

Country Roads

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THE WORLD OF A TRAFFIC ENGINEER

By Bradley Dicola

This article is the first in a series regarding the fields of traffic and transportation engineering. In upcoming issues of this newsletter, we will be discussing the role of traffic and transportation engineers in our nation's roadway systems, from planning to design to traffic operations.

Traffic engineering includes a wide array of topics and issues, many of them very close to home to the everyday citizen. It is not always understood, however, what exactly a traffic engineer does.

Traffic engineering exists within the larger context of transportation engineering. Transportation engineering deals with the planning and design of all transportation

systems, including air, rail, water, and roadway. This may include the design of airports, ports and harbors, canals, rail lines, transit systems, roadways, and multi-use paths. Traffic engineering provides for safe and efficient movement of pedestrians, bicycles, and motor vehicles. This is done through traffic signals, signs, and markings. Similar positions that may overlap with

One traffic engineering challenge is to provide safe and efficient travel for motor vehicles, bicycles, and pedestrians within the constraints of our built environment.



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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 roadway 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.



traffic engineers include traffic and transportation planners and highway engineers. (Note that the title of traffic engineer and highway engineer are often interchanged with one another, depending upon the nature of the work and the organization of the agency.)

According to the Institute of Transportation Engineers Yearbook, traffic engineering is defined as follows:

Traffic Engineering is that phase of engineering which deals with the planning, geometric design, and traffic operations of roads, streets, and highways, their networks, terminals, abutting lands, and relationships with other modes of transportation for the achievement of safe, efficient, and convenient movement of persons and goods.

This definition provides an idea of the diversity of topics and disciplines in which the traffic engineer is involved—everything from safety studies to intersection improvements to congestion relief. The role that traffic engineers play in the operation of our transportation system is vital to national mobility, economic growth, and traffic safety. Traffic engineers everywhere face new challenges, as it becomes more difficult to add capacity by way of additional roadway construction. Traffic operations solutions, including intelligent transportation systems (ITS), need to be utilized to provide the continued efficient movement of goods and people.

Safety

Safety is a priority for every traffic engineer. Traffic engineers are concerned with signs, markings, and signals; establishing speed limits; and evaluating sight distance—just to name a few of the areas. Traffic engineers also evaluate troublesome roadway locations, analyze crash histories, and evaluate countermeasures to improve safety.

Traffic Operations

Traffic engineers are also heavily involved in traffic operations, which focuses on making roadways more efficient. By studying traffic operations, traffic engineers can develop signing, marking, and signaling schemes that allow traffic to flow more effectively. As traffic engineers become more knowledgeable about traffic patterns, vehicles move more smoothly, and congestion is reduced or eliminated without constructing more roads. Traffic operations are particularly important in urban areas that are facing congestion problems and find it cost-prohibitive to construct new capacity. Traffic operations includes the effective design and maintenance of traffic signals and signal systems, as well as the implementation of ITS technologies to provide for better traffic flow and transportation system utilization. The core goal of traffic operations analysis is to maximize the safe movement of vehicles through the existing roadway network in the most efficient manner possible.

Planning

Planning is another area of involvement for traffic engineers. Quantifying the current state of the roadway system is important to determining potential future needs in the transportation network. Traffic engineers are often responsible for making sure that speed, volume, crash, and other data are continuously collected and properly documented. The data collected serves as an important factor in determining the need for new projects and their priority in funding.

Traffic engineers also assist planners in determining the traffic impacts of new development. Traffic engineers face a wide variety of challenges and must be familiar with several different fields of work such as traffic

law, driver psychology, and human perception. The ability to perform these tasks well is important to the efficiency and safety with which goods and people travel.

How Can Traffic Engineering Expertise Benefit Locals

Most West Virginia municipalities do not have a traffic engineer on staff, yet are faced with issues such as traffic congestion, lack of parking, and troublesome intersections.

Municipalities often get calls from citizens complaining of speeding vehicles and high traffic volumes in their neighborhood. A traffic engineer can help the municipality by setting out traffic recorders to gather speed and volume data and analyzing the information collected.

