The Science of Highway Safety

Highway Safety Manual is a valuable tool for local agencies

by John Ryynanen, Editor, Center for Technology & Training, Michigan Tech Transportation Institute

As a civil engineer (or one who works closely with civil engineers) you know that when you’re designing an intersection and you have a question about sight distance, you can look in the American Association of State Highway Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets, also known as the AASHTO Green Book, for an answer. Similarly, when you have a question about signs, pavement markings and signals for the same intersection, you know you will find all the answers in your copy of the Manual on Uniform Traffic Control Devices, or MUTCD.

But where do you look when you have a question about traffic safety? For example, what is the safest method for handling left turn movements at a four-way signalized intersection? Until recently, you would have had to sift through multiple sources of information (including, probably, the AASHTO Green Book, the MUTCD, and published research reports) to find an answer to such a question. But there was no guarantee that you would find a definitive answer. The question about left turn movements exposes a dilemma that safety professionals have grappled with for years: What constitutes safety on a road? Must a road simply adhere to established design standards to be considered safe, or does it require something more?

Dedicated turn lanes, pedestrian refuge areas, adequate signage, and wide separation between traffic lanes all contribute to the safety of a road. The new Highway Safety Manual provides guidance for determining the best treatments to address safety concerns.
Thirteen states are participating in the Lead States Initiative, which is sponsored by the National Cooperative Highway Research Program (NCHRP). Objectives of the project are to:

- Provide the participating states with access to experts who are familiar with HSM development and implementation.
- Facilitate the exchange of HSM implementation experiences among the lead states.
- Develop an HSM user guide to assist other state and local road agencies in implementing HSM.

For more information go to www.MichiganLTAP.org/pubs. Then select “NCHRP Lead States Initiative”.

REFERENCES


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Training Calendar 2011

MUTCD Training
May 10
Huntingburg
May 12
Seymour
May 24
Selma
May 26
Danville
June 7
Fort Wayne
June 9
South Bend
*attendees will receive credit for Road Scholar Core Course #8 - MUTCD

- Road Scholar Core Course #5
  Roadway Safety
  June 1
  Indianapolis

- Hydraulics and Hydrology Basics
  June 1
  Indianapolis

- Hot Mix Asphalt Workshop
  June 30
  Bloomington

- Road Safety Workshop
  July 28
  West Lafayette

Watch our website for more information
www.purdue.edu/INLTAP

2011 CE OPEN
Friday, May 20, 2001
Birck Boilermaker Golf Complex
Purdue University, West Lafayette

- Golf Challenges
- Hole-in-One Contest
- Longest Drive Contest
- Closest to Hole Contest

For more information and registration forms visit:
https://engineering.purdue.edu/CE_People/Alumni/CEOpen
STANDARDS NOT ENOUGH
Dr. Ezra Hauer, Professor Emeritus in the Department of Civil Engineering at the University of Toronto and internationally-recognized highway safety expert, introduced the adjectives “nominal” and “substantive” to help shed more light on the topic of roadway safety. In a 1999 paper titled Safety in Geometric Design Standards, Hauer wrote, “Nominal safety is judged by compliance with standards, warrants, policies and sanctioned procedures … substantive safety is measured by expected crash frequency and severity.” (Hauer 1999a)

The problem with defining safety as a function of compliance with standards, Hauer asserted, is that “Limit standards do not tell the designer what the safest design is. Rather, they specify the limit of what is permissible.” (Hauer 1999b).

Today the Highway Safety Manual (HSM), which is available through AASHTO, is the definitive source of substantive answers to roadway safety questions. The manual was developed and refined by a diverse team of roadway safety stakeholders over the past ten years to provide a single source for safety information and tools in a form that facilitates data-based decision-making.

MAJOR EFFORT
Creation of the HSM began in May 2000 under the direction of a group of volunteers from eight different subcommittees of the Transportation Research Board (TRB) in Washington DC. Research and development for the effort was funded in large part by the National Cooperative Highway Research Program (NCHRP). The Federal Highway Administration (FHWA) provided supplementary funding and research support. In 2006, a decision was made to publish the HSM as an AASHTO document, at which point a Joint Task Force was formed with representatives from the AASHTO subcommittees on Design, Traffic Engineering and Safety Management. Over the next three years, the task force examined the HSM to ensure that it would meet the needs of State Departments of Transportation and local agencies. During that time, members of the task force also worked to promote the HSM within their respective subcommittees.

In 2009, after nine years of intensive development and careful refinement, the AASHTO board of directors approved the HSM for distribution.

VALUABLE RESOURCE, BUT NOT A STANDARD
Priscilla Tobias, Bureau Chief of Safety Engineering for the Illinois Department of Transportation (IDOT) serves as Chair of the task force that oversees the maintenance and on-going development of the HSM. She is extremely pleased that such a powerful tool is available for road owning agencies. “This manual represents the best safety-related science of our day,” she said. “And it has been thoroughly vetted by safety experts and representatives from all groups involved with roadway safety to make sure it’s accurate and relevant for all stakeholders. This is the first time we have had such a resource.”

Tobias is careful to stress that the HSM is not a standard, like the MUTCD. “The manual is intended as a guide; nothing about it constitutes a legal standard, nor does it mandate responsibilities,” she said. “It’s simply a great tool for making informed decisions about how to allocate resources to address safety issues most effectively.”

NEW DIRECTION IN HIGHWAY SAFETY
The key to the manual’s usefulness lies in its thorough, scientific approach to identifying, analyzing and solving safety problems. First, by accounting for the statistical phenomenon of regression to the mean, many methods of site selection in the HSM help road agencies zero in on the most relevant sites by eliminating from consideration sites that are at a randomly high or low fluctuation in crashes. After a site is identified, the HSM provides a means for analyzing the safety impact of decisions at all stages of the project development process, which enables practitioners to quantify the effectiveness of safety improvements along with other transportation performance measures. Finally, the HSM includes an extensive catalog of proven crash modification factors (CMFs) for a variety of geometric and operational treatment types. Using CMFs, practitioners can predict the safety impact that a potential treatment or design may have on their road system.

