CLEANER AIR, BRIGHTER FUTURE? Connecticut Demonstration and Evaluation of Hybrid Diesel-Electric Buses Seeks Answer

by

Stephen W. Warren
Assistant General Manager, Maintenance
CTTRANSIT

CTTRANSIT operates the state-subsidized bus services in the greater metro areas of Hartford, New Haven, and Stamford, Connecticut. In 2001, CTTRANSIT was planning for the replacement of older buses in the four hundred vehicle bus fleet. Aware that the standard diesel bus costs $275,000, has a life expectancy of twelve to fourteen years, and a half million miles of operation, it was clear that any vehicle purchased would be a decision to live with for a long time.

The Connecticut Academy of Science and Engineering (Academy) was hired to do a study of existing and potential bus propulsion technology to guide the right replacement decision. In the resulting February 2001 report, the Academy analyzed many options: new clean diesel, CNG, LNG, methanol, biodiesel, electric, hybrid, and fuel cell technologies. It recommended that CTTRANSIT physically test hybrid buses as well as the just-available ultra low sulfur diesel fuel and diesel particulate filters. The Academy study stated these technologies would be the most cost effective and have the greatest potential for success, until fuel cells become a viable option ten or more years into the future.

CTTRANSIT immediately converted the Stamford division fleet to operate on ultra low sulfur diesel and equipped thirty-two buses with the latest filter technology. The results were startling: emissions were cut by ninety percent. The fuel and filters immediately eliminated any black smoke coming from the tailpipe. This strategy was clearly a great success.

So could hybrid technology, with the potential for reduced emissions and improved fuel economy, be the bus propulsion system of the future for CTTRANSIT? That question is being addressed by a unique eighteen-month study underway since July 2003. Project goals are to identify a vehicle that is cost-effective, reliable, produces fewer emissions, and operates with improved fuel economy when compared to the standard heavy-duty diesel powered bus.

CTTRANSIT went out to bid for two hybrid diesel-electric buses and accepted a proposal to join the General Motors Allison Electric Drive Preview program using their hybrid system installed in two New Flyer low floor buses. We were one of only five transit systems in the country selected to receive and test this new technology.

During the year and a half that it took to produce the hybrid buses grant funding was obtained to pay for the test program, program partners were lined up, and a test protocol was developed. The eight program partners – the University of Connecticut, the Connecticut Academy of Science and Engineering, Allison Electric Drive, New Flyer...
Our first year as the new editorial team for the New England Chronicle has been both challenging and rewarding, and we are looking forward to another exciting year. We would like to thank all those individuals who contributed to the Chronicle in spite of their busy schedules; we could not have done it without your help and support. Hence, you have helped make this year a successful one.

As we march forward to next year’s editions of the Chronicle we are looking for ways to improve and enhance the newsletter. At this time, we are considering offering the following new topics in the Chronicle:

- **Feature Projects**: This section will feature pictures and drawings of interesting projects relating to a particular theme, which will vary with each edition. Examples of potential themes include: roundabouts, multi-span bridges, and pedestrian enhancements. We encourage all members to submit projects related to the proposed themes for inclusion in the upcoming issues of the Chronicle. A list of project themes for 2005 will be provided in the March 2005 edition of the Chronicle. If you have an idea for a project theme you would like to see included please contact the editorial team via christinep@crossmaneng.com.

- **Where Are They Now?**: For this section, we will track down and report on the current activities of previous award winners, such as the ITE Engineer of the Year or Thomas E. Desjardin Memorial Scholarship recipients.

- **Transportation Shorts**: This section will include interesting fun facts, humorous essays, cartoons, etc. related to transportation.

The editorial team strongly believes that the success of any organization requires the involvement of its members. One of our goals for next year is to encourage all ITE members to become more involved in this worthwhile professional organization; providing information for the Chronicle is one way of becoming an active participant. The deadline for articles and information to be included in the March 2005 edition of the Chronicle is February 14, 2005. Make it one of your New Year’s resolutions to become more involved in ITE.

The Chronicle Team wishes all members and their families a safe and prosperous New Year!

**Chronicle Team**

Christine Ann Palmer  
Kien Ho  
Jenn Hupp  
Alan Cloutier
Bus, the East Coast Hybrid Consortium, the Connecticut Department of Transportation Bureaus of Public Transportation and of Research, and Horiba Instruments – each brought special expertise to the project.

The final budget included $1,275,513 from the FHWA and $100,000 from the East Coast Hybrid Consortium. The two buses cost $500,000 each, which left approximately $375,000 for equipment, university assistants and faculty consultation for the eighteen-month test period. The two hybrid buses were delivered in June 2003. Following a dedication ceremony they were put into revenue service and testing officially began on July 1, 2003.

The buses purchased by CTTRANSIT utilize a parallel hybrid design providing high extended speed and steep grade capabilities. It has a highly tuned internal combustion engine paired with a generator, storage batteries, and two electric motors. Electronics control power to the drive wheels, and the variations of operating with only the direct drive from the engine and transmission, just the drive from the two electric motors, or a blend of the two. Advanced nickel metal hydride batteries are utilized as they weigh less, take up only a third of the space of standard lead acid batteries, and have a projected life of six years with no maintenance required. The batteries are recharged by a combination of the generator and by what is called brake regen. When the bus driver applies the brakes, the electric motors are instantaneously reversed to act as generators with the electrical resistance providing braking and recovering the bus inertia energy that would otherwise be lost as heat though conventional friction brakes.

