Tennessee Safe Routes to School Program Announces Grant Opportunities

by Dr. Melany Noltenius

The Tennessee Department of Transportation’s Safe Routes to School (SRTS) Program assists schools across the state in their efforts to promote pedestrian and bicycle safety for students at levels ranging from kindergarten through the eighth grade. SRTS is a federally-funded program focusing on infrastructure improvements within two miles of an elementary or middle school and non-infrastructure activities that encourage elementary and middle school students to safely walk and bike to school. Projects and activities are 100 percent federally funded for fiscal year 2015.

There are two current opportunities for schools, cities, or counties that wish to participate in the SRTS program. First, TDOT will host a series of SRTS Application workshops to introduce potential applicants to the program, define eligible and ineligible expenses and activities, and provide an opportunity for interaction with SRTS staff from TDOT and UT. The second opportunity will provide encouragement items for schools that register to hold a walk to school event in conjunction with the International Walk to School Day 2014 on October 8.

Workshops are being held across the state in September 2014 to assist county and local governments in understanding the SRTS program. The workshop consists of an explanation of the application, the selection criteria, and expectations of selected grant recipients. It is required that a qualified representative of the applicant school, such as a city or county employee, attend a workshop. One workshop will be held in each of the four TDOT regions:

- Monday, September 22 - 12:30pm – 4:00pm EDT - Agriculture Building, 270 Bryan Road, Rutledge, TN 37861;
- Tuesday, September 23 - 12:30pm – 4:00pm CDT – White County Courthouse, 1 East Bockman Way, Sparta, TN 38583;
- Wednesday, September 24 - 12:30pm – 4:00pm CDT – Hickman County Career Center, 130 Progress Center Plaza, Centerville, TN 37033, and
- Thursday, September 25 - 12:30pm – 4:00pm CDT - GEMC Building, 402 Egg Hill Rd, Alamo, TN 38001.

Registration for each workshop is limited to 40 people. Please register at least one week prior to the training date and include your name, organization, address, phone, email and preferred workshop location. To register, fax or e-mail Diana Benedict, Safe Routes to School Coordinator at (615) 741-9673 or Diana.Benedict@tn.gov.

In addition to the workshops, the Safe Routes to School program is inviting all elementary and middle schools in the state to participate in...
From the Director

Hello, everyone! I hope your summer is going well. As I write this, I hear Tennessee is having an unusually cool spell. The view from my window is of downtown Beijing, China, where I’m spending several weeks teaching at an international summer school. While it may be cool in Tennessee, Beijing is one hot place in July!

The school is on the campus of Beijing Jiaotong University, one of China’s premier transportation universities. On this toasty summer evening, the campus streets are filled with students doing a surveying lab assignment.

Each team has a total station, prism, and field table, and I can see a dozen or more groups busily engaged. A couple of unusual things stand out. First, it’s a summer Saturday. Second, it’s nearly 7:00 pm, and the activity is still going strong. That says a lot about the work ethic of these young people. In fact, my class met today for 5-1/2 hours, starting at 8:00 am, and was nearly full. These people take education seriously. We ignore that at our peril.

Summer surveying camp had been discontinued before my time in the university, now many years ago. I don’t believe surveying is even offered as a separate class in today’s curriculum. That always surprises me, considering how fundamentally important it is to the civil engineering and construction professions. Apparently, they still believe this in China.

A visitor to China is immediately struck by both the large scale of its major cities and the tremendous pace of development around them. It has to be a great time to be a construction contractor here. The pace of development no doubt burdens existing public works—roads, stormwater systems, water treatment systems. During a previous visit, I saw a heavy summer rainstorm overwhelm the stormwater system. Everywhere around you see road and street repairs underway, with the predictable effect on traffic flow. China’s large cities are old by U.S. standards, and their infrastructure is a mix of ancient and modern. Public works officials here, like their American counterparts, have a “can do” attitude. Things seem to get done, and that’s what counts.

While China is an interesting place to visit, and I highly recommend a trip there, I’m certainly looking forward to coming home to Tennessee, my favorite part of the good ole U.S. of A. I’m starting to get excited about football time!

As always, TTAP is here to help. Please give us a call. We look forward to working with you.

