

TRAFFIC SAFETY PRIMER FOR LOCAL ELECTED OFFICIALS *Some things to think about before seeking traffic safety solutions.*



Local elected officials can have a huge impact on traffic safety in their community. Becoming educated about the proper usage of traffic signs is just one area. These signs are also a good reminder to stop and think about the benefits and risks of each request; go and gather information from knowledgeable resources; and always proceed with caution and due diligence. Elected officials are viewed by the public as "people of action." On a daily basis, elected officials are forced to make numerous decisions that have significant impacts on the community they represent. The public expects a skilled elected official to collect information, weigh the consequences, and make the best decision for their community. Because of the broad nature of decisions that elected officials face, they frequently find themselves working in areas outside their "comfort zone."

Traffic safety is one of those areas. There are even aspects of traffic safety that can foster a false sense of security for elected officials, such as:

• **Counter-intuitive nature:** Many traffic safety decisions are counter-intuitive. For example, installing a stop sign to control vehicle speed can actually lead to vehicles traveling faster between intersections than they did before, as drivers accelerate to "make up" lost time.

• Roads are a public asset: The vast majority of roads are in the public trust. Because of this, many people feel they have an interest in deciding the operation and function of roads in their community. This is true to an extent, however, when

the general public begins to dictate design and operation factors without an understanding of their impact, the chance is high that there will be negative consequences to safety.

• **Roads viewed as "commonplace":** The public has come to view roads as an ordinary, simple feature of the landscape. This desensitization to the subtle design features of a road and the complex relationships that exist within roadway infrastructure lead to the belief that good, safe roads are "simple." Road safety, however, is anything but simple.





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Many local roads have characteristics that pose safety challenges different from state and interstate highways.

• Lane Width: State highways and freeways typically have wider lanes than local roads. In addition, many of these higher "functional class" roads also have wide paved shoulders. Research has shown that wider lanes and shoulders result in a decrease in the number of crashes, but may also lead to an increase in speeds—a different problem.

• Curve and Grade Geometry: Contrary to state highways and freeways, local roads generally have more locations where geometric design exceptions have been made around curves and hills. Local roads often have sharper curves and steeper grades because the cost of correcting the geometric problem may not be feasible based on the number of vehicles that use the road.

• Signing and Paint Striping: Generally speaking, local agencies do not have the budgets necessary to maintain signs

and pavement markings on local roads to the same level as higher functional class roads. In some cases, poor markings and a lack of signing can influence the number of crashes that occur.

• Roadside Obstructions: Higher functional class roadways (freeways and highways) typically have a wide, relatively flat, clear area outside the driving lanes where drivers who run off the road can recover and get their vehicle back on the road, or stop without causing a traffic crash. It is not uncommon for local roads to have little, if any, recovery area or to have obstructions directly adjacent to travel lanes.

• Number of Driveways: Research has shown that an increase in the number of crashes comes with an increasing number of driveways. Local roads are primarily for local property access, and as such, have a significant number of driveways. Higher functional class roads typically do not have as many driveways or have active "access management" programs to control driveway access.

FACTORS THAT INFLUENCE THE NUMBER OF CRASHES ON ALL ROADS:

DRIVER CONDITION

• **Reflexes** – How quickly a driver can respond to a situation.

• Attentiveness – Is the driver paying attention?

• Experience – A less experienced driver has an elevated crash risk.

• Alcohol & Drug Use – Impair drivers.

• **Driver Aggressiveness** – Aggressive or frustrated drivers take more chances or are more likely to drive beyond their limit of control.

HUMAN FACTORS

• Visibility – How well can an object be seen? Humans have a cone of vision 15 degrees around the center of their focal point where items of interest will likely be noticed. • **Expectancy** – Drivers use an understanding of past situations to lessen the mental workload of driving. For example, drivers in the Midwest expect that if they don't see a stop sign at an intersection they can proceed without stopping. In Western states this is not always the case—there are many uncontrolled intersections without any signs or traffic signals.

• **Consistency** – When designs for roads and traffic control are applied consistently in the same situation, drivers have an easier time driving, resulting in fewer crashes.