Another request that municipal street departments get is requests for stop signs. Often the public and city council request the installation of stop signs, thinking that they are the solution to speeding problems. A traffic engineer can help determine if

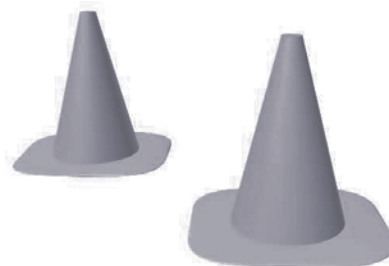
indeed a stop sign is the best option or if other alternatives should be used.

Many West Virginia towns and cities are not designed to be both pedestrian and motorist friendly. Hilly terrain, narrow streets, and narrow sidewalks or lack of sidewalks are just a few of the challenges faced by motorists and pedestrians. A traffic engineer can help assess the situation and suggest ways to accommodate motorized and non-motorized modes.

The WV LTAP is fortunate to have a traffic engineer on staff and is available to provide on-site technical assistance to your community. Please contact us if we can be of assistance.

TYPICAL ACTIVITIES OF A TRAFFIC ENGINEER

1. Conducting traffic impact studies, including conducting traffic counts and analyzing data
2. Designing roadway intersections and parking lots
3. Determining feasibility and best practices for traffic calming devices
4. Analyzing crash data, determining causes of crashes and selecting counter-measures
5. Enhancing traffic operations



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BUILD A CRASHWORTHY WORK ZONE SIGN STAND

*By Lloyd H. Rue, Design-Safety-Traffic Engineer
Federal Highway Administration—Helena, Montana*

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 program also receives funding from the West Virginia Department of Transportation.

Mission:

The mission of the West Virginia 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.

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.



Where there are cars, there will be collisions. When there are collisions, people will get hurt.

How do we lessen the chances of injuries when there are collisions with sign stands in our work zones?

We make sign stands 'crash-worthy.' Once upon a time, work zone devices were not held to a crash-worthy standard. Crashworthy work zone devices now, and for the last decade, follow an industry standard.

Making a crashworthy device can be complicated. The ultimate proof for a crashworthy device is testing at highway speeds with test vehicles. One test criteria examines whether there is an intrusion into the occupant compartment. A gaping hole in the windshield, for example, would cause the test to fail.

Numerous types of crashworthy sign stands can be purchased from suppliers. Often these sign stand

designs are patented. Patented or proprietary devices usually are more costly than those fabricated in a local shop.

There is a crashworthy, non-patented sign-stand design that uses commonly available materials — thanks to some recent research. The sign-stand design (among other devices tested) is outlined in a research report from the National Cooperative Highway Research Program, Report 553: Crashworthy Work-Zone Traffic Control Devices. And, the Federal Highway Administration issued an acceptance letter on the device (September 8, 2006, WZ-240).

The figures on the following page show the basic dimensions and components for the design. One figure shows dimensions for a 5-foot mounting height, while the other figure shows dimensions for a 7-foot mounting height. Either plywood or aluminum sign substrates may be use.

If you need new sign stands for your county or city crews, the non-patented designs on the following page may be beneficial in making your own.

This article is reprinted by permission of the Montana LTAP Center. The article, along with the diagrams on the following page, appeared in Montana LTAP Matters Winter 2007. Our hope is that this information will help your agency save money and decrease injuries in work zones when collisions occur.