Highway safety expert Dr. Hauer is pleased that the manual is available. “Publication of the Highway Safety Manual indicates wide recognition of the need for approaching safety in some evidence-based manner. With procedures that examine safety quantitatively rather than subjectively, the document is an important first step in the right direction.”

EARLY ADOPTERS LEAD THE WAY
At three volumes and nearly one thousand pages, the HSM contains a formidable amount of information, especially for those who are not experienced in the practice of analyzing and improving roadway safety. To help disseminate new information in the manual and to continued on page 7
This year’s County Bridge Conference focused on processes to extend the life of bridge structures. The goal was to not only provide new information but to provide practical examples of successes local agencies are having implementing new ideas. Day One consisted of three separate tracks; inspection, design, and maintenance. Participants could spend the entire day in one focus area or move to different sessions that suited their needs.

The inspection track included updates on the bridge inspection manual, bridge committee discussions, the QC/QA process, FHWA and INDOT oversight, a discussion of fracture critical inspections, underwater inspection and the associated costs. Inspect Tech gave an update on the BridgeInspect software. The design track included a bridge design manual update, information regarding pile design and pay items, a discussion of geotechnical issues, information on the NEPA permitting processes and presentations on bridge aesthetics. The maintenance track continued the discussion of methods to help preserve bridge structures. It included a history of Indiana bridges and a discussion of the repairs to some of Indiana’s older structures. There were also presentations on the use of microsilica in bridge deck concrete, pile repairs, glass fiber reinforced polymer repairs and epoxy overlays.

The general session was held on day two. The Federal Highway Administration opened the session with an introduction to the new Every Day Counts initiative covering specific bridge topics addressed in that initiative relating to geosynthetic reinforced soils and accelerated bridge construction using prefabricated bridge elements. Geosynthetics were further defined with a presentation on why they work and a local agency perspective on their use. The next presentation discussed the trend of highway funding nationally and provided a description of resources available to local agencies to help identify funding for their specific needs. The afternoon continued the theme of extending the life of bridge structures with presentations on inspecting box beam bridges, a presentation on prestressed beam repair, inspecting and load rating railroad flat car bridges, a knowledge base on steel bridge fracture and fatigue repair case studies and the use of an internally cured concrete mixture to improve the durability of bridge decks.

Indiana LTAP would like to extend our sincerest thanks to everyone involved in the conference. The success of this event would not be possible without the participation of the 263 in attendance and the effort of those involved.
On February 10th, LTAP held its annual Stormwater Drainage Conference in West Lafayette. A record 234 participants representing city, town and county engineers, street and highway commissioners, and public works directors as well as private consultants, surveyors, stormwater coordinators and drainage and environmental specialists were in attendance.

High attendance was due in part to the Continuing Education Rules for Professional Engineers which took affect on August 19, 2010. This popular event now provides professional development hours (PDH) that apply to both civil engineers and land surveyors.

This year’s agenda was divided among concurrent sessions covering the technical and policy aspects of stormwater drainage.


This event was co-hosted by the Indiana Association for Floodplain and Stormwater Management, Inc. For more information and upcoming events, visit www.inafsm.net.

LTAP would like to thank the following organizations for supporting this event: Advanced Drainage Systems, American Structurepoint, Commonwealth Engineers, Inc, Contech, and the staff of Christopher B. Burke Engineering Ltd.
Question: How important is the 2% cross slope on sidewalks?
- John in Missouri

Answer: Extremely important for several reasons.

1. The first reason is it is required by the ADA Standards, and ANSI 117.1, Accessible standards.
2. This isn't just an arbitrary number. It is there because a steep cross slope seriously affects the safety of those with disABILITIES and the wear and tear on the arms of the wheelchair users trying to keep the wheelchair moving in a straightforward motion. It is a common affect for manual wheelchair users to have surgery on their shoulders, wrists, and elbows due to cross slopes that they must fight against on a daily basis.

Ways to combat the errors made on sidewalk cross slopes
1. Suggest to the engineers designing the sidewalks to spec 1% cross slopes. (We all know that it won’t happen but it does let the contracting supervisor know that steep cross slopes are not acceptable.
2. Have your contracts specify that any cross slope > 2% will not be accepted and will be reconstructed at the expense of the contractor.
3. Provide training especially a walk-about with a wheelchair user who can demonstrate the importance on the cross slope being no greater than 2%. I have found the supervisors and workers in the field do take pride in their jobs. The problem is that all too often they do not realize the logic behind the 2% standard. Once they realize it, they become partners in the process and do everything they can to comply.

Someone once laughed at me during one of my presentations, saying that I lived in never-never land and that trying to demonstrate with the crew was a waste of time. Well I strongly disagree. Of course you always have someone who doesn’t care. My trust is in the majority who do care. I have actually had supervisors walk off a job until I was called in because someone was going to have an in-accessible product installed; or a contractor who planned on installing a walk or curb ramp the incorrect way. How rewarding it is to experience personally the efforts of people who do care if only they understand the consequences of their actions.

By the way this 2% rule is all too often forgotten or misunderstood in parking spaces. The 2% rule is for all directions of an access aisle. I have had engineers who thought it was only the linear slope. Remember, it is for all directions of the access aisle.

In closing I can’t help but refer to the wonderful quote from George Elliot “What do we live for, if it is not to make life less difficult for each other?”

Wishing you a wonderful spring season. Michele w/ Maddie by my side.
The Science of Highway Safety, continued from page 3

encourage road-owning agencies to use it, the NCHRP is sponsoring an effort that involves showcasing different states’ experiences with the HSM. The effort, officially titled the Lead States Initiative for Implementing the Highway Safety Manual, involves state and local transportation officials in thirteen states (see “Lead States Initiative” on page 4).

