Warming Up to Warm-Mix

Fuel savings, better working conditions, environmental benefits, and FHWA advocacy are just a few reasons to consider warm-mix asphalt for paving projects.

It’s a bird! It’s a plane! It’s warm-mix asphalt!

It’s not Superman, but as far as road-building technologies go, warm-mix asphalt (WMA) has taken off at lightning speed. Less than a decade ago, the first test section of WMA was laid in the United States. Today, more than 45 million tons of WMA are produced in the U.S. each year, and all but three state DOTs adopted specifications allowing WMA to be used on projects in 2011.

The Benefits of WMA

One look at its long list of benefits and the reason for WMA’s rapid adoption is clear. According to the Federal Highway Administration (FHWA), these benefits include:

• **Reduce paving costs**
  WMA is produced at temperatures 30 to 120 degrees Fahrenheit lower than traditional hot-mix asphalt. Because less energy is needed to heat the asphalt mix, less fuel is needed to produce WMA. In fact, fuel consumption during WMA manufacturing is typically reduced by 20 percent.

• **Extend the paving season**
  Cold temperatures negatively affect hot-mix asphalt, limiting the times of the year pavement projects can occur. WMA cools more slowly, so it can be successfully placed at lower temperatures—extending the paving season and making night paving more feasible.

• **Improve asphalt compaction**
  Proper compaction is essential for good pavement performance. WMA is easier to compact, helping to achieve proper density and improve performance.

• **Better working conditions**
  Working conditions are much healthier with WMA at both the plant and the construction site because workers inhale far less smoke and dust and benefit from the lower temperatures.

• **Environmental benefits**
  WMA produces fewer emissions, which is good for the environment and can also make paving possible on “non-attainment” days in areas with air quality issues.

continued on page 5
Indiana LTAP has Moved!

On June 25th, Indiana LTAP moved into the Purdue Technology Center, located in the Purdue Research Park of West Lafayette. This switch gives the team access to facilities in the other three Purdue Research Parks across Indiana and puts them in proximity with other Purdue civil engineering groups. Indiana LTAP appreciates this opportunity to create a transportation synergy with these teams as well as access increased resources to better serve local agencies across Indiana!

Indiana LTAP’s new address is:
3000 Kent Avenue
Suite C2-118
West Lafayette, IN 47906

Scan the QR Code to the right with your smartphone to receive an Outlook contact with the updated address.

Where are the LPA Links?

Last fall, when the Indiana LTAP website was redesigned, all LPA links were moved to a page of their own for a one-stop resource. To find this page, simply select the far right tab on the menu bar, “LPA Certification.” (Note: Be sure to reset any bookmarks to the previous page to this new link.)

This page contains the registration forms for the upcoming LPA certification events, as well as session agendas and the most recent updates to INDOT’s LPA Guidance Document and Training Slides. For anyone who needs a list of current and past LPA certifications and their expiration dates, the LPA Database contains a list of those who have attended sessions. It is available in Microsoft Excel format and is presorted by agency name, certification date, or attendees’ names.

The Indiana LTAP homepage can be found at www.purdue.edu/iltap.
Every agency wants durable and long lasting concrete, especially for bridge decks, which are susceptible to premature cracking and corrosion of the reinforcing steel. To increase the durability and service life of concrete, many transportation agencies turn to high-strength concretes. However, high-strength concretes often encounter early age cracking due to shrinkage. These cracks can then open a path for chloride ions (found in road salts) to reach the reinforcing steel.

The results of a recent research project supported by Indiana LTAP, however, indicate that internally cured concrete presents a better alternative for durable bridge decks. Traditionally, water is placed on the surface of concrete after it is poured to provide hydration as the concrete cures. With internally cured concrete, a portion of the fine aggregate in the concrete is replaced with the same volume of prewetted lightweight aggregate. As the concrete cures, water from the prewetted aggregate provides the hydration necessary for curing, and also enables the concrete to cure from the inside. This internal curing process results in a concrete with less shrinkage, lower thermal stress, lower strain, and greater resistance to chloride ion penetration.

Bridge decks on two structures in Monroe County, Indiana, were built in 2010. The first bridge used traditional plain concrete, and the second bridge used internally cured concrete. The plain concrete bridge deck exhibited early cracking, including both longitudinal and transverse cracks, whereas the internally cured concrete deck had no visible cracks. Numerous lab tests confirm the superior performance for the internally cured concrete. Overall, the internally cured concrete resulted in less cracking initially, higher strength, and higher predicted service life.

The researchers would like to express their appreciation to the people of Monroe County, the construction contractors, the engineering consultants, and the material supplier for their assistance in this project.

For more information, you can download the full report from the LTAP website. (Homepage: rebar.ecn.purdue.edu/ltap, then click Resources/General Publications/Bridge.) Or, use this shortcut: bit.ly/ICconcrete.

Additional information can also be found on the National Institute of Standards and Technology website (www.nist.gov/publication-portal.cfm, search “Internal Curing: A 2010 State-of-the-Art Review”).

The compressive strength for the internally-cured concrete surpassed the plain concrete’s strength.
July 9, 2012

Dear Local Public Agency and Consultant Partners,

I write to inform you of a recent Indiana Supreme Court opinion that may impact some of your trail projects.

On March 20, 2012 the Court issued an opinion (Howard vs. U.S.) regarding the use of easements for the purpose of trail projects.

