Country Roads & City Streets

WV Local Technical Assistance Program

Summer 2005 *College of Engineering & Mineral Resources* *Vol. 20 No.2*

West Virginia University

ltap West Virginia

Crash Reconstruction Workshop Recap

By: Bradley DiCola

A depiction of the many items of physical evidence at a crash scene.

On June 9, 2005, as part of the Safety Circuit Rider program, the WV LTAP hosted a Crash Reconstruction Workshop in the Jerry West Lounge of the WVU Coliseum, Morgantown, WV. Dr. Ron Eck was the workshop instructor, and attendees of the workshop included safety specialists, law enforcement, highway safety officials, and representatives from the West Virginia Division of Highways. The workshop format was part lecture and part discussion, and all attendees were encouraged to contribute to the workshop by sharing their own experiences in dealing with motor vehicle crashes, and what they have learned from these incidents.

The workshop opened with a brief overview of accident reconstruction and some of the general procedures to follow at the scene. The different types of data to be collected, such as tire marks, road conditions, and vehicle inspection, were then covered in greater detail, as well as the significance of each of those types of data. The physics of vehicular motion and basic equations for this motion were also covered, leading up to a procedure for the analysis of the data available in determining vehicle speed based on the scene data and type of crash. The workshop concluded with the discussion and presention of special cases to be considered, such as crashes involving trucks, motorcycles, and pedestrians.

Course participants received a copy of the *Handbook of Accident Reconstruction* that Ron Eck authored based on his experience in crash reconstruction.

Overall feedback from the presentation was very positive, with several participants attesting to the value of the program, and stating they believe it would be of great use to some of their fellow employees. Please contact the WV LTAP Center for more information regarding this course at 304-293-3031 x 2612 .

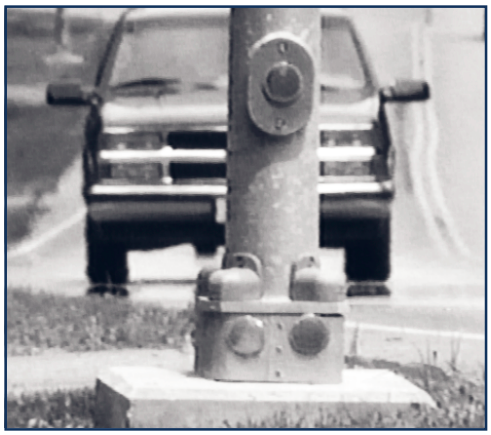
Some of the Workshop attendees.

In This Issue

Country Roads and City Streets is a quarterly publication of the West Virginia Local Technical Assistance Program (WV LTAP). The purpose of this newsletter is to provide information that is beneficial to highway construction and maintenance personnel.

The material and opinions contained in this newsletter are those of the West Virginia Local Technical Assistance Program, and do not necessarily reflect the views of the Federal Highway Administration or the WV Department of Transportation. Material contained in *Country Roads and City Streets* is a combination of original and borrowed material. Every effort has been made to ensure the integrity and accuracy of this material. However, the West Virginia LTAP does not assume responsibility for any incorrect material.

WV LTAP's Safety Circuit Rider Update



This photo depicts a potential roadway departure hazard for motorists, one of the areas being assessed with the WV Safety Circuit Rider Program.

Things are really picking up in terms of our activity with the Safety Circuit Rider Program. For those of you not familiar with this program, the Safety Circuit Rider is funded by a $150,000 grant from the Federal Highway Administration (FHWA) and is geared toward making low to moderate cost safety improvements on local and rural roads. West Virginia was chosen as one of four states for this pilot program. FHWA has outlined three major goals for this program, seeking a 10% reduction by 2007 in these types of fatalities: roadway departure, intersection, and pedestrian.

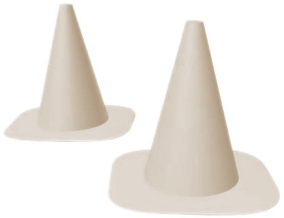
On June 17, Ron Eck, Mike Blankenship, Brad DiCola, and Bill Wyant traveled to Charleston to meet with Cathy Satterfield of FHWA-WV Divison and Cindy Cramer and Marsha Mays of the West Virginia Division of Highways (WVDOH) to discuss the geographic areas of the state to focus on, as well as the data needed and potential solutions. After an initial data analysis of areas with a high crash incidence, it was decided that the program would focus on roadway departures in WVDOH Districts 5, 6, 7, and 10.