• Workload – When a driver becomes overloaded with driving inputs they lose the ability to process information. An overloaded driver is actually impaired for a short period of time after the overload occurs. Overload situations include negotiating a complex, busy intersection, presence of billboards, etc. Overloaded drivers may also suffer from a temporarily reduced field of vision (tunnel vision).

VEHICLE CHARACTERISTICS

• Handling Characteristics – Newer vehicles have improved handling characteristics that include reduced stopping distance due to anti-lock brakes, traction and skid control, and better cornering behavior. Older vehicles do not.

• Maintenance – Lack of vehicle maintenance such as poor brakes can lead to crashes. However, the total percentage of crashes attributed to vehicle malfunction is very low – less than 5 percent of all crashes.

ROADWAY AND ENVIRONMENTAL CHARACTERISTICS

• Geometry – How roadway features are designed has a major impact on safety. Everything from the radius of a curve, or the grade that a road takes through a hill, to the slopes leading into and out of the ditches can influence traffic safety. Geometric features should be reviewed whenever major road work is planned or when there is a high incidence of crashes at a specific location.

• **Maintenance** – Upkeep of roadside features such as shoulders and signs can impact traffic safety.

• Surface Condition – Maintaining a smooth, high friction road surface can reduce the incidence of traffic crashes.

• Rain / Snow / Fog – These elements can impact driver information gathering and stopping distance.

WORKING WITH ENGINEERS

In seeking solutions to traffic safety problems in your jurisdiction, you will probably be working with engineers. Engineers are guided by federal, state and local regulations, national and state guidance, and professional engineering judgement in making recommendations.

Engineers are trained to make technically sound recommendations that are legally defensible, conservative and based on data. As part of this training, engineers tend to be very precise, in both their technical decisions and the language they use. Some engineers have difficulty translating technical information to nontechnical audiences, in ways that are easily understood. As an elected official or community decision maker it is important that you ask for clarification when you do not feel you know what something means or the possible impacts.

It is important for elected officials, public works departments, and engineers to work together in developing traffic safety solutions. Remember, you are all working toward the same goal: seeking solutions to traffic safety problems in your community.

CONTROLLING SPEEDS

Speed Limits: Research has shown that drivers typically drive a speed that "feels" safe. Speed limits outside of residential areas are based on the 85th percentile speed – the speed that 85 percent of drivers do not exceed. Research has shown the 85th percentile speed to be near the optimum speed for safety. Traffic safety studies have also shown that driving too slow with respect to the average speed can put drivers at the same risk as driving too fast.



Stop Signs Are NOT For Speed Control: Stop signs should not be used for speed control. Over 20 research studies have concluded that stop signs are not effective for speed control and in many cases increase the speeds between the signs.



This article has been excerpted and adapted with permission from the Kansas LTAP, from the Fall 2009 edition of the Kansas LTAP newsletter. The Kansas LTAP originally excerpted and adapted their article with permission from an instructional workbook entitled *What Elected Officials Need to Know About Traffic Safety (and What Your Constituents EXPECT You to Know)*, Michigan Local Technical Assistance Program (LTAP), December 2008.

Country Roads & City Streets is typically published quarterly. The purpose of this newsletter is to provide information that is beneficial to decision makers, elected officials, and roadway construction, maintenance and management personnel.

The material and opinions included in this newsletter are those of the West Virginia LTAP and do not necessarily reflect the views of the Federal Highway Administration or the West Virginia Department of Transportation. Every effort has been made to ensure the integrity and accuracy of both original and borrowed material; however, the West Virginia LTAP does not assume responsibility for any information that is found to be incorrect.



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MISSION:

The mission of the WV LTAP is to foster a safe, efficient, and environmentally sound surface transportation system by improving skills and increasing knowledge of the transportation workforce and decision makers.

To help achieve this mission, training, demonstrations, personalized technical assistance, and resource materials are provided.

CITY OF MORGANTOWN ROADS SCHOLAR I GRADUATES

Last fall, 24 employees from the Public Works Department in the City of Morgantown became Roads Scholar I graduates. We are so proud of this group and hope they can put into practice the information they learned.

We are also pleased to note that in 2011 we had a total of 48 graduates and we'd like to have even more in 2012.

Please contact Kim or Andrew if you are interested in attending Roads Scholar classes or would like to learn more about hosting classes at your location. The majority of the Roads Scholar I classes are available at no charge, and we provide the class material.











