President’s Message
By David Tuttle, P.E.

Welcome ITE New York Upstate Section members to the Spring 2016 edition of The Interchange.

It is an honor to be voted in this year as your ITE Section President. Please do not hesitate to contact me if you have any questions or concerns about your membership in ITE; my contact information can be found on page 2.

My first officer event for ITE was judging the 2015-2016 National Engineers Week Future City Competition, Western New York, in Buffalo, NY on January 23rd, 2016. The annual Future City Competition hosted by the National Engineers Week Foundation reaches over 35,000 students across the nation. Future City is a cross-curricular program that lets students in the 6th, 7th, and 8th grades explore the work of an engineer: identify problems, brainstorm ideas, design solutions, test and retest, build and then share the results.

This year’s theme was Waste Not, Want Not and I was the judge for the Most Innovative Transportation System, (sponsored by NY Upstate Section of ITE). For the grades represented (6th, 7th and 8th) I was amazed by the ideas these students

(Continued on page 4)
The INTERCHANGE

A quarterly publication of the New York Upstate Section of the Institute of Transportation Engineers. Send comments or articles to:

Mark Nadolny - Editor
☎ (518) 446-0396
✉ mnadolny@cmellp.com

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✉ c.doughney@chacompanies.com

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✉ k.revalli@bergmannpc.com

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✉ jyonkoski@co.broome.ny.us

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✉ shellyjohn@cmellp.com

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✉ afroshno@mlnc.com

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✉ jyonkoski@co.broome.ny.us

Syracuse
Alex Kerr
☎ (315) 457-5200
✉ akerr@bartonandloguidice.com

Also find us at: www.itenyupstate.org

2017 Section Treasurer Call for Nominations

For those members seeking greater participation in ITE decisions, policy making and activities, becoming an Officer in the Section is ideal for you. We are currently looking for members interested in being the 2017 Section Treasurer, who will be elected this fall. As we look for geographic diversity in the Executive Board, qualified candidates for this position will come from the Rochester geographic area this year.

If you, or someone you know, is an ITE NY Upstate Section Member from the Rochester Area and are interested in running in the next election, please contact David Tuttle at David_tuttle@pittsfordtrafficandradar.biz for more information.

Welcome New Members

The ITE NY Upstate Section is proud to welcome our newest members. Below is a list of members that have joined the Section since our last publication. We look forward to meeting you at our next event!

H. Randall Warden
Federal Highway Administration

Joseph Paull, II, E.I.T.
Alta Planning and Design

Steve Godlewski, P.E.
Creighton Manning Engineering, LLP

Also find us at: www.itenyupstate.org
The world of transportation is transforming before our eyes. Big advances in technology, generational demographic shifts, and globalization are among the many forces that will transform our profession. This type of change can either be a threat, or it can present great opportunities. To seize the opportunities, ITE must take a leadership role to ensure that our members have the right information, the right connections, and the right opportunities to succeed.

- **Develop a strong ITE brand.** ITE needs to clearly define its space among transportation organizations and then provide decisive leadership where it can be most effective.
- **Leverage technology and social media.** ITE must modernize its approach to service delivery and communication by better utilizing technology, fully embracing online and cloud-based platforms, social media, and mobile technology.
- **Embrace & encourage diversity.** In our changing profession, ITE must position itself as the organization of choice for professionals of all diverse origins and backgrounds.
- **Define ITE’s global role.** A global economy more strongly dominated by Asia and other emerging economies is impacting the transportation industry, even for those that never work outside North America. ITE needs to identify how it can best engage and support transportation professionals globally.
- **Leadership.** In our own organizations, in our profession, and in society, ITE members need to be the technical experts and the advocates leading the conversations and delivering the solutions to the transportation challenges of the 21st century.

ITE is the organization that I have devoted my career to serving for the last 20 years. I have served ITE as an elected leader at the chapter, section, district, and international levels, and I have served on many committees, task forces, and technical councils. I love ITE for what it has done for me professionally and for the many personal relationships I value so much. ITE is at a crossroads and change is needed for ITE to be successful into the future. With your help and collaboration, I look forward to applying my knowledge of ITE, along with my education and experience as a business leader, to effectively lead our Institute through this transformative time.

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**SAVE THE DATE**

**ITE 2016 Annual Meeting and Exhibit**

**Expanding our Horizons**

**Anaheim, California**

**August, 14-17**

[http://ite.org](http://ite.org)

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**2016 Student Scholarship Extension**

Applications for the 2016 Student Scholarship are being accepted! We are also pleased to announce that this year’s scholarship has been increased to $750. Please share the attached application with graduating high school seniors and college students that you know. All applicants need to be sponsored by an ITE NY Upstate Section member. The application deadline has been extended to April 22, 2016!
This Swedish City Figured out a Brilliant way to Reduce Downtown Traffic

From Tech Insider By Drake Baer

If you walk through a certain section of downtown Gothenburg, Sweden’s second-largest city, you won’t find big delivery trucks jamming up traffic like you do in places like New York City.