In terms of pedestrian and intersection crashes, we decided the more densely populated urban areas with high pedestrian crash rates would be the focus, with seven areas being selected. These areas are: Charleston, Huntington, South Charleston, Parkersburg, Wheeling/Weirton, Martinsburg, and Morgantown.

Currently, Ron, Mike, and Brad are in the data analysis phase, having been provided with an abundance of information from the WVDOH. From this data, we have been able to obtain crash listings by half-mile, crash reports, and straight-line diagrams to use in evaluating the roadway departures, as well as crash reports for both the intersection and pedestrian crashes. In-depth analysis of this data will assist staff in pinpointing those specific locations that will be the focus of on-site visits and technical assists.

Once we are finished analyzing the data, we intend to begin visiting selected sites and working with local and state roadway officials in making low-cost roadway safety suggestions and improvements.

While we are using specific traffic data to determine high-priority areas, we also would like your input. To recommend a stretch of roadway or an intersection where accidents are regularly occurring, or areas where pedestrians and bicyclists have been injured, please contact Mike Blankenship either via email or phone at michael.blankenship@wvu.edu or 304-293-3031 x 2629 with your suggestions. Mike is also happy to provide additional information regarding this program and answer any questions you may have.



The following information was taken directly from the US Department of Transportation and Federal Highway Administration Publication Number FHWA-SA-05-003. Unsafe pavement edges are just one of the many items that will be considered during the WV LTAP's Safety Circuit Rider pilot program.

The Safety Edge: Pavement Edge Treatment

Unsafe pavement edges are a serious safety problem. An estimated 11,000 Americans suffer injuries and160 die each year in crashes related to unsafe pavement edges, at a cost of $1.2 billion. The true extent of the problem is difficult to assess because the role of the hazardous pavement edge in the sequence of events leading to a crash often is not documented.

What is the Definition of an Unsafe Pavement Edge?

An edge dropoff of four or more inches is considered unsafe if the roadway edge is at a 90º angle to the shoulder surface. Near-vertical edge dropoffs of less than four inches are still considered a safety hazard to the driving public and may cause difficulty upon reentry to the paved surface.

How do Unsafe Edges Cause Crashes?

Drivers who slip off a resurfaced road onto an unimproved shoulder are likely to lose control as they attempt to climb onto the roadway. The pavement edge creates a "scrubbing" condition that must be overcome through over-steering. As drivers over-steer to reenter the roadway, they are prone to lose control of the vehicle. This yaw movement often causes the car to veer into the adjacent lane, where it may collide with oncoming cars, overturn, or run off the road and hit a fixed object. Adopting a standard contract specification requiring a 30-35º angle asphalt fillet along each side of the roadway in all resurfacing projects is a simple and cost-effective way to provide safer pavement edges.

Solutions to the pavement edge drop-off hazard are to:

- **Require a *30-35º angle asphalt fillet*** "Safety Edge" as a contract specification in all pavement resurfacing projects; and
- ***Routinely resurface shoulders*** when roadways are resurfaced.

The asphalt fillet provides a safer roadway edge, and a stronger interface between the roadway and the shoulder. The cost of an asphalt fillet is minimal in comparison to the total amount of the resurfacing contract, and pays back in countless dollars saved from reduction of fatalities, injuries, property damage and lawsuits. An inexpensive way to assure pavement edge safety is to specify a 30º-35º angle asphalt fillet "Safety Edge." The fillet ties the existing shoulder into the resurfaced roadway and allows a vehicle to reenter the roadway safely. Highway agencies are able to restore the shoulder after the resurfacing project is completed.

For More Information about the "Safety Edge"

The Georgia Department of Transportation working with the FHWA has demonstrated the ability to construct the "Safety Edge" with no impact on production and at less than 1% additional material costs. Based on the successful performance after one year in service, GDOT intends to incorporate the "Safety Edge" design into all resurfacing projects beginning in 2005. Local city and county governments in Georgia, such as Gwinnet County, are also making the safety edge part of their routine overlay design. Indiana DOT and the NYDOT are implementing the safety edge on several pilot projects in 2005.

PAVEMENT EDGE HAZARDS AND TORT LIABILITY

Tort liability claims resulting from pavement edge drop-offs cost highway agencies millions each year. In one case, the court awarded $6 million for injuries caused by a pavement edge condition.

Safety Fact Sheet

Lifting and Carrying: Correct Lifting Techniques

advice for crew members...

Photo courtesy of the LTAP Graphics Collection

Warm up with stretching exercises before attempting to lift any object.

Rock the load to estimate its weight. It is not advisable to lift an object weighing over half your body weight.

