



What is the Tennessee Transportation Assistance Program?

by Matt Cate, Director, P.E.

This headline, and the question that it poses, sums up a significant portion of my career. It's a question that I spend quite a bit of time answering as the director of the Tennessee Transportation Assistance Program, or TTAP. I spend quite a bit of time telling our program's sponsors at the Tennessee Department of Transportation (TDOT) and the Federal Highway Administration (FHWA) what TTAP has done or will do quarterly and annually. Additionally our TTAP team meets weekly to discuss what our program will do now and in the future. The one thing that I don't often do is to tell you, and others like you, why TTAP exists and what TTAP can do to help you.



This issue of our quarterly newsletter, RoadTalk, will hopefully provide you with a solid overview of the Tennessee Transportation Assistance Program and the services that TTAP provides to help the transportation professionals who work every day to make Tennessee's roadways better.

TTAP's mission is to move innovative transportation technologies and practices into the hands of the men and women charged with maintaining Tennessee's local roads and bridges. Our goal is to assist city and county staff in solving their transportation-related problems. Our guiding vision is to be the prime resource in developing and transferring innovative technologies, proven solutions, and reliable services to resolve the transportation challenges facing local government.

These mission and vision statements are important, but so are the details behind them. Two subsequent articles in this issue of RoadTalk will provide additional information about how we connect Tennessee's local transportation professionals with the information, services, and skills that they can use to provide Tennesseans with safe and efficient roadways that meet the needs of all community members. The first article describes TTAP's training program. The second article details the opportunities for direct technical assistance that are available to Tennessee cities and counties.

For those of you who are relatively new to the world of local transportation, I hope that these articles will serve as an introduction to TTAP and as an invitation to utilize the resources that we provide. For those of you that have been around for a few years, I hope that this issue of RoadTalk will provide a helpful reminder and update of our program.

TTAP Background

Nationally, cities and counties own and maintain 76% of all roadways (3,154,202 of 4,165,348 miles) in the United States. In Tennessee, cities and counties maintain an even greater proportion of the state's roadway network (80,058 of 95,986 miles, or 83%). However, roadways owned and maintained by state and federal agencies carry the vast majority of traffic in terms of vehicle miles of travel. As a result, local officials must stretch limited resources across a vast roadway network.

In recognition of the unique challenges faced by local roadway agencies, FHWA began a 10-state pilot program (initially known as the "Rural Technical Assistance Program", or RTAP) in 1982. Since 1982, this program has evolved to become the Local Technical Assistance Program, or LTAP. There are currently LTAP centers in all 50 states, Puerto Rico, and the Virgin Islands. TTAP has served as Tennessee's LTAP center

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since 1985.

Nationally, LTAP's mission 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. The training, technical assistance, information exchange and partnership activities provided by LTAP centers allows local and rural communities to both maximize the performance of their transportation workforce and manage a safe, efficient, and environmentally-sound transportation infrastructure.

In 2017, TTAP delivered 98 training sessions for 27 unique topics with a combined length of 605 hours. These sessions were attended by 2,140 students and resulted in a total of 13,588 student-hours of instruction. TTAP also responded to 93 requests for technical assistance from 80 unique agencies and individuals.

TTAP Training and Continuing Education

There's an old saying that goes "If you give a man a fish you feed him for a single day, but if you teach a man to fish you feed him for a lifetime." This proverb reflects the goal of our training and continuing education program. We strive to give you the information and skills that you need to carry out your future responsibilities for the planning, design, construction, operation, and maintenance of Tennessee's public roads.

TTAP's workshops cover a broad range of topics in categories including traffic operations, roadway safety, worker safety, infrastructure management, roadway drainage, transportation planning, roadway design, Americans with Disabilities Act (ADA) compliance, and even tort liability for public officials. Some of these workshops are geared to introduce fundamental concepts to those in a new role. Other topics are intended to provide exposure to advanced concepts that may be new to even seasoned veterans. Regardless of the topic and its level of complexity, we want to convey up-to-date information to you in an interactive setting with a focus on real-world problems and solutions.

As a statewide program we attempt to provide an equitable distribution of training opportunities to transportation professionals across the state. Recurring topics are typically rotated among Tennessee's three grand divisions (West, Middle, and East) or TDOT's four regions. Topics with a narrow scope or limited instructor availability are typically offered in Middle Tennessee to equalize the travel burden for participants from West and

East Tennessee. Thanks to our support from TDOT and FHWA, TTAP is able to offer many workshops to participants from cities and counties at a reduced registration fee. To learn more about our training and continuing education workshops, please visit our training calendar at <http://ttap.utk.edu/training/course-calendar.php>.