The test protocol called for comparing the two hybrid buses against two identical new diesel buses using #1 diesel for several months, then switching to ultra low sulfur diesel for the next few months, and finally adding a diesel particulate filter to the four test buses for the final months in the project. Three Hartford area bus routes with different characteristics were selected for operation of the test buses. The E-Farmington Avenue route is a slow speed, frequent stop-and-go operation. The Enfield express route is a high-speed service with few stops originating at a suburban Park and Ride lot and traveling on the highway to downtown. The third route selected, the Avon express, combines both high and slow speeds, as well as a very steep grade over Avon Mountain. Each hybrid bus is trailed in revenue service by the standard diesel test bus to insure they drive the same routes and that fuel consumption could be tracked and fairly compared. The cost of maintaining all the vehicles was also closely documented so that a life cycle cost could be estimated at the end of the project.

The most unique feature of the Connecticut study includes a monthly in-vehicle mobile emission test of each project bus. Previously, emission tests were done on a chassis or engine dynamometer that can only simulate real world conditions. The EPA is transitioning from dynamometer to mobile testing because they have found the dynamometer tests do not accurately document the results. An example of this inaccuracy is the new Toyota Prius hybrid automobile, recently in the news. The engine dynamometer tests printed on the car’s sticker showed much better fuel economy than most people actually achieved. In real world operation the fuel economy was excellent, but not as good as the dynamometer predicted. Mobile testing would have given an accurate fuel economy expectation for the vehicle.

Doing mobile emissions testing is extremely difficult. Until recently the test equipment was not available to make this a viable alternative. CTTRANSIT purchased the second Horiba Instruments 1000 portable gas sampling unit that came off the assembly line. The EPA obtained the first unit, which measures Carbon Monoxide (CO), Carbon Dioxide (CO₂), Nitrous Oxide (Nox), and Unburned Hydrocarbons (UHC). The unit also has a built-in GPS function that documents vehicle speed, location and altitude. Other features include measurement of ambient pressure, temperature, humidity and exhaust flow rate, pressure and temperature. Last, but not least, CTTRANSIT is also measuring Particulate Matter (PM) both in mass and particle size using two mini-dilution tunnels and Scanning Mobility Particle Sizer (SMPS) and Electrical Low Pressure Impactor (ELPI) equipment.

All of this apparatus takes a lot of electrical power and clean compressed air to operate, which could not come from the bus, as it would adversely affect the test results. To solve the problem a small trailer was purchased from Home Depot and an auxiliary electrical generator and compressor were installed on it. The electrical power and compressed air lines run from the trailer into the bus through the roof ventilation hatch.

Although the hybrid buses began service in July, all the emissions testing equipment was not delivered and operational until later in 2003. Special vibration dampers had to be built so the sensitive laboratory-grade equipment
could operate in the bumpy bus environment. Mobile emissions testing began and was debugged in January and February 2004. It was a challenge to get all the test instruments working together with an exact second-by-second timing mark so that the data could be aligned for analysis at any point in time in the bus run. The equipment is all operated by University of Connecticut graduate students, under the direct supervision of professors who are experts in the combustion technology and nano particle fields.

The emissions tests on #1 diesel were gathered in the first four months 2004. As outlined in the test protocol, the buses then were changed to ultra low sulfur fuel, and just recently they were outfitted with diesel particulate filters. Data collection will be complete by the end of this year and data analysis and a final report will be compiled by the spring of 2005. Preliminary study results show the hybrid buses getting five percent to fifteen percent better fuel economy than their comparable brand new clean diesel technology buses. This figure increases to over thirty-five percent better fuel economy when compared to the overall CTTRANSIT bus fleet, which admittedly includes some older, less efficient, vehicles. Would the addition of hybrid diesel-electric buses result in cleaner air in Connecticut? It is too soon to come to any conclusions yet about the bus emissions. However, if the hybrids burn five percent to fifteen percent less fuel one would expect to see a corresponding decrease in emissions as well.

The hybrid buses cost about the same to operate as a standard diesel bus. For a technology “right out of the box” the hybrid buses have run extremely well and have proven to be as reliable as a new standard diesel bus. There have been very few hybrid design-related problems and no problems at all with the nickel metal hydride batteries. Life cycle costing is in process. Preliminary analysis shows that there will need to be a significant reduction in the hybrid bus purchase price to put it in the ballpark with the life cycle cost of a clean diesel bus. The hybrid bus sticker price should come down, however, as production volume of this new vehicle increases over time.

The Connecticut demonstration project of hybrid bus technology, combining a unique mobile testing capability and comparisons of in-service operational data, is providing evidence to support earlier study recommendations guiding vehicle acquisition planning. With the cost of oil at $55.00 a barrel at the time of this writing, it appears that hybrid technology just may well be the recommended bus propulsion system for the near future for CTTRANSIT.
Old Town, Maine, just north of Bangor, has recently installed a LaneLight crosswalk system as part of a study on LED in-pavement systems.

“These installations are the first of their kind in the state of Maine. A different vendor was chosen for each of three locations. We will be doing an assessment and comparison of the three systems based on cost, ease of installation, durability, performance (especially in Maine winter conditions), ease of working with the vendor (i.e. customer service), and driver responsiveness, based on before and after studies. A university of Maine Transportation Engineering professor is conducting the before and after studies to assess driver responsiveness,” states Sandi Duschesne, P.E., Transportation Engineer, BACTS.

Many cities in snowy regions of the United States have chosen LaneLight – including Manassas and Norfolk Virginia; Rockville, Maryland; Philadelphia, Pennsylvania; and Battle Creek, Michigan – due to their fully daytime-visible light output of over 1.35 million candela/square meter, durable snowplowable housings, and reliable maintenance-free use.

About BACTS

BACTS is the Bangor Area Comprehensive Transportation System. It is the organization designated by the federal Maine state governments to carry out transportation planning in the Greater Bangor urbanized area. The BACTS area includes Bangor, Brewer, Veazie, and the major portions of Hampden, Orono, and Old Town. BACTS evaluates and approves proposed transportation improvement projects and facilitates communication between its member communities and state and federal transportation agencies. It provides opportunities for public participation in both transportation planning and funding decisions. It also sponsors and conducts studies to assist in the transportation planning process.