Use a crane, hoist, dolly, or other lifting and moving equipment when lifting or moving heavy or bulky objects.

Use a dolly or enlist a helper if the load is too bulky to see over.

Inspect objects for slivers, jagged or sharp edges before you begin lifting.

Consider repairing damaged loads before moving them.

Wipe off greasy, wet, slippery, or dirty objects before trying to handle them.

Position your feet correctly. One cause of muscle injury, particularly to the back, is the loss of balance due to working with your feet too close together. To minimize injury, place your feet about shoulder-width apart, with one foot in the proposed direction of movement and the other in a position where it can give thrust to the body.

Keep the load as close to your torso as possible. When your arms are held away from your body, they lose much of their strength and power. Tucking your arms in will help keep your body weight centered.

Keep your back relatively straight and your knees bent when lifting an object.

Bend over slightly (but don't bend your back into an extreme curve) and pull the load close to your torso when lifting a load that is too large to pass between your knees. If you are going to carry a compact load, squat down and straddle the object with your knees. Keep your back relatively straight, pull the load in toward your torso, and use your leg muscles to help lift the load. Remember your legs are four times as strong as your back.

Grasp an object correctly; keep your fingers away from pinch and shear points. Grasp boxes at alternate top and bottom corners; grasp stacked materials at alternate corners. Get a firm hold.

Move as smoothly as possible. If the load interferes with normal walking, get help or use mechanical aids. Seek advice from your supervisor.

Keep work areas free of debris to avoid tripping, and keep a clear view over the load.

Use extra caution when walking on ice and snow.

Never turn at the waist to change direction or to put an object down.

Set your load down close to your body, or place it on the near edge of a shelf or truck bed, then slide it back.

Never throw or drop loads or equipment from elevated places. Use a suitable lowering device.

team lifting...

Adjust your load so that it is level. Lift, walk, and set down in unison. Call out commands of "lift," or "set down" if more than two are involved.

Place long sections of pipe on shoulders when carrying them, and use shoulder pads.

Reprinted with permission from KS LTAP Workplace and Equipment Safety Fact Sheet.

Safety Fact Sheet

Special Considerations for Season/Weather Conditions/Time of Day

in the summer...

If you must work in the heat, wear loose, lightweight, light-colored, layered clothing to help keep your body temperature down. This type of clothing reflects heat and sunlight and helps your body maintain normal temperatures. Layered clothing slows dehydration and minimizes exposure.

Drink plenty of water to avoid dehydration.

Take frequent rest breaks. Humidity and heat decrease your body's endurance level by adding extra demands on your heart to cool your body, causing many to suffer from heat stroke.

Wear a hat/cap — one that protects your neck and ears from sunburn.

Use sunscreen and wear sunglasses.

in the winter...

Dress in layers of thin clothing instead of single layers of thick clothing. You'll be warmer and as the temperature changes, you can easily remove layers to remain comfortable.

Choose mittens instead of gloves. They're warmer.

Wear a hat. Body heat is lost through the top of the head.

Cover your mouth with fabric (coat flap or scarf) to protect your lungs from directly inhaling extremely cold air.

Keep a full change of clothes handy. The severity of hypothermia and frostbite increase when socks, boots, and gloves are wet.

miscellaneous...

Rainy Days: How do you keep dry and safe when working in the rain? Proper planning. To avoid condensation two important elements need to be considered in regard to your raingear: sizing and design. Worker visibility is also a major consideration in rainy weather.

> **Sizing:** A slightly oversized suit with a vented cape-back, adequate sleeve size and room inside can make the garment pump hot air and moisture out of the rainwear system when you move. Likewise, a rain suit that is too tight may be responsible for many condensation problems and water leaking into your suit.
>
> **Design:** Breathable material for the exterior of the suit will make more difference in your comfort due to the suit's capacity to allow water to escape but still prevent it from returning. Breathable material keeps you dry and cooled off at the same time.
>
> **Visibility:** Add fluorescent colors and retroreflective trim to all raingear ensembles.

Daytime: Wear orange, strong yellow-green or fluorescent colored warning garments such as vests, jackets or shirts, safety glasses, and a white hard hat.

Nighttime Work: Wear retroreflective garments, safety glasses, and a white hard hat. White outer garments with retroreflective material may be worn in lieu of colored vests, jackets, and/or shirts. White outer garments should not be worn during snow or fog conditions.

Reprinted with permission from KS LTAP Workplace and Equipment Safety Fact Sheet.

