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Contributors

Neil Boudreau
Kim Eric Hazarvartian, Ph.D., P.E., PTOE
Michelle Langone
Kevin Johnson
Jim Terlizzi, P.E.

Chronicle Team
Howard/Stein-Hudson Associates, Inc.
Thomas A. Stokes
Michelle Langone
Raymond Hebert

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Improving Roadway Design through Crash Data Analysis
Case Study: Young Driver Crashes in Massachusetts

Michelle Langone, Howard/Stein-Hudson Associates, Inc.

Crash data is commonly presented in tabular format. With advances in technology, such as geographical information systems (GIS), global positioning systems (GPS), and software development, crash data analysis has the potential to improve. By using these advancements, crash data can be presented spatially creating a non-typical viewing method. Traditional crash data analyses can be expanded into more sophisticated methods and aid transportation safety professionals in reducing the frequency and severity of crashes. For example, crash data, when presented spatially, has the potential to improve driver safety through identifying characteristics associated with roadway design features. This article will present a case study of traditional and spatial crash data analysis in the Commonwealth of Massachusetts. This case study analyzed young drivers, defined herein as 16 to 20 year olds, that were involved in a crash in Massachusetts in 2003 while driving alone (no passengers) and on a dry roadway.

Motor vehicle crashes are the leading cause of death in the U.S. among 15 to 20 year olds. Young drivers are over-represented in motor vehicle crashes throughout the U.S. Identification of the most prevalent crash characteristics involving young drivers has been the focus of numerous research efforts; however, further analysis is still necessary based upon continued over-representation of young drivers in motor vehicle crashes. To-date, young driver research has consisted primarily of analyzing crash data through generalized crash characteristics.

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Where did the time go, it is already November and I am winding up my term as President of the Section. It has truly been a rewarding experience to work with so many extremely dedicated transportation professionals this year. Throughout the year I have had the opportunity to meet several new colleagues at the various Joint State Chapter Meetings, and I look forward to continuing these relationships as I serve the Section in other capacities. The section cannot perpetrate itself without the contributions of the Executive Board and the Committee Chairs, and I would like to extend my sincere appreciation to my fellow members who have helped me keep the Section moving in the right direction this past year. Thank you and here we are as you move on and up in your service to NEITE.

This year we have had a few notable achievements, from the introduction of the Rhode Island State Chapter and a very successful kickoff event, to the Young Professionals Group seeing a resurgence through the introduction of the brown bag lunch mentoring sessions. These lunch seminars will set the groundwork for us to continue to make progress in support of our young professionals. At the end of November (30th), we will have a joint meeting between the Section and Congress for the New Urbanism (CNU) at Northeastern University. This meeting will focus on ITS/CNU’s proposed recommended practice for “Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities”. This will be the first time that NEITE has teamed up with the CNU in a formal meeting.

One of the areas that I perceived as a success for the Section was the approval from the Executive Board to fund the purchase of Name Badges for members of the section who wanted to participate. The Board wanted to extend the gesture for an official NEITE badge to our members as our way of thanking everyone for their continued support. However, our efforts have seemed to have not been very successful as we have just over 100 responses taking advantage of this offer.

Finally, I like to take one last opportunity to promote the District 1 Meeting next May in Providence, Rhode Island. In the next few months, the preparation work for planning this event will kick into high gear and we need the support of our members to bring this meeting success. Please let us know if you can help out in any fashion as we move forward.

Once again, thank you and please feel free to contact me should you have any comments or suggestions. I look forward to seeing everyone at the Annual Meeting in Warwick, Rhode Island on December 4th.
In this case study, crash data was obtained by using the Massachusetts crash database, maintained and developed by UMassSAFE, located at the University of Massachusetts Amherst. This database is equivalent to the systems used at the Massachusetts Registry of Motor Vehicles (RMV) and the Massachusetts Highway Department (MHD) and contains information found on the Massachusetts crash report form. By using this database, a traditional crash data analysis was conducted and analyzed demographics, participant factors, crash factors, temporal factors, and environmental factors. During 2003, there were 4,241 young driver crashes in Massachusetts where the driver was between 16 and 20 years old, driving alone, and on a dry roadway. This accounts for 3.8 percent of all reported crashes during 2003 and 12.3 percent of all young driver crashes. The breakdown of the age of the driver for the young driver crashes analyzed is shown below. This figure shows that 16 year olds have the highest involvement in the crashes being analyzed.