We encourage you to have your own legal counsel read the opinion, but we read the Court to say that if a railroad holds an easement for the purpose of operating a rail line, a public trail is not within the scope of such an easement. This is true even if the rail line is “railbanked” under federal law for interim trail use. Transformation from rail use to trail use, according to the Indiana Supreme Court, is not permitted because the trail purpose (recreation) is too different from the purpose of the original rail use (transportation.)

The Federal Highway Administration requires INDOT to submit a right of way certification for trails in which federal funds are used. To avoid and eliminate right of way certification problems, INDOT is instructing LPAs with active trail projects currently in development to follow the instructions below:

- If your trail project is located on a railroad easement, even if that easement is railbanked, the trail right-of-way must be purchased from land owner(s) in accordance with federal and state laws as described in INDOT’s various manuals including: Appraisal Manual, Buying Manual, Relocation Manual, Property Management Manual and INDOT’s Right-of-Way Engineering Manual.

- Once purchased, the right-of-way must be certified as described in the above noted manuals and the LPA Guidance Document.

The staff at INDOT understands this court ruling may change project schedules and costs. We are committed to working with you to promote the best possible outcomes within the constraints of this recent determination and all other applicable laws and regulations.

If you have questions regarding how this recent determination may impact your project, please contact your INDOT District Local Program Coordinator.

Sincerely,

Audra Blasdel
INDOT Director LPA/MPO and Grants Administration
The Federal Push for WMA
The FHWA has been a strong advocate for the increased use of WMA across the nation, naming WMA as one of its five “accelerated technologies” in its Every Day Counts initiative. “We looked at dozens of technologies before selecting these five,” said FHWA Deputy Administrator Greg Nadeau.1 “The main thing that distinguished these technologies is they make a difference in helping us reach the ultimate Every Day Counts goal of being better, faster, and smarter.”

With this strong national backing, the misconceptions surrounding WMA are beginning to disappear—but a few still linger. “In the past people have worried that because we’re not heating the mix as much the performance might not be as good, but that’s not the case,” says National Center for Asphalt Technology at Auburn University Director Emeritus Dr. Ray Brown. “In fact, it’s often easier to compact WMA because it doesn’t cool as quickly.”

Warming Up to Warm-Mix, continued from page 1

What is Warm-Mix Asphalt?
Warm-mix asphalt—known as WMA—is a set of asphalt technologies that allow asphalt to be mixed and placed on the road at temperatures 30 to 120 degrees Fahrenheit lower than traditional hot-mix asphalt. Methods for manufacturing warm-mix asphalt include water-foaming technologies and chemical additives. Both methods increase the workability of asphalt, allowing it to be produced at lower temperatures.

Using WMA on Local Jobs
According to Andrewski, the easiest way for local highway departments to begin using WMA on their projects is to cite the INDOT specification in their requests for proposals; this gives the contractor the option of using either warm-mix or hot-mix asphalt. Often, contractors will eagerly accept the invitation to use WMA. “In many states, the contractors have pushed for WMA more than anyone else because it saves fuel during the production process and provides better working conditions for their employees,” says Brown.

Local highway departments who purchase asphalt from a supplier to place themselves also have the option of using WMA, but should be aware that there is a slight learning curve. “Remember not to be alarmed when you’re rolling it and you see a lower temperature, such as 240 degrees instead of 300 degrees,” says Andrewski.

With its many benefits and relative ease of adoption, it’s clear to see why local transportation agencies across the country are warming up to the idea of warm-mix asphalt. By simply taking advantage of the many WMA resources and making small adjustments to internal processes, the benefits of WMA are within easy reach.

Additional Resources
Warm Mix Asphalt Technical Working Group
A partnership between FHWA and other transportation organizations www.WarmMixAsphalt.com

Every Day Counts
FHWA’s transportation initiative www.fhwa.dot.gov/everydaycounts

Asphalt Pavement Association of Indiana
www.asphaltindiana.org

Megan Tsai is a freelance writer specializing in transportation and engineering. Learn more at www.redwagonwriting.com.

Going, Going . . . Let’s Hope It’s Not Gone!

Why Transportation Asset Management Should be on Your Agency’s Agenda

By Terry McNinch, Keweenaw Technologies, LLC

No doubt about it, these are challenging times for local agency public works. Streets and highways appear to be in much worse condition than they were even just 20 years ago. There simply doesn’t seem to be enough transportation funding to go around. And to make matters worse, the public thinks that the hundreds of millions of transportation dollars that are being spent aren’t being spent efficiently, and the decision-making process isn’t transparent nor above-the-board. What’s a county, city, or town to do?

As complex as this situation is, it might be helpful to break it down and tackle individual aspects of the situation, rather than trying to solve the whole problem at once. Let’s go back to where this all started.

Our Crumbling Streets and Highways—Whose Fault is It?

During the 1960s and 70s, a significant portion of our national gross domestic product (GDP) was devoted to creating a transportation system unlike any that ever existed before. The Interstate Highway System was built. The National Highway System came into being. And 3 million miles of local roads were upgraded or improved. This expansion of transportation infrastructure throughout the U.S. surely paved the way for the economic growth that resulted over the next 40 years.

It was a transportation legacy paid for and given to us by our parents and grandparents. What did we do with that legacy? We took advantage of it by using it to create a level of prosperity never seen before—and then either forgot or intentionally didn’t replace it. Now we wonder how things got so bad. (Wake-Up-Call: China and India are making huge investments in transportation right now.)

