

# t r a n s p o r t a t i o n

# TRACKS

Technology Transfer Newsletter

Published by the Local Technical Assistance Program (LTAP)  
At the Institute for Transportation Research and Education, North Carolina State University

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## Inside this issue:

Roadway Safety Pledge	2
Preventing Backovers	3
OSHA Training Tool	4
LTAP Training	9
LTAP Officers	10

transportation TRACKS  
North Carolina Technology  
Transfer Center

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Research and Education

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## Vision Zero

The National Local Technical Assistance Program Association is a partner with the Federal Highway Administration in the Toward Zero Deaths Strategy. The North Carolina Local Technical Assistance Program (NC LTAP) is a partner with the Highway Group at the Institute for Research and Education (ITRE) at North Carolina State University.

ITRE researchers have been working on a research project sponsored by the North Carolina Governor's Highway Safety Program (GHSP) to investigate the feasibility and necessary components of an overall highway safety outreach initiative, Vision Zero. Vision Zero is an initiative that sets a vision for zero fatalities on our highways. Vision Zero encompasses a single unified vision that involves the collaboration of key stakeholders ranging from government agencies to law enforcement to educators to individuals—it includes EVERYONE. To meet this vision, a transformation in driver behavior and traffic safety culture must be reconstructed from its foundation. This necessary change can be encouraged by sustained focus and effort from stakeholders, which a primary objective of Vision Zero.



In 2012, approximately 92 people died each day in a motor vehicle crash in the United States—averaging one life lost on a roadway every sixteen minutes. In the same year, a total of 33, 561 people died and over 2 million people were injured as a result of vehicular crashes across the country. These figures represent a 3.3 percent increase in fatalities and a 6.5 percent rise in injuries. According to the Centers for Disease Control and Prevention (CDC), unintentional injury resulting in death from a vehicular collision is in the top three leading causes of death for every age group<sup>2</sup>.

In 2010, collisions cost the United States a total of \$277 billion. There were over 240,000 traffic crashes reported in North Carolina in 2012, resulting in over 110,000 injuries and 1,276 deaths on roadways. The high incidence of motor vehicle crashes costs the state over \$1 million per hour, adding up to over \$10.3 billion dollars annually.

We would like for you to participate in the Vision Zero initiative by printing the safe drive pledge on the next page, make copies or email it to your friends, family and co-workers, asking them to sign it and place in a location where they will be reminded every day to drive mindfully.

For more information about NC Vision Zero: email [djfindle@ncsu.edu](mailto:djfindle@ncsu.edu).

Visit the YouTube link below to watch a video produced to share the concept of Vision Zero for NC.

<https://www.youtube.com/watch?v=W30IeLgB0xQ&feature=youtu.be>

## *Roadway Safety Pledge*

Our organization supports NCDOT's Traffic Safety Unit's efforts to save lives and reduce injuries on North Carolina's streets and highways. We have to reduce the loss of life due to road fatalities, and we do not want to lose any more family, friends, or citizens to a fatal crash. Below is a list of items that are critical to making good decisions and promoting safe driving 7 days a week and 24 hours a day. We want to serve as role models and display safe behavior on the roads at all times.

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I agree to be a positive influence on my friends, co-workers, and my family by sharing the importance of safety on our roadways through the following actions:

- ◆ To obey all traffic laws when operating a motor vehicle including obeying all speed limits, wearing a seat belt, requiring anyone riding with me to do the same, and restraining all children in age appropriate car seats.
- ◆ To not operate a vehicle while fatigued or under the influence of alcohol and/or drugs, or ride in a vehicle where the operator is fatigued or under the influence of alcohol and/or drugs
- ◆ To leave the roadway network if a potential distraction must be addressed such as making/receiving calls, reviewing directions, addressing the needs of passengers, recording notes/observations from field investigations, and adjusting navigational devices
- ◆ To obey all traffic laws when operating a non-motorized vehicle including wearing a helmet and coming to a complete and full stop at all stop signs and red traffic signals
- ◆ To obey all pedestrian laws when traveling as a pedestrian including crossing at signalized intersections or other appropriate crossings, crossing only when the "WALK" signal is displayed (when available) and wearing conspicuous clothing
- ◆ To respect all roadway users
- ◆ To ensure any vehicle I operate to be road worthy

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Name

---

Date

## Preventing Backovers

A backover incident occurs when a backing vehicle strikes a worker who is standing, walking, or kneeling behind the vehicle. These incidents can be prevented. According to the Bureau of Labor Statistics, over 70 workers died from backover incidents in 2011.