About LaneLight LED In-Pavement Markers

LaneLight systems were introduced unto the United States in late 2003 and are represented exclusively by ITEM Ltd. and its distribution network throughout North and South America. The LED modules are designated and manufactured in Austria by Swarco Futurit, an established manufacturer of high-quality polycarbonate signal heads for road and rail as well as a leading producer of fiber-optic and LED variable message signs and a supplier of related components. The wiring and controllers were designed by ITEM and are made in the United States.

For more information on LaneLight LED in-pavement systems and installations please visit www.lanelight.com.
MEMBERSHIP COMMITTEE

Between May 31st and August 31st there was an increase of 28 new members bringing the total New England membership to 790. Approximately 85% (668) are voting members.

New England Institute of Transportation Engineers (NEITE) Membership Summary

(As of August 31, 2004)

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Institute Affiliate: 4 1 5 1 3 1 15
Institute Affiliate Retired: 0 0 0 0 0 0 0
Esteemed Colleague: 5 7 10 3 6 9 40

Total Non-voting Members: 24 8 56 5 10 19 122
Total Voting/Non-voting Membership: 668 + 122 = 790

Happy Thanksgiving!
CONTINUING EDUCATION COMMITTEE

In the last few months the Continuing Education Committee has been quite busy. NEITE presented two training courses in September and we are planning another for the Annual Meeting in December. A PTOE Refresher Course was held in Manchester, Connecticut, in mid-September. The refresher course was attended by thirteen professionals and taught by Ken Petraglia, Kim Hazarvartian, and Gary Hebert, all PTOEs themselves.

At the NE/MAITE joint meeting in Waltham, Massachusetts a Traffic Signal Clearance Interval training course was held. This 2-hour course focused on the timing of clearance intervals and the various techniques used for calculation of the yellow, all red, and pedestrian clearance intervals and dilemma zones. Michael Knodler of UMass Amherst instructed the course which was attended by twenty-five people. This was the first training course developed by ITE as part of the Professional Development program presented locally by NEITE, and we look forward to presenting others in the future.

Earlier this year the State of New York Higher Education Department mandated the attainment of professional development hours (PDHs) for license renewal for New York registered Professional Engineers. The state’s criteria for acquiring PDHs are more specific and stringent than the criteria established for PE licenses issued by the states of New Hampshire and Maine and PTOE certification. In response to the need to provide PDHs for New York licensed engineers, ITE has recently become certified by the International Association for Continuing Education and Training, which satisfies the state’s requirements to provide PDHs through ITE’s workshops and courses. Currently, this certification applies only to programs developed and presented by ITE International, but we hope this certification can be expanded to cover district, section, and chapter programs in the near future. In the meantime NEITE will attempt to have our training courses approved by ITE, and accepted by New York, on a case-by-case basis.

An all day workshop on Accessibility will be held at the NEITE Annual Meeting Monday, December 6, 2004 in Warwick, Rhode Island. The course was developed and will be presented by the United States Access Board. The Access Board is an independent federal agency devoted to accessibility for people with disabilities, and its responsibilities include developing and maintaining accessibility requirements, providing technical assistance and training, and enforcing accessibility standards. Lois Thibault, a nationally recognized authority on accessibility issues, will be the instructor for this workshop. The workshop will begin with an overview of the federal ruling creating the accessibility requirements, the Americans with Disabilities Act (ADA) of 1990, discuss the ADA’s applicability to transportation facilities, and conclude with some design examples and case studies. All of the participants are encouraged to bring plans of projects that they are working on, as well as specific questions regarding their projects. Participants at this workshop will receive a certificate for 6 PDHs. Details and registration information for the workshop are included in this issue of the Chronicle and on the NEITE website at www.neite.org.

For information on NEITE training courses, please contact John Mirabito, P.E., PTOE, Continuing Education Committee Chair at mmirabito@festo.com or (781) 221-1126.

TECHNICAL COMMITTEE

The Technical Committee has completed its literature review. Each document was reviewed by at least one committee member and the relevant features were summarized for the committee’s review. We then identified features from each document that would be appropriate for our application. Examples of features considered included locater tones, pavement/curb treatment and audible crossing devices. We are currently making arrangements to invite a mobility specialist to one of our meetings to review our list of features for comment before we finalize selections. We also hope to have the mobility specialist set up a demonstration, with committee participants being blindfolded to simulate visual impairments. This demonstration should heighten our sensitivity to the needs of the visually impaired. Our next meeting will be scheduled to meet the schedule of the mobility specialist.

PUBLIC RELATIONS COMMITTEE

The Public Relations Committee has been busy becoming a committee over the past few months and since we last wrote in the Chronicle. We have prepared two draft versions of the soon to be released NEITE Directory and coordinated with the local media on NEITE sponsored events. The NEITE Directory was last updated in 1994 and was long overdue for “brand upgrade” and revamping of the directory information. The Committee has been supported by the Executive Board with comments and suggestions for the Directory. Once final reviews of the Directory are completed by the Board, copies of the Directory will be made available in time for the Annual Meeting in December. The Directory is intended to become a downloadable document on the NEITE website for ease of use by members and potential members rather than a document that must be printed.

Be sure to visit the NEITE website for an announcement on the Directory and look for copies at the Annual Meeting. An upcoming article in the Chronicle will detail the information in the Directory as well.