GRADUATES: Zachary Bosley **Dale Brown Dave Chidester David Dalton** Harry Dalton * **Damien Davis** Matt Fisher **Cliff Gill Kenny Holloway** John Kelly **Kris Lute** George McClain **Charles Malone Chris Maloney** Chris Mayle Michael Neyman **Bob Nicholson Charles Obrad** John Schumber, Jr. **Dave Shrout Steve Simmons Eric Smith Rod Squires Bill Walsh**

Not Pictured *







Congratulations to this round of WV LTAP Roads Scholar I Graduates!



A WV LTAP FAVORITE RECIPE

Shared by Howard Leedy, WVDOH-D10 Technician Coordinator

LTAP staff travel a lot during the year conducting training, attending meetings, and providing technical assistance. Part of the enjoyment for us is meeting new people, seeing old friends, visiting different parts of West Virginia, and trying different foods.

During a training trip to the WVDOH-D10 Headquarters in Princeton, WV, Andrew Morgan of the WV LTAP sampled a homemade cheese ball. Andrew raved about how good the cheese ball was and what a hit it was with the training attendees. (We've learned over the years that attendees learn better when they aren't hungry, thirsty, or sleepy!) Better yet, the cheese ball was made by Howard Leedy, WVDOH-D10 technician coordinator who helped arrange the class and who always provides delicious snacks.

We hope you enjoy this recipe and if you have a favorite one you would like to share, please email Kim at kim.carr@mail.wvu.edu.

CHEESE BALL INGREDIENTS:

2 (8 oz.) packages of cream cheese (softened)1 large can of crushed pineapple (drained well)1 cup of pecans chopped in pieces

 $\frac{1}{4}$ cup of diced green pepper $\frac{1}{4}$ cup of diced onion

DIRECTIONS:

Mix all the ingredients together and enjoy. Great with chips, crackers, pretzels, celery, carrots, cucumbers, etc.

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ROAD SLEUTH INFORMATION SHEET

WV LTAP

There are many myths about transportation related issues. Road Sleuth has been designed to help dispel these myths and reveal the truth. Road Sleuth came from conversations WV LTAP staff had with public works directors, street supervisors, and others. From these conversations, one common theme emerged: public works personnel getting the same questions and requests time and again from their elected officials and residents and not having educational information readily available.

The Road Sleuth series can be downloaded from the WV LTAP website (http://wvltap.wvu.edu) as a PDF or Microsoft Publisher file. The Publisher files are formatted so agencies can add their individual contact information if desired. The WV LTAP does ask that the main text not be changed or altered without permission. Agencies are encouraged to post these information sheets on their webpage, distribute printed copies to city council members, send out in mailings, etc. The WV LTAP staff welcomes your suggestions for new topics and will continue adding new sheets as they become available.

Myth: Traffic Signals Reduce Crashes



Residents often see traffic signals, commonly referred to as stop lights, as the safest way to move traffic through an intersection — and they can be. Signals provide a sense of security to drivers and pedestrians by assigning right-of-way to particular movements. They can interrupt traffic on high volume busy streets to let motorists in and out of cross-streets and businesses, and can also allow more traffic to pass through an intersection than if the same intersection was controlled by stop-signs. However, they are not the best choice for every intersection.

First, traffic signals are expensive to install and maintain. The total cost to install a traffic signal can be upwards of \$100,000, and the annual electric bill per intersection averages \$1,500. These numbers do not include the associated maintenance such as replacing bulbs and repairing pavement sensors damaged during the winter months.

Secondly, many believe that a traffic signal is safer and will reduce or eliminate crashes as the movements are controlled. In fact, traffic signals tend to increase the number of crashes at an intersection. A signal can reduce the likelihood of angle (or "T-Bone") crashes, but the number of rear-end crashes typically increases as drivers abruptly brake at the last minute. However, rear-end crashes are typically not as severe as angle crashes and are a reasonable safety trade-off.