### How do backover incidents occur?

Backover accidents can happen for a variety of reasons. Drivers may not be able to see a worker in their blind spot. Workers may not hear backup alarms because of other worksite noises or because the alarms are not functioning. A spotter assisting one truck may not see another truck behind him. Workers riding on vehicles may fall off and get backed over. Drivers may assume that the area is clear and not look in the direction of travel. Sometimes, it is unclear why a worker was in the path of a backing vehicle. A combination of factors can also lead to backover incidents.



### What can be done to prevent backover incidents?

Many solutions exist to prevent backover incidents.

- ◆ Drivers can use a spotter to help them back up their vehicles.
- ◆ Video cameras with in-vehicle display monitors can give drivers a view of what is behind them.
- ◆ Proximity detection devices, such as radar and sonar, can alert drivers to objects that are behind them.
- ◆ Tag-based systems can inform drivers when other employees are behind the vehicle and can alert employees when they walk near a vehicle equipped to communicate with the tag worn by the employee.
- ◆ On some work sites, employers can create internal traffic control plans, which tell the drivers where to drive and can reduce the need to back up. In some cases, internal traffic control plans can also be used to separate employees on foot from operating equipment.

Training is another tool to prevent backover incidents. Blind spots behind and around vehicles are not immediately obvious to employees on foot. By training employees on where those blind spots are and how to avoid being in them, employers can prevent some backover incidents. One component of this training can include putting employees who will be working around vehicles in the driver's seat to get a feel for where the blind spots are and what, exactly, the drivers can see. The National Institute for Occupational Safety and Health (NIOSH) has several blind spot diagrams that can help explain what drivers of various large trucks can see.

Source: US Department of Labor - Occupational Safety and Health Administration

<https://www.osha.gov/doc/topics/backover/index.html>

## WIN A FREE LTAP CLASS

Can you identify the class where this demonstration took place in 2014?



First person to answer wins a training class of your choice!

Contact Linda Collier  
linda\_collier@ncsu.edu

If you would like to host an NCLTAP training class in your city or town, contact Linda Collier, [linda\\_collier@ncsu.edu](mailto:linda_collier@ncsu.edu)



## *OSHA's Hazard Identification Training Tool*

The US Department of Labor - Occupational Safety and Health Administration (OSHA) has created an interactive, online, game-based training tool for small business owners, workers and others interested in learning the core concepts of hazard identification. After using this tool, users will better understand the process to identify hazards in their own workplace. *Source: United States Department of Labor - Occupational Safety and Health Administration*



This training tool is intended to:

- ◆ Teach small business owners and their workers the process for finding hazards in their workplace,
- ◆ Raise awareness on the types of information and resources about workplace hazards available on OSHA's website.

To begin the Hazard Identification Training Tool click on this link

<https://www.osha.gov/hazfinder/>



## *Improving the Performance of the Transportation Industry Through Training*

All National Highway Institute **New and Updated** Courses Can Be Found at link below:

[http://www.nhi.fhwa.dot.gov/training/new\\_updated\\_courses.aspx](http://www.nhi.fhwa.dot.gov/training/new_updated_courses.aspx)

Free Web-based Trainings offered by the National Highway Institute can be found at link below:

[https://www.nhi.fhwa.dot.gov/training/course\\_search.aspx](https://www.nhi.fhwa.dot.gov/training/course_search.aspx)

Click on Choose delivery type options, click on web-based training, click on search

## Alternative Intersections Coming to North Carolina

by Shannon Warchol

This fall, North Carolina Department of Transportation opened the state's first Diverging Diamond Interchange (DDI, a.k.a., Double Crossover Diamond, DCD). An interchange is the grade-separated intersection of two roads, typically a city street and an interstate road. Drivers are likely most familiar with a diamond interchange, in which drivers can exit the freeway on a straight exit ramp prior to the bridge while drivers entering the freeway do so with a straight



Source—Chunho Yeom

entrance ramp after the bridge. DDIs use the same type and position of ramps to exit and enter the freeway, but how you access them from city street makes them unique. As with a diamond interchange, there are two traffic signals at the DDI. At the DDI, however, the first traffic signal serve to help inbound traffic move from traveling on the right side of the road, to traveling on the left side of the road. While on the left side of the road, drivers are merge with left turning traffic from the off-ramp and can make a free-flowing left turn onto the on-ramp without having to yield to oncoming traffic. The second traffic signal then moves the remaining drivers back to the right side of the road.

