grave or phased role. They form a team, establish clear expectations, communicate, refine scope, and negotiate budget and schedule. The project manager communicates project progress to the public through the VDOT Dashboard. Several factors are considered in assigning project managers, including: project category and requirements, project manager's experience, competencies and results, district resource availability, and succession planning. VDOT recognizes and prepares for the continuous loss of talent, especially during periods of downsizing. Mentors coach and progressively prepare project managers for increasingly challenging and complex projects.

Since the early 1990s, a series of strong leaders emphasized institutionalizing a project management culture in VDOT. In a multi-pronged approach, VDOT's commissioner, chief engineer, and PMO director outline and communicate leadership, project manager, and project team roles and responsibilities. VDOT's performance and individual project progress are transparent to the public through real-time data in the VDOT Dashboard.

VDOT's framework and support systems for project managers include the implementation of aggressive performance metrics and a project management-centric forum for: policy, procedures, processes, templates and tools (integrated Project Manager (iPM), VDOT Dashboard, Project Cost Estimating System (PCES), Microsoft Project, Primavera). Additionally, VDOT developed an extensive training program for project managers that includes: Transportation Construction Management Institute, Project Management Development Program, and Transportation Project Management Institute. PMP certification is desirable, encouraged, and funded. VDOT established a Lessons Learned database and created Communities of Practice (CoPs), which provide great venues for project management and other practitioners to share best practices. The best practices continuously shape and impact policies and procedures.

In VDOT, the organizational benefits of the project management program are performing project teams and strong project ownership, standardized processes and improved reliability/predictability for program delivery, and a single source for all project information, cradle-to-grave. The project manager and team know their roles and accountability, communicate openly with the public, and they understand consequences. Project delivery is transparent, processes are streamlined, and project managers have an improved ability to successfully deliver projects and the program. Project teams actively manage risks and innovate to accelerate project delivery. All stakeholders including maintenance and construction staff are part of the project team from day one. In Virginia, the DOT proactively pioneered government transparency and accountability to regain public trust.

### C.3.4 KENDALL GRIFFITH, MORTENSON CONSTRUCTION AND ASSOCIATION OF GENERAL CONTRACTORS

Griffith spoke about project management practices in the construction industry. Mortenson Construction's values are trust, teamwork, responsibility, safety, service, and stewardship. These values frame their project management approach. The company was established in Minnesota in 1954, and has grown to become one of the most successful construction companies in the United States with 2,200 team members. Mortenson's projects range in size from $100,000 to $400,000,000 but regardless of size, they take the same project management approach.

Examples of recent projects include Target Field, the new home of the Minnesota Twins, and TCF Stadium at the University of Minnesota. Target Field is a $420 million project with a project team of 35 people, which is on budget and will be delivered on time. The Gophers stadium had a project team of 15 people, which was completed on budget and early.

Griffith said that it is important to constantly adjust project management practices based on changes in the industry, and although field-technology advances very slowly, their project management role is very dynamic, and constantly evolves. Project managers work differently now than they did two years ago – and significantly differently than they did 10 years ago.

Project owners are encountering greater challenges with securing capital spending within organizations and difficulty securing funding or financing. As customer needs change, this creates new priorities and approaches. Mortenson is using more design-build, virtual design and construction, green building, and integrated project delivery.

Today, project goals at Mortenson Construction are on-time, on-budget, zero injuries, zero defects, and provide an exceptional experience for customers and design partners. This includes working with architects to mitigate potential problems during construction.

The typical project manager is the leader of a project team with full responsibility for the success of the project including preconstruction and design-phase management; safety, quality, productivity management; scheduling and budget management; procurement, insurance, billings, etc., and the customer relationship.

To achieve project management goals takes planning and communication; on-site presence and attention to progress; scheduling discipline; quality management planning; and issue management such as identify, communicate/collaborate, and pro-actively resolve. One tool they use is a 3D model to communicate plans to mitigate and avoid potentially disruptive issues. Mortenson defines issues as anything that can potentially affect the project in any way, and much of project management time is spent on issue management.

### C.3.5 LARRY LANGER, ARIZONA DEPARTMENT OF TRANSPORTATION

The Arizona Department of Transportation (ADOT) project management process has been in place since the mid-1990s and is used on most large projects managed. Prior to this ADOT was experiencing delays in time needed to get project to bid, lack of project ownership, poor project definition, scope creep, lack of timely decisions, and communications breakdowns.

ADOT is a centralized organization and most projects are managed by Valley or Statewide Project Management Groups. Sub-program projects are managed by the technical area. It is a matrix organization with project team representation from each technical area, and 80 percent of design is done by consultants.

The project manager's roles and responsibilities include:

- Ensure all project development steps are followed.
- Delegate and coordinate work efforts.
- Monitor progress and take corrective action.
- Coordinate and communicate with internal and external stakeholders.
- Negotiate project agreements.
- Manage scope, schedule, and budget.
- Resolve project issues not resolved by team consensus.
- Be responsible for obtaining approvals for all project changes.
- Manage consultant contracts.
- Coordinate public involvement with Communication & Community Partnerships.

Project managers' authority is limited but they are empowered to make scope, schedule, and budget decisions with team consensus. Communication and consensus building skills are essential. Project managers ensure that the process is followed, kept within scope, and issues are addressed in a timely way.

They use PPMS for all project schedules and Primavera. Project work plans are to be developed for every project, although this is one area they don't do well and need to do differently.

Projects are measured by the percentage of projects and dollar value delivered each quarter and the final cost growth compared to the bid amount. Project managers are eligible for a 5.75 percent incentive pay for meeting goals, which came about because of an inability to increase salaries.

The program is successful because ADOT has a culture of project delivery with dedicated project managers and a well defined five-year program. Early planning and scoping and extensive use of consultants add to the success of project management. Langer noted that ADOT needs improvement in training, project manager guidance, and better maintenance feedback.

### C.3.6 TUCKER FERGUSON, PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

The Pennsylvania Department of Transportation (PennDOT) has about 12,000 employees and is a decentralized organization. The districts are organized into design, construction, and maintenance units. About 35 percent of design is done in-house and the balance is done by consultants (about $300M).

Portfolio managers oversee project managers, who receive support from PRO teams, which are central office experts. The project manager's roles are to assemble and direct the design team, serve as single point of contact, represent PennDOT at public meetings, coordinate

project issues with outside agencies, monitor design team performance and project development, control project costs, and coordinate flow of project information.

Project manager responsibilities include monitoring scope, communication, schedule, performance and quality, budget, functional units, and the design team. PennDOT has three levels of project managers. Level one project managers are selected to work on projects that required a limited technical expertise and will spend less than 50 percent on a project. Level two project managers oversee projects that require more technical expertise and increased coordination between units. They have increased responsibility and will spend about 75 percent on a project. Level three project managers are the most experienced and manage larger projects plus they will typically supervise level one and two project managers.

Project managers meet monthly, quarterly, and annually to analyze performance measures. Performance measure data is recorded on the internal website through dashboards. PennDOT has incorporated smart transportation themes in its project management, which include tying project scope according to dollars coming in, to build what we can afford, and build the right projects.

PennDOT uses Open Plan for project scheduling, which it adopted 10 years ago. The program is similar to Primavera. It had a gradual implementation of Open Plan in which each district started by identifying its top 20 projects to put into Open Plan. Next they entered accelerated bridge projects. Now, all projects will go into Open Plan.

PennDOT pays for project managers to take certain training and certifications, and it has a well-developed incentive program for different levels of professionals.

### C.3.7 PASCO BAKOTICH, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

The Washington State Department of Transportation (WSDOT) is currently focused on delivering the nation's largest recent state investments in transportation. The State Legislature passed state gas tax increases of 5 cents in 2003, and 9.5 cents in 2005, which will generate approximately $12.6 billion in revenue over 16 years for projects selected by the legislature.

WSDOT began exploring the topic of project management in the mid 1990's, and since then its commitment to effective project management, in support of project delivery, has expanded and grown. This commitment to develop and implement best practices in project management has provided fertile ground for innovation, including development of the cost estimate validation process, which is now recognized as a best practice and being emulated by other organizations across the country.

The benefit of developing a project management plan is not necessarily the document itself, although it is useful. The biggest benefit comes from the teams going through the thought process of developing different parts of the project management plan.

The process of developing the document brings even greater benefits to the project team, including:

▪ Alignment of team goals.

- Mutual understanding by all of the project objectives.
- Clear identification of roles and responsibilities.
- Clearer understanding of who is accountable to deliver what.
- Help maintaining focus on project scope (less vulnerable to scope creep).

The *WSDOT Project Management Online Guide* provides guidance and tools for performing project management functions on WSDOT projects. The *Online Guide* is a linked information network comprised of the five-step WSDOT project management process.

There are activity guides that provide definition, step-by-step directions, guidelines, and access to various samples and templates for performing each element of the WSDOT project management process. Process maps describe the sequence and flow of activities within each of the five project management steps. There are a variety of tools available to help people in creating a project management plan.

The Project Management Reporting System (PMRS) training program is intended for all WSDOT personnel participating in projects and/or activities associated with the Capital Construction Program whose jobs require them to enter data into PMRS, to retrieve and analyze data from PMRS, or to access data from PMRS in order to manage projects. The Project Management Academy is a four-day intensive class that gives an overview of the WSDOT project management processes.

"Six Regions but One DOT": WSDOT share staffing resources across district offices to help even workloads for staff. The theme of the WSDOT Project Management is "no surprises" project management. Workshops help project managers and project teams develop their risk management plan, which is the heart of the PMP.

### C.3.8 MIKE PADDOCK, CH2M HILL

The Marquette interchange reconstruction, a $810 million project, was delivered three months early, under budget, and constructed in a way to keep the downtown open with safety as a priority. The project manager was assigned early to be out in front of project, before the team got there to find the critical paths and reduce the project impacts to the community. This project went through three scoping documents, three governors, three mayors, and four commissioners. However, key staff were part of the project from beginning to the end.

Community outreach was a success. They met with the public on their terms. Their motto was to meet anytime, anyplace with anybody who had issues or concerns. They assigned community liaisons to develop relationships with the neighborhoods. Many were on a first name basis with residents, which made a huge difference when it got to construction of the project. People knew who to talk to when problems came up. The community involvement had a significant cost, about 1.5 percent of the total budget, but it was worth it. They also created a website, primarily targeted at commuters, which included a map-it tool to help customers find routes to local business, taking into account detours.

One primary goal of the project manager was to forecast conflicts and be aggressive about addressing them. Some issues included:

- Securing funding—needed to work to build broad support for the project.

- Keeping project within original footprint.
- Addressing utilities impacts early.
- Relocating a business with the direction to keep jobs in Wisconsin and in Milwaukee. The business took a year and a half to move (to North Milwaukee).
- Maintaining access to business by keeping two lanes in each direction throughout.
- Creating a traffic mitigation taskforce to manage expectations and mitigate issues.
- Job training—trained 200 people to work on project; still employed and created some smaller contracts for local business to bid on.
- Working with advisory groups to come up with creative ways to involve the community regarding community aesthetics.