If you do spy a delivery vehicle, it will be one of two zero-emission cars that are part of the town’s Stadsleveransen (or City Delivery), a system that consolidates deliveries for 400 businesses at a site about a mile from the city center.

The system eliminates noise and emissions, says Gothenburg city logistic project manager Christoffer Widegren.

The Stadsleveransen vehicles “blend into the traffic with pedestrians and bicyclists,” he tells Tech Insider. “They are widely perceived as a nice thing in the street environment rather than an obstacle like normal trucks might be perceived.”

Regular cars are allowed in the area (except for two pedestrian-only streets), but standard delivery trucks are not.

(Continued on page 5)

Speaking of budgets, President Obama signed into law a five-year, $305 billion highway bill on December 4, 2015 called the Fixing America’s Surface Transportation (FAST) Act. The bill requires all design for National Highway System roadways to take into account access for all modes of transportation. The measure is the first long-term national transportation spending package in a decade. It follows a string of temporary patches that began before Obama entered office. A goal for all transportation engineers over the next 5 years is to use some innovation yet follow design requirements to “Fix America’s Surface Transportation” for all modes of transportation.

New York State Senate passed the 2016-2017 $155 billion State budget. The budget included $55 billion in transportation investments statewide. The $55 billion transportation plan is the largest ever to be included in the State. State DOT programs will get $27.14 billion and the MTA will get $27.98 billion. The DOT will use the money to improve highways, bridges, rail and aviation infrastructure, as well as non-MTA transit. It will also launch three new initiatives: BRIDGE NY, PAVE NY and the Extreme Weather Infrastructure Hardening Program.

I would like to mention ITE 2016 International Board of Directors:

- International President—Paula Flores (Benway) - (who spent the majority of her career here in Rochester working at Stantec, and now in Florida with Stantec).
- International Vice President—Shawn J. Leight
- International Past President—John J. Kennedy

For Northeastern District 1, of which New York Upstate Section is a branch, 2016 officers are:

- District Chairperson—Kim Fabend (C&S Companies)
- District Vice Chairperson—Joseph Balskus (CDM Smith)
- District Past Chairperson—Gordon Meth (RBA Group)

I look forward to serving as your president this year and hope to see you at local events or at the annual meeting in Syracuse this fall.
States and Cities Try Smarter Signals to Reduce Red Lights
You’re stuck in traffic, waiting for the signal to turn green. When it finally does, you inch forward, as several cars up ahead of you make it through the intersection. Then the light turns red and you hit the brakes again, only to repeat the process.

Most drivers can relate to this frustrating scenario, whether they’re commuting to work or heading to the mall. Now, a growing number of cities, counties and states are trying to tackle the traffic congestion nightmare by improving the way lights are synchronized.

The Driverless Car Debate: How Safe Are Autonomous Vehicles?
As companies like Google and Delphi Automobile continue to test autonomous vehicles on the road, issues concerning the safety in regard to accidents and vulnerability in the software continue to rise. How safe are autonomous cars?

Swedish Article
(Continued from Page 4)
The Stadsleveransen model is something that has the potential to remake city centers. According to the European Union logistics initiative Smartset, freight accounts for up to 20% of traffic and 50% of greenhouse gas emissions by automobiles in cities.

The program started three years ago as a small pilot, handling goods for eight shops. Now it handles packages for a 90,000 square meter section of the city, or about 10 blocks. The area will expand this year when the program adds a third car. Thus far five traditional delivery trucks have been taken off the road.

Stadsleveransen initially relied on private and public funding while in pilot mode. Now it survives on revenues from transport companies, which use the program as a subcontractor. Revenue from advertising on the vehicles also helps.

Similar programs could make downtowns in other cities more welcoming — especially in places like Gothenburg with medieval, cobble-stoned centers.

"Like many city cores, Gothenburg is competing with malls and shopping centers," Widegren says. "Reducing congestion is an important contribution, but it's also important to make a more attractive and competitive city core. It’s part of an overall approach to strengthen the competitiveness of the city core."

Enlighten lets your car talk to traffic lights
"I hate traffic lights," said Matt Ginsberg, CEO and founder of Connected Signals. So do the rest of us. Which is why Connected Signals created EnLighten, an app for iOS and Android that communicates with a city’s traffic lights to let you know when a stale green light is about to turn yellow, or a red light two blocks ahead will turn green.

Mayors Summit kicks-off year of safety for everyone on our roads
America’s mayors are busy people. They are on the front lines of providing citizens the municipal services they expect from their local government. So when mayors, elected officials, and other local leaders take time away from that duty —as they did yesterday— to attend the Mayors Summit for Safer People and Safer Streets here at DOT’s Washington, DC, headquarters, they’re making a positive choice...and a clear statement.