Today we spend billions of dollars on transportation infrastructure. Although costs have increased and inflation has taken its toll, that amount is still a relative fraction of the original investment when compared to today’s GDP. We spend the majority of today’s money on reconstruction or heavy rehabilitation (the most costly fixes) of the worst roads—while tossing a relatively few crumbs for minimal maintenance activities (the most cost effective fixes) for the roads that are in fair or good condition. That is called the “worst first” approach, and it’s running our street and highway network into the ground and taking public works agencies with it. (Wake-Up Call: The first rule of holes. When you find yourself in a hole, stop digging.) There is more than enough blame to go around. Everyone shares some part of it. It’s time to stop digging and do something different.

A Solution: Local Agencies Applying the Concepts of Transportation Asset Management

I know, I know! Right now some of you are saying, “Not more of that management system stuff, I thought we got over that.” It’s a common response. But you know, if agencies had jumped on the management system bandwagon when it was mandated back in 1991 as part of the Intermodal Surface Transportation Efficiency Act (ISTEA) federal transportation legislation, we would be 20 years into the solution and probably wouldn’t be staring at such a monumental problem.

The management systems that were considered back in the early 1990s are now being referred to in total as transportation asset management (TAM). In a nutshell, TAM means: (a) know what you own, (b) know what condition it’s in, and (c) develop a strategy of invest-
In a nutshell, Transportation Asset Management means: know what you own, know what condition it’s in, and develop a strategy of investment to keep it in good condition.

Interested In Learning More?
Indiana LTAP hosted three workshops earlier this summer that covered how the concepts of transportation asset management apply to managing pavements. Plans are also in the works for Indiana LTAP to prepare and offer additional resources to help local agencies boost their inventory management. Stay tuned in the coming months for more details!

In the meantime, there is a growing bank of TAM resources for agencies to draw from as more respond to the need for efficient and cost-effective management of their transportation infrastructure. Below are some titles that are perfect for counties, cities, or towns to get started:

**The Asset Management Guide for Local Agencies in Michigan**, published by the Michigan Transportation Asset Management Council, was created with the sole intention of explaining the concepts of TAM in a way that is relevant to the local agency situation. Its 130 pages are packed with information that any local agency can use.

**The Asset Management Primer**, a 30-page booklet published by the Federal Highway Administration, provides a broad overview of how the concepts of asset management apply to transportation.

**Beyond the Short Term**, published by the Federal Highway Administration, takes a more in-depth look at how the application of transportation asset management is critical to the long-term sustainability and performance of our street, highway and bridge infrastructure, and how the TAM process also insures accountability to tax-payers.

**Local Communities Adopting Asset Management**, published by the Transportation Research Board in the September-October 2010 issue of TR News, explores the statewide initiatives in Michigan and Wisconsin that have encouraged local agencies to adopt an asset management approach in managing their paved roads and how these agencies have used these concepts to educate decision makers and stakeholders about the logic and common sense of a mix-of-fixes preservation strategy.

**Shortcuts to all the above resources, and more, can be found at:**

Terry McNinch is retired from the Michigan LTAP and the Center for Technology and Training, where he served as the director for 13 years. Over the past decade he was heavily involved in the statewide implementation of transportation asset management by local agencies in Michigan and is a member of the Transportation Research Board’s Committee on Transportation Asset Management. He now works as a consultant through his company Keweenaw Technologies, LLC, and was the key speaker in the Pavement Management workshops offered by Indiana LTAP. He can be reached by e-mail at terry.mcninch@gmail.com or by phone at 906-482-6737.

Indiana LTAP would like to extend thanks to both Terry McNinch and the Louisiana LTAP team for permission to reprint and adapt this article.
MUTCD Guidance: How Indiana LTAP Can Help Your Agency Fulfill the New Retroreflectivity Requirements

By FHWA Safety and Laura Slusher, HELPERS Project Manager

With the recent changes to the Manual on Uniform Traffic Control Devices (MUTCD) regulations on traffic sign quality—and the revisions to some of these requirements and compliance dates—questions have abounded regarding agency responsibilities for maintaining and replacing their sign inventory, as well as the time line for this work. Keep in mind that the goal of all these changes is to help traffic signs have better visibility, especially at night and for older drivers—which will provide better warnings and instructions for roadside travelers and, accordingly, boost traffic safety.

Read on for an excerpt from FHWA’s Safety website that offers further explanation of sign retroreflectivity definitions and regulations. On the next page, you’ll find information about Indiana LTAP’s available resources to help local agencies establish and maintain a healthy sign inventory. Know that you are not alone in your efforts to comply with MUTCD regulations!

Have a question that isn’t answered here? Additional information about MUTCD regulations and sign retroreflectivity can be found at http://safety.fhwa.dot.gov/roadway_dept/night_visib/signfaq.cfm.

What is retroreflectivity?
Retroreflectivity is a term that is synonymous with the coefficient of retroreflectance, which is formally defined in ASTM E808. In general terms, retroreflectivity describes the efficiency of a material to redirect light back to its source. This is a unique form of the more common diffuse reflection, whereby light is scattered in all directions after striking an object. Retroreflective materials are engineered to redirect most of the light back toward the source, which gives signs and pavement markings a brighter appearance at night from the driver’s perspective.

Motorists experience the benefits of retroreflectivity whenever light from their headlights shines on traffic signs. Signs made with retroreflective sheeting materials appear to glow in the dark, making them easier to see. The legends on retroreflective signs provide important information to motorists as they navigate the nation’s highways, streets, and roads at night.

