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Maintaining Louisiana's Off-System Bridges

Louisiana's public roads include approximately 13,500 bridges that are more than 20 feet long. Over 5,500 of these bridges are not in the state-maintained highway system and are commonly referred to as off-system bridges. Maintenance and interim inspection of these off-system bridges fall to the bridge owner which, in most cases, is the parish. In accordance with a 1978 change to the Federal–Aid Highway Act, off-system bridges are now included in the joint State / Federal Bridge Replacement Program and are therefore subject

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Cost-Effective Asphalt Pavement Preservation - By Carl Rascoe

Pavement managers are all familiar with the citizen complaints about "bad" streets and the challenges and factors that contribute to a deteriorated pavement network: load, temperature, and water; work force turnover; and equipment breakdowns, among others.

One solution to the problem is a pavement preservation program—a planned strategy of cost-effective treatments that preserves an existing roadway system, retards future deterioration, and maintains or improves the functional conditions of the system. The key words in this definition are "cost-effective" and "preserves." The best repair may not always be the one that returns the pavement to its original condition.

Therefore it is important to focus on the cost-effectiveness of proposed treatments. What makes a treatment cost-effective? It must yield the lowest cost per original volume of damage over a specified life when all factors—materials, equipment, and manpower—are combined. In other words, the most cost-effective treatment is the one that provides "the most bang for the buck." As with other maintenance procedures, one size does not fit all. Local conditions, materials, weather, and experience all have an impact on the cost-effectiveness of any given procedure. Let's look at an example.

Suppose we have 100 square feet of potholes to repair. There are many materials (cold-mix, modified cold-mix, HMA, etc.); techniques (throw and roll, spray injection, semi-permanent, etc.); and labor skill sets to

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A LOCAL TECHNICAL ASSISTANCE PROGRAM OF THE LOUISIANA TRANSPORTATION RESEARCH CENTER IN COOPERATION WITH LADOTD, FHWA, AND LSU.

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to the same stringent maintenance and inspection standards as the "on-system" bridges for which the state is responsible.

All parishes in Louisiana have at least one off-system bridge. Caddo and East Baton Rouge Parishes each have the most off-system bridges, with 297 and 270 bridges, respectively. Jefferson, Calcasieu, and Rapides Parishes have over 200 bridges maintained directly by the parish, and another 20 parishes have over 100 bridges. St. John the Baptist, St. Charles, and St. James Parishes are primarily responsible for the fewest off-system bridges, with three or fewer bridges each.

With the 1978 federal law change, LADOTD began inspecting all bridges on all public roads, regardless of their system status. Since the initial inspections, LADOTD has inspected all bridges in the state at least every two years. LADOTD keeps the inspection reports on file and sends them to the respective bridge owners. The bridge owner is then responsible for correcting deficiencies as well as performing more frequent, interim inspections that are mandated if a bridge is found to be deficient or requiring load limitation posting.

LADOTD has found over 2,700 of these off-system bridges to be deficient or load-posted, requiring interim inspections, repair, or replacement. Over 1,320 of these bridges qualify for replacement under the State / Federal Bridge Replacement Program, and nearly 400 are in the design phase with estimated construction costs of nearly $100 million.

In 1987, LADOTD reiterated eligibility requirements for parish participation in the joint State / Federal Bridge Replacement Program as set forth in federal regulations. While LADOTD satisfied all of the requirements initially for all bridges, the active participation of the off-system bridge owners is required.

In an October 1987 letter, LADOTD issued a detailed policy to ensure continued successful participation in the State / Federal Bridge Replacement Program. The policy includes certification by the parishes that all requirements are being fulfilled. The requirements for off-system bridge owners include:

- Bridge inventory verification
- Interim inspections of deficient and / or load-rated bridges
- Review of load capacity analysis on timber bridges and engineering analysis of other structures
- Maintenance of load posting signs
- Consideration of repairs to improve structural capacity
- Maintenance of the computerized data base by LADOTD for submittal to the FHWA.

In an effort to ensure that the requirements to maintain a safe and effective bridge system are fulfilled, each LADOTD district conducts an annual meeting with the parish representatives to review the bridge inventory and the status of each bridge. The inspection schedule for the next year is verified at that time, and maintenance and repair alternatives are discussed.