The project manager for the Lead States Initiative is Charles Niessner, senior program officer at NCHRP. To kick the project off, Niessner worked with Tobias’ AASHTO task force on the HSM to solicit participants from among State Departments of Transportation (DOTs). He was encouraged by the response. “Thirty DOTs initially expressed interest,” Niessner said. “That was encouraging. We didn’t expect that kind of response from the states because launching something like this is not a simple thing – it’s a major effort.” Niessner thinks the willingness to get involved is thanks to the requirement in the transportation bill of 2005 (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or SAFETEA-LU), that required each state DOT to establish a strategic highway safety plan by October 1, 2007. “Requiring strategic highway safety plans really elevated the importance of roadway safety and helped everyone move more purposefully in that direction. I think the response to our invitation shows that our State DOTs see the HSM as another great tool to help refine our collective approach to improving the safety of our roads.”

MICHIGAN IS A LEAD STATE

Tracie Leix, supervising engineer for the Michigan Department of Transportation (MDOT) Safety Programs Unit, is managing MDOT’s participation in the Lead States Initiative. Leix is especially excited about the HSM because she expects it to enhance her group’s already healthy relationships with local road agencies. She and her team have seen first-hand how engaging with local partners on safety projects can produce great results. In 2004, Leix’s group, at the time under the leadership of Dale Lighthizer (retired 2010), established the Local Safety Initiative to help local road agencies in Michigan implement safety improvements (see “MDOT Local Safety Initiative,” below).

“Through the local safety initiative, we stress the importance of measuring safety and quantifying the effectiveness of improvements,” Leix explained. “The HSM will be a great tool to support these efforts as we continue to work together with our local partners to improve the safety of Michigan roads.”

To help local agencies understand and use the HSM in Michigan, Leix and a Local Agency HSM Implementation Team are working with Michigan’s Local Technical Assistance Program (LTAP) to produce training materials for various groups of stakeholders that are involved in making roadway safety decisions. “Among our local agency partners, we have metro, urban, and rural agencies. And within each agency we have people dedicated to design, development, safety, and other focus areas,” Leix said. “No matter where someone fits in the process of improving roadway safety, certain aspects of the manual apply to them. We’re working to make sure the training is relevant to each groups’ needs.”

NOT JUST FOR STATE DOT

Tony Giancola, Executive Director of the National Association of County Engineers (NACE) is also excited about the availability and relevance of the HSM for road-owning agencies across the country. “This is a very useful tool,” he said. “It will be a big help for road agencies at state and local levels as they evaluate, design, plan for and implement safety improvements in their respective communities.”

Everyone familiar with the HSM agrees that it will be a great tool for improving roadway safety, but some are expecting more—especially those who have experience with implementing safety improvements at the local level. Wayne Schoonover, P.E., County Highway Engineer for Ionia County Road Commission in Michigan, says the HSM could help local road agencies pay for road projects. He has been an enthusiastic participant in the Michigan Department of Transportation’s (MDOT) Local Safety Initiative program (see “MDOT Local Safety Initiative,” on page 5) since it was created in 2004. “The success we’ve had in securing federal safety funding for Ionia County road improvements is a great example of the value of a data-driven approach to safety,” Schoonover said. “If not for the quantifiable solutions that MDOT’s Local Safety Initiative group helped us define, we would not have qualified. The Highway Safety Manual can help any agency define quantifiable solutions to their safety problems, which could help them secure similar funding.”

For more information about the Highway Safety Manual, including how to order it, please visit www.highwaysafetymanual.org.

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“In America we have a history of great achievements in transportation,” said Federal Highway Administration Deputy Administrator Greg Nadeau. “Now our transportation system is at a crossroads. Should we accept the status quo? No – we must continue to invest in an innovative transportation system to move people and goods as effectively and efficiently as possible in order to drive progress.”

In the opening session of the 97th Annual Purdue Road School, Nadeau’s message emphasizing the importance of transportation to our nation’s future resonated with a packed auditorium of transportation stakeholders from across the state and the nation. The March 8, 2011 speech marked the beginning of the nationally recognized three-day transportation conference: the longest-running of its kind. “It’s striking that Road School honors tradition while still remaining modern and current,” said Nadeau. “I am humbled to be part of a program that is taking place for the 97th time.”

More than 2,100 people attended this year’s Road School, which offered a packed schedule of more than 80 classes to further participants’ knowledge of current trends, innovative strategies and latest developments in transportation. Changes were made to this year’s event to further increase its value. These updates included a new, easy-to-use program and a revamped schedule with tracks for 12 focus areas including bridges, design, construction, maintenance, pavement, safety and sustainability.
Planning for Progress

Progress was a central theme of the opening session – and for many of the sessions to follow. Nadeau discussed how new federal transportation funding legislation would positively impact the nation’s future and outlined the Federal Highway Administration’s new forward-looking initiative, Every Day Counts. “With Every Day Counts, our goals are to shorten project delivery, improve the safety of our roadways and protect the environment,” said Nadeau. “Indiana is making notable progress, especially in project delivery and safety.”

Bluffton mayor Ted Ellis then took the stage on behalf of the National League of Cities. Ellis stressed the need to take action and ensure transportation progress continues. “You need to know that maintaining the status quo has long-term negative consequences,” he said. “We need to innovate by looking for more flexible financing options and advocating for the funding of transportation infrastructure.”

INDOT Commissioner Mike Cline also took up the message of progress as he detailed the many accomplishments of the Indiana Department of Transportation (INDOT) since the passage of Major Moves in 2006. Those projects include Interstate 69, the Hoosier Heartland corridor, Fort-to-Port, the Madison-Milton Bridge and the Ohio River Bridges. Looking to the future, Cline addressed the need to innovate on a state and national level. “We need to look at better ways to manage the business and deliver our program faster, better and cheaper,” he said.

To conclude the Opening Session, INDOT Chief Engineer Mark Miller presented the Indiana Partnership for Transportation Quality Awards and Indiana LTAP Program Manager John Habermann presented the Master Road Builder awards.

Ideas for Innovation

The theme of innovation continued through numerous Road School sessions. Many of the innovative ideas presented centered on process improvements to speed project delivery and save money. For example, in Transportation Asset Management for Local Agencies, Monroe County Highway Director Bill Williams explained how two communities implemented an innovative asset management program. In Monticello, Indiana, this meant investigating the loss of city water due to leaks in their system. “The city identified and mapped 12 major leaks and once they were fixed, the city’s water treatment plant pumped 124,000 fewer gallons of water per day,” says Williams. He explained how local agencies can change the way assets are managed to increase service life, preserve value and save on maintenance costs.