Tennessee Academy of Transportation Engineering

Since 1999, the Tennessee Academy of Transportation Engineering (TATE) has provided engineers, planners, designers, technicians, and other personnel working in the transportation field with a coordinated series of classes that address current topics in design, operation, and maintenance of transportation facilities. By completing the TATE Basic Certificate, participants gain valuable exposure to a wide range of fundamental transportation topics. Completing this certificate provides a broad base of knowledge and perspective for serious transportation professionals. Participation in TATE may be driven by a personal desire to learn, by the need to attain new skills, or as a way to demonstrate commitment to supervisors and decision makers within one's own organization.

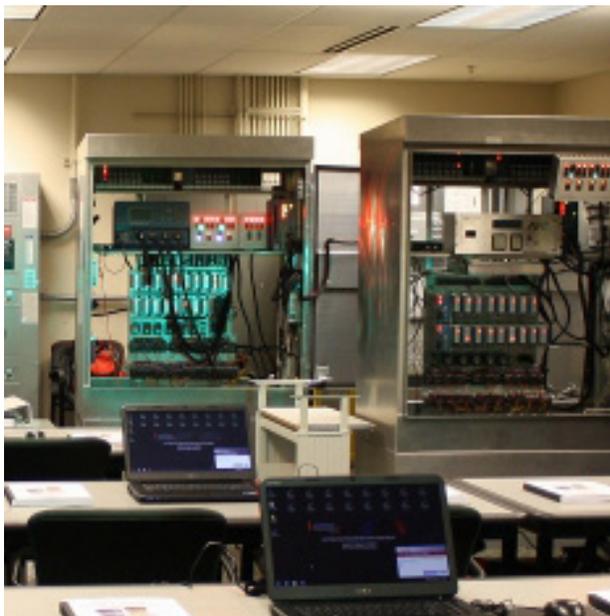
To attain the basic certificate, TATE participants must complete six core classes (Geometric Design for 2-Lane Roads and Streets, Basic Traffic Studies, Fundamentals of Traffic Control, Traffic Flow Principles, Highway Safety Analysis, and Introduction to Highway Capacity

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Analysis) and three elective titles. TATE participants must pass a written exam after each class, but please don't let that deter you! The goal of the exam is to ensure that you were paying attention and understand the basic concepts, not to demonstrate mastery of every topic presented in the workshop. To learn more about TATE, please visit our website at <http://ttap.utk.edu/training/tate.html>.

Center for Transportation Traffic Signal Academy

Traffic signal operations play an important role in the safe and efficient movement of people, goods, and vehicles through our roadway systems. In Tennessee, city and county officials are responsible for the operation and maintenance of every one of the state's approximately 6,000 signalized intersections. Many agencies must maintain aging equipment while making every effort to keep up with the regulatory requirements and engineering guidelines that govern our roadways. On top of that, traffic signal technology is changing rapidly. New systems and software offer the promise of improved operations and safety, but this same technology increasingly forces highway and public works agencies into the world of information technology and data security.



Traffic Signal Academy Lab

To help address these issues, the Traffic Signal Academy (TSA) focuses on emerging technologies and established best practices in signal timing procedures and policies. This reliable information can help improve benefit-to-cost ratios by operating new or existing systems with greater efficiency. TSA offers a comprehensive discussion on standards, warrants, installation and maintenance guidelines, and strategies to minimize the adverse effects of liability issues. Investing in traffic signal training, from design to operations to maintenance, demonstrates a robust commitment to continuous improvement in the nation's transportation system.

On-Site Training

Sometimes the timing or the location of TTAP's classroom training workshops is not compatible with your schedule. Maybe we have the right class to help you address an immediate need, but it's offered in the wrong end of the state. We may even have offered the class in your area, but you learned about the class too late to register or there was a conflict with your personal or organizational calendar. Perhaps we had a class that you think could help a relatively large number of employees within your organization, but we only had a few seats available for the scheduled class. On-site training could be the solution to your scheduling challenges.

