

Build a Better Mousetrap NC LTAP Competition

Once again it is time for the Build a Better Mousetrap Competition and we want to hear from you. Every year we participate in the Build a Better Mousetrap Competition to celebrate the smart solutions that our public works community uses to fix their problems. The deadline to submit for the NCLTAP competition is May 31, 2021.

The National Competition has reformatted the competition, introducing new categories of projects. If you think a solution in your city or town fits one of these categories let us know!

Innovative Project– Any solution that addresses any or all phase(s) of the ‘project’ life cycle- Planning, Design/Engineering, Construction, Operations and Maintenance. This project shall introduce new ideas, is locally relevant, original, and creative in thinking.

Bold Steps– Any locally relevant high-risk project or process showing a breakthrough solution with demonstrated high-reward.

Smart Transformation– A locally relevant significant change in any transportation activity or process that is SMART “Specific, Measurable, Achievable, Realistic and Time-bound” in nature that results in improved efficiencies.

Pioneer– A locally relevant product/tool that is among the first to solve a maintenance problem with a home-grown solution.

The North Carolina winner “Temporary Roundabouts” also won the National Competition in 2019. I think we can do it again! To apply to the NC competition, go to <https://itre.ncsu.edu/focus/ltap/build-a-better-mousetrap/>, download the entry form and submit it to Bill Woods at wewoods@ncsu.edu.

Sometimes we don’t have the solution though, and that’s ok - we’re a community that helps each other out. We’ve got a couple resources to suggest, both local and national.

To get in touch with fellow members of the North Carolina public works community, join the NCLTAP listserv ncroads, a listserv dedicated to the community getting advice from one another. To join, email Kate Davison at kbdaviso@ncsu.edu

Past submissions to the Build a Better Mousetrap competition can often come in handy when trying to find solutions too. Check out <https://www.fhwa.dot.gov/clas/babm/> for past submission booklets.

One last great resource for innovations and solutions is the Every Day Counts program. The EDC - 6 (2021-2022) Innovations are out and could be just what you’re looking for. <https://www.fhwa.dot.gov/innovation/everydaycounts/>

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Technology Transfer Newsletter

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Coordinator's Corner - The 4 way Stop intersection

by Bill Woods

I have recently taken on a new task here at NC-LTAP, that being starting a new column in our newsletter, Transportation Tracks, called the 'Coordinators Corner'. It is my wish that these articles convey helpful information on real driving situations.

This one starts close to home as I drove through a neighboring city, I found myself in a rare situation at a 4-way stop intersection. Several other drivers and I pulled up at a 4 way stop at the same time. In addition to the four of us going straight through the intersection, there were also vehicles that pulled up in the turn lanes. So, even with all my years of driving and working in transportation, I was not clear who had the right of way to go first, and I was not alone. All the other drivers froze, no one wanted to be the first to go. After a brief series of uncomfortable starts then (very) abrupt stops, someone finally rolled ever so cautiously forward and navigated successfully through the intersection. This started the cascading of the other cars, whether in the right order or not (I will address that in a moment) until we had all successfully navigated through the intersection. Yes, we all made it through unscathed. Whew!! Well this got me thinking who exactly, to the letter of the law, had the right of way? Well the law is clear about who goes first down to who goes last and I find it easy to remember and also practical in nature.

First and it is just that. First come first served. The first to arrive and come to a complete stop is the first to go. However, read that again, that is the first to come to a complete stop. Typically, that should be the first one there but as we all know, everyone pushes the boundaries of the definition of "complete stop". The legal definition of a complete stop is yes, going zero mph.

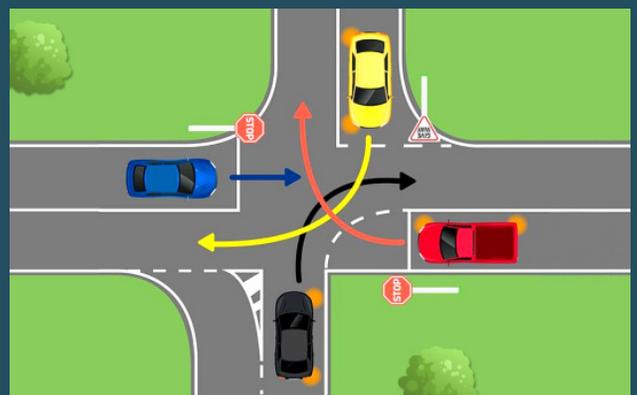


Next, for all drivers arriving at the same time, all need to yield to the person on their right. If there is a person to their right, then both yield to that driver. Basically yield to the car all the way on the right.