In the MPO Session, presenters from the Michiana Area Council of Governments (MACOG) outlined a simple method for tracking local road projects to help ensure they stay on track and on budget. “Because of the number of parties involved with a local aid project, communication is essential for success,” says MACOG planner James Turnwald.

INDOT also discussed how it is using a new process to keep project costs under control during the session INDOT’s New Long Range Plan. Leaders from INDOT explained how they will identify major capacity and needs deficiencies by corridor in a long-range plan, but will not include specific projects or dollar amounts. “This avoids having a 25-year list of improvements with many unknowns including funding, land use, demand...
growth, economy, inflation and transportation alternatives,” said INDOT Capital Program Management Director Gary Mroczka.

**Spotlight on Safety**
With a two-day track dedicated to the topic, transportation safety remained a top priority at Road School 2011. Topics included the Strategic Highway Safety Plan, updates to the Work Zone Traffic Control Handbook, road safety audits and roadway departure crashes. In the session *HSIP Process and Funding*, INDOT Office of Traffic Safety Manager Mike Holowaty described how local public agencies can secure funding for effective, low-cost safety improvements through the HSIP program. Session attendees also learned how they could take advantage of the LTAP HELPERS program to help reduce the number and severity of crashes on their local roads.

Important safety information was also presented at many other sessions. Local leaders received advice on how to make their roadway signage safer and achieve compliance with new federal safety standards for highway signs during *MUTCD for Local Officials*. “You must have a program for systematic sign upgrades, and when a sign is due for replacement that is the time to bring it up to the new standard,” advised FHWA Operations Engineer Karen Stippich. Finally, valuable tips for keeping pedestrians safe were presented during *Pedestrians and Intersections*. New technologies discussed included foot-actuated lighted crosswalks, solar-powered flashing beacons, rectangular flashing beacons and pedestrian-only traffic lights.

**Up-to-Date Information**
Transportation experts have long trusted Road School as the most reliable source for up-to-date information on the latest transportation developments and regulatory issues, and 2011 was no exception. Due to the new continuing education requirement for professional engineers in Indiana, attendees filled the auditorium to learn about the revised Indiana Statutes and Rules for Professional Engineering Licensure.

“The new continuing education requirement now means Indiana Professional Engineers must earn 30 professional development hours every two years,” explained Purdue University Civil Engineering Professor Vincent Drnevich.

Sessions covering GASB-34 – regarding compliance with the Government Accounting Standard Board – and right-of-way issues for counties and cities were also popular.

**Environment & Sustainability**
Creating an environmentally friendly and sustainable transportation system is a key component of the Every Day Counts FHWA initiative and a major focus area of Road School this year. Nine sessions dedicated to sustainability were presented in the two-day Sustainability track including *Sidewalk Reconstruction: How to Handle Tree Roots and Curb Ramps*. Traditionally, sidewalk and curb ramp construction and repair has taken a heavy toll on surrounding trees because of damage to the trees’ root systems. In this session, Davey Resource Group natural resource consultant Jennifer Gulick described a more sustainable approach that balances the need for new...
transportation facilities with the goal of tree preservation. “When you want to protect a tree, it’s important to think of the whole tree, including the crown, trunk and the root system,” said Gulick.

Other sessions addressing sustainability included Transportation for Livable Communities, Green Infrastructure and Incorporating Aesthetics in Bridge Design. During the bridge design session, CH2M HILL World Headquarters Chief Bridge Engineer Joe Showers encouraged bridge designers to consider a bridge’s design from every angle and at every speed. “Think about your bridge from beneath, above and at eye level and from the perspective of a pedestrian, bicyclist and motorist,” said Showers. “Design your bridge with all these factors in mind.”

**Lunch with the Lieutenant**

For many Road School attendees, lunch with Indiana Lieutenant Governor Becky Skillman was one of the conference highlights. Skillman expressed her gratitude at ‘finally’ being invited to the event she never had an opportunity to attend during her many years in local government. “I was an elected county official for 16 years and President of the Association of Indiana Counties,” said Skillman. “My friends would go every year but I never got to go. I wanted to be one of the cool kids. Now I have arrived.”

During her address Skillman focused on Indiana’s many transportation achievements during her time in office, particularly the importance of Major Moves. “Indiana has challenges, but our roads and highways are among the best in the nation,” said Skillman. “We’re preserving, modernizing and improving while many states are just trying to decide how they’ll deal with their crumbling infrastructure.”

Skillman also picked up on the message of progress and innovation that ran through this year’s Purdue Road School. “Government works best when it is intentional,” said Skillman. “In this economic climate we cannot afford to miss any opportunity to breathe new life into our communities and put Hoosiers to work. We’re all working toward the same goal, and we all have a part to play in that process.”

With the lessons learned during Purdue Road School 2011, transportation leaders across the state now have the tools, strategies and ideas they need to continue working toward their common goal of transportation success and innovation.

Proceedings from this year’s Road School will be available later this spring. Please continue to check the LTAP web site home page for further details at www.purdue.edu/INLTAP.

If you have an idea for a session for the 98th Annual Road School, we want to hear it. Please send your abstract and contact information to roadsch@purdue.edu.

**SAVE THE DATE**

98th Purdue Road School
March 6-8, 2012
Indiana Partnership for Transportation Quality (IPTQ) Awards

Each year at Road School, Federal Highway and INDOT in partnership with Purdue University and Indiana’s highway industry present the annual IPTQ Awards. Their goal is to demonstrate and publicize their commitment to excellence by presenting awards to project teams that clearly demonstrate dedication to quality processes, innovative practices, teamwork, customer focus, and safety. Each category is scored by an engineer from FHWA, INDOT and Purdue University. The project receiving the highest combined score from the judges is the category winner. Special thanks to the Indiana Chapter of American Concrete Pavement Assoc (IN-ACPA) and the staff at Indiana Ready Mix Concrete Association (IRMCA) for their strong support of the IPTQ Awards since its inception.

