Evaluation of Average Effective Vehicle Length in Queue: A Report from the ITE New England Section Technical Committee

We Need to Throw Away Our “Throw Away” Culture
Submitted by: Leon Goodman, P.E., PTOE

What’s Next for ITE?
Submitted by: Jason M. DeGray, P.E., PTOE
Dear NEITE Members:

With the start of the 2014, I would like to inform you of the New England Section goals and upcoming events. First, I would like to thank Immediate Past President Joe F. Segale, P.E., PTOE for making 2013 a memorable year with two important and successful meetings – the Section hosted the District Meeting in Northampton, Massachusetts, and assisted with the ITE International Annual Meeting and Exhibit in Boston, Massachusetts. Thanks Joe! I would also like to thank Roger J. Dickinson, P.E., PTOE who has served on the Section’s Executive Board for several years; including service as Section Treasurer, Chair of the Public Relations Committee, and Chair the Membership Committee. Although Roger has stepped down from the Executive Board, we hope he will continue to be involved in the Section!

Executive Board Minutes

The first New England Section Board Meeting was held on January 22nd at Sugarbush Ski Resort in Warren, Vermont as a joint meeting with the Vermont ITE Chapter. In addition to the Board Meeting, the event including discounted skiing, technical sections on Vermont’s Highway Safety Alliance and the redesign of the Quechee Covered Bridge damaged by Tropical Storm Irene. The evening concluded with a social networking event. Thanks to the Vermont Chapter for hosting us!

The Board Meeting included a discussion of the 2014 Section goals, budget, and schedule. The Section goals for 2014, include updating the Strategic Plan, encouraging new participation and membership involvement, streamlining membership outreach, and continuing to produce excellent editions of the New England Chronicle. The Section has a Strategic Plan that was last updated in 2007. This year, the Section will assign an eight member committee to update this Strategic Plan, chaired by Joseph C. Balskus, P.E., PTOE. If you are interested in being involved, please let me know.

As the Section increases new participation and membership involvement, we have several new Executive Board members and Committee Chairs. I would like to welcome Jason M. DeGray, P.E., PTOE and Samuel W. Gregorio, E.I.T. - both from Massachusetts - to the Executive Board as the 2014 Junior Directors. In addition, I would like to welcome the following new committee chairs:

- Jason M. DeGray, P.E., PTOE - GPI - Continuing Education Chair
- Fayssal J. Hussein, P.E., PTOE - Nitsch Engineering - Desjardins Scholarship Chair
- Michael W. Fenley, E.I.T. - CDM Smith - Emerging Professionals Co-Chair
- Alex Lovejoy, E.I.T. - MBTA - Emerging Professionals Co-Chair
- Kevin W. Johnson, P.E. - CDM Smith - Program Committee Chair
- Thomas A. Errico, P.E. - TY Lin - Technical Committee Co-Chair
- Steven C. Fidlen, P.E. - McMahon Associates - Technical Committee Co-Chair
- Ian A. McKinnon, E.I.T. - BETA Group - Webmaster

In addition, I would like to thank all the previous committee chairs for all that they have done for the New England Section!

Upcoming Events

There are some great NEITE events coming up in the following months. The University of Massachusetts Amherst Student Chapter will be holding their annual Technical Day on March 27th in Amherst, MA. The New England Section and Connecticut Chapter will be hosting a joint meeting which will include the second Section Board Meeting and the annual Student Symposium on April 2nd at the University of Connecticut. Lastly, the Northeastern District Annual Meeting will be held on May 21st through 23rd on the Jersey Shore in New Jersey. Keep a look out for these event flyers!

In closing, I would like to thank in advance Joseph F. Segale, P.E., PTOE, Immediate Past President, and Joseph Hallisey, P.E., Vice-President, for their assistance this year as they will be handling the Section while I am on maternity leave this spring. I look forward to working with everyone this year and keeping with the mission while moving the Section forward! If you have any questions or suggestions, please contact me at (617) 619.9910 or at mdanila@tooledesign.com.

Sincerely,
Michelle Danila, P.E., PTOE
New England Section President
New England Section Directory

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http://www.ite.org

ITE Northeastern District:
http://www.northeasternite.org

ITE New England Section:
http://www.neite.org

ITE Upstate New York Section:
http://www.itenyupstate.org

ITE New York Metro Section:
http://ite-metsection.org

Young Professionals in Transportation - Boston Chapter
http://www.yptboston.org/

Boston Society of Civil Engineers:
http://www.bsces.org

American Society of Civil Engineers:
http://www.asce.org

ASCE New Hampshire Chapter:
http://www.aschenh.org

ASCE Vermont Chapter:
http://sections.asce.org/vermont

ASCE Maine Chapter:
http://www.maineasce.org/maine

ASCE Connecticut Chapter:
http://www.csce.org

ASCE Rhode Island Chapter:
http://riasce.org

Urban Land Institute:
http://www.uli.org

MA Association of Consultant Planners:
http://www.maconline.org

The American Planning Association Northern New England Chapter:
http://www.mnepa.org

APA Massachusetts Chapter:
http://www.massapa.org

APA Connecticut Chapter:
http://www.ccapa.org

APA Rhode Island Chapter:
http://www.rhodeislandapa.org

On the Cover: View of the Burns Bridge (Route 9) construction over Lake Quinsigamond between Worcester and Shrewsbury, Massachusetts. Photo Source: Jeffrey C. Seymour, E.I.T. of the Middlesex Corporation.

Wow! It’s Already 2014

Now that most of us are dug out from the latest snow storm, I am happy to report that the New England Chronicle was successful in meeting its goal to release four issues during the 2013 calendar year. The upcoming 2014 will be no different. The ultimate goal of the New England Chronicle is to convey a sense of community in our six New England states. Hopefully, the newsletter can operate as an interface between the Section’s 600+ members; shining a light on not only Section and Chapter activities, but the projects, challenges, and solutions that we face and tackle everyday.

New/Old Faces in New Section Places

With the turn of the calendar, the New England Section has had many members volunteer to slide-into many of the Section’s open Committee Chair roles. This includes two new members to the Section’s Executive Board. To help the Section membership visualize these volunteers, the Chronicle has highlighted all new Committee Chairs and the 2014 Executive Board on page 9.

Articles

As tradition, when the New England Section Technical Committee releases a technical report, the Chronicle will highlight it. A special thanks go out to Michael Wasielewski, P.E., PTOE and his team on their report entitled, “An Evaluation of Average Effective Vehicle Length in Queue.” The report took many months and a large amount of data to prepare.

In this quarterly issue, we also feature two additional articles written by former ITE International President Leon Goodman, P.E., PTOE and current New England Section Junior Director Jason M. DeGray, P.E., PTOE. The article focuses on two challenges that the transportation community and ITE is currently facing; including: the utilization of existing abandoned right-of-way and the future direction of ITE.

A special thanks to Ahmed Halawani, a graduate student at Northeastern University, who’s research is the focus of this issue’s Student Research Spotlight. He presents a case study from Roxbury Crossing in Boston, MA entitled, “Signal Priority for Left-Turning Buses Including Phase Re-service.”

Contributions to the Section

As I have stated in previously issues, I would also like to take this opportunity to welcome all within the New England Section to contribute their experiences, opportunities, challenges, and innovative strategies to the New England Chronicle; to share knowledge within the many aspects of transportation engineering and planning.

I would again like to thank all contributors to the first issue of 2014. Behind the scenes, it takes many people across the Section’s membership to put together the award winner newsletter publication of your New England Section. I hope you enjoy the first issue of 2014. Behind the scenes, it takes many people across the Section’s membership to put together the award winner newsletter publication of your New England Section. I hope you enjoy the first issue of 2014.

Please remember to visit the New England Section website at http://www.neite.org and our updated Section Directory for information on the New England Section.

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Evaluation of Average Effective Vehicle Length in Queue

ITE NEW ENGLAND SECTION TECHNICAL COMMITTEE
Chairman: Michael W. Wasielewski, P.E.

Problem Statement
Intersection analysis summaries generally include three measures of effectiveness (MOE’s), including average delay, volume-to-capacity ratio and queue lengths per lane. The latter value, queue length, is essential to the design of storage lengths for each lane. This calculation, if overstated, often leads to overdesign resulting in unnecessary construction to provide the storage, and in turn significant cost implications.

Several methodologies are available to estimate queue length, both manual and electronic. Most common are: 95th percentile queue, or “maximum queue”; and 50th percentile queue, or “average queue”. In either case, the calculation requires two steps, either directly or indirectly. First is the estimate of the number of vehicles in the queue. Second is the assignment of an average effective length per passenger car equivalent (pce). In years past, the assumption of 20 feet per vehicle was a standard, 25 feet per vehicle has become more accepted. The focus of this project, conducted by the New England Section of the Institute of Transportation Engineers (NEITE) Technical Committee, will be to identify an appropriate assumption for the average effective length of a passenger car equivalent in queue.