The city that lets cyclists jump red lights
Cyclists in Paris no longer have to stop at every red traffic light - new rules mean that in certain circumstances they can ignore the signals and keep going. The aim is to make the city's roads much safer.

Tips and Trends in Transportation
Compiled by Martin Bretherton, P.E., FTIE
And Vishal S. Kakkad, P.E., PTOE, MITE

Read Me
### 2016 ITE Northeastern District
#### Annual Meeting
##### May 11 - 13, 2016
#### Portsmouth, New Hampshire

**REGISTRATION FORM**

**Name** (First/Mid/Last)

**Title**

**Pro Suffix (P.E., PTOE, etc.)**

**Nickname for Badge**

<table>
<thead>
<tr>
<th>Agency/Firm</th>
<th>Phone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Address</td>
<td>Gold/Silver Sponsor Representative (1 per sponsor)? [Y/N]</td>
</tr>
<tr>
<td>City/State</td>
<td>Email</td>
</tr>
<tr>
<td>Zip Code</td>
<td>Guest Name</td>
</tr>
</tbody>
</table>

#### Your Registration Covers:

- Full - Admission to Professional Program, Products and Services Exhibit, Welcome Reception, Breakfast (2), Thursday Lunch, Awards Banquet and Networking Reception, Refreshments and Welcome Gift (Gold and Silver Sponsors receive One Free Full Registration - Indicate Above)
- Student - Admission to Professional Program, Products and Services Exhibit, Welcome Reception, Breakfast (2), Thursday Lunch, Awards Banquet and Networking Reception, Refreshments and Welcome Gift
- One Day: Wednesday - Admission to Professional Program (Wednesday), Products and Services Exhibit (Wednesday), Welcome Reception, Refreshments and Welcome Gift
- One Day: Thursday - Admission to Professional Program (Thursday), Products and Services Exhibit (Thursday), Thursday Breakfast, Thursday Lunch, Awards Banquet and Networking Reception, Refreshments and Welcome Gift
- One Day: Friday - Admission to Professional Program (Friday), Friday Breakfast, Refreshments and Welcome Gift

**Tech Only:** Admission to Professional Program, Products and Services Exhibit, Thursday Lunch, Refreshments During Breaks

<table>
<thead>
<tr>
<th>Full Registration</th>
<th>Student Registration - Full</th>
<th>Tech Registration Only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On or Before</strong></td>
<td><strong>After</strong></td>
<td><strong>On or Before</strong></td>
</tr>
<tr>
<td>$275</td>
<td>$300</td>
<td>$125</td>
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<tr>
<td>$75</td>
<td>$100</td>
<td>$100</td>
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<tr>
<td>$150</td>
<td>$175</td>
<td>$175</td>
</tr>
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</table>

**One Day Registration (check day)**

- **Wednesday**: $100 | $125 | $125 | $150
- **Thursday**: $175 | $200 | $200 | $225
- **Friday**: $75 | $100 | $100 | $125

**Thursday Lunch (check one dish)**

- **Chicken**: $10 | **Haddock**: $12
- **Vegetarian**: $12

**Awards Banquet (check one dish)**

- **Beef**: $30
- **Salmon**: $10
- **Vegetarian**: $10

**Schedule of Events**

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Date/Time</th>
<th>Unit Cost</th>
<th>Quantity</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Development Workshop (w/ Lunch)</td>
<td>Wednesday May 11, 2016</td>
<td>9:00 A - 12:00 P; 1:00 P - 4:00 P</td>
<td>$175</td>
<td></td>
</tr>
<tr>
<td>Bike Tour</td>
<td>Thursday May 12, 2016</td>
<td>11:00 A - 1:00 P</td>
<td>$25</td>
<td></td>
</tr>
<tr>
<td>Technical Tour (2 tours - bring Hard Hat, Steel Toe Boots, &amp; Protective Eyewear)</td>
<td>Thursday May 12, 2016</td>
<td>9:00 A - 12:30 P</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Welcome Reception Cruise (included with Full, Student, and Wednesday)</td>
<td>Wednesday May 11, 2016</td>
<td>6:30 P - 9:00 P</td>
<td>$75</td>
<td></td>
</tr>
<tr>
<td>Thursday Lunch (check one dish)</td>
<td>Thursday May 12, 2016</td>
<td>1:00 P - 2:00 P</td>
<td>$30</td>
<td></td>
</tr>
<tr>
<td>Awards Banquet (check one dish)</td>
<td>Thursday May 12, 2016</td>
<td>6:30 P - 8:30 P</td>
<td>$75</td>
<td></td>
</tr>
<tr>
<td>Networking Reception (included with Full, Student, and Thursday)</td>
<td>Thursday May 12, 2016</td>
<td>8:30 P - 10:00 P</td>
<td>$50</td>
<td></td>
</tr>
<tr>
<td>Companion Program (includes shuttle service)</td>
<td>Thursday May 12, 2016</td>
<td>9:00 A</td>
<td>$25</td>
<td></td>
</tr>
<tr>
<td>Annual Northeastern District Golf Tournament (Pro/Am Golf Course)</td>
<td>Wednesday May 11, 2016</td>
<td>9:00 A - 4:30 P</td>
<td>$70</td>
<td></td>
</tr>
</tbody>
</table>

*Specific Golf Registration Form will be Upcoming - If you anticipate playing, please record information here. Space for payment will also be provided on specific form.