Award categories are:

- Major New: Rural
- Special Project: Under $2 Million
- Bridges: Rural

- Major New: Urban
- Special Project: Over $2 Million

Major New Construction: Rural
US 24 Allen County

Owner: INDOT - Fort Wayne District
Construction Director: Jim Keefer
Designer: INDOT Central Office
Project Manager: Kimberlee Parker
Designer: Andy Peters

Contractor: E&B Paving
Operations Manager: Mike Collard
Project Manager: Travis McPeak
Project Manager: Mike Korba
Concrete Paving Supt: Mark Hayden
Concrete Paving Supt: Tony Korba

This project was to construct Segment 3 of the Indiana portion of the very important “Fort to Port” highway. A 3.5 mile segment constructed on new alignment, there was extraordinary teamwork between all of the contractors on this project to complete it in 2010. In addition to the contractor, E&B Paving, the team always involved INDOT, and the community officials through progress/schedule meetings. Through Value Engineering of the subgrade treatment and pavement thickness, nearly $200,000 in savings was realized. The contract had a completion target date of July 30th 2011. Through continuous communication and teamwork, the contract was substantially completed on October 8, 2010 - nine months ahead of schedule.

Major New Construction: Urban
SR 62 Warrick County

Owner: INDOT - Vincennes District
Project Supervisor: Brandon Mathies
Project Engineer: Jenbien Tsai
Area Engineer: Curt Schum
Construction Director: Bart Mueller
Deputy Commissioner: Rusty Fowler
Designer: United Consulting
Trans Dept Mgr: Chris Hammond
Team Leader: Jeremy Richardson
Sub: Bernardin, Lochmueller & Assoc
CEO: Keith Lochmueller
Contractor: E&B Paving
Operations Manager: Mike Collard
Project Manager: Travis McPeak
Concrete Paving Supt: Mark Hayden
Concrete Paving Supt: Tony Korba

This project was the third of four phases to transform a busy two lane road into a modern four lane corridor between the cities of Evansville and Boonville. The challenges of constructing in an urban area are many but with teamwork and constant communication, the project was completed on time and within budget. For those parts of the project that utilized asphalt, a more environmentally sustainable Warm-mix asphalt, which is produced and placed at lower temperatures, was used. This not only reduces cost through reduced fuel usage, but also reduces harmful carbon emissions and is a 100% recyclable product. This project also required very close coordination with business owners who were invited to attend weekly progress meetings as well as seek their input. Through value engineering a modification was made that will result in a time and financial savings for the adjoining segment to be constructed.
LaPorte County and the Northern Indiana Commuter Transportation District (NICTD) jointly planned the replacement of the NICTD Bridge over County Road 200 East in LaPorte County, Indiana. The improvement addressed serious vertical and horizontal clearance issues. To minimize downtime to NICTD, DLZ designed a bridge superstructure that utilized rapid insertion of the superstructure by roll-in procedure. As a result, the project was completed on-time, under budget, and within the 14 day track outage permitted by NICTD. The “roll-in” procedure has now become a standard procedure for construction of bridges along NICTD rail lines.

Special Project: Under $2 Million
Pufferbelly Train - City of Forty Wayne

Owner: City of Fort Wayne
Greenways Manager: Dawn Ritchie
Contractor: 3D Company
Project Manager: Deanna Case
Superintendent: Chris Rhoades
E&B Paving: David Christman

This was a fast-track project that took advantage of the availability of American Reinvestment and Recovery Act (ARRA) funding. DLZ was given the “Notice to Proceed” on May 6, 2009, and final contract documents were approved by INDOT on October 21, 2009 – a process that would normally take 18-24 months. The City worked closely with the surrounding community to ensure donations of needed parcels as well ensure they were involved in the development process. The contractor and construction inspection team’s attention to detail and their ability to quickly ascertain the current construction costs were vital to the project being completed on time, under budget, and in compliance with INDOT and City standards. This true partnership effort under tight deadlines has provided the citizens of Ft. Wayne with a critical segment of the trail that will ultimately connect to Pokagon State Park.

Special Project: Over $2 Million
Shanklin-Millrace Park Bike & Pedestrian Tunnel - City of Goshen

Owner: City of Goshen
City Engineer: Mary Cripe
Contractor: Anlann Corporation
Project Manager: Derrick Arens

This project was undertaken to provide a safe midblock crossing of the heavily traveled Plymouth Avenue/SR 119 in Goshen. Prior to the tunnel, the at-grade crossing made it difficult and dangerous for trail users to cross. Since the tunnel and portions of the trail are below the groundwater table, and only 100 feet from the Millrace Hydraulic Canal, an extensive underdrain system in conjunction with a lift station and “Wa-Stops”, or in line check valves (one of the first projects in the State of Indiana to use this technology) was utilized. Additionally, unforeseen construction challenges were discovered and successfully dealt with regarding disposal of unexpected scrap rubber debris; the surcharge of the Elkhart River; and reinforcement of the Hydraulic Canal. In the end, the City of Goshen, the public, the Contractor, and DLZ worked as a team to complete this successful project and deliver a safe crossing for trail users.
This year over 230 professionals donated their time and expertise to provide a packed schedule of more than 80 classes to further participants’ knowledge of current trends, innovative strategies and the latest developments in transportation. We thank you for your continued support.

Roger Harvey
Bose Public Affairs Group

Vincent Drnevich
Purdue University

Nicole Hipp
USI Consultants, Inc.

Siva Venugopalan
Siva Corrosion Services, Inc.

Mark Cornwell
Sustainable Salting Solutions, LLC

Andrew Tarko
Purdue University

Audra Blasdel
Indiana Department of Transportation

Ellen Jacquart
The Nature Conservancy

Thomas Vandenberg
Butler, Fairman & Seufert, Inc.

Jon Peterson
Government Fixed Asset Services, Inc.

