White Paper:
Project Management Peer Review

Prepared for:

Minnesota Department of Transportation

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I. INTRODUCTION AND VISION

The Minnesota Department of Transportation (Mn/DOT) recently formed and mobilized a Working Group to deliver a 2009 Peer Review on project management best practices. The Working Group developed and issued this White Paper to provide context and background ahead of a workshop involving Mn/DOT staff and U.S. transportation industry peers, scheduled for sessions in Minnesota from October 5 to 8, 2009. Section I of this White Paper provides an introduction to the Peer Review, including Mn/DOT's vision/objectives and other introductory information.

A. Mn/DOT's Strategic Vision and Peer Review Objectives

Mn/DOT created the Office of Project Scoping and Cost Management in 2008, in part to address an organizational priority on estimating, managing, and controlling costs, which in turn supports Mn/DOT's Strategic Vision to be a "global leader in transportation." Project management has been recognized as a critical connection between the values identified in the Strategic Vision (provided below in its entirety) and implementation of its related commitments, especially given the current economic challenges faced by the agency and its partners. Project management is a tool that can help efficiently manage the risks and constraints to delivering projects on time, on budget, and within the committed scope.

Mn/DOT's Office of Project Scoping and Cost Management is leading the current project management Peer Review with the following objectives in mind:

> ***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.*
>
> *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.*

The Peer Review is an initial step in a Mn/DOT change management process. The Peer Review will identify project management best practices within the industry and within Mn/DOT; it will also identify areas for improvement in the implementation of project management practices to ensure the success of project managers. The Peer Review will conclude with findings and recommended next steps, including input toward an implementation plan to advance and increase the use of project management best practices across the organization. The implementation plan will also outline proposed initiatives to further evaluate, and possibly implement, Mn/DOT organizational changes and improvements.

B. Purpose and Organization of this White Paper

This White Paper serves as an introduction to the Peer Review and the issues that have led to it, while capturing trends in the industry as described in recent national transportation publications on project management. The audience for this White Paper includes the Peer Review Steering Committee, composed of Mn/DOT's top managers, and all other participants scheduled for the October 2009 Peer Review Workshop—internal Mn/DOT staff and representatives of other states' transportation organizations and consultants. After the workshop, proceedings and findings will be provided in a final report, which will focus on project management best practices, gaps within Mn/DOT, and potential opportunities for improvement.

The types of changes necessary to achieve the goal of a "project management organization" must be made over an extended period of time. This White Paper is a first step and baseline reporting for what will later become an implementation plan in a shift toward a strengthened project management culture at Mn/DOT.

II. PROJECT MANAGEMENT FOR TRANSPORTATION PROJECTS

This section establishes understandings of projects and project management in the transportation industry, references decision-making issues and important trends, and outlines Mn/DOT's project management organization and practices. Several references and links are provided to expand on the concise information that is provided.

A. Basic Definitions and Industry Trends

Projects and Project Management

The Project Management Institute (PMI)[1] is the leading membership association for the project management profession—a not-for-profit organization that champions project management knowledge and skills. The PMI is known—mostly in private industry—for offering professional certifications or credentials (for example, the Project Management Professional credential, or PMP). According to the PMI:

- ***A project*** *is a temporary endeavor undertaken to create a unique product or service.*
- ***Project management*** *is a methodical approach to planning and guiding project processes from start to finish.*

These PMI definitions provide a reasonable starting point, recognizing that much more must be said about project management and its practice. The PMI, for example, provides an extensive amount of project management documentation in the *Project Management Body of Knowledge* (PMBOK). Experienced project mangers know that as project management definitions are expanded, familiar parameters enter into the discussion, essentially revolving around objectives, processes, and resources—time, progress, money, and people:

- What is the objective; how do we define or envision the completed work?

[1] http://www.pmi.org

- When must the work be completed; what is the overall schedule and what phases or progress milestones are anticipated?
- What will the project cost; what budget amounts are considered reasonable?
- Who should manage and deliver the project; what range skills are needed in the project staff or in the various functions of the team?

With these parameters in mind, and considering that project delivery requires management of risks, we should review several more in-depth definitions:

A project:

- Is [a number of] tasks, done by people, within certain time frames.[2]
- Is a defined set of activities—having specific start and completion dates—undertaken to bring about beneficial change.[3]
- Is a novel undertaking or systematic process to create a new product or service the delivery of which signals completion. Projects involve risk and are typically constrained by limited resources.[4]

Project management:

- According to PMI and its PMBOK, involves many processes organized into five groups: initiation, planning, executing, controlling, and closing.
- Includes: (1) chartering, building and sustaining the team; (2) developing the project work plan; (3) endorsing the project; (4) executing work and managing change; and (5) closing the project.[5]
- Is the art and science of managing a project from inception to closure as evidenced by successful product delivery and transfer.[6]
- Is the art and science of guiding all of the stakeholders through a series of changes that we call a "project."[7]
- Is an approach used to manage work within constraints of time, cost and performance targets.[8]

The project manager (PM):[9]

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2 http://manager-tools.com/2009/01/horstmans-law-project-management-part-1

3 http://www.aidworkers.net/?q=advice/project_management

4 From: http://www.maxwideman.com/pmglossary/index.htm (see the link for further source information)

5 CH2M HILL, 2000 (3rd Edition), *Project Delivery: A System and Process for Benchmark Performance*

6 From: http://www.maxwideman.com/pmglossary/index.htm (see the link for further source information)

7 NCHRP, 2009, Web-Only Document 137: Guidance for Transportation Project Management – available for download: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_w137.pdf (see the document's Chapter 2, page 6, for specific source information; see also Section III.A of this White Paper, below)

8 From: http://www.maxwideman.com/pmglossary/index.htm (see the link for further source information)

9 ibid

- 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.
- Is a non-technical role to take day-to-day responsibility for management of the project throughout all its phases.

Finally, project management definitions often include reference to deliverables, which are products, services, or results. A deliverable can be either an end item in itself or a component item, supporting an overall work plan or project delivery program. Effective project management demands uniqueness in deliverables. For example, many thousands of office buildings have been developed, but each building is unique—different owner, different design, different location, different contractors, etc. The presence of repetitive or similar design elements does not change the fundamental uniqueness of the project work and the project management effort required for delivery.[10]

Project Decisions, Stakeholders, Organizational Issues, and Managing Risks

In many project-oriented organizations, as in Mn/DOT, the motivations for improved project management are often to identify and manage risks and to apply the right resources to ensure cost-effective delivery. Based on the discussion above of what is involved in a project and project management, several factors will influence a project's outcome. Factors such as external stakeholder involvement and changes in scope, schedule, or budget can create additional complexities for project managers.

Mn/DOT recognizes that efforts must be placed on approaches to develop and apply better information which in turn will improve project/program decision-making and outcomes. As previously noted, Mn/DOT's Office of Project Scoping and Cost Management is part of an initiative to improve public trust and confidence. The Cost Estimating/Cost Management and scoping initiatives from this Office have provided new tools for Mn/DOT project managers to address project complexities. Other tools made available by Mn/DOT for its project managers include:

- Hear Every Voice – The Mn/DOT source for guidance, policies, tools, training, and resources related to its public involvement process.
- Context Sensitive Solutions (CSS) – An approach to integrating stakeholder input into a structured decision-making process.
- Risk Management – To aid in decision making, Mn/DOT has developed a team to assist project managers in identifying and planning for risk on a project, including meeting facilitation, workshops, and risk management plans.

