



Tennessee Traffic Signal Users Group (TTSUG)

2018 Face-to-Face Meetings

Steve Bryan, TTSUG Steering Committee Chair

Tennessee Traffic Signal Users Group (TTSUG)



2016 Formation

TTSUG Formation

TDOT, FHWA, and ACEC Partnership

- Originally met on 9/16/16 as part of the American Council of Engineering Companies (ACEC) Traffic Ops Working Group. From that meeting ACEC along with TDOT and FHWA approved the creation of a **Traffic Signal Users Group**.
- The first TTSUG Steering Committee meeting was held on 2/27/17. Since then, the committee has met 11 times with our next meeting on 11/5/18.
- Current TTSUG Steering Committee Membership Participation:
 - TDOT (3 Persons)
 - FHWA (2 Persons)
 - Local Agencies (1 Person)
 - Academia (1 Person)
 - ACEC (4 Persons)

TTSUG Partnerships and Sponsorships

Founding TTSUG Partnerships



<https://www.tn.gov/>



<https://www.fhwa.dot.gov/tndiv/>



<http://acectn.org/>

TTSUG Sponsorships



TENNESSEE SECTION INSTITUTE OF TRANSPORTATION ENGINEERS

<http://tsite.org/>



<http://itstn.org/>

Tennessee Traffic Signal Users Group (TTSUG)



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2017 Outreach Efforts
Local Agency Survey

TTSUG Outreach Efforts – Local Agency Survey

- The TTSUG Steering Committee determined that feedback from local agencies would help us understand the traffic signal operations and maintenance activities within various agencies.
- The initial survey compiled had **44** questions. Too long & too many questions. After that, the survey was reduced to a brief **nine** questions and was then sent out to the TTSUG database members in November/December 2017.
- A total number of **296** different agencies throughout Tennessee were sent the initial TTSUG survey. From these 296 agencies, a total of **101** different agencies responded back that their agency does not maintain traffic signals.
- Of the remaining **195** agencies in the database, a total of **83** agencies responded to the survey. Removing **15** duplicate responses from within the same agency, a total of **68** different agency responses remained for further analyses. 68 out of 195 total agencies equated to a **35%** response rate. ✓ OK
- The following slides summarize the 68 different agency responses to these nine questions contained in the TTSUG survey.

TTSUG Survey Question 1

Q1: How many traffic signals does your agency maintain?

- 32% – Less than 5 signals
 - 22% – 5 to 20 signals
 - 13% – 21-40 signals
 - 15% – 41-80 signals
 - 18% – Over 80 signals
- From this question, a significant trend was determined that traffic signal maintaining agencies were split almost 50% at the 20 traffic signal threshold, which is summarized as follows:
- **Small Agencies: 20 Traffic Signals or less = 54%**
 - **Large Agencies: 21 Traffic Signal or more = 46%**
- For the remaining eight questions contained in the initial TTSUG survey, the responses to the questions hereinafter have been presented based on the above two groupings described above.



TTSUG Survey Questions 2-4

Q2: Does your agency have controller communications between signalized intersections such as a central computer system or an on-street master?

- Small Agencies Yes – 19% No – 81%
- Large Agencies Yes – 84% No – 16%

Q3: Does your agency have written standards or specifications regarding traffic signal design and/or installations?

- Small Agencies Yes – 24% No – 76%
- Large Agencies Yes – 77% No – 23%

Q4: Does your agency have an established traffic signal preventive maintenance program?

- Small Agencies Yes – 30% No – 70%
- Large Agencies Yes – 90% No – 10%

TTSUG Survey Question 5

Q5: How often does your agency update traffic signal timings (other than small adjustments in the field)?

- Over 2 Years Small Agencies – 19% Large Agencies – 70%
- 1 to 2 Years Small Agencies – 19% Large Agencies – 24%
- Never Small Agencies – 38% Large Agencies – 3%
- I Don't Know Small Agencies – 24% Large Agencies – 3%

Q5: Breakdown by signal group:

- Over 2 Years <5: 9% 5-20: 33% 21-40: 89% 41-80: 50% >80: 73%
- 1 to 2 Years <5: 14% 5-20: 27% 21-40: 0% 41-80: 40% >80: 27%
- Never <5: 54% 5-20: 13% 21-40: 11% 41-80: 0% >80: 0%
- I Don't Know <5: 23% 5-20: 27% 21-40: 0% 41-80: 10% >80: 0%

TTSUG Survey Questions 6-8

Q6: Does your agency currently install or have a plan to install Advanced Transportation Controllers (ATCs)?