They tracked quarterly cost estimates to track major items and kept a list of scope items that could be cut and added. They aggressively tracked costs using tools to forecast and to take advantage of the budget.

There was significant pressure to complete the project in three years; contractors said it could not be done. But by getting early buy-in from the community, expediting construction, and completing advance work early, they were able to finish the project early. They also used a resource-loaded schedule (the same method as contractors use), and built the schedule and then turned it over to contractors one year before bidding. They were able to get feedback on it before letting.

The keys to success for this project were minimizing handoffs, early and extensive community outreach, detailed scoping, aggressive change management, and the ability to forecast conflict.

## C.3.9 DISCUSSION

Question: Do FHWA, VDOT, and UDOT program management and organizational performance measures get tied to individual program manager performance measures?

Jones: In project management plans, the PMP is tied back to specific projects then judged and compared to make sure projects are done on time and on schedule. Project managers use dashboards to gauge performance.

Detmer: Everyone is measured on results, including functional managers, project managers, and construction engineers.

McMinimee: At UDOT, we use the same measures to measure central groups as well as project managers.

Question: Is the project manager certification funded by VDOT?

Detmer: The DSI training in Virginia is quite expensive. As a result, more localities are taking ownership and partnering with us. We offer seats in our classes at a discounted rate. VDOT funds the training through a payback, once you pass the PMP exam. There is a pay increase incentive, but more engineers are getting certification. The Project Management Institute Body of Knowledge (PMIBOK) is not necessary but helps with preparation for the PMP exam (Project Management Professional). The Transportation Project Management

Institute—for design phase engineers and preliminary engineering—is completely transportation focused.

Question: At PennDOT, how are project manager assignments and functions team assignments made? Do assignments set up competing priorities?

Ferguson: Assignments are based on who's available and expertise. Conflicts are taken up the chain of command, and the assistant district engineer ultimately makes a decision.

Question: At Mortenson, is there any relationship between project management to human resources?

Griffith: He works with the project manager to assess needs, make adjustments on the fly. He said he uses gut level feel, along with experience and training, to determine if someone is ready to take on a project.

Question: What were some of the methods used to convince the workforce of changes?

Ferguson: At PennDOT, change was not easy. It took strong leaders who have implemented a lot of the performance measures. For many years many resisted the idea of comparing districts, but now we compare districts. We put data out there and people know how they stand against their peers. This has worked to a great degree, but it's still not completely embraced.

Detmer: In Virginia, the approach took strong leadership, but there was also a strong grassroots effort. It was a great collaboration from the beginning. Collecting data and making it available created competitiveness; no one wanted to be at the bottom of the list.

Question: Who served as the community liaisons for the Marquette project?

Paddock: Since it was a Wisconsin Department of Transportation project, they were the primary contacts. CH2MHILL provided support and resources, businesses provided venues for meeting, but the "face" was always a Wisconsin DOT person.

Question: How does WSDOT communicate resource sharing across the state?

Bakotich: Each region took responsibility and has a contact person to manage. The contact people meet monthly to discuss project status and who is available. They don't just talk about one person, but will provide teams to other districts. Each region has a spreadsheet to monitor resource availability.

Question: In WSDOT, does the project manager administer the construction contract too?

Bakotich: In the larger regions, they will have a design-only project manager but in the smaller regions, the project manager does both design and construction management. They have used a variety of methods to transition projects between project managers, such as the field engineer comes in six months prior to letting to conduct a constructability review. That way, they have knowledge and ownership of a project. They will also send design project managers to the construction site and review the construction phase. They can provide history for the construction engineers. They also have a "commitments" database that notes things like "big black mean dog in backyard," to give the construction engineers more background on a project.

## C.4 GROUP INTERVIEW SUMMARIES

*NOTE: DATES, TIMES, AND INTERVIEW PARTICIPANTS ARE INCLUDED IN APPENDIX A.*

### C.4.1 TOOLS (PPMS), SYSTEMS, AND PROJECT MANAGER TRAINING

Tools (PPMS) and Systems

The Program and Project Management System (PPMS) is a system designed to assist managers in the management, development, and delivery of preconstruction phases of transportation projects, as well as the department highway program.

PPMS schedules, monitors, and reports activities and milestones. The system generates preconstruction project schedules, and uses critical path methods to model schedules. Information is available at a project and program level. PPMS is used by Mn/DOT management to track project development progress and schedule monthly lettings. However, sometimes when there are a large number of projects in a single letting, Mn/DOT will add another letting in the same month. This helps with getting good bids since more companies will submit proposals.

The PPMS uses a universal template, which has a standard list of 90 activities. Based on the universal template, the PPMS coordinator can create a unique template for each project, including a critical path network and an active and dynamic schedule.

Mn/DOT maintains an internal website that is broken out by district, where anyone can go in and view a summary of projects. Power users are able to see more detail on a specific project. There are also a number of standard crystal reports, where staff can find more project detail. However, because not many people knew where to find the information, Mn/DOT has reorganized its website to a topic-based website (away from organizational based) to make it easier to find information.

Costs entered into PPMS are estimated costs; however, as the department moves toward total project cost management, the costs will become more comprehensive to include more than just construction costs.

Estimates for "labor hours" are rule-based and built in. And, again, as the department moves to total project cost management, it will need to make better use of the labor hours shown on the project schedule to help determine the engineering costs. The labor hour estimates have never gone through a thorough validation process.

Mn/DOT's performance is published in a few different reports: *The First Year's STIP*, *Reasons For Delay*, and *Project Float* reports. The STIP report publishes projects that will be delivered and the projects actually delivered. Throughout the year, staff can monitor and track what happens to projects. Included are key measures the department uses, and it is posted on the Governor's website. The goal is that 90 percent of the projects listed in the STIP are completed.

About six years ago, Mn/DOT started reporting on reasons for delay of projects in an effort to find common problems and examine them. This is reported quarterly and includes projects delayed more than a month.

The *Project Float Report*, published three times per year, summarizes project schedules on time by grouping them by whether there is negative float or not. Only projects that are in the STIP years are included.

Currently, the Mn/DOT Office of Technical Support is undergoing a needs assessment and gap study on alternatives to the current system to determine if functionally similar software exists; if so, potential maintenance costs, user friendliness, and detailed functionality will be evaluated to determine its usability vs. PPMS. Because the current software is outdated, there are not many programmers who can make updates. Staff have a long list of needed improvements and enhancements. Typically Mn/DOT spends about $75,000 annually to maintain the system.

It has not been determined whether to customize an off-the-shelf system , develop a custom system, or examine a shared solution from AASHTO. Also under consideration is that fact that the State of Minnesota is updating its cost accounting system to a People Soft Financials system.

## Project manager training

Mn/DOT has an internal training department, which offers three levels of project manager training: Essential Skills, Advanced Skills, and Master Skills. Mn/DOT has also developed the Critical Issues Program, which is also open to people outside of Mn/DOT. Mn/DOT subsidizes the cost of the training making it a cost-effective way for external partners to participate and learn about project management and Mn/DOT processes.

*Essential Skills for Project Managers*—An eight-day training, provides an introductory project management training opportunity for present, new, or potential Project Managers at various levels.

*Advanced Skills for Project Managers*—A two- to three-day advanced training for those people who are working as Project Managers in the preconstruction phase of program delivery.

*Critical Issues Program*—A one-day session that expands on information presented at the Essential Skills for Project Managers Class, further supplementing skills project managers have and routinely use on the job by presenting new, emerging, and hot topics.

*Master Skills Development for Project Management*—A seven-day program that helps experienced project managers strengthen their management/ interpersonal skills to manage complex projects and deliver results on time and within budget.

Mn/DOT also created a day-and-a-half program to help project managers understand managing a project schedule to a positive flow. It was developed based on feedback that people didn't understand the PPMS application.

The training is not a prerequisite for being a project manager but it helps when project manager assignments are made. Employees, working with their supervisor during annual reviews, decide which training is appropriate. No training is mandatory. The training schedules are staggered to give all staff the opportunity to attend. The training does not lead to any certifications. There is no project manager civil service classification.

The group discussed what skills a project manager needs: project management experience, understanding of available tools, good communication skills, coordination skills, and ability to complete projects and handle conflicts. Many feel that a project manager does not have to be an engineer since they rely on team members for engineering expertise. Others thought that project managers who are engineers would have an advantage because they have an understanding of interactions between engineering groups.

The masters skills course is geared toward employee retention; Mn/DOT has not studied if it has a retention impact. Mn/DOT typically does not have a lot of turnover but people do change jobs within the agency.

## C.4.2 PLANNING

The Office of Investment Management (OIM) is responsible for statewide planning and programming, establishing broad performance measures and funding targets, and providing guidance for the development of district plans and programs. Annual meetings are held with top division staff and expert offices to present and discuss proposed investments for bridge and pavement preservation and mobility and safety improvements during the 10-year planning period. The fiscally constrained 10-year plans are the basis for development of the fourth year of the annual four-year STIP.

Minnesota develops the STIP through the use of Area Transportation Partnerships (ATPs) that cover eight geographic regions around the state. ATPs are composed of a variety of transportation partners, representing state, regional, local, tribal, and transit interests. The ATP group receives annual program updates and guidance from Mn/DOT (through OIM and the districts) and is responsible for recommending transportation priorities seeking federal funds to include in the STIP. There is some overlap between the ATP boundaries and Mn/DOT district construction boundaries but this is helpful in reinforcing communication between the districts.

Project managers are involved in the planning and pre-programming of projects. The project management process now requires project managers to be actively involved early in the planning process and before a project is officially programmed into the STIP. Mn/DOT district offices generally select projects using a performance-based approach that is tempered by sound planning and engineering judgment. Projects involving greater levels of planning and environmental review are typically identified in a district's 10-year plan, and then assigned a project manager. However, a project manager may also be assigned to study a particular transportation problem or issue when there is an external need to do so even though it may or may not be a performance-based need from the district's planning process. In those cases, a project manager is assigned even before is it classified as "a project." Sometimes a planning study is entered into PPMS and even though the project is not in the STIP, a project manager will be assigned.

Typically, a project manager will hand off the project at letting, when responsibility for the project is given to a construction project manager. But there are differences between how the districts and metro office determine hand-offs. In outstate district offices, project managers have many roles, in addition to managing projects. In the metro office, there tends to be more hand-offs such as after pre-design, design, etc. The process has evolved over the years.

A project manager is assigned for all projects. When a project manager is assigned, it is entered into PPMS. Because there is no set time when a project manager is assigned or when hand-offs occur, a project manager may or may not understand the complete history of a project.

Project managers have some level of decision-making authority but it may vary by district. Sometimes a project manager makes a decision but then it may or may not be communicated to the next project manager. Mn/DOT collects more project data now and staff are trying to create a more consistent approach, both project-wide and system-wide. This additional data will help understanding of the decisions and commitments made throughout the processes.