Additional tools made available to Mn/DOT staff have included a process for Systematic Development of Informed Consent (SDIC) and currently in progress is a conflict management initiative to further support these programs. A complete discussion of CSS or similar stakeholder-based decision-making models is far beyond the scope of this White

[10] This paragraph explaining deliverables is paraphrased from http://www.e-projectcoach.com.

Paper. However, the basic point warrants emphasis: ***Effective project management often requires working closely with stakeholders and this is often what makes transportation project development nuanced and complex.***

Risk Assessment and Management

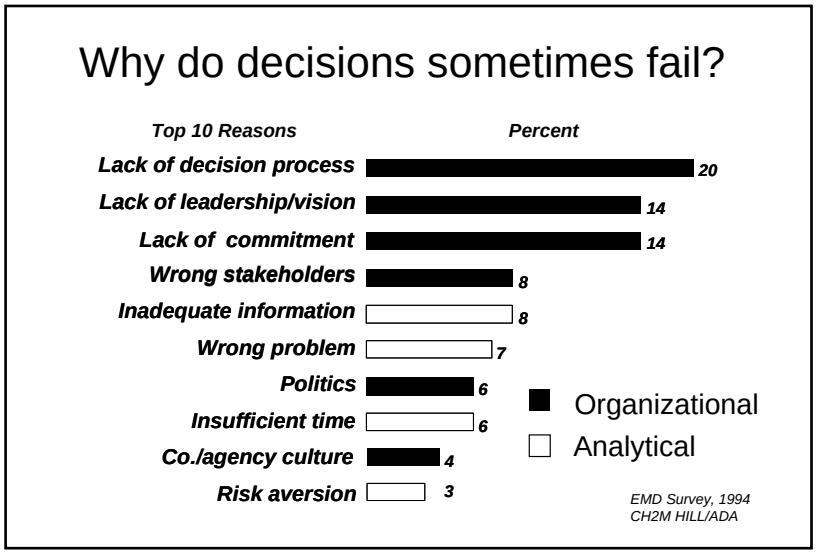
Advanced identification and management of risks are necessary components for effective project management. Some useful definitions related to risk are as follows:[11]

- **Risk Identification:** The process of systematically identifying all possible risk events which may impact on a project. They may be conveniently classified according to their cause or source, and ranked roughly according to their level of risk or ability to manage effective responses.
- **Risk Assessment:** The process of identifying potential risks, quantifying their likelihood of occurrence and assessing their likely impact on the project.
- **Risk Management:** An organized assessment and control of project risks.

A CSS-based project delivery process may include important linkages to risk management, in part because of the openness of CSS to flexibility in design. Project cost estimating should typically also address risks in a manner that is context-sensitive and increasingly subject to alternative, independent expert, cost opinions as the engineering design progresses to higher levels and as alternatives are screened out.

When project managers and their teams keep risk management principles in mind and in the work process, priorities are better understood and managed and problems are more likely to be avoided. Today, all credible project management/delivery systems recognize this and will instill project managers in the importance of risk management, change management, and quality management.

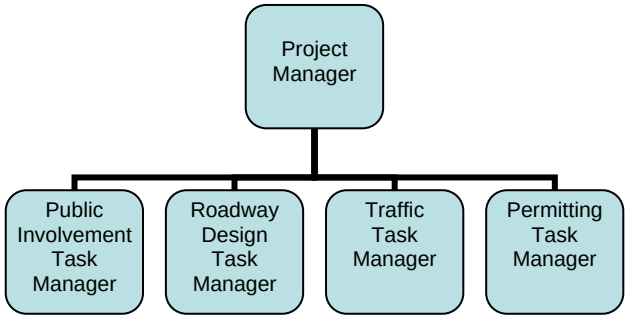
Research completed in the 1990s asked infrastructure professionals about success and failure with major project decisions. Contrary to the conventional wisdom of many engineers and other technical professionals, the research found that more information or data (or more technical analyses) were often less important toward building sound decisions than were efforts to address organizational and communications issues.



At the project level, organizational issues often arise through a lack of defined roles and responsibilities. Task management as a sub-set of project management is a technique that offers a

[11] From: http://www.maxwideman.com/pmglossary/index.htm (see the link for further source information)

solution to that problem. While especially necessary on large or complex projects, the process of identifying project roles and placing them into a project organization chart (example provided below) can be beneficial to any project. In particular, the use of task managers helps control issues related to accountability and project ownership, which directly relate to some of the reasons decisions fail, as shown above.



B. Mn/DOT's Project Management Practice

Project management in Mn/DOT has been historically recognized as a complex topic that is continually subject to changing forces. In 1993, Mn/DOT completed a similar effort to the ongoing effort titled "New Directions for Project Management at Mn/DOT." At that time, issues related to the National Environmental Policy Act (NEPA) and the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), along with a related increase in the types of functional specialty areas (e.g. hazardous materials and archaeology) drove a need to re-examine the role of a project manager.

Today, the specifics may have changed, but the basic issues that have created a renewed focus on project management are similar. Effective management is necessary for efficient implementation of an increasingly large and complex transportation improvement program. Activities and resources from many functional areas must work together to assure projects are completed efficiently. Also many outside agencies, consultants, and the general public must be involved; and, as resources are often stretched, good project management becomes more critical to effective program delivery.

Project Manager Role and Training/Development

A Mn/DOT project manager (PM) begins with a clear understanding of the project needs and objectives. Once assigned to the task, the PM will create a project schedule, becoming responsible for managing project team interactions and communications. As the project progresses, the PM will also monitor project budget and resources. Specific details of how these functions are carried out will vary from District to District (see below for more on Mn/DOT organization) and between project phases. Typically, one of the key project handoff points occurs at project letting for construction. At this transition, the "pre-construction" staff hand off project duties and responsibilities to the "construction" staff.

The PM must apply project development processes using available resources, meet acceptable standards, and establish and meet schedules. The Mn/DOT Office of Technical

Support offers extensive project management training programs and tools/guidance,[12] and supports the Program and Project Management System (PPMS) most commonly used with Mn/DOT (see more about PPMS below). Training programs and project management systems have grown within Mn/DOT as project complexity and time demands have increased. The current direction of Mn/DOT, as an engineering organization, is that of becoming a "program and project management Organization" which requires an increased emphasis on, and investment in, developing project managers. The most commonly offered Mn/DOT project management training programs are:

- Essential Skills for Project Managers (formerly known as Project Management Academy) – 10 days
- Advanced Skills for Project Managers – 2 days
- Critical Issues for Project Managers – 1 day
- Master Level Skills for Project Managers – 7 days

Other training and best practice sharing opportunities for Mn/DOT PMs occurs through the following:

- Project Scoping Training
- Cost Estimating/Cost Management Training
- An annual environmental workshop
- Hear Every Voice (public involvement guidance and training)
- Functional group meetings (e.g. design engineers, traffic engineers, or resident engineers)
- Pre-construction, Construction, and Operations Management Groups (PCMG, CMG, and OMG, respectively), which meet on a regular cycle to discuss current PM issues

Training emphasis is determined on the basis that the new PM must first be familiar with the Mn/DOT philosophy and core project management fundamentals to properly understand organizational goals and objectives. After this, the PM is introduced to roles and responsibilities, "How To" examples, and then more enhanced training. Each of the training offerings has been developed and delivered in attempt to build on the success of the previous program and offer more in-depth training that will address the current and future needs of Mn/DOT PMs.