Methodology
The NEITE Technical Committee conducted observations to identify intersections that exhibited the following characteristics:

- Under traffic signal control;
- Lane(s) with queues of ten or more vehicles per signal cycle;
- Exclusive left turn lanes, if the left turn volume is heavy; and
- Locations in urban and suburban communities

Eight intersections, four in urban and four in suburban locations, were selected for this project. In addition, all intersections consisted of four approaches. Aerial photos of the intersections are provided in the appendix of this report. The intersections include:

Urban Locations
- Commonwealth Avenue at Babcock Street, Boston, MA
- Massachusetts Avenue at Boylston Street, Boston, MA
- Massachusetts Avenue at Beacon Street, Boston, MA
- Boylston Street at Bowker Overpass, Boston, MA

Suburban Locations
- University Drive at Amity Street, Amherst, MA
- Fellsway East at Pond Street and West Wyoming Avenue, Stoneham, MA
- Main Street at Spring Street, Medfield, MA
- Salem Street at Maplewood Street and Lebanon Street, Malden, MA

Observers pre-marked distances from the STOP line with chalk, and for each cycle counted the number of vehicles in a queue while measuring the distance from the STOP line. The number of feet divided by the number of queued vehicles yielded the average storage length per vehicle for that cycle.

A Queue was discarded if a bus or heavy vehicle was present within the first 8 vehicles of the queue during a signal cycle.

Two observers were assigned to each intersection, with each responsible for two approaches. During a one-hour period each observer alternated fifteen minute periods between their two approaches.

Analysis
Upon review of field sheets for accuracy, a common anomaly was noted. On several cycles it was noted that vehicles did not queue as expected. Examples are shown below in Table 1.

| A vehicle would leave a space between the automobile in front equal to a car length for no apparent reason. |
| A vehicle would leave a space between the automobile in front equal to a car length to avoid blocking a driveway. |
| The lead vehicle in the queue would pull up significantly beyond the STOP line. |
| The lead vehicle in the queue would pull up significantly short of the STOP line. |

Table 1: Examples of Vehicles Unexpected Queues

Continued on Page 6
In these cases a measurement from the STOP line to the end of the queue may not accurately describe the storage length required for the number of vehicles counted. One thought would be to treat a space between vehicles as if it were occupied by another vehicle. Alternately, it could be assumed that these “anomalies” are actually commonplace and no adjustment would be necessary. It is also possible that, when considering all of the data, these anomalies will result in no significant difference. Unfortunately, these anomalies were noted after a review of collected data, and were not documented in sufficient detail to analyze with any significance. Inclusion of this factor might be considered in a follow-up study.

Data will be stratified by each individual intersection, for Urban vs. Suburban locations, and for all eight intersections. Tables containing the raw collected data are included in Appendix A of the report.

Data

Urban Locations

Commonwealth Avenue at Babcock Street, Boston, MA
The data showed (seen in Report Figure 1) that the average queue length per vehicle is approximately 26 feet for vehicles traveling eastbound on Commonwealth Avenue, and 25 feet for vehicles traveling westbound.

Massachusetts Avenue at Boylston Street, Boston, MA
The data indicates (seen in Report Figure 2) that vehicles approaching on Massachusetts Avenue northbound and southbound are each averaging approximately 22 feet per vehicle. Boylston Street eastbound traffic is approximately 23 feet per vehicle, while westbound is at approximately 19 feet per vehicle.

Massachusetts Avenue at Beacon Street, Boston, MA
The data shows (seen in Report Figure 3) that the average effective length per vehicle for traffic on Massachusetts Avenue is approximately 23 feet northbound and just under 21.5 feet southbound. Beacon Street westbound traffic averages approximately 21.5 feet per vehicle.

Boylston Street at Bowker Overpass, Boston, MA
The data indicates (seen in Report Figure 4) that the average effective length per vehicle is approximately 22 feet, 23 feet and 22 feet for vehicles approaching on Bowker Overpass southbound, Boylston Street eastbound, and Boylston Street westbound, respectively.

Suburban Locations

University Drive at Amity Street, Amherst, MA
The data indicates (seen in Report Figure 5) that traffic on each of the four approaches average between 23.5 feet and 25.2 feet per vehicle.

Fellsway East at Pond Street and West Wyoming Avenue, Stoneham, MA
The data shows (seen in Report Figure 6) that the average queue length per vehicle ranges between approximately 23.5 feet and 25.5 feet for each approach.

Main Street (Route 109) at Spring Street, Medfield, MA
The data indicates (seen in Report Figure 7) that the average effective vehicle length on Spring Street southbound is approximately 22 feet. The remaining three approaches range from 23.5 feet to 25.2 feet per vehicle.

Salem Street at Maplewood Street and Lebanon Street, Malden, MA
The data shows (seen in Report Figure 8) that average effective vehicle length for approaching traffic on the Maplewood Street northbound approach and the Salem Street westbound approach are approximately 20.2 feet and 20.1 feet, respectively. The Lebanon Street southbound and the Salem Street eastbound approaches are approximately 25 feet per vehicle.

Aggregated Data

Report Figure 9, as seen to the left, presents the average effective vehicle lengths aggregated for all urban locations, all suburban locations, and all studied locations. The average effective vehicle length at urban locations is approximately 22.5 feet. At suburban locations, the average effective vehicle length is 24 feet. The average effective vehicle length for all locations studied is 23.2 feet.

Conclusions

The data indicate that the average effective length of a vehicle in queue is slightly shorter at urban locations than at suburban locations, but the difference is negligible. The 23.2 foot average effective vehicle length calculated for all studied intersections indicates that the assumption of 25 feet per passenger vehicle equivalent used in queue calculations is valid.

The full report with Appendices and figures can be found on the New England Section website at:
Continuing Education Opportunities in NEITE

As always, the Continuing Education Committee needs your feedback and fresh ideas for training opportunities that are innovative and that would draw significant interest to the Section membership. Most importantly, training opportunities that would serve you, the New England Section membership in the upcoming meetings and gatherings.

If you have ideas for training sessions that would benefit the membership the most and have a high interest level, whether a half-day or full-day or training, please contact:

Jason M. DeGray, P.E., PTOE
jdegray@gpinet.com

Membership Update

Committee Chair: Rebecca L. Brown, P.E., PTOE

Good news! We received a new membership contact list today that shows our section membership is up from 599 members in May 2013 to 626 members at the end of December 2013. It has been our goal to increase our membership and get people to update their contact information regularly with International so that correspondence and voting ballots are properly distributed to our membership.

Northeastern District Executive Committee

The Northeastern District Executive Committee is pleased to announce that Kimberly M. Fabend, PE, PTOE of the NY Upstate Section has been elected the incoming 2014 District Secretary / Treasurer. Kim will take office at our January Executive Committee Meeting. We look forward to Kim’s participation on the board and know she will contribute greatly to the continued success of our organization. Please join me in congratulating Kim on this new position.

Kimberly M. Fabend, P.E., PTOE
Senior Project Engineer/Planner
C&S Companies
Syracuse, New York

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- The cost of a one year business card size advertisement in the New England Chronicle’s Professional Services Directory is $100 per year, payable to the New England Section of ITE.
- Business Card Size Advertisements should preferably be in PDF format.
- NOTE: NEITE Tax ID: 52-1326217

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27 Thurber Blvd Smithfield, RI 02917

Send Business Card Sized Ad to: Samuel W. Gregorio, E.I.T. Chronicle Editor
sgregorio@theengineeringcorp.com

Applications for the future June 1 to 30, 2014 computer-based exams of Professional Traffic Operations Engineer (PTOE) and Professional Transportation Planner (PTP) are due April 17, 2014.

Please note that applications received after the deadline will require an additional $75 late fee to process the application in addition to the application and examination fee that must accompany the application. TPCB will try to accommodate late applications but there is no guarantee they will be able to do so.

For a list of available exam cities, please visit: http://castleworldwide.com/mainsite/ibtsites/default.aspx
ITE has some soul searching to do. For right or wrong amongst a steadily growing number of policy makers, advocates and general citizens the transportation engineer has become a lightning rod for criticism in a broader culture war. Is this scrutiny warranted? Toward the individual no, but toward the Institute the answer is more complex and our next generation hangs in the balance.

What makes this moment in our history unique is that for the first time since our inception the Institute must contemplate its role in a world of declining automobile dependence. After decades of steady growth, studies have shown that vehicle miles traveled per capita peaked in 2004. This fact however is only the outward manifestation of deeper sentiments which have evolved over the course of the suburban experiment. During the past 60 years of relatively unchecked suburban growth congestion has increasingly played a greater role in people’s daily lives, compounding the stress of the commute and time away from home. Fueled by pressure to ease these concerns, infrastructure projects classically have focused on increasing capacity. In hindsight we now understand the consequences of our attempts to build our way out of congestion on the human scale environment. Today perpetual gridlock, over-built byways and drive-till-you-qualify commutes have contributed to a shift in societal behaviors and increased demands for the realization of sustainable transportation options.

Maybe even more daunting though, and still sensitive to discuss, is the fundamental unsustainability of the boundless suburban growth that the recent mortgage crisis personified. In the decades to come our society will need to come to terms with the implications of this reality. There is simply not enough tax revenue to support the maintenance of the public infrastructure needed to preserve the totality of our suburbs long into the future. Today too many of our communities rely on outward growth as a means to generate additional tax revenue to address existing infrastructure needs. This of course creates more infrastructure which requires maintenance. Ponzi scheme comparisons are not without merit. With the implosion of real estate prices it has become impossible to perpetuate this cycle any longer and as a result critical infrastructure needs are going unmet. The future of our communities is poised to be measured by winners and losers. As some fall into deeper states of disrepair residents with means will leave for greener pastures and those remaining will experience further decline marked by increased poverty rates and blight of the built environment.