Once a project enters the STIP, the expectation is that project costs will not increase. A detailed project scope and a total project cost estimate is prepared and documented before a project is programmed, and the project manager is accountable for any changes in project scope. Any significant changes in project scope must be approved by district management staff.

Currently, there is no formal guidance to instruct project managers to involve maintenance and construction staff in the project planning process; however, this is being done in many districts. The new total project cost management process has just recently been introduced, and as a result, the project planning process is still in transition. The new project scoping and cost estimating process accounts for risk and unknowns, but it has not been fully implemented to date.

### C.4.3 SCOPING AND EARLY PROJECT DEVELOPMENT

A new cost estimating and scoping process was implemented by Mn/DOT requiring districts to conduct a more detailed and documented scoping of their projects before programming them into the STIP. This scoping process has been very helpful in determining the key project issues early in project development. The group generally felt the process helped Mn/DOT and its ability to manage its program more effectively, and districts should be encouraged to continue to implement the new process and refine their internal scoping processes accordingly.

While each district has its own way of assigning project managers, a common problem has been the lag time between scoping and design. For some districts, this has resulted in a lot of rework (e.g., sending out survey crews multiple times in response to project changes). The authority of project managers to make scope changes varies between districts. Often, the project manager is responsible for budget but doesn't have the authority to make changes. One best practice that was identified has been the use of a scope amendment process and annual updates to the scoping cost estimate. The group identified a key trait of successful project managers to be an entrepreneurial spirit and a genuine interest in the area with the drive to push decision-making forward.

Opportunities for change noted by the group include: demonstrating more value for the professional role of a project manager (consider creating a project manager classification); often more paperwork is created as a response to increasing demands on the project manager, the experienced project manager (especially when given greater authority) will

not need the paperwork; many of the career rewards are given to people who rotate positions within the agency, the project manager role seems best suited to those who are willing to stay in one place for a long time. Additionally, a more stable program (funding and project selection set) will help the development team reduce rework and thus produce more quality work with greater value for the organization.

## C.4.4 METRO DISTRICT MATRIX ORGANIZATION

Earlier this decade, the Mn/DOT Commissioner (Tinklenberg) noted some concerns about project delivery in the Metro District. An "over the wall" mode of delivery—where individuals would finish tasks in a vacuum and then pass the work on to the next task; a lack of communication about project issues seemed problematic—was noted. Cost overruns and schedule delays were becoming common. This led to the formation of an area manager role to serve as an external liaison responsible for tracking issues into Mn/DOT projects. After some implementation of this system, Metro District conducted a survey with the following findings: the area manager role is accepted, though often viewed as too much of an advocate for external parties; project hand-offs weren't being made to design engineers; and squad leaders were overly burdened.

Metro is now evolving toward an approach where the project manager will control budget, schedule, and scope. Each project will be owned at the principal level with either an area engineer or design engineer as the project manager (effectively creating another matrix in the organization). This change is intended to elevate the role of the design engineer in the organization. The project manager will be expected to have a high level of external visibility. Key qualities in a project manager include a broad knowledge of project delivery, the savvy to get things done, and an ability to work with external partners.

Metro is also beginning a scoping (which includes PPMS and other standard project information) and risk management approach that identifies and gradually retires risk over the course of the project, such that the goal is to have no risks remaining at letting except for those construction-related. With a $300 million annual program spread across approximately 75 projects per year, the typical project tends to be in the $2-3 million range. Each project manager is handling about 15-20 projects (at various levels of effort) at any one time.

## C.4.5 CONTEXT SENSITIVE SOLUTIONS AND HEAR EVERY VOICE

### Context Sensitive Solutions

Context Sensitive Solutions (CSS) is a decision-making, service delivery, planning, project development, construction, operations and maintenance approach to transportation that encompasses preserving, enhancing, and balancing historic, aesthetic, scenic, environmental, and community objectives along with safety and mobility objectives. In 2000, Mn/DOT (as one of the five FHWA designated Context Sensitive Design (CSD) pilot states) developed CSD training, advocacy, and policy and started delivery of a pilot CSD workshop targeted for project managers. That training curriculum has continued to expand to date, and FHWA has recognized Mn/DOT for an exemplary CSS training approach.

While the philosophy and principles-based approach remains the same, CSS has replaced CSD as the terminology of national preference. The CSS approach has been seen as

instrumental to the success of many nationally recognized and acclaimed Mn/DOT and Minnesota transportation projects including Trunk Highway 61 reconstruction projects along the North Shore of Lake Superior, the Excelsior Boulevard reconstruction project in St. Louis Park, Trunk Highway 38 reconstruction north of Grand Rapids, and reconstruction of the collapsed I-35W St. Anthony Bridge over the Mississippi River in Minneapolis. In each of these cases, the creativity and flexibility in design resulted in cost-effective balancing of competing stakeholder needs and objectives, improved safety through significantly reduced crash rates, building the right-sized solutions for the purpose and need of each project, and community stakeholder acceptance and satisfaction. The CSS approach fits very well with and in support of Mn/DOT's strategic vision and the strategic directions of safety, mobility, innovation, leadership, and transparency. However, to integrate CSS into project planning and development means making further changes to the traditional ways in which projects are managed from planning through the project development, construction, operations, and maintenance phases.

Mn/DOT staff are largely aware of CSS as a philosophy and approach, but most Mn/DOT staff can't readily articulate CSS principles. Misperceptions and false assumptions are still prevalent in regards to CSS, and a knowledge gap is most problematic between the upper and middle layers of staff. Project managers and planners seem to understand and grasp application of CSS principles the most. What resonates the most for upper management has been recognition of research and documented correlations between CSS and project management principles and numerous agency and stakeholder benefits that Mn/DOT desires. But, organizationally, there's not a consistent understanding or recognition of how to tie more things together in a CSS approach to day-to-day services, activities, and decision-making—so the CSS efforts and benefits fall short on most projects. There's a need to convince all managers of the importance of supporting the broadly informed risk taking, and challenge of assumptions that is necessary to get to a point of successfully integrating CSS on a more consistent basis to balance competing objectives and optimize benefit to cost ratios.

### Hear Every Voice

Hear Every Voice (HEV) is an initiative to help project managers and others to understand the importance of listening and engaging with the public. The initiative has been in place for several years; a HEV project manager was hired this year. The HEV coordinator works closely with staff to encourage including public involvement in the early project development and planning phases of projects. By including public involvement early in the project phase, project managers can build better relationships with the community and create a public involvement plan that includes a budget for implementation. The coordinator offers guidance and resources to project managers on how to effectively include and engage the public in their projects. The initiative includes *Hear Every Voice: Mn/DOT Public and Stakeholder Participation Guidance* and online tools and resources to provide "real world" implementation opportunities. Mn/DOT recently held a series of courses to support successful public engagement such as the core class "Stop the Pain and Increase the Gain: Public Participation and Mn/DOT."

## C.4.6 MN/DOT CROSSTOWN: I-35W/HWY. 62 RECONSTRUCTION PEER REVIEW

In 2001, Mn/DOT was prepared to let a project to reconstruct the Crosstown Commons. That project was considered the minimal safe alternative. Just before the letting the Minnesota State Legislature intervened, stopped the project, and requested Mn/DOT to prepare a study of other alternatives. The legislature wanted Mn/DOT to hire a consultant to come up with a different design. There was a loss of trust between the legislature and Mn/DOT.

One of the mandates in the legislation was to not take anymore right of way than the original plan. With the other mandates in the legislation, this was impossible to do. In order to illustrate the necessary impacts and to show the modest level of right-of-way takings from the surrounding neighborhoods, Mn/DOT with the help from the Consultant Design Team, developed an animation that illustrated how the new design would take up about the same space as the current freeway. The animation became a powerful tool at public meetings, assisting Mn/DOT in showing impacts and the relationship of the construction and neighboring properties.

The program delivery effort for the Crosstown project was essentially a turnkey project. There were a few functional group activities done internally by Mn/DOT but for the most part all were accomplished under one consultant contract. The $285 million construction project was the largest single roadway project that Mn/DOT has ever let. In the construction contract, Mn/DOT added a communications and public engagement element. This helped with a large number of communication issues but Mn/DOT still has been understaffed to handle the face-to-face contact with the public that is desired.

The four-year project is not being constructed linearly, so construction is occurring all along the corridor simultaneously. All the noise walls will be up shortly, which will reduce many complaints. The final completion date for the project is June 2011.

The construction is being completed by a joint venture of three construction firms. John Griffith was the lead project manager for the project, who has been supported by a large design team. Because of the size of this project and the turnkey approach, it was often difficult to get timely dedicated staff to review the project. In order to meet the project schedule, Griffith spent much of his time managing the consultant schedule and budgets to have the consultant manage to the letting rather than Mn/DOT. This was done since the consultant had the ability to add resources as necessary. Griffith also worked closely with political representatives and the local municipalities involved in the project. He felt he had the support of the area manager and district engineer and the authority to make changes but he didn't make decisions in a vacuum.

One recent difficult issue that Mn/DOT is working through involves the temporary relocation of a family because of construction damage. This situation has ended up being very visible since it was not anticipated prior to work commencing. There is still a question about the department's responsibility to the family versus the contractor responsibility.

In the early stages of the project, Mn/DOT recognized the importance of setting up an advisory group that would meet monthly. This group was made up of city staff, political representatives, and Mn/DOT. In the beginning of the project construction, participation

was good but it has tailed off. Mn/DOT staff also met with neighborhood groups. The public relations consultant has done outreach through community events. Most of the time, Mn/DOT staff attended events as well.

Mn/DOT initiated an internal peer review to examine what has been going well and to identify areas for improvement. There's still time to make changes since the project is ongoing. The peer review took one week, during which residents and other stakeholders, including political leaders, project staff, the contractor, and the public relations firm, were interviewed to tell stories and express feelings about the project and process.

The primary recommendation from the peer review is to assign someone to the public relations function and manage public engagement.

Other findings of the peer review include:

▪ Engage businesses so they can plan around construction.

▪ Develop new and different ways to illustrate projects to help the public understand the project and its potential impacts.

▪ Use a project management plan to establish clear roles and responsibilities. Many of the issues that came up were small but because some were not addressed quickly and adequately, some problems escalated.

▪ Track costs of public engagement internally.

▪ Develop a common understanding of what resolution of an issue means.

### C.4.7 DISTRICT 4, HWY. 10 PROJECT

The Trunk Highway 10 project in Detroit Lakes had several challenges to overcome, including a series of curves, 70 access points, safety issues and bottlenecks, and many left-hand turns. Detroit Lakes is a resort community: Big Detroit Lake is directly adjacent to the highway and the Pelican River runs through town. The goal was to complete the project quickly with minimal impact on local businesses while protecting water quality. The construction season in the areas is just six months long.