What if two drivers arrive at the same time and they are facing each other with nobody on each other's right? This is when using turn signals is crucial. Obviously if they are both going straight they may both proceed at the same time. If not, then it is right turn first, then left turn are last to go.

Fortunately, 4 way stop intersections are few and far between these days. If you do happen to encounter one, most likely it is in a residential area. There probably will not be many cars at the intersection with you. But remember Hurricane Season is always right around the corner in NC and NC Law states that when the power is out at an intersection, we are supposed to treat them as a 4-Way stop.

But this still doesn't answer the question in my original situation. We had 6 cars at the intersection, all of which seemed to arrive (and stop) at the exact same time – well exact enough that we didn't know who was first.



Continued on Page 3

So, after a bit more research and chatting with some traffic folks it boils down to this. Let's review, the turning traffic is out. Sorry, you must wait. Therefore, that leaves all the folks trying to go straight thru the intersection. If there is no way to determine who stopped first, and therefore who goes first, then we must rely on communication between drivers, being patient, and common courtesy. After one person successfully navigates through the intersection, this kicks in the "yield to the right" rule. How much will you really be delayed if you yield? Maybe 5 seconds? Totally worth spending to avoid a crash! One more thing, if there is a close call or you feel someone cut you off, it is not worth fighting about. Yes, we are emotional creatures, but it is times like that when we should all be thankful that no one got hurt instead of using it as an excuse to fight.

Happy Trails! Hope this helps!

Bill Woods is the Program Coordinator for the North Carolina Technical Assistance Program, based on North Carolina State University's Centennial Campus in Raleigh, NC.

Road Scholar Program - Advanced Road Scholar Review Papers

Throughout the year we receive advanced road scholar review papers, and every paper tells us something important about our program. The unique perspective our students can give us into what they learn from the classes helps us decide what new classes might be needed - like the ADA in Temporary Work Zones class, or the upcoming new class, Bike/Ped: Meeting the needs of all users. This year one of our favorite papers came from Chris Cox of the City of Greenville, and he was kind enough to let us share some of his paper with you:



"The Advanced Roads Scholar program is a special training curriculum that offers training to local government employees to sharpen their skill sets, and increase their knowledge beyond what they learned in the Roads Scholar program. These courses are intended to help employees develop professionalism and advance in their respective career.

ADA Self Evaluations and Elements of Public Right of Way Accessibility Guidelines (PROWAG) and Designing Pedestrian Facilities for Accessibility had the most direct impact on myself, my job, and my community. As an adult without impaired mobility, it is sometimes easy to forget or not completely understand the troubles that a person with impaired mobility faces in traveling along sidewalks, crossing streets, and accessing facilities. Trained inspectors are key in protecting the public, and providing safe and accessible routes for all citizens.

The sections of the class (How to Keep Yourself and Your Agency Out of Court) dealing with tort liability were eye opening, as sometimes you become numb to certain construction practices, or lack of maintenance that can pose a threat to the citizens of the community.

Personally, these classes have made me recognize the accessibility challenges that others may face daily, and have given me a newfound respect. Professionally, I have become a more thorough plan reviewer as well as a stronger mentor to our inspectors."

APWA Conference Dates

APWA-NC is excited to announce they will hold two in person conferences this fall. The Stormwater Division Annual Conference will be held in Asheville September 28-20, 2021 and the Combined Equipment Services and Streets Annual Conference will be held in Hickory October 13-15, 2021. More information about these conferences will be forthcoming. APWA-NC is also accepting nominations for several recognition awards - find out more at northcarolina.apwa.net

2021 Bicycle and Pedestrian Planning Grant Initiative

NCDOT provides funding for municipalities across the state to develop comprehensive bicycle or pedestrian plans. There are several plan options available to meet specific community needs. Applications are due June 5, 2021, visit the NCDOT website for more information.

Updates to the Manual on Uniform Traffic Control Devices

The Federal Highway Administration is updating the Manual on Uniform Traffic Control Devices (MUTCD) and recently held three webinars to educate the public on the notice of proposed amendments to the MUTCD. These webinars had limited space and recordings have been made available. Find the topics and links to watch below.