What are the current requirements for sign retroreflectivity?
The 2009 MUTCD Section 2A.08, Maintaining Minimum Retroreflectivity, is current. That section did not change as a result of 2012 updates to the MUTCD. Only the compliance dates were revised.

Without compliance dates for replacing signs, when would signs identified through an agency’s assessment or management method as not meeting the minimum retroreflectivity levels need to be replaced?
Signs identified through an agency’s method as below the minimum established retroreflectivity levels have exhausted their useful service life and need to be replaced because they do not meet the needed function of being adequately visible at night. Similar to other occurrences of signs that are no longer serviceable, agencies are expected to prioritize replacement of these signs based on engineering considerations such as the relative importance of the sign to the safety of the road user, volumes and speed of nighttime traffic, and optimal use of limited resources, among others.

Signs that are no longer serviceable might demand a higher priority for replacement over other non-compliant signs that are replaced by systematic upgrading or routine maintenance schedules. Accordingly, it is expected that the use of the assessment or management method would serve to identify and program the replacement of signs that are found to or expected to be below the minimum retroreflectivity levels.

Note: The compliance date of June 13, 2014 applies only to the implementation and continued use of an assessment or management method that is designed to maintain regulatory and warning sign retroreflectivity at or above the minimum retroreflectivity levels. Agencies are expected to add signs other than regulatory or warning to their method as resources allow.

—FHWA Safety
So . . . What’s Next?

Local Agency Responsibilities

Per MUTCD requirements, your agency must select and practice both an assessment and management method. The different methods are briefly explained below. More detailed information about both the MUTCD requirements and assessment and management methods is available on the Indiana LTAP website (www.purdue.edu/INLTAP).

Review of Assessment Methods

Two available methods for assessing the quality of your agency’s current sign inventory include Visual Inspection and Retroreflectivity Measurement. See below for descriptions and examples of both processes.

Visual Inspection Method

The Visual Inspection Method relies on a visual inspection of signs at night to assess their compliance with the retroreflectivity requirements. The Visual Inspection Method includes three different procedures: consistent parameters, comparison signs, and calibration panels.

- **Consistent parameters** involve an inspector at least 60 years old assessing the signs at night. If the signs are bright enough to be detected and read by the inspector, then they are acceptable according to MUTCD regulations. If the signs are marginal, they should be scheduled for replacement. If the signs are not bright enough for the inspector to detect and read, they should be replaced as soon as possible.

- When using **comparison signs**, an inspector of any age views the calibration signs prior to conducting a night inspection. The inspector uses the visual appearance of the calibration sign to establish the evaluation threshold. If the signs are marginal, calibration panels are also used.

- **Calibration panels** are attached to signs with marginal retroreflectivity. The sign with attached panel(s) is viewed and compared by the inspector to determine if a sign passes or fails.

Retroreflectivity Measurement Method

The retroreflective levels of a sign are measured using a retroreflectometer. If the sign is below the minimum required level, it should be replaced.

A Trio of Management Methods

After your agency evaluates its existing inventory and determines which equipment needs to be replaced, you’ll then be expected to establish and maintain a plan for routine sign replacement. The following examples are all acceptable courses under MUTCD regulations:

- **Expected Sign Life**
  Signs are replaced at the end of their expected life.

- **Blanket Replacement**
  All signs in an area or of a given type are replaced at specified intervals.

- **Control Sign**
  Control signs are installed in a maintenance yard and monitored. When the control sign is at the end of its retroreflective life, the signs in the field represented by the control sign are replaced.

How Indiana LTAP Can Help

Indiana LTAP is here to assist your agency meet the MUTCD requirements for sign assessment and management by providing resources, equipment, and technical support. Indiana LTAP has many sign resources on our webpage that cover all aspects of the MUTCD requirements, including examples and templates. If your agency needs an inventory system, Sign Inventory Management (SIM) is a simple spreadsheet that can be downloaded from the Indiana LTAP’s website to keep track of the data that needs to be recorded for each sign on your road system. The SIM spreadsheet is adaptable for your own agency’s use if you would like to add or remove data fields. Instructions for how to modify the spreadsheet are included with it.

Indiana LTAP’s free equipment loan program has equipment available to assist your agency with assessment of your signs, including retroreflectometers and sign toolkits.

Two Road Vista 922 retroreflectometers are available to measure sign retroreflectivity as part of sign assessment. The retroreflectometers are simple to use and can record GPS location if you want to use your GIS system for your sign inventory.

If your agency is using the Visual Inspection Method, a sign toolkit with both calibration signs and comparison panels is also available for loan.

If you have any questions about signs in general, including selecting the appropriate signs and sign locations for your roadways, adding signs to increase safety, determining stop sign warrants or calculating curve advisory speeds, please contact the HELPERS engineer at 765-494-7038 or ltaphelpers@ecn.purdue.edu.

—Laura Slusher,
HELPERS Project Manager
This is the premier of a series highlighting best practices demonstrated by local municipalities across Indiana. The goal of these articles is provide a venue where local agencies can share success stories as they strive to improve the level of service offered to their communities.

Robert Young, Superintendent of the LaPorte County Highway Department, first gave the Roadpatcher a spin in 2008. While initially he had to convince himself that the machine was worth the investment, in the end, it was simple economics that secured his decision. Young faced the same bind common to many local transportation agencies in this struggling economy—trying to do more with less. Short five employees due to a hiring freeze and faced with an active string of requests year-round, Young needed to streamline his agency’s operations to provide the best road maintenance to his districts.