The finished project resulted in seven access points, a grade-separated railroad crossing, elimination of two at-grade crossings, and a shifted railroad grade. Safety was improved, and major construction was complete in two years, creating minimal business impact. Key to this project's success was early public engagement and identifying focus areas to complete early, such as moving the Burlington Northern Santa Fe Rail Road line and complying with the Pelican River Watershed District needs.

There was no point in time when the design project manager and the construction project manager handed off the project. Project managers worked jointly on all projects as they got close to letting, slowly transitioning between design and construction. Because there was early coordination between design and construction engineers, together they looked for ways to shorten the timeline, separating certain parts of the project that didn't have as much public impact, and put those projects into letting a year in advance to minimize community impacts.

Decision-making authority fell to the group. When issues came up, they talked it out as a group and they split up authority to the final decision: if it was a "what" decision, the

design project manager made the decision; if it was a "how" decision, then the construction project manager made the decision. Rarely did they have to enlist decision-making help from the assistant district engineer.

Mn/DOT used innovative contracting with early incentive for completion of the bridge work in one year, which paid for itself by reduced need for railroad "flaggers." They also examined maintenance and cost and determined early who was paying for what and who was maintaining what. They used a color-coded printout to determine who's responsible for what and worked out agreements early.

Mn/DOT worked on project aesthetics in advance by telling the city what it would and would not pay for. This allowed the city to plan with a public process for what it would pay for and include, which helped the project gain public acceptance.

Mn/DOT hired a contractor who focused efforts on relations with the business community. The business community liaison met personally with affected businesses, with start/end dates of construction, and access.

Mn/DOT tried to head off concerns with utilities with early involvement by meeting two years out. It found ways to complete relocations ahead of time. Utility company representatives came to weekly meetings, so they had buy-in for the project.

## C.4.8 ENVIRONMENTAL

The Early Notification Memo and PPMS tend to be the ways in which environmental functions are notified of an upcoming task/project. Reviews of PPMS, performed three times per year, are conducted with the districts to verify workload needs. These have been helpful to engage with environmental staff, but issues related to turnover of project managers and inconsistent application of the Early Notification Memo (some don't use it, others do it two years in advance of letting, others four years in advance) have created some difficulty in managing the work. A key question that needs resolution is: "Where does scoping and environmental review come together?"

In addition to the district project manager placing a project in PPMS, the project manager must also use the appropriate activity codes based on information provided in the Highway Process Development Process (HPDP). Technical experts need the activity codes logged into PPMS so they can sort out the projects they need to work on. Additionally, the district project manager must notify the specialty offices immediately when there is a change to the project letting date or the scope of work. A change in the scope of work may require additional investigation by the specialty office.

Typically state-aid projects present more management problems and potentially high liability to the department as compared to Mn/DOT-led projects because of less involvement with the specialty offices.

Opportunities for improvement include a more formalized method for tracking project commitments and the use of "brown bag" informational sessions at district offices to describe how each of the environmental units works. Some best practices noted were: good external agency relationships and Mn/DOT funding of liaison positions.

## C.4.9 UTILITIES

About five years ago, the Utilities unit in the Central Office underwent a significant process change to improve project delays due to utility needs. Before the process change, Mn/DOT had $3-4 million costs in utility delays. Today, as a result of the changes, Mn/DOT has less than $100,000 cost in utility delays. Mn/DOT staff and the utility companies welcomed the process changes, and delays due to utility work are now unusual.

Now, Mn/DOT has a centralized and coordinated utility permitting and tracking system where the Central Office completes all permanent installation permits for the entire state. All utility permitting for temporary installations is done in the regional offices. Additionally, the Central Office handles all invoicing. Anyone in the agency has access to the utility tracking system. The changes were precipitated by a 1999 legislative requirement to improve utilities coordination.

As part of scoping projects, project managers begin the process of determining utility needs, then give the information to the Central Office staff, who then develop utility agreements. The utility permits section within the Central Office stands independent from the project manager. All utility agreements have to go through an audit system. One issue cited was that large projects at smaller districts sometime create staffing problems—specifically following up for as-built drawing.

Mn/DOT's process gets the utility companies involved early in the process. Notice of Orders, the date when utilities have to move, give the utility 14 days to respond. The project manager is notified about a Notice of Order by email and then can proactively follow up with the utility. The District staff negotiate location of the moved utility. After a Notice of Order is issued and a utility does not move, the utility is held financially responsible.

Each district holds an annual meeting with local utility companies to discuss future projects. The meetings allow the utilities to learn about upcoming projects and to put them into their budget and planning process. Attendance at the meetings has been good. The Central Office Utility group has recently updated its utilities manual and provides utility owner training. Consultants are invited to trainings so they can remain up-to-date on Mn/DOT projects and processes. Additionally, Mn/DOT has resources for project managers and utility owners on its website.

## C.4.10 METRO DISTRICT DESIGN PROJECT MANAGERS

Decisions about how projects are assigned are based on experience and availability. Usually project managers are assigned before a project is entered into the STIP, early in the process. When a project is in the scoping process, a project manager and sometimes that person will stay with the project after being entered into the STIP.

Project managers have varying levels of experience; some lots of experience, some with limited experience. Examples were cited of project managers only having two years of experience out of college before becoming a project manager. Inexperienced junior staff serving as project managers need to work with more senior functional managers and are at a status disadvantage when requesting work completion on a given schedule. Project managers come from all functional areas of Mn/DOT, and the role is mostly considered to

be a stepping stone rather than a career milestone. Project Manager Institute training would be useful.

There are some measures to assess workloads and help assign work and share work loads in functional areas. Squad leaders can use PPMS to develop workload drafts as a guide to get an idea of workload.

Functional area project managers are assigned based on expertise level and availability. For larger projects, many people will be involved, so the project manager's role shifts to keeping other project members involved. Some squad leaders will create a project coordination chart to track all staff who are involved in a project.

The design group maintains final design resources on the website, which is especially useful for those who have less experience designing projects.

Project managers have a lot of autonomy to make decisions as long as the scope isn't affected. However, as Mn/DOT moves to a total project cost management system, there will be more rigor around decisions. The intent of the changes is to limit scope creep.

The amount of communication with external stakeholders on a typical project design depends on the project. Some projects have larger impacts on stakeholders and require communication with the locals to address issues and solve problems.

Currently, workload is uneven. With the incoming funding from federal stimulus money, there are too many projects right now. The design project managers would like to see a more even workflow. The functional groups are doing a good job meeting the increased demands, and teamwork has been very good. However, the group reported that if they have advance notice, they can hire consultants for individual tasks to help with workflow issues.

Recently, Mn/DOT has reorganized the Metro District to a matrix organization where project management responsibility was shifted up one level to principal engineers. In the new organizational model, the goal is to have a project manager stay with a project from cradle-to-grave but that is not currently happening. Currently, the design project manager will hand off the project once design is complete to a construction project manager. Communication is important between project managers to help answer questions. Sometimes the transition goes well and sometimes not. It depends on the project managers involved.

Experienced design project managers have received training including the essential skills, context sensitive solutions, and some technical training, but there is a disconnect between when training is available and when staff can take it.

Many of the younger engineers aren't getting project management training when they need it. The group stated a need for training on softer skills like communication, project coordination, and dealing with conflict. They also expressed a need for more practical hands-on training on how to get cost estimates.

Some issues that were identified by the group include:

▪ A design project manager is not sure who the construction project manager is going to be early on in the project's life.

- 95 percent plan reviews by the resident engineer and project engineer do not always include the project engineer.
- Principal engineers were often default project managers.
- Metro program oversight committee has an impact on project scope, scale, and cost.

## C.4.11 GREATER MINNESOTA DESIGN PROJECT MANAGERS

Training for project managers has been especially helpful for the introductory levels. However, as project managers become more experienced, the training does not seem to match their needs as well. Staff turnover can be an issue for maintaining a stable of project managers in the districts. While the smaller size of district groups enables an organic, natural progression of staff into project manager roles, they are also susceptible to staff losses. Often times, project managers believe they have responsibility for a project but minimal authority to make decisions. This also contributes to staff turnover into other functional areas within Mn/DOT. Performance issues for the project managers tend to be a function of communications.

Opportunities to make the project manager role more valued in the agency include: 1) the development of a project manager role that is a career endpoint; this may mean the development of a "senior project manager" or related position; 2) certification requirements would be helpful; 3) current project managers tend to get "piled on" for work, as though the project manager role is "collateral duty;" 4) no measures for achievement are currently available, and that limits reward and accountability. Additionally, greater value in the project manager role may help to resolve those instances where a senior-level staff person acting as project manager runs the risk of being disregarded by a principal level staff person.

Important characteristics of a project manager were identified to be: 1) a "big picture" point of view, such that the person can manage ambiguity in a project; 2) an appreciation of the implications certain decisions will have on a schedule and other project processes; and 3) an ability to manage work through delegation of tasks. Project managers need experience with building relationships and communication. Also, the organization structure should allow for sharing knowledge and allow project managers to make decisions.

Some frustrations voiced by project managers included: 1) Lack of functional group (i.e., materials, hydraulics, survey, traffic, etc.) "vested interest or responsibility" in a project; 2) receive functional group recommendations too late; could advance projects more quickly if got earlier input from functional groups; 3) lack of communication or project feedback from construction (i.e., how could design been improved, construction questions, etc.). Typically design does not hear about construction issues after letting and thus cannot provide input to construction on specific design issues or learn about potential design improvements; and 4) not being involved in the project scoping process.

## C.4.12 TRAFFIC

The Office of Traffic, Safety and Technology in the Mn/DOT Central Office establishes policy, keeps an approved materials list, and signs off on plans. It has a process committee, which evaluates policy and makes changes periodically throughout the year.

Project planning in the district offices varies widely. In the Metro District, the Traffic Unit felt that project manager experience levels vary considerably and as a result communication varies. As a result, they felt they need to initiate a lot. The smaller district offices said they had better communication because many have worked together for a long time, and they feel more involved in the process.

Generally, traffic staff felt that they don't have a clear set of priorities and there is not a clear list of projects. There was also a question about the definition of a project manager. The Traffic Unit may not know about a delay that is caused by another functional area.

They have monthly PPMS meetings for project managers and functional units, which is a good way to find out project updates, but that may not often enough. Having regular communication with project managers is good, but every project manager wants their project to be the highest priority. In those cases, they need to seek out direction from the project manager.

There was some confusion about decision-making, but overall they reported that conflicts are resolved between designers and construction when there's a good relationship, which makes it easier to identify project impacts. However, less experienced designers may not anticipate a project's impacts with traffic. When there is a conflict with priorities, the assistant district engineer will decide. Issues are raised in regular meetings but decisions are made outside the meeting. But there is no consistent feedback loop for the Traffic Unit to know the final decision. Changes are made in PPMS, but you need to monitor it.

The Traffic Unit does have the authority to work overtime and outsource work, if there is enough time. The outsourcing process takes six weeks. A direct-select process could help with emergency projects.