Since there is a potential for intersection crashes to increase after the

installation of traffic signals, it is important that the benefits outweigh the costs. The *Manual on Uniform Traffic Control Devices* (MUTCD), which presents traffic control device standards and guidelines, lists nine "warrants" that serve as the criteria for installing traffic signals. These "warrants" include the amount of traffic entering the intersection, the number of pedestrians trying to cross the road at the intersection, the presence of a nearby school with school children walking through the intersection, and trains crossing the road nearby. The MUTCD states that at least one of the nine warrants must be met before a traffic signal should be considered, but not that one must be installed if the criteria are met. The MUTCD has been adopted as state law, thus if a signal is installed without meeting the criteria, the road agency's liability risk can increase.

Similarly, just because a traffic signal is currently installed at an intersection, doesn't mean it needs to be there forever. Traffic patterns change, and businesses come and go. Traffic signals should be evaluated periodically to see if they are still needed. In some cases, removing an existing traffic signal can improve safety and traffic operations.

SMART PHONE APPLICATIONS (APPS)

By Andrew Morgan and Ashley Collins, WV LTAP



In today's society, cell phones have become an essential communications tool for many people. Previously, cell phones were primarily used for calling others, followed by text messaging. Today, cell phones provide users with more than just interpersonal communication. With the installation of mobile applications, users are able to turn their phone into a learning, organizing, and entertainment device.

There are many apps available through the Apple, Android, and Blackberry stores for cell phones. Below are a few transportation related apps you may find beneficial. Please note that this list is

far from comprehensive and the WV LTAP is not specifically endorsing any of the apps listed below.

ANDROID APPLICATIONS:

Car Locator: Can't find your car in a crowded parking lot? Car Locator can find your car as long as the location has been saved. This application provides a parking timer, map, saved notes, driving directions, location history, and location favorites.

FuelLog: The FuelLog app calculates many useful statistics including fuel consumption and economy of your vehicle, total cost and mileage, average cost per distance or gas amount, and a lot more. You can also track maintenance and services such as monthly insurance, tolls, parking, yearly taxes, and oil changes.

Driving Text Answering Machine: When you receive a text message while driving, this app auto-responds with a custom-made message. This way callers know you are busy driving and unable to respond to their texts.

IPHONE APPLICATIONS:

MUTCD App: Need to know where or how high to mount a sign? Are the pavement markings supposed to be yellow or white? When you're in the field, this tool can help you find those answers and more. This app includes the entire *Manual on Uniform Traffic Control Devices* in an easy to use format.

TurnCount: You need to know how much traffic you have before you can solve many intersection problems, and traffic counting equipment can be expensive. With Turn Count you can turn your phone into a count board that can help you collect turning movement information for cars, bikes, and pedestrians.

Theodolite: You can now carry a surveying tool in your pocket. Theodolite allows you to check angles and slopes and calculate distance in the field from your phone. You can also take pictures and map their locations, to help identify where they were taken.

BLACKBERRY APPLICATIONS:

Snow Plow Preparation List: This app serves as a step by step guide for operating a plow truck. It covers everything from the pre-trip inspection to the cleanup at the end of the storm. This tool is geared to everyone who battles snow and ice, regardless of their experience level.

Concrete Calculator: Unsure how much concrete or asphalt to order? This tool helps you calculate those quantities to help you get your order amount right.

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WINTER ROADWAY MAINTENANCE COMPUTER BASED TRAINING SETS STILL AVAILABLE



The WV LTAP still has copies of the winter roadway maintenance computer based training sets available for free giveway. The following topics are covered in this computer based training: Anti -icing/RWIS – 24 Hrs; Selecting Snow and Ice Control Materials to Mitigate Environmental Impacts – 2 Hrs; Equipment Maintenance – 2 Hrs; Proper Plowing Techniques – 2 Hrs; Deicing – 4 Hrs; Blowing Snow Mitigation – 3 Hrs; Winter Maintenance Mitigation – 2 Hrs; Winter Maintenance Management – 2 Hrs; and Performance Measures for Snow and Ice Control Operations – 4 Hrs.

The Winter Roadway Maintenance CBTs are a great resource for self-paced training. The training can be done at your convenience and it doesn't have to be completed all at once.

This training package includes narrated presentations with 2D and 3D animation, digital videos, photographs, and many more features that help keep users engaged and involved. Each session includes a pre-test and a post-test. Users can also print certificates of completion when they finish a specific session.

To get your free copy, please call Stephanie Spangler at 304-293-9922 or email Stephanie.Spangler@mail.wvu.edu.

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- City Engineers
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