**A One-Man Band**
The LaPorte County Highway Department maintains over 1150 miles of county road across three districts, with over 1100 miles of their inventory being paved. Requests for road maintenance don’t stop when winter storms dump snow or summer rains tear down trees—but in the past, these situations were enough to push road care to the back burner. As Young considered how to achieve road maintenance on a regular basis with his existing workforce, the Roadpatcher became a convincing option. “The more I saw it, [the more I realized] there’s something to this,” he said.

For many years, LaPorte County handled its road maintenance with trailer-mounted spray injection patching units. These units, however, required Young to dedicate a crew of three or four to the process—two for operating the truck and hose, and an additional one or two to provide traffic control, since this model required crews to stand on the road—putting them in proximity with oncoming vehicles. The Roadpatcher, however, is a “one-man band,” according to Young. Computerized and operated by a single joystick, the machine is run by one driver who stays within the truck cab, off the road and out of the elements. Furthermore, the truck provides minimal disruption to traffic as it operates entirely within a single lane: pulling up to a damaged spot, extending the hose via an electric arm, repairing via the spray injection method, and smoothly rolling onto the next site. These nominal strains on personnel and traffic flow enable road maintenance to become a regular task for LaPorte County. Young pointed out that a recent rainstorm tore down 40 trees in his district. This emergency required most of his crew’s attention to resolve; however, with the Roadpatcher, he can “always spare one guy” to provide safe, quality roads for drivers.

“Whether it’s in the winter after a freeze-thaw cycle or during the height of construction season, we can perform pavement maintenance on the road network with little impact on our other operations.” Young reports that his crew has found that year-round maintenance with the Roadpatcher is a possibility, since its spray-injection method functions even in adverse weather. Furthermore, they’ve found the machine is capable of repairing not only potholes, but also pavement edge distress, alligator cracking, and damaged chip seal roads.

**High-Profile Results**
Increased work efficiency isn’t the only improvement Young has experienced with the Roadpatcher. The effectiveness of the spray-injection patching method has proven itself over the years, and Young is pleased with the quality and endurance of the process: “This stuff stays, if not forever, then times longer than cold patch.” Not only do these long-lasting replacements free his crew for other projects, but they also keep area residents satisfied with higher quality roads. In fact, the crew’s Roadpatcher has become a familiar and welcome sight on LaPorte County streets. “Everyone who sees it loves it!” Young said. “We
get calls thanking us for it and [letting us know] what a fine job that guy is doing.”

Young is also quick to share credit where it is due: “We wouldn’t have these without the commissioners and county council’s support for the idea of getting them and [securing] the funding.” In 2011, they aided his department in obtaining a second Roadpatcher to further increase the crew’s road maintenance capabilities. Young recognized that these leaders’ encouragement to procure advanced equipment plays a key role in providing the best service to their community. Way to go, LaPorte County!

For more information, contact Robert Young at 219-362-2051.

If your agency has a success story to share, please contact Rich Domonkos at rdomonko@purdue.edu or 765-494-4255.

A computer-control panel and joystick are a familiar and welcome site to today’s rising generation and enable workers of all ages to easily adjust to the machine. According to Young, after a day of training his crew was comfortable operating the truck.

The Roadpatcher operates entirely in a one traffic lane, allowing drivers to pass the machine while Young’s crew is at work.

The patcher is equipped with its own caution light, enhancing traffic safety as it warns oncoming cars of the need to slow down and move aside to pass the truck—and eliminating the need for workers to be on the road acting as their own safety agents.

The hose that distributes the patching mix is attached to a robotic arm that is controlled via the joystick—so there is no need for workers to stand on the road to operate the hose and no chance of the hose becoming bent and clogged during use.

The hose and arm also fold and compact neatly to the front of the truck for easy long-distance traveling.
Americans do more with a day than ever before. No longer confined by traditional nine to five thinking, for better or worse, we are looking to pack productivity into every waking moment, which has led many businesses to reconsider their hours. Even banks don’t operate under stereotypical “banking hours” anymore. In this age of 24-hour accessibility, Indiana’s cities, too, are responding to Hoosiers’ need for the great outdoors that isn’t dictated by the clock.

The Road Well Traveled By

In an effort to encourage healthy habits in Hoosiers, boost tourism, and increase Indiana’s ability to attract new businesses, the State, in cooperation with its cities, has been dedicated in its efforts to place a trail within 7.5 miles of every resident’s home. To date, Indiana has roughly 3,000 miles of trails within the state and nearly 100 percent connectivity throughout.

“ThisFinally, people are seeing that the No. 1 activity in the state is being able to have a safe place to walk and bike,” says Bob Bronson, section chief, Indiana Department of Natural Resources, Division of Outdoor Recreation. “They are realizing the benefits in a personal way, as a matter of health and economics. They are understanding that people move to areas because of green areas and trails … We’re trying to get everyone out and about and make outdoor healthy living accessible for everyone in Indiana,” he says.

As trails become more and more popular and usage grows, some cities are detecting a real need to expand trail accessibility beyond daylight hours for those residents who don’t have traditional working schedules or who have long commutes but would like to exercise outside before or after work.

Lighting the Way

“I’d say right now that 90 percent of our trails are not lighted and operate from dawn to dusk,” says Bronson. “But we are seeing more people who want to use trails around the clock, so that’s something that could be changing. There is a pretty strong movement to allow that to happen.”