For local information about the DOTD off-system bridge program, contact Simone Ardoin, Program Manager, LADOTD Off-System Bridge Replacement and Rehabilitation Program at (225) 379-1338. Also, visit the FHWA's Office of Bridge Technology at www.fhwa.dot.gov/bridge. This web site is replete with results of recent projects and examples of research application.

LPESA Spring Seminar Convenes in Crowley

Over 50 parish representatives and public works employees recently attended the Louisiana Parish Engineer and Supervisor Association (LPESA) Spring Seminar. The Acadia Parish Cooperative Extension Service Building in Crowley hosted the event May 26 - 27.

Acadia Parish Police Jury president Cecilia Broussard welcomed the group by thanking them for the work they do to support Louisiana's infrastructure. She also expressed her support for Robert Bergeaux, President of LPESA and Acadia Parish's Road Superintendent.

The many educational offerings included roadway safety, traffic control device assistance, Army Corps of Engineer permitting requirements, mosquito and roadside vegetation management, and an update on legislative issues affecting the parishes and municipalities. The LPESA Board and membership extends a warm "thank-you" to seminar sponsors Nortrax South and the Acadia Parish Police Jury for their hospitality.

LPESA will hold its next seminar September 29 - 30, 2004, in Ruston. Seminar topics include culvert installation, highway traffic data, seal coats for pavement preservation and other pertinent subjects. Call Marie Walsh at (225) 767-9184 for more information.

Mark Your Calendar

CONVENTION / CONFERENCES

67th LA Municipal Association Convention
Cajun Dome Converntion Center-Lafayette
(August 12 - 14)

LA Parish Engineer and Supervisor Association Fall Conference
Ruston Library (September 29 - 30)

LTRC Pavement Conference
Holiday Inn Select (formerly the Radisson)
(October 6 - 7)

ROAD SCHOLAR COURSE #4 - Work Zone Safety
Jefferson Parish - September 8
Slidell - September 9
Alexandria - September 14
Bossier City - September 15
Sulphur / Lake Charles - September 21
Lafayette - September 22
Ruston - September 28

SPECIAL INTEREST

LA One Call "Diggers Night Out"
- Monroe-September 14 - University of LA at Monroe
- Lake Charles - September 30 - Isle of Capri
- Denham Springs - October 6 - North Park Rec. Center
- Shreveport - October 12 - Location TBA

National "Put the Brakes on Fatalities Day"
(October 10)
The goal of the Day is to heighten consciousness about what people can do - and what official steps they should support - to reduce transportation fatalities. For more information visit the website - http://www.brakesonfatalities.org.

Employee Performance Appraisals

Many of us work in organizations that require some type of formal annual employee evaluation or performance appraisal. In some cases, a signature on a form indicating "satisfactory" performance is all that is necessary. Giving an employee an "unsatisfactory" rating usually results in additional required documentation and action by the supervisor.

In other organizations, supervisors must conduct yearly performance appraisals with each employee. Supervisors and employees often dread these meetings and view them negatively. However, with proper planning and a realization that the actual meeting is just one part of an ongoing communication process, both supervisors and employees can use these meetings to their advantage. The key to a positive and constructive meeting is that there should be NO SURPRISES. Clearly defined expectations, goals, and standards help ensure that employees know what they will be judged upon. Regular performance feedback from supervisors with an opportunity for input from employees should occur routinely, not just once a year. Employees should know whether they are struggling or excelling through regular communication with supervisors—evaluation results should not be a surprise.

Steps in the performance management and appraisal process generally include:

- Clearly define the job by describing what an employee is really supposed to do.
- Communicate the job and performance expectations to the employee. Make sure they understand their responsibilities and include "how," "when," and "why" if possible.
- Conduct ongoing observation and evaluation of work performance. Remember that an "annual" evaluation covers the entire rating period.
- Provide informal and ongoing feedback. The benefits of ongoing communication and feedback are extensive. Don't miss the opportunity to catch your employees doing something right or encourage performance improvement.
- Document feedback and plans for improvement. Who can remember a whole year's worth of events? Collect work samples, consider a performance log, keep supervisor's notes, etc. Just be sure what you do for one employee, you do for all.
- Plan for the annual meeting. Be assured the employee is taking the meeting seriously and is looking to you for leadership.
- Follow agency policy and document the process using the appropriate forms.
- Conduct the performance appraisal meeting. Be objective, honest, and consistent. Focus on behavior, not on attitude or personalities. Be open to employee feedback about your role as a supervisor.
- Follow-up. Provide input and feedback to employees about their progress towards the goals set during the process. Communicate expectations as necessary as well as any changes.