Program and Project Management System (PPMS)

Mn/DOT has had a software scheduling system since the early 1980s. The current system has been in place for more than 20 years. PPMS is the official source of project data for Mn/DOT staff. It includes schedules, costs, and locations of projects in the 4-year State Transportation Improvement Program (STIP), which may be considered those projects that also inherently contain the greatest agency risk management issues as well. PPMS covers all trunk highway projects in addition to programs in: state aid (state funding assistance for

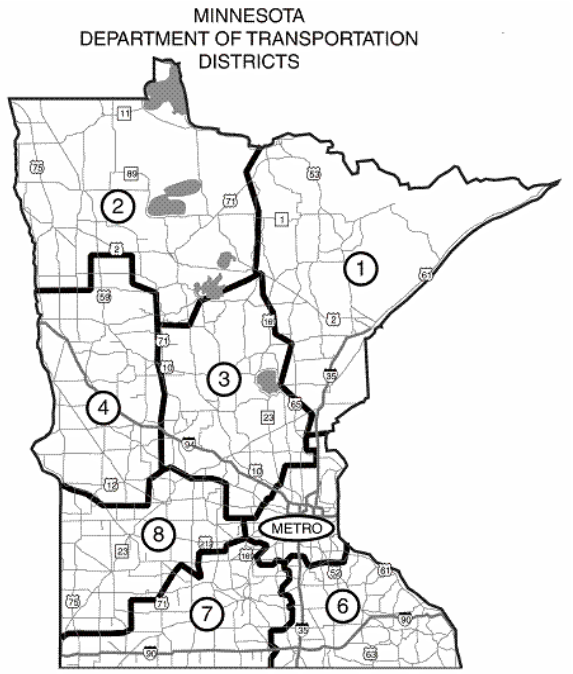
[12] Mn/DOT's Highway Project Development Process (HPDP) is well established as a tool and as guidance for PMs—see the HPDP at this link: http://www.dot.state.mn.us/planning/hpdp/scoping.html

county and local jurisdictional projects), rail, transit and intelligent transportation system (ITS) projects that include federal funding.

PPMS is focused on identifying activities on the critical path to project letting, and monitoring whether projects are staying on schedule. This system helps ensure Mn/DOT stays on track toward delivery of the transportation improvement program. An important aspect of this review of Mn/DOT project management practices is to have Mn/DOT PMs understand the capabilities of and how to use the PPMS tool.

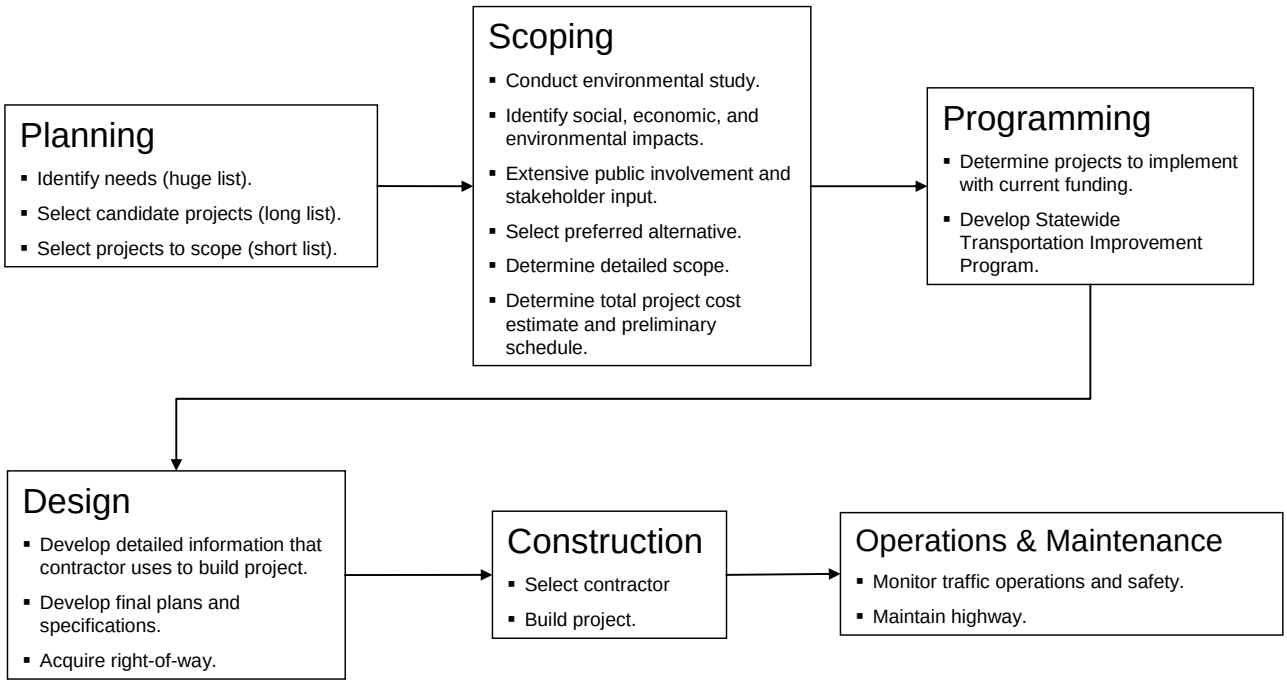
Mn/DOT Organization and Project Delivery Process

Mn/DOT is organized around a mixture of "centralized" and "decentralized" processes. As shown in the organization charts attached to this White Paper, Mn/DOT is organized around six divisions. The Operations Division, houses all eight Mn/DOT Districts (one comprises the Twin Cities Metropolitan Area, and the other seven represent greater Minnesota). The day-to-day operations of Mn/DOT are managed at the district level, (representative organizational charts from greater Minnesota are attached to this White Paper) including highway construction projects, maintenance, and highway right-of-way issues. The other divisions of Mn/DOT provide functional area (e.g. bridges or environmental services) and related technical support not available at the district level.



One recent development at the Metro District has been the implementation of a "matrix" organization. As shown in the attached organization chart for the Metro District, "Area Managers" are now in place with a geographic area of responsibility. This role is responsible for engaging external stakeholders into the Mn/DOT project delivery program and proactively managing those relationships as a means to promote better decision making on projects being delivered in a geographic area. This organizational approach will be discussed further at the October Peer Review.

A schematic of the Mn/DOT project development process is shown below. Attached to this White Paper is another depiction of the typical project development process for major projects at Mn/DOT, referencing the various processes, technical group involvement, and timeframes involved.



Mn/DOT's project development process (Source: Mn/DOT Cost Estimation and Cost Management Technical Reference Manual, 2008).

Beyond Program Delivery

As a large organization of more than 4,000 employees, Mn/DOT conducts a wide variety of projects beyond the visible programmed design and construction jobs. Projects such as studies or internal technology projects may offer examples of successful project management methods and techniques that can be used elsewhere in the agency to meet the values of the Strategic Vision. The Peer Review is a process of discovery to identify those best practices already being used and determine methods to implement them more broadly.

The project management approaches used by various portions of a large organization like Mn/DOT will differ, just as there is a broad spectrum of project scale and complexity. However, Mn/DOT does provide a set of tools and training opportunities that lay the groundwork for project management and program delivery within the organization.

III. CURRENT TRANSPORTATION INDUSTRY REVIEWS OF PROJECT MANAGEMENT

This section provides references and highlights from recent transportation industry reviews of project management. For Mn/DOT's purpose, important points about these reviews include the following: (1) they address industry wide issues which are similar to the issues faced by Mn/DOT; (2) they are current; and (3) they will be well represented by participants in the Peer Review process.