There's also conflict between project planning and working in the field, since in the Traffic Unit, it's the same people. They need balanced letting dates and want management to even out workloads; maybe even sharing resources between districts.

Functional units are responsible for quality control in the technical areas while the Central Office looks at plans for consistency. The Traffic staff like their connection to field work and as a result they get good feedback on plan quality from Construction staff.

## C.4.13 BRIDGE AND HYDRAULICS

The Bridge Office has developed a routine method of work process that involves district bridge staff handling much of a project's upfront scoping-related work before turning it over to Central Office staff. At Central Office, a preliminary bridge unit will assign its own project manager as a bridge task manager to the project. This person manages all bridge-related work tasks until the design progresses to the point of final plans, at which time a final design unit will take over the bridge-related tasks. The office prioritizes its workload according to project letting date. When workload dictates the need, engineers from the final design unit will be pulled into project manager roles during pre-design.

A best practice for managing change is maintaining good relationships between the district project manager and the Bridge Office project manager. The bridge scoping worksheet needs to be clear about assumptions in bridge design. As more details become known,

changes in the project cost can be communicated along those lines (assumptions then vs. known information now). Co-location of the internal bridge/hydraulics staff has improved communications within the group. Another improvement has been the use of a checklist of possible bridge repair items to ensure all work activities are included in the original scope on bridge rehabilitation projects. Review of bridges in final design is a way to optimize the bridge designs.

### C.4.14 RIGHT OF WAY

The Right of Way group is generally decentralized, and in the metro completely decentralized. However, strong communications within the group along with the use of the Real Estate and Land Management System (REALMS) tool has been extremely effective in managing project documentation and processes. When workload becomes an issue for districts, a common practice has been to share staff across districts. The scoping process has helped with early identification of potential problem parcels, cost issues, and potential resultant design decisions.

It's important to recognize field staff serve as a "face" of Mn/DOT for many people affected by the project. They can help identify project "hot spots" and relay that information to the project manager and project designers.

The group would like to see more consistent use of the Construction Limit Change Record form—it is currently used about half the time. Historically, Right of Way would be implicated in the *Reasons for Delay Report*, but further review often discovers earlier causes for the delay. The PPMS "early finish" and "late finish" entries do not work; people focus on the late finish, which sets up problems for the right of way group. An innovative contract practice, referred to as Indefinite Time & Indefinite Quantities, has been used for rapid response to residential and commercial building demolitions.

### C.4.15 MATERIALS

Pavement preservation needs develop through the use of the pavement management system and the engineering judgment of the materials engineers. Based on funding and other influences, these preservation needs are prioritized into a district's STIP, 10- and 20-year plans, long before they are reflected in PPMS and assigned a project manager. However, major projects (reconstruction for capacity increase, safety, etc.), because of their complexity and impact to the public, are assigned (or should be assigned) to a project manager well in advance of most materials engineering involvement.

Once a project is in PPMS (and assigned a project manager), a schedule is developed for the various activities needed to deliver the project on time. The design and soil activities (the responsibility of the materials engineer) require varying amounts of field work by soils crews before the materials engineer can deliver design recommendations. Sometimes the time allotted in the project schedule to soil does not reflect the terrain, season of the year the work is done, or the staffing availability. Planning as well as design recommendations are usually year-round activities for the materials engineer, so only a small amount of time is spent in the field.

The districts all use PPMS as their project delivery schedule. Most functional areas have senior engineers on their staff; in materials it is the soils engineer. In most cases, project

managers are principal engineers along with the senior engineers working in project development. The use of functional area personnel as project managers generally occurs if the project was specific to that functional area, i.e., a traffic signal project. There is a question about project managers' authority.

There has been a policy change within the department that affects materials selection. Now they need to perform life-cycle cost analysis (LCCA) to compare alternative rehabilitation strategies for pavement surfacing (bituminous or concrete). If the district does not prefer the low cost option, the selection of another must be justified.

The more structured scoping process now in place goes a long way toward eliminating scope creep during the project development phase. From the materials standpoint, it is important that the LCCA process be applied to pavement preservation projects that are candidates for inclusion in the current STIP to set the type of pavement work that will be done in the project.

The key is not how the selections are made but the fact that they are made far enough in advance and made correctly to avoid major scope changes and project development delays. The power of the pavement management model (HPMA) tool is it provides the ability to forecast the future condition of all the pavement sections in a district based on data collected in the past. The forecasting of pavement needs up to 20 years in the future provides a sound basis for developing short- and long-range programs. HPMA's value is further enhanced by its ability to develop programs that attempt to meet the pavement needs as much a possible given changing budget and performance scenarios. By managing high- and low-volume roads as independent systems in HPMA, a more balanced approach in programming can be achieved.

However, the point was made that adding cost to the scope can be a good thing for the long-term effectiveness of a project. The life-cycle cost analysis is a project-specific analysis and does not take into consideration the entire system. For example, Joint Bond is a relatively new product that may lead to less longitudinal cracking of the centerline joints. Using this product adds $3000 per mile to a project; however, it has better performance. But it is a new product and not accounted for in the scope, since the scope was completed three to four years prior.

### C.4.16 CONSTRUCTION

Some Mn/DOT construction engineers felt that they are not involved early enough in projects. However, some district project managers carry projects cradle-to-grave. For example, in District 2, the project manager performs most of the project development functions with its own staff. These functions include but are not limited to: project management, scoping, public involvement, surveys, construction limits, geometric layouts, detail design, cost estimating, special provisions, and contract administration.

In District 2, there is no hand-off between detail design and construction because everything is being handled by the same staff. Communication is ongoing throughout the entire process. Project managers rely on other functional units for permits, project memorandums, environmental reviews, right of way, hydraulics, soils recommendations, bridge design, and

traffic control. But since the project engineer is also the project manager, Construction is very much involved in all of the processes that lead to the final product put out for bid.

The Central Office supports the district offices, establishing policies and special permissions. The district staff have to work with many different Central Office staff such as the claims engineer and constructions standards engineer.

Quality control is handled through staffing reviews in coordination with the Federal Highway Administration to review processes. They also perform audits on projects to make sure processes were followed and determine quality of design as well as construction quality, but it is not a formal process. They report performance through a measures report, causes for change report, and report on cost overruns, which they now are classifying the reasons.

Project manager assignments vary by district. An example of a good relationship with the design project manager might mean communication until a year before letting. For complicated projects, there is no good hand-off of communication between design and construction.

Through the new scoping process, construction project managers are becoming more involved in the scoping process; however they could be more involved. How involved they are depends on the design project manager. Staging construction is the biggest opportunity to make improvements to minimize public impact.

There are not always clear roles and responsibilities between the design and the construction project manager. Lack of project manager experience and turnover may be causes. There is opportunity for coaching and helping, but this is difficult with busy work loads, and sometimes it is overwhelming to work with an inexperienced project manager.

Training inexperienced project managers on the construction process might help. But department-wide, there is not clear definition of what a project manager really is. A good project manager views a project from cradle-to-grave. But in an ideal world people change jobs and move on to other projects.

There is no career path for project managers and in fact most people don't want to manage projects. But there is a big difference between the districts and the metro; in the metro, being a project manager is their only job; in the districts, project managers have other jobs and roles get fuzzy.

They don't always have the resources to review plans but it is also a timing issue since they can't do it during construction season. There is tension between completing plans in the summer; for fall letting and for spring construction. Recently, Construction has been working on many last-minute projects.

There is annual training but it is focused on technical and administration issues, not how to run a project. Project managers learn through mentorship. Improvements could be made in knowledge transfer from functional areas working on different project phases such as commitments made but not told to those working on construction. It would be helpful to understand the design process. If Construction is more involved in design process, then it is

less likely that changes will be made in the field. In the Metro District, there is a formal feedback process to design process for bigger projects, which is appreciated.

## C.4.17 DESIGN-BUILD PROJECTS AND PROCESS

Mn/DOT began using design-build in 1996 and constructed three projects using a low-bid approach. In 2001, Mn/DOT obtained legislative approval to use the design-build best value procurement process. Since 2002, Mn/DOT has awarded seven best value design-build projects totaling more than $860 million.

On design-build projects, there is one Mn/DOT point of contact, involved from the beginning with authority to make decisions. The design-build process manages all functional areas. Design-build projects are done throughout the districts but they are managed differently in the Metro versus other districts. The difference is that the districts don't have the resources that Metro District does. As a result, the district offices rely on the Central Office for support. The Central Office has set up consistent procurements policies.

The district offices select project managers for design-build projects. A good design-build project manager is someone with skills and the ability to communicate, understand the inner workings of Mn/DOT, be open to different approaches, and accept change. They try to find project managers with experience. The Central Office is able to coach less-experienced project managers on the process.

Project managers on design-build projects are offered a temporary leave and a temporary pay increase from their current jobs. When the project is complete, they are not promised their same job and their pay goes back to what it was prior to working on the design-build project. This makes it hard to recruit project managers for design-build projects. All design-build project managers are temporary. There is a need for staff succession planning to retain and attract project managers.

The design-build process is not viewed well by all because it drives change and some people are uncomfortable with it. Design-build project managers are given a lot of authority to cut through the "red tape," which frustrates some people working in the traditional process. However, upper management sees design-build as successful.

Mn/DOT prefers to staff design-build projects with those who want to work on those projects, but some are reassigned. Once people work on a design-build project, many don't want to go back to traditional build project. Design-build is pure project management with empowerment to make decisions.

Contractor selection is based on best value selection, a price plus time scoring system; however, some is still low bid. Mn/DOT has a design-build manual that is being redrafted to be more specific and a living document. There is a perception that the design-build process is more expensive but that has not proven to be true.

Because Mn/DOT is a decentralized organization, it would be difficult to fully institute design-build for all projects but Mn/DOT could take design-build qualities out to regions. There are processes in design-build that could streamline traditional practices. In fact, some design-build best practices, such as state-of-the-art project controls, are starting to migrate to other areas.

The Central Office design-build staff have met individually with contractors to get feedback, which has been informative. In fact, industry was part of the development for the contracting templates.

In design-build projects, problems are solved quickly to avoid escalation. But if a problem can't be resolved quickly, it escalates quickly to help make a quick decision. Design-build project managers need to have construction mentality in design and the ability to make decisions and understand repercussions of decisions.

Risk assessment and mitigation, project scheduling, identifying critical path, project estimating, negotiating, writing contract documents—these are things many project managers don't learn in school but could be part of a training program.

Design-build project managers use Primavera to schedule and track projects, not PPMS, which gives them the ability to track schedules closely and identify potential problems quickly. Primavera also tracks submittals such as the contractor's diary, schedules, and invoices. There are tremendous opportunities to improve document management.