- Small Agencies Yes – 19% No – 81%
- Large Agencies Yes – 84% No – 16%

Q7: Does your agency have traffic signal improvement projects programmed into your long-range transportation plan?

- Small Agencies Yes – 16% No – 84%
- Large Agencies Yes – 77% No – 23%

Q8: Does your agency have challenges in identifying and/or allocating funding for traffic signal improvement projects?

- Small Agencies Yes – 49% No – 51%
- Large Agencies Yes – 90% No – 10%

TTSUG Survey Question 9

Q9: For future guidance to our user group, how you believe the TTSUG can best help your agency regarding traffic signals? (Check all that applies)

- | | | |
|-------------------------------|-----------------------------|-----------------------------|
| • Face-to-Face Meeting | Small Agencies – 41% | Large Agencies – 61% |
| • Formal Training | Small Agencies – 32% | Large Agencies – 39% |
| • Online Forum | Small Agencies – 22% | Large Agencies – 39% |
| • Online Meeting | Small Agencies – 54% | Large Agencies – 45% |

Q9: Overall ranked of both signal groups (Large and Small Agencies)

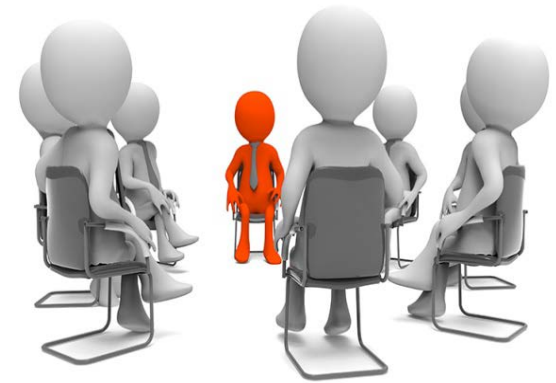
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|----------|-----------------------------|-----|
| 1. (Tie) | Face-to-Face Meeting | 50% |
| 1. (Tie) | Online Meeting | 50% |
| 3. | Formal Training | 35% |
| 4. | Online Forum | 29% |



TTSUG Survey Outreach Efforts – What Did We Find Out?

- There's about a 50-50 split at 20 traffic signals threshold for local maintaining agencies. Small agencies were classified as those agencies below that threshold and large agencies were those agencies above that threshold.
- Small agencies have different needs and experiences than large agencies. As a result, the TTSUG decided to focus our efforts using a two-tier approach:
 - Meeting the needs of small agencies
 - Meeting the needs of large agencies
- Face-to-face meetings and online meetings were the top responses as the best ways to best help both agency groups regarding traffic signals.
- The TTSUG Steering Committee decided to conduct face-to-face meetings across the State of Tennessee in 2018.

Tennessee Traffic Signal Users Group (TTSUG)