When you schedule for an on-site training workshop, you benefit getting the training you want, getting as many employees trained as possible, reducing or eliminating your own travel expenses. By having the training offered when and where you want it, organizations with a large number of participants can schedule workshops exclusively for their own workforce. Agencies with smaller number of participants can partner with neighboring cities, counties, utility companies, contractors, or consultants to increase participation in order to reduce per-person expenses or meet minimum registration requirements.

TTAP's Work Zone Traffic Control and Flagger/Highway Safety workshops are our most requested on-site topics, but many workshop titles are available with ample lead times. If you want to learn more about this on-site workshop option, please contact Frank Brewer, TTAP's Training Coordinator, at 865-974-8251 or fbrewer1@utk.edu. Frank will work with you to determine the

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availability of workshop titles for on-site delivery, potential workshop dates, and costs. There is no predetermined cost to deliver an on-site workshop. The cost of an on-site workshop may vary based on the instructor, location, workshop duration, and number of students. Regardless, we seek to deliver high-value, low-cost training to all Tennessee cities and counties.

AASHTO TC3 Online Training

Classroom training may offer the best experience for many students, but your schedule or financial resources may prevent you from attending a workshop of interest. In other cases TTAP may not offer a class to address a topic of interest. Fortunately there are additional training resources available to local agency officials. One such resource is the American Association of State Highway and Transportation Officials (AASHTO) Transportation Curriculum Coordinating Committee's (TC3's) online library of training modules. Available categories include Construction, Employee Development, Maintenance, Materials, Pavement Preservation, and Traffic and Safety.

Many of these modules are free for all users, thanks to an agreement between FHWA and AASHTO. The entire collection of more than 190 modules is free to local agency officials across the nation. To browse and access TC3 course offerings, please go to <https://tc3.transportation.org/>. All users will need to create an AASHTO user account to view online training modules. Local agency (cities and counties) users can use the discount code "D5X3-B3D9-52CB-4XCX" to view modules at no cost. We encourage you to check out the TC3 training library and take advantage of this impressive resource.

The Future of TTAP Training and Continuing Education

TTAP's training staff devotes a significant amount of effort to monitoring, assessing, and ultimately improving its training program. Every training participant is asked to complete a workshop evaluation form. We use this feedback to ensure that individual workshop topics and instructors are relevant, up-to-date, and meet the needs of our local transportation professionals. Additionally, evaluations and student comments are carefully reviewed to identify opportunities for improvement. This feedback may lead to the addition of new or

revised material in future offerings of the same topic, the development of a new but related training workshops, or the retirement of a training topic that has become obsolete or unnecessary. Many TTAP workshops have evolved over time to keep up with technology, regulations and guidelines, and a changing workforce.

Beyond feedback from workshop participants, TTAP is constantly looking for new training topics and sources. In some cases these new training products result from an obvious need for our audience. Our recent Americans with Disabilities Act (ADA) workshops are a prime example of our efforts to help local agencies address current needs. As FHWA and TDOT has placed an increased emphasis on ADA compliance, many local agencies have needed to make significant updates to their accessibility policies and procedures. Beyond existing obligations to provide citizens with accessible facilities and services, the availability of transportation grant funds is now tied to the local agency's compliance efforts. In the last three years, TTAP has offered 10 sessions in two distinct ADA-related topics (ADA Self-Evaluations/Transition Plans and Overview of Elements of Public Right-of-Way Accessibility and Designing Pedestrian Facilities for Accessibility).

The CTR Traffic Signal Academy is another example of our efforts to address the needs of local agencies. TSA has filled a void providing transportation professionals with detailed information regarding the design, construction, maintenance, and operation of traffic signal systems. TSA continues to expand and evolve as we engage local, state, and federal transportation officials, engineering consultants, equipment manufacturers, researchers, and other transportation stakeholders to identify new or unaddressed needs.

Finally, we are working behind the scenes to improve your overall training experience. We hope to have a new training registration system online in early 2019. This system will improve your registration experience, enable true online credit card payment, and improve our efficiency behind the scenes. The new system will also give us the option to offer some training content in an online format, further increasing our flexibility and providing you with a greater range of training options. It will take more time to develop this online content, but we anticipate that our first efforts will also be available in 2019.

Technical Assistance

Do you remember the TV gameshow *Who Wants to Be a Millionaire*? If contestants could correctly answer a series of 15 questions they won \$1,000,000. If they ran into a question they could not answer, they had a “lifeline” that could be used to phone a friend who could help answer the question. Think of TTAP’s Technical Assistance program as your phone-a-friend lifeline. There may not be a million dollars on the line, but we can help you answer that question that has you stumped. We can even go one better than *Millionaire*. If we don’t have the answer, we can use lifelines of our own to find additional answers from other UT faculty and staff members, TTAP instructors, TDOT and FHWA contacts, and even other LTAP centers.