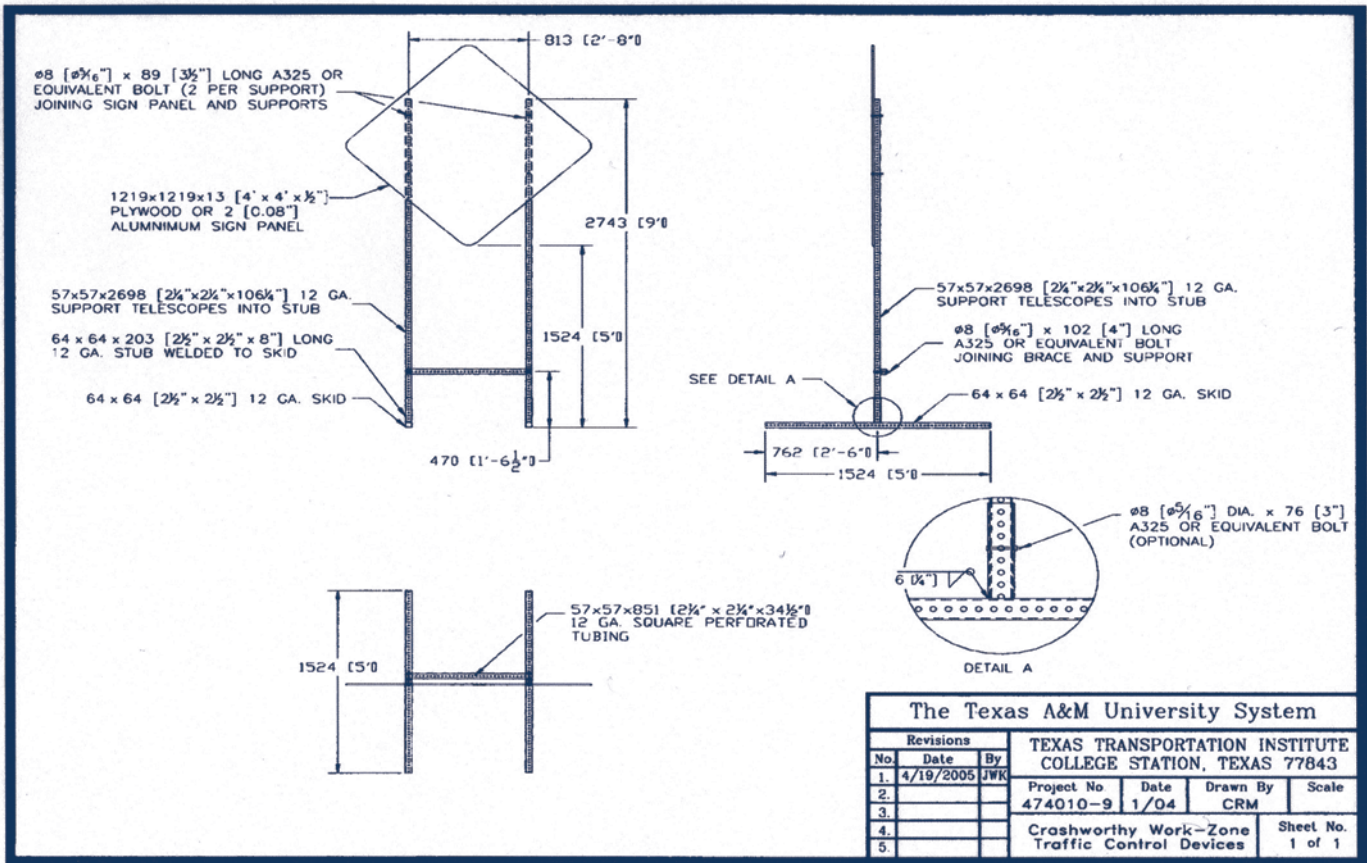


Figure 9.8. Details of the strong dual-upright sign support system with sign panel mounted at a height of 1.5 m (5 ft).