One of the crash factors analyzed was manner of collision. The highest manner of collision among young drivers for these crashes was rear-end crashes. Young driver crashes often occurred in July, on Fridays, and between the hours of 3:00 pm and 5:59 pm. For environmental factors, the breakdown of young driver crashes by intersection type yields an over-involvement in crashes that occurred not at a junction. The task of locating, obtaining x and y coordinates, for the young driver crashes were conducted with the help of the Massachusetts RMV and the MHD. MHD has a Geocoder that uses the Massachusetts roadway inventory file and the crash data entered by the RMV to automatically locate crashes spatially. Of the 4,241 young driver crashes of interest, approximately 94 percent were located. 73 percent by the MHD Geocoder and 21 percent by manually locating the crash in the Geocoder based on the crash report form data. With the location of most of the crashes determined, the x and y coordinates were imported into a GIS program to locate the crashes spatially, as shown on Page 1.

With the young driver crashes located spatially, nontraditional crash data analysis can be conducted. By using the data in other the crash database or the roadway inventory file, the young driver crashes can be presented spatially for different crash characteristics, such as roadway intersection type, as shown above, functional class, average annual daily traffic volumes, or speed limit.

Michelle Langone is a member of the 2006 NEITE Chronicle Team and works at Howard/Stein-Hudson Associates. She recently received her Masters degree from the University of Massachusetts where her research focus was crash data analysis through the University of Massachusetts Traffic Safety Research Program (UMassSafe). More information about the research program can be found at www.ecs.umass.edu/masssafe. For more information, contact Michelle at mlangone@hshassoc.com.

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Improving Roadway Design through Crash Data Analysis

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EDITOR’S MESSAGE

With this our final issue, we hope you enjoyed reading the Chronicle over the past year.

Happy Holidays!
Chapter Reports and News

International Director
Kim Haavarian, P.L.D., P.E., P.T.O.E.

I participated in the excellent ITE 2006 Annual Meeting and Exhibit in Milwaukee, Wisconsin from August 6 to 9. The International Board of Directors (IBD) met on August 4 and 5. The IBD is meeting in Washington, D.C. from October 28 to 29. The 2007 Spring Technical Conference and Exhibit will be March 25 to 28 in San Diego, California. All IBD members are elected International Vice President for 2007. Earl Newman will serve as International President and Rich Romet will serve as an International Intermittent Past President. District One can be proud of the several hundred 2006 international awards presented at the 2006 Annual Meeting. The Transportation Achievement Award for safety went to the Port Authority of New York and New Jersey in recognition of Accident Analysis and Mitigation System. The Edmund R. Rickor Traffic Safety Award—Organization went to the Port Authority of New York and New Jersey in recognition of Accident Analysis and Mitigation System. The Transportation Planning Council Award—Youth Consultant’s Award went to Kevin P. Winiars, Traffic Engineer, KLD Associates, Inc., Commack, New York in recognition of his paper Development of Evaluation Time Estimates for the Turkey Point Nuclear Power Plant. The IBD will discuss ITE’s international role at the major issue at its fall 2006 meeting, and will discuss the public face of transportation during 2007.

Rhode Island Chapter of ITE
Kevin Johnson, RIITE Chapter President
The RI Chapter held a joint luncheon with PTS and the RI Chapter of APA on November 8th. The subject of the meeting was “The Future of Transit in Rhode Island” with keynote speaker Mark ... Section and District. Anyone interested in serving on the board or our committees should contact the Chapter President, Kevin Johnson at (401) 457-0309 or johnsonkw@cdm.com.

Massachusetts Chapter of ITE
Jim Terlizzi, P.E., President
On September 19th, the Massachusetts Chapter of the Institute of Transportation Engineers (MAITE), in conjunction with the New England Section, hosted its annual joint dinner meeting at ... Vehicles, as our keynote speaker. Training in Safety Audits was also offered by the Federal Highway Administration.

Keep apprised of these and other events by viewing the New England Section Web site (www.neite.org), which has a link to the Massachusetts Chapter Web site.

Last year, the symposium was hosted at Northeastern University and there were presentations by students from Boston University, Massachusetts Institute of Technology, Northeastern, and UMASS.

International Director
Kim Eric Hazarvartian, Ph.D., P.E., P.T.O.E.

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Howard/Stein-Hudson Associates (HSI), a transportation engineering and planning firm, is searching for qualified individuals to join our growing team for a variety of challenging assignments. HSI’s downtown Boston location is easily accessible and an exciting place to work. HSI offers a competitive salary and benefits, including

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This is an exciting opportunity for the right career-oriented candidate who enjoys the challenge of working on a variety of interesting projects with a diverse client base. The qualified candidate will have a B.S. or M.S. in Transportation Planning or Civil Engineering and 3 to 5 years experience including some project management; business