The first DDI was built in Springfield, Missouri in 2009. Research conducted in areas where DDIs have been implemented show while drivers are at first skeptical of the design, impressions improve after it opens. Drivers generally reported they found driving through the DDI no more complex than a conventional diamond interchange, gave an average rating of 4.26 out of 5 for safety of the interchange, and gave higher marks to the DDI over the conventional diamond interchange on reduction of congestion. (1)

North Carolina opened the first DDI in September of 2014 along I-85 in Concord, just north of Charlotte. At least 10 more are under review or already being constructed throughout the state. Extensive research is continuing in all aspects of DDIs, but citizens and local governments can rest easy knowing that more than 36 have already been successfully implemented across America.

(1) Jackson, Cunningham, Yeom, Hummer, Kirk. *Public Perception of Double Crossover Diamond Interchanges*. *Journal of Transportation*, Vol. 6, No. 1, 2014, pp. 33-54.

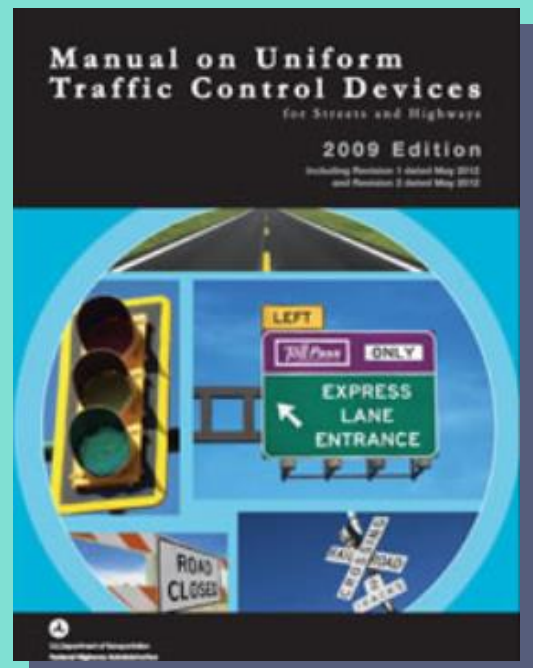
## *MUTCD Target Compliance Dates in the 2009 MUTCD*

In May 2012, The Federal Highway Administration revised or eliminated compliance dates from the 2009 Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD applies to all roads open to the public, including local roads. As a reminder, you will find below these important compliance dates as well as some that have recently passed.

As always, any new or replacement traffic control device on our nation's road shall be in compliance with the current MUTCD.

### Dates that have passed

- ◆ Have all workers within the right-of-way, including emergency responders, wear high-visibility safety apparel. Section 6D.03. December 31, 2011.
- ◆ Have all flaggers within the right-of-way, including law enforcement personnel, wear high-visibility safety apparel. Section 6E.02. December 31, 2011.
- ◆ Have all adult crossing guards within the right-of-way, including law enforcement personnel, wear high-visibility safety apparel. Section 7D.04. December 31, 2011.
- ◆ Have crashworthy supports for all signs on roads with a speed limit of 50 mph or higher. Section 2A.19. June 17, 2013.
- ◆ Develop and use an assessment or management method to maintain minimum or higher sign retroreflectivity levels for all regulatory and warning signs. This does not include signs with brown or blue backgrounds. Section 2A.08. June 14, 2014.



### Upcoming Dates

- ◆ Meet requirements for yellow change and all red clearance intervals at all traffic signals. Section 4D.26. June 13, 2017 or with signal retiming, whichever happens first.
- ◆ Meet requirements for pedestrian change intervals at all traffic signals. Section 4E.06. June 13, 2017 or with signal retiming, whichever happens first.
- ◆ Meet requirements for the number and location of all One Way signs. Section 2B.40. December 31, 2019.
- ◆ Meet requirements for horizontal alignment signs on all freeways and expressways, and on all arterials and collectors with an Average Annual Daily Traffic above 1,000. Sections 2C.06-2C.14. December 31, 2019.
- ◆ Meet requirements to use specific plaques for all left-hand exits. Sections 2E.31, 2E.33, and 2E.36. December 31, 2014.
- ◆ Have a retroreflective strip on all Crossbuck sign supports at passive railroad grade crossings and on the back of all Crossbuck signs at active and passive crossings. Sections 8B.03 and 8B.04. December 31, 2019.
- ◆ Supplement Crossbuck signs with Stop or Yield signs at passive railroad grade crossings. Section 8B.04.