Our profession, as much as nearly any other, facilitated the suburban explosion this country experienced over the better part of the past century. The Institute is clearly branded by this fact and as its members our collective reputations are entwined in it. This statement is not intended to be an indictment of our industry, but rather recognition of the public relations issue at hand. Consider these facts:

• The rate of suburban population growth has outpaced that of urban centers in every decade since the invention of the automobile, but in 2011 for the 1st time in 100 years that trend reversed,

• During nearly every recession in history urban home prices have suffered the most, but in this latest downturn real estate in the urban cores predominately retained its value at a higher percentage than surrounding suburbs,

• In 1990, 7% of building permits in New York City where in the urban center and 70% on the suburban fringe; In 2008, 9% of the building permits where in the suburban fringe and 70% in the urban core,

• In 1980, 66% of 17 year olds had a driver’s license; In 2010, 47%, and

• Only 50% of adults are married today, down from 75% in 1960.

These statistics speak to the metropolitan revolution underway. The younger generations simply do not have the love affair with the automobile their parents did. They also do not have the same conventional...
outlooks on marriage and the need for the individual lot with the picket fence. It’s not limited to just young hipsters though. Baby boomers are giving up their empty nest homes to return to walkable neighborhoods filled with social activity. Families are returning to the urban core to raise their kids. If you are not convinced talk to some of the players in the real estate markets. The buzz in the room is about the fundamental shift our society has experienced, and they are betting hard on the future of our cities. Today growth is being redefined from a term which is measured by the outward expansion of the built environment, to one which reflects its inward rejuvenation. As long as policy makers, advocates and the public associate ITE with the now dated outward definition of growth we will find it increasingly difficult to maintain the credibility and relevance of our Institute.

Positive change is taking place. ITE has come a long way from viewing our charge as simply moving cars from point A to point B. For some time the Institute has made a concerted effort to become more inclusive of sustainable transportation principals. Multi-modal and context sensitive solutions are part of our toolbox. It is now up to the individual engineers to embrace and implement these principals. Design guides such as the NACTO Urban Bikeway and Urban Street Design Guides, as well as community specific strategies like the City of Boston’s Compete Streets initiative, provide specific direction. I would also encourage all members to review the Institute’s Strategic Plan. This document clearly lays the foundation for changes to come.

These measures though, while essential to our survival, are not enough. To achieve our strategic mission to be the principal source of professional expertise, knowledge and ideas promoting transportation science and principles internationally will require being far more proactive. We need to start by addressing our self-image. We have a propensity to consider ourselves service providers seeking to address the needs of our clients. Transportation engineers are not simply hired guns willing to bend our integrity to the agenda of any given client; we must stand on deeper principals as stewards of the built environment. One definition of engineer is that of a versatile mind that creates links between science, technology, and society. In our profession we must be comfortable with the fact that this is not a linear association. We are dealing with an applied science routed deeply in human factors. To be successful we must adhere as much to cold logic as to human empathy. Amongst the engineering fields Transportation Engineering is a uniquely right brain orientated discipline. At its core our shared vocation is the art of wielding transportation as a tool to the benefit of society. This is a tremendous charge and carries with it immense ethical responsibilities.

Which brings us back to the generational issue facing ITE. Today our future transportation leaders are rejecting the Institute and forming new professional organizations. We must ask ourselves why. Within our profession the weight of the great recession was borne most heavily by 20 and 30 somethings, the very individuals most in-tune with changing societal priorities. As employers predominately spared the positions of established engineers at the expense of those starting out, the Institute likewise experienced a decline in the involvement of younger members. This affected our ability to adapt to rapidly changing societal trends driven by this very age group. Today, just as those of the general public perceive ITE to be associated with an antiquated approach to transportation problem solving, so do younger transportation professionals. Make no mistake, the transportation professional is not losing relevance, ITE is. To regain our stature ITE must do a better job of integrating younger members by rejuvenating this Institute with a spirit of optimism that resonates with those who stand to inherit it.

How do we do this? To stay relevant ITE will need to find its voice and take the intellectual lead regarding transportation issues. Promote all forms of sustainable transportation. Articulate the links between the built environment and public health and educate how walkable/bikeable environments have demonstrated health benefits. Note that pedestrians are currently assuming an inequitable amount of personal safety risk along our roadways. Understand that 85% of what is spent on driving leaves the local economy. Identify counterintuitive facts like cities with higher congestion levels use less fuel per capita than cities with the least congestion. Point out that we will need to disincentive one mode choice over another to reach mode shift goals and greenhouse gas reduction targets. State that dogmatic guidelines or policy directives, however well

continued on page 10
intentioned, often only commandeer and limit the abilities of talented design professionals. Advocate for sustainable funding approaches, zoning ordinances and public policy. Appreciate that collaboration is a prerequisite for success. Finally we cannot be afraid to say that congestion cannot be solved by adding capacity, for as someone smarter than me has said, were it not for congestion we would drive enough to make congestion.

The challenge ahead for ITE is not so much a matter of adapting, it’s a matter of evolving. ITE needs to be out in front of transportation issues articulating a message to renew the built environment to meet the needs of the future. We have the tools at our fingertips to address so many of the issues that have been maligning our society for too long. The obesity epidemic, crumbling infrastructure, global warming, promoting healthy human interaction. This is everything. The world is going to change whether we like it or not, why would we not live up to the challenge and embrace the role awaiting us to inspire the next generation of transportation professionals to be a major part of the solution.

The content of this editorial reference facts cited within work by others. These include Walkable City: How Downtown Can Save America One Step at a Time by Jeff Speck; The End of the Suburbs: Where the American Dream Is Moving by Leigh Gallagher; The Metropolitan Revolution: How Cities and Metros Are Fixing Our Broken Politics and Fragile Economy by Bruce Katz & Jennifer Bradley.

Jason M. DeGray, P.E., PTOE is a Project Manager at Greenman-Pedersen, Inc. in Wilmington, Massachusetts. If you wish to contact Jason for more information, please send messages to: jdegray@ginet.com

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Evaluations Criteria:
- Originality
- Significance
- Scope and Format
- Validity
- Applicability

Eligibility:
- Must have been a student member of ITE during the period between April 1, 2013 and March 31, 2014,
- Must have completed the work that provides the basis for the paper while a student member of ITE, and
- Must be the only author.

$500 Honorarium
$500 Travel Expenses
+ Attend Northeastern District Annual Meeting - May 14th to 16th, 2014 in Long Branch, New Jersey
+ Present Paper at Northeastern District Annual Meeting
+ Become a Candidate for the ITE International Student Paper Award that includes a $1,750 travel stipend to the ITE Annual Meeting, a plaque, recognition in ITE Journal, and possibly being published in the ITE Journal.

**3rd Place - $250**

**2nd Place - $500**

**1st Place - $500**

**Umass Amherst ITE - 15th Annual Technical Day**

On Thursday, March 27, 2014, the University of Massachusetts Amherst Student Chapter of ITE will be hosting its 15th Annual Technical Day at the Mullins Center (Massachusetts Room) on the campus of the University of Massachusetts in Amherst, Massachusetts. The event, starting at 3:30pm with a series of technical sessions, will also include a social hour, viewing of student research posters, and the annual UMass ITE Awards Dinner with Keynote Speaker: Ken Shain, President & CEO of Smart Signal Technologies, Inc. The night will be concluded with student run social event at the Amherst Brewing Company.

**Cost:** Professionals ~ $50 | Students ~ $15 | Corporate Sponsors ~ $250 (includes 1 dinner ticket)

**Registration includes tech sessions, refreshments, dinner, and breakfast the following morning.**

Checks from employers can be made out to ‘UMass ITE Student Chapter’. No shows will be billed.

Any Questions Contact: umassite@gmail.com
Hello ITE Northeastern District Members!

It’s hard to believe a whole year has passed since my becoming Northeastern District Chair, but in a few short weeks I’ll be passing the torch on to your 2014 District Chair, Michael A. Knodler, Jr., Ph.D. Mike is an outstanding leader and I am confident he will be successful in the position. As far as 2013 goes, it was an honor to have been your District Chair for the past year and I’d like to thank the Executive Committee, the District Board and the District membership as a whole for being supportive of my agenda and for assisting wherever needed to help this organization succeed. Some of the highlights from this past year include the following:

Elections
The District was involved in elections at all levels this year. I’d like to congratulate Kim Fabend, P.E., PTOE for being elected as your new District Secretary/Treasurer, and Kenneth J. Petraglia, P.E., PTOE for being elected as the District’s Next International Director. Ken will be serving a 3-year term, providing a voice for us at the International level. I am confident he will be effective in that position. A special congratulations also goes out to John J. Kennedy, P.E., PTOE of the New England Section who was elected to the position of International Vice-President for 2014. John has been an active leader within the District for many years and he looks to use his ample talents and experience to make a true difference at the top level of our organization. I wish John much success in this position.

Meetings
The District hosted meetings at the District and International level this year. Our Northeastern District Annual Meeting in Northampton, Massachusetts was a great event at a beautiful and historic venue. It featured 14 training sessions; a technical workshop; a bike tour; golf; and several social events, including virtual horseracing, that was a favorite for many. There were more than 280 attendees at the meeting. A special thank you goes out to Michael A. Knodler, Jr., Ph.D. and Joseph C. Balskus, P.E., PTOE for their efforts as Annual Meeting Co-Chairs. You both did a great job!