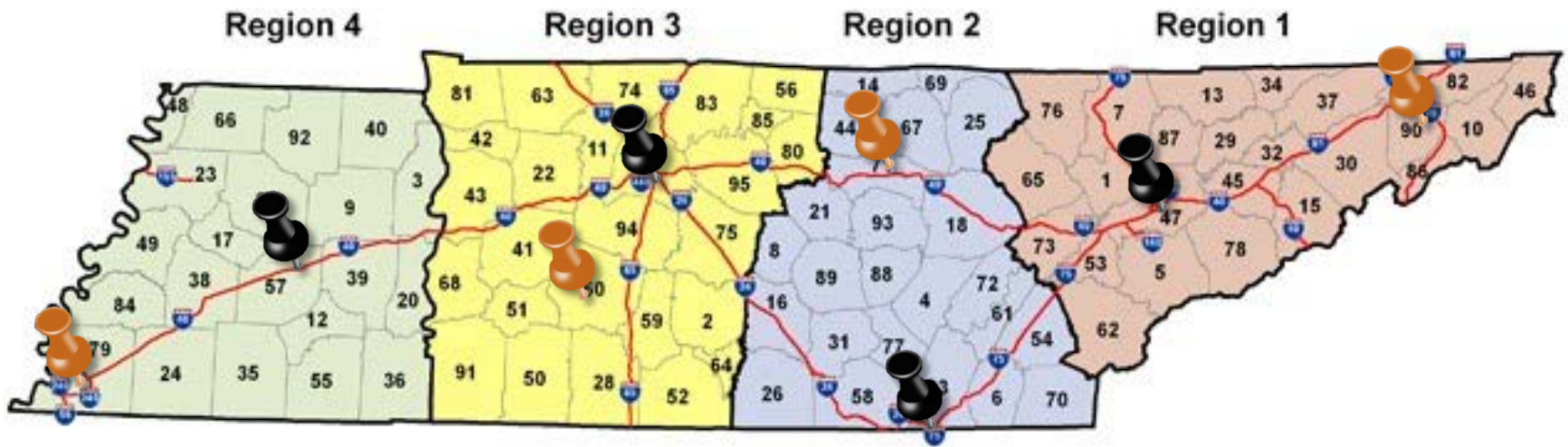


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**2018 Outreach Efforts
Face-to-Face Meetings**

TTSUG 2018 Face-to-Face Meeting Locations

- TDOT Region 1: Johnson City and Knoxville
- TDOT Region 2: Chattanooga and Cookeville
- TDOT Region 3: Columbia and Nashville
- TDOT Region 4: Memphis and Jackson



- Fact: Bristol to Memphis is 452 miles "as the crow flies"

Bristol to Windsor, Ontario, Canada is 398 miles "as the crow flies"

Region 4 TTSUG Face-to-Face Meetings (5/24 & 5/25)

Jackson & Memphis Meetings: 2 Large & 0 Small Agencies, 1 MPO/TPO/RPO, 14 Attendees

Large Agencies

- City of Jackson
- City of Memphis

Small Agencies

- None

MPO/TPO/RPO

- Memphis MPO

Other

- TTSUG Steering Committee

Region 2 TTSUG Face-to-Face Meetings (6/6 & 6/7)

Chattanooga & Cookeville Meetings: 6 Large & 3 Small Agencies, 1 MPO/TPO/RPO, 26 Attendees

Large Agencies

- City of Chattanooga
- City of Cleveland
- City of Cookeville
- City of East Ridge
- City of Mt. Juliet (R3)
- City of Murfreesboro (R3)

Small Agencies

- City of Dayton
- Hamilton County
- City of Livingston

MPO/TPO/RPO

- Center Hill RPO

Other

- TDOT Region 2 Traffic Office
- TTSUG Steering Committee

Region 1 TTSUG Face-to-Face Meetings (6/27 & 6/28)

Johnson City & Knoxville Meetings: 9 Large & 6 Small Agencies, 1 MPO/TPO/RPO, 37 Attendees

Large Agencies

- City of Alcoa
- City of Elizabethton
- Town of Greeneville
- City of Johnson City
- City of Kingston
- City of Knoxville
- Knox County
- City of Maryville
- City of Sevierville

Small Agencies

- Town of Erwin
- City of Gatlinburg
- City of Kingsport
- Town of Mosheim
- Town of Oneida
- Sullivan County

MPO/TPO/RPO

- Knoxville TPO

Other

- UTK Center for Transportation Research
- TDOT HQ/Region 1 Traffic Office
- TTSUG Steering Committee

Region 3 TTSUG Face-to-Face Meetings (7/11 & 7/12)

Columbia & Nashville Meetings: 10 Large & 3 Small Agencies, 2 MPO/TPO/RPO, 38 Attendees

Large Agencies

- City of Brentwood
- City of Clarksville
- City of Columbia
- City of Franklin
- City of Gallatin
- City of Hendersonville
- City of Lebanon
- City of Nashville Metro
- City of Shelbyville
- City of Spring Hill

Small Agencies

- City of Goodlettsville
- City of Savannah (R4)
- City of White House

MPO/TPO/RPO

- Middle Tennessee RPO
- South Central RPO

Other

- Shelbyville Power
- TDOT Long Range Planning Office
- TTSUG Steering Committee

TTSUG 2018 Face-to-Face Meeting Attendee Summary

Location	Date	Local Maintaining Agencies	MPO/ TPO/ RPO	Other Agencies	Total Attendees
Memphis	5/24	1 (1L,0S)	1	0	9
Jackson	5/25	1 (1L,0S)	0	0	9
Chattanooga	6/6	5 (3L,2S)	0	1	16
Cookeville	6/7	4 (3L,1S)	1	1	15
Johnson City	6/27	7 (4L,3S)	0	1	19
Knoxville	6/28	8 (5L,3S)	1	3	23
Columbia	7/11	4.5 (3.5L,1S) ⁽¹⁾	1	1	19
Nashville	7/12	8.5 (6.5L,2S) ⁽¹⁾	1	1	22
Totals	-	39 (27L,12S)	5	8	132 (16.5 att/mtg)

⁽¹⁾City of Franklin sent persons to both the Columbia and Nashville meetings.