A. NCHRP 137: Guidance for Transportation Project Management

For purposes the Mn/DOT Peer Review, many relevant issues are addressed in *NCHRP Web-Only Document 137: Guidance for Transportation Project Management* (March 2009).[13] The introduction to this report defines the industry problem as follow-up to NCHRP Project 20-24, *Comparing State DOTs Construction Project Cost and Schedule Performance*, which addressed two questions:

- Was the project delivered at or below the contract award price (bid amount)?
- Was the project delivered on the expected schedule?

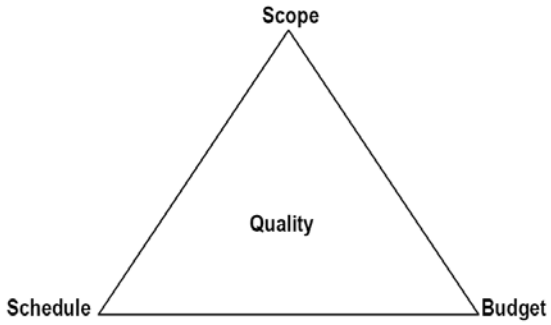
The results showed that in almost 50% of the cases the projects were not delivered on time or on budget. For projects over $5 million in construction cost, less than 20% were on or under budget and only 35% were delivered on time.

In response, the two main objectives of NCHRP 137 include:

- The development of a Project Management Guidance Document and accompanying toolbox aimed at improving effectiveness in the management of state DOT transportation projects.
- The provision of benefits to state DOTs in terms of strengthened project management leading to successful transportation projects, robust organizational structures, staff development, and management processes.

NCHRP 137 summarizes effective project management with reference to an often-cited triangular relationship as shown here. In Chapter 2, the document states that the definition of a successful transportation project management effort would be:

- The scope, schedule and budget are in balance.
- Quality meets established standards and public expectations.
- No unresolved project issues—for example, unresolved construction claims.



The document further states that the characteristics of a successful project management process and environment are:

- An organizational culture of project management
- Tools in place within the agency to assist the project manager
- Effective change management
- A comprehensive project quality oversight system
- An effective construction oversight/management program

[13] Link for download: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_w137.pdf

The potential applicability of the content found in NCHRP 137 to the Mn/DOT Peer Review cannot be understated as it summarizes current best practices and contains links to a number of state DOT websites for additional information on best practices. For example, the cited document goes on to define a capable PM, traits of the best PMs, and discusses the following important concepts for consideration on any project (Chapter 2):

- **Project Charter—** the document states that a Project Charter's purpose is to formally authorize the project and provide the PM with the authority to execute it.
- **Project Management Plan (PMP)—** an extension of the Project Charter, which basically adds more operational detail about the work plan.

NCHRP 137 further supports an understanding of project management best practices through its discussions of universal project management concepts and elements, including management of risks and critical path issues (Chapter 3) and by exploring best practices by phase (Chapter 4). In addition, more than 150 pages of appendix material is offered, including additional reading, suggested project management tools, and Web links.

B. AASHTO Project Delivery Management Scan (NCHRP 20-68A)

NCHRP 20-68A – Best Practices in Project Delivery Management; AASHTO Scan 07-01 (summary paper April 2009) – looked at:

- Arizona
- City of Phoenix, Arizona
- Florida
- Missouri
- Utah
- Virginia
- Washington

The Best Practices identified by the team in these seven agencies in the area of Project Management fall into five major categories:

- **Project Management Structure** - Each of the agencies visited had adopted and made extensive use of a project management structure. A hallmark of these successful systems was the accountability to which PMs and technical support units were held.
- **Shared Leadership** - The best practices observed in the area of project management had strong elements of leadership that created the venue for individuals and organizations to function well. Each state had its own leadership characteristics which were apparently keys to their success. While much attention might be placed on [top management], the contribution of leadership at multiple levels in the project management process is apparent.
- **Risk Management** - States with effective project management systems in place are addressing risk in ways that enhance their delivery process. They recognize that risks are inherent by their very nature in transportation projects but they are deliberate in how they address these influences. The Scan Team observed that managing risks is more than just listing them in a tabular format - rather risk management involves identification, assessment, quantification, prioritization and deliberate actions focused on the "big picture" objectives of the agency.

- **Use of Consultants** - Each of the agencies visited by the Scan Team used outside resources for a variety of tasks. Their utilization rate ranged from a low in Missouri of about 25% to over 80% as reported in Arizona, Florida and Utah. With diminishing staff levels due to funding and retirements, increasing workloads and increasingly complex projects the prospects for continued reliance by state DOTs on the consulting community remains strong. Using consultants in a way that compliments and enhances a state DOT's project management process is clearly a best practice.
- **Investment in GIS and Data Management Tools for Project Delivery** - States employing Best Practices in project management are also using a variety of technologies to enhance their abilities to be effective in this area. The states visited by the Scan Team were not using technology for "technology's sake" but had found ways to optimize project delivery and management through the use of tools that they had either procured or developed to help them in that process.

Other topics addressed in NCHRP 20-68A include performance measurement, contracting practices, and community involvement. Some of the cited elements are noted in the next section.

C. Other Project Management Reviews and Best Practices

This subsection provides additional information about other project management reviews that have been completed and includes examples of best practices.

Washington State Department of Transportation (WSDOT)

In 2003 and 2005, the Washington State Legislature enacted transportation revenue increases which funded approximately $10 Billion in transportation improvements. WSDOT recognized that project management practices as usual would not suffice to deliver a program of this magnitude and embarked on a complete examination of its practices and developed a strategic plan for program delivery. Following many of the principles of the PMI's PMBOK, WSDOT adopted a formal project management process for delivering capital projects. The process includes best practices, training, tools and templates.[14]

WSDOT is in the process of implementing a new Project Management & Reporting System (PMRS) which provides WSDOT staff with industry state-of-the-art tools for managing scope, schedule, cost and associated support for project status reporting and communications.

Arizona Department of Transportation (ADOT)

ADOT conducted a Strategic Partnering session in 1991 and commissioned a survey of contractors, subcontractors, suppliers, consultants and ADOT employees to obtain ideas that would help it become a more effective organization. At that time, the ADOT Quality and Productivity Initiative (QPI) was in full swing. The feedback regarding project management was significant and a cross-functional project team was formed.

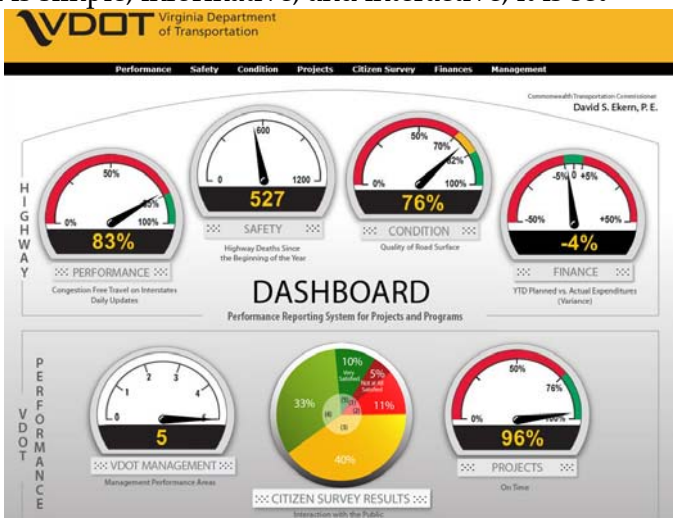
These initial steps taken by ADOT have, over a period of several years, resulted in tangible changes, including mandatory project management training, requirements and tools for scheduling tools/software, improved business and consultant processes, application of consistent job expectations for project managers, and other changes. In addition, continuous

[14] See: http://www.wsdot.wa.gov/Projects/ProjectMgmt/Process.htm

improvement of project management has remained a high priority for the Intermodal Transportation Division (ITD) within the Department and strategies to improve and implement stronger project management competencies and processes remain active to this date.