P.S. It’s Sunday afternoon, and the kids are out again in full force with their surveying equipment. Incredible!
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the 2014 International Walk to School on Wednesday, October 8. Tennessee students will join approximately three million participants from more than 40 countries on this occasion.

In order to extend the Walk to School movement and allow more schools to get involved, Tennessee SRTS has designated the entire month of October as Walk to School Month. Our goal is to register at least 100 schools throughout the month; last year, approximately 75 Tennessee schools participated. Event registration is available at www.walkbiketoschool.org. Each elementary or middle school that registers for International Walk to School Day 2014 will receive a Walk and Bike to School banner.

Both the workshops and incentive banner are sponsored by the Tennessee Department of Transportation’s Safe Routes to School Program. To learn more about Tennessee’s SRTS, visit the TDOT website at http://www.tdot.state.tn.us/bikeped/saferoutes.htm. Assistance and guidance is available from Diana Benedict, Tennessee Safe Routes to School Coordinator, at 615-253-2421 or Diana.Benedict@tn.gov.

How Wide Should Your Bicycle Lane Be?

Source: “NCHRP Report 766 - Recommended Bicycle Lane Widths for Various Roadway Characteristics”

The 2012 edition of the American Association of State Highway and Transportation Officials’ Guide for the Development of Bicycle Facilities (AASHTO, 2012), often referred to as the Bike Guide, defines a bicycle lane as “a portion of a roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs. It is intended for one-way travel, usually in the same direction as the adjacent traffic lane, unless designed as a contra-flow lane.”

The Bike Guide states that, in most situations, the recommended width for bike lanes is 5ft, but in some circumstances, wider bicycle lane widths may be desirable, while in other cases a 4-ft-wide bike lane can be used. Additional research was done to develop recommendations for bicycle lane widths for various roadway and traffic characteristics. The focus of the research was in developing design guidance for bicycle lane widths for roadways in urban and suburban areas.

General Conclusions
1. A buffered bike lane provides distinct advantages over simply providing a wider bike lane.
2. Narrowing the width of a bicycle lane reduces the variability of the bicyclists’ lateral positions; however, this impact is relatively minor, at least for the bicycle lane widths evaluated in the research.
3. As traffic volume increases, bicyclists move away from vehicles in the travel lane and position themselves closer to parked vehicles or the curb.
4. As truck percentage within the vehicle mix increases, bicyclists move away from vehicles in the travel lane and position themselves closer to parked vehicles or the curb.
5. For streets with on-street parking and where the parking lane width is between 7ft and 9ft and the bike lane width is between 4ft and 6ft, the effective bike lane will likely be less than the physical width of a typical adult bicyclist, and the majority of bicyclists will position themselves outside of the effective bike lane.
6. For streets without on-street parking, as long as the adjacent travel lane is at least 10-ft wide and the bike lane is 4ft to 5ft in width, most bicyclists will position themselves in the effective bike lane, and the effective bike lane will be equivalent to the width of the marked bike lane.

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Design Guidance

1. Travel lanes between 10ft and 12ft in width are appropriate for streets with a bicycle lane.

2. At sites with travel lane widths between 16ft and 18ft on streets without on-street parking, marking a bicycle lane provides no distinct advantages for the lateral positioning of bicyclists and motorists. While this statement is true with respect to the issues addressed in this particular study, there are other reasons why bike lanes on streets with 16ft to 18ft lanes would be desirable. These include using the bike lane to narrow the travel lane to provide a traffic calming measure; encouraging bicyclists to travel in the correct direction on the street; getting bicyclists off of adjacent sidewalks; and using the bike lane as a link to a larger bikeway network.

3. In most situations where a bicycle lane is adjacent to on-street parking, the suggested width for the parking lane is 8 ft. An 8ft parking lane provides sufficient space for a large percentage of vehicles to park within the limits of the parking lane, and it is narrow enough that it allows more of the roadway cross section to be designated for bicyclists in the bicycle lane and motor vehicles in the travel lanes. This is consistent with current recommendations in the AASHTO Bike Guide.

