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Transportation Research Board, National Research Council, Washington, D.C., 2002

Arkansas' Interstate Rehabilitation Program

Research, Planning, and a Healthy Dose of Innovation

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The Arkansas State Highway and Transportation Department (AHTD) has taken an innovative approach to rehabilitating Interstate highways. When the program began, more than 60 percent of the state's 35-year-old Interstates were in poor condition—patching and spot overlays could no longer repair the uneven seams.

“We started where everyone seems to begin—with financial constraints,” recalls AHTD Director Dan Flowers. “Then we moved to searching for and developing long-term methods for rehabilitation. Along the way, we discovered the importance of widespread communications. Combining research and best practices in several areas into one program is innovative in itself.”

Most of the program's individual components may not be new, but combining them under Arkansas' Interstate Rehabilitation Program (IRP) has produced unique results. Highway officials crafted an approach incorporating innovation—breaking the program down into elements and addressing each element in its own framework with established best practices. As a result, the IRP has stimulated innovative thinking, research, planning, and implementation that have made the Arkansas approach a national model.

Flowers explains why a quick fix was not an option: “This problem was going to take a lot of creative thought with participation and cooperation from several groups, including federal and state governments, as well as the consulting community, contractors, and the public—that's where all the research and homework paid off.”

Creative Financing

Funding presented the first and most challenging obstacle. The cost for the state's original 542-mile Interstate system was \$837 million, with much of the funding from the federal government. The cost of repairing approximately 69 percent of those miles today (Figures 1, 2) was estimated at \$950 million,

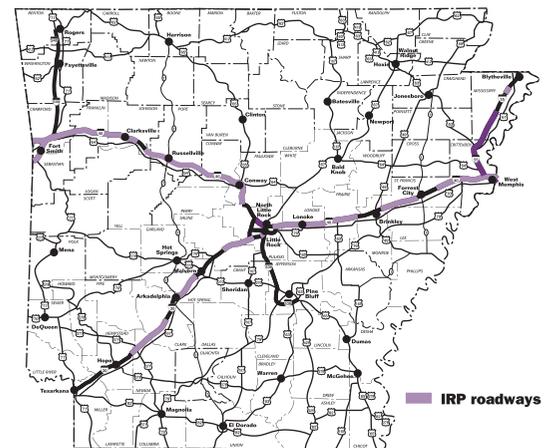


FIGURE 1 Roadways included in Arkansas' Interstate Rehabilitation Program (IRP).

with much of the financial burden on the proprietor, the state of Arkansas.

In early 1998, the Arkansas Highway Commission began exploring the use of Grant Anticipation Revenue Vehicle (GARVEE) bonds for the rehabilitation program. The bonds may be retired with future anticipated federal funds in a “buy now, pay later” payment arrangement.

“The funding commitment was substantial,” Flowers notes. “The Department recognized that it needed to go to a higher level and involve the gover-

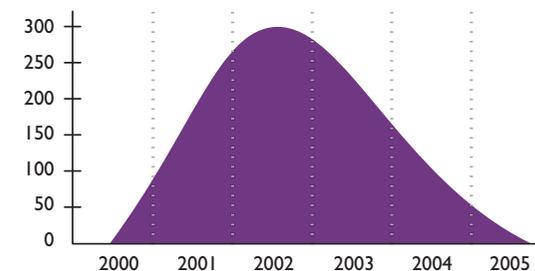


FIGURE 2 Average IRP miles under construction, per year, 2000–2005.

nor, the state legislature, and most likely the Arkansas voters. We determined to make a full-court press to get these roads rebuilt as rapidly as possible.”

In 1999, with the governor’s support, the legislature passed phased-in increases for a 3-cent gas tax over three years and diesel taxes of 4 cents over two years. Legislators also authorized the Highway Commission to sell GARVEE bonds subject to voters’ approval. The governor campaigned for the program and made Interstate rehabilitation a major part of his agenda for state infrastructure and roadways.

Well aware of the poor condition of the Interstates, voters approved the bond program overwhelmingly, by a margin of 4 to 1. The voter-approved IRP authorized the Highway Commission to sell up to \$575 million in GARVEE bonds. The initial bond issue was a competitive sale; however, throughout the multiyear program, the Commission will evaluate each successive bond sale to determine whether a competitive or negotiated sale is appropriate.

Well-Researched Methods

With funding established, AHTD engineers worked to coordinate rebuilding plans quickly, efficiently, and safely for motorists and construction crews. What is the best way to repair an Interstate system constructed of reinforced, jointed concrete 9 to 10 inches thick? The state had spent millions of dollars in the past decade to patch and overlay the portland cement concrete (PCC) roadways, which continued to deteriorate because of increases in traffic and heavy loads and because of an unstable base.

Examining the results of both state and national research and drawing on past experience and positive outcomes in a few recent projects, AHTD officials identified a rehabilitation solution—rubblization. This construction technique breaks deteriorating PCC pavement into 2- to 6-inch pieces that become a base for a hot-mix asphalt overlay.

