



New Tool to Evaluate Construction Impacts from a Network Perspective

Integrated framework enables better decisions

The impacts of construction on congestion and work-zone traffic control are routinely considered by transportation agencies at a project level. Less common, however, is consideration of how a multitude of projects being constructed at the same time can affect traffic flow on a system-wide basis.

Yet in today's environment, higher traffic volumes often mean that adjacent projects being constructed simultaneously within a network have a greater impact than ever before. Without program-level considerations of scheduling and phasing, proper staging on contracts, use of innovative technologies and techniques, and adequate work-zone traffic management, traffic disruptions can occur across the network for an extended period of time, with unsatisfactory results all around.

WISE: Work Zone Impacts and Strategies Estimator Software

The Solution

The *WorkZone Impacts and Strategies Estimator Software* or *WISE* (R11) was developed through the second Strategic Highway Research Program (SHRP2) to analyze the impacts on road users of multiple, concurrent work zones across a network or complex corridor. This tool will **help agencies assess the optimal sequencing of renewal projects, and help determine the efficiency (cost-effectiveness) of strategies for the minimization, management, and mitigation of road user costs from safety or operational perspectives.** The WISE tool is flexible, and can be used at a planning level as well as the operational level.

Historically, decisions about when and where to schedule construction projects and associated work zones have been made on a project-by-project basis, primarily in consideration of pavement and bridge needs and available funding. Sometimes, project schedules may be adjusted reactively to avoid some of the worst combinations of work zone delay within a corridor or network. WISE offers a proactive alternative that relies on existing traffic data in the form of transportation planning dynamic traffic assignment models – specifically through the simulation-based dynamic traffic assignment DynusT software. WISE is designed to consider projects that create traffic impacts for at least a few weeks, and is not generally intended to consider very short term construction or maintenance projects lasting less than a week.

WISE software analyzes construction impacts of multiple, concurrent work zones

**FOCUS AREA:
Reliability (R11)**

Decision support software.

Save Lives

- Better coordinated work zone scheduling can reduce the number of work zone-related crashes by providing alternate routes that allow motorists to avoid work zones altogether.

Save Money

- Free-flowing traffic through construction zones saves the contractor and the traveling public money.

Save Time

- Careful planning and scheduling of work zones can mitigate or avoid some work zone delays.

The Benefits

WISE benefits users by filling an observed gap in currently available products. With the integrated framework, planning-level decisions can be based on network- and corridor-level impacts. Users can import traffic networks from existing travel demand models so that large networks can be easily imported and evaluated. The tool has an optimization routine that will recommend efficient staging strategies. WISE can evaluate the impact of changes in route choice behavior, as well as impacts from intelligent transportation systems.

Coordinated and well-planned work zones within a transportation improvement program across a corridor or region will reduce mobility, safety, and economic impacts of highway renewal activities. By integrating WISE into practice as an improvement program development tool, agencies will continue to evolve their culture towards transportation systems management and operations (TSM&O), while enhancing their community credibility in highway system development and renewal.

In practice, WISE is a decision support system for use by planners and engineers to help them evaluate the traffic impacts of work zones to better schedule/sequence a set or program of projects and determine other strategies to reduce the overall impacts. WISE has the capability to evaluate the regional impact of various strategies such as day/night operations, accelerated construction techniques, and traveler/community information campaigns. WISE evaluates renewal projects at both the planning and the operations levels. When used as a planning tool, WISE develops an optimized renewal programming schedule that minimizes the total cost of delays to the public and agency construction cost. When used at the operational level, it evaluates the impact of individual strategies at the project level and provides results that can then be used as part of an iterative procedure with the planning analysis.

How can you learn more?

Updates on current implementation efforts can be found on the FHWA's GOSHRP2 website, <http://www.fhwa.dot.gov/goshrp2/>, and the AASHTO SHRP2 pages, <http://shrp2.transportation.org/Pages/default.aspx>. Research reports are available through TRB at <http://www.trb.org/SHRP2/Publications>. For more information, contact Tracy Scriba at FHWA, tracy.scriba@dot.gov, or Gummada Murthy at AASHTO, gmurthy@aaashto.org.



About SHRP2 Implementation

The second Strategic Highway Research Program is a national partnership of key transportation organizations: the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and the Transportation Research Board. Together, these partners conduct research and deploy products that will help the transportation community enhance the productivity, boost the efficiency, increase the safety, and improve the reliability of the Nation's highway system.

Strategic Highway Research Program

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