**Method of Payment** (credit, cash, or check):

- Online registration: [http://portsmouth2016.neite.org](http://portsmouth2016.neite.org)
- Checks payable to: ITE NE District Meeting
- Send Registration & Payment to:
  - Samuel W. Gregorio, P.E., PTOE
  - TEC, Inc.
  - 65 Glenn Street
  - Lawrence, Massachusetts 01843
  - Phone: (978) 794-1792
  - Fax: (978) 794-1793
  - sgregorio@theengineeringcorp.com

For more information, please contact Meeting Co-Chairman:

- Kevin R. Dandrade, P.E., PTOE (kdandrade@theengineeringcorp.com) - (978) 794-1792
- Jeffrey S. Dirk, P.E., PTOE (jdirk@rdva.com) - (978) 474-8800

Look for Annual Meeting Updates at [http://portsmouth2016.neite.org](http://portsmouth2016.neite.org) or on Twitter: [@ITENEDistrictAM](https://twitter.com/ITENEDistrictAM)

**MEETING ATTIRE:** BUSINESS CASUAL
2016 ITE Northeastern District
Annual Meeting
May 11 - 13, 2016
Portsmouth, New Hampshire

Wednesday May 11, 2016

TIME
7:30 AM
8:00 AM
8:30 AM
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Registration
Professional Development Workshop w/ Lunch [Amphitheater]
Golf Outing [Peter Golf Course]
Exhibit Closed
Exhibit Set up [Ballroom Lobby]

Session 1A [Gardner]
Session 2A [Harbor's Edge Room]
Session 1B [Lear]
Session 2B [Lear]
Session 1C [Wentworth]
Session 2C [Wentworth]
Session 3A [Gardner]
Session 3B [Lear]
Session 3C [Wentworth]
Session 4A [Gardner]
Session 4B [Lear]
Session 4C [Wentworth]
Session 5A [Gardner]
Session 5B [Lear]
Session 5C [Wentworth]
Session 6A [Gardner]
Session 6B [Lear]
Session 6C [Wentworth]
Session 7A [Gardner]
Session 7B [Lear]
Session 7C [Wentworth]

Northeastern District Board Meeting [Harbor's Edge Room]
Welcome Reception [Isles of Shoals Charter Cruise]
NETE Emerging Professionals Group Event

Thursday May 12, 2016

Breakfast [Ballroom]
Session 1A [Gardner]
Session 1B [Lear]
Session 1C [Wentworth]
Technical Tours
Session 2A [Harbor's Edge Room]
Session 3A [Lear]
Session 4A [Wentworth]
Session 5A [Gardner]
Session 6A [Lear]
Session 7A [Gardner]
International Candidate Luncheon [Wentworth]
Break
Day / Walking Tour
Student Poster Session [Outside Harbor's Edge Room]
Awards Banquet [Gardner]
Banquet/Reception Drinks and Dessert [Harbor's Edge Room]
Networking Reception [Ballroom]
Exhibits Open [Ballroom Lobby]

Friday May 13, 2016

Breakfast [Ballroom]
Session 6A [Gardner]
Session 6B [Lear]
Exhibits Open [Ballroom Lobby]
Session 7A [Gardner]
Session 7B [Lear]
Exhibits Take Down [Ballroom Lobby]
Annual Northeastern District Golf Tournament
Wednesday May 11, 2016 | 9:30 AM - 4:30 PM
Hit the links with your colleagues for the Northeastern District Annual Golf Tournament. This year’s tournament will be hosted at Pease Golf Course, the ultimate golf venue on the New Hampshire Seacoast. Come experience 18 of the course’s 27 holes with the Atlantic Ocean breeze helping to keep you in the fairway. $70 cost includes cart, practice balls, lunch and chance at door prizes. A special golf registration flyer will be circulated.

For more information, please contact:
John W. Diaz, P.E., PTOE
Greenman-Pedersen, Inc.
jdiaz@gpinet.com
978-570-2953

Welcome Reception
Wednesday May 11, 2016 | 7:00 PM - 9:00 PM
Boarding Starts at 6:30 PM | Ship Leaves Dock Promptly at 7:00 PM
Join your colleagues aboard the M/V Thomas Laighton as its steams along the Piscataqua River to Portsmouth Harbor for our annual Welcome Reception. The outside and enclosed decks provide attendees with breathtaking views of the New Hampshire and Maine coastlines.