Rubblization also saves time and money—always a characteristic of best practices in project assessment and planning. Debris and unused material do not need to be removed to another site. Moreover, the crushed PCC base reduces the chance that cracks, joints, and other defects will reflect through the asphalt overlay, negatively affecting performance.

“Rubblization makes the base into an interlocked



Rubblizing allows reuse of deteriorating pavement: resonant breaker head reduces old concrete surface to rubble, which is compressed with vibratory roller and becomes the bed for layers of asphaltic concrete hot mix (ACHM).

matrix of pieces as the concrete breaks up,” explains AHTD Chief Engineer Bob Walters. “It functions much like a jigsaw puzzle with broken pieces fitting together.”

The six-step rehabilitation process includes setting up the work zone, installing underdrains, rubblizing, rolling the rubblized surface, paving or overlaying, and smoothing the surface. For each step, AHTD found payoffs in research and in reviewing improved practices.

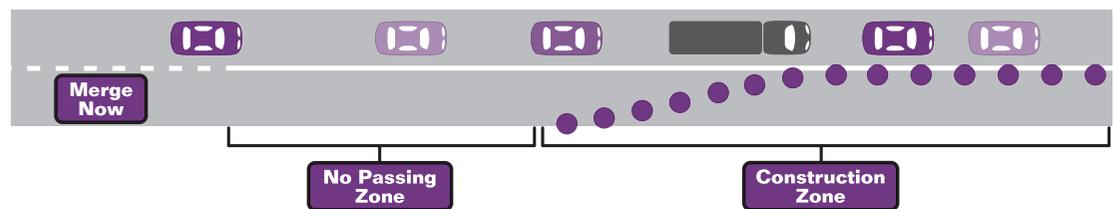
“Developing extensive quality control methods in a new state-of-the-art materials testing laboratory also added to the program’s success,” Walters observes. “Persistent testing of the asphalt mix to minimize rutting has ensured the highest-quality product.”

Setting Up Work Zones

Setting up the work zones also required innovations. Nearly every Interstate work zone for the project is arranged the same way—so that approaching traffic merges to the left lane, with the right lane initially closed (Figure 3). As a result, motorists quickly recognize what to do when approaching work zones and act accordingly to maximize traffic flow.

“Merge Left” warning signs are placed 2 miles before the work zone, with “Merge Now” reminders 1 mile away and enforceable “No Passing Zones” 1,500 feet before the lane closure. Crews work one lane in a direction at a time; traffic is diverted first to the left and then gradually moved with strategically placed barrels and arrow signs.

FIGURE 3 Guiding traffic around a work zone.



To make sure that the taxpayers who voted to support the program—and who negotiate the barrels around the Interstate rehabilitation sites—are pleased with the final product, AHTD asked contractors to help identify improved practices and develop new ones.

Lessons Learned

On the list of “what was learned in rubblization,” AHTD included the renewed attention to subsurface drainage. AHTD engineers have revised the underdrain materials and design and have instituted video inspection to ensure that the system functions properly. A dry base material has improved pavement performance. AHTD also has specified that contractors must roll the rubblized surfaces with a 10-ton vibratory roller to consolidate the rubblized PCC for paving.



Arkansas road work crews use stringline to double-check thickness, grade, and slope of the laydown of coarse first layer—or base course—of ACHM. Each successive layer uses more finely crushed aggregate.

In addition, use of stringline was found to be important in ensuring successful paving. When crews profile the PCC and then rubblize, the old PCC expands, but not uniformly. Stringline profiles based on the old PCC profile do not provide the proper thickness for the new surface. AHTD found the answer in a base-mix formula of a 1.5-inch top-size virgin aggregate from a state quarry, a binder mix with a 1-inch top size, and a surface mix of a 0.5-inch top size. Portable asphalt plants often are set up close to a job and the asphalt may be compacted with two double-drum vibratory rollers.

AHTD contracts also offer smoothness incentives of up to 3 percent and disincentives of up to 4 percent of the surface cost by measuring the accumulation of surface irregularities. Contractors use a profilograph not only on the finished surface but on every lift. This identifies any problem areas early, to be dealt with immediately.

AHTD also has incorporated roadway safety measures that were not available when the original Inter-

states were built. Rumble strips, reflective pavement striping designed to be visible under rainy conditions, and plowable reflectors have brought the new roadways in line with current best practices.

However, rubblization was not the answer to all of Arkansas' Interstate rehabilitation needs. In many locations, the subsurface conditions necessitated either a full-depth reconstruction or a complete redesign of the roadway. Concrete reconstruction was the best solution. Because research has played a key role in determining the best processes and materials for different conditions, drivers in Arkansas are on the way to smoother motoring.

Excellence in Communications

To communicate with the public about this massive project, AHTD turned again to a best-practice model. The highway commissioners decided that hiring a communications expert would extend resources as well as ensure expertise. A full-service marketing and business communications firm came on board early in the planning.

“Having a communications partner to plan, guide, and implement the huge public education and media relations component of this campaign was a must,” Flowers observes. “This part of the overall program is another sure model for other states.”