## C.4.18 RISK MANAGEMENT AND CONFLICT MANAGEMENT

### Risk Management

Risk management practices, processes, and skills create transparency and stimulate innovation by helping to make more informed decisions. Risk management is a tool and a process. Mn/DOT's Office of Policy Analysis, Research & Innovation (PARI) advocates for a collaborative approach to risk management. It is currently developing a "Risk Management 101" training course for Mn/DOT staff. The goal is that in each district, there is one risk management champion. Risks can be legal, technical, a future event, or even reputational.

The key is to identify risk, develop a probability-times-impact score, prioritize the risk based on risk score, then develop a plan to mitigate the risks. Figure out what will be most effective to mitigate risk; then reprioritize project planning based on the plan to mitigate the risk.

Total project cost management training incorporates a risk spreadsheet and asks project managers to assign a contingency cost to the risk. Risk-based cost estimating is new and an adaptation of the Caltrans risk register (risk times impact). This new process was rolled out to design engineers in a recent meeting. Mn/DOT went through a Cost Risk Assessment and Value Engineering (CRAVE) process on 13 major bridge projects to assess risk on projects and assessing a cost.

### Conflict Management

One year ago, Mn/DOT created a new position, the transportation ombudsman, located within the Commissioner's Office. The position is externally focused and deals with Mn/DOT partners, stakeholders, and members of the public. If issues are not resolved through normal channels, they will be brought to the ombudsman. The ombudsman conducts independent reviews and makes recommendations to the commissioner. Many of the issues are about drainage, business impacts, damage to homes, and noise issues. The vision for the office is to address issues earlier so that there is not a need for an ombudsman

position. Many of the issues could have been easily dealt with early on through early and effective communication about Mn/DOT projects and impacts.

Currently, the department measures progress by delivering successful transportation projects but that measure does not take into account quality-of-life issues. Training, such as the Hear Every Voice program to institute real public engagement, is needed for project managers on how to get ahead of problems.

One challenge for the transportation ombudsman is that Mn/DOT is a decentralized organization, which results in inconsistent policies in each district office. It is difficult for many project managers to admit a mistake; however, some staff are starting to proactively contact the ombudsman for assistance.

### C.4.19 MAINTENANCE AND OPERATIONS

Group members noted that the new scoping process has been beneficial to the communications process. Some best practices that have been noted include:

- Use of a project "drive-thru" prior to completion of the project so that a punch list of items may be generated for the contractor
- A dual-hatted construction/maintenance staff person in districts creates a natural connection between the two functions
- Bringing designers out into the finished project as a means for maintenance staff to provide feedback about design issues.

More opportunities for Maintenance/Operations feedback to design and construction would be helpful. Early involvement of Maintenance and Operations staff helps gain their buy-in and ultimate ownership of the constructed project. Any implementation of a project management culture should be scalable to allow for a better fit with the types of projects conducted by Maintenance/Operations. A change to the contracting restriction limits would be helpful – currently the $25,000 limit creates cumbersome processes and a disincentive to do more involved maintenance work. The dollar limitations on maintenance contracting and purchasing authority sometimes result in simple work having to utilize a project manager and be administered as a typical Mn/DOT construction project.

### C.4.20 REGIONAL TRANSPORTATION MANAGEMENT CENTER (RTMC) AND INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

The Regional Transportation Management Center (RTMC) is fully integrated into the project scoping process, so it is involved in projects from the beginning. Staff create incident management plans and do most design work in-house. Sometimes they need to be proactive about getting information about projects, but they attend meetings where there is a lot of information sharing during the design process.

Intelligent Transportation Systems (ITS) functions are also on the scoping form, and their work is closely coordinated with the project manager. They sometimes serve as project managers for specific projects where they identify needs and develop the system.

Many RTMC and ITS staff have taken the Essential Skills Project Manager training and found it helpful, though they'd like to have training on contracting. They are measured on

keeping projects on schedule and on budget; they work off of project dates as entered in PPMS.

Ownership of projects resides in the district offices. The project managers make decisions on projects but if there is conflict, then it goes to the assistant district engineer. Project managers are assigned based on experience level. The more complex projects are assigned to more experienced staff.

*NOTE: THE FOLLOWING INTERVIEWS WERE CONDUCTED AFTER THE PROJECT MANAGEMENT PEER REVIEW.*

## C.4.21 INFORMATION TECHNOLOGY (IT)

Similar to a traditional construction project, IT office projects go through multiple phases. In this case, the phases are: Project Scoping, Initiation, and Execution.

- **Project Scoping** – this is done by an "Information Architect" to build the case for the project, assess alternatives, estimate costs and ROI.

- **Initiation** – Assign the PM, develop a project plan, reassess the cost estimate and ROI, go to division director with Go/No-Go decision.

- **Execution** – Do the project, conduct quarterly reviews with Director and project champion (e.g. DE or office director). Monthly status reports are done that go to the whole IT team.

Each project has performance measures for budget, scope, schedule and overall health of project; uses a green, yellow, red scale of display. The PM is responsible for schedule and budget, the Architect is responsible for QA and design; each has a different supervisor and clearly defined goals.

PMBOK guidance is used for all projects. Tools used by PMs include Microsoft Project/Portfolio and Innotas. These are considered superior to and more state of the art compared to PPMS.

Best Practices considered by IT include: use of PMBOK, sharing of practices with sister agencies (i.e. other State agency IT departments); training; use of templates and an emphasis on process. Projects $50k+ will have a customized PMP.

Mn/DOT IT recognized for excellence through a state audit of practices.

Challenges identified: salaries are not competitive with market, difficult to schedule/juggle the workload

## C.4.22 OFFICE OF TECH SUPPORT

Geometrics and plan review serves as the statewide stewards for design, all design exceptions must go through central office. Consultant services is in charge of managing the funds and acts as liaison for outside services; Districts will handle their own contracting when the expertise is there to do it, otherwise central office will help. Also manages the pre-qualification program.

Geometrics version of review and approval tends toward educated spot checking, assessment of engineering merit. No geographic orientation of staff, a very collaborative effort to complete reviews, though each layout is assigned a "lead reviewer."

There is no set process for conflict resolution, often an exchange of memos will resolve most conflicts before escalation to more personal meetings and ultimately elevation to state engineer. Timeframe is highly variable, depending on urgency.

Consultants may be reporting to different project managers than the overall project manager (e.g. cultural resources investigation as one part of a larger project). District administrators can be "certified" to provide greater autonomy in their work toward consultant contracting.

Good PMs will be proactive and provide complete documentation. A best practice is for PMs to be more aware of proper procedures and timeframes – with that, a lot of issues go away. Retention of PMs is a challenge, they have a lot to balance; turnover has resulted in too many grad and senior engineers as PMs.

Review of consultant performance is done at end of project. Problems are often related to communications issues (e.g. different project expectations).

### C.4.23 OFFICE OF INVESTMENT MANAGEMENT (OIM)

How do you do business?

See flow chart for 20-year, 10-year, and 4-year programs, these are developed by OIM with input from Districts. OIM manages the overall program budget. Districts provide annual updates to the 10-year and 4-year plans, based on own work and work with stakeholders.

OIM observation that there appears to be a disconnect between State program (and measures) and the planning efforts, or resultant projects. The scoping process states that each project should tie to the statewide performance goals. Project cannot go into the STIP without scoping document.

OIM gives guidance only to district planners. Some districts have a good alignment between their program and the state plan. OIM tries to juggle the different pots of money that feed into projects (not a PM responsibility to understand the various "colors" of project money).

PPMS is not considered valuable as a program review tool for OIM, it does not reconcile cost changes with other systems. Three program reviews are done annually. March for draft STIP, September for STIP review, December on more review.

OIM does not use PMs on its products (e.g. 20-year plan is a collaborative effort that is understood by all to have a specific deadline.)

### C.4.24 FREIGHT, RAIL AND WATERWAYS

The office is divided into several sections:

- Freight Planning & Development
- Railroad Administration (Rail Engineering)
    - grade crossing and safety projects
    - Trunk Highway projects with rail involvement

- Rail Program and Planning
    - MN Rail Service Improvement Program
- Waterways
    - Port Development Program

Several positions within the office are noted as being project managers; in some cases, these positions have responsibilities for managing both programs and projects.

This summary mainly covers programs within the Railroad Administration section (grade crossing and safety projects, and trunk highway projects with rail involvement). Rail project managers work with the districts, covering a geographic area of the state. They become involved in the scoping phase of highway projects when a rail line will be impacted by a trunk highway project. District project managers generally know the Mn/DOT rail staff, and contact them when an issue arises that involves the rail office.

Rail issues can often be a critical path item in highway project development. If the rail office is unable to complete their process, the project cannot move forward. The highway department relies on the railroads to meet their deadlines.

Turnover in District project managers can play a role in familiarity (or lack thereof) with the tools and resources available to project managers. There is a flowchart detailing the process for assisting district personnel.

To manage their own projects, Office of Freight, Rail, and Waterways staff use a database that includes information on financials; creation/execution of agreements; construction activities; final inspection; audit tracking and closeout; flagging; temporary easements; etc. Staff does not use PPMS to track their projects. Several staff does use Task Status Manager to update the activities that are assigned to their office. The office sometimes relies on PPMS to inform them about when they're involvement may be needed in a project. For example, grade crossing projects are included in PPMS, so Office staff relies on PPMS to identify projects requiring their involvement. However, if the correct code (Activity Code 1291) is not used in PPMS by the project's PM in the District, Office staff would not necessarily know that their involvement is required. Some ARRA projects are tracked through PPMS. PPMS does not identify the element costs and the project-related activities.

Several Office employees have participated in one or two of the project management courses but found that the curriculum is not very applicable to their positions because it generally addresses management of highway projects.

As the staff examines the possibility of taking on more multi-modal projects, there will be a need for additional formalized coordination with further assistance from the districts and their office to address environmental components and federal requirements.

The nature of ARRA has heightened the awareness of inspection because it is thought that FHWA will more frequently review projects. Because the Office of Freight, Rail and Waterways works a lot with land management staff, it would be helpful to have additional rail expertise in the Office of Land Management. Additional assistance from the districts would also be helpful.

Flagging is often a high profile issue that ties back to risk management, roles and responsibilities, authority, accountability. Districts need to provide the necessary oversight to track proper hours and costs; this requires additional coordination.

Railroad agreements with large owners are often challenging. Language from project to project can change, and the review process is lengthy. Agreements with short lines are often much easier. Some railroads request compensation to review plans. Due to the high potential for challenges, the railroad office must be involved in the process very early in the project.  It is important to ensure that any projects requiring railroad agreements have appropriate time factored into letting dates. Due to the nature of working with the railroads, the office has over time developed good negotiating skills with that stakeholder group. The office also understands that solutions are often based in compromise. Mn/DOT cannot draw a line in the sand and expect the result the agency wants.

The Freight and Railways office occasionally hires cities and counties to put together bid packages. Sometimes the counties will then hire the Mn/DOT district staff to help them. This reinforces the need for good coordination with the Districts and city/county staff.