In addition, the Northeastern District hosted the International Annual Meeting in August. This meeting was held in Boston, Massachusetts and provided most of the District membership with one of our best opportunities to attend an International Meeting without extensive travel. The local arrangements committee was lead by Kenneth J. Petraglia, P.E., PTOE, and he and his team did a great job. The event went off beautifully and the Beantown Beach Party, which gave the international attendees a taste of what the Northeastern District has to offer, was one of the most entertaining events in Annual Meeting history. (well, I’m not sure about that, but it was a blast!!!)

In 2014, the MET Section will be hosting the District Annual Meeting on the Jersey Shore, at the Ocean Place Resort in Long Branch NJ. Mark your calendars now for May 14-16. This is an event you won’t want to miss.

Awards
Notable award winners this year included Gary L. Hebert, P.E., who was presented the Harvey B. Boutwell Distinguished Service Award by the Northeastern District. Gary has been a great asset for this organization for many years and I thank him for his service and support.

Other District awards this year include the MET Section, winner of the Section Activities Award; and Northeastern University, winner of the Student Chapter Award. At the International level, Sections within the District won two of the three available Newsletter Awards; the NY Upstate Section and Editor Christina L. Doughney, P.E. won for circulation below 250 and the New England Section and editor Samuel W. Gregorio, E.I.T. won for circulation over 500. Congratulations to all the award winners for this year!!!

LeadershipITE
This new program sponsored by ITE International provides participants with the leadership training and tools they can use to be successful leaders within the District and in their professional and personal lives. The one-year program has participants attend three live training workshops and several webinars throughout the year. The program provides networking opportunities, where participants can learn from each other, and it requires work on case studies and team projects to help participants hone their leadership skills. Thirty participants were selected for the inaugural LeadershipITE program, and I am proud to say that four were from the Northeastern District. Congratulations and good luck to Amir Rizavi, Andy Kaplan, Adam Allen and Grace Van Kirk for your selection in this exciting new program.

Student Chapters
Student chapters are running strong in the District and I am pleased to announce the addition of a new student chapter at the College of New Jersey. I believe that brings the District up to an even dozen chapters. Students are our future, so let’s support these Chapters to the fullest extent possible, and let’s give these students the tools they need to be able to grow into great transportation professionals.

District Website
Finally, I’d like to mention the District Website. Months ago I promised a more modern and easy to update website design for the District. I want everyone to know that, though it is taking longer than expected, we are still working on it and I’m hopeful that the new site will be up and running by the end of January, though content will continue to be added and updated throughout the year. To be a true conduit of communication, the site needs to be fluid and current, and it is my hope that changing platforms to make it easier to update will help facilitate that for the future.

It has been a pleasure serving you this past year. Thank you for the opportunity.

Michael R. Wieszchowski, P.E., PTOE
Outgoing Northeastern District Chairperson
The 2013 New England Section Awards

Committee Members
The 2013 New England Section Awards Committee was comprised of Roger Dickinson (Vermont), Diane Morabito (Maine), Kim Hazarvartian (New Hampshire), Russell Holt (Rhode Island), Joseph Balskus (Connecticut) and chaired by Douglas Prentiss who also voted as the Massachusetts representative. The Awards Committee’s guidelines identify that upon selection by the President, the Chairperson appoints a committee including a member from each state who will serve a three-year term. There are carryovers as the guidelines state that terms should be three years, and two members ‘turnover’ each year. Each Committee member is a past award recipient, a NEITE requirement.

Process
The guidelines speak to the Chairperson reporting directly to the Section President. Otherwise the nomination process is open to the general membership. A database is kept by the Chairperson of past nominees which may be reused for future nominations. E-mail has facilitated the exchange of information among the committee. In 2013, all of the coordination/voting was completed by email. Candidate nominees were solicited from the membership via Section meetings, the Section Executive Board, State Chapter Officers, and membership via Sections coordination/voting was completed by email. Candidate nominees were solicited from the membership via Section meetings, the Section Executive Board, State Chapter Officers, and general Section input.

2013 Presentation
Presentations were made by various Section members at the New England Section’s Annual Meeting in Warwick, Rhode Island on December 2, 2013. The recipient of the 2013 Sections awards are:

Transportation Leadership Award: James P. Redeker
Commissioner
Connecticut Department of Transportation

Transportation Engineer of the Year: Thomas A Errico, P.E.
Senior Associate
TY Lin International

William P. McNamara Distinguished Service Award: Jeffrey S. Dirk, P.E., PTOE
Principal
Vanasse and Associates, Inc.

Emerging Professionals Award: Ian A. McKinnon, E.I.T.
Engineer
BETA Group, Inc.

Cole D. Fitzpatrick, E.I.T.
Civil Engineer I
Town of Agawam, Massachusetts

The New England Section of the Institute of Transportation Engineers’ TRANSPORTATION LEADERSHIP AWARD is presented to James P. Redeker

Commissioner of the Connecticut Department of Transportation for his leadership in 2013 leading Connecticut through the New Haven line derailment and substation failure crisis, shepherding the $2 billion dollar Q Bridge project ahead of schedule and under budget, and for initiating TransformCT, the first strategic plan for Transportation in Connecticut.

Commissioner James P. Redeker has been Commissioner of the Connecticut Department of Transportation since August 2011. Prior to that, James served as Deputy Commissioner and previously was Bureau Chief of Public Transportation. He serves on the Board of Directors of Connecticut Airport Authority, the Capital Region Development Authority, the Capital Region Development Authority, and is a Board member of the UCONN School of Engineering. Prior to coming to Connecticut he had worked at NJ TRANSIT for 30 years.

His major project accomplishments as Commissioner include:
- the $2 Billion dollar Q-Bridge which was completed ahead of schedule and over $200M under budget;
- the Moses Wheeler Bridge;
- an award for bridge construction innovation for CTFastrak – which is 50% complete, on schedule, on-budget and scheduled for opening 2015;
- the New Haven-Hartford-Springfield Rail which is scheduled for 2016 service;
- the opening of new rail stations – Fairfield Metro, West Haven and almost 4,000 new parking spaces for the rail system;
- an award for safety for the round-about in Killington.

For Outstanding leadership as Project Manager for the highly-successful MassDOT / Baystate Roads Complete Streets Design Training Initiative across the Commonwealth of Massachusetts in 2011-2012 and for promoting MassDOT’s goal of an Enhanced Transportation Compact.

Tom Errico is a registered P.E. in each of the northern-most New England states, including Massachusetts. Since receiving both a Bachelor and Master of degrees in Civil Engineering from Northeastern University he has been hard at work engineering solutions to just about all of the types of problems given to a traffic/transportation engineer. In recent years he has been integrally involved with efforts focused on improving the safety and mobility of non-motorized traffic, something many of our roadways in New England still seem to need a lot of help with.

In 2011 and 2012, Tom was Project Manager on the highly successful Complete Streets training sessions and technical workshops conducted across Massachusetts in coordination with the MassDOT and the Baystate Roads Program. Outside of the Massachusetts training, Tom has also instructed Complete Streets sessions in Maine, New Hampshire, and Connecticut as a member of the Speakers Bureau of the National Complete Streets Coalition and the Association of Pedestrian and Bicycle Professionals.

Tom has been a member of ITE since 1987 and is very active in the Section, serving on the NEITE Board and in various committees. He is presently a Senior Associate and the Traffic Director at TY Lin International in Falmouth, Maine.

The New England Section of the Institute of Transportation Engineers’ TRANSPORTATION ENGINEER OF THE YEAR is presented to

Thomas Errico, P.E., PTOE

For Outstanding leadership as Project Manager for the highly-successful MassDOT / Baystate Roads Complete Streets Design Training Initiative across the Commonwealth of Massachusetts in 2011-2012 and for promoting MassDOT’s goal of an Enhanced Transportation Compact.

Tom Errico, P.E., PTOE
This year for the first time the New England Section of ITE is pleased to have, co-recipients for the Emerging Professionals Group Award. The 2013 co-recipients are Cole D. Fitzpatrick, E.I.T. and Ian A. McKinnon, E.I.T.

Both Cole and Ian have Masters Degrees from the UMass Amherst, studying under their faculty advisor, Dr. Mike A. Knodler, Jr. They received the bachelor’s degrees 3,000 miles apart, Ian from the University of Maine and Cole from Oregon State University. It was in graduate school that their classmate bond was formed. Ian served as President of the Student Chapter of ITE while Cole served as Vice-President in 2012-2013.

Separately, they both co-authored papers with their faculty advisor, Dr. Knodler. Ian received the Tom Desjardins Scholarship while Cole the Student Paper Award from the Northeastern District. Both participated in the 2013 Northeastern District meeting in Northampton; including Cole as a moderator and Ian as a presenter. Both collaborated as co-presenters at the 2013 ITE Annual Meeting and continued growth as an Emerging Transportation Engineer.

Cole presently works as a Civil Engineer I in the Engineering Department for the Town of Agawam, Massachusetts. Ian presently works as an Engineer for Beta Group, Inc. in Norwood, Massachusetts.

Would You Like to Contribute to the New England Chronicle?

Would you like to contribute to an award winning New England Chronicle newsletter? The New England Chronicle’s Editor Staff at TEC, Inc. is seeking members (both professionals and students) who are interested to write both short and feature articles for publication in the upcoming New England Chronicle issues. Both short and feature articles should be about technical topics, professional matters, innovative projects, and cutting-edge solutions that affect transportation engineering and planning.