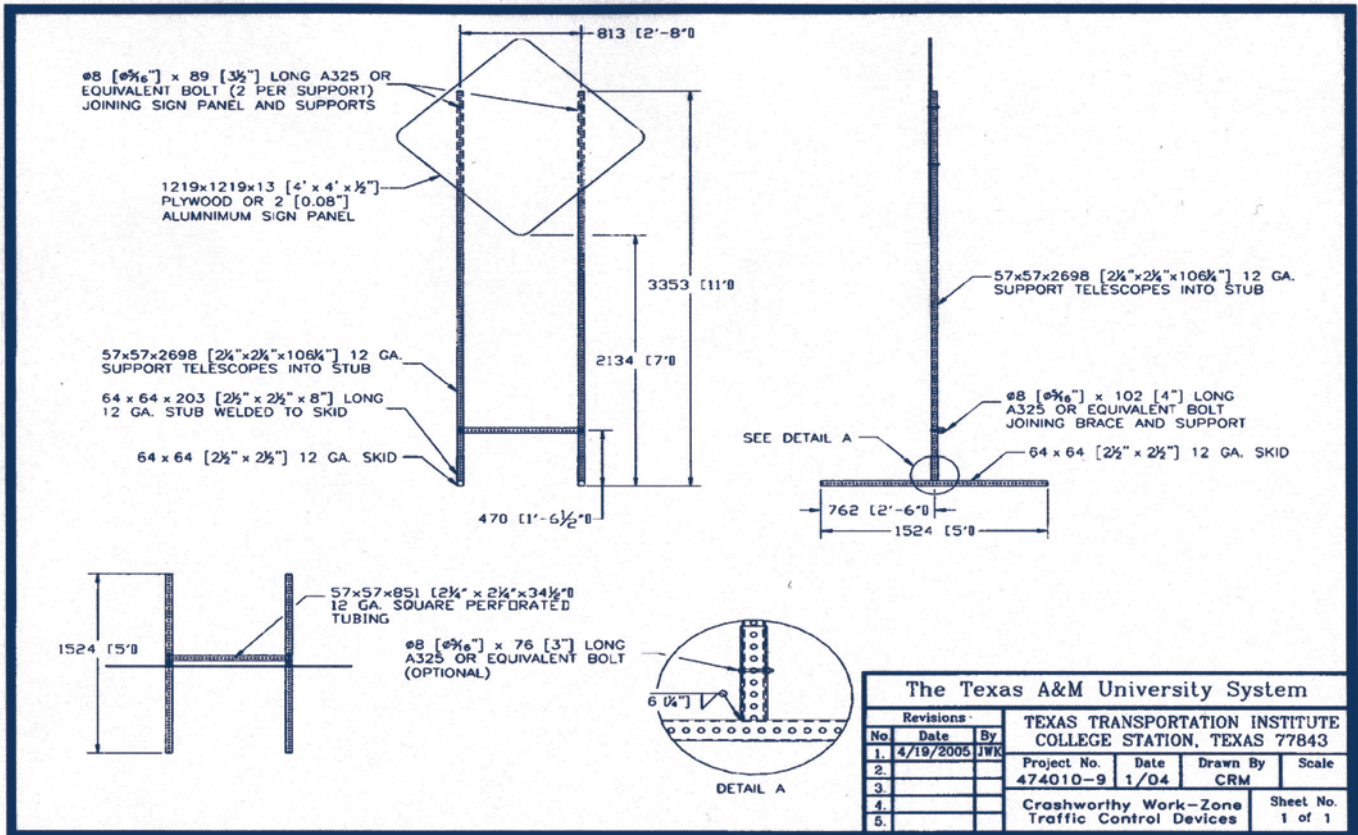


Figure 9.9. Details of the strong dual-upright sign support system with sign panel mounted at a height of 2.1 m (7 ft).

FLAGGER CERTIFICATION COURSES SCHEDULED THROUGHOUT WV



Flagger training is vital in providing for worker and driver safety while on roadway construction jobs. Flaggers are often in positions where they are vulnerable and exposed to moving traffic, and proper training can minimize their personal risk.

The ability of a flagger to effectively control traffic in a safe manner is also

important to protecting the rest of his work crew, as well as the motoring public. This is important in light of the fact that over 40,000 people are injured in work zone crashes each year, and over 1,000 died in 2003. (This is the latest data available from FHWA.) Flaggers need to be able to properly perform their jobs to provide for the safety of their co-workers, themselves, and the motoring public.

The WV Rural Water Association is offering free flagger certification courses throughout the 2007 calendar year at various locations throughout the state. These courses focus on the standard flagging procedures and how to provide safe passage in and around work zones. Clay Lutz, WV Rural Water Association wastewater training technician, is a National Safety Council

certified flagger instructor and will be instructing these courses.

Municipal workers can attend any of the WV Rural Water Association flagger training sessions at no cost. Each class can accommodate up to twelve people on a first come, first serve basis. Upon completion of the four hour course, participants will be certified flaggers.

Participants must register directly with the WV Rural Water Association for their courses. For a complete listing of upcoming courses, contact the WV Rural Water Association by calling (304) 201-1689 or visiting their web site at http://www.wvrwa.org/training/registration_form.htm.

ADDITIONAL FLAGGER CERTIFICATION COURSES SPONSORED BY WV LTAP

The WV LTAP has also arranged for Clay to teach four additional flagger certification courses, based on requests from several of our customers. These courses will be open to local, state, or private agency attendees. A fee of \$20 will be charged per person to help offset the workshop and participant manual costs. This fee can be paid via credit card or check. As in the other courses, participants will be certified flaggers upon successfully completing the class. Class size is limited to twelve.