Charlie Pride
State Board of Accounts

Pam Broviak
City of Geneva, IL

Lynn Shireman
Milestone Contractors, L.P.
Road School Statistics

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<td>Purdue Student</td>
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<td>MPO/RPO</td>
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<td><strong>TOTAL</strong></td>
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<tbody>
<tr>
<td></td>
<td>1255</td>
<td>59%</td>
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A bar chart is also present, showing the distribution of the participants, with a total of 2145 participants.
Indiana LTAP presents MASTER ROAD BUILDER AWARDS at the 97th Annual Purdue Road School

Pictured from left to right are: Steven Brooke, Robert Young, Dwight Smith, Kevin Myers, Raymie Eckerle, Richard Byers

<table>
<thead>
<tr>
<th>Name</th>
<th>County</th>
<th>Achievements</th>
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</table>
| Steven Brooke, Road Supervisor | White County    | • 1971 began working for White County as a truck driver  
• 1979 appointed assistant supervisor  
• 1981 appointed supervisor  
• served as president of the Indiana Association of County Highway Engineers and Supervisors (IACHES)  
He has been married to wife Joyce for 46 years and has a daughter, Stephanie, and two grandchildren Tyler, 18 and Riley 12. |
| Dwight Smith, Highway Superintendent | Bartholomew County | • 1979 began working for Bartholomew County as a truck driver, crew chief, and then assistant superintendent  
• 2000 appointed highway superintendent  
• Currently serves as vice president of IACHES  
• 2009 awarded Supervisor of the Year by the Indiana Association of County Commissioners (IACC)  
He has been married to wife Joyce for 46 years and has a daughter, Stephanie, and two grandchildren Tyler, 18 and Riley 12. |
| Robert Young, Highway Supervisor | LaPorte County | • Worked for the LaPorte County Highway Department for 27 years, 13 of them as supervisor  
• served as assistant supervisor for one year and district foreman for three  
• Served on IACHES Board of Directors  
• 2008 awarded Outstanding County Highway Supervisor by the Association of Indiana Counties (AIC) and County Highway Supervisor of the Year by IACC  
He has been married to Patti for 34 years and has three children and two grandchildren. In his free time he enjoys fishing, hunting, and golfing. |
| Kevin Myers, Highway Supervisor | Clinton County   | • 1994 began working for the Clinton County Highway Department  
• 1999 appointed assistant superintendent  
• 2000 appointed superintendent  
He has been married to Dana for 32 years. They have two children and 6 grandchildren. In his spare time he enjoys spending time with his family, running, and camping. |
| Raymie Eckerle, Street Commissioner | City of Jasper   | • 1996-1999 City of Jasper council  
• 2000 appointed street commissioner  
• 2004 president of the Indiana Street Commissioners’ Association  
• 2001 and 2004 ISCA Street Commissioner of the Year  
• Served 14 years as manager, Dubois County Airport Authority at Huntingburg Airport  
He has been married to Rita for 34 years. They have two children, Brad and Michaela (Knies). Eckerle have blessed them with granddaughter Kate. Jennifer is married to Aron Wright. |
| Richard Byers, Engineer/Surveyor | Henry County    | • Lifetime resident of Henry County  
• Attended the University of Cincinnati  
• Graduated from Ball State University  
• 1976 became a registered professional engineer  
• 1992 Henry County engineer  
• 1993 Henry County surveyor  
For 15 years before his employment with Henry County, he worked in private practice. He is a member of IACHES and National Society of Professional Engineers (NSPE). |
Landscaping a roundabout not only gives it visual appeal, it also offers visual cues for drivers.

Roundabouts reduce traffic injury accidents by 80 percent compared to the standard traffic-signal intersection. They reduce fatalities by more than 90 percent. Total accidents decrease 40 to 50 percent with the installation of a roundabout.

With statistics like these, it's no wonder that the city of Carmel, Ind., has 65 roundabouts in total, with 55 of them being in the primary roadway network, according to Mike McBride, Carmel's city engineer.

McBride, a civil engineer with a focus in transportation, says that roundabouts are a key component of the cities dedication to safety and to aesthetics. “We want it to be beautiful even though it has a very utilitarian purpose.” He explains here how they achieve both.

Who is responsible for planning the design of roundabouts for the city?

The city has a planning department, but they are typically focused on planning for land use—what will be residential or commercial. There is a component to the planning that addresses transportation, but where the rubber meets the road, so to speak, is really up to the engineering department. We plan the designs and priority for implementation for transportation-related improvements. The engineering department takes it from broad concept to implementation in its true form.

How does the design process work?

Our engineering department is pretty lean staff, and we have a variety of tasks to address, including those related to drainage and the city’s storm sewer piping, as well as inspecting infrastructure on the private sites. We have 12 staff in total, but really two engineers are overseeing these types of projects.

Based on traffic needs and where we can identify funding, we work with outside consultants to develop a design plan for roundabouts. Internally, we generally put together a very conceptual idea and sketch out what we think will work from a traffic standpoint, then we go to an engineering consultant and ask them to do the design. When they come back to us with a design, we'll make changes where we think necessary, but they will draw up the construction documents. A lot of the engineering consulting firms that we work with have landscape architects on staff, and they are charged with doing the design for that side of it.

What is the main goal when planning the design for a roundabout?

First and foremost, we are much more concerned about how it handles traffic and the safety with which is does so. The landscaping of a roundabout serves a purpose from the safety side, as well. You can use the landscaping in a way that it increases the safety of the roundabout. In the U.S., drivers anticipate standard right-angle types of intersections. Obviously, roundabouts aren’t that. When drivers have to move their vehicle through an intersection in a slightly different way, they need more visual cues so they know it’s not typical. To achieve this, we use different striping, different signage and the landscape. A more pronounced landscaping in the center of a roundabout with more height gives drivers a cue because they can’t see the roadway in front of them. That signals them that this is not a standard intersection. So even on a subconscious level, they begin to slow down.