For more information on the NEITE Public Relations Committee or more importantly, if you have ideas and want to become part of the committee, please contact Joe Balskus, P.E., PTOE, Public Relations Committee Chair at jbalskus@fanto.com or (203) 374-13748, Ext. 3509.
**Young Professionals Group**

The NEITE Young Professionals Group (YPG) was very active during the spring season of this year. The first event hosted by the YPG was a technical session at the Connecticut chapter meeting held in East Hartford, Connecticut. The topic of the technical session was “Traffic Impact Studies,” and was presented by Kim Hazavarian. The session was attended by approximately thirty people. The YPG thanks Kim for a great presentation.

In late April, the YPG co-sponsored a tour of the “Big Dig” Traffic Operations Center (TOC) with the ASCE younger members groups from Vermont, New Hampshire, Maine, and Massachusetts. The one-and-a-half hour tour introduced the group to the vast array of technology being deployed as part of the multi-billion dollar Central Artery/Tunnel project. The members of the tour took the opportunity to ask many insightful questions, which were masterfully answered by members of the TOC staff. The tour was followed up with a social meeting at the Rock Bottom Brewery in downtown Boston. A good time was had by all.

With the help of Raghu Dharmaraju and the District 1 Annual Meeting Committee the YPG was able to sponsor a technical session at the District 1 Annual Meeting held in Burlington, Vermont. The technical session was a Hot Topic Roundtable discussion of some of the most important issues facing transportation professionals today. The YPG wishes to thank the District 1 Annual Meeting Committee, Raghu, and the speakers that participated in the session for the opportunity to sponsor such an event.

**The next YPG Event:**

**Monday December 6, 2004**

**New England Section Annual Meeting**

**Warwick, Rhode Island**

**YPG Meeting 4:30 PM – 5:00 PM**

The Young Professionals Group is comprised of NEITE members with five years or less of professional experience. The goal of the group is to provide a mechanism for establishing a network of contacts for younger members entering the transportation engineering field. For more information on the Young Professionals Group, to sign up for the YPG e-mail list, or to suggest an activity, visit the YPG webpage at www.neite.org/committees/YPG/.

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**2004 District 1 Annual Meeting**

The 2004 ITE District-1 Annual Meeting was held on the shores of Lake Champlain in Burlington, Vermont from May 19th to 21st. Wyndham Hotel, the meeting venue located in downtown Burlington, provided visitors easy access to both the waterfront and the quaint Church Street Marketplace. The conference was a huge success attracting 146 registrants including twenty students and a number of attendees representing the fifteen vendors. The event also attracted record sponsorship – five gold, twenty-one silver and three bronze.

The event started Wednesday afternoon with a bike tour on Lake Champlain and a free FHWA course on human factors. The very well attended Welcoming Reception at the ECHO Center against the picture-perfect backdrop of a golden sunset on Lake Champlain set the tone for the rest of the conference. Participants, enjoying the vista from the ECHO Center’s deck on the lake, agreed there could not have been a better beginning to the conference.

In a departure from tradition, Thursday began with a sit-down breakfast meeting with the ITE International Vice-Presidential candidates. The eight technical sessions, conducted Thursday and Friday, focused on the conference theme: Safe-T for all Seasons. The conference technical committee ensured a wide variety of presentation topics by reaching out to potential presenters early and enabling online abstract submission via the conference website. Financial support was made available for student presenters and that ensured their participation in record numbers – fifteen of the technical presentations were by students from five universities. All the conference presentations and papers were made available to participants on a compendium CD as well as on the conference website.

ITE International President, Steve Hofener spoke to the conference attendees during the Annual Luncheon. Thursday also included a tour of Shelburne Museum conducted for the companions of conference attendees. Thursday late afternoon saw teams wearing bright orange safety hats and vests battle in the ever-popular Traffic Bowl. Thursday evening brought the highlight of the conference – the Annual Banquet and Awards Ceremony held aboard the cruise ship, Spirit of Ethan Allen III, on the lake. A roving magician provided the entertainment while the attendees enjoyed their dinner and views of the lake and Adirondack Mountains. The evening provided another opportunity for the attendees to socialize and mingle. After two technical sessions Friday morning, the conference ended with the hot-topic roundtable, in which about forty-five participants discussed various transportation issues.

The conference owed its success to a great deal of time and effort put in by the Local Arrangements Committee (LAC). The LAC consisted of David Scott, Joe Segale, Susan Smichenko, Roger Dickinson and Raghu Dharmaraju. The LAC received considerable support from many volunteers and the New England Section. The conference was informative, entertaining and informal. All in all it was a great success.
-On September 14, 2004, the New Hampshire Chapter organized a fall meeting at the New Hampshire Department of Transportation (NHDOT) to view a live webinar (web-based seminar), sponsored by ASCE. The webinar was entitled, “Pedestrian Crossing Treatments” and drew a crowd of approximately forty consultants and municipal and agency representatives. The New Hampshire Chapter decided to hold this lunchtime meeting at NHDOT to encourage more agency participation. Bill Lambert, Administrator of the NHDOT Bureau of Traffic, was instrumental in organizing this event in NHDOT’s new conference room.

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The Maine ITE Chapter held its fall meeting in Auburn on October 28, 2004. Approximately twenty members attended the technical sessions, business meeting and luncheon. The morning session was devoted to the November release of the Third Edition of the ITE Parking Generation. Kevin Hooper, Technical Editor for the document, provided a sneak preview of its expanded contents, improved approach toward data analysis, and enhanced data summaries and data plots. In the afternoon session, Tom Errico (Wilbur Smith Associates) and Don Craig (Androscoggin Transportation Resource Center) presented an overview of the Lewiston-Auburn Downtown Connector and Turnpike Interchange Feasibility Study. At the business meeting, tentative dates were set for upcoming meetings of the chapter: January in Portland and March in Bangor or Orono.

