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Renewal Research in SHRP 2

SHRP 2 Renewal research aims to develop a systematic approach to renewing highways that is rapid, minimally disruptive, and results in lasting facilities. This goal involves an array of research topics that have been organized as eight tactics, which are described in the following sections of this program brief. The projects developed from each tactic and selected to advance renewal goals are shown in Table 1, which also indicates the planned research schedule.

Tactic 1: Reduce In Situ Construction

Projects R01-R03

Rapid renewal applies innovations in methods, materials, and technologies to reduce the time it takes to complete on-roadway construction activities that impact traffic flow. The use of new materials and techniques involves tradeoffs that must be accounted for in the design phase in order to attain the desired service life. Information technology will play a pivotal role in helping to accelerate the work pace and minimize disruption on renewal projects. Sharing real-time information among the participants on renewal projects can accelerate decision-making and the distribution of field inspection results.

Tactic 2: Minimize Field Fabrication

Projects R04 and R05

To speed up the on-site construction phase of the work that impacts traffic, new systems need to be developed that consider design approaches, construction processes, material selection, and maintenance requirements. Developing and applying sustainable materials, products, systems, and technologies that reduce life-cycle costs, extend useful life, and improve constructability will decrease on-site construction times. New bridge and pavement systems with short construction times will minimize disruption to motorists. The research plan addresses prefabrication, modular, standardized, and roll-in strategies for bridges and pavements.

Tactic 3: Inspect without Delay

Project R06

An innovative, high-speed inspection process could ensure that quality is obtained without delaying the project. Rapid assessment should provide sufficient information to predict the value of the facility over a long period of time. The application of more rapid nondestructive testing will require reconsidering the number of locations that can be sampled, thereby improving our understanding of the constructed facility and reducing variability.

Tactic 4: Facilitate Innovation and Equitable Contracting

Projects R07, R09, and R10

Agencies and contractors need project management strategies to implement rapid renewal. Well-developed performance-based specifications are key to achieving optimum contracting potential. Performance-based specifications, especially as they apply to rapid renewal, will allow contractors to pay more attention to quality, safety, and innovation. Improved management of the design and delivery process, as well as the design-build process, calls for innovative project management strategies to handle paper flow and decision-making.

Tactic 5: Mitigate Disruption

Project R11

There are more ways to minimize the impact of renewal if the analysis starts early in the project development process. This means planning and developing improvements from both corridor and network perspectives, selecting the best way to assemble and procure renewal work, and selecting renewal strategies that are appropriate for the subject infrastructure. This tactic investigates current practices both in the United States and overseas, examines several innovative strategies such as “mix of fixes” and “route management” and addresses the impact of corridor concepts on traffic flow, public relations, contractor capabilities, work selection, long- and short-term funding requirements, downstream implications, and overall corridor performance.

Tactic 6: Improve Customer Relationships

Projects R15 and R16

Renewal project planners must accommodate the needs of utilities and railroads that share roadway right of ways and have a huge stake in renewal activities. New streamlined permitting and relocating processes will allow for timely and efficient progression of renewal projects for agencies, utilities, and railroads.

Tactic 7: Design and Construct Low-Maintenance Facilities

Projects R19, R21, and R23

Improving material selection and design processes and integrating them with construction technologies can produce facilities that reliably achieve the desired performance life. The goal is to integrate performance-related designs with innovative construction processes to produce long-life solutions. This requires research and development in the areas of materials, mixture composition, structural systems and components, pavement structure, and modeling.

Tactic 8: Preserve Facility Life

Project R26

One of the essential components of a rapid renewal program is preserving existing facilities as long as possible at the required level of performance. Proactive preservation not only shows good stewardship of the public’s investment but also significantly reduces disruption. In spite of the sizeable investment, the ability to finance renewal projects without jeopardizing other programs remains the biggest challenge facing facility owners.

Techniques are especially needed to extend the life of roadways that carry high traffic volumes.

Table 1 Renewal Projects

Status	Project No. (Tactic No.)	Renewal Research Projects	Budget (x1,000)	Estimated duration (months)
In progress	R01 (1)	Encouraging Innovation in Locating and Characterizing Underground Utilities <i>Contractor: Louisiana Tech University</i>	\$300	20
	R06 (3)	A Plan for Developing High-Speed, Nondestructive Testing Procedures for Both Design Evaluation and Construction Inspection <i>Contractor: Texas A&M</i>	\$350	12
	R07 (4)	Performance Specifications for Rapid Highway Renewal <i>Contractor: Trauner Consulting Services, Inc.</i>	\$3,000	60
	R15 (6)	Strategies for Integrating Utility and Transportation Agency Priorities In Renewal Projects <i>Contractor: ICF International</i>	\$250	18
	R02 (1)	Geotechnical Solutions for Soil Improvement, Rapid Embankment Construction and Stabilization of the Pavement Working Platform	\$3,000	48
	R04 (2)	Innovative Bridge Designs for Rapid Renewal	\$2,000	48
	R09 (4)	Risk Manual for Rapid Renewal Contracts	\$250	18
	R21 (7)	Composite Pavement Systems	\$4,000	48
	R19 (7)	Durable Bridges for Service Life beyond 100 Years	\$3,000	48
	R16 (6)	Railroad-DOT Institutional Mitigation Strategies	\$400	18
	R26 (8)	Preservation Approaches for High Traffic Volume Roadways	\$250	18
	R05 (2)	Modular Pavement Technology	\$1,000	36
	R23 (7)	Using Existing Pavement in Place and Achieving Long Life	\$1,000	36
		Total Budget	\$18,800	
Contingency	R03 (1)	Identifying and Reducing Worker, Inspector, and Manager Fatigue in Rapid Renewal Environments	\$1,000	36
	R10 (4)	Innovative Project Management Strategies for Large, Complex Projects	\$750	24
	R11 (5)	Strategic Approaches at the Corridor and Network Level to Minimize Disruption from the Renewal Process	\$500	24

RFPs for highlighted projects were released in March 2007

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