## C.4.25 AERONAUTICS

The Office of Aeronautics oversees planning, design and construction of airport improvement projects. There are 135 public airports that receive state funding, and 97 of them are eligible to receive federal funding. (Mn/DOT does not typically own any airports with the exception being a joint agreement with Manitoba for the Piney-Pinecreek Border Airport). The amount of federal funding is approximately seven times more than the annual state funding program. Close coordination with the Federal Aviation Administration (FAA) is required. Types of projects include maintenance, new construction, equipment grants and navigational aids, etc. In an average year, the office typically sees 75 federal projects and 150 state projects. This year, they also saw 12 ARRA grants. Every year, the office also administers 135 grants for maintenance and operations. The annual state budget for these programs is $20 - $25 million.

There are four regional airport engineers and three assistant regional airport engineers that oversee projects and activities throughout the state. These engineers act as consultant managers and funding managers. Regional engineers are principal engineers, and assistant regional engineers are typically senior engineers or senior engineering specialists. The aeronautics office also includes a planning function that oversees environmental compliance and airport safety zoning, and manages the state aviation system plan updates, which informs the state policy plan.

The Office of Aeronautics sometimes hires consultants to help manage specialty projects and perform studies. The majority of project-level airport engineering is performed by consultants, which airport owners hire to manage improvement projects and planning—similar to a city hiring a consultant firm to act as a City Engineer. The Navigational Aids group, which consists of two principal engineers and a radio technician, also hires contractors directly and manages mostly professional/technical contracts.

At any given time, regional engineers have around 150 open projects to manage. For these projects they prepare all the grants and manage payments. Project managers use

spreadsheets that include milestone deadlines to track pre-construction projects, and they also have a database to track payments.

For federal projects, the engineers have a very active role as liaison project managers between the FAA and the airports. For state projects, the engineers have direct control, making the process somewhat simpler to manage. Their overall process for planning and delivery is typically an annual process that is very cyclical.

Turnover within their office has been about 90 percent over the past ten years. Typical training for new staff happens through several means: reference to manuals, working in teams (two people per region), and through relaying history. They acknowledge that consistency can be an issue, but new staff usually learns over time how much discretion they have. Formalized training is offered through the FAA, and there is a course that is a pre-requisite for Mn/DOT staff. Several engineers have taken the Mn/DOT Essential Skills course for project managers.

The Office of Aeronautics does maintain relationships with several groups, including the Minnesota Council of Airports, whom they meet with on a monthly basis. This group does have a political voice and also hosts an annual airports conference. The Office of Aeronautics also trains consultants and actively performs outreach. They are also involved and work closely with AirTAP, the University of Minnesota's Airport Technical Assistance Program.

There is occasionally a need for Aeronautics to work with other Mn/DOT offices, most often involving highway or LRT impacts on runway approaches. From the engineering side of Aeronautics, one aspect that could use improvement is the management of consultants, including managing costs and helping cities in managing consultant costs as well as more accurate project estimates.

### C.4.26 CIVIL RIGHTS

Roles of staff within the Office of Civil Rights are described below:

*Disadvantaged Business Enterprise (DBE) Specialist*
- Set goals on federally funded projects based on scope of work, location, engineer's estimate and availability of DBEs. Following the letting, specialists review "Good Faith Efforts" submitted by the low bidder prior to award of contract. Work with the prime contractors to achieve highest DBE participation on contracts. Once "Good Faith Efforts" are cleared, the Project manager/engineer as well as the prime contractors are informed with a letter.

- Review DBE applications, conduct onsite inspections and present findings to the Uniform Certification Program for MAC, Metropolitan Council and Mn/DOT to vote on certification of DBE's. Once certified, the DBEs submit "No Change Affidavits" each year to report changes. Every five years, a recertification application is required as well as a new onsite review.

- Follow federal regulations CFR 49, Part 26, to ensure Mn/DOT's DBE program including certification and good faith efforts are in accordance.

- Work with community organizations, companies, DBEs, counties, and other state agencies to promote our DBE program.

*Team Lead for Contract Compliance*
- External Civil Rights programs
  - Monitor employment for all projects (state and federal)
  - Develop/administer the On-the-Job Training Program (OJT) federal program; also set goals, monitor, and enforce the program
    - o Write grants to FWHA for training or other assistance (e.g., recruitment) with the intent of bringing women and minorities into entry-level positions.
    - o When grand funding is obtained, write RFPs to spend the grant dollars
  - Coordinate Title 6; assure programs are administered without discrimination
    - Ensure Mn/DOT is conducting all activities fairly and equitably
    - Send out forms to all Mn/DOT managers highlighting areas where Title 6 could be an issue, such as right of way acquisition, public involvement, hearings, meetings, and limited English proficiency
    - Ensure Mn/DOT responds to all Title 6 complaints to ensure processes are fair and detail new initiatives; summarize and report outcomes to the FHWA
  - Conduct compliance reviews on behalf of FHWA, including:
    - o On projects (onsite)
    - o Interview EEO office
    - o Talk to foreman or superintendent
    - o Interview employees (especially women and minorities)
- Complete required FHWA annual reports, including reports on all active projects; Title 7, which reviews external civil rights programs and activities; and reports that correspond with compliance reviews. Districts are often enlisted to help supply information for these reporting efforts.

*Business Development and Assistance Program Team Lead*
This is a new program and is still being implemented. There are more than 450 DBEs, but only 80-90 have ever bid on projects and contractors have difficulty finding DBEs. Due to misconceptions about the DBE program, several activities have been initiated as part of this new program, including:

- An orientation program to help newly certified firms access resources within the Civil Rights office; following orientation, a business assessment and business development plan are created
- The Transit office also has a representative to monitor large transit projects for DBEs
- They are also working to identify firms that are new to bidding and any barriers they may encounter
- Re-establish the Working Capital Fund program, which:
  - Offers short-term loans to DBEs to help meet their payroll and to get supplies and
  - Helps to prevent primes contractors from disqualifying DBEs
- Run the Working Equipment Fund which provides loans for purchasing/leasing equipment

*Project Management Factors in the Office of Civil Rights*

*Work with Partners*—The Civil Rights office works with Southwest Community College to provide general business training and is offered to the whole DBE community. Another effort through Selby Community Involvement provides support in identifying financial assistance to resolve situations where a prime may disqualify a DBE. Selby Community Involvement also works to ensure that equipment (e.g., trucks) is up to date with inspections, etc.

The office coordinates with Southwest Community College and Selby Community Involvement to create business development plans. Federal regulations say that all DBE's must have a Mn/DOT approved plan within six months of certification. This coordinated effort helps to develop this plan and identify needs to meet the plan.

*Mentor/Protégé Program*—This program exposes smaller firms—many in Greater Minnesota—to opportunities for being part of a project. This program utilizes a prime contractor to provide on-the-job training for business. Also, as part of the assistance program, the civil rights office helps get DBEs enrolled in bidding and estimating classes and offers assistance to help the DBEs sharpen their bids.

*Limited Resources*—Like many offices, the Civil Rights office is tight on resources. They have many partners, including other state and federal governments, internal Mn/DOT staff, contractors and unions, the legislature, the community at large, the DBE community, and the FHWA. What these partners all have in common, at a minimum, is a common due diligence to comply with the law, but it goes far beyond that. Relationship-building and trust are key.

*Available Tools for PMs*—The tools and resources that Civil Rights uses to manage projects are:

- FHWA as a resource
- Top management support – it's critical
- Web resources
- Help and support of other Mn/DOT offices
- BizTrack – a software program that tracks basic contract information like goals, DBE participation, etc. The software includes all vendors.
- Workforce Information Tracking Initiative (WITI) – Employment information
- CRLMS – software; a web transport system will replace this and the MAPS replacement will be looked at as well.
- Capital funding system – close to getting this up and running
- Various tools for the RFP process
- Communication

*Training*—Below are some training opportunities available to staff within the Civil Rights office: -

- Contract administration training through Department of Admin.
- Civil Rights staff must be trained by other experts in the field (e.g., FHWA)
- American Contract Compliance Organization (ACCO) training is available to 2-3 people in the office each year
- Contacts in other states

- NTI, NHI training resources
- Mn/DOT project management training, however, there typically is not time to take this training. Also, because the curriculum is geared to highway project managers, the training isn't viewed as applicable to civil rights personnel.
- Risk Management Training—While viewed as useful, it was felt that you need to understand the program first before you can identify risks.
- Conflict management/negotiation training – several in the office have had this training either through ACCO or through the state

*Authority/Accountability*—Staff were asked whether they feel they have the authority and if there are clear lines of authority and decision-making. Staff responded that it depends upon the issue and decisions that need to be made, they generally feel they have the necessary authority. They also recognize when decisions need to be elevated and when to divest themselves of authority to let others be involved decision-making. All recognize that Mn/DOT's main function is to build transportation projects on time and on budget; they understand their roles and responsibilities. However, staff feels that their office is perceived as a necessary evil by the transportation project managers, which sometimes results in isolation. The following tools and resources were described by the Office of Civil Rights as needed to get beyond isolation within Mn/DOT:

- The Office Director's role is intended to ensure broad integration
- District/Office champions—An example of a district project manager who spoke on behalf of Civil Rights was given; this person understands the value and importance of getting Civil Rights involved in the process early.
- Circulating grad engineers through the Civil Rights office—This used to occur but currently does not.
- Direct access between the DBE liaison officer (the Office Director) and the Commissioner, per regulations.
- Trust and credibility within the office and between Director and the Commissioner is critical.

## C.4.27 RESEARCH SERVICES

The Research Services office is arranged similar to how traditional highway project development is structured. The office has a process that outlines Planning, Scoping, Execution and Implementation. Their annual budget includes $2.7 million in State Planning and Research funds for projects; $2.4 million from the Local Road Research Board (LRRB); and $3.4 million from Mn/DOT. The office mainly works with universities, consultants, and other internal Mn/DOT staff.

Projects are tracked by using an Oracle database. The office is attempting to: improve how it engages Mn/DOT staff to participate in research-related projects; and how feedback is provided from the end-user through the design/development of the office's processes.

Research Services has many partners and stakeholders including: the FHWA; the state; LRRB; cities and counties; Mn/DOT in general, especially from functional groups; and Mn/DOT's PCMG, CMG, MBMT groups. The challenge is to get the partners in the same room to collaborate and allow people to be innovative. Other partners include the

Maplewood lab, Minnesota universities and national universities, other state DOT's, other state agencies, the private sector, and industry.

Road Map Managers have had some level of project management training, including the Essential Skills for Project Managers course. Other training has included conflict management through the Systematic Development of Informed Consent (SDIC) course. The Administrative Liaisons have mostly on-the-job training with an estimated two-year learning curve. More facilitation training is viewed as essential for Research Services staff, given their natural role as facilitators. Other "soft skill" training such as communications, listening, and additional conflict management training is needed. Project Management training for Administrative Liaisons would also be helpful.