The Vermont ITE Chapter is currently planning for its joint meeting with the NEITE Board of Directors on January 25, 2005. The meeting will be held at the Vermont Agency of Transportation in Montpelier. The NEITE Board will meet in the morning followed by lunch and a technical program in the afternoon. Additional information will be available later this fall. Please save the date!

The January 2005 event is also the annual meeting for the Vermont Chapter. New executive board members will be elected. Current nominations include: Roger Dickinson, P.E., PTOE, Lamoureux and Dickinson, for President; Susan Smichenko, P.E., Chittenden County MPO for Vice President; and Raghu Dharmaraju, Vermont Agency of Transportation for Secretary/Treasurer. Joe Segale, P.E., Resource Systems Group, Inc. will remain on the executive board as the immediate past President. Nominations for the at-large position are being sought. The at-large position provides an opportunity for new members to become active in the Vermont Chapter while learning from the current slate of executive board members. Nominations for all positions are encouraged and are due by November 30, 2004. Please contact Joe Segale at 802-383-0118 or jsegale@rsginc.com for additional information.

The Connecticut Chapter held a lunch meeting on Tuesday, October 19, 2004 at the State Capitol in Hartford to discuss transportation Issues facing Connecticut. A diverse panel of transportation experts representing the Federal Highway Administration, municipalities, the Department of Transportation, the Strategy Board, and legislative perspectives was assembled and the discussion proved to be informative. The panel collectively discussed congestion, financial constraints, and the aging infrastructure concluding that there are a few solutions: preserving and maintaining the existing infrastructure, improving mobility through the use of incident management strategies and management of traffic systems, reviewing land use and how it relates to transportation, and working toward changing cultural thinking and attitudes related to travel.

The next Chapter meeting will be a joint meeting with ITS, planned for January 20, 2005.

Officer News: The Connecticut Chapter congratulates Tim Sorenson, P.E. (Vice President) who relocated to Wilbur Smith’s Kentucky office over the summer. We welcome Carla Tillery from Fitzgerald & Halliday (previously Secretary/Treasurer) to the position of Vice President and Roger Krahn, P.E. from URS Corporation to the position of Secretary/Treasurer.

Send your Chapter information and announcements for the next edition of the Chronicle to: KHO@BETA-INC.COM
OR
CHRISTINEP@CROSSMANENG.COM
The Massachusetts Chapter September meeting was held on September 23, 2004. There were many more attendees than had been anticipated for both the afternoon technical sessions and the evening dinner meeting. Approximately ninety-nine members attended the dinner meeting, twenty-three people participated in the class, and approximately eighty people attended the technical sessions.

The New England Institute of Transportation Engineers (NEITE) had a lunchtime Board of Directors meeting to discuss the section’s business matters.

The events began at noon with Mike Knodler, from UMass Amherst, teaching the Traffic Signal Clearance Interval course. This class was approximately two hours long. Mike was an excellent instructor and the material he presented was clear and concise. He relayed to his students the standard practice for calculating the clearance interval time as well as how other jurisdictions (outside Massachusetts) calculate the clearance interval. The classroom lecture generated some discussion and healthy dialogue as to these practices.

The technical sessions began at 2:30 PM and the general theme was traffic and traffic management in the large urban setting of Boston. The first speaker was John Mirabito, P.E., PTOE, an associate of Fay, Spofford, and Thorndike, LLC. John spoke on the countdown pedestrian signals study that was undertaken by the NEITE Technical Committee, at the request of the Boston Transportation Department. This study included a before and after analysis of pedestrian safety at three locations in Boston, where traditional pedestrian signal heads were replaced by countdown pedestrian signal heads. John and Ken Petraglia, chairperson of the Technical Committee, expressed that perhaps the most telling result of the study was that many lay people do not know what the flashing “Don’t Walk” signal command means.

The second speaker for the technical sessions was Bill Bent, the State Traffic Engineer from MassHighway, who spoke on the planning for the Democratic National Convention (DNC). Bill discussed the planned shutdown of transportation facilities surrounding the Fleet Center to ensure the safety and security of the people attending the DNC, a possible target of terrorists according the United States
Department of Homeland Security. Bill worked with the Secret Service and many other agencies to develop a plan. The plan ultimately involved shutting down Interstate 93 (the Central Artery) at exits prior to the Fleet Center at certain times of the day for a one week period, and not allowing trains to arrive at North Station, which is next to the Fleet Center. Much publicity was generated about the plan prior to the convention, and surveys by MassHighway showed a marked decrease in traffic on Interstate 93. The plan was very successful and many commuters to Boston found alternate routes, alternate modes of transportation, or decided to stay out of Boston and vacation for the week. The keynote speaker was John Cogliano, MassHighway Commissioner, who discussed in detail the challenges and opportunities of the new Executive Office of Transportation. One of his key points was that it is a great time to be in the transportation field.

In addition to the speakers and technical sessions, awards were presented.

Michael Seluga, a student member of ITE and ASCE, receives the Thomas E. Desjardins Memorial Scholarship award from Rod Emery. Michael is an undergraduate student at Northeastern University, currently working towards his BS in Civil Engineering.

The evening concluded with a dinner meeting attended by nearly one hundred people.
New England Chronicle

Public Rights-of-Way Accessibility Workshop

A One-Day Workshop for Engineers, Planners and Public Officials.

The course was developed by the US Access Board. The Access Board is an independent Federal agency devoted to accessibility for people with disabilities. Its responsibilities include developing and maintaining accessibility requirements, providing technical assistance and training, and enforcing accessibility standards.

WORKSHOP CONTENT
The workshop will begin with an overview of the Americans with Disabilities Act (ADA) of 1990, discuss the ADA’s applicability to transportation facilities, and conclude with some design examples and case studies. Participants are encouraged to bring plans of projects that they are working on as well as specific questions regarding their projects.