TTAP transportation technical assistance is FREE to every city or county in Tennessee. Technical assistance projects range in scope from a single phone call or email to several on-site visits, depending on the nature and complexity of the issue at hand. Technical assistance projects cover a broad range of topics, including traffic operations, highway safety, roadway drainage, and pavement management. Traffic counts, traffic signal warrant analyses, and speed studies are among our most frequently requested technical assistance activities. Local government officials may request TTAP assistance by telephone (1-800-252-7623 or 865-974-5255) or email (TTAP@utk.edu).

Equipment Loan Program

TTAP also offers an equipment loan program as part of its technical assistance efforts. Any Tennessee city or county may utilize these items, including traffic counter-classifiers (tube counters), turning movement count boards, and handheld traffic sign retroreflectometers. TTAP staff members are available to provide instruction and assistance in the use of this equipment. Our equipment is available on a first-come, first-served basis. Please make your loan request several weeks in advance if your activities are on a fixed timeline.

Sidewalk Inventory and ADA Compliance Assistance

We’ve already talked about TTAP’s training workshops to assist city and county officials as they perform ADA self-evaluations, develop transition plans, and implement upgrades to bring all sidewalks, curb ramps, and crosswalks into compliance. While ADA has far-reaching

implications for all aspects of local government, city and county streets and highway officials must typically focus their ADA compliance efforts on sidewalks and related pedestrian infrastructure.

In 2019 TTAP will provide targeted technical assistance to local agencies that are working to conduct ADA self-evaluations and/or to update transition plans. At the center of this assistance effort will be an open-source geographic information system (GIS) software tool that will allow agencies to build an inventory of pedestrian infrastructure assets, evaluate common compliance issues related to these assets, and to identify and prioritize projects to improve compliance. TTAP will provide training, documentation, and technical support for the use and implementation of this inventory software. On-site data collection assistance will also be available through this effort.

Watch future issues of RoadTalk for more information on TTAP’s ADA technical assistance services. If you’re interested in partnering with TTAP as one of our pilot communities, please contact Melany Noltenius at mnolteni@utk.edu for more information.

Traffic Signal Asset Management System (TSAMS) Assistance

We’ve also talked about traffic signals in the context of TTAP’s training and continuing education program. Traffic signal technology is changing at a rapid pace. All of the old, familiar components are still there, but the technology in and around the controller cabinet is making tremendous leaps forward. Think about how your cell phone has changed in the last 10 years. In 2008 you probably had a flip phone (if you were tech-savvy) that served as your link to friends, family, and co-workers when you were not at home or in the office. Today most of us carry a smart phone in our pocket that would have given us super-human powers only 30 years ago.

In fact, I found a comparison that stated “A single Apple iPhone 5 has 2.7 times the processing power than the 1985 Cray-2 supercomputer.” Think about that for a minute, then consider that the same advances are occurring in the field of traffic operations. We’re also entering (or advancing into)

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a connected world where cars, phones, and signals can communicate to share information that can be used to alter operations in real-time. At the same time, many agencies operate signal systems that are more than 20 years old. Think about a 20-year-old cell phone or desktop computer. How could you possibly function in today's world with that kind of technology? Yet we routinely take this approach with traffic signals.

The first step in adopting new technologies is actually quantifying what we currently use. Some agencies already maintain detailed traffic signal equipment inventories, but most do not. TTAP plans to develop an online traffic signal asset management system (TSAMS) tool that will allow cities and counties across Tennessee to begin gathering, sorting, and sharing information about their traffic signal systems. This asset will benefit local agencies by providing a framework to detail existing assets, identify gaps and deficiencies that will hinder implementation of new technology, and ultimately to lay out a plan to utilize the impressive capabilities of today's (and tomorrow's) traffic signal technology. The TSAMS database will also assist state and federal officials by providing a greater understanding of the traffic signal systems that are maintained and operated exclusively by local agencies in Tennessee.

We will provide additional information when the TSAMS database is available for use. In the meantime, please contact Airton Kohls at 865-974-0298 or akohls@utk.edu if you have any questions about this technical assistance opportunity.