Virginia Department of Transportation (VDOT) Performance Measurement Dashboard and Similar Approaches

The VDOT online dashboard, shown below, is an often-cited industry best practice for performance measurement.[15] The dashboard is simple, informative, and interactive; it is set up to allow users to drill into more detailed data behind several of the performance measures.



The Missouri DOT *Tracker* performance measurement system is a similar example, which includes 18 results categories and more than 100 performance measurements.[16]

Both of these performance-measurement examples were cited in AASHTO Project Delivery Management Scan (NCHRP 20-68A).

Utah Department of Transportation (UDOT) electronic Program Management (ePM)

UDOT developed ePM, an Oracle-based product, as an internal tool for agency management and PMs. Used during the planning, concept/environmental, and design phases, the ePM collects project data for planning, managing, customer service, and trending purposes.

The ePM was also cited in the AASHTO Project Delivery Management Scan; reviewers from this study noted that ePM was particularly effective because it was based on a warehouse of existing data or information that was normally generated. That is, project managers were not tasked with additional work in order to maintain the functionality and usefulness of the ePM system.

IV. MN/DOT PEER REVIEW PROGRESS REPORT

A. Peer Review Status and Work Plan

The Peer Review facilitators met with Mn/DOT leadership through a series of individual interviews in August 2009. The interviews helped provide an understanding of Mn/DOT project management issues. Additionally, the Peer Review facilitators were able to use the information to develop a survey form for use with Mn/DOT staff. The survey, distributed mid-September 2009, requested input from staff about all facets of project management at Mn/DOT.

[15] See: http://dashboard.virginiadot.org/

[16] See: http://www.modot.org/about/general_info/Tracker/Jan09Tracker.htm

A Peer Review panel of industry professionals has been assembled to participate in the October 2009 Peer Review. The panel consists of staff from FHWA, other State Departments of Transportation, and the private sector. In advance of the October Peer Review sessions, panel members will be asked to prepare brief presentations of the project management practices employed by their organizations.

The Mn/DOT survey, along with Peer Review panel member presentations, will provide a baseline of information for more in-depth discussion of project management issues and practices. At the conclusion of the Peer Review process, some initial findings, recommendations, and follow-up steps will be identified by the Peer Review panel. A final report will conclude the process with a comprehensive review of findings and recommendations.

B. Mn/DOT Project Management Initiatives and Issues

Mn/DOT's initiative to improve project management has been marked with several efforts already underway. These current efforts are summarized as follows:

- **Scoping Process**: Mn/DOT established a statewide standard for project scoping. The scoping process provides an early and comprehensive review of project issues with stakeholder coordination. A formal amendment process is included to document and obtain approval of changes in projects. The process allows for an evaluation of impacts on the broader program and stakeholder involvement issues.
- **Cost Estimation and Cost Management**: In 2008, Mn/DOT developed a Technical Reference Manual[17] for staff to implement a department-wide priority on estimating, managing, and controlling costs. Concepts such as total project cost have been implemented to improve credibility with stakeholders and provide clear accountability for project cost estimates. Total project cost takes a broader accounting of costs, beyond construction costs and including costs such as utilities relocation, engineering, and right-of-way.
- **Scoping Tools**: In addition to the guidance described above, tools such as a total project cost estimate spreadsheet and risk checklist have been made available to support project managers and estimators.

Future supporting efforts are also planned, especially related to the areas of risk and conflict management.

Through initial conversations with Mn/DOT staff, a few projects have been identified as good case studies of the practices and lessons learned that exemplify reasons for a renewed emphasis on improved project management. These projects, which will be presented and discussed during the October Peer Review, are listed below with a brief description of their important characteristics:

- **I-35W Saint Anthony Falls Bridge Replacement –** This Design-Build project was characterized by a strong project team that worked aggressively to manage project schedule. The team also maintained a vibrant public involvement program; including demonstrated responsiveness to public input on the design, a focus on maintaining

[17] See: http://dotapp7.dot.state.mn.us/edms/download?docId=670233

relationships with stakeholders and external resources, and the use of weekly "Sidewalk Superintendent" talks all helped make the project successful.

- **I-35W and 62 Crosstown –** This complex and expensive project is notable for its location in the heart of a large residential area of south Minneapolis. The duration of the project and its resulting impacts to residents and neighborhood businesses have challenged Mn/DOT to think of ways to manage quality of life factors and context sensitive solutions.
- **TH 10 Access Management through Detroit Lakes ("Connect Detroit Lakes") –** Early public and business community involvement provided a noteworthy basis for substantial project changes that resulted in a different and improved project delivery approach. This revised construction plan has been endorsed by the community and is viewed as a successful example of demonstrating how public input can be used to improve a project.

The projects above underscore the values of collaboration, trust, transparency, and accountability that are described in the Strategic Vision for Mn/DOT. Over the course of initial Peer Review interviews, the following issues were identified, as briefly described below. These topics will be considered over the entire course of the Peer Review process, and as suggested below in the list of key topics and questions for the October Peer Review workshop (Section IV.C).

- Project process and handoffs between phases are important. A divide exists between pre-construction (the "what" phase of a project) and construction (the "how" phase of a project) at the project letting date. As the project designers hand-off to the constructors, there is a loss of project continuity in the life-cycle of the project. This becomes especially apparent when the public has accepted that the project will happen and expects information from those who will be building the project.
- An external focus is important to success on projects, as well as an internal focus; CSS and other tools like conflict and risk management provide examples of best practices addressing external stakeholders. Good PM practice includes a process to involve all stakeholders and tends to address problems early so that they do not move on to the next project phase, enabling a more seamless project delivery process.
- A proper balance of functionally (or technically) oriented and holistically oriented team members is necessary to manage risks on large or complex projects. PMs must be able to understand the larger project context and how to balance competing interests.
- The assignment of staff to the project manager role is accomplished by varied means within the agency. Inconsistencies in the practice can be related to differences in responsibility, authority, accountability, and workload of the project manager and other staff assigned to the project.
- Project management is not a recognized career path within Mn/DOT. This perhaps points to a need for changes in existing and respected training opportunities and tools available for use by project managers. Additionally, certification or other qualification means should be explored.

C. Themes for Mn/DOT Peer Review Participants

The list of questions below are intended to provide some background into the areas of interest and themes of discussion we anticipate being explored at the October Peer Review. Not all questions will apply to everyone; note the categories of questions below as they may relate to the interview topic or your area of expertise.