The communications firm began with a survey, discovering that the public rated its own level of knowledge about the upcoming project most often as “little” or “none.” The other important finding was that most of the respondents constituted what professional communicators term a nontraditional audience.

How can the message reach such a diverse audience? Moreover, how can the message reach those already on the road who suddenly and unexpectedly encounter a construction zone? The challenge was twofold: how to communicate with an audience planning a trip and how to reach those already en route.

With the help of an advisory board of municipal, hospitality, emergency management, and business leaders from around the state, AHTD staff and the media consultant developed a multilevel campaign called “Pave the Way.” The campaign has received national awards for its creative format that offers information and safety tips, and for its innovative methods of reaching audiences.

Advisory board members included representatives from such diverse groups as the Arkansas State Chamber of Commerce, the Arkansas Trucking Association, and the travel and tourism sectors. The board members not only provided input but also distributed the messages to their constituencies and beyond through publications and presentations.





Drainage pipes installed along edge of the Interstate collect and remove water that soaks into pavement layers; renewed attention to underdrain materials, design, and inspection is preventing problems caused by temperature fluctuations.

The campaign message interweaves practical safety information with an emphatic subtheme of “Think Ahead.” The campaign encourages drivers to think seconds and minutes ahead—when approaching and navigating work zones; hours ahead—by learning about construction locations before traveling; and years ahead—to some of the best Interstates in the country.

A website was developed for drivers planning a trip or seeking the most up-to-date roadway information (www.ArkansasInterstates.com). The user-friendly website offers information such as recent travel times between major cities, as well as printable maps indicating active construction zones and lane closures.

Users also can download information from a resource center with everything from printed materials, web-link graphics, and ready-to-use newsletter articles, logos, and graphics. A regularly updated press room page serves the media with easy-to-access updates and photos.

An electronic newsletter is sent out every month via fax or e-mail to all who request it. The IRP Advisory Board, Tourist Information Centers, and other partners in the AHTD Pave the Way advocacy team distribute the information and keep contacts informed through brochures, posters, and collateral materials. Humorous radio spots also have attracted interest.

The public information campaign reaches motorists already behind the wheel with radio spots, electronic and standard roadside signs, highway advisory radio (HAR), and intelligent transportation systems reports of real-time conditions via AM radio. A statewide network of 12-by-24-foot roadside signs announces, “There’s a Whole Lot of Paving Going On,” and informs drivers to tune the car radio to one of eight Pave the Way HAR stations for an overview of what to expect on the Interstate.

In heavily populated areas, AHTD’s roving Motorist Assistance Patrol performs a frontline public relations function, moving disabled vehicles safely off the roadway to keep traffic flowing. Helping stranded motorists call for help, arrange for a tow, replenish fuel, change tires, restart vehicles, extinguish fires, or render first aid are all a part of keeping Interstate motorists safely on their way.

Accolades and Kudos

Documenting results is one of AHTD’s best practices and is vital to research. The consultant tracks all media involvement; the reports on media coverage since the campaign’s launch in April 2001 include the following:

- ◆ More than 2,500 inches of print in newspapers statewide, with more than 21 IRP stories in Arkansas’ largest newspaper, which has a circulation of 189,000 readers.

- ◆ More than 1 hour of television coverage statewide with stories ranging from the launch of the Pave the Way campaign to the opening of construction zones.

- ◆ More than 4,000 subscribers to the monthly *Interstate Update* electronic newsletter.

- ◆ More than 260 inches of coverage in specialty publications, from *The Trucker* to the *Governor’s Electronic Newsletter*.

- ◆ More than 90,000 visits to the AHTD Pave the Way website.

- ◆ Many website stories and links to information partners, including the websites of television stations.

- ◆ Favorable airing of radio spots through the Arkansas Broadcasters Association’s Nonsustaining Commercial Announcement Program.

National and regional awards have confirmed that the program is progressive, innovative, and results-oriented. The campaign and its components have received such national recognition as

- ◆ An International Roadway Work Zone Safety Awareness Award from the American Road and Transportation Builders Association (ARTBA) and the National Safety Council;

- ◆ A first-place Public Affairs Skills Award from the American Association of State Highway and Transportation Officials (AASHTO) for three public-service radio announcements;

- ◆ Website of the Day chosen by *Transportation Communications Newsletter*, a national electronic publication sponsored by Yahoo! Groups; and

- ◆ ARTBA’s annual Pride in Transportation Construction Award.

The campaign also fared well in nontransportation industry contests: Pave the Way has received a Bronze Quill Award of Excellence from the International Association of Business Communicators and a Prism Award from the Public Relations Society of America in the category of statewide public affairs campaigns. In December 2001, the AASHTO President’s Award for Highway Safety recognized Pave the Way as the “best of the best” nationwide in highway department communications.

With requests for assistance continuing from other states and with experience as cosponsor with FHWA of a national conference on rubblization, AHTD officials are eager to share the knowledge gained from the program. For more information about the Arkansas IRP or the Pave The Way campaign, visit the website (www.ArkansasInterstates.com) or contact the AHTD Public Affairs Office, 501-569-2227.