



Construction projects, like the replacement of the [Black Hawk Bridge](#) that spans the Mississippi River in Lansing, have unique scheduling needs, depending on their complexity, duration, location, financial impact, and other factors.

RESEARCH SOLUTIONS

Matching construction scheduling specifications to project scope

Standard specifications at Iowa DOT ensure that construction projects can be managed and completed on time and on budget. However, large or complex projects require more detailed systems and resource investment that can be burdensome and counterproductive for smaller projects. A comparison of practices from 11 state transportation agencies reveals how different states address the variation in project complexity and details the scheduling specifications they adapt to maintain well-run construction projects with appropriate scheduling oversight based on the project needs.

THE NEED

To ensure road construction projects are managed effectively, Iowa DOT has established specifications detailing the scheduling procedures for construction companies contracted to complete projects. These specifications include timely communication of progress and accurate tracking of resources. For large or complex building

projects, computer programs such as Primavera P6 by Oracle are needed to manage project resources and activity. Since Iowa DOT's specifications have been written to anticipate projects of large scope, the requirements align with the capabilities of these programs specialized for construction management and scheduling.

Using these specialized programs entails training and user licenses, which are not currently part of Iowa DOT's budget. Consequently, contracted construction companies and Iowa DOT must pay consultants for their expertise and access to the specialized programs. For larger projects, the value of the added investment in a more robust



“The solutions we learned from other state DOTs have helped us revise our scheduling specifications for constructing Iowa’s roads and bridges, refining our standards and adapting to different scenarios.”

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scheduling program and consultants can be justified by the need for more detailed oversight. However, the scope of road construction projects varies, and some projects may not have the same resources for external consultants and additional administrative work. In light of these differences, Iowa DOT was interested in evaluating revisions to the specifications to reflect variable project scopes.

PROJECT APPROACH

Researchers collected information about similar specifications from transportation agencies in 11 states: Alabama, California, Colorado, Idaho, Iowa, New Jersey, Ohio, Tennessee, Utah, Virginia, and Wisconsin. Areas of focus included critical aspects of project management and scheduling with construction companies. Follow-up interviews with survey respondents from Colorado, New Jersey, Tennessee, and Virginia DOTs allowed for detailed discussion of the specifications and their implementation in completed construction projects. Iowa DOT then convened agency personnel, contractors, and researchers to revise the state’s scheduling specifications.

WHAT IOWA LEARNED

The scheduling specifications related to the software requirement, which was the original impetus for this research, revealed variations among the 11 states. Although Iowa DOT does not

require a specific scheduling software program, six of the 11 states specify either Primavera P6 or Microsoft Project. (Colorado DOT allows either program.)

In the follow-up interviews, some DOTs indicated a lack of in-house expertise or software licenses, requiring them to rely on external consultants for critical aspects of scheduling. Respondents from Tennessee and Virginia DOTs address needed software resources by categorizing their construction projects into three tiers (high, middle, and low) based on project duration, complexity, time impacts, and risk. More complex projects require robust scheduling software, middle-tier projects require a bar chart, and low-complexity projects require a written plan.

Beyond the software requirements and project complexity, the examination of specifications evaluated how the different states address definitions, float ownership, frequency of schedule updates, and other topics.

PUTTING IT TO WORK

Researchers then met with Iowa DOT staff and contractors to evaluate revisions to Iowa DOT’s specifications. The group defined the three tiers of project scope according to complexity, location, length of the project, potential risk, and potential for schedule impacts. By adopting these categories, Iowa DOT and its contractors benefit from

a detailed scheduling program when complex construction requires it and more agile scheduling tools for smaller projects.

ABOUT THIS PROJECT

PROJECT NAME: [Updating Progress Scheduling of the Iowa DOT Standard Specifications for Highway and Bridge Construction](#)

[Final Report](#) | [Technical Brief](#)

PROJECT NUMBER: SPR-RE23(009)-8H-00

REPORT DATE: February 2024

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