For more information on how you can become a New England Chronicle contributor contact the New England Chronicle Editor: Samuel W. Gregorio, E.I.T. at sgregorio@theengineeringcorp.com.
Democrats and Republicans agree that America’s transportation infrastructure needs rebuilding and upgrading but can’t agree on how to do this, especially as to how to pay for it. This agreement, and disagreement, was clearly evident in President Obama’s March 29, 2013 infrastructure remarks at the Port of Miami. To supplement state and federal programs, the President proposed a series of tax breaks and loans to stimulate private investment. Speaker John Boehner noted that Republicans also want to upgrade American infrastructure, but only if it could be paid for.

Funding sources are certainly critical considerations, but shouldn’t we also be assuring that program costs are minimized, consistent with environmental goals. This can be achieved with multipurpose, innovative design, including value engineering and, wherever possible, making the best use of available facilities and transportation rights-of-way (ROWS). Available ROWs include inactive or lightly used railroad lines. I call them “transportation rights-of-way” because that term captures their potential for the 21st Century, rather than their role in the 19th Century or the 20th Century. Such ROWs should not be considered as “forever abandoned”, as suggested by the accompanying photo.

Recycling is a big part of sustainability and we need to apply that thinking to transportation planning. In transportation planning we should stop “throwing away” perfectly usable transportation rights-of-way. Too often we build new rather than repurpose and improve an existing channel, or we look to “what was” rather than fully exploring “what might be”.

As examples, I focus in this article on four transportation programs in the Northeast, potentially benefitting Massachusetts, New York City and Long Island, that did not or are not following these common sense principles. First, a current repurposing opportunity in eastern Massachusetts that could advance several sustainability strategies. In a second case, construction is completed but a “throwaway” approach resulted in project costs way over what they might have been. Third, a current proposal for re-use of an inactive rail ROW that will not achieve its full mobility / community serving potential, unless its possible transportation function is considered. In a fourth case, involving a lightly used rail ROW, there could be a missed opportunity for a major multimodal transportation / economic development initiative.

Case 1 - Central Massachusetts Railroad ROW (Pedestrian / Bike and BRT)
An April 2011 study looked at the feasibility of using an eastern section of the (inactive) Central Massachusetts railroad ROW for a shared use (bicycle / pedestrian) path and a dedicated Bus Rapid Transit (BRT) busway. This analysis, requested by the communities along that travel corridor, was done by the Metropolitan Area Planning Council (MAPC). The study revealed significant challenges including ROW constraints, environmental aspects, community concerns, bus service travel times and potential usage.

Most of those challenges derived from the proposal of a standards-based 43-foot wide cross-section and the assumption that buses would stop at each grade crossing (long transit service travel times/low usage). In a proposal presented at the May 2013 ITE Northeastern District Meeting, an alternative, staged approach was suggested. Stage 1 would create a 24-foot wide “way”, fitting through all existing underpasses. Also included... relatively simple bus priority traffic signals at the grade crossings, aimed at creating lower transit travel times and attracting more ridership. This “way” could be used either time-shared or “split”.

Time-shared it would be used for two way BRT service during AM and PM weekday peak periods. The buses would use regular roadways during other weekday hours. At all other times, the entire way would be available for use as a shared use bicycle/pedestrian path, e.g., weekdaze mid-day, late afternoon; and all day on Saturdays, Sundays and holidays.

The Split alternative, as seen in Figure 1 on the following page, would dedicate a 10-foot width for a bicycle/pedestrian trail and a 12-foot width for a one-way, reversible BRT busway. A 2-foot-wide concrete barrier would separate the trail from the busway. The BRT service would operate all day to and from Boston, using the busway in the peak direction e.g., AM inbound, PM outbound … and regular roadways in the other direction. The shared use bicycle/pedestrian path would be available on all days.

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Leon Goodman, P.E., PTOE
Transportation Consultant
compared with the Van Wyck route. Transfer direct route from Manhattan to the airport as completely grade to the LIRR at Rego Park. That ROW, Wyck, runs from the northeast corner of JFK Beach Branch. That line, parallel to the Van Wyck Expressway, would have required a much lower construction cost, probably in the $200-$300 million range.

Case 3 - Inactive LIRR Rockaway Beach Branch (present)
In March 2013, the New York Times reported on the QueensWay proposal, which would convert the still inactive ROW of the LIRR Rockaway Beach Branch to a pedestrian/bicycle trail. QueensWay advocates compare this idea to the High Line in Manhattan, with food stands along the way. But the Rockaway Beach Branch ROW still has great transportation potential for residents of the adjacent Queens communities. It should not be used only for a linear park and food stands. This irreplaceable, publicly-owned land could also serve to reduce auto traffic and increase mobility in the local communities. This could be achieved by using that ROW for a modern, context-sensitive, grade separated BRT service with connections to area bus and rail lines, including Metropolitan Ave., Atlantic Ave, other major crossroads and the Queens Blvd. subway. This type of quick, reliable, environmentally friendly BRT system has been in service for years in many cities. At Atlantic Avenue in Woodhaven, the BRT station could connect to a rehabilitated Woodhaven Station on the LIRR Brooklyn line. In this way, the Queens communities would gain the public transportation service denied to them under the Air Train JFK program.

Both sustainability elements - parks and high-quality transit - could be achieved by the time shared use of a single “way” within this ROW: transit during weekday peak periods and a pedestrian/bicycle trail at all other times. The trail would therefore be available weekdays (midday and late afternoon), Saturdays, Sundays and holidays (all day). When the “way” was in use as a trail, the BRT service would operate along parallel Woodhaven Blvd., with stops only at major crossroads.

Sponsors of QueensWay should consider both elements, using funding from parks and transportation programs. Moving this very achievable idea forward would give Queens residents two quality-of-life improvements in one program.

Case 4 - LIRR Bay Ridge Branch (The Gateway Project Proposal)
The Bay Ridge Branch of the Long Island Railroad, traversing central Brooklyn, could play a key role in creating:
- Major multi-modal regional mobility and environmental improvements.
- A new Brooklyn-Queens rapid transit service.
- A significant economic boost for Brooklyn, Queens and Long Island.

These benefits could be achieved by creating The Gateway Project, including “Brooklyn Way” (almost entirely within the ROW of this lightly used freight rail line). Gateway would address the cost-inefficiencies and environmental negatives of the major Southern “missing links” in the regional transportation system. It would have three elements: Brooklyn Way, Staten Island Transit and Liberty Tunnel. Gateway’s central element, Brooklyn Way, could be the first stage with the tunnel and/or Staten Island Transit added later.

1) Brooklyn Way would be a modern, electronically tolled, managed lanes roadway fitting within the Bay Ridge Branch ROW, and within existing highway ROWs in southern Brooklyn and Queens, with virtually no relocations needed. Where needed, below grade sections could be decked over as part of its context-sensitive design. New double-stack clearance freight rail would be included, replacing the existing outmoded, low clearance tracks.

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This staged approach could allow an early tryout of transit and shared use, a “taste”, while minimizing initial investment and construction. It would also reduce potential environmental/community effects. With the integrated transit/shared use concept, State and Federal transit funding could be applied to supplement available funding for bicycle/pedestrian trails.

Case 2 - Air Train JFK (opened 2003)
This long needed transit facility for JFK Airport provides: on-airport circulation, connection to the subway system and connection to the Long Island Railroad (LIRR). This last element, the 4 mile long link to Jamaica, cost about $900 million. This very high cost was due to the link being built as a completely new viaduct, over the VanWyck Expressway and, at a third level, over the cross-street overpasses. Major funding for this link came from the FAA who ruled that there could be no local stations between the airport and Jamaica. Consequently, the local Queens communities bore the visual impact of three-level structures but got no transit service benefits.

During planning of this link, many transportation planners, including me, urged use of the path of the inactive LIRR Rockaway Beach Branch. That line, parallel to the Van Wyck, runs from the northeast corner of JFK to the LIRR at Rego Park. That ROW, completely grade-separated, provides a more direct route from Manhattan to the airport as compared with the Van Wyck route. Transfer to the LIRR could have been provided at a new LIRR Rego Park station also serving that community. The Rockaway Beach Branch route, essentially requiring only upgrading of the existing ROW, would have required a much lower construction cost, probably in the $200-$300 million range.

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2) The Staten Island Transit element would allow BRT services from Staten Island’s northerly and southerly communities to operate to JFK Airport, via the Verrazano Bridge and Brooklyn Way.

3) The New York-New Jersey cross-harbor Liberty Tunnel, would include freight rail and electronically tolled managed lanes.

Summary
In summary, Gateway would:

(a) Divert truck trips from many overloaded expressways and reduce VMT (Vehicle-Miles Traveled) by creating a more direct route for trips from the west destined to Southern Brooklyn, Queens and Long Island. A significant number of these trips now travel along circuitous, energy-wasting routes involving the George Washington Bridge, the East River toll bridges and connecting overloaded expressways.

(b) Divert truck trips from the Staten Island Expressway.

(c) Improve freight rail for the New York City and Long Island

(d) Provide new transit connections for JFK Airport and improve connections among the airports and seaports.

(e) Create new transit service between Staten Island and other boroughs. For the first time, Staten Island residents would have quick, reliable transit access to the thousands of jobs at JFK Airport in Queens.