<http://mutcd.fhwa.dot.gov/>

## On the web

### ***Comprehensive Study to Reduce Pedestrian Crashes in Florida***

[http://www.dot.state.fl.us/research-center/Completed\\_Proj/Summary\\_SF/FDOT-BDK80-977-32-rpt.pdf](http://www.dot.state.fl.us/research-center/Completed_Proj/Summary_SF/FDOT-BDK80-977-32-rpt.pdf)

### ***Evaluation of Winter Pothole Patching Methods -Ohio DOT***

<http://rebar.ecn.purdue.edu/LTAP1/multipleupload/Maintenance/Evaluation%20of%20Winter%20Pothole%20Patching%20Methods.pdf>

### ***Bike and Pedestrian Accommodation-Federal-aid Essentials for Local Public Agencies***

Federal-aid funds can be used to construct safe, convenient and accessible walking and bicycling facilities

<http://www.fhwa.dot.gov/federal-aidessentials/catmod.cfm?id=69>

### ***Federal-aid Essentials for Local Public Agencies: List of online videos***

<http://www.fhwa.dot.gov/federal-aidessentials/indexofvideos.cfm>

### ***A Guide for Maintaining Pedestrian Facilities for Enhanced Safety***

[http://safety.fhwa.dot.gov/ped\\_bike/tools\\_solve/fhwasa13037/fhwasa13037.pdf](http://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa13037/fhwasa13037.pdf)



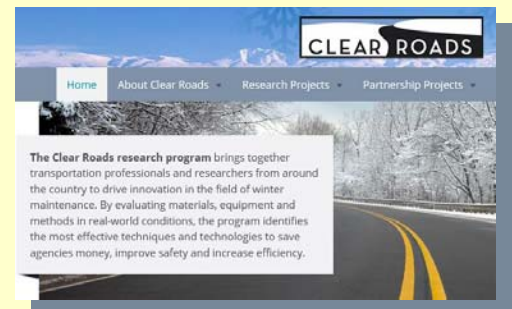
### ***NEW Clear Roads Website***

The new Clear Roads website is live at <http://clearroads.org>

The redesigned site presents a wealth of information about the Clear Roads program, projects and partnership efforts using a streamlined navigational structure. Visit the site for the latest Clear Roads news and resources, including the quarterly winter maintenance newsletter.

Clear Roads quarterly newsletter captures the latest research and news on winter maintenance technology and practices within the U.S. and around the world, providing links to recent reports, guidance documents, news articles, and research updates.

<http://clearroads.org/winter-maintenance-newsletter/>



### ***Mickey Mouse 1931 Traffic Troubles***

<http://www.youtube.com/watch?v=UcO9DHZw5Yk>





## Let Us Know . . .

To update your mail information, add a colleague to the database  
or obtain information about the Roads Scholar Program,

Fax this sheet to 919-515-8898 or

email to Linda Collier [linda\\_collier@ncsu.edu](mailto:linda_collier@ncsu.edu)

Your Name: \_\_\_\_\_

Company/Organization: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

email: \_\_\_\_\_

Check Appropriate items:

- Add/update to the NCLTAP listserv NCTROADS
- Send information about Roads Scholar program
- Send schedule of Training opportunities



### ***NCTROADS: A listserv that works for you!***

NCTROADS, the NC LTAP listserv, is an informal network for the exchange of news about current research, discussion of problems and solutions, request for advice and assistance, and announcements of upcoming conferences, events and training opportunities for transportation personnel.

Once you are subscribed, you can send a message all the listserv members at [NCTROADS@lists.ncsu.edu](mailto:NCTROADS@lists.ncsu.edu)



***To Subscribe:***

Send an email to [linda\\_collier@ncsu.edu](mailto:linda_collier@ncsu.edu) and ask to be added to NCTROADS

***To Post A Message (after you subscribe):***

Send an e-mail message to: [NCTROADS@lists.ncsu.edu](mailto:NCTROADS@lists.ncsu.edu)

Check out the online video library

<http://www.itre.ncsu.edu/LTAP/techAssist/videolibrary.asp>



## Registration Form

### North Carolina Local Technical Assistance Program

October - December, 2014

**Register by Mail:** Fill out a copy of this form and mail with a *check payable to NC State University*  
ITRE/NC State, Attention: Bill Woods, Campus Box 8601, Raleigh NC 27695-8601

