



## Highways for LIFE

*Picture in your mind's eye...*

*An urban Interstate reconstruction project, comprised of five miles of pavement and four bridges, is completed in 60 days – without impacting rush-hour traffic! Not only is the project constructed quickly, but it includes a high-level of pavement and bridge safety and functional improvements including pavement/tire noise emissions so low that noise walls are not required. Moreover, these pavements and bridges will be*

*exceptionally smooth and endure for 50 years or more with no need for major repairs or rehabilitation. Public and media accolades have been overwhelming.*

This remarkable vision is not a distant dream; it is attainable now. When a disaster has required extraordinary effort to get a major transportation facility back in service, the owners and industry have risen to the occasion. For example:

- Loma Prieta Earthquake – CA
- I-40 Bridge Collapse at Webbers Falls – OK
- Queen Isabella Causeway Collapse – TX

These and other exceptional efforts have demonstrated the tremendous potential of the highway community, and the technology and practices available to us. Accelerated construction techniques can dramatically reduce the time the public has to spend driving through work zones. Use of manufacturing processes or prefabricated components can expedite the on-site phase of construction, improve the quality of the end product, and reduce the exposure of both the construction forces and the traveling public to the hazards of the work zone. Innovative contracting approaches can streamline front-end efforts and promote quality in our highway infrastructure. However, high standards and expectations are needed to drive widespread adoption of these innovations and technologies.

Highways for LIFE<sup>1</sup> is an integrated approach to changing the way in which we construct and deliver highway infrastructure, with three strategic goals.

- Improved safety
- Reduced congestion due to construction
- Improved quality

The Highways for LIFE goals will be achieved through:

- Showcase projects built under high standards for quality and performance;
- An extensive program of technology transfer, education, and evaluation; and
- Industry partnerships to encourage more extensive integration of beneficial technologies in highway construction equipment, materials, processes and practices.

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<sup>1</sup> LIFE is an acronym for **L**ong lasting highways using **I**nnovative technologies and practices to accomplish **F**ast construction of **E**fficient and safe pavements and bridges.

Funding for Highways for LIFE is included in the Administration's \$247 billion reauthorization proposal. A \$1 billion dollar investment over the life of the new bill is proposed as part of spending down the balance of the highway trust fund. Highways for LIFE will advance the state-of-the-practice in highway construction by demonstrating and promoting the adoption and use of the best available technologies and contracting practices.

### Why should you support Highways for LIFE?

In 2001, highway construction work zones resulted in an average of 2.6 hours of delay per driver. The economic costs of these delays are staggering. More staggering is the loss of human life attributable to highway construction work zones where the fatality rate has increased from 693 in 1997 to 1,079 in 2001. On the 140,000-mile National Highway System alone, 11,000 miles of pavement are in poor condition and more than 24,000 bridges are classified as “deficient.” These deficiencies are themselves an impediment to safe, efficient and reliable transportation of goods, and need to be corrected.

Improving the overall condition of our highway system using current practices, technologies, and revenue streams is a daunting task. We can afford neither the costs associated with a deficient highway system, nor the costs in congestion and human life associated with perpetuating current practices. Highways for LIFE will bring about much needed changes in the way things are done by providing the impetus to greatly accelerate the rate at which improved practices and technologies are put into routine practice.

### How will Highways for LIFE operate?

Both the highway users and the highway community will be involved in determining how the objectives of Highways for LIFE will be achieved. The Highways for LIFE Alliance will provide a forum through which the state and local transportation agencies private sector consultants, material suppliers, equipment manufacturers, highway users and contractors can provide advice on the structure and conduct of Highways for LIFE, improved construction technologies, performance standards and business practices.

