



Washington County Tackles Sign Retroreflectivity

by Matt Cate, P.E., Technical Assistance Coordinator

If the employees of the Washington County Highway Department don't seem worried about traffic sign retroreflectivity, there's a good reason. I recently had a chance to catch up with Superintendent Johnny Deakins and Computer Programmer Jeff Waddell in Jonesborough to see what the county has done to ensure compliance with the Federal Highway Administration's minimum retroreflectivity requirements.

Soon after the new standards were finalized, Mr. Deakins recognized their potential impact on his department's budget and operations. Realizing that the clock was already ticking toward the three compliance dates associated with the new standards, Jeff was tasked with developing a plan to prepare Washington County.

The first task was to conduct a comprehensive sign inventory. Washington County maintains approximately 9,800 signs on 750 miles of roadway. Starting with a clean sheet of paper, the department quickly developed a field data collection process. Handheld Garmin eTrex GPS receivers provided sign coordinates. Information on the sign type, size, sheeting, mounting height, and latitude and longitude were recorded on paper in the field. This process was completed countywide in only a month by four two-man crews working full time during the winter months.

Completed field inventory forms were brought into the office, where several staff members populated a CTAS-developed Access database over the next three months. The database was imported to ArcMap GIS software providing an interactive sign map for the county. The software displays the type and location of all signs. Users can select a sign to view all of the information collected during the inventory. This GIS map and database are the heart of Washington County's sign retroreflectivity management system.

The inventory revealed that most existing signs used engineer-grade sheeting. As a result, the county elected to utilize a blanket



Johnny Deakins, Washington County Highway Superintendent, and Jeff Waddell, Computer Programmer, take time out on a busy day to discuss their sign retroreflectivity program at their office in Jonesborough.

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From the Director

I generally start this column with a blurb on the weather. Last issue, I was commenting on how cold the winter had been. It's now blazing hot in east Tennessee as I write this. Spring was cool and wet till the beginning of June. Now, seemingly overnight, we're in summer's furnace. For all of you working outdoors, protect yourselves!

We've had a busy spring at TTAP. Besides the normal round of continuing education classes, technical assistance calls, and responses to requests for materials, we've had a hand in organizing and conducting two conferences. It was Tennessee's turn to host the annual meeting of the Region 4 Local Technical Assistance Program centers—those in AL, FL, GA, KY, MS, NC, SC, TN and Puerto Rico. Jenny Jones and Matt Cate worked hard organizing the event, which was held May 12-14 in Nashville. Though their meticulous planning hadn't reckoned on the cataclysmic flood that started May 3, our Nashville area venues came through and the conference was very successful.

The second meeting was a regional summit on transportation workforce development, co-hosted with university transportation centers in Knoxville and Memphis. Many transportation agencies and providers are concerned about grooming replacements for an aging workforce. In my travels to various agencies and transportation related events, I've noticed for awhile that hair color (for those of us fortunate to still have some!) tends to gray or white. We're facing the near term loss of a huge amount of knowledge and experience in the transportation sector, without any real certainty that a next generation stands ready to fill these big shoes. The Workforce Summit, held in Nashville on May 11, brought key officials from transportation agencies, carriers, builders, and design firms together with counterparts in the workforce development community, including Tennessee's state Departments of Labor and Education, universities and community colleges. State Senator Jim Tracy and Education Commissioner Tim Webb provided keynote remarks. Chief of Administration Randy Lovett provided TDOT's perspective on workforce needs.

I learned a great deal from the Workforce Development Summit—the limits of this column preclude a full discussion. However, here are a couple of highlights. First, in the United States, only 22 percent of high school graduates are considered educationally prepared to enter the workforce or to continue with higher education. For Tennessee, this drops to 18 percent. While the new Race to the Top program promises to help our state, these numbers shocked me. On a positive note, Scott Shelar of the Construction Education Foundation of Georgia gave a passionate presentation on his organization's Construction CareerExpo. This annual event attracts nearly 5,000 high school students from throughout Georgia to learn about construction related careers, including highway construction and maintenance. It's quite a dy-

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namic affair, with much “hands-on” and demonstrations for the students. The extensive sponsor list includes the Georgia Department of Transportation, various universities and community colleges, trade associations, and highway contractors. Could Tennessee benefit from a similar event?