FHWA brings workshop on ATSPMs to Tennessee

by Airton Kohls

On October 30th, the Federal Highway Administration in collaboration with its Tennessee Division Office, the Tennessee Department of Transportation and the University of Tennessee Center for Transportation Research held a free, one-day workshop in Knoxville on the use of Automated Traffic Signal Performance Measures (ATSPMs). In attendance were 71 people representing 19 government agencies, 16 consultant firms and 5 equipment companies.

First, a little bit of background... The Federal Highway Administration (FHWA) is continuing to promote ATSPMs from the Every Day Counts (EDC-4) initiative as a means to improve on the traditional traffic signal retiming processes by providing continuous performance monitoring capability. Signal retiming efforts can be based directly on actual performance without dependence on software modeling or



Attendees at the National Transportation Research Center during FHWA's workshop on ATSPMs.

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expensive, manually collected data. ATSPMs consist of a high-resolution data-logging capability added to existing traffic signal infrastructure and data analysis techniques. This provides agency professionals with the information needed to proactively identify and correct deficiencies. They can then manage traffic signal maintenance and operations in support of an agency's safety, livability and mobility goals.

Back to the workshop details... Mr. Rick Denney, from the FHWA Resource Center, got the day started elaborating on "an objectives-based approach to signal operations and measurement". He demonstrated how different signal performance measures can assist practitioners to achieve their carefully selected operational objectives. Operational objectives that can vary from assigning intersection right of way in a safe manner to minimizing phase failures during light flow, to selecting smooth flow or equitable service during uncongested flow, to finally maximizing throughput or managing queues during congested flow. Remember, signal timing is not one size fits all!

Dr. Christopher Day, from Iowa State University detailed the requirements of the ATSPMs system, including data collection, communications and detection requirements. He also provided very detailed case studies of how ATSPMs helped his team fine tune traffic signal systems and improve operations on facilities in Indiana. Mr. Justin Effinger, a traffic signal engineer from Lake County in Illinois, pointed to how his agency is implementing and using ATSPMs. One interesting example was the use of signal performance measures, more specifically the split monitor, to address common citizen complaints, like "I am not being served at the traffic signal".

During the afternoon sessions, two different business models for ATSPMs were presented. First, the city of Cleveland, TN, represented by Mr. David Sheely and Mr. Tad Bacon (Cleveland Utilities) presented their recently deployed Miovision system that collects and generates reports on ATSPMs. Here, the system was purchased from the vendor which allows the agency to bypass the need for in-house data storage and maintenance. Even though just a few days of data were being analyzed, the city pointed to the benefits of a study corridor health-check report that portrayed potential operational issues to be addressed. For instance, in one intersection a side street through movement was "diagnosed" with a minimum green larger than typical. After the adjustment, the signal performance measures analysis yielded a 14% improvement in simple delay during the PM peak period for the major street.

Addressing a different business model of ATSPMs use, the city of Sevierville, TN, represented by Mr. Bryon Fortner and Mr. Eric Itzel presented on their adoption of ATSPMs using the UTAH DOT open source code (<https://udottraffic.utah.gov/ATSPM/Home/About>) plus an on-premise server running Windows Server, IIS and SQL 2016. The city of Sevierville started implementation of ATSPMs in 2016 and has used it in innovative ways, including to check results of a coordination retiming project, to demonstrate effects of new developments at signalized intersections and to check activity of a remote detector used to conditionally call a blankout sign at the Eastbound ramp at the diverging diamond with I-40.

Furthermore, Mr. James Hagermann, Mr. Jeffery Branham and Mr. Ernie Pierce from the city of Knoxville hosted a meeting the next morning at the Public Works Service Center and demonstrated some of the city's initiatives on advanced transportation technologies, including traffic signals, parking meters, school zones beacons, etc.

Finally, I believe the workshop presented a great opportunity for practitioners to learn more, network and create collaborative efforts for using ATSPMs in Tennessee. It is necessary to recognize and thank everyone that collaborated to make this a special and successful event, including the workshop presenters, as well as Mr. Charles Lattimer (Atkins), Mrs. Pamela Heimsness and Mrs. Melissa Furlong (FHWA TN Division Office), Mr. Steve Bryan (TDOT Headquarters), Barge Design Solutions and CDM Smith (lunch sponsors) and all participants.



Mr. David Sheely and Mr. Tad Bacon during installation of their ATSPMs system in Cleveland, TN.

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