### How does Highways for LIFE differ from conventional construction?

Projects using conventional construction methods take years, present safety hazards, delay traffic and do not always produce a long lasting product. Highways for LIFE construction differs from conventional construction in that it utilizes proven best practices, technologies and innovations to reduce on-site construction time, attain higher quality and improve safety. The Highways for LIFE performance standards will establish elevated goals for safety, construction-related congestion and quality of workmanship. Highways for LIFE will also provide a toolbox of approaches and technologies to assist the highway owners and builders in reaching the performance standards.

### If highway agencies are already using these technologies, why do we need Highways for LIFE?

Many of these technologies and innovative approaches are being used today. However, their use is sporadic. Eventually, all highway agencies will adopt these techniques and innovations, but the pace at which adoption is taking place is a slow creep. The American people cannot afford to wait for the changes that are so badly needed. Highways for LIFE will bring about a leap forward in our highway construction practices, so that improved approaches become the standard way of doing business a lot sooner.

Some examples of how **Highways for LIFE** technologies and innovations are being used...

<b>Mitchell Gulch Bridge, Denver, Colorado</b>		
	Conventional Construction	<b>Highways for LIFE</b>
Technology	<ul style="list-style-type: none"> <li>• Cast-in-place</li> <li>• Assembled on site</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Prefabricated</b></li> <li>• <b>Pre-assembled</b></li> </ul>
Process	Design-bid-build	<b>Value engineering</b>
Time of Construction	60 days (estimated)	<b>2 days (actual)</b>
<b>Summary</b>	<ul style="list-style-type: none"> <li>• <i>Time of construction reduced 97%</i></li> <li>• <i>Initial construction cost savings of a “couple of thousand dollars”</i></li> </ul>	

<b>1.7 mile segment of Interstate 10, Pomona, California</b>		
	Conventional Construction	<b>Highways for LIFE</b>
Technology	4-hour strength concrete	<b>4-hour strength concrete</b>
Process	<ul style="list-style-type: none"> <li>• Design-bid-build</li> <li>• Limited outreach</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Incentives/disincentives</b></li> <li>• <b>Extensive outreach to inform public of closure</b></li> </ul>
Time of Construction	16 night-time closures of 7-10 hours (estimated)	<b>One 55-hour weekend closure (actual)</b>
<b>Summary</b>	<ul style="list-style-type: none"> <li>• <i>Time of closure reduced 51% to 66%</i></li> <li>• <i>Duration of construction reduced 81%</i></li> </ul>	

<b>Expansion of 120 miles of New Mexico 44 from two to four lanes</b>		
	Conventional Construction	<b>Highways for LIFE</b>
Process	Design-bid-build	<b>Design-build</b>
Time of Construction	27 years (estimated)	<b>3 years (actual)</b>
Cost of Construction	\$261 million (estimated)	<b>\$252 million (actual)</b>
20- yr. maintenance cost	\$151 million (estimated)	<b>\$62 million (warranted)</b>
<b>Summary</b>	<ul style="list-style-type: none"> <li>• <b>Time of construction reduced 89% (24 years!)</b></li> <li>• <b>Cost savings of \$98 million over first 20 years of service</b></li> </ul>	

<b>I-95 Bridges over the James River, Richmond, Virginia</b> (Superstructure replacement and substructure rehabilitation of twin 4,184' bridges)		
	Conventional Construction	<b>Highways for LIFE</b>
Technology	<ul style="list-style-type: none"> <li>• Cast-in-place construction</li> <li>• Typical concrete</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Prefabricated and assembled composite units</b></li> <li>• <b>High-performance concrete</b></li> </ul>
Process	Design-bid-build	<b>A + B contracting with incentive/disincentive</b>
Time of Construction	36 Months (estimated)	<b>7 Months (actual)</b>
Cost of Construction	\$43.7 M (estimated)	<b>\$38.6 M (estimated)</b>
<b>Summary</b>	<ul style="list-style-type: none"> <li>• <i>Time of construction reduced 81% (29 months)</i></li> <li>• <i>Initial construction cost savings of 12% (\$5.1 million)</i></li> </ul>	