Well, I guess I'd better close with those remarks. As always, please feel free to contact TTAP for technical assistance, training, or information. We look forward to serving you.



TTAP Welcomes Dr. Airton G. Kohls

Dr. Airton G. Kohls joined the UTK Center for Transportation Research on June 1, 2010. He will devote a portion of his time to assisting with TTAP’s training and technical assistance activities. A native of Brazil, Dr. Kohls worked for the city of Santa Cruz do Sul for 10 years. He was the worksite inspector for many infrastructure projects, including streets, sewage treatment facilities, schools and a racetrack. He was also the city’s traffic engineer. Dr. Kohls first came to Knoxville in the early 1990’s to attend UTK, where he received his BS in Civil Engineering. After working in Brazil, he returned to UTK in 2006 to attend graduate school, earning both a Masters and a PhD in transportation engineering. Dr. Kohls lives in Knoxville with his wife Caroline and two year old son Nicholas. Please join us in welcoming him to the TTAP family!



New and Recent Videos and Publications Available

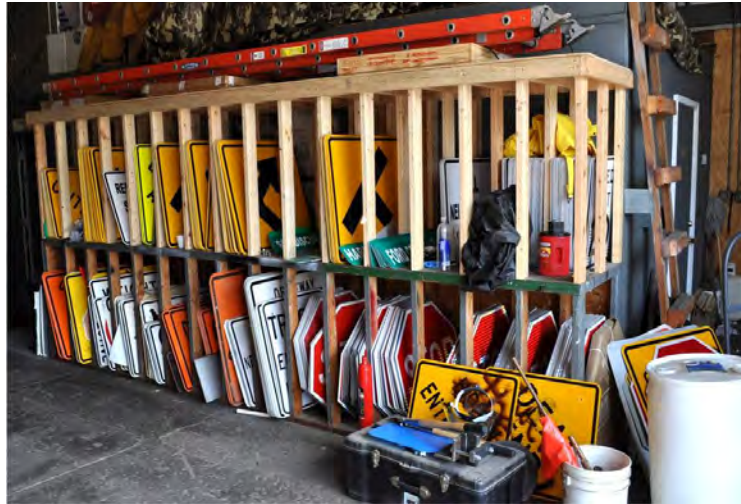
To request these or other transportation reference and resource materials, contact TTAP at 1-800-252-7623 or TTAP@utk.edu

Title	Type	Author	Date	Notes
Recognize, React, Recover: Using Rumblestrips to Prevent Run-off-the-road Crashes	Data DVD	Roadway Safety Foundation, South Carolina DOT	2009	Research reports, educational material, PSA videos
Sign Retroreflectivity Guidebook	Book (53 pages) and Data CD	FHWA	2009	Comprehensive retroreflectivity library
Access Management DVD Library	Data DVD	TRB Committee on Access Management	2007	Conference proceedings, videos, and research reports
Reduce Congestion Through Access Management	Data CD	FHWA	2007	Video, reports
Road Safety Audits: A New Way of Doing Business	Video DVD (15 min.)	FHWA	2007	
Designing for Enhanced Community Mobility	Data CD	APWA	2006	Click, Listen, & Learn archived presentation (loan only)
Good Practices: Incorporating Safety into Resurfacing and Restoration Projects	Book (60 pages)	FHWA	2006	
Highway Safety and Trees: The Delicate Balance	Video DVD (12 min.)	FHWA	2006	
Low-Cost Treatments for Horizontal Curve Safety	Book (57 pages)	FHWA	2006	

replacement approach rather than trying to identify the few signs that exceeded the new standards by a comfortable margin. The highway department divided the county into six zones of about 1,600 signs each. This would allow the department to evenly distribute the cost of sign upgrades over a period of several years to meet the January 2015 compliance date for most ground-mounted signs. Moving forward, each zone will be replaced at 10- to 12-year intervals to reflect the expected service life of the new high-intensity sheeting.