For more information, please contact:
Michelle L. Danila, P.E., PTOE
Toole Design Group
mdanila@tooledesign.com
617-619-9910

Emerging Professionals Group Event
Wednesday May 11, 2016 | 9:00 PM - 11:00 PM
Looking for more fun? Spend a little night on the Town after disembarking from the Welcome Reception and join the Emerging Professionals Group for a social networking event for our young members to interact with their seasoned colleagues.

For more information, please contact:
Michael W. Fenley, P.E.
CDM Smith
fenleymw@cdmsmith.com
617-452-6871

The District Professionals Traffic Bowl
Thursday May 12, 2016 | 4:30 PM - 6:00 PM
Need I say more! Section vs. Section vs. Section!
IT’S ON!

For more information, please contact:
Ken J. Petraglia, P.E., PTOE
BETA Group, Inc.
KPetraglia@BETA-Inc.com
781-255-1982
**District Awards Banquet and Dessert**  
Thursday May 12, 2016 | 6:30 PM - 8:30 PM  
Join your colleagues for our Northeastern District Annual Awards Banquet. Come celebrate the achievements of the many members of the Northeastern District, its Sections, and its several Student Chapters. After dinner, dessert will be served in an adjoining area to allow for set-up of the Networking Reception (Casino Night).

For more information, please contact:  
Samuel W. Gregorio, P.E., PTOE  
TEC, Inc.  
sgregorio@theengineeringcorp.com  
978-794-1792

**Networking Reception - Casino Night**  
Thursday May 12, 2016 | 8:30 PM - 10:00 PM  
LET IT RIDE! Don’t worry, we are not using real money here, but that doesn't mean you still can’t enjoy a roll of the dice or a flip of the cards. Join the Northeastern District for its annual Networking Reception.

For more information, please contact:  
Michelle L. Danila, P.E., PTOE  
Toole Design Group  
mdanila@tooledesign.com  
617-619-9910

**Vendor Exhibits**  
Wednesday May 11, 2016 - 1:00 PM to Friday May 13, 2016 - 11:00 AM  
Learn from manufacturers, installers, and product developers as the exhibit hall will be buzzing with new technologies and products from both local and national vendors and suppliers. As always, the vendor exhibit showcase will run concurrently with many of the meetings events, so you will have plenty of opportunities to visit vendor booths.

For more information, please contact:  
Gary Maccarone  
Ocean State Signal Co.  
gmaccarone@oceanstatesignal.com  
401-231-6780
2016 STUDENT SCHOLARSHIP

The New York Upstate Section of the Institute of Transportation Engineers (ITE) seeks to encourage students to consider Transportation Engineering/Planning in their studies and career aspirations and to provide partial financial support for tuition and fees to students who have demonstrated an interest in and are likely to work in the transportation field. The Section will award one (1) scholarship in the amount of $750 to be applied to educational expenses during the 2016-2017 academic year.

Eligibility

As a member benefit of the ITE NY Upstate Section, an eligible applicant must be sponsored by a current Upstate Section member in good standing. At the start of the 2016-2017 academic year an applicant must be either a full-time undergraduate or graduate student in an ABET accredited College or University, ideally with a career goal emphasis on Transportation Engineering and/or Planning. Graduating high school seniors that meet these criteria may apply. Note that the same individual cannot win this award in two consecutive years. While eligibility is not restricted to Transportation Engineering/Planning students, preference will be made to candidates in those or related disciplines.

Selection Criteria

Sponsored candidates will be evaluated primarily on the basis of a personal essay. Such essays are expected to be of high quality with grammar, spelling and thoroughness of research all considered in the evaluation process. References must be also cited as appropriate.

Essay Topic (500 words or less)

A Connected Transportation System. We hear more and more these days about the future of integrating technology into our transportation system through the use of connected and autonomous vehicles. Vehicle technology is there, but the programming of infrastructure and management of such systems is behind. The U.S. Department of Transportation (DOT) has initiated the Smart City Challenge, a nationwide competition to provide federal funding ($40 million) to one medium-sized city to use towards making their city “smarter”; various agencies in Upstate New York have submitted applications. Present examples of how intelligent transportation systems (ITS) and connected & autonomous vehicles could make the transportation in the community you live in safer and more efficient. Also describe the challenges in implementing such systems.

How to Apply

To apply for an ITE New York Upstate Section 2016 Student Scholarship Award, a candidate must complete the attached application form and return it with the completed essay to the address indicated below prior to April 22, 2016. Award notifications will be made on or about May 6, 2016. The scholarship check will be presented to the award recipient prior to the start of the 2016-2017 school year.

Return to: Christina Doughney, P.E., PTOE
Vice President, ITE NY Upstate Section
c/o CHA, Inc.
3 Winners Circle
Albany, NY 12205

Electronic submissions are encouraged and may be e-mailed to: cdoughney@chacompanies.com
Institute of Transportation Engineers  
New York Upstate Section  

2016 STUDENT SCHOLARSHIP APPLICATION

Instructions: Complete all four (4) parts and sign below

1. Check one:
   - □ Graduating High School Senior accepted at an ABET accredited College.
   - □ Returning Undergraduate or Graduate Student at an ABET accredited College.