Obviously, these steps and activities cannot be accomplished in a single yearly or monthly meeting. Rather, they are part of the ongoing process of communication and performance management between supervisors and employees.

When you use this process to your advantage, you can stop dreading these meetings and look forward to them as an effective communication tool.

Ideas to Action

Priority, Market-Ready Technology, and Innovation

Rumble Strips

Many of us have strayed over raised or grooved strips along the side of the road while driving. Hopefully, the resulting noise and physical vibration roused us from our fatigue or distraction to keep us on the road. These raised or grooved patterns, known as rumble strips, have proven to be a very effective way to alert drowsy or inattentive drivers.

Roadway departure fatalities, which include run-off-the-road (ROR) and head-on fatalities, are a serious problem in the United States. In 2001, there were 23,205 roadway departure fatalities, accounting for 55 percent of all roadway fatalities in the United States. There were an additional 740,000 roadway departure injuries. So what do these statistics mean? One roadway departure fatality crash takes place every 26 minutes and a roadway departure injury crash occurs every 43 seconds! Seventy percent of ROR fatalities occur on rural highways and about 90 percent happen on two-lane roads. Contributing factors include driver fatigue and drowsiness as well as inclement weather.

Many studies have shown very high benefit-to-cost ratios for shoulder rumble strips, making them more cost-effective than other safety features like guardrails, culvert-end treatments, and flattened slopes. The most common type of strip is the continuous shoulder rumble strip that prevents roadway departure crashes on expressways, interstates, parkways, and two-lane rural roads. Centerline rumble strips are used on some two-lane roads to prevent head-on collisions; transverse strips are installed on approaches to intersections, toll plazas, horizontal curves, etc.

The cost-effective benefits of rumble strips include:

- A reduction in ROR crashes caused by driver inattention, driver error, visibility or fatigue
- Low cost to install
- No noticeable pavement degradation
- Little or no required maintenance
- Can be installed on new or existing pavements (milled rumble strips)

Find out more about rumble strips at the FHWA Rumble Strip web site at http://safety.fhwa.dot.gov/programs/rumble.htm, and view the Technical Advisory for Roadway Shoulder Rumble Strips at www.fhwa.dot.gov/legsregs/directives/techadvs/t504035.htm. For more information, contact Richard Powers, FHWA Office of Safety Design, (202) 366-1320.

References and Resources

Take a Look

Erosion Control for Local Roads

The Minnesota Local Technical Assistance Program, in association with the FHWA, the Minnesota Department of Transportation, and the Minnesota Local Road Research Board, has developed the Erosion Control Handbook. This manual assists parishes and local governments by providing guidance and methods for effective erosion control practices on low volume roads. It provides information on maintenance activities, and case studies outline best management practices. This excellent handbook is available on the Minnesota LTAP website at http://www.mnltap.umn.edu/pdf/erosioncontrolhandbook.pdf or from the LTAP Center.

OSHA Quick Takes

OSHA Quick Takes is a bi-weekly e-news memo with information, updates, and results about safety and health in America's workplaces. Topics focus on practical issues in the American workplace. One recent safety and health bulletin highlighted the dangers and hazards associated with small tire repair. Hazards while Servicing Light Truck, Automobile, and other Small Tires was designed for service station and other tire repair shops. OSHA's Hartford, CT, area office has investigated numerous serious injuries and one fatality that occurred during the repair of small tires. Most incidents have occurred when workers attempt to service mismatched tires and rims. The bulletin describes the most prevalent hazards found in this line of work and offers recommendations to ensure safe tire servicing procedures are followed. Subscribe to OSHA Quick Takes at www.osha.gov.

Driver Education Work Zone Awareness Program

The Illinois Technology Transfer Program and Bureau of Local Roads and Streets recently made available a "turn-key" training package titled "Driver Education Work Zone Awareness Program." The program was developed by the Illinois Department of Transportation's Bureau of Operations in association with the American Traffic Safety Services Association and the Virginia Department of Transportation. This presentation was sent to every Illinois high school's driver education program to make new drivers aware of dangers in highway work zones.