TTSUG Face-to-Face Meeting Agenda

- 2016 TTSUG Formation
- 2017 Local Agency Survey Results
- Advanced Transportation Controllers (ATC)
- Advanced Controller Programming Features
- Accessible Pedestrian Signals (APS)
- Traffic Signal Yellow and Red Clearance Timings
- Flashing Yellow Arrows (FYA)
- Automated Traffic Signal Performance Measures (ATSPM)
- Funding Opportunities for Traffic Signal Improvement Projects
- Summary of TTSUG Outreach Activities
- Separate Breakout Sessions for Small and Large Agencies



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Face-to-Face Meeting Breakout
Session
Comparisons

TTSUG Breakout Session – Priority Question

What are your agency's top six priorities in ranked order?

Small Agencies

- 1) Signal Operations Training
- 2) Signal Response Maintenance Training
- 3) Signal Preventative Maintenance Training
- 4) Signal Operations and Maintenance Funding
- 5) Signal Manufacturer Training
- 6) Signal Manufacturer/Equipment Demonstrations

Large Agencies

- 1) Signal Operations Training
- 2) Signal Operations and Maintenance Funding
- 3) Signal Response Maintenance Training
- 4) Signal Preventative Maintenance Training
- 5) Signal Manufacturer/Equipment Demonstrations/Training
- 6) Connected and Autonomous Vehicles/Infrastructure

TTSUG Breakout Session – Additional Priority Question

For Large Agencies, what are your agency's top six priorities in ranked order?

Large Agencies

- 1) Upgrade and replace traffic signal system and communications equipment
- 2) Agency capabilities to maintain knowledge of traffic signal system technologies and keeping your infrastructure in a state of good repair
- 3) Agency procurement of technology, systems, and service to achieve operational objectives
- 4) Development of your traffic signal operations and management workforce
- 5) Utilizing automated traffic signal performance measures to identify and quantify the need for operational improvements
- 6) Agency's capabilities to share data with internal stakeholders and other regional partners

TTSUG Breakout Session – Infrastructure Questions

What is the approximate average age of your agency's controllers?

Time Period	Small Agencies	Large Agencies
Less than 10 Years	26%	43%
11 to 20 Years	48%	39%
Over 20 Years	26% ⁽¹⁾	18%

⁽¹⁾Two small agencies stated that all of their controllers were over 20 years old.

What is the approximate average age of your agency's signal infrastructure?

Time Period	Small Agencies	Large Agencies
Less than 10 Years	45%	27%
11 to 20 Years	25%	40%
Over 20 Years	30% ⁽²⁾	33%

⁽²⁾One small agency stated that their entire signal infrastructure was over 20 years old.

TTSUG Breakout Session – Miscellaneous Questions

What is the agency's typical traffic signal equipment and infrastructure replacement plan (in ranked order)?

Small and Large Agencies (Same Order)

- 1) Replace/upgrade when a construction project or knock-down affects the signal
- 2) Replace/upgrade when signal malfunctions become numerous
- 3) Replace/upgrade plan that updates the signal equipment on a planned cycle

What is the estimated percent of work time applied for additional duties?

Small Agencies: 84%

Large Agencies: 30%

What type of planning organization does your agency belong to?

Planning Organization	Small Agencies	Large Agencies
MPO/TPO	27%	80%
RPO	73%	20%

TTSUG Breakout Session – CMF Questions

Have you heard of Traffic Signal Management Capability Maturity Framework (CMF)?

Small Agencies Yes – 20% No – 80%

Large Agencies Yes – 14% No – 86%

Follow up: Would your agency be interested in conducting a Traffic Signal Management CMF self-assessment?

Small Agencies Yes – 50% No – 50%

Large Agencies Yes – 64% No – 36%

TTSUG Breakout Session – Smart Technology Questions

For Large Agencies, are you familiar with smart city concepts in regards to transportation?

Large Agencies **Yes – 77%** No – 23%

Follow up: What types of smart technology would your agency be interested in?