For all of the inactive or lightly-used transportation ROWs noted here, use by rail transit or by BRT services represents efficient, forward-looking transportation development. Let’s get serious about not “throwing away” these irreplaceable resources.

These “old arteries” can be utilized to inject new vitality into the nation’s economy, and to better our quality of life, by improving urban mobility at relatively low cost with minimal environmental impacts. Let’s fully realize the great opportunities for the future that they offer.

Leon Goodman, a transportation professor at Pratt Institute, is a Past International President of the Institute of Transportation Engineers (ITE) and former Manager, Transportation Planning for the Port Authority of New York and New Jersey. He currently resides in Sudbury, Massachusetts.
Signal Priority for Left-Turning Buses Including Phase Reservice: Case Study of Roxbury Crossing, Boston

Buses that turn using protected left turn phases can experience long delays, especially if the intersection has a long cycle time because left turn phases are usually green for only a short part of the cycle. In this project, three control options were tested: passive priority (giving the left turn phase a longer split), green extension, and green extension together with conditional phase reservice. In each case, the aim was reducing delay to buses turning left without causing an undue impact to other traffic. A more complete report is available at Halawani (2012).

Existing Conditions

The study site was the intersection of Malcolm X Boulevard, Columbus Avenue, and Tremont Street in Boston; a busy intersection known as Roxbury Crossing (see Figure 1). Nine MBTA bus routes run through the intersection. During the PM peak hour, five bus routes, with a combined frequency of 31 buses per hour, use the southbound left-turn (SBL) phase, turning from Tremont Street to Malcolm X Boulevard.

Traffic volumes and signal timing parameters were measured on Thursday April 4th, 2013 during the P.M peak hour (see Figure 2). The existing signal timing plan uses coordinated-actuated logic with a 135s cycle (see Figure 2) when the all-pedestrian phase is called, and 100s otherwise. In coordinated-actuated logic, coordinated phases – in this case the north-south through movements – have a fixed ending time in the cycle, while other phases end either by gapping-out (a gap is detected after the queue has dissipated) or maxing-out (the phase runs its full maximum green) with slack time caused by gapping-out enabling the coordinated phase to begin early. In practice, during peak hours, vehicular phases almost always run their maximum green and the all-pedestrian phase is called every cycle, so that the existing operation is pretimed control with a 135s cycle length.

Simulation Models and Results

The intersection was modeled using VISSIM. The network included the subject intersection as well as neighboring signals within 0.25 miles. Simulation parameters were calibrated to match the measured saturation flow rate. Signal control logic was coded with Vehicle Actuated Programming (VAP), a programming language provided with VISSIM. Existing conditions were modeled following coordinated-actuated logic, with all phases on minimum recall (that is, no phase will be skipped, including the all-pedestrian phase).

With existing control, the model indicates that buses using the SBL phase experience a 90s delay on average, due to a long red interval along with frequent overflow (buses being left in the queue when the phase ended). Field observations confirm the frequent overflows in the SBL lane.

The first control option tested was lengthening the maximum green for the SBL phase from 14s (the existing setting) to 22 s, with the northbound through (NBT) phase shortened by 8s in order to keep the overall cycle length unchanged. Note that because SBL is actuated, it won’t necessarily use the full 8s of extra green time. Unused green time will automatically revert to NBT and so NBT’s average loss in green time may be far less than the nominal loss of 8s. This control option can be called “passive transit signal priority” because it does not involve detecting and responding to particular transit vehicles.

The second control option used green extension, a common transit signal priority tactic. The maximum green for SBL was returned to the existing value of 14s, but if one or more left-turning buses were detected within the trap between a check-in detector located 15s travel time upstream of the stop line and a checkout detector located at the stop line, the green would be extended by up to 15s. Intelligent detection was assumed, distinguishing buses turning left from buses going through. Extended green ended when the last bus in the trap crossed the checkout detector. Time consumed by green extension was taken from the NBT phase, keeping the cycle length unchanged.

The third control option was a combination of green extension and conditional phase reserve. Green extension was as previously described, except that the maximum extension was limited to 10s (and so the check-in detector was located 10s travel time upstream of the stop line). Phase reserve means that the ring diagram has a lagging SBL phase (a “reservice phase”) in addition to the normal, leading SBL phase. The reservice phase was served only when a bus was

Figure 1: Location of Roxbury crossing, Boston (Source: Google Earth)
Continued from Page 17

detected with the trap between check-in and checkout detectors. Its minimum green was 8s, its maximum green was 18s, and it gaps out as soon as the last bus in the trap crosses the checkout detector. Time consumed by green extension and conditional reservice were taken from NBT.

Based on the simulation models results (as seen in Figure 3), all three control options lead to dramatic reductions in average bus delay. The passive priority option decreased average bus delay by 43s. This tactic could be implemented without investing in any new control or detection equipment; it’s just a matter of adjusting the signal timing parameters to favor the movement carrying buses.

Green extension had essentially the same impact on bus delay as the passive priority option. Green extension together with conditional phase reservice had the greatest impact, reducing average bus delay by 64s. With two windows per cycle in which a bus can be served, the maximum red time a bus could face is dramatically reduced, resulting in a large reduction in delay.

What about impacts to vehicular traffic? Figure 3 shows that all of the proposed bus priority actions have negligible impact on vehicular delay, with a slight decrease (0.3s to 1.1s) found for every option. There is a small increase was delay (4s or less) for the NBT movement, offset by a large reduction in delay to the SBL movement, and little to no change for other movements.

How can it be allowing the SBL phase to “borrow” so much time – up to 28s in the last option – from the NBT phase yet affect the NBT movement so little? The answer is the automatic compensation that occurs with coordinated-actuated logic. Lengthening the max green for SBL by 8s, for example, while shortening the nominal length of the NBT phase by 8s doesn’t mean that NBT will actually be shortened by 8s, because SBL will consume only what it needs and return the rest to NBT. While SBL ran to its max green almost every cycle when max green was only 14s, when its max green was increased by 8s, it maxed out only 25% of the time. Moreover, its average green time increased by only 0.9s – and thus the average green for NBT decreased by only 0.9s. When SBL’s green is extended in one cycle, it served more vehicles than usual, and so it would have less demand and therefore be more likely to gap-out early in the next cycle.

The same compensation mechanism was observed with all tactics – borrowed green time from NBT when it could be used to reduce delay to a bus, but used less green time in subsequent phases, in effect compensating NBT preventing long queues from building up. Because of this, it was possible to realize a large reduction in delay for buses with little negative impact to vehicular traffic. These results are consistent with those found by a similar study involving a high volume of left-turning buses near Boston’s Ruggles Station (Furth, Cesme, and Rima, 2010).

Conclusions

In conclusion, giving priority to buses using a protected left turn phase offers means of reducing bus delay with little impact on other traffic. We found that simply retiming the signals to favor the bus movement could reduce bus delay substantially without requiring any investment in detectors or control equipment. In this study, the benefits of this passive priority tactic were as great as those of green extension. Conditional reservice offers additional benefits because of how it reduces the maximum red time buses can face. Because of the automatic compensation mechanism built into actuated logic, these large reductions in bus delay are possible with little impact on other traffic.

Acknowledgement

Thanks to Prof. Peter Furth for guidance, and to Burak Cesme for his help with VISSIM.

References


Chapter, and Student Chapter Updates

**CONNECTICUT STATE CHAPTER**  
**President:** Ranjit A. Bhave, P.E.

The Connecticut Chapter of ITE hosted the annual joint winter meeting with Connecticut Chapter of ITS on January 28, 2014 at East Side Restaurant in New Britain, Connecticut. Over 75 attendees from private as well as public agencies attended this meeting.

The program consisted of a technical session in the afternoon followed by the dinner presentation. The technical session was on “Integration of Wireless Detection Strategies for Various ITS and Intersection Application” presented by Robert Blasi and Gregg Hoffman of Traffic Systems, Inc. The dinner presentation was on “CTFastrak - Transit at the Speed of Life” by Brian Cunningham of Connecticut Department of Transportation.

The Connecticut Chapter of ITE has organized a Student Symposium with the UConn student chapter of ITE on April 2, 2014. The symposium will be held at Rome Commons Ballroom at Storrs, CT. The call for abstracts notice and the meeting notice will be sent out shortly.

**NEW HAMPSHIRE STATE CHAPTER**  
**President:** David Saladino, P.E.

The NH Chapter of ITE held their Annual meeting on December 11th, 2013 at the Common Man Restaurant in Concord, NH. The presentation portion of the meeting included an overview of current NHDOT Rail & Transit Projects presented by Shelly Winters and Patrick Herlihy both of NHDOT Bureau of Rail and Transit. The business portion of the meeting included the results of annual officer elections, with David Saladino, P.E. being elected president, Jeff Santacruce, P.E. being elected as Vice President, and Nick Sanders being elected as Secretary/Treasurer. David DeBaie, P.E., PTOE, the outgoing president received a plaque for his years of service to NHITE.

**UNIVERSITY OF MASSACHUSETTS STUDENT CHAPTER**  
**President:** Curt P. Harrington

UMass ITE would like to thank the New England Section for sponsoring the 2nd Annual UMass Reception at the Transportation Research Board (TRB) Annual Meeting this past month. It was a resounding success for the second straight year and allowed for social and work-related connections between students, faculty, and professionals to be made. (Side Note: a number of UMass ITE members presented at TRB as well.