Project Management Themes

- How does the Mn/DOT organizational structure facilitate good project management? Does it cause any problems? If you work in a District, in what areas has Central Office involvement been most impactful for you?
- How is the project manager accountable for project outcomes and what performance measures are used to evaluate outcomes? How do performance measures influence your decision making?
- Describe how internal "hand offs" (e.g. from final design to construction) and coordination activities occur within your project management process. Describe how commitments made to stakeholders in one phase get carried through to future phases.
- What practices are appropriate for conflict management and resolution?
- How are competing objectives prioritized? How do project managers work with projects that are politically driven or driven by external stakeholders?
- How are external communications handled? How do project managers communicate with key stakeholders, both internally and externally, to ensure all are on the same page?
- Who is responsible for making project decisions, and how does the project team participate in decision-making?
- What industry standards are you aware of (e.g. from the Project Management Institute) that Mn/DOT should be using?
- What kind of training is necessary to develop project managers at Mn/DOT?
- How does the use of consultants alter project management approaches on a project?
- What successes, best practices, and innovations have you seen in project management that Mn/DOT should look at implementing statewide?
- What else could Mn/DOT do to ensure the success of project managers and the success of our projects in the eyes of the public?

Functional Area Related Themes

- When and how are functional tasks integrated into the project delivery process? Are task managers assigned to the project?
- How does functional area staff understand project-specific constraints and schedules?
- Where is the greater accountability or ownership: to the functional area program or to the individual project?

- What does Mn/DOT do to identify and manage project risks? How do functional groups identify and communicate risks to project managers?
- Specific functional area topics may include:
  - Environmental Review: Describe agency relationships with external agency partners
  - Utilities: Describe the process improvements that occurred with rewrite of the manual

Case Study Themes

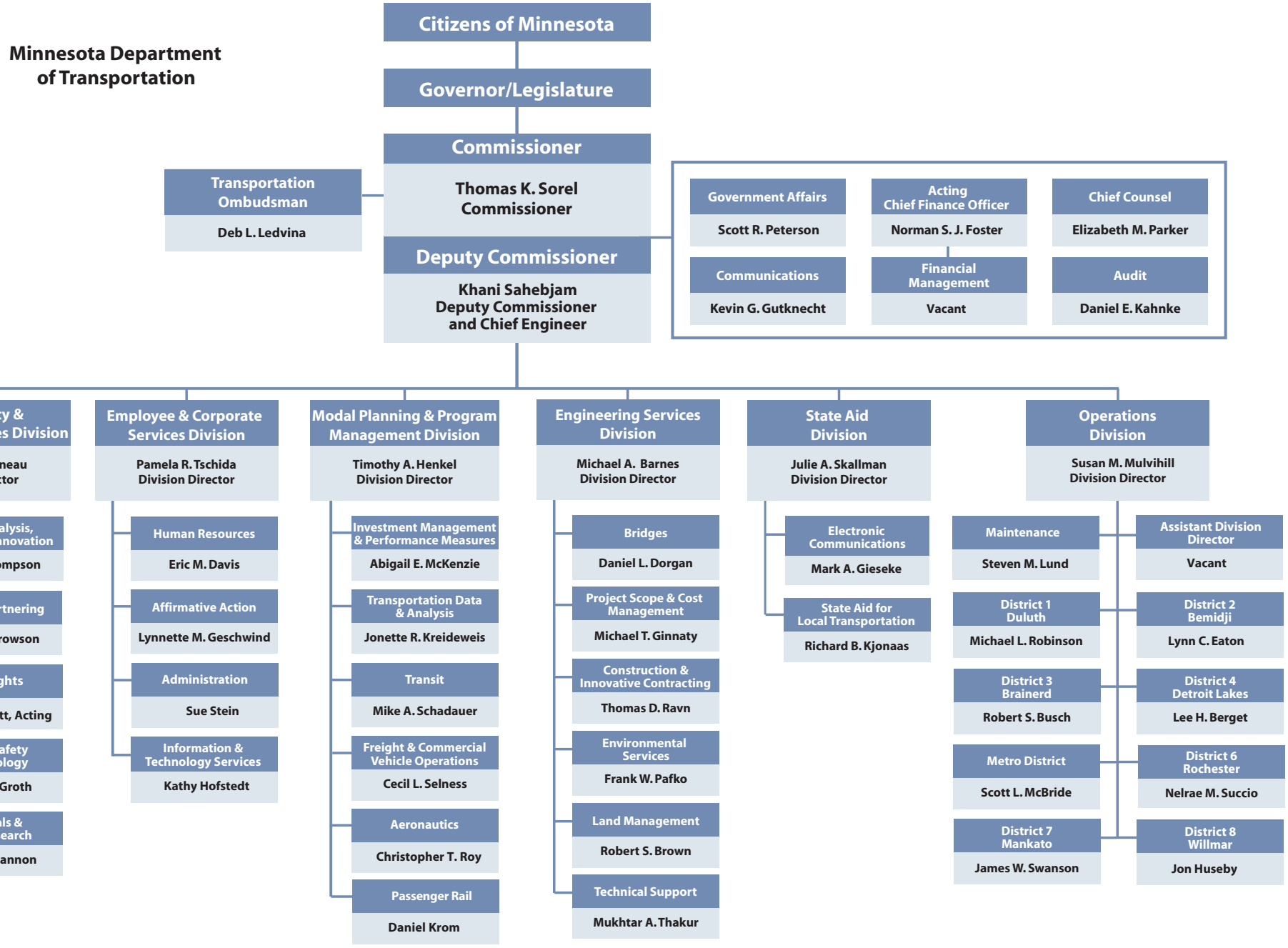
- Please describe examples of project management challenges and the best practices that have been used to overcome them. What are the keys to your success in project management?
- Design-Build: What are examples of project management techniques used in Design-Build that could be transferred to other project management processes within Mn/DOT?
- Training programs: Please provide example agendas from classes and describe the evolution of training and PM tools at Mn/DOT.

V. NEXT STEPS

Overall, the White Paper will remain in the context of information developed and provided prior to completion of the Mn/DOT project manager survey and the October Peer Review. The content provided in this document serves as baseline information for the Peer Review panel members and an introduction to the themes and discussion points planned for the October Peer Review.

A final report will be developed separately after completion of the October Peer Review. As appropriate, this White Paper may also be referenced, incorporated into, or attached to the Peer Review final report.