4. The AASHTO Bike Guide states that under most circumstances, the recommended width for bike lanes is 5ft. The guide also states that under certain conditions, wider bicycle lanes may be desirable. In particular, the guide states that when adjacent to a narrow parking lane (7ft) with high turnover, a wider bicycle lane (6ft to 7ft) provides more operating space for bicyclists to ride outside of the door zone of parked vehicles. Based on the data collected in this study, a 6ft bicycle lane does not provide additional benefits to bicyclists compared to a 5ft bicycle lane. Most bicyclists will still position themselves within the open door zone of parked vehicles whether in a 6ft bicycle lane or a 5ft bicycle lane. A 7ft bicycle lane may offer distinct advantages for bicyclists compared to bicycle lane widths of 5ft and 6ft; however, data for 7ft bike lanes were not investigated in this research. Where space permits, the data suggest that installing a narrower bicycle lane with a parking-side buffer provides distinct advantages over a wider bike lane with no buffer.

5. For parking lanes that are 7ft to 9-ft wide, assuming the 95th-percentile parked vehicle displacement and an open door width of 45 in., the open door zone width of parked vehicles extends approximately 11ft from the curb. Therefore, the design of the bike lane should encourage bicyclists to ride outside of this door zone area and account for the width of the bicyclist.

For additional information on NCHRP Report 766 – “Recommended Bicycle Lane Widths for Various Roadway Characteristics” please go to: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_766.pdf

The research also looked into the definition of Effective Bike Lane
Let me get started with an exchange during one of our Traffic Signal Academy workshops:

“Are you responsible for traffic signal timing in your agency?”

“Yes, we are actually retiming several intersections currently.”

“Please tell me your main objective when timing your traffic signals.”

“Minimize delay.”

“Ok, good, this is one of the most common objectives for traffic signal timing. Do you know or has anybody measured the amount of delay in the intersections you are currently working on? “No, not really...”

So, this brings me to two considerations I would like to address here:

- The need for collecting performance measures;
- Understanding traffic signal operations objectives.

Collecting performance measures in signalized intersections has been historically interpreted as a costly and time consuming effort. More than that, additional personnel is necessary to analyze all the information and implement appropriate strategies to improve operations. Technology has helped change that concept. Today, it is a lot easier and less costly to collect performance measures and make good use of the data.

Going back to our exchange, it is necessary to understand that to improve operations one needs to know the current state of the operations. Knowing the current state of the operations relies on the need for collecting performance measures. Adequate performance reporting means that enough information is provided to the system operator to know whether the quality of operations is satisfactory. Even when adequate budget and staff are available, it can still be challenging to allocate resources if there is limited knowledge about which locations are operating well and which are not.

The table below gives us a good mapping of performance measures or Measure of Effectiveness (MOEs), data sources and operational objectives, our second topic in this article.

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<th>Data Sources</th>
<th>Operational Objectives</th>
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<td>Import travel time data from Bluetooth scanner</td>
<td>Smooth Flow</td>
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<tr>
<td>Route travel delay</td>
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<tr>
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<td>Platoon ratio, by link</td>
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<td>Phase green to occupancy ratio by movement</td>
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<td>Reliability of phase metrics</td>
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Recently two documents have been made available addressing the issue:

- Performance Measures for Traffic Signal Systems – an Outcome-Oriented Approach can be found at http://docs.lib.purdue.edu/jtrpaffdocs/3/

Now, regarding traffic signal operations objectives, minimize delay is by far the most common answer I get during our workshops, but there are other objectives that warrant considerations. We can include maintaining safe operations, smooth flow or minimizing the number of stops, maximize throughput, access equity, manage queues, etc. Let’s see what the second document I listed above tells us about some of these traffic signal operations objectives:

**Smooth Flow or Minimizing the Number of Stops**
This objective seeks to provide a green band along an arterial road, in one or both directions, with the relationship between the intersections arranged so that once a platoon starts moving it rarely slows or stops. This may involve holding a platoon at one intersection until it can be released and not experience downstream stops. It may also involve operating non-coordinated phases at a high degree of saturation (by using the shortest possible green), within a constraint of preventing or minimizing phase failures and overflow of turn bays with limited length, and with spare time in each cycle generally reverting to the coordinated phases.