Join us as UMass ITE hosts our annual Technical Day! Technical session will be held during the late afternoon of March 27th, followed by a happy hour, buffet dinner reception with a keynote speaker and the annual UMass ITE awards. A social outing will follow afterwards! A block of rooms will be reserved at the Hotel UMass and a breakfast buffet will be available the following morning.
The Vermont Chapter of ITE convened for a meeting at Sugarbush Ski Resort in Warren, Vermont on January 22nd, 2014. While temperatures started the day well below 0°F and peaked only in the single digits, several members met up for a day of skiing prior to the technical presentations and board meetings for the Vermont Chapter and New England Section.

The first technical presentation was provided by Kevin Marshia, P.E., Assistant Director of Program Development at VTrans. Mr. Marshia updated the group on recent initiatives undertaken by VTrans to improve the integration of crash data analysis with program development, education, and enforcement throughout the state, and on the formation of the Vermont Highway Safety Alliance (VHSA), which is a new public/private partnership with a goal of reducing major crashes in Vermont by 10% by 2016. The VHSA recently published the Vermont Strategic Highway Safety Plan (SHSP), which presents focus areas and strategies for achieving this goal. Additional information on the VHSA and the SHSP can be found at: [highwaysafety.vermont.gov](http://highwaysafety.vermont.gov).

Mr. Marshia concluded by discussing one of the first major project initiatives undertaken by the VHSA. The section of US 4 from Bridgewater, VT to Hartford, VT experienced multiple fatalities in the first half of 2013 and caused considerable local interest in improving safety along this roadway. The VHSA convened a meeting of VTrans officials, local government officials, law enforcement, and interested parties to discuss and address this situation. Contrary to public perception that winter weather, poor road conditions, teen drivers, and evening commuter traffic were to blame for safety issues on US 4, VTrans data showed the majority of crashes on this roadway occurred with clear weather and dry pavement, involved middle-aged drivers, and occurred most frequently during the middle of the day, but included a higher than expected percent of head-on collisions. In parallel with a scheduled paving project, and consistent with systematic improvement policy, VTrans installed centerline rumble stripes along the corridor to help limit future cross-over crashes.

The second presentation was given by Evan Dietrich, P.E. of Dubois & King, Inc. on their recent work designing a covered bridge replacement in Quechee, Vermont, where the original was severely damaged by Tropical Storm Irene. Mr. Dietrich described the challenges facing this project including the initial question of whether to replace or repair the damaged bridge, the need to design a new bridge keeping with the historical character of the area, and structural support issues that arose during construction. What was initially understood to be ledge under the southern bridge supports was discovered to be a “hodge-podge” of boulders, gravel, and concrete and once the ledge was uncovered, a significant fracture in the ledge required the team to alter the design to move the overall bridge approximately 15 feet to the south. While not without challenges, the resulting bridge was completed on schedule in June of 2013 and remains an asset to the town, attracting tourists and accommodating local industry with an increased roof height and cedar shingles.

The Vermont Chapter of ITE is planning two additional meetings for 2014. The next will occur in May and will be located at the CCRPC offices in Winooski. Another will be held in October at the VTrans offices in Montpelier. For 2014, Jennifer Conley, P.E. will serve as VT ITE president and Jenny Austin, P.E. will serve as Vice President. Bruce Nyquist, P.E. will continue as VTrans Liaison, Ben Swanson will serve as Secretary, and Jason Charest, P.E. will serve as Treasurer.
BETA Group, Inc.

Senior Traffic Engineer

BETA has exceptionally strong traffic practice. We are seeking a highly motivated individual to join our team in a key position. Candidate should have 8-12 years of experience in traffic engineering and/or transportation planning. Skill in making presentations and managing assignment/project a plus. Thorough knowledge of traffic analysis software is required. MassDOT requirements are requirements. Bachelor of Science Degree in Civil Engineering and Professional Registration required. PTOE preferred.


Green International Affiliates, Inc.

Transportation Engineer
Westford, Massachusetts

Green International Affiliates, a major transportation/civil engineering firm serving the New England region from its Boston, MA office, currently has an opportunity for a Transportation Engineer who has 2 to 6 years experience in transportation planning and traffic engineering. The firm provides a range of study and design services for both public and private clients. The successful candidate must have experience in performing traffic operational analyses using the currently accepted tools including SYNCHRO, SimTraffic, SIDRA, etc. The candidate must also have experience in preparing Traffic Impact Reports and Functional Design Reports. Additional experience with traffic signal operations and design, traffic calming, developing temporary traffic control plans, and intersection design is highly desirable. Excellent writing and speaking skills are essential as the selected candidate will be responsible for preparing reports for clients, interacting with public review boards and clients and assisting on proposals. Registered (or eligible for exam) PE or AICP with specific transportation planning experience are desirable. Green offers competitive and comprehensive benefits.

Interested candidates should send a letter of interest with resume and references to Human Resources, Green International Affiliates, Inc., 239 Littleton Road, Westford, MA 01886.

Fay, Spofford, and Thorndike, Inc.

At Fay, Spofford & Thorndike, Inc. (FST), we are engineers, planners, and scientists in the classic tradition. Since 1914, we have responded to the challenges of our clients’ needs and operational requirements with effective engineering solutions. FST is an ED/AA/V/E/ Disabled Employer.

Engineer / Planner - Req. #729
Boston / Burlington, Massachusetts

Planner/engineer for traffic engineering/transportation planning. In this position, candidate has the ability to be located either in our Boston or Burlington, MA offices. Candidate will be expected to work both independently and on teams. Duties will include field data collection, traffic analysis, preparation of contract drawings, report/presentation graphic production, and GIS based analysis. Position requires a strong background in traffic engineering or transportation planning. Experience with multimodal transportation planning and analysis is a plus. Preparation of traffic impact studies along with the review of such studies prepared by others is a major part of this position’s responsibilities.

Senior Engineer / Planner - Req. #728
Boston, Massachusetts

Seeking a Senior Transportation Engineer or Planner for transportation analysis and planning of large and small projects in Massachusetts and surrounding New England states. This position is based out of our Boston, MA office. Responsibilities include conducting transportation studies for private/public sector projects and supporting conceptual development of transportation projects. Candidate will be expected to work both independently or serve as technical lead on a project with oversight of junior staff. Other duties will include coordination with clients and other design disciplines throughout project development; preparation of feasibility/justification studies; performing peer reviews of traffic impact studies, preparation of technical proposal and fee estimates; participation in meetings with clients and the public and, monitoring of project budgets.

To learn more about FST, please visit our website: www.fstinc.com

Nitsch Engineering

Nitsch is a privately-owned company that provides opportunities for individuals exhibiting strong technical, managerial, marketing/business development, and leadership qualities to become shareholders of the firm. We are an established mid-sized engineering firm that provides survey, civil/site, transportation, GIS, and planning services to a wide variety of clients including developers, architects, universities, state and municipal government agencies. As we continue to grow, we are striving to position ourselves to build on our successful model of client delivery by expanding our transportation capacity. To learn more about Nitsch Engineering, please visit our web site at: www.nitscheng.com.

Senior Transportation Leader
Boston, Massachusetts

Nitsch Engineering is looking for a Senior Transportation Project Manager to help lead our vibrant 12 person transportation group. We want you to mentor and help develop the talents of our enthusiastic staff. Your leadership will guide projects through all stages of development, from proposals to project wins, to design development and into final construction. You will have the support and backing of a full service 80 person engineering firm that is big enough to tackle any project but yet still prides itself on treating each client as if they are our only client.

Transportation Engineer
Boston, Massachusetts

Nitsch Engineering is looking for a dynamic Transportation Traffic Engineer professional with 5-10 years of hands on practical Transportation/traffic engineering experience. To achieve this goal, we need talented individuals like you on our team. Do you have experience in performing traffic operational analysis using traffic engineering software applications (including Synchro, SimTraffic, and SIDRA), traffic data collection, safety analysis, Warrant analysis using MUTCD, roadway and highway design, signalized intersection design, traffic signal coordination, and arterial analysis? Are you proficient in AutoCAD? This may be the position for you!
Employment Opportunities

Howard/Stein-Hudson Associates, Inc.

Now in our twenty-seventh year of service to the transportation industry, Howard/Stein-Hudson Associates, Inc. (HSH) provides consulting services in the areas of transportation and municipal planning, traffic engineering, and public involvement/strategic planning. We at HSH take pride in our creative approaches to transportation issues, which synthesize sound planning and engineering practice with an understanding of community concerns. The firm’s principals, along with a team of outstanding professionals, provide transportation consulting services to public and private-sector clients around the country.

Sr. Transportation Engineer/Planner
Boston, Massachusetts

This is an excellent opportunity for a candidate with 8-12 years of experience in managing transportation planning and design projects including roadway design, safety improvement, Complete Street projects, traffic signal improvements, and other related project types. Work with Principals on strategic pursuits including proposal development while maintaining strong relationships with public and private clients. You will be responsible for Quality Assurance/Quality Control of key project deliverables. High-level planning and analysis work including preparation of technical documents and reports is required. Direct experience with project management is preferred. The successful candidate will have excellent communication, motivational, and leadership skills. BS degree in Civil/Transportation Engineering or City Planning required. P.E., PTOE, and/or AICP desirable, but not required.