In some areas, trail hours have already been expanded to provide for nighttime use, especially in the wintertime when it gets darker earlier.

“We do have some trails that are lit and use energy-efficient lighting,” says Bronson. “They are experimenting with the times to allow around-the-clock use for those people who do work until 11 p.m., for example, and need to exercise that late.”

The B-Line Trail, a 3.4-mile trail in Bloomington, is one of the lighted trails; another is the Cultural Trail in Indianapolis, which is lit for 16 miles and wraps around the downtown area, connecting main attractions. Both are expanding hours. If all goes well for these trails, other cities will, no doubt, follow suit.

“People want trails in their communities . . . Especially in the urban areas, people are on [the trails] and we need to make it easy for them to have the accessibility to being outdoors and to being healthy.”

—Bob Bronson
Section Chief,
Indiana Department of Natural Resources,
Division of Outdoor Recreation

A Sign of the Times: Improving Trail Safety and Accessibility

By Cindy Ratcliff

Indiana LTAP Newsletter, Summer 2012
On the Safe Side

One indicator of things going well will be maintaining the same safety records that the trails currently have, which indicates that being on the trails at night has not compromised the safety of those people using the trails.

“Currently, crime is not a problem on our trails,” Bronson says. “I know that in the beginning, people speculated that the trails might be ‘crime corridors,’ bringing crime from the cities into the rural areas, but that simply has not been the case.”

He adds, though, that increased use of the trails could result in more rules and regulations on them. “The more use you have, the more rules you need,” he says.

Nationwide, trails and greenways have long been a part of the Active Transportation and Recreation plan for most states. But in the past 10 to 15 years, there has been an emphasis on adding more miles of trails for bicyclists, pedestrians, joggers, runners, skateboarders—all groups who enjoy being outdoors and need a place to exercise or simply take a walk to get away.

In Indiana, with its 3,000 miles of trails throughout the state, cities are responsible for posting the rules and regulations for their trails. Most are overseen by the Parks and Recreation Department or by specific greenways/trails managers, depending on the location. While each city’s version may differ slightly based on how the trail is used, the rules all encompass the same general safety standards that pertain to sharing the paved area with walkers, bikers, etc. (To see an example of trail rules, see “Mapped Out” on page 16.)

“The rules are mainly about the etiquette of the trail,” says Bronson. “Keep dogs on short leashes. Walk with the traffic, stay to the right and let people and bikers pass to the left. Don’t take up the whole trail by walking shoulder-to-shoulder so that others cannot pass. As more and more people get used to that etiquette, the better it will be to intermix pedestrians and cyclists.”

Traveler Responsibilities

Cities have the rules and regulations posted on the trail head or, in most cases, you can look them up online, which is a good idea if you are unfamiliar with what is or is not allowed on a trail. For example, while many of Indiana’s trails allow cycling, not all do. So it’s good to know before you go.

continued on page 16
**ADA Corner**

**Question:** I attended a seminar where you stressed displeasure with the use of flares for certain curb ramps. I’m fighting my supervisor over this; could you explain your reasoning again?

—Mack, Mississippi

**Answer:** Thanks for staying awake at one of my trainings! Yes, the overuse of flares versus the straight return curb is a bone of contention with me. Here are some things to keep in mind regarding curb ramps:

1. Flares are necessary for curb ramps located in the actual PAR (Pedestrian Access Route).
2. The straight return curb is perfect for locations where pedestrians are not meant to use as access routes.
3. The FHWA, HUD, UFAS and 1991 ADAAG has great examples of using the return curb.
4. The problem is that many contractors and designers overlook the two choices and the reasoning behind them.
5. The worst problem is when the flares used are not within the regulations and become, so to speak, an accident waiting to happen. When the bowl-type flare is used instead of the simple return curb, a person who steps on the curved flare has no ability to gain footing since he/she is forced to keep sliding downward.

Below are some helpful images from the UFAS, ADAAG, manuals.

1 & 1a from the UFAS Retrofit Manual


(Note that the flare is allowed to be 1:10 here versus the AFAS that stated 1:12)
3 & 3a from 2010 ADA

FHWA Sidewalk and Street Crossing Guide (Note that the diagonal curb is not recommended.)

The first two images below document flares that increased project costs. Note that the third image, however, documents a return curb with an easy approach and good directional cues for those with visual impairments, and the long detectable warning is no longer required, allowing for cost savings.

Best of Luck!

Michele S. Ohmes is an author, trainer, consultant, and motivational speaker who has helped both the public and private sector successfully comply with the Americans with Disabilities Act. For more information, visit www.michele-able.com.
Cities post trail rules and regulations on the trail head and often also have the information available online. The example provided below is posted online for the Westfield City Parks trail system. For a list of rules that pertain to trails in your area, log on to your local Parks and Recreation Department website.

**Parks and Recreation Department**

Rules of Operation: Trails

No motorized vehicle, including golf carts, scooters, and mopeds, are allowed on any trails in the Westfield City Parks trail system, with the exception of motorized wheelchairs or official city vehicles being operated by City employees. Ride, walk, run and skate on the RIGHT, except when passing. Cyclists are asked to announce and slow down when they are approaching a pedestrian on the trail and to observe all of the other rules of the road for cyclists. Do not disturb or harass wildlife. Observe additional trail rules as posted on/or along the trail corridors. Please remember the YIELD rules:

a. Bicycles yield to rollerbladers
b. Bicycles and rollerbladers yield to skateboarders
c. Bicycles, rollerbladers, skateboarders yield to runners
d. All yield to pedestrians

NOTE:
Violation of any of these rules can mean expulsion from the park/trail.

