



# Draft Project Management Update to the Iowa DOT Project Development Manual

tech transfer summary

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## PROJECT TITLE

Draft Project Management Update to the Iowa DOT Project Development Manual

## SPONSORS

Iowa Department of Transportation  
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The Construction Management and Technology (CMAT) program is part of the Institute for Transportation (InTrans) at Iowa State University. The mission of the CMAT program is to improve the efficiency and cost-effectiveness of planning, designing, constructing, and operating transportation facilities through innovative construction processes and technologies.

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This work supported drafting project management guidance for the Iowa Department of Transportation (DOT).

## Goal

The goal of this project was to help incorporate a greater focus on project management in the Iowa Department of Transportation (DOT) project development process.

## Problem Statement and Background

The shift in US transportation infrastructure needs has largely been from building new infrastructure to replacing, expanding, or renewing existing infrastructure. The project management issues involved with infrastructure renewal are markedly different than the issues for new construction, furthering the need for a change in project management approaches for renewing the nation's infrastructure.

Not only are infrastructure renewal projects more complicated by their nature, but the situation has also been exacerbated by years of under-funded maintenance and replacement. In other words, what would have been a complex process under ideal circumstances has been made even more challenging because of the need for rapid renewal to avert infrastructure failures. Adding to the challenge is the fact that complexity can evolve from the interaction of many factors, not all of which manifest themselves on each project.

Rapid-renewal projects cover a wide spectrum of project types, varying in engineering complexity, size, modality, jurisdictional control, financing approach, contract type, and delivery method. Each project calls for a distinct project management style with teams comprised of different resident skill sets to successfully complete the project.

The objective of the Second Strategic Highway Research Program (SHRP 2) R10 research project, Project Management Strategies for Complex Projects, was to determine the specific requirements for successfully managing complex rapid-renewal projects. The ultimate goal of the work was to develop a comprehensive training and development program to enable project partners to work more cooperatively on such projects.

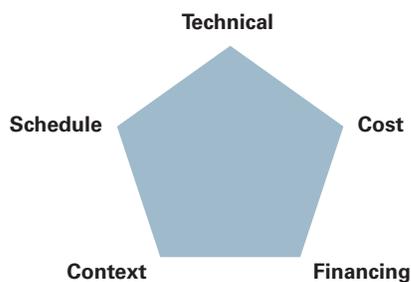
## Project Description and Methodology

The Iowa DOT applied and was selected to receive User Incentive funding from the U.S. DOT Federal Highway Administration (FHWA) for the SHRP 2 R10 Implementation Assistance Program. Through the program, the Iowa DOT plans to utilize the results from the SHRP 2 R10 project on the reconstruction of Segment 4 of the Council Bluffs Interstate System (CBIS), which is a major effort focused on improving the Interstate system in the Council Bluffs, Iowa metropolitan area.

In May 2016, the Iowa DOT hosted a peer exchange with agencies that have implemented or are actively implementing R10 outcomes as well as other agencies that are reviewing their project management policies. As part of the assistance for the User Incentive funding, the Iowa DOT is interested in developing a statewide policy for managing projects based on the outline of R10 as well as the lessons learned from implementing R10 on the CBIS project.

The work on this part of the project management implementation assistance supported drafting project management guidance for the Iowa DOT, and a technical advisory committee (TAC) was assembled to accomplish this effort. The TAC consisted of a group of Iowa DOT personnel familiar with the R10 project management concept, the Iowa DOT Project Development Process Manual, and the Iowa DOT project development process.

TAC members represented as much as possible the various offices and levels involved in project development at the Iowa DOT—from planning through maintenance and operation. This spectrum represented the participants typically requested to participate in project meetings using the five-dimensional project management (5DPM) process developed as part of the R10 project.



*Five-dimensional project management (5DPM)*

Once the TAC was identified, the group met frequently for targeted, facilitated sessions, which were documented, during the next several weeks.

The TAC took into consideration the current status of project management with the Iowa DOT, their experience during the demonstration workshop held in Iowa as part of the implementation assistance in the spring of 2015, the project management peer exchange hosted by the Iowa DOT in May 2016, and additional examples of project management that were presented at the peer exchange.

## Key Findings

- A number of decisions need to be made within the Iowa DOT, so the TAC may be premature in identifying exactly what actions should be taken at what point.

- A draft Policy and Procedure document and a project management position description have already been developed.
- The TAC can develop some guiding principles in greater detail that would add value to the project development process.