Center Staff & Contact Information

WV LTAP
West Virginia University
PO Box 6103
Rm. 651 and 653-B
Morgantown, WV 26506-6103

Phone: (304) 293-3031 x 2612
Fax: (304) 293-7109

Staff

Dr. Ronald Eck, P.E.
Director
(304) 293-3031 x 2627
ronald.eck@mail.wvu.edu

Michael Blankenship, P.E.
Program Manager
(304) 293-3031 x 2629
michael.blankenship@mail.wvu.edu

Kim Carr
Program Coordinator
(304) 293-3031 x 2612
kim.carr@mail.wvu.edu

Brad DiCola
Technical Assistant
(304) 293-3031 x 2662
bradley.dicola@mail.wvu.edu

Emily Walters
Public Relations Intern
(304) 293-3031 x 2662

Sherry Williams
Program Assistant
(304) 293-3031 ext. 2662

Sandy Wotring
Administrative Assistant
(304) 293-3031 ext. 2630

Bill Wyant
Senior Volunteer
wwyant@hsc.wvu.edu

Coming to North America...

Intertraffic North America (INA)

Your "one-stop shop" for virtually everything you want to know about the transportation infrastructure market. INA combines a major exhibition with a comprehensive conference in one location. The INA Conference will discuss cutting-edge issues of interest to the transportation infrastructure industry plus provide professional development hours (PDHs) for people who need to maintain their engineer's certification.

INA has been endorsed by the National Association of County Engineers (NACE), the National Local Technical Assistance Program Association, and has the support of the Maryland OSH. INA is being held in partnership with the Federal Highway Administration.

INA Exhibition:

For the first time in the United States, the exhibition will bring 200 companies promoting the latest products and services for the transportation infrastructure market to one location. In attendance are firms representing virtually every aspect of transportation infrastructure — Road Infrastructure; Parking Road Safety; Traffic Management; and Consultancy and Services.

INA Conference Program:

The INA Conference includes five separate tracks covering:

- Economics and Financial Management
- Environmental Regulation and Compliance
- Workzone Safety
- Traffic Management and Calming
- Transportation Security

For additional details of the INA Conference, please visit: www.northamerica.intertraffic.com

Mid-Atlantic Pedestrian Safety Forum * September 7, 2005

University of Delaware, Clayton Hall, Newark, Delaware

Join us for an exciting day to share best practices to help improve pedestrian safety. You will be involved in valuable pedestrian discussions and issues that can help improve your pedestrian programs and enhance your current efforts to reduce pedestrian injuries and fatalities. This is open to all individuals interested in improving pedestrian safety.

Agenda

8:30 Welcome and Opening Remarks

9:15 Break

9:30 Breakout Sessions
- Development of Statewide and Local Pedestrian Safety Plans
- Pedestrian Issues and Crash Reduction Programs in Large Cities

11:30 Lunch (Provided)

12:30 Breakout Sessions:
- Accessibility/ADA Issues
- Pedestrian Data Needs and Issues

2:00 Break

2:30 Breakout Sessions
- Working with Local Advocacy Groups
- Incorporation of Pedestrian Needs in Highway Design Standards

4:00 Closing Session (15 minutes)

Registration Information:

Registration Fee is $50 per person
You can register online by accessing:
www.engr.udel.edu/outreach/DelawareT2courses.html
or by calling: **302-831-8302**
Contact Mr. Patrick Kennedy at (302) 734-5326 or via e-mail at **Patrick.Kennedy@FHWA.DOT.GOV** for more info.

Accommodations:

A block of rooms has been reserved through Aug. 17 at the Marriott Courtyard Newark - University of Delaware. The standard room rate is $129 plus tax. A government room rate of $108 plus tax is available. You can access their web site at: wwww.marriott.com or contact the Marriott Courtyard Newark directly at (302) 737-0900. (When reserving a room, be sure to mention the Mid-Atlantic Pedestrian Safety Forum.)

Sponsored By:

Federal Highway Administration
National Highway Traffic Safety Administration
Delaware Office of Highway Safety
Delaware Department of Transportation
University of Delaware

Welcome to our Newest Staff Member: Brad DiCola

Bradley "Brad" DiCola is originally from Latrobe, PA, and graduated from Greater Latrobe Senior High School in 2001. He then earned his Bachelor of Science in Civil Engineering from the University of Pittsburgh in April 2005. (Please don't hold this against him, as he is truly a Mountaineer.) He has come to West Virginia to earn his master of science in civil engineering, focusing in the area of transportation.