A CD-ROM contains all the information needed to teach the Driver Education Work Zone Awareness program and includes a PowerPoint presentation complete with instructor notes. Other training aids include:

- An introduction to the program
- A student assessment pre-test and answer key
- "A Sudden Change of Plans" video
- "Scholarship Award Speech" video with a personal testimony of a victim's daughter
- "The Pact," a student agreement to drive safely through work zones
- Student roster
- Student certificate

While geared to the younger driver, the course provides an excellent overview of the responsibilities motorists of all ages face while driving in work zones and compelling stories of the consequences of not practicing safe driving habits.

Sign Installation Guide

LTAP has a number of copies of the US Forest Service's excellent publication, "Sign Installation Guide," available upon request. The handbook includes guidelines for typical sign installations on low-volume rural roads. The guide, published in July 2003, is a quick reference in a format that is easy-to-read and use. Call LTAP for your free copy.

Tech Brief - A Review of the Signalized Intersections: Informational Guide

LTAP has multiple copies of the Review of Signalized Intersections: Informational Guide published by the Turner-Fairbank Highway Research Center in April 2004. The short guide is a synopsis of the comprehensive final publication on the study and contains examples of novel treatments and best practices used by jurisdictions across the United States. These treatments include low-cost measures such as improved signal timing and signs, and high-cost measures such as intersection reconstruction or grade separation. Call now for your copy. For more information on intersection safety, check out www.tfhrc.gov/safety/intersect.htm.

Geometric Design Consistency on High-Speed Rural Two-Lane Roadways

TRB's National Cooperative Highway Research Program (NCHRP) Report 502: Geometric Design Consistency on High-Speed Rural Two-Lane Roadways is now available. The report presents rules on geometric design consistency suitable for use in an expert system such as the Interactive Highway Safety Design Model (IHSDM). The rules can also be used to evaluate roadway designs or to conduct reviews of existing roadways, thus improving design, consistency, and safety. View this report at http://gulliver.trb.org/publications/nchrp/nchrp_rpt_502.pdf or order through TRB online at http://www.national-academies.org/trb/bookstore.

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choose from. How do we choose the best combination? The figure used by many agencies is the Cost per Original Pothole Volume (COPV). The COPV is simply the cost of the patching operation multiplied by the ratio of the analysis period divided by the patch survival rate. The patch survival rate, or how long the patch lasts, needs to be determined by each local agency for their conditions.

In our example, one operation could be local cold mix used with semi-permanent patching and a seven-man crew. The patch survival rate is 36 months, and the analysis period is 36 months. Leaving out a number of details, we calculate the COPV to be $1,660/ft^2. A second option could be a modified cold mix used with the throw and roll technique and a two-man crew. The patch survival rate is 24 months, and the analysis period is 36 months. Using local cost we find that the COPV is $471/ft^2.

Therefore, under these circumstances, the second option is more cost-effective, but conventional wisdom may have led us to choose the first option. Remember that these results are specific to costs and survival rates for your agency. You can find a full description of this cost analysis in the Federal Highway Administration, Manual of Practice, 1999, which can be downloaded at http://www.tfhrc.gov/pavement/ltpp/mofpract.htm.

From the previous example, we see the COPV is dependent upon the survival rate of the patch. So how do we ensure that the survival rate is maximized? This is a function of not only equipment and materials but also the quality of work. The quality of work can be maximized by providing timely and current training for the crews performing the work. Utilize LTAP courses and their library of videos along with the manuals of practice mentioned earlier to help train motivated work crews.

Carl Rascoe is employed by Applied Research Associates in Vicksburg, MS. He has over 25 years of experience in the asphalt industry and is a popular trainer on pavement management systems. He is active in the Transportation Research Board and a member of ASCE and APWA. He currently chairs the ASTM committee on pavement management.

LTAP was fortunate to have Carl serve as the instructor of the LTAP Roads Scholar Courses "Asphalt Roads: Common Maintenance Problems" and "Asphalt Roads: Surface Treatments" conducted in May 2004. Over 350 people participated in the classes that were held at eight locations around the state.

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The Louisiana Local Technical Assistance Program was established at the Louisiana Transportation Research Center on the LSU campus in 1986. The purpose of the center is to provide technical materials, information, and training to help local government agencies in Louisiana maintain and improve their roads and bridges in a cost-effective manner. To accomplish this purpose, we:

- publish a quarterly newsletter,
- conduct seminars, workshops, and mini-workshops covering various aspects of transportation,
- provide a lending library service of audio/visual programs on a variety of transportation topics,
- provide technical assistance through phone and mail-in requests relating to transportation technology,
- and undertake special projects of interest to municipalities in Louisiana.

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