Washington County purchased signs to upgrade two of the six zones in 2009 in order to maximize the benefit of a vendor discount program. The total cost for these signs was about \$110,000. Mr. Deakins expects sign upgrade costs of approximately \$50,000 over and above his baseline sign maintenance budget for 2010.

Washington County has taken some steps to reduce their sign replacement costs. Where possible, existing signs are stripped and reskinned. The department purchased a pneumatic roller to assist in the application of new sign faces. Washington County also upgraded their sign software and cutter in order to accommodate the thicker high-intensity sheeting. The new cutter and SignCAD software were purchased as a package for \$8,900. Finally, the department is applying green transparent film to white high-intensity street name blanks rather than applying white lettering to a green blank. While the film is significantly less expensive than high-intensity sheeting, the county has found that the process



This is one of several racks full of signs ready for placement on Washington County roads.

is more labor-intensive. However, they do feel that the changeover is worthwhile.

Sign vandalism and maintenance remain a concern. Stolen street name signs and spray-painted regulatory and warning signs are the most frequent offenses. While the county does not view

vandalism as a significant problem, it accounts for much of the \$9,000 spent in 2009 to repair or replace signs.

While the minimum sign retroreflectivity requirements introduced in Revision 2 to the 2003 Edition of the *MUTCD* will place an additional financial burden on most roadway agencies, the Washington County Highway Department has taken the challenge in stride. With quick action, they beat the January 2012 compliance date for a retroreflectivity management system by almost three years. Furthermore, they are on track to beat the 2015 compliance date for retroreflectivity of regulatory and warning signs by at least a year and will beat the 2018 compliance date for street name signs by four years. As if that was not enough to keep them busy, they are now turning their attention to the proposed minimum retroreflectivity standards for pavement markings, set to be introduced as Revision 1 to the 2009 *MUTCD*.



Greg Constable (left) and Wayne Cloyd make and install signs in Washington County's sign shop.

Bicycle and Pedestrian Facilities Design Course

by Terrance Hill, E.I.T.

As urban populations continue to increase and energy costs steadily rise, bicycling and walking are becoming more popular. Investing in facilities that can accommodate walkers and cyclists



promotes alternatives to vehicle use, encourages healthy lifestyles and creates livable communities.

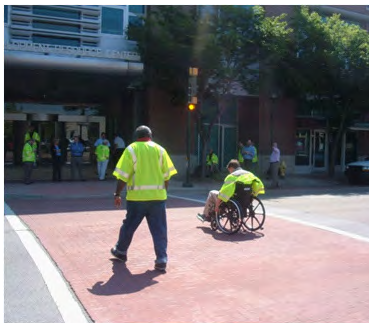
TTAP and the Tennessee Department of Transportation's (TDOT) Long Range Planning Division recently organized the "Bicycle and Pedestrian Facilities Design Course." This class was aimed at planners and engineers in the state who manage, prepare, or are involved in the creation of roadway and highway plans. The course goal is to actively involve participants and also offer a design-oriented perspective.

There were a total of six training sessions; each session spanned two days, with one day dedicated to bicycle facilities and the other designed for pedestrian facilities. The courses were held in Nashville, Jackson, Chattanooga, and Knoxville.

The class was taught by Bruce Landis, Theodore Petritsch and Christopher Fellerhoff. The instructors are professionals who perform planning studies, prepare corridor plans, design multi-use

trails, conduct research, are certified expert witnesses, and instruct courses for the Federal Highway Administration's National Highway Institute and various state agencies.

Among the topics covered were design speeds, lane and trail widths, longitudinal grades, cross slopes, and the placement and types of facilities. Additionally, new



requirements from the Manual on Uniform Traffic Control Devices (MUTCD) as well as elements from the forthcoming Public Right-of-Way Accessibility Guidelines (PROWAG) from the Access Board, the American Association of State Highway Transportation Officials' (AASHTO) Guide for the Development of Bicycle Facilities, and the Highway Capacity

Manual were introduced. As a class activity, participants were divided into groups and given design projects in which to implement their newly acquired knowledge. The pedestrian exercise included a site visit and re-design of a nearby intersection as well as a wheelchair tour. The bicycle design project included the design of a hypothetical multi-use trail. Group representatives presented their layout to the class, allowing other groups the opportunity to question and critique their designs.