INSTRUCTOR

DATE AND LOCATION
ITE New England Section Annual Meeting
Date: Monday, December 6, 2004
Time: 9:00 AM - 4:15 PM
Location: Crowne Plaza Hotel, Warwick, RI

CONTINUING EDUCATION
Six professional development hours (PDHs) will be awarded to workshop participants.

FEE
The fee for this workshop is $150 and includes lunch and dinner at the NEITE Annual Meeting.

REGISTRATION
To register for this workshop, please contact:
Ocean State Signal Company
27 Thurber Boulevard
Smithfield, RI 02917
Phone: (401) 231-6780
Fax: (401) 431-4930
Email: suemc@oceanstatesignal.com

Make checks payable to:
NEITE

Space is limited.
For more information visit our website at www.neite.org

To register complete information below and return.

Name
Company
Telephone Number

Dinner Choice:  Beef _____ Scrod _____ Cheese Tortellini _____

Please bring a gift or bottle for the door prize raffle.
November 2004

For comments, or to make a submission to the Agency Corner, please contact Kien Ho at kho@beta-inc.com or at (781) 255-1982, or Christine Ann Palmer at christinep@crossmaneng.com or (401) 738-5660.

**NEW HAMPSHIRE**

Rapid Bridge Replacement Project in Epping Completed in Just Eight Days

It is not enough time to get into shape, lose ten pounds or grow a new lawn. But eight days was all it took to put a new 120-foot long bridge in place over the Lamprey River in Epping and open it to traffic this past summer. The planning for the bridge rapid-construction initiative took months of planning and only days to execute. “I’m ecstatic, extremely happy,” was the reaction of NHDOT Project Engineer Peter Stammas (Bridge Design) as he reflected on how the construction project went. “I don’t think it could have gone any smoother for the first time. It was very successful.” Fast tracking what is normally a four to six month project to eight days was made possible through the use of precast, prestressed High Performance Concrete (HPC) components as a means of minimizing traffic delays and improving worker safety. “In many ways it’s really like a giant erector set,” Stammas says. “Everything is pre-made at a concrete casting facility, then shipped to the bridge site, assembled, and the reinforced connections grouted and sealed. Good communication is essential to make it go smoothly.” Only a handful of similar bridge replacement projects have been completed throughout the country, and this one is unique because it is totally precast concrete, including the substructures and footings. Stammas says this fast-track bridge replacement approach is more costly (twenty to twenty-five percent or more depending on the site), but calls it “another tool in the bag” that can be used effectively for certain projects, such as those which would require lengthy traffic detours or temporary bridges to maintain traffic. He adds that the higher initial project costs should be compared to the savings by a shorter construction period to evaluate whether the higher additional cost is worth it. R.M. Piper, Inc. of Plymouth, New Hampshire was the general contractor for the $1,047,000 project. (Check out the project website and webcam at http://webster.state.nh.us/dot/bridgecam/index.php)

**VERMONT**

Chittenden County Circumferential Highway

When completed, the Chittenden County Circumferential Highway (CCCH) will be a 15.8-mile long, limited access, two-lane, two-way highway with climbing lanes constructed on a four-lane right-of-way. Its purpose is to intercept and redistribute traffic among the arterial routes serving the Burlington, Vermont area from the north and east; promoting efficient use of existing radial highway capacity. In 1982, Congress established the project with $50 million in demonstration funds. The project became the responsibility of the State of Vermont when the Legislature accepted the highway as part of the state highway system in 1986. The first sections of highway to be constructed were opened to traffic in October 1993. The Susie Wilson Road relocation and about four miles of highway between VT Routes 117 and 2A in Essex are now in service. Landscaping contracts for those sections of highway were completed in the fall of 1995, as well as a wetland mitigation construction project. Environmental review and highway location planning was completed with the publication of the Environmental Impact Statement (EIS) in August 1986. Initial design of the entire highway has been completed and right-of-way has been acquired between and including the Interstate 89 interchanges in Williston and Colchester. In July 2004 the Vermont Agency of Transportation (VTrans) began new environmental studies for the proposed Sections A-B of the CCCH project, which would run from a new interchange with I-89 in Williston to the CCCH’s existing interchange with Vermont Route 117 in Essex. These environmental studies will be a new draft EIS. This is the highest level of environmental review for any transportation project. Sections G-J of the CCCH (which would run from the CCCH’s existing interchange with Vermont Route 2A in Essex to a point near the existing Heineberg Bridge between Burlington and Colchester) are a separate project and will be reanalyzed in the future. The EIS will identify and study alternatives as well as direct and indirect environmental impacts of the project. The new EIS will analyze historic, cultural and environmental resources in the study area. This study will address issues raised in the CCCH litigation. “The new EIS study will meet both the letter and spirit of the environmental law that governs this process,” said Transportation Secretary Patricia McDonald. Our goal is to involve the public in the process, and develop a transportation project for the people of Vermont that uses state of the art treatment methods that can actually help improve the condition of the waters in the study area.” The CCCH study is being conducted by VTrans as the sponsoring agency and the Federal Highway Administration (FHWA) as the lead federal agency, with support from the Chittenden County Metropolitan Planning Organization, the Chittenden County Regional Planning Commission, and the towns of Essex, and Williston and other communities in Chittenden County. In addition several state and federal review, resource and regulatory agencies are cooperating in the study.

**MAINE**

Watch out for moose!

Over 700 crashes with moose occur each year in Maine, resulting in several fatalities and about 200 injuries. With moose weighing up to 1500 pounds and 10 feet tall, collisions often knock their thin legs out and cause the moose to crush a vehicle’s passenger compartment.


