WASHINGTON STATE SAVES BY COLLABORATING ON MAIN STREET DESIGN

On state highways that also serve as main streets in municipalities, DOT projects typically undergo costly scope and schedule revisions to meet community demands. Through a $47,000 research project, Washington State DOT developed and piloted a program to engage community members early in the design process. By actively building consensus and addressing a range of both agency and community concerns—traffic flow, livability, safety, tourism—WSDOT is saving $9 million per project.

EASING CONGESTION WITH ADAPTIVE TRAFFIC SIGNAL TIMING

The annual cost of traffic congestion in the United States is a staggering $87 billion in wasted fuel and lost productivity. Through its Every Day Counts initiative, FHWA is helping states implement an intelligent transportation technology that can make a real dent in that number. Adaptive signal control adjusts the timing of stoplights to accommodate changing traffic patterns and ease congestion, providing optimal and equitable green-light time for all motorists.

While the timing of traditional manually programmed traffic lights may become out of date as traffic patterns change over time, this adaptive technology gathers data on traffic in real time and automatically responds to dynamic conditions. The benefits are numerous: fuel savings, emissions reductions, improved mobility, and enhanced customer satisfaction. From coast to coast, agencies are adopting this technology and seeing motorists’ travel times improve by as much as 50 percent.

POOLED FUND HELPS STATES OPTIMIZE WINTER MAINTENANCE

The Maintenance Decision Support System pooled fund study is a collaborative effort of 16 states across the nation. Led by South Dakota DOT, the program developed a winter maintenance tool that weighs such factors as road conditions, weather, and feasible treatment options. By analyzing alternatives and modeling predicted performance, the system can recommend the most appropriate maintenance treatments given an individual agency’s available resources and service goals.

Together, the states in the pooled fund study have conducted field deployment trials on nearly 20,000 miles of in-service highways, and they have enjoyed savings up to 25 percent; in the most dramatic example, one state saved $11 million on a $40 million program.

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DECLARER: The opinions and conclusions expressed or implied in reports are those of the research agencies. They are not necessarily those of the Transportation Research Board, the National Research Council, or the program sponsors.
BUILDING LONGER-LASTING ROADS AND BRIDGES

SMATER BRIDGE REPAIR WITHOUT COMPROMISING SAFETY

Safety will always be the first concern for bridges, which makes new techniques for assessing and addressing deterioration so important. With this in mind, the Kentucky Transportation Cabinet saw the potential of carbon fiber-reinforced polymer fabric to repair bridges that otherwise would require replacement or coosier repair techniques. The retrofit of a three-span prestressed bridge has been studied for a decade and demonstrated outstanding performance, leading Kentucky to employ this method on a dozen additional bridges. Using this technique, the state can save $500,000 per bridge, and motorists enjoy spans that remain open during repairs. Determining when to repair bridges is just as important as how; as Maine DOT demonstrated with its advanced SlabRate software. Using finite element analysis and calculations from AASHTO's 2009 Manual for Bridge Evaluation, Maine assessed the load-carrying capacities of 20 concrete slab bridges. Among these, over a dozen that would not have had acceptable operating ratings using traditional assessment methods were shown to be sound when evaluated using these advanced techniques. Given the million-plus dollars required for just one bridge replacement, the $200,000 research cost is already paying off and helping position Maine to better direct its repair efforts.

STATES IMPROVE PAVEMENTS AT EVERY LEVEL

From riding surfaces down to subsoils, state DOTs are leading research efforts to improve every aspect of pavements. For example, Maryland State Highway Administration developed an advanced method to evaluate asphalt pavements' surface friction—a major factor in performance and safety. The new technique to test susceptibility of aggregates to unwanted polishing takes a fraction of the time of standard tests and provides vital data for quality control. Quality must run all the way to the bottom of a pavement. Wisconsin, Iowa, and Minnesota DOTs, among others, have attested to this by putting the emerging technology of intelligent compaction through its paces for both asphalt lifts and pavement subgrade layers. Compaction measurements collected in real time by specially equipped rolling drums allow workers to respond to compaction deficiencies. It's a promising technology to help ensure long-lasting, high-performance roads.

And in Alaska, where building on loose and sandy soils presents a major challenge, the state's Department of Transportation and Public Facilities is testing the use of inexpensive geotextiles and synthetic fluids to strengthen underlying base layers. Results so far are very encouraging, with significant and lasting increases to the bearing capacity of subsoils.

A GREENER TRANSPORTATION SYSTEM

CONNECTICUT TRANSIT GOES GREEN WITH HYBRID BUSES

Connecticut DOT seized the opportunity afforded by new technologies to make its transit system more environmentally friendly without sacrificing performance or cost. Connecticut Transit deployed hybrid diesel-electric buses over several years, studying their performance side-by-side against standard diesel buses. After extensive testing and system optimization, the hybrid proved its value: Connecticut reports that fuel economy for its hybrid buses now exceeds that of its diesel-only buses by 15 percent or more, and life-cycle costs are actually lower for the hybrid vehicles. In a companion research effort, the agency tested a new diesel exhaust filter targeting particulates of 10 to 130 nanometers—the range of greatest concern for public health. Buses retrofitted with the filter showed a remarkable drop in emissions of these particulates: fully 99 percent. Connecticut led the way for other transit systems to invest with confidence in hybrid buses and to retrofit existing buses with particulate filters.