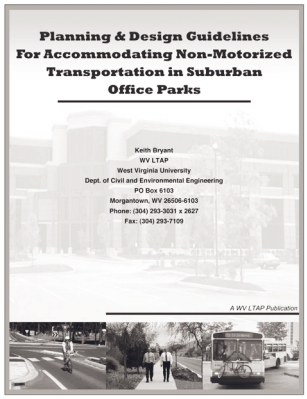
Brad served as an undergraduate teaching assistant at Pitt, serving as TA for both the introductory Transportation Engineering course and the Dynamics course offered to sophomores. Brad was also very involved in student activities at Pitt, serving as Vice-President for the Engineering Student Council and Chi Epsilon student chapter, while also holding the position of President for the school's student chapter of the American Society of Highway Engineers. He was also treasurer for his student chapter of the Institute of Transportation Engineers, before Pitt cancelled the transportation program in civil engineering.

Brad's leisure interests include playing any sport he can get involved in and working out. He played rugby for 3.5 years at Pitt, earning all-Midwest honorable mention his junior year. Brad also enjoys soccer and basketball, and looks to get involved in intramurals here at WVU. He looks forward to everything about being here at WVU, from football Saturdays to working with the LTAP staff and helping to improve the state's transportation infrastructure and serve the public.

Brad officially began working at the Center on June 16, and we've had him busy from day one! His official title is technical assistant, and like his predecessors, his duties are numerous. From maintaining the lending libraries, to helping with technical assists, to assisting with workshops, we'll put his talents to work. Already he has updated our web page - which was much needed - assisted with a workshop, gone out on technical assists, written various articles, and much more! We are very excited to have Brad on board, and look forward to at least two -years of his services as he completes his master's degree.

We would also like to congratulate Keith Bryant on successfully defending his thesis this past spring and officially graduating from West Virginia University. Keith's thesis focused on guidelines for accommodating non-motorized transportation in suburban office parks.

To receive a copy of the handbook Keith developed as part of this thesis work, *Planning & Design Guidelines for Accommodating Non-Motorized Transportation in Suburban Office Parks,* please contact Kim at kim.carr@mail.wvu.edu or by phone at 304-293-3031 x 2612.



The handbook is available for a $15 charge to cover printing/binding and postage.

The West Virginia LTAP Center is a part of the nationwide Local Technical Assistance Program (LTAP), which is funded by the Federal Highway Administration. The Center also receives funding from the West Virginia Department of Transportation.

Mission:

The mission of the West Virginia LTAP is to foster a safe and efficient transportation system. The LTAP Center's mandate is to improve the transportation system by improving the professional skills of those involved in highway design, construction, and maintenance, and to act as a resource for them by keeping up-to-date training libraries and constantly seeking/developing new technologies.

Overall Goal:

The Center's overall goal is to improve the transportation system by focusing on professional training, technical assistance, and information dissemination.

To achieve this goal, the WV LTAP does the following:

- Provides on-site training and demonstrations
- Publishes a quarterly newsletter
- Maintains a video, CD-Rom, and publications library
- Provides technical assistance via mail, telephone, fax, email, or site visits.

Program Changes

As you may already know from the spring 2005 edition of *Country Roads and City Streets,* our program has made a lot of changes in 2005. One of the biggest changes was changing our name and logo to more closely align with the National LTAP identity. As a reminder, the West Virginia Transportation Technology Transfer Center (WV T[2)] is now the WV Local Technical Assistance Program or WV LTAP.

We are also pleased to announce that we have made several revisions to our website, including an easier to remember web address: **wvltap@wvu.edu.** (You don't even have to type in http, and the www isn't part of the address.)

Regarding upcoming courses and workshops, we realize that many of you are eager to take advantage of any available training. We are currently working on course scheduling for this fall, and anticipate having a training schedule for September – December by mid-August. Please feel free to email Kim at **kim.carr@mail.wvu.edu** if you have a specific training request or workshop suggestions. Once we have the training schedule finalized, we will send out a mailing, along with posting the information on our website.

The staff of the WV LTAP appreciates your patience as we continue to stretch both our monetary and staff resources to meet our program goals and help improve transportation in WV. This has been an exciting year thus far, and we look forward to even more exciting changes.

West Virginia Local Technical Assistance Program
West Virginia University
College of Engineering and Mineral Resources
Department of Civil and Environmental Engineering
PO Box 6103
Morgantown, WV 26506-6103

Change Service Requested

Non-Profit Organization
U.S. Postage Paid
Morgantown, WV
Permit No. 34

Mark your calendar
for the
2005 Snow and Ice Control Workshop!

September 21, 2005
at WVU Jackson's Mill,
Weston, WV.

More information to come.