For additional information, contact Weslie or Kim of the WV LTAP at 304-293-3031 x2662 or x2612. *Participants must register directly with the WV LTAP for these May courses.*

May 24 - WVDOH D4 Headquarters
Clarksburg, WV
Meadowbrook Mall Exit

*Two classes being offered:
8:00 AM - 12:00 PM and
1:00 PM - 5:00 PM*

May 25 - WVU Coliseum
Jerry West Lounge
Morgantown, WV

*Two classes being offered:
8:00 AM - 12:00 PM and
1:00 PM - 5:00 PM*

| | | |
|---------------------|-------------|-----------|
| Name _____ | | |
| Agency _____ | | |
| Address _____ | | |
| City _____ | State _____ | Zip _____ |
| Phone _____ | Fax _____ | |
| Email Address _____ | | |

Please indicate your first and second choices when registering. Put 1 for your first choice and 2 for your second choice. Your registration will be confirmed via a phone call or email from our office.

Course Registering For:

- _____ **May 24 8:00 AM - 12:00 PM**
- _____ **May 24 1:00 PM - 5:00 PM**
- _____ **May 25 8:00 AM - 12:00 PM**
- _____ **May 25 1:00 PM - 5:00 PM**

The course fee is \$20 per person.

Method of Payment:

If paying by check, please make payable to WV - NTC.

Check: Number _____ Amount _____

Credit Card: Master Card _____ Visa _____

Number _____

| |
|---|
| Fax to 304-293-7109 |
| Mail to WV LTAP Flagger Training PO Box 6103 Morgantown, WV 26506 |

WV LTAP WELCOMES NEW BOARD MEMBERS

By Weslie Boyd

WV LTAP is glad to welcome two new members to our advisory board. Bill Lanham and Cathy Satterfield joined the board last year. Both of them have brought a lot of energy to the program, and we are happy that they have decided to serve.

Bill currently acts as town superintendent of Fayetteville, WV. He was born and raised in Dunbar, WV and served as the public works director for eight and a half years. Bill was instrumental in obtaining grants for town beautification programs. The small town was awarded the West Virginia Make it Shine Community Award twice and also named a Keep America Beautiful City. Although he has worked as Fayetteville's town superintendent for only a short time, he has already secured several grants for the town. In 2006, the Town of Fayetteville received a West Virginia Municipal League All-Star Community award and the West Virginia Governor's Make It Shine Community award. Bill has also helped bring recycling programs to the area. He is currently the president of the West Virginia Chapter of the American Public Works Association. He attended West Virginia State University and West Virginia University where he majored in political science and business management.

Cathy is currently employed by the West Virginia Division of the Federal Highway Administration (FHWA) as a safety and traffic engineer in Charleston, WV. Originally from Minnesota, she has worked for FHWA for seventeen years. She spent several years in the Idaho Division Office as a generalist engineer where she helped develop the Idaho Transportation Consortium. She then worked at the Midwestern

Resource Center as the geometric design/safety engineer. There, she taught courses on roadside design, human factors engineering, and design for older drivers. Her goal in her current position is to decrease the rate of fatalities and severe injuries on West Virginia highways. She obtained her Bachelor of Science in Civil Engineering from the University of Minnesota in 1990 and her professional engineer (P.E.) certification from the state of Idaho. The West Virginia LTAP is proud to welcome both of these exceptional individuals to our advisory board and looks forward to working with them for many years to come.



As the town superintendent of Fayetteville, Bill is kept very busy.



To relax, Kathy, her husband Joe, and their dog Baron love traveling and being outdoors.

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During an equipment/snowplow rodeo, drivers test their operating skills on simulated courses.

INTERESTED IN AN EQUIPMENT/SNOWPLOW RODEO?

WV LTAP and WV APWA are exploring the possibility of co-sponsoring an equipment/snowplow rodeo in 2008 in Morgantown. Please take a minute to answer the following questions and either fax this information to Weslie at the WV LTAP at (304) 293-7109 or email to weslie.boyd@mail.wvu.edu. Please send responses by April 30, 2007.

1. What is the best month to hold an equipment/snowplow rodeo?

2. How many operators from your agency would likely participate?

3. Would you prefer a one-day or two-day event?

Name _____
Agency _____
Title _____

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Department of Civil and Environmental Engineering
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