**By Email:** [bill\\_woods@ncsu.edu](mailto:bill_woods@ncsu.edu)

**Online:** <http://www.itre.ncsu.edu/LTAP/education/index.asp>

Date	Class Title	Location	RS/ARS	Cost
October 24	Fall Protection	Durham	RS	\$125.00
November 5	Stormwater Hydrology	Raleigh	ARS	\$99.00
November 7	Excavation Safety Class	Durham	RS	\$125.00
November 11	Snow and Ice Control	Raleigh	RS	\$99.00
November 12	Snow and Ice Control	Raleigh	RS	\$99.00
November 14	Concrete: What, When and How	Raleigh	RS	\$150.00
December 1	Basic Work Zone Safety Training	Raleigh	RS	\$99.00
December 2	Intermediate Work Zone Safety Training	Raleigh	RS	\$125.00
December 3	Flagging Instructor Recertification	Raleigh	ARS	\$125.00
December 4-5	Flagging Instructor Training	Raleigh	ARS	\$175.00
December 8	Flagger Training AM	Raleigh	RS	\$69.00
December 8	Flagger Training PM	Raleigh	RS	\$69.00
December 10-12	Work Zone Traffic Control Supervisor	Durham	ARS	\$345.00
December 16	Basic Drainage/ Roadway Drainage Maintenance	Durham	RS	\$99.00
December 18-19	OSHA 10 Hour Safety Training	Durham	ARS	\$150.00

Confirmation letters with class detail will be **emailed** 2 weeks prior to the class. Dress is casual.

Name: \_\_\_\_\_ Department: \_\_\_\_\_

Title: \_\_\_\_\_

Agency: \_\_\_\_\_ Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Supervisor's Name: \_\_\_\_\_ Title: \_\_\_\_\_

Confirmation  
sent to:

email should be

***New Training Coming Soon!! -  
Watch for Dates on the 2015 Calendar***

OSHA Confined Space Standard for Construction  
 NCDOT Crosswalk Guideline  
 Alternative Intersections  
 Highway Capacity Manual

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**2014 NC LTAP Advisory Board**

Terry Arellano, NC DOT  
 Russell Byrd, Carteret County  
 Joe Geigle, Federal Highway Administration  
 Mustan Kadibhal, NCDOT  
 James Martin, ITRE  
 Ken Martin, City of Charlotte  
 Steve Lander, USI  
 Robby Stone, City of Winston Salem  
 Todd Brooks, ATKINS  
 Walt Morgan, Village of Pinehurst  
 Eric Keravuori, Town of Wake Forest  
 Magda Holloway, City of Sanford  
 Chris McGee, City of Raleigh



LTAP Links on the Web	
NC LTAP	<a href="http://itre.ncsu.edu/LTAP/">http://itre.ncsu.edu/LTAP/</a>
National LTAP/TTAP	<a href="http://www.ltapt2.org/">http://www.ltapt2.org/</a>
Federal Highway Administration (FHWA)	<a href="http://www.fhwa.dot.gov/">http://www.fhwa.dot.gov/</a>
Institute of Transportation Engineers (ITE)	<a href="http://www.ite.org/">http://www.ite.org/</a>
U.S. Department of Transportation	<a href="http://www.dot.gov/">http://www.dot.gov/</a>
NCSITE (NC Section of Institute of Transportation Engineers)	<a href="http://www.ncsite.org/NCSITE.html">http://www.ncsite.org/NCSITE.html</a>
North Carolina Department of Transportation (NCDOT)	<a href="http://www.ncdot.org/">http://www.ncdot.org/</a>
NCDOT Safety & Loss Control	<a href="http://www.ncdot.org/doh/safety/">http://www.ncdot.org/doh/safety/</a>
School of Government	<a href="http://www.sog.unc.edu/">http://www.sog.unc.edu/</a>

Transportation Tracks is published quarterly by the North Carolina Technology Transfer Center at the Institute for Transportation Research and Education (ITRE), North Carolina State University (NCSSU), in cooperation with the North Carolina Department of Transportation (NCDOT) and sponsored by the Federal Highway Administration (FHWA) through its Local Technical Assistance Program (LTAP). Center staff include: James B. Martin, P.E., Director; Linda Collier, Assistant Director and Newsletter Editor; and Bill Woods, Program Assistant.

To be added to the mailing list or to submit articles for the newsletter, contact the center at ITRE: NCSU Centennial Campus, Box 8601, Raleigh, NC, 27695-8601. Phone: (919) 515-8899. Fax: (919) 515-8899. Web site: [www.itre.ncsu.edu](http://www.itre.ncsu.edu). Address correction requested. Any opinions, findings, conclusions, or recommendations expressed herein are those of the author(s) and do not necessarily reflect the findings, policies, or procedures of ITRE, NCSU, NCDOT, or FHWA.

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