2. Check one:
   - □ Current ITE NY Upstate Section member.
   - □ Child of a current ITE NY Upstate Section member.
   - □ Sponsored by an ITE NY Upstate Section Member *(1 sponsorship per member).*

3. Complete Sponsor Information:
   - ITE NY Upstate Section Member’s Name: _____________________________
   - ITE Member Number: _______________

4. Applicant Information:
   - Name: _____________________________
   - Address: _____________________________
   - Phone Number: _____________________________  Age: _____________________________
   - College Attending (2016-2017 school year):
   - Anticipated Year of College Graduation:
   - Degree/Major:

   By signing below, I confirm that I meet the eligibility requirements and that I have completed the attached essay on my own and without the assistance of another party.

   Signature: _____________________________  Date: _____________________________

Submission Deadline: April 22, 2016

Return Completed Form AND Personal Essay to:

Christina Doughney, P.E., PTOE  
Vice President, ITE NY Upstate Section  
c/o CHA, Inc.  
3 Winners Circle  
Albany, NY 12205

Electronic submissions are encouraged and may be e-mailed to: cdoughney@chacompanies.com

The Trip Generation Manual is one of the primary resources of the Institution of Transportation Engineers (ITE), and arguably what ITE is best known for outside of the Transportation Engineering community. As a living evolving document, it is a masterpiece – The 9th Edition of the Trip Generation Manual includes 26,621 trip generation samples covering 173 land uses and 358 variables. This information was gathered by volunteers and complied and reviewed by a combination of volunteers and staff, all for the betterment of our industry and the public.

Yet for as great a tool the Trip Generation Manual is, it has its limitations, which every practitioner should recognize and address during their work efforts. There has been a tendency, particularly for retail land uses, to add new categories based on very limited data. Table 1 contains a summary of the number of samples for each land-use-variable combination, by time period. As shown, about 20% of all land-use-variable combinations have only 1 sample. A sample size of 20 is considered a good sample in ITE guidance documents. Approximately 20% of weekday peak hour and less than 10% of Saturday peak hour land-use-variable combinations have 20 or more samples. Only 3% of weekday peak hour land-use-variable combinations have 100 or more samples.

**Table 1 – Land Use-Variable Combination Sample Sizes by Time Period**

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Weekday Adjacent Street (7-9) AM Peak</th>
<th>Weekday Adjacent Street (4-6) PM Peak</th>
<th>Saturday Peak Hour Generator</th>
<th>Weekday (24 hour)</th>
<th>Saturday (24 hour)</th>
<th>Sunday (24 hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>62</td>
<td>66</td>
<td>42</td>
<td>52</td>
<td>43</td>
<td>38</td>
</tr>
<tr>
<td>2-4</td>
<td>59</td>
<td>77</td>
<td>81</td>
<td>70</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>5-9</td>
<td>49</td>
<td>55</td>
<td>48</td>
<td>42</td>
<td>39</td>
<td>34</td>
</tr>
<tr>
<td>10-19</td>
<td>48</td>
<td>53</td>
<td>36</td>
<td>59</td>
<td>38</td>
<td>40</td>
</tr>
<tr>
<td>20-49</td>
<td>43</td>
<td>45</td>
<td>14</td>
<td>25</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>50-99</td>
<td>12</td>
<td>15</td>
<td>2</td>
<td>12</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>100+</td>
<td>7</td>
<td>9</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>280</td>
<td>320</td>
<td>224</td>
<td>265</td>
<td>208</td>
<td>196</td>
</tr>
</tbody>
</table>

Statistical validity of the data in the ITE Trip Generation Manual is a whole separate issue. The correlation coefficient ($R^2$) is a measure of the statistical fit of data to a mathematical model. The guidance provided in the ITE Trip Generation Handbook is that mathematical models, which are either linear or logarithmic, should be used when the number of samples exceeds 20 and $R^2$ exceeds 0.75 (which roughly means that 75% of the variation of data can be explained by the variable used). The guidance goes on to state that an average rate should be used otherwise. One interesting question to ask is that if a good statistical fit isn’t found for the combination of the data and variable, should the data be used in the first place. It is noteworthy that even an average rate per variable is simply a mathematical model with a linear form and a 0 intercept. Therefore, why is it OK to use an average rate
when the data doesn’t seem to fit the variable? Table 2 summarizes the correlation coefficients of land use-variable combinations with 20 or more samples. As shown, only 30-40% of samples meet the statistical fit recommended by ITE. That means that less than 10% of total land use-variable combinations satisfy the guidance within ITE to be suitably statistically robust.