There is a $500 fine for damaging or defacing public property.

If you notice broken equipment or anything that requires immediate attention, please call the Westfield Parks and Recreation Administrative Office at 317-804-3184. We appreciate your cooperation.

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Also, no motorized vehicles are allowed on the trails, with the exception of those that allow wheelchair accessibility.

“Some corridors (like the one in Carmel) actually have speed limits posted, especially where there is a comingling of bikers and walkers,” adds Bronson. “Some of the fast-racing road bikes can go 30 mph on a flat surface and that isn’t appropriate when there are pedestrians on the corridor, too.”

Other rules that Bronson says are critical to the safety of trail users are obeying stop signs at street crossings. “They must realize that vehicles are not, by law, stopping for them,” he says. “While we try not to have ‘at grate’ crossings and, instead, use tunnels or bridges where we can, there are areas where pedestrians and cyclists do have to cross roadways and they need to stop for traffic or they are going to get hurt.”

Expanded nighttime hours also bring to light, so to speak, another safety requirement for cyclists: reflective body gear. Those riding at dusk, dawn or dark must have a blinking light on their back, reflectors, a reflective vest, etc. It’s also a good idea to have a bell on your bike, too, says Bronson. And, of course, a helmet should be worn at all times, day or night.

So what should you do if you’re out on the trails and see rules being broken? If it’s not an emergency, you should report the problem to your local parks department or greenways manager. If it is a crime situation, call 911.

“There are trails coordinating mile markers with colors and providing GPS points so that you can be found in emergency situations,” says Bronson. “Even where GPS is not yet available, they can find you by the mile marker or the color of trail you are on.” Emergency personnel have been equipped with maps and information on all trails and corridors.

With the popularity of cell phones, emergency phone stations along the trails are not as common as they once were. Bronson says there is just not much need for them anymore.

A low occurrence of crimes on trails overall is a testament to how they are being used: appropriately and for recreation. “Crime on trails is very uncommon. That’s why it makes the news. The vandalism isn’t even that bad,” he says.

He believes that trails will continue to grow in popularity, and is optimistic that the expanded hours experimented with by a few cities will eventually spread throughout the state.

“People want trails in their communities,” Bronson says. The evidence: They are using them. A lot. “Especially in the urban areas, people are on them and we need to make it easy for them to have the accessibility to being outdoors and to being healthy.”

Cindy Ratcliff is a freelance writer who specializes in landscape, trees, and chemicals. She can be reached at cindy_ratcliff@yahoo.com.
The Indiana Farm Bureau has opened registration for the 2012 Drainage School. This seminar promotes an understanding of the laws and regulations that control land drainage in Indiana. Attendees will gain a greater understanding of drainage law and dispute resolution.

Farmers, public officials, agency personnel, attorneys, and members of the general public are invited to attend this event. Continuing education credit for attorneys is being sought.

**Date & Time:** Wednesday, August 29, 2012 - 9am to 4pm

**Location:** Indiana Farm Bureau Building  
225 South East Street  
Indianapolis, Indiana 46202  
(317) 692-7840

**Registration:** Online registration is available at the Indiana Farm Bureau site at infarmbureau.org under the Events menu. Cost is $50 per person. Registration is not complete without payment.

After August 10, 2012, please contact Maria Spellman at (317) 692-7840 or mspellman@infarmbureau.org regarding registration availability.
Classified Ads

New Publications

**Geosynthetic Reinforced Soil for Low-Volume Bridge Abutments**

The National Concrete Pavement Technology Center at Iowa State University has released a report that presents a review of literature on geosynthetic reinforced soil (GRS) bridge abutments, and test results and analysis from two field demonstration projects to evaluate the feasibility and cost effectiveness of the use of GRS bridge abutments on low-volume roads.

To download a copy, please visit: [http://www.trb.org/Geotechnology/Blurbs/166712.aspx](http://www.trb.org/Geotechnology/Blurbs/166712.aspx)

**Cost-effective and Sustainable Road Slope Stabilization and Erosion Control (20-05/Topic 42-09)**

TRB’s National Cooperative Highway Research Program (NCHRP) Synthesis 430: Cost-Effective and Sustainable Road Slope Stabilization and Erosion Control presents information on cost-effective and sustainable road slope stabilization techniques, with a focus on shallow or near-surface slope stabilization and related erosion control methods used on low-volume roads.

The report addresses topic planning, site investigation, erosion control techniques, soil bioengineering and biotechnical techniques, mechanical stabilization, and earthwork techniques.

To download a copy, please visit: [http://www.trb.org/Main/Blurbs/167227.aspx](http://www.trb.org/Main/Blurbs/167227.aspx)

Job Postings

**Engineering Assistant**

*Lafayette, IN*

Highway Safety Services seeks to add an Engineering Assistant to its staff. Job duties include reading blueprints and road plans, dealing with Public Works, and estimating man hours and materials.

The successful applicant must have meticulous attention to detail, knowledge of unit billing pricing as applies to the DOT, as well as experience in accounting, bookkeeping, order entry, and bill processing via proprietary software. An understanding of highway construction is required.

A full-time commitment is preferred, but part-time work is negotiable, as is compensation, depending on qualifications. Interested candidates who lack direct experience in the job duties, but have proficient engineering and figures skills, may also apply as an apprentice to receive complete training.