Introduction and Overview

<https://connectdot.connectsolutions.com/pg7bbyl0ixsr/?proto=true>

This first webinar covered what the MUTCD is, how the revision process works, and reviewed some, not all, of the proposed changes. Specific changes discussed include general provision changes, speed limit flexibility, pedestrian devices, pedestrian access in work zones, crosswalks, bicycle signs and signals, and more.

Pedestrians, Bicycles, and Transit

<https://connectdot.connectsolutions.com/pn4g59ssemml/?proto=true>

The second webinar reviews what the MUTCD is and isn't, emphasizing its focus on the road user and enhancing safety and improving mobility for all. At minute 17 specific proposed changes are discussed: colored pavement, bicycle signs, curb extensions and crosswalks, pedestrian safety devices, signal warrants, grade crossings and more. Detailed instructions for viewing the proposed changes and submitting comments were given. The speakers took questions from the audience for the final 30 minutes.

Urban Traffic Control

<https://connectdot.connectsolutions.com/piyn8vl38x8q/>

The third webinar also contains a MUTCD review until around minute 17. The what is an isn't a traffic control device is reviewed, as well as issues with sign clutter and excess informational load. Specific proposed changes discussed include overhead sign letter height, unsignalized intersection control, speed limit flexibility in roadway context, and signal warrants. Again, the final 30 minutes were reserved for instructions on viewing proposed changes and questions from the viewers.

To find the full list of proposed changes (over 600) visit https://mutcd.fhwa.dot.gov/mutcd_news.htm#dec_17_20

Public comments must be submitted to the public docket on or before May 14, 2021.



Get the Picture!

Can you tell what's wrong with this picture? Turn to page 5 to see what the problem is.

More Training from NC State

A highlight for Public Utilities! NC State, through the McKimmon Center, has two programs potentially of interest: [The Energy Management Diploma](#) and the [Facilities Management Diploma](#). These programs offer classes like Improving Equipment Efficiencies, Plant Renovations, and HVAC Maintenance.

American Rescue Plan Resources

Curious about the American Rescue Plan and how it relates to North Carolina? The NC League of Municipalities has a new [website](#) to help answer your most important questions - how much money can my town expect, how can the money be spent, and what resources other than money are available?

Combating Road User Errors

by Dr. Ron Eck and Kate Davison

One frustrating aspect of being a transportation worker is the inability to predict driver behavior. Drivers speed, they run red lights, and they drive impaired, none of which we can easily influence. But there are road user errors, facilitated by the roadway environment, that transportation workers can affect.

Thinking about five basic human factors principles can be useful in reducing driver errors:

- **Information Overload:** When road users are overwhelmed with information, they tend to make more errors. When there is too much information, road users may not have time to locate the most critical information, make sense of it, make decisions, and respond appropriately.
- **Positive Guidance:** Road users need information about the road ahead so they can prepare the correct maneuvers. They need accurate information, placed in the correct location, in a form they can understand easily.
- **User Expectancy:** Road users make assumptions about the road ahead based on their previous experiences, e.g., exits on Interstate highways are located on the right. When these expectancies are violated, users' planned responses will be incorrect, and they may not have time to evaluate the roadway and change their responses quickly enough.
- **Priority of Information Needs:** Information that is necessary for basic vehicle control is more urgent than guidance (for example, choosing the correct lane); guidance is more urgent than wayfinding information. When offering information to road users, consider which level of information they need.
- **Visual Perception at Night:** Nighttime limits the timing, quality, and location of information road users can acquire and use for safe travel.

Principles adapted from [FHWA Practical Safety Solutions for Local and Tribal Roads: A Human Factor Approach](#)

Dr. Ron Eck, one of NCLTAP's instructors, put together a real-life example and analysis of a roadway with violations of several of the principles listed above.

The first picture presents the view of a northbound X Road driver approaching the intersection with Y Avenue. For northbound traffic, the roadway is particularly deceptive. The vantage point shown in the photograph suggests that the road



continues straight

ahead essentially to the horizon. Even in the vicinity of the speed limit sign (second picture), the curve is not readily apparent to northbound motorists during daylight. At night, the street lights and headlights/taillights on Y Avenue would be more conspicuous than the curb and grass. This is an example of the road user expectation being violated - due to the misleading informal cues of street lights and vehicle lights, the road appears to be straight to northbound drivers despite an upcoming curve.