Table 2 – Statistical fits for Land Use-Variable Combinations with 20 or More Samples

<table>
<thead>
<tr>
<th>R²</th>
<th>Weekday Adjacent Street (7-9) AM Peak</th>
<th>Weekday Adjacent Street (4-6) PM Peak</th>
<th>Saturday Peak Hour Generator</th>
</tr>
</thead>
<tbody>
<tr>
<td>****</td>
<td>26</td>
<td>30</td>
<td>11</td>
</tr>
<tr>
<td>&lt;055</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>0.55-0.74</td>
<td>11</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>075-0.84</td>
<td>10</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>0.85+</td>
<td>14</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>69</td>
<td>17</td>
</tr>
</tbody>
</table>

One variable that has a particularly poor statistical fit is acreage. Over 20% of land uses in the ITE Trip Generation Manual have the variable acreage, and acres comprise over 10% of the 358 land use-variable combinations within said manual. While having the variable acreage may be useful for order of magnitude trip generation estimates from areas with potential growth, its predictive abilities on specific trip generation are questionable.

To its credit, the ITE Trip Generation Manual does not purport to be anything other than an accumulation of data samples and equations. The ITE Trip Generation Handbook further warns practitioners of the importance of understanding where data is limited, and of the need to collect local data to supplement data in the manual.

Knowing this, it is incumbent on practitioners to thoroughly review and understand the data adequacy and fit for trip generation before using it for studies. It is necessary to review trip generation from every angle, and make the best judgement, given all the facts. Where equations are used, there are ranges where the results become unrealistic for extremely small or extremely large sites. In these instances, the practitioner may need to not use the equation. Where trip generation can be calculated a number of ways, the practitioner should look at the full range of results and make an appropriately conservative determination of which to use. One should always compare the size of what they are looking at versus the data from the ITE Trip Generation Manual.

Where statistical fits of data are not appropriate, it is possible to look to a subset of data based on size of site, region, or age of data in order to determine if an improved predictive ability is possible. The web-based program OTISS ([www.otisstraffic.com](http://www.otisstraffic.com)) provides the ability to filter the ITE dataset and produce equations based on a portion of the data.
There are many means of gathering more information than is contained within the ITE Trip Generation Manual. Seeking additional articles by practitioners can be helpful, especially if data in the ITE Trip Generation Manual is limited. The ITE digital library affords the opportunity to review articles regarding a specific land use quite well. Customer counts or transaction histories from similar stores are sometimes readily available from applicants as well, and this can often provide information for more than just one day. Where possible, actual trip generation rates of similar sites should be considered. By leveraging video technology, the cost of collecting data can be dramatically reduced. For instance, we recently collected traffic counts at 3 Dunkin Donut stores with two driveways each from 7-9 am and 4-6 pm using video technology set for Automatic Traffic Recorder counting, which could be reported minute by minute after the fact. With one visit to the sites during each peak, we were able to determine parking occupancy for the entire peak, as well as trip generation, all for a data collection cost of less than $700. Adding this step to traffic impact studies when trip generation data is questionable would only marginally increase costs.

By means of example of the need to review all possible options available, consider the case of land use that is being constructed throughout the region, the Super Convenience Market/Gas Station. These stores tend to be between 5,000-6,000 square feet, and have 12-20 fueling positions. An article by Jina Mahmoudi regarding this land use was in the ITE Journal in June, 2012. Table 3 below contains a summary of trip generation for various Convenience Mart alternatives. As shown, the most likely ITE land use produces less traffic in the morning than a stand-alone convenience store without gas. This makes no intuitive sense whatsoever. In the case of a Super Convenience Mart/Gas Station, both uses can be described as primary. Consequently, a reasonable estimate of trip generation (which is similar to observed trip generation) can be obtained by determining trip generation for a 24 hour convenience store and 16 fueling position gas station separately, and assuming an internal capture of about 15% between the two uses (which was found in a recent traffic study at one site). The land use category of Gasoline Station with Convenience Mart also seems to reasonably match the data. However, said land use usually has a convenience store component of only 400-2,800 square feet, and is consequently easily dismissed as not being relevant.

**Table 3 - Square footage of Convenience Store Comparisons of Trip Generation**

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>Convenience Store Size</th>
<th>Morning Peak Hour</th>
<th>Evening Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU 853 - Convenience Mart with Gas</td>
<td>5,500 sf</td>
<td>225</td>
<td>280</td>
</tr>
<tr>
<td>LU 851 - Convenience Mart (Open 24 Hours), no Gas</td>
<td>5,500 sf</td>
<td>369</td>
<td>288</td>
</tr>
<tr>
<td>LU 945 - Gasoline/Service Station with Convenience Mart</td>
<td>5,500 sf</td>
<td>452</td>
<td>536</td>
</tr>
<tr>
<td>New Jersey sites from June, 2012 Article</td>
<td>4,980 sf</td>
<td>634</td>
<td>538</td>
</tr>
<tr>
<td>9 Recent Samples in New Jersey</td>
<td>5,506 sf</td>
<td>567</td>
<td>425</td>
</tr>
<tr>
<td>Convenience Mart (Open 24 Hours) + 16 fueling position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas Station, 15% internal capture</td>
<td>5,500 sf</td>
<td>479</td>
<td>434</td>
</tr>
</tbody>
</table>