Using the landscaping to keep drivers from seeing through the intersection also keeps them from being concerned about the traffic on the other side. The traffic to the left is their only concern, so we use landscaping to direct their attention to

This roundabout located in Carmel, IN is in a more residential area and makes use of a landscaping wall that gives a variety of perspectives depending on the direction of approach.
the left and shield their view to traffic that’s not of concern to them. Typical intersection design requires that you establish visibility guidance so that the driver is able to see a certain distance to the left and right in order that they might perceive conflicts. But with roundabouts, because drivers reduce vehicle speed, we use the landscape to give the driver an angle of view just enough to enter the roundabout. If they can see too far, they won’t reduce their speed. So we use it as a control.

In the planning stages, how important is maintenance of the site and how does that impact design?

In Carmel, we don’t necessarily trend toward low-maintenance landscaping. Our street department has a substantial crew who focus on this type of maintenance, on roundabouts and medians. It’s common for the city to have an irrigation system installed to ensure that we can keep annual plants growing. The city really likes to have bright, vibrant colors at least within pockets. Most communities don’t go to this level. In some other cases, we do go low-maintenance, but for the most part, we try to landscape the roundabouts in a way that complements the area. We try to match the residential and commercial environment and what they have in the landscape.

Are water requirements ever an issue?

In some cases, we’ve done roundabouts in a way that we’re not dependent on irrigation; in other cases, we’re completely dependent upon it. Currently, we’re looking at ways to harvest rain and recapture and reuse water.

As you approach this roundabout, the more pronounced landscaping in the center island prevents drivers from seeing the roadway on the other side of the intersection thereby directing their attention to the left.

Maintenance matters

For the City of Overland Park, Kan., maintenance of landscape design is a critical component for its roundabouts and traffic-calming circles.

“Maintenance is a huge concern of ours,” says Sarah Patterson, city Forester for Overland Park. “The perennial aspects of the roundabout are extremely low-maintenance shrubs, such as grow-low sumac and spirea. We also have a number of ornamental grasses and prairie-type blooming plants. We do use annuals in roundabouts to add seasonal interest. Our downtown roundabout, for example, is highly visible, especially during our Fall Festival in September. Typically, we pull out the summer annuals in September and replace with cold hardy plants, such as mums.”

Patterson describes the city’s roundabout spaces as a mix of hardscape (sculpture or rock), woody shrubs and perennials, then large pockets for annual interest. “Our main goal is to provide a landscape that has year-round interest and high impact for drivers.”

Because the roundabouts are irrigated only where there are pockets of annual plants, drought-tolerant plants are vital to the design, adds Patterson, who has worked in forestry for seven years.

The city features two main roundabouts and six smaller traffic-calming circles designed to slow down traffic on residential streets. For the circles, the city minimizes landscaping so that there is little-to-no maintenance required. Roundabouts are maintained by the city’s forestry crew.
How do you select the plants for the roundabout?

We leave plant selection to the discretion of the landscape architect. We do, however, give them height restrictions. They have the freedom to choose the plants, usually based on a footprint of the area in which we are working. Then we review their plans to make sure what they’ve selected won’t impede safety issues.

Who implements the design?

The engineering department stays very involved in the installation of the design the first time because it sets the pace for how it will be done in the future. We are heavily involved in that. We set the parameters. The street department then does the maintenance: annual plant placement, irrigation maintenance, etc. is all done through the street department. The engineers aren’t the ones to be determining plant species and variety. But we do stay involved.

Examples of landscaping in roundabouts
TRB International Roundabout Conference
Carmel, Indiana
May 18-20, 2011
Sponsored by: Transportation Research Board, Task Force on Roundabouts
Hosted by: The City of Carmel, Indiana

**IF YOU HAVE INTEREST IN THE MODERN ROUNDABOUTS, YOU CAN’T MISS THIS ONE**

EXCITING AND INFORMATIVE PRELIMINARY PROGRAM INCLUDES:


ADDITIONAL OPTIONS:
1. A Free Optional Workshop Tuesday Afternoon: A “Roundabouts 101” workshop with the objective of getting beginners, novices, local officials, administrators and anybody wishing to increase his/her knowledge or review fundamental issues.


3. An afternoon and banquet at the Indianapolis 500 track, the world renowned “Indy 500” in its 100th anniversary year. Visit its fantastic museum.

4. Local roundabout tours, both guided by knowledgeable leaders and self guided with maps provided.

5. With more than 80 roundabouts within 5 miles of Carmel, this “Roundabout City, USA” is the perfect setting for this conference and for seeing dozens of roundabouts in use all over the city.

Contacts:
Gene Russell
Conference Chairman
K-State
785.539.9422
gen@ksu.edu

Michael T. McBride
Planning Committee Co-Chair
City Engineer, Carmel, IN
mmcbride@carmel.in.gov

John Habermann
Planning Committee Co-Chair
Program Manager, Indiana LTAP
jhaber@purdue.edu

Richard Pain
TRB Staff
202.334.2964
rpain@nas.edu

Exhibitor spaces/sponsorship opportunities are available. For more information contact Julie Miller at jmiller@nas.edu.

For information on registration, conference program, hotel, sponsorships, and tabletop exhibits, visit:

This event is cosponsored by the Institute of Transportation Engineers (ITE).
Indiana LTAP was saddened to learn of the death of Tom Jones, Mayor of Linton who passed on March 3, 2011. Mayor Jones, 55, was a Democrat in the final year of his second term. He was not seeking re-election this year. His death appears to have been from natural causes.

Before taking office, Jones was a 25-year veteran coal miner with the Peabody Hawthorne Mine where he was active in the United Mine Worker's Union. When the mine shut down he went back to college at Vincennes University where he graduated summa cum laude with a 3.986 GPA in 2001. He received an associate degree in business management.

His political career caught everyone’s attention in 2003 when he beat 20-year Linton Mayor Jimmie K. Wright by 180 votes in the Democratic primary election. He went on to beat his Republican opponent by more than three-to-one margin. Jones took office in 2004.