Minnesota Department of Transportation



September 2009

Mn/DOT District 2

September 2009

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  - Kristi Olson — Soils Asst. — **218-755-6586**
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  - Jeremy Hadrava — Bemidji Const Project Manager — 218-755-6527
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  218-7556508
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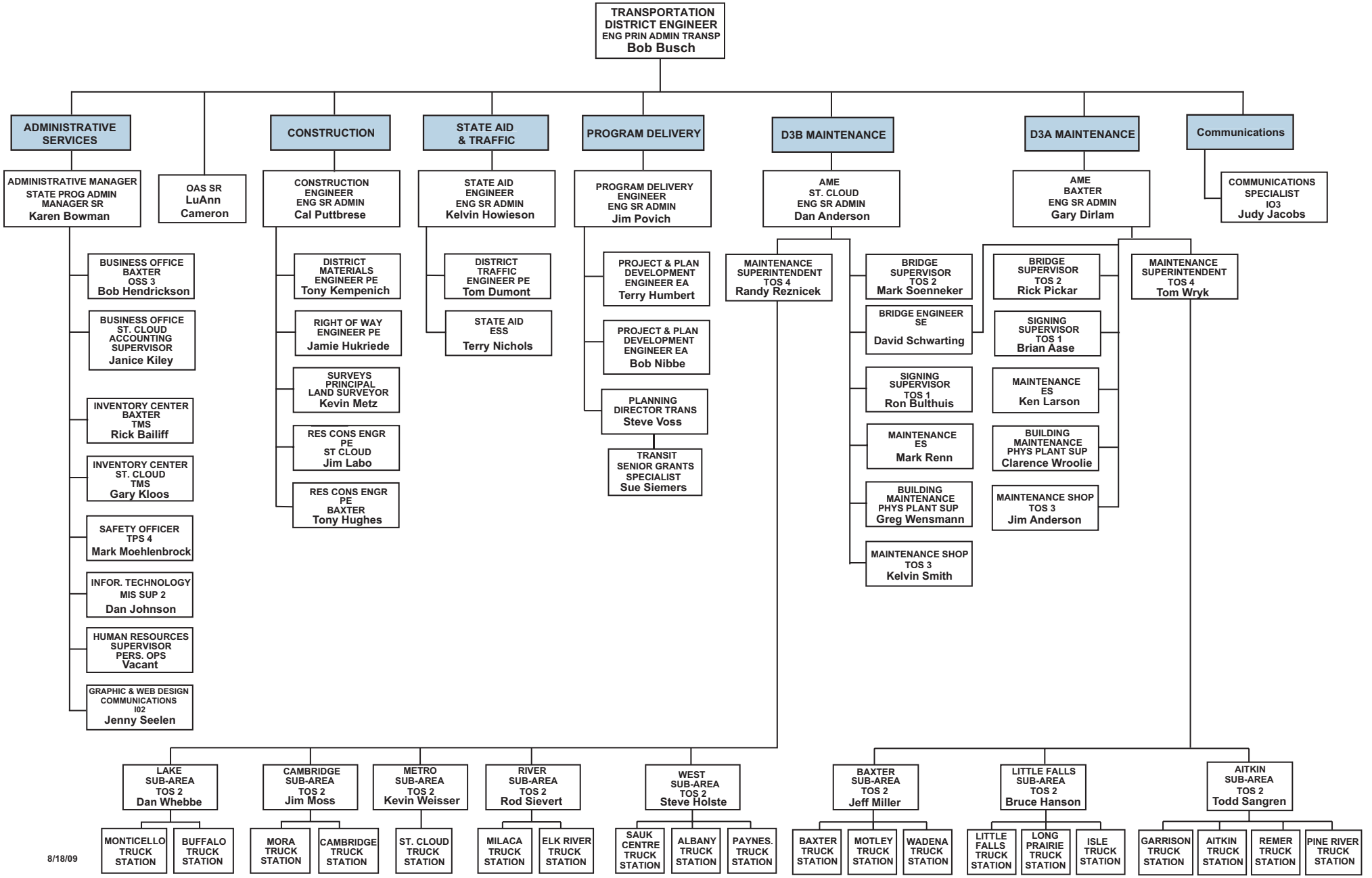
- **Brenda Bard** — Business Office Manager — 218-755-6504
  - Joel Leas — Transp Materials Supv Bemidji & Crookston — 218-755-6529
- **Dan Trickey** — Building Maintenance Supervisor Bemidji/Crookston/ Thief River Falls — 218-277-7958 — 218-755-6507

Mn/DOT Organizational Chart
District 3



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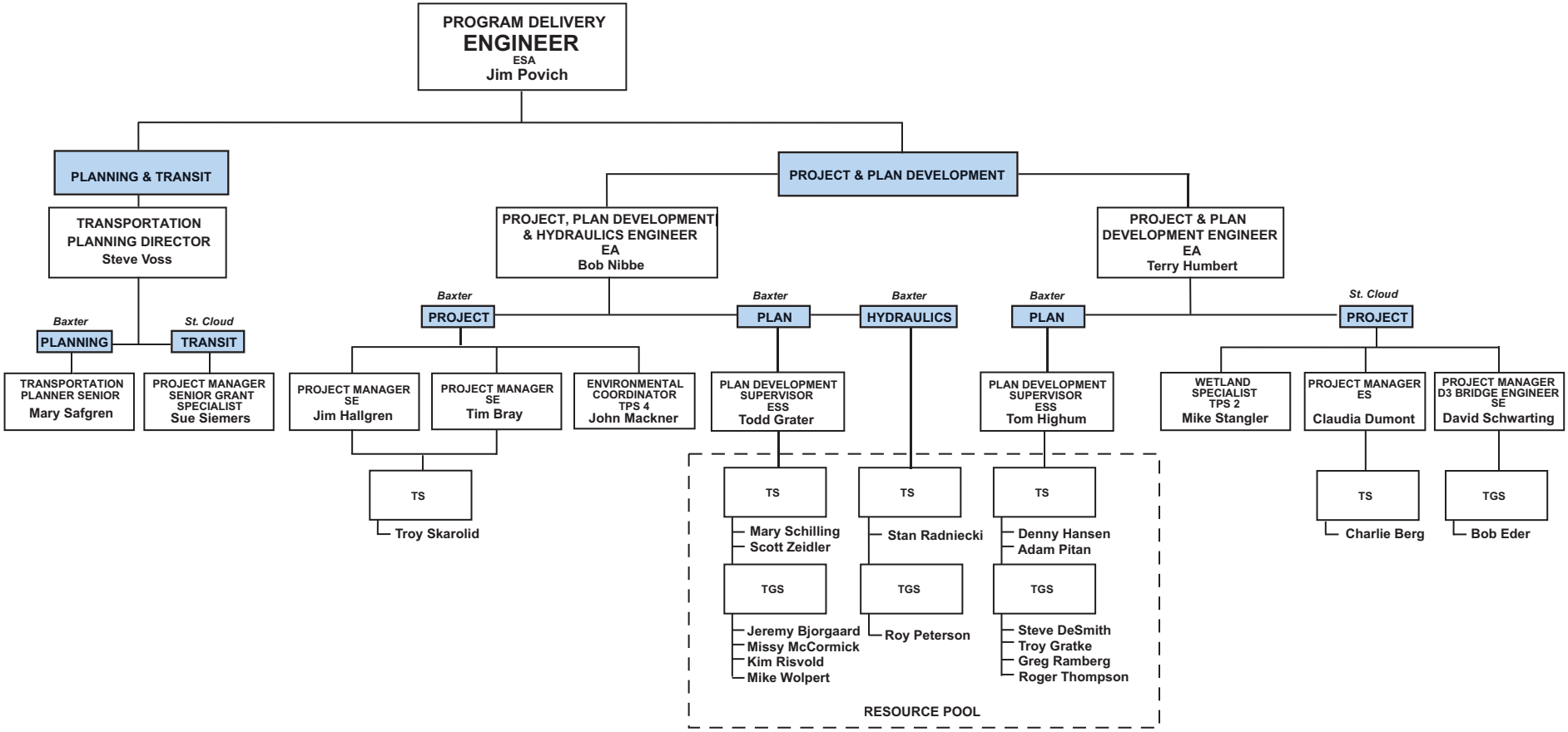
Mn/DOT Organizational Chart
District 3 Program Delivery