Project managers (Road Map Managers and Administrative Liaisons) generally understand their responsibility and what they are accountable for. They are generally given a good amount of authority to manage their programs and projects.

The office has developed a universal lifecycle process ("**Universal LifeCycle**") and flowchart for the development and delivery of projects (**see next two pages**). The purpose of the universal lifecycle process was to develop solutions that look down the road to implementation and value-added. It has helped to define duties. External to the office, research services can act as a broker or facilitator early on to facilitate discussions between Mn/DOT offices by acting in a supportive role rather than driving the agenda.

Specific positions and roles are identified for each phase of the universal lifecycle process. For instance, Roadmap Managers manage the process from the early phases of Idea, Discovery, Scope, and Contract up to the Execute phase. At the Execute phase, Administrative Liaisons take over and wear two hats—Project Manager and Contract Administrator to carry the process through Execute, Deploy, and Close. The transition between the Roadmap Managers and the Administrative Liaisons is designed to happen during the Scope phase; the Research Management Engineer oversees the entire process.

During the Scope phase, the Roadmap Manager and the Administrative Liaison work together and develop a precise project scope. Scoping is a critical piece of the process, during which both a Manager Lead and a Technical Lead are defined. The Technical Lead is usually in the Mn/DOT district or office that is supporting the project. The Manager Lead is usually the Technical Lead's manager; however, depending on project or product complexity, the Manager Lead could be a different person, including someone higher in the management chain. Sometimes it can be difficult to keep the Technical Lead engaged in projects since they have many other duties and responsibilities to their own offices.

To supplement the lifecycle process, a Business Flow Model is being developed, which will define tasks for each of the boxes on the flowchart. A version of a Team Charter also exists in the early Idea and Discovery phase in the form of a "Needs Statement".

Cross-functional projects or projects that rely on other partners (e.g., a university, consultants, and industry) require more coordination. Sometimes CTS is utilized to oversee the university professors to ensure that contract requirements are being met. This involvement relies on the partnership that exists between Mn/DOT and CTS since CTS is

# Universal LifeCycle

**Strategy**

**Roadmaps**

| IDEA | DISCOVERY | SCOPE | CONTRACT | EXECUTE | DEPLOY | CLOSE |
|------|-----------|-------|----------|---------|--------|-------|

We have an idea?

What is the high level cost?

When can the organization get started?

What are our options?

What are we doing?

Can we do it?

How are we doing it?

We Are Doing It!

Transfer It!

How did it go?

PRODUCTS →

PROJECTS →

CONTRACTS →

▲ Phase Gate Reviews

# Who Does What by When

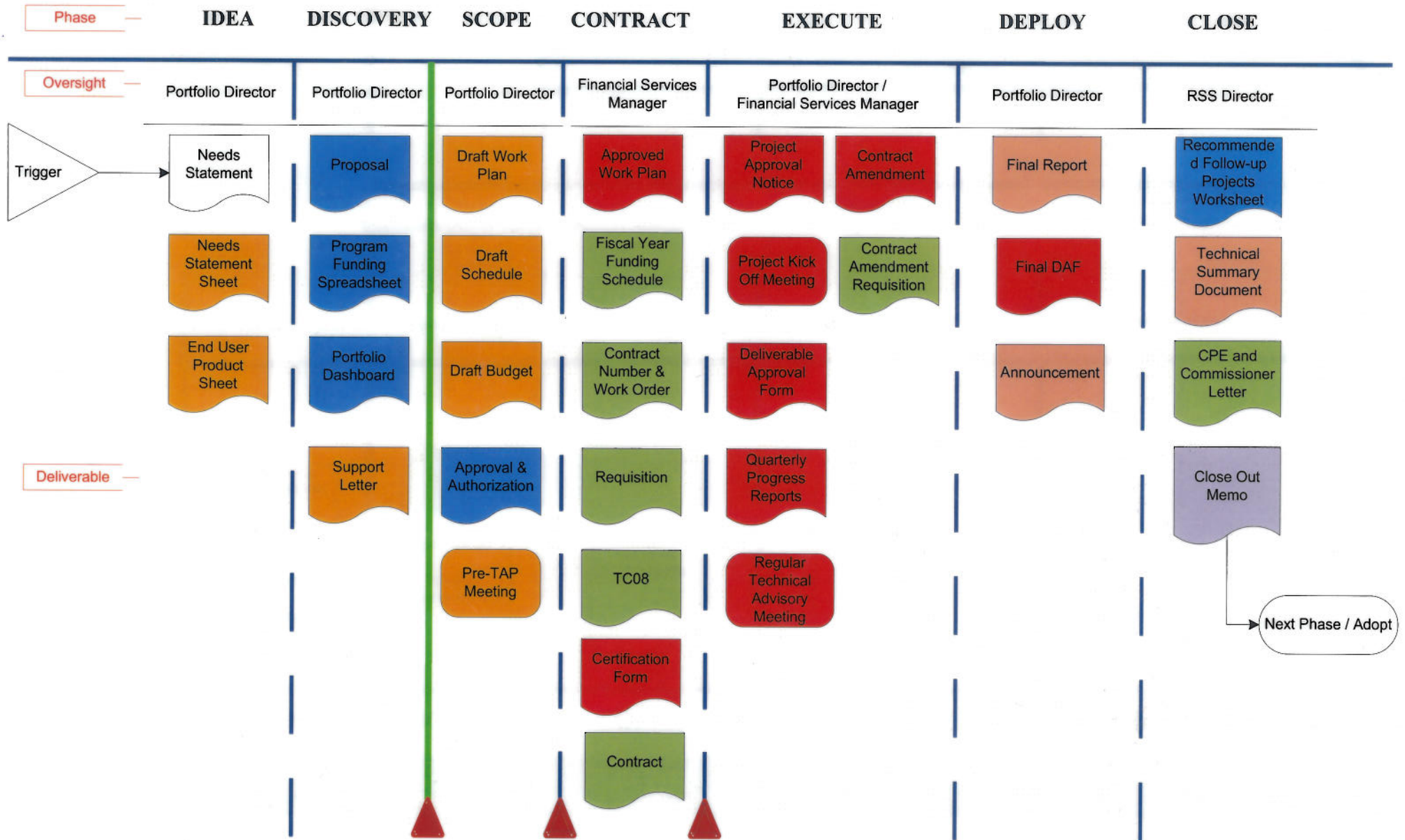| | IDEA | DISCOVERY | SCOPE | CONTRACT | EXECUTE | DEPLOY | CLOSE |
|---|---|---|---|---|---|---|---|
| **Phase** | IDEA | DISCOVERY | SCOPE | CONTRACT | EXECUTE | DEPLOY | CLOSE |
| **Oversight** | Portfolio Director | Portfolio Director | Portfolio Director | Financial Services Manager | Portfolio Director / Financial Services Manager | Portfolio Director | RSS Director |
| **Deliverable** | Needs Statement | Proposal | Draft Work Plan | Approved Work Plan | Project Approval Notice | Contract Amendment | Final Report | Recommended Follow-up Projects Worksheet |
| | Needs Statement Sheet | Program Funding Spreadsheet | Draft Schedule | Fiscal Year Funding Schedule | Project Kick Off Meeting | Contract Amendment Requisition | Final DAF | Technical Summary Document |
| | End User Product Sheet | Portfolio Dashboard | Draft Budget | Contract Number & Work Order | Deliverable Approval Form | | Announcement | CPE and Commissioner Letter |
| | | Support Letter | Approval & Authorization | Requisition | Quarterly Progress Reports | | | Close Out Memo |
| | | | Pre-TAP Meeting | TC08 | Regular Technical Advisory Meeting | | | |
| | | | | Certification Form | | | | |
| | | | | Contract | | | | |

Trigger → Needs Statement

Next Phase / Adopt

## LEGEND

▲ Phase Gate Reviews

WHO DOES WHAT →

- Financial Services Manager
- Road Map Manager
- Portfolio Director
- Business
- AL
- RSS Publishing Coordinator
- RSS Director

often not on the contract to perform this role. This is beneficial as a management tool, but sometimes not a very clear process.

Contracts with the University of Minnesota include a resolution process where anyone involved with the project can raise an issue through an escalation process. CTS also offers facilitation assistance; however, this arrangement does not exist with other universities. Professors often need assistance with project management. They sometimes hire contractors to perform this function, which can add another layer of challenge to contract management. Research Services is looking at some efficiencies for this practice. More competition may help to resolve this issue.

In general, Research Services uses consultants quite a bit, especially in the Deploy and Close phases. Project management of consultants was discussed. It was noted that the ability to develop incentives and motivators is beneficial in being able to manage consultants.

Several factors are viewed as successes and best practices. Engaging the right people is important to getting the best outcome. The universal lifecycle process flowchart is also viewed as a good tool for identifying and assigning roles and responsibility at various points in the process and in ensuring good transitions between phases. Due to requests for information and documentation of funding, they have a better understanding and accountability for funding. Finally, performance measures have been a good tool for better understanding of direction.

## C.4.28 TRANSIT

The Office of Transit resides under the Modal Planning part of the Mn/DOT organization. The Office of Transit is primarily responsible for the proper use of funding—typically granting funds to other agencies and thus helping to develop projects through the right staff, other resources, and properly managed efforts. Transit projects in MN are typically delivered by other agencies—the grantees. The breakdown is generally that 60% of the funding is managed by the Transit Office in St. Paul and 40% is for districts—Metro and the Greater MN projects. Most project managers are classified as Grant Specialists, Senior; also, most transit PMs are not engineers, which has met some organizational resistance.

Each Greater MN district has one transit-oriented PM, for a total of seven. The typical projects for these districts are relatively focused—equipment procurement, building projects, and transit system operations. Central Office and Metro have more staff and their PMs are more properly called program coordinators/managers (or business managers), with many grants for them to manage and some very large projects. Typically the grantee, not Mn/DOT, owns the project delivery issues—for example, the Metropolitan Council and Metro Transit in the Metro District.

Cooperative agreements, which are required by FTA, are used to define roles in program/project delivery. FTA looks at technical capacity and capability. Therefore, the staff members assigned to the Office of Transit have good track records in preparing PMPs—other plans as well, such as construction management plans. Mn/DOT's transit PMs also uses a "Contact Strategy Process" in the very early stages of project definition to strategize on funding and project delivery issues with the potential grantee (this is a good example of linkage to project management objectives now promoted by the Office of Project

Scoping and Cost Management). FTA management plans are also often used to define the overall program plan—led by the Program Coordinator. The staff sees value in these project planning efforts in that they force the PM and team to think ahead, define roles and responsibilities, etc. The project types in transit typically are classified as follows: capital projects, operations programs, and vehicle/equipment purchases.

The Office of Transit meets monthly to review project status/performance issues. This practice is used to identify current project issues, manage change, and to refine or update project management organizations and plans. In many cases, Mn/DOT's functional specialists are assigned roles to help in project delivery—the Office of Environmental Services is an important example.