**Maximize Throughput**
Maximizing throughput is achieved when the highest possible traffic flow is achieved across a cordon line. This is typically achieved by creating smooth flow along a route, but it may also be achieved by maximizing both through and turning movements along a given direction of travel. Satisfactory performance on a throughput maximization objective requires emphasis on maintaining large split times for phases that serve the intended direction of travel and maintaining offset and green-time relationships between adjacent intersections so that downstream queues do not affect the flow of vehicles along the critical route. Non-critical phases may have increased delays in order to provide the best possible level of service for the heaviest travel route.

**Access Equity**
Traffic signals are often provided so that major traffic generators along a street can have safe and efficient access to and from the arterial. In these cases, the objective is to equitably serve all traffic movements at each intersection. At the same time, coordination is generally provided along the arterial, but not at the expense of accessibility to local land uses. An example is a suburban retail shopping district that generates significant demand for left-turn and side-street movements. Intersections that serve significant traffic volumes on many movements, but are sufficiently isolated from other signals may also benefit from the objective to optimize for access equity. Providing satisfactory performance on such an objective requires appropriate allocation of split time and less emphasis on maintaining opportunities for coordination.

**Manage Queues**
Where there are closely spaced intersections and particularly when a short link is fed by movements from various phases, it can be important to ensure that queues do not block upstream intersections or movements or that upstream signals do not release traffic downstream when there is nowhere for those vehicles to go. Similarly, a queue management objective can include management of these situations, such as when a left turn bay spills over into adjacent lanes or when through movement queues prevent vehicles from entering a left-turn bay. Providing satisfactory performance on such an objective often requires tight constraints on cycle and phase durations to ensure that a large platoon does not enter a short block if it must be stored within that block and wait for a subsequent green phase. It may also involve “gating” actions, so that vehicles are stored upstream of the critical links because the upstream location has adequate queuing capacity.

**Variable Objectives**
It is often the case that different objectives are appropriate at different times of the day and under different traffic conditions. An arterial road that provides access between a freeway and large residential areas, but also has traffic generators
TTAP would like to congratulate Bo Mills and the maintenance crew at the Germantown Public Services Department for winning Tennessee’s first Build a Better Mousetrap competition. Germantown’s tool rack and organizer embodies the innovations developed by agencies across the country to increase safety, reduce cost, improve efficiency, and/or improve the quality of transportation.

Innovation: Service Truck Tool Rack/Organizer

Problem: When tools are put in the bed of a service truck you run the risk of tools being damaged by other equipment or materials being stacked on top of the tools. It is also difficult to get the tools out for use, hard to keep up with them, and impossible to keep them clean and free from damage.

Solution: Install a tool rack/organizer. The tool rack/organizer is made of schedule 40 PVC pipe. Holes are drilled in the top and bottom section of the pipe large enough to allow tool handles to easily fit into. The tool rack/organizer is attached to the tool box or inside bed of the service truck using “U” clamps or other clamping devices. Once the tool rack/organizer is installed various tools can be placed into the rack allowing easy access while organizing and protecting the tools.

Cost/labor and Materials: The total cost for construction and installation of the tool rack/organizer was approximately $100.00. The costs for materials and labor were $50.00 each. All work and materials were supplied in house.

Germantown’s in-house tool rack/organizer keeps a variety of long-handled tools out of harm’s way and within easy reach of the maintenance crew.

Seen from inside the bed of the service truck, the tool rack/organizer keeps tools neat without significantly reducing the amount of room available for other equipment and materials.
TALK TO TTAP

We are always looking for your comments, ideas and suggestions to help make the TTAP Program more useful to you. Please fill out and fax the form below to TTAP at (865) 974-3889 or mail to TTAP; Suite 309 Conference Center Building, Knoxville, TN 37996-4133.

1. Please send me more information on the following articles mentioned in this newsletter.

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2. Please list any additional training workshops you would be interested in attending.

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3. Please list topics for videos you would like TTAP to obtain.

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4. Please list any other ideas or suggestions on how TTAP could assist you.

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5. Please list your name and organization to verify for TTAP’s mailing list.

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Are you currently on TTAP’s mailing list?
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