Several hundred feet in advance of the curve for northbound traffic there is a yellow and black diamond-shape right curve with side road warning sign. However, in the first picture there is nothing in terms of size or color (e.g., the sheeting is standard yellow as opposed to fluorescent yellow) to make this sign conspicuous.

In fact, the curve warning sign is sandwiched between a SHARE THE ROAD warning sign, a municipality identification sign, and a 25 mph Speed Limit sign. Here the signs are not prioritizing the information the drivers need. The SHARE THE ROAD sign should not be the most prominent traffic control device in the driver's visual field at this location since it is a non-critical device that can be placed anywhere along the roadway. In the configuration shown, the SHARE THE ROAD warning sign diminishes the importance of the curve warning sign and complicates the driver information gathering process.

A paving joint can be observed a short distance north of the speed limit sign, separating two different "ages" of pavements. Closer examination reveals that the solid white edge lines end at this paving joint. That is, there are no edge lines in the curve, where their delineation function is most important. Industry practice, as described by McGee and Hanscom (2006), is to apply edge lines just prior to and within curved sections of roadway, if not on the entire section of roadway. In this instance, where the apparent roadway alignment straight ahead is the most prominent visual feature, drivers are deprived of the positive guidance of a delineation cue since the edge lines do not continue through the curve.



As noted above, the most prominent visual feature is the apparent straight-ahead alignment of the roadway. While there is a warning sign for the curve, the value of the warning is diminished by its position near other signs. The only delineation for the curve is the painted double yellow centerline. At night, there is no other delineation of the alignment of the curve. Thus, it is difficult for motorists to make the appropriate steering and speed adjustments. Given the lack of curvature upstream of the location in question, the hillcrest which prevents motorists from seeing the alignment of the curve, the inadequate advance warning and the lack of delineation of the curve itself, I expect that at night drivers would be surprised by the horizontal curve due to it being unexpected and due to difficulty in seeing the curved alignment. Research has shown drivers adjust their speed only as a curve becomes imminent. In this case, it is foreseeable that drivers would not be able to adjust their speed in time to safely negotiate the curve. Therefore, it is foreseeable that drivers may not be able to safely negotiate the curve, especially at night.

Given the roadway design and traffic control associated with this section of roadway, I would expect this location to have a history of run-off-the-road incidents and/or crashes, and indeed there is physical evidence of roadway departures in the final picture. This picture presents a close-up view of the west edge of X Road in the curve. Note that there are a number of clearly visible gouges in the top of the curb and that these gouges all have the same orientation. They are indicative of vehicles failing to negotiate the curve and running off the west side of the road. As they do so, their undercarriages cause gouges and scratches on the top of the curb. The physical evidence is clear that drivers are having difficulty negotiating the curve and are leaving their lane.

Review of police accident reports and incident reports provides proof of these crashes. There were four nighttime, single-vehicle run-off-road crashes where northbound vehicles ran off the road to the left and roads were not snow- or ice-covered. These occurred as follows:

DATE	TIME
05/23/07	0327
03/30/08	2129
07/11/08	2300
07/18/10	2107

There was an average of one single-vehicle, run-off-road crash per year involving northbound vehicles for the period 2007 to 2010. There are reported crashes and physical evidence of vehicles running off the road on the outside of the curve. It is apparent that the existing delineation is not sufficient to show the alignment of the roadway at night and to overcome the misleading information created by the alignment of Y Avenue. Recommended countermeasures for this situation include enhancing delineation of the curve by installing edge lines, chevrons and other guidance enhancements. Painting edge lines and installing chevrons and enhanced delineation of a curve are standard low-cost safety improvements.



What's Wrong with this Picture?

by Scott Tison

ITRE Training Specialist

Here's the situation. paving work is being done on a Two Lane Roadway. Needing to shut down part of One Lane, the operation becomes the equivalent of a One Lane, Two Way Road. Traffic will need to be alternated by a Flagger on each end. So, what's wrong with this picture?

If you've been through our Flagger Training, I am hoping that you remember to stand on the shoulder of the road. Your safety, the safety of the crew and that of the motoring public are more important than the job being performed. In this scenario, there is a usable shoulder area.

You will also remember that it is crucial to establish an escape route for possible dangerous situations. The Manual on Uniform Traffic Control Devices (MUTCD) states in Section 6E-08 Flagger Stations, Note 3, "The Flagger should identify an escape route that can be used to avoid being struck by an errant vehicle." In this scenario, the Flagger is standing in the middle of a travel lane. If an errant vehicle fails to stop or loses control of the vehicle, how does the flagger escape? How fast can the flagger run to safely get out of the way of an errant vehicle?