- Automated Traffic Signal Performance Measures – 95%
- Integrated Corridor Management – 73%
- Connected Vehicle Infrastructure – 55%

TTSUG Breakout Session – Preventive Maintenance Questions

Does your agency have an established signal preventive maintenance program?

Small Agencies Yes – 20% No – 80%

Large Agencies Yes – 95% No – 5%

If yes follow up: Who performs your signal preventive maintenance?

PM Forces	Small Agencies	Large Agencies
In-House Staff	57%	78%
Contractor	43%	22%

If yes follow up: How often your agency perform signal preventive maintenance?

Time Period	Small Agencies	Large Agencies
Less than 6 Months	14%	18%
6 to 12 Months	86%	55%
Over 12 Months	0%	22%

TTSUG Breakout Session – Additional Priority Question

What is the best way for TTSUG to support local agencies?

Comment	Small Agencies	Large Agencies
Training	88%	71%
Funding	33%	47%
Agency Networking/ Online Forum	33%	35%
Inventory Database/ Sharing Data	22%	24%

Tennessee Traffic Signal Users Group (TTSUG)



Outreach Efforts
What's Next?

TTSUG Outreach Activities – What’s Next?

➤ Identify Training and Funding Opportunity Considerations

- Small and Large Agency’s Top Priorities
 - 1) Signal Operations Training
 - 2) Signal Response Maintenance Training
 - 3) Signal Operations and Maintenance Funding
 - 4) Signal Preventative Maintenance Training
- Tennessee Transportation Assistance Program (TTAP) Training & Workshops including the Traffic Signal Academy (Need course descriptions & instructors)
- International Municipal Signal Association (IMSA) certification programs (TTAP is considering developing similar certification programs for Tennessee)
- TDOT is considering using a limited portion of maintenance funds to help agencies with small signal projects to existing infrastructure such as adding pedestrian signals/buttons, replacing signal infrastructure, and signal retiming projects
- Develop a mentoring program where large agencies can help small agencies
- Online webinar training possibilities
- August 30th – FHWA/TDOT/UTK sponsoring an Automated Traffic Signal Performance Measures (ATSPM) Workshop in Knoxville

TTSUG Outreach Activities – What’s Next?

➤ Statewide Traffic Signal Inventory Database Considerations

- Traffic signal controller database (Start small, spreadsheet, probably initial effort)
- UTK Center for Transportation Research is exploring the possibility of developing an online database to include all types of traffic signal equipment
- Continue peer exchange efforts with PennDOT (similar to TDOT) to understand their lessons learned when they developed their traffic signal inventory database entitled Traffic Signal Asset Management System (TSAMS) (It’s the gold standard)

➤ Online Traffic Signal Peer Exchange Forum Considerations

- Traffic signal maintaining agencies can share and pass along traffic signal information between themselves that could be beneficial to all maintaining agencies
- TDOT hosting a traffic signal peer exchange community forum on their web page
- Interim: Create a Facebook page (possibly closed group) to host an online traffic signal peer exchange community forum for Tennessee (Similar to the Facebook Group Page: Tennessee and Alabama Traffic Signal and ITS Round Table)

TTSUG Outreach Activities – What’s Next?

➤ Face-to-Face Meeting Considerations

- Determine a 2019 face-to-face meeting schedule with local agencies (8 Meetings?)
- Invite other persons to the face-to-face meetings such as local administrators and planners
- Try to think of more ways to get more Small Agency participation in face-to-face meetings (There was a 2:1 ratio of Large Agencies compared to Small Agencies)
- Evaluate the differences of Small Agency vs. Large Agency with MPO/TPO vs. RPO
- Create regional TTSUG Champions that would be able to meet regularly regarding traffic signal issues and concerns
- Joint meeting with the ACEC Annual Meeting in Nashville

➤ Next Steering Committee Meeting is 11/5/18

- Continue to sort through and analyze the feedback from the 2017 TTSUG Survey and the 2018 Face-to-Face Meetings
- Develop 2019 Outreach Activity Plan
- Our focus is on traffic signal maintaining agencies, so maybe rename the group as Tennessee Traffic Signal Maintaining Users Group (TTSMUG)

We've Only Just Begun...



Creating the TTSUG is a start, but continuing to interact and listen to the local traffic signal maintaining agencies is important to the user group progressing and moving forward

Questions?



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