Jones was named a Sagamore of the Wabash by former Governor Joe Kernan and he's been the recipient of the Distinguished Citizen’s Award from the Linton Elks. He has served as member of the Legislative Committee of the Indiana Association of Cities and Towns (IACT) and on a number of local government and economic boards. He was the current president of the Indiana Conference of Mayors (ICOM) as well as a voting member of the Indiana Local Technical Assistance Program (LTAP) advisory board.

In 2010 Mayor Jones gave the Invocation at the 96th Annual Purdue Road School where he shared with his audience some favorite words his mother spoke to him as a young man that were indicative of his character. “You don’t have to go to work every day. You get to go to work every day.”

He leaves behind wife Patti, daughters Jodi, Jill, Tomi, and Lauren, and his grandchildren.

**2011 LTAP Directory Addendum**

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<td>Commissioner: Nancy Fogle, 833 Gardenside Drive, Greencastle, IN 46135</td>
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COUNTY ENGINEER
FRANKLIN COUNTY

Incumbent serves as County Engineer for the Highway Department responsible for planning, designing, and supervising construction, maintenance, and repair of County infrastructure.

DUTIES
Supervises and directs assigned personnel, including determining staffing requirements, planning and delegating work assignments, establishing goals and work standards, and maintaining discipline.

Provides engineering and administrative services for maintenance of County roads/rights-of-way, including investigating and discussing road condition problems with Foremen, determining and designing cost-effective improvement projects, overseeing construction, ensuring adherence to budget, and conducting engineering and traffic studies to establish speed and load limits and warning signs.

Provides engineering and administrative services for maintenance of large and small County bridges and culverts, including directing maintenance of inventory, designing rehabilitation and replacement projects as needed, preparing specifications, bid/contract documents and legal ads, coordinating work performed by consulting engineering firms in completing projects and related reports.

Frequently performs on-site inspection of Department projects to ensure compliance with specifications, determine project status, and certify completion.

Prepares and publishes county-wide inventory and classification of County roads. Prepares and submits reports of Department projects/activities to federal, state, and local agencies as required.

Reviews various plans/specifications for compliance with County ordinances, rules and regulations, such as subdivisions, large developments, residential and commercial drives, and utility permit applications.

Periodically attends various meetings as needed or requested to report on projects such as County Council, Board of County Commissioners, Board of Zoning Appeals and Plan Commission.

Prepares annual Department budget, including estimating costs for materials, equipment and personnel, and submitting and presenting to County Commissioners for approval. Prepares and administers long-range program of road and bridge construction/improvements.

Maintains current knowledge of trends and developments in road and bridge improvements, including reading professional publications and periodically attending seminars/workshops as needed.

Serves on 24-hour call for emergencies.

Incumbent reports directly to Board of County Commissioners.

JOB REQUIREMENTS
Masters Degree in Civil Engineering and ability to satisfy minimal requirements for Indiana Professional Engineer license. Possession of land surveyor license preferred.

Thorough knowledge of and ability to make practical application of principles and practices of civil and structural engineering, and road and bridge construction and maintenance.

Thorough knowledge of and ability to ensure compliance with local, state, and federal requirements and design specifications of assigned construction projects.

Ability to supervise and direct assigned personnel.

Ability to ensure cost-effective purchase, operation and maintenance of equipment, vehicles, materials and supplies.

Ability to physically perform essential duties of the position.

Ability to effectively communicate orally and in writing.

Ability to occasionally work extended hours, occasionally work weekend and/or evening hours, and occasionally travel.

Ability to operate department computer for such applications as structural and hydraulic design, office programs and bridge and road management systems.

Ability to speak knowledgeably in public meetings regarding Department projects.

Possession of a valid driver’s license and demonstrated safe driving record.

CONTACT
Franklin County Commissioners
1010 Franklin Avenue
Brookville, IN 47012
765-647-4985
765-647-6926 fax
commissioners@franklincounty.in.gov
UPCOMING ASSOCIATION EVENTS

www.indianacountycommissioners.com
District Meetings
North - June 8
Central - June 15
South - June 22

Indiana Association of Cities and Towns
www.citiesandtowns.org
May 19
North Central Mayors Roundtable
May 20
Northern Mayors Roundtable
May 26
IACT Budget Workshop

www.iaches.org
June 1-2
Summer Conference
Indianapolis

www.indianacounties.org
May 20
AIC Institute Elective Class
June 17
AIC Institute Leadership Class

www.indianaite.org
May 11
Keep Indianapolis Beautiful
ITE Community Service Day
May 21
ASCE/ITE Day at the Track

www.asphaltindiana.org
July 15-17
APAI/IMAA Joint Summer Meeting

email: jantrobus@marionindiana.us
August 16-18
Annual Conference
Aztar Convention Center
Evansville

http://indiana.apwa.net
June 27-29
Sustainability in Public Works Conference
Portland, OR

www.cityengineer.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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Vice Chair
Vacant

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Tom Murtaugh, Tippecanoe County
Tom Stevens, Hancock County
Walter Wilson, Fountain County
Kevin Woodward, Wells County

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Michael Fincher, Mayor, Logansport
Randy Strasser, Mayor, Delphi

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Dr. Robert Connor, Associate Professor
Dr. Jon Fricker, Professor
Dr. Jason Weiss, Professor

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Eric Conklin, Manager, Office of Technical Services

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Stephanie Yager, Executive Director

Indiana Association of County Highway Engineers and Supervisors
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Tom Kouns, Boone County Highway Supervisor

Indiana Street Commissioners Association
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Indiana Association of City Engineers
Mike McBride, City of Carmel Engineer

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Chuck Muller, Indiana 811, utilities representative
John Thomas, Area Plan Commission of Tippecanoe, MPO Council
Anne Troubaugh, Indiana Association of Cities and Towns
Bill Williams, Monroe County Highway Director, NACE States Rep.
Joe Williams, Brown Equipment, vendors representative

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John Habermann, Program Manager

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Neal Carbounou, Research Manager
Richard Domonkos, Training Specialist
Celina Osborn, Secretary
Laura Slusher, HELPERS Project Manager

Miranda Robledo-Fisher, Undergraduate Assistant
Eka Linwood, Graduate Research Assistant
Hunter McNichols, Graduate Research Assistant