If you haven't been through our training, we would like to see you. Again, it is more than legal liability. It is about giving our workers tools for doing their tasks as safely as possible. It is also about keeping your family and my family safe as they traverse our work zones.

If you have any questions about worker's safety or work zone traffic control, give me a call at (919) 515-6949, or you can email me at sitison@ncsu.edu.

NC Local Technical Assistance Program 2021 Schedule

Questions or Email Registration: kbdaviso@ncsu.edu

For Online Registration: itre.ncsu.edu/training/ltap-training/

Date	Class Title	RS/ ARS/ MRS	Cost	Location	To Sign Up
March 29, 2021 8:30-11:30 a.m.	Plan Reading for Transportation	RS	\$100	Online	Click Here
April 6-7, 2021 8:30-11:30 a.m.	Basic Work Zone Installer	RS	\$150	Online	Click Here
April 8-9, 2021 8:30-11:30 a.m.	Intermediate Work Zone Safety	RS	\$175	Online	Click Here
April 12-14, 2021 2-4 p.m.	Fundamentals of Government	MRS	\$150	Online	Click Here
April 27, 2021 8:30-12:30 p.m.	Flagger Training	RS	\$100	Online	Click Here
May 11, 2021 9 a.m.-12 p.m.	Introduction to UAS	MRS	\$150	Online	Click Here
May 17-18, 2021 9 a.m.-12 p.m.	ADA Self Evaluations/Elements of PROWAG	ARS	\$150	Online	Full
May 19-21, 2021 10 a.m.-12 p.m.	Reducing Roadway Departure Crashes	ARS	\$150	Online	Click Here
May 26-27, 2021 8:30-11:30 a.m.	Work Zone Supervisor Recertification	ARS	\$175	Online	Full
June 2-3, 2021 8:30-11:30 a.m.	Basic Work Zone Installer	RS	\$150	Online	Click Here
June 7-11, 2021 8:30-11:30 a.m.	Work Zone Traffic Control Supervisor Certification	ARS	\$450	Online	Click Here
June 14-15, 2021 8:30-11:30 a.m.	Basic Drainage/Roadway Drainage Maintenance	RS	\$150	Online	Click Here
June 16-17, 2021 8:30-11:30 a.m.	Intermediate Work Zone Safety	RS	\$175	Online	Click Here
June 16-18, 2021 10 a.m.-12 p.m.	Bicycles and Pedestrians: Meeting the Needs of All Users	MRS	\$150	Online	Click Here
June 22-24, 2021 9-11 a.m.	Ethics in Public Works	MRS	\$150	Online	Click Here
June 29-30, 2021 8:30-11:30 a.m.	Asphalt Pavement Maintenance	RS	\$150	Online	Click Here

LTAP Links on the Web

Transportation Information at your fingertips!

NC LTAP	https://itre.ncsu.edu/focus/ltap/
National LTAP/TTAP	http://www.nltapa.org/
NC Department of Transportation (NCDOT)	https://www.ncdot.gov/
Rural Road Safety Center	https://ruralsafetycenter.org/
Federal Highway Administration (FHWA)	https://www.fhwa.dot.gov/
US Department of Transportation (USDOT)	https://www.transportation.gov/
UNC School of Government	https://www.sog.unc.edu/
Institute of Transportation Engineers	http://www.ite.org/
NC Section of ITE (NCSITE)	http://ncsite.org/
APWA - NC Chapter	http://northcarolina.apwa.net/
NLTAPA Tailgate Talks	https://nltapa.org/information-exchange/nltapa-tailgate-talks/

NC LTAP 2021 Advisory Board

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Neil Mastin (<i>NCDOT</i>)	



Program Staff

James Martin, PE

LTAP Director
jbm@ncsu.edu
 919-515- 8620

Bill Woods

Program Coordinator
bill_woods@ncsu.edu
 919-515- 8033

Kate Davison

Assistant Director
kbdaviso@ncsu.edu
 919-515- 3983

Scott Tison

Training Specialist
sitison@ncsu.edu

transportationTRACKS

NC LTAP
 ITRE at NC State University
 Centennial Campus Box 8601
 Raleigh, NC 27695-8601
www.itre.ncsu.edu