Winter Driving Tips

To help prepare drivers for the winter driving season, the Connecticut Department of Transportation suggests the following driving tips:

**Time** – Give yourself plenty of extra time for getting to your destination.

**Vision** – Take the time to clear all windows of snow, ice or fog before starting out. Also clear any snow off the hood.

**Lights** – Even though you can see, drive with low-beam headlights in fog and winter murk. Keep all lenses free of dirt by wiping them periodically.

**Tires** – Be sure your tires have adequate tread for traction in snow and to reduce the risk of hydroplaning in rain or puddles on the road. Keep tires adequately inflated. Keep in mind that every time the temperature drops by 10º F, the tire air pressure goes down about one pound per square inch.

**Ice/Freezing Rain** – At 30º F ice is twice as slippery as it is at 0º F. It also forms first and lasts longer on bridges and in the shade. If you hit an unexpected patch, do not try to brake, accelerate or downshift. Let up on your accelerator and let your vehicle “roll” through the slippery area.

**Skidding** – If you go into a skid, act quickly by taking your foot off the accelerator. Keep your foot off the brake and steer in the direction the rear of the vehicle is skidding. Hold the steering wheel firmly, but don’t make large turns. Use a light touch to correct the swerve.

**Braking** – Your owner’s manual will usually recommend the braking technique most effective for your car. For front and rear wheel drive vehicles with disc or drum brakes the National Safety council recommends the following procedure: Squeeze your brakes with a slow, steady pressure until just before they lock. When you feel them start to lock, ease off until your wheels are rolling; then squeeze again.

**Following Distance** – Maintain at least three times the normal following distance on snow or ice. If you are being followed too closely, maintain an extra distance behind the vehicle ahead so that you can slow down or brake gradually. Be prepared to adjust speed and/or stop to avoid colliding with the vehicle in front of you. Plan ahead when approaching intersections so that braking can be done smoothly.

**Stay on the Beaten Path** – Stay in line when traveling to or from a snow zone. Do not blaze your own trail, especially going downhill.

**Safety Belts and Child Safety Seats** – In addition to keeping you in the vehicle during a collision, they will also keep you and your child from being thrown around inside your vehicle should you go into a skid or hit an object. Use safety belts and child safety seats at all times - it’s the law!

**Deer** – Bad weather can cause deer to be on the move. Be particularly alert when traveling in known areas of deer migration. When you see deer or other animals ahead, slow down and be prepared to stop until you are safely past them. A good defensive driving technique is to try to avoid animals if possible; however, do not swerve into the on-coming lane and risk a head-on collision, or run off the road and risk hitting another object.

**Dead Batteries** – When jumping batteries connect one cable to the (+) terminal of each battery. Then connect one end of the second cable to the (-) terminal of the booster battery and the other end to a nut or bolt on the engine. Do not connect it to the (-) of the discharge battery. Start the engine of the helper vehicle and let it run a few minutes, then start the disabled vehicle engine. Remove cables in the exact REVERSE order.

**Walking on Ice or Snow** – After being in a warm vehicle, the soles of shoes or boots are warm enough to melt snow or ice, creating a film of water between the sole and the snow or ice surface. Be especially cautious for the first five minutes after leaving the vehicle. When walking on snow or ice, use short steps and keep your hands out of your pockets. These factors will help you maintain your balance. If you do fall, tuck your arms close to your body and roll with the fall.

**Stay Clear of Plows and Sanders** – Watch out for these vehicles as you round corners, curbs, etc. They do not travel at a high speed; therefore, you’ll tend to come up on them quickly. Slow down. Plows and sanders will pull over periodically to let traffic pass. It is risky to pass on the left of a snowplow because of blowing snow. Never pass on the right. Flying rocks can damage your car if you pass a sander. The best advice is to stay three car lengths behind plows and sanders.

MassHighway Unveils New Sound Barrier Policy

Transportation Secretary Daniel A. Grabauskas and MassHighway Commissioner John Cogliano recently announced a new sound barrier construction policy to address the concerns of neighborhoods affected by noise from adjacent highways. The new policy calls for at least two “Type II” sound barriers to be advertised for construction each year. “Being a good neighbor, in part, means limiting the impact you have on the people next door,” said Secretary Grabauskas. “This new policy is a good-faith effort to try to minimize highway noise for homes and residents that abut certain highways.” Sound barriers are typically classified into two types - Type I barriers and Type II barriers. Type I barriers deal with projects that widen a roadway or add vehicle capacity. In the case of Type I barriers, if a certain decibel threshold is exceeded and the barrier is determined to be reasonable and feasible, then it must be constructed by MassHighway. Type II barriers are constructed on a voluntary basis by the Highway Department. In 1989, a list was compiled of fifty-three priority locations for these Type II barriers. In the fifteen years since then, only four of these voluntary barriers have been constructed by the state. “Projects on the Type II list have moved with a speed akin to a glacier, much to the frustration of communities adjacent to
Rhode Island

New Technology Helps RIDOT Increase Safety for Bike Path Users and Motorists

The Rhode Island Department of Transportation (RIDOT) has adopted Cross Alert system, an innovative traffic safety technology invented by a Warwick, Rhode Island company, to help motorists and bike path users coexist safely. "We're pleased to take advantage of this new technology by providing another safety measure for bicycle and pedestrian traffic," said RIDOT Director James R. Capaldi, P.E. "This system will provide another set of eyes for both the motorists and the users of the path, by telling the motorists to proceed with caution, and telling path users to stop." The Cross Alert system features a red LED (light emitting diode) light and stop sign that are presented to bike path users and a yellow LED light and warning sign that are presented to motor vehicle traffic. The system is activated when users of the path pass through an infrared motion sensor. When the sensor detects motion on the path, the companion sign on the other side of the road is activated through a radio signal. Solar powered, the system is backed up by battery power. Systems have been installed on the East Bay Bike Path at the intersection of Franklin Street in Warren, and at the intersection of Child Street in Warren. Two additional systems were at the Coventry Greenway and the intersection of Route 117 in Coventry, and the South County Bike Path and the intersection of Route 108 and Railroad Street in South Kingstown. "We have selected these four locations as test sites," added Capaldi. "We're hoping to obtain feedback from path users to determine its effectiveness before we install the system in other locations.