Based on this discussion, the TAC members were asked to provide one key take-away from the peer exchange that they attended in May 2016, as well as 1 to 3 guiding principles, to facilitate discussion on how to proceed. The principal investigator (PI) compiled a master list, which she distributed at the next TAC meeting, July 5, 2016, along with the draft Policy and Procedure document and the project management position description that were mentioned at the first TAC meeting.

The key take-aways from the peer exchange were as follows:

- Facilitated communication from project team members
- Clarify roles and responsibilities and develop frameworks for communication
- The DOT can be significantly more effective in management of projects
- Implementation of project management needs to come from top management
- Difficult for senior/experienced staff to change the way they do business

The master list included 10 guiding principles, some with subcategories, that had been submitted by the TAC at the first meeting. The TAC discussed, consolidated, and ranked these guiding principles, in order of importance, as follows:

- 1a. Clear definition of roles and responsibilities
- 1b. Dedicated project management resources
- 2a. Standard scope of work process
- 2b. Project schedules should be developed and managed for all projects
3. Estimates of effort for all project tasks to aid in decision-making and resource distribution
4. Project risks should be identified and managed

The TAC then started to discuss guiding principles 1a and 1b in greater depth.

At the next TAC meeting, July 15, 2016, the PI provided several sample documents, including information from other DOTs regarding their development process as it related to each of the guiding principles. The TAC reviewed these examples and discussed portions of these documents that they found favorable, as well as those that created some concerns.

Through this discussion, a foundation for the Iowa DOT to build upon was developed to support the identified guiding principles. The foundation is that an effective project management system needs to embrace the following:

1. Provide a governance role on all projects, regardless of size, and aid in assessing scope, allocating resources, and verifying time, budget, risk, and impact assumptions prior to programming the project.
2. Serve as a source of information on project methodology and standards.
3. Serve as a management coach, assist in the development of project management skills, and aid in sharing practices and communication across functional areas. The best practices will be documented and shared as project performance will be actively monitored.
4. Provide project management for specifically identified projects.

## Implementation Readiness and Benefits

This project involved consideration and development of guidance to incorporate a greater focus on project management in the Iowa DOT Project Development Process Manual. The TAC participated in a number of discussions to develop draft guidance for the foundation of a Project Management Office (PMO) within the Iowa DOT.

The primary goal of the PMO is to establish benefits from standardized processes and promote the adoption of project management policies, processes, and methods throughout the Iowa DOT. The PMO will facilitate the execution of the foundation, as well as the guiding principles identified by the TAC.

The PMO is founded on four functions:

1. A governance role on all infrastructure projects
2. A source of information on project management methodology and standards
3. A project management coach
4. A project manager where appropriate

These four functions with detailed lists of roles and responsibilities are included in Appendix A of the final project report.

Throughout this discussion, it was recognized that the PMO is likely centrally located. The PMO is approximately 12 to 15 staff members, many of which are engineers, but not exclusively, as some of the functions of the PMO do not require an engineering license or education. It is expected that the PMO staff will bring a wide variety of skills to the department.

Possible resources that may be helpful to the PMO in establishing project management resources are listed in Appendix B of the project report.

## SHRP 2 R10 Implementation Relevance

In developing the draft guidance, as presented in Appendix A of the project report, the TAC was mindful of the lessons and guidance provided from 5DPM and other project management resources. While on the surface, the guidance does not explicitly represent 5DPM, in many cases, it does embrace the concepts from the five dimensions, the 5DPM methods, and the project management tools as represented in the published guidebook (Shane et al. 2015) and training. Several examples of this relationship include the following:

1. The responsibilities for a project manager explicitly state that in addition to managing the three dimensions of the iron triangle (project scope, cost, and schedule), project managers must also manage financing (i.e., cash flow, efficient use of capital, project prioritization, and asset management) and context.
2. The responsibilities of the PMO include training Iowa DOT staff and consultant partners on 5DPM concepts and tools as applicable to Iowa DOT project delivery processes.
3. The PMO will participate in selecting the project manager and in-house resources and in identifying and working with consultants, which is a function of assembling the project team and selecting team arrangements.
4. The PMO will provide governance on standard processes including the guiding principles, which include several of the 5DPM tools, including performing a comprehensive risk analysis.

## References

Shane, J. S., K. Strong, D. Gransberg, and D. Jeong. 2015. *Guide to Project Management Strategies for Complex Projects*. SHRP 2 S2-R10-RW-2. Second Strategic Highway Research Program, Washington, DC.