Sr. Transportation Engineer/Planner/Manager
Boston, Massachusetts

Due to sustained growth we seek an engineer or planner with 12+ years of experience in managing land development projects and support staff. The successful candidate will work with Principals on maintaining growth, strategic pursuits including proposal development while maintaining strong relationships with public and private clients. You will be responsible for Quality Assurance / Quality Control of key project deliverables. High-level planning and analysis work including preparation of technical documents and reports is required. Direct experience with traffic impact studies and project management is required. The successful candidate will have excellent communication, public speaking, motivational, and leadership skills. BS degree in Civil/Transportation Engineering or City Planning required. Master’s degree preferred. P.E., PTOE, and/or AICP desirable, but not required.

Traffic Engineer
Boston, Massachusetts

We are currently interviewing candidates to work in our Public Infrastructure/Traffic Engineering group. Candidates with a B.S. or M.S. in Civil Engineering/Transportation Planning would be preferred. We are looking for candidates with 2 - 5 years of related experience in all facets of traffic transportation engineering including traffic signal design, temporary traffic control plans, pavement marking/signage and traffic impact studies/traffic analysis. Experience with Synchro traffic simulation software and AutoCAD is necessary. The qualified candidates must have strong communication and management skills, be flexible, have the ability to work on multiple projects of varied complexity, possess good computer skills, and enjoy learning. Familiarity with City of Boston and MassDOT traffic analysis and design is a plus.

For Detailed Employment Opportunity Information, please visit: http://www.neite.org/employment.html

Resource Systems Group, Inc.

Transportation Planner / Engineer
White River Junction / Burlington, Vermont
Concord, New Hampshire

RSG has an immediate need for an Analyst to conduct transportation analyses and design on a broad range of projects for municipal, regional, state, and Federal clients. Typical projects include transportation master plans, transportation scoping/feasibility studies, traffic operations assessments, traffic impact studies, transportation corridor studies, bicycle and pedestrian facility studies and design, micro-simulation modeling, transportation facility design, traffic signal timing and optimization, and traffic signal design. This person shall perform drafting, design, calculations, and report writing to support roadway, sidewalk, drainage, and other transportation projects.

Senior Transportation Planner / Engineer
Burlington, Vermont

RSG is seeking a senior transportation planner/engineer to join our growing Northeast U.S. Transportation Planning and Engineering Practice. This individual will work closely with RSG’s transportation planning and engineering staff in conducting and managing transportation corridor studies, scoping/feasibility studies, traffic operations analyses, transportation master plans, micro-simulation modeling, transportation facility design efforts, and traffic impact studies. This individual will play an important role in staff management, business development, and outreach to both private sector and public sector clients, including local, regional, state, federal and institutional clients.

Transportation Project Engineer
White River Junction / Burlington, Vermont
Concord, New Hampshire

RSG has an immediate need for an Analyst to support our growing transportation planning and engineering practice in northern New England. This person will work in teams conducting transportation analyses and design on a broad range of projects for municipal, regional, state, and Federal clients. Typical projects include transportation master plans, transportation scoping/feasibility studies, traffic operations assessments, traffic impact studies, transportation corridor studies, bicycle and pedestrian facility studies and design, micro-simulation modeling, transportation facility design, traffic signal timing and optimization, and traffic signal design. This person shall perform drafting, design, calculations, and report writing to support roadway, sidewalk, drainage, and other transportation projects.

To apply for this position, please visit our employment page at http://rsginc.com/join-us. We are an equal opportunity / affirmative action employer.

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To submit Employment Opportunities, Please contact:
Samuel W. Gregorio, E.I.T.
Chronicle Editor
sgregorio@theengineeringcorp.com

http://www.neite.org/employment.html
Vanasse & Associates, Inc. (VAI), a leading full-service Traffic Engineering, Transportation Planning and Highway Design firm located in Andover, Massachusetts, has immediate openings for Traffic and Highway Engineers. VAI offers excellent opportunities for career advancement and a competitive salary and benefit package. Qualified candidates should email their resume to Ms. Dusty Beeley at dbeeley@rdva.com.

Highway Engineer
Andover, Massachusetts

Applicants with 2 to 5-years highway design experience to conduct technical analysis and prepare highway design documents. Responsibilities include field inventory, record plan research, roadway design, grading and drainage analysis and design; and preparation of construction plans, specifications and quantity and cost estimates. Candidate must possess a Bachelor of Science Degree in Civil Engineering from an accredited university and an F.E./E.I.T. certification is desired; good communication and computer skills with working knowledge of AutoCAD Civil 3D; and familiarity with MassDOT design guidelines.

Senior Highway Engineer
Andover, Massachusetts

Applicants with a minimum of 10-years highway design experience. Candidate must be able to lead design staff in the preparation of technical analysis and highway design documents for the development of highway engineering projects for both public and private sector clients. Responsibilities include project scope and budget development, project administration; all aspects of highway design; grading and drainage analysis and design; preparation of construction plans, specifications and quantity and cost estimates; and client representation at project and public meetings. Candidate must possess a Bachelor of Science Degree in Civil Engineering from an accredited university and license as a Professional Engineer; good communication and computer skills with working knowledge of AutoCAD Civil 3D; and familiarity with MassDOT design guidelines.

Traffic Engineer / Traffic Signal Designer
Andover, Massachusetts

Applicants with a minimum of 5-years traffic engineering and design experience to conduct traffic analysis and prepare traffic signal design plans. Responsibilities include traffic impact and corridor studies, traffic signal warrant analysis and traffic signal system design, including preparation of plans and written specifications. Candidate must possess a Bachelor of Science Degree in Civil Engineering from an accredited university and an F.E./E.I.T. certification or licensure as a Professional Engineer; good communication and computer skills with working knowledge of AutoCAD Civil 3D; and familiarity with MassDOT design guidelines.

Sr. Traffic Engineer / Transportation Planner
Andover, Massachusetts

Applicants with a minimum of 5-years transportation planning and traffic engineering experience to prepare Traffic Impact Assessments and Functional Design Reports, with emphasis on traffic operations analysis and traffic modeling (SrnTraffic and Vissim). Additional experience with traffic signal and roadway/intersection design is highly desirable. Candidate must possess a Bachelor of Science or Master Degree in Civil Engineering from an accredited university and licensure as a Professional Engineer; good communication and computer skills; and familiarity with MassDOT design guidelines.

Gannett Fleming is a global planning, design, and construction management firm with more than 60 offices worldwide. Founded in 1915, we have fostered a culture of service and innovation with close to 2,000 diverse and talented professionals. Consistently ranked among the nation’s most prestigious engineering firms, we provide multi-discipline engineering services, including civil, transportation, environmental, structural, and construction management. GFI is an Equal Opportunity Employer.

Highway Design Engineer
Newton, Massachusetts

Gannett Fleming’s seeking an Highway Design Engineer in our Newton, MA office. Responsibilities include: Performing engineering design tasks for roadway projects from preliminary to final design; develop plans, specifications, cost estimates, reports, and prepare final bid packages; established working relationships and contact with client technical staff and project managers; provide engineering design services on traditional design-bid-build projects and design-build highway projects; manage and mentor junior engineers on project assignments; coordinate design activities and meetings between design staff, subcontractors, and client managers; coordinate the planning, staffing, scheduling, budget management, quality control, of subcontractors and internal technical and support staff; participate in project decisions regarding technical approaches, cost and scheduling performance; lead projects and complete tasks within schedule and budget with teams comprised of different disciplines; project QA/QC; have strong written and oral communication skills and a team-oriented attitude; and assist project managers with various other tasks.

Qualifications include: A Bachelor’s Degree in Civil Engineering; P.E. registration in Massachusetts; 6-8 years of engineering experience; experience working with MassDOT required and with MBTA and MassPort is highly desired; and must be proficient and have experience with AutoCAD, Civil 3D, Microstation, Inroads and MS Office.

To Apply, please go to this link: https://careers.gannettfleming.icims.com/jobs/2404/highway-design-engineer/job

Tetra Tech

Project Manager - Transportation
Framingham, Massachusetts

Tetra Tech is currently seeking a Project Manager to join our team of traffic engineers and transportation planners that provide services for a broad spectrum of fast-paced private development projects and complex public works projects.

Primary responsibilities will include: management and execution of transportation design and planning projects; public presentations; leadership, management and mentoring of technical staff; maintaining client relationships; business development and proposal activities. The ideal candidate will have the following skills and abilities: bachelor’s degree in Civil/ Transportation Engineering; minimum of 15 years of experience; a PE and PTOE; excellent written and verbal communication skills; prior experience managing transportation projects and leading project teams; experience working in multi-disciplinary project settings; familiar with MassDOT design and permitting requirements and the MEPA regulatory process.

If you are interested in this opportunity please apply on-line at the Careers page at http://www.tetratech.com or mail resumes to Human Resources, Tetra Tech Inc., 1 Grant St, Framingham, MA 01702. Job Code: INE-ProjMgr-DVY

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Gannett Fleming, Inc.
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The New England Section Chronicle staff thanks you and we hope you enjoy the issue.

REMINDERS

Those members of the New England Section that have not updated your personal and/or business contact information recently should visit the ITE website and do so. An updated contact directory allows the Section to properly send information emails, election information, and other details such as the NEITE calendar.

http://www.ite.org

For those members of the New England Section that would like to be included on the Section email list for Google Groups, please contact Nick M. Fomenko, P.E., PTOE at BETA Group, Inc.

nfomenko@BETA-inc.com

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