For more information or to submit a resume, please contact David Goldman at dlgoldman@msn.com.

Equipment Loan

The following equipment is available for loan:

- Traffic counters (magnetic and tube type)
- Laser speed and distance measurement instruments
- Sign retroreflectometer
- Radar speed display signs
- Safety Edge boot
- Digital camera
- Cones and barricades (emergency use only)

Request by calling the LTAP Center at (800) 428-7639 or emailing inltap@ecn.purdue.edu

H.E.L.P.E.R.S.

The Hazard Elimination Project for Existing Roads and Streets Program aims to increase safety on local roads for counties, small cities, and towns.

HELPERS offers the following assistance as part of its services:

- Crash Analysis
- Road Safety Audits
- Traffic Volume Counts
- Signal Warrant Analysis
- Ball Bank Studies
- Low Cost Improvement Ideas
- HSIP Application Assistance

For more information, email ltaphelpers@ecn.purdue.edu

On-Site Training

The Indiana LTAP team offers several training courses available to host on-site at your location:

- Temporary Traffic Control
- Snow and Ice Control
- Chainsaw Safety
- Flagger Training

To schedule your agency for a course, call (800) 428-7639 or (765) 494-2164.

Submit Your Own Ad

Does your agency have a job to advertise?
Equipment to sell?
An event to promote?

**Spread the word through the Indiana LTAP website and newsletter!**

Email inltap@ecn.purdue.edu or call Indiana LTAP at (800) 428-7639 (toll-free in Indiana) or (765) 494-2164 to provide your information.

We look forward to hearing from you and assisting your agency.
## Association Information

### Asphalt Pavement Association of Indiana (APAI)

**Winter 2012 Conference & Trade Show**
*co-hosted with Indiana LTAP*
*December 13-14*
Indianapolis, Marriott East
Visit [www.asphaltindiana.org](http://www.asphaltindiana.org)

### Indiana Street Commissioners Association (ISCA)

**ISCA Annual Street Commissioners Convention**
*August 14-16*
West Lafayette, Four Points by Sheraton
Visit [www.indianastreets.org](http://www.indianastreets.org)

### Institute of Transportation Engineers (ITE)

**Transportation 2012**
*Co-hosted with Indiana LTAP*
*July 26*
Indianapolis
ITE Scholarship Golf Outing
*September 6*
Bear Slide Golf Course
Visit [www.indianaite.org](http://www.indianaite.org)

### Indiana Association of County Commissioners (IACC)

**IACC Annual Conference**
*November 27-29*
Indianapolis
Visit [indianacountycommissioners.org](http://indianacountycommissioners.org)

### Indiana Association of Cities and Towns (IACT)

**Mayors Roundtables**
*August 16 - North Central*
*August 24 - Southern*
*August 24 - Northern*
**IACT Leadership Conference**
*August 8-9*
French Lick Springs Hotel
**IACT/IU-SPEA Mayors Institute**
*Sept 18-20*
IU-SPEA Building at IUPUI
**Webinars**
Code Enforcement 101 - Tools for Enforcing the Rules
*August 7, 10:00-11:30am EDT*
Visit [www.citiesandtowns.org](http://www.citiesandtowns.org)

### Indiana Ready Mixed Concrete Association (IRMCA)

**Promotional Group Meetings**
*August 22 - CI (Indianapolis)*
*August 24 - NC (Mishawaka)*
*Sept 21 - NW (Merrillville)*
**IRMCA SEC Committee Meeting**
*August 22*
Indianapolis
Visit [www.irmca.com](http://www.irmca.com)

### American Public Works Association

**2012 APWA Congress - The Best Show in Public Works**
*August 26-29*
Anaheim, CA
Anaheim Convention Center
**Click, Listen, & Learn**
Innovative Products and Practices for Pavement Markings
*August 9, 11:00am-1:00 pm EDT*
Trees & Municipal Infrastructure: Creating a Sustainable Alliance
*September 13, 11:00am-1:00 pm EDT*
Visit [www.apwa.net](http://www.apwa.net) and [indiana.apwa.net](http://indiana.apwa.net)

### Association of Indiana Counties (AIC)

**Treasurers Conference**
*July 31-Aug 3*
Indianapolis
**Assessors Conference**
*Aug 21-24*
Indianapolis
**Clerks Southern Fall District Meeting**
*Sept 11*
McCormick’s Creek State Park
**AIC Annual Conference**
*Sept 23-26*
Indianapolis
**Webinars**
Institute Elective Class
*Part 1*
*August 23, 9:00-11:00am EDT*
*Part 2*
*August 24, 9:00-11:00am EDT*
Visit [www.indianacounties.org](http://www.indianacounties.org)

### Transportation Research Board (TRB)

**2012 Transportation Hazards and Security Summit**
*August 20-24*
Irvine, California
**Transportation Planning for Small and Medium-Size Communities Conference**
*September 6*
Big Sky, Montana
Visit [trb.org](http://trb.org)
Indiana Local Technical Assistance Program (LTAP) was established by the Federal Highway Administration (FHWA). The purpose of the LTAP program is to translate the latest, state-of-the-art road, highway, and bridge technologies into systems usable by local highway agencies. LTAP is funded by FHWA, the local agency distribution of the Motor Vehicle Highway Account, and Purdue University. A newsletter is published quarterly by the Indiana LTAP office at Purdue University. It is distributed free to county, city, or town road and street personnel, and others with transportation responsibilities.

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