For a second example, consider the case of someone proposing to add a drive-through window to an existing Dunkin Donuts store. Table 4 contains a summary of trip generation rates for various land use
categories involving Coffee/Donut Stores and Drive-Through Windows, as well as some actual data samples from New Jersey and an article from the ITE Journal in June, 2011. For the morning peak hour, it would appear that adding a Drive-Through Window to an existing store would drop the number of trips slightly – a conclusion that makes no intuitive sense. However, if indoor seating is removed as well as adding a drive-through window would nearly triple trips. This also makes little intuitive sense. The real samples show that samples in New Jersey align closely with the average rate from ITE, but that rates in the Rochester area are far lower.

**Table 4 – Trip Generation Rates for Coffee/Donut Shops**

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>Trip Rate Basis</th>
<th>Morning Peak Hour</th>
<th>Evening Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU 936 - Coffee/Donut Shop without Drive-Through Window</td>
<td>per 1,000 ft</td>
<td>108.38</td>
<td>40.75</td>
</tr>
<tr>
<td>LU 937 - Coffee/Donut Shop with Drive-Through Window</td>
<td>per 1,000 ft</td>
<td>100.58</td>
<td>42.80</td>
</tr>
<tr>
<td>LU 938 - Coffee/Donut Shop with Drive-Through Window and No Indoor Seating</td>
<td>per 1,000 ft</td>
<td>303.33</td>
<td>75.00</td>
</tr>
<tr>
<td>4 samples from New Jersey Sites - no drive-thru</td>
<td>per 1,000 ft</td>
<td>99.53</td>
<td>32.54</td>
</tr>
<tr>
<td>1 sample from Rochester Area - no drive-thru (from June, 2011 ITE Article)</td>
<td>per 1,000 ft</td>
<td>38.76</td>
<td>not avail</td>
</tr>
<tr>
<td>12 Samples from Rochester Area - with drive-thru (from June, 2011 ITE Article)</td>
<td>per 1,000 ft</td>
<td>49.04</td>
<td>not avail</td>
</tr>
</tbody>
</table>

It is noteworthy that the article concluded that store size provided among the lowest statistical fit of all potential variables. Therefore, it may be more useful to look at raw trip generation regardless of size of facility. The relevant numbers are shown in Table 5. It is also necessary to recognize the wide range of data in the samples. Using the data below, one could conclude that adding a drive-through window would add 30-41 trips per hour during the morning peak hour. However, it would also be useful to measure some New Jersey samples, so that it can be compared to the 4 samples shown from said state.

**Table 5 – Trip Generation Totals for Coffee/Donut Shops**

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>Store Size</th>
<th>Morning Peak Hour</th>
<th>Evening Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU 936 - Coffee/Donut Shop without Drive-Through Window</td>
<td>2,000 sf</td>
<td>217</td>
<td>81</td>
</tr>
<tr>
<td>LU 937 - Coffee/Donut Shop with Drive-Through Window</td>
<td>2,000 sf</td>
<td>201</td>
<td>86</td>
</tr>
<tr>
<td>LU 938 - Coffee/Donut Shop with Drive-Through Window and No Indoor Seating</td>
<td>100 sf</td>
<td>30</td>
<td>8</td>
</tr>
<tr>
<td>4 samples from New Jersey Sites - no drive-thru</td>
<td>2,140 sf</td>
<td>213</td>
<td>68</td>
</tr>
<tr>
<td>1 sample from Rochester Area - no drive-thru (from June, 2011 ITE Article)</td>
<td>2,090 sf</td>
<td>81</td>
<td>not avail</td>
</tr>
<tr>
<td>12 Samples from Rochester Area - with drive-thru (from June, 2011 ITE Article)</td>
<td>2,488 sf</td>
<td>122</td>
<td>not avail</td>
</tr>
</tbody>
</table>

One way that practitioners can help make the ITE Trip Generation Manual better would be to submit data to ITE. OTISS allows one to submit trip generation samples to ITE within about 10-15 minutes, even if one is not a paid subscriber. In researching for this article, I personally submitted 169 data points from 28 sites on land uses that included convenience markets with gasoline, day care centers, ice skating rinks, cemeteries, car washes, private schools, and coffee shops. Some of these land uses only had 1-2 data points for peak hours, meaning that these submissions have the potential to substantially improve how robust future ITE Trip Generation Manuals will be. If only 150 additional practitioners (remember that there are about 700 members in the Met-Section and about 15,000 ITE members worldwide) could provide a similar amount of data, the data samples used in the ITE Trip Generation Manual, which took over 40 years to could compile, would be doubled!