2005 District 1 Annual Meeting Returns To Met Section

The 2005 ITE District 1 Annual Meeting, which will be held on May 2nd to 5th, returns to the Met Section of New York and New Jersey at the Madison Hotel in Morristown, New Jersey. Social/companion activities being considered include a tour of some of the historic homes in the Morristown area or a tour of local museums. In addition, a trip to a Broadway show on Wednesday afternoon, timed to coincide with the golf outing, is also being considered. The technical program is expected to include an all-day workshop on Monday, as well as a series of technical sessions. The Local Arrangements Committee is working to ensure that the technical program will provide professional development hours (PDHs) for professional engineers registered in New York. Potential technical tours being investigated include a tour of the World Trade Center site/PATH Station, the New Jersey transit light rail construction through the Palisades or the Port Newark container terminal. As always, we will be having the exciting "Traffic Bowl." Please plan on attending this event and register early.

Happy New Year!
MDM is currently seeking a qualified candidate for the following position:

**TRANSPORTATION PLANNER/ENGINEER – 4 to 8 years experience**

Position involves preparation of traffic impact and access studies, corridor studies, environmental impact reports and functional design reports. Position also involves roadway and intersection design, traffic signal design, preparation of plans, specifications and quantity/cost estimates. Experience with Synchro®, Excel, MS Word and AutoCAD Land Development Desktop is required. BSCE, F.E., excellent written and oral communication skills and a minimum of 4 to 8 years experience is required. Working toward P.E. and PTOE registration is desired.

MDM offers a challenging opportunity for career growth as a Transportation Planner/Engineer in our Marlborough, MA office. We offer a dynamic working environment with Principal Transportation Planners and Engineers on high-profile land development and municipal contracts. MDM is an Equal Opportunity/Affirmative Action Employer and offers an excellent benefits package.

For confidential consideration, please forward a cover letter and resume to:

MDM Transportation Consultants, Inc.
5 Mount Royal Avenue
Marlborough, MA 01752
Fax: (508) 303-0371
E-mail: rdesrosiers@mdmtrans.com

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**TRAFFIC SIGNAL SYSTEMS ENGINEER**

Oversees, implements and operates computer “closed loop” traffic signal system.

Requirements: BS in Civil, Electrical or Traffic Engineering or closely related field plus 6 years progressively responsible experience in traffic engineering of which 1 year’s experience is in design and/or operation of computerized traffic control systems, or equivalent combination of education and experience. Salary: $58,720 - $75,768.

File application with the:

Town of Greenwich
Human Resources Department
101 Field Point Road
Greenwich, CT 06830

Visit [www.greenwichct.org](http://www.greenwichct.org) for additional information.

Position open until filled. Review and rating of resumes and applications begins on 11/12/04. Applications received after 11/12/04 will be considered at the discretion of the Town of Greenwich. EOE M/F/D/V

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Pare Engineering Corporation, an established northeast regional consulting engineering firm is seeking to fill the following positions:

**WATERFRONT/STRUCTURAL ENGINEER** – Position requires experience on a variety of project types including the design of buildings and marine/waterfront structures. Candidate should possess engineering design knowledge of steel, reinforced concrete, timber and masonry structures and their foundations. P.E. registration is preferred.

**BRIDGE ENGINEER** – Position requires a minimum of 4 years of bridge design experience. Work includes task assignments under the direction of a project engineer for various RIDOT and MHD bridge projects. Use of structural analyses programs such as STAAD.PRO, MDX Steel Girder Design and ConSpan are preferred. P.E. registration is preferred.

**CIVIL ENGINEER** – Staff position available for planning and design assignments involving a variety of site development, waterfront and transportation projects. Minimum of 3 years experience.

All positions are available in our Lincoln, Rhode Island office and require strong oral and written communication skills.

Benefits package includes health and dental insurance, 401(k), tuition reimbursement, life and disability insurance. Please send your resume in confidence noting your professional experience, education, and area of interest to:

Human Resources
Pare Engineering Corporation
8 Blackstone Valley Place
Lincoln, RI 02865


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**2004 New England Chronicle Sponsors**
Reminders

PLAN NOW FOR 2005!

WHAT: District 1 Annual Meeting
WHEN: May 2-5, 2005
WHERE: Morristown, NJ

Public Rights-of-Way Accessibility Workshop

December 6, 2004

WISHING EVERYONE A HAPPY AND HEALTHY HOLIDAY SEASON!!

Upcoming Events

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 6, 2004</td>
<td>Warwick, RI</td>
<td>NEITE Annual Meeting &amp; Section Elections</td>
</tr>
<tr>
<td>January 25, 2005</td>
<td>Montpelier, VT</td>
<td>VT/NEITE Joint Meeting</td>
</tr>
<tr>
<td>February 27 - March 2, 2005</td>
<td>Las Vegas, NV</td>
<td>ITE 2005 Technical Conference &amp; Exhibit</td>
</tr>
<tr>
<td>May 2-5, 2005</td>
<td>Morristown, NJ</td>
<td>ITE District 1 Annual Meeting</td>
</tr>
<tr>
<td>August 7-10, 2005</td>
<td>Melbourne, Australia</td>
<td>ITE 2005 Annual Meeting &amp; Exhibit</td>
</tr>
</tbody>
</table>

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New England Section
c/o Kien Ho, Editor
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