

Wisconsin Department of Transportation

Traffic Simulation Modeling Process

Lean Initiative Summary Report



Project Summary

This Lean project involved review and suggested improvements to traffic analysis procedures; specifically microscopic traffic simulation models. As traffic analysis tools, simulation models assist planning and project teams to identify highway capacity issues prior to construction. The Lean project was led by the Wisconsin Department of Transportation (WisDOT) Division of Transportation Investment Management's (DTIM) traffic forecasting section and involved teaming up with experts across planning, traffic operations and project development disciplines (including consultant teams).

The team provided insight and examined inconsistencies on development timelines, costs and general microsimulation analysis. For example, the number of hours to complete a microscopic traffic simulation model varies between 200 and 8,200 hours per project. This variability makes it difficult for WisDOT staff to properly scope traffic analysis timelines as part of a transportation project.

Improvements

- Developed a formalized process to define WisDOT business roles and responsibilities across several disciplines
- Clarified that formal guidance is needed for standards, consultant contracts and data development

MAPSS Core Goal Area

- Accountability

Statewide Goal Area

- Cost of Government
- Customer satisfaction

Issue

Currently, the Wisconsin Department of Transportation's (WisDOT's) microscopic traffic simulation models go through an inconsistent and inadequate development and review process. Project deliverables can vary between consultants making WisDOT's modeling results inconsistent. Additionally, the current maintenance and storage structure does not permit traffic simulation model use for more than one project even if the projects are located in the same area. This often adds additional time and costs to develop individual traffic simulation models for each project.

Because of this and other minor factors, WisDOT has undergone a review and goal setting process to clarify business area roles so as not to lose valuable and important input and data. Microscopic traffic simulation models can be properly vetted and projects will experience less delay with more streamlined costs associated with traffic analysis activities.

Lean Six Sigma Process

- Identified key issues and concerns from the WisDOT business areas
- Identified the lack of a formalized process as a key factor to the confusion and added time it takes to develop and review the models
- Conducted research about modeling standards and how other DOTs, organizations and consultants develop and review the models
- Developed a flowchart to outline tasks associated with the process
- Defined clear roles and responsibilities for each business area

Results

Cost of Government: The number of consultant hours associated with microscopic traffic simulation model development should be reduced by eight percent (or approximately 150 hours per project), resulting in a savings of approximately up to \$18,000 per project; assuming six-nine models are built per year, up to \$162,000 annually.

Customer Satisfaction: Formalizing and streamlining the traffic analysis process will eliminate confusion, provide more consistent results and reduce time and costs associated with development and review.

Next Steps

- Develop centralized storage system to allow for the storage, tracking and version control of all microscopic simulation models
- Update the *Mega/Major Guidelines*, *Transportation Planning Manual* and *Facilities Development Manual* to include details on the process
- Provide training on the new process
- Implement the new process throughout the department
- Document the number of consultant hours it takes to complete the various stages associated with the development and review of a model; provide yearly summary of average consultant hours per project