Feedback from attendees of all six classes was overwhelmingly positive: many noted that the wheelchair tour gave them a new perspective on mobility, the instructors were given high marks, and nearly everyone agreed that this course should continue to be offered in the future. The bicycle and pedestrian courses, along with others offered through TTAP, aim to assist Tennessee's dedication to improving the mobility of all roadway users.



Knoxville's Stormwater Drainage Maintenance

by Jonathan P. Watson, E.I.T

As cleanup and recovery from the recent flooding in Middle and West Tennessee continues, the topic of stormwater drainage has come to the forefront. While the May floods were caused by a historic rainfall event, many drainage issues resulting from smaller, more frequent storms can be mitigated or prevented with proper drainage maintenance. With this in mind, I decided it would be a good idea to go out and see first hand some of the ways that the City of Knoxville Public Service Department's drainage maintenance crew keeps their stormwater runoff in check.

On my first visit I caught up with the crew on the morning after a severe thunderstorm. While there were no reports of flooding during this storm, there was still ample opportunity for the accumulation of debris in the drainage system. The City of Knoxville routinely inspects the stormwater drainage system two to three times a year. However, after a heavy rainfall there are about twenty-five critical culverts that are checked to insure that they are unrestricted by vegetation, driftwood, and other debris. This is especially true for culverts with grated inlets,



(from left) Danny Hickey, Albert Long, and Tim Tilley work to remove debris from a drainage grate.

which are designed to collect debris and prevent them from flowing deep into the drainage system.

The process of cleaning a culvert's grated inlet is done using mostly manpower, rakes, and pitchforks. Debris that is collected on the grate is scooped one load at a time and deposited on the bank in a pile. This is not the easiest of jobs since workers must remove the debris while trying to stay as dry as possible. Once the grate is clear, the removed debris is loaded into the back of a boom truck to be hauled away so that it will not make its way back into the drainage system. They also utilize a pump truck to vacuum up loose garbage and small debris that accumulates on the surface of the water near the inlet. After watching them repeat this process all day, I have more understanding and respect for what it takes to keep our stormwater drainage system flowing properly.

On a second visit I met up with Danny Hickey and Albert Long to witness them using



A cleaned drainage grate allows the maximum drainage flow to occur.

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the city's vacuum truck (or vac-on truck). This piece of equipment uses a combination of high pressure water jets and a vacuum system to unclog the inlet grates, catch basins, and pipes throughout Knoxville's drainage system. The high pressure water jet is inserted into one end of the pipe and the high pressure water flushes out any debris that has collected inside. The vacuum pump is then used to suck up the debris to remove it completely from the drainage system. This process of cleaning driveway drainage pipes and catch basins is usually done on demand as obstruction problems arise. However, the size of Knoxville requires a crew to daily perform these tasks.

These are just two of the routine processes that must be performed on any stormwater drainage system to maintain optimal flow throughout the system.



Albert Long uses the vacuum pump to suck up any debris flushed from the drainage pipe.



The water jet uses extremely high pressure water to flush out the drainage pipe.

In addition to these two processes, routine maintenance and inspection should consider pavement cross slopes, drainage channels, curb and gutter, and storage basins to ensure that the stormwater drainage system functions properly as a whole.

I would like to thank David Brace, Steve Ballard, Jerry Whaley, Danny Hickey, Albert Long, Tim Tilley and the entire City of Knoxville Public Service Department for allowing me the opportunity to witness first-hand how they keep our stormwater drainage system flowing.

Upcoming Workshop

**Drainage System
Maintenance
September 9, 2010
Nashville, TN.**

Check out our website ctr.utk.edu/ttap for other workshops.

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

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

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

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

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

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