Shared: Works in Multiple Areas
Split: Snow & Ice Duties

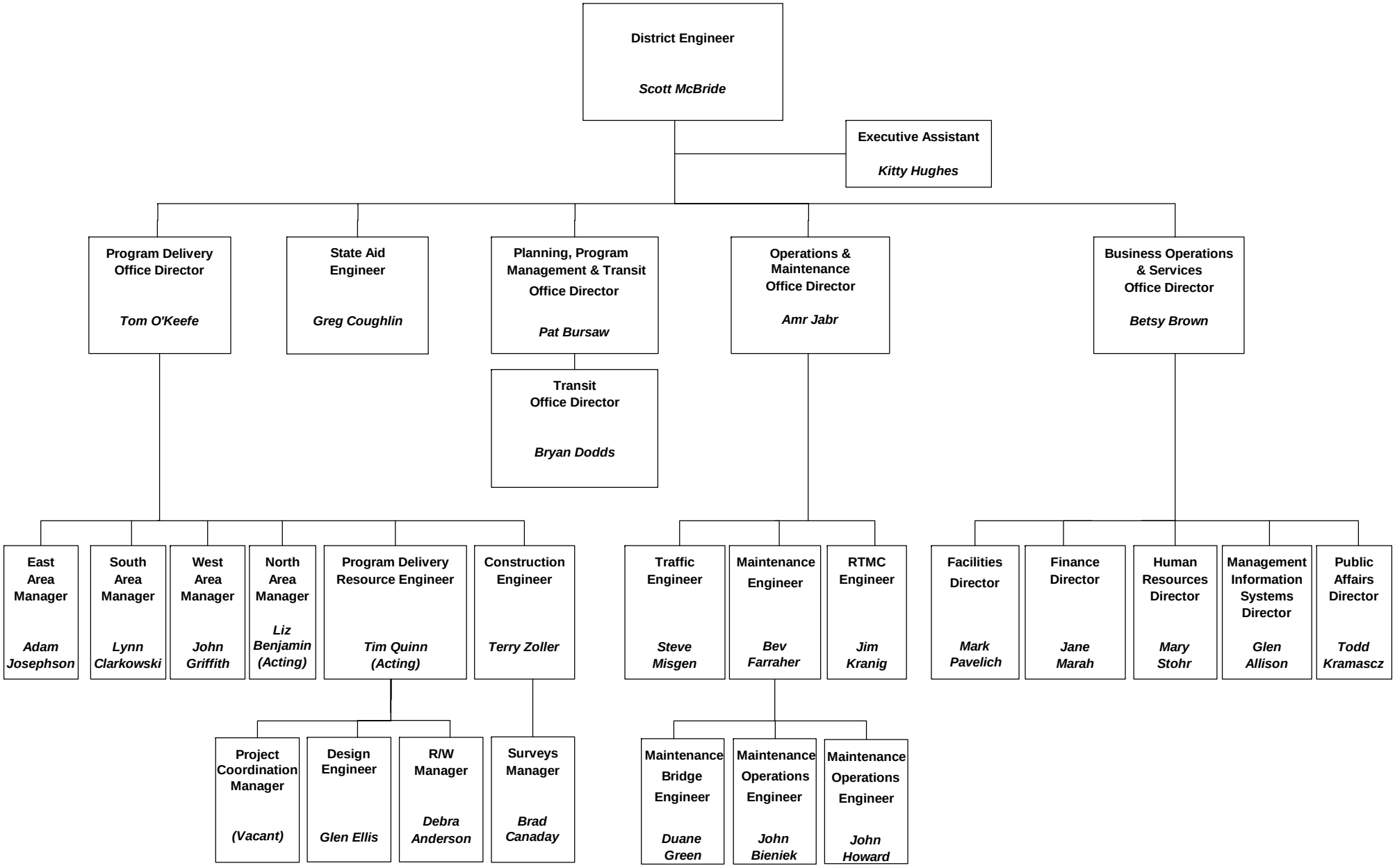
ESA - Engineer Senior Administrative EA - Engineer Adminstrative PE - Principal Engineer SE - Senior Engineer ESS - Engineering Specialist, Senior ES - Engineering Specialist
TS - Transporation Specialist TGS - Transportation Generalist Senior TG - Transportation Generalist TA - Transportation Associate
TPS 1-4 - Transportation Program Specialist

8/19/09

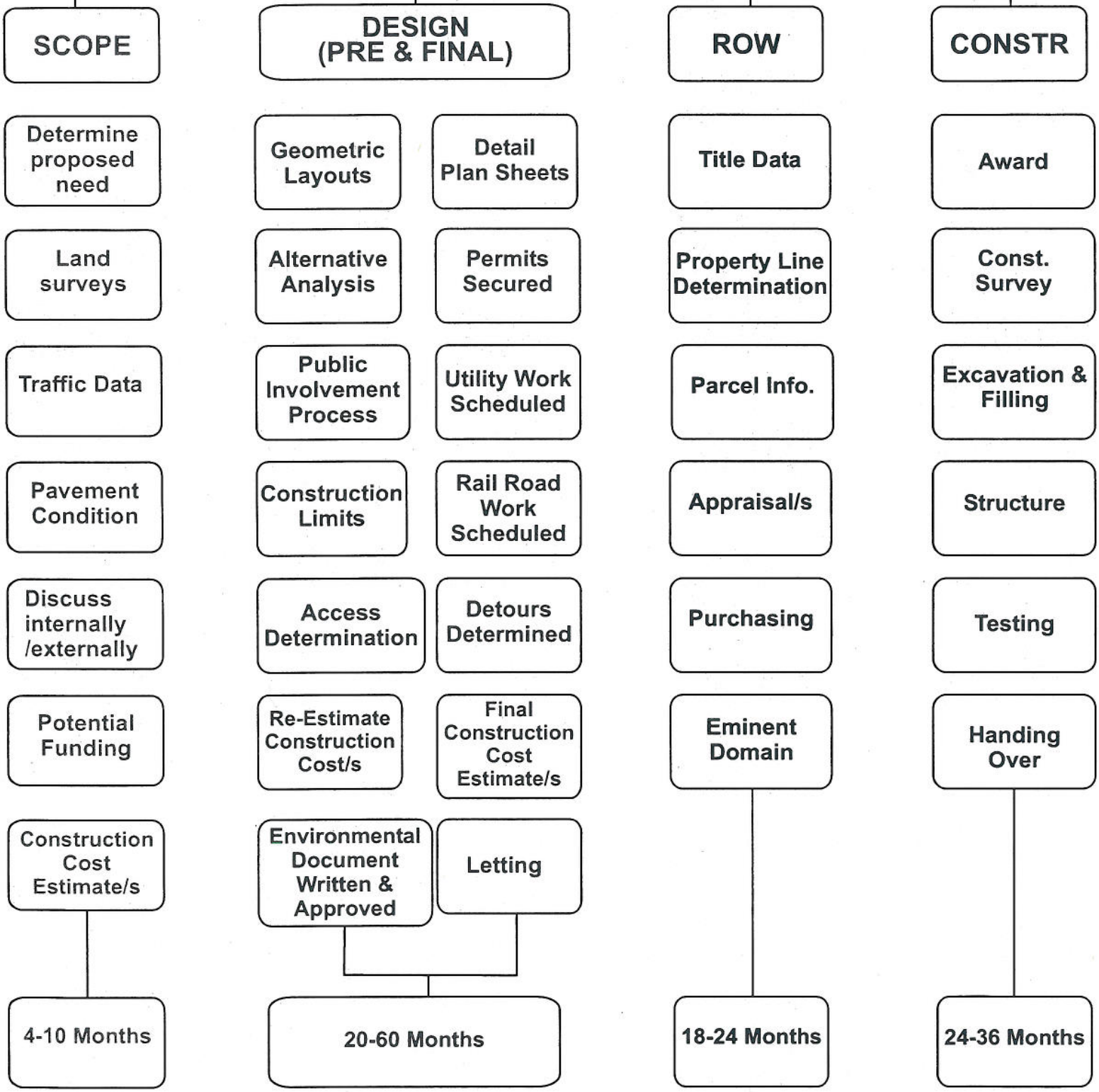
Mn/DOT - METRO DISTRICT

METRO MANAGEMENT TEAM

8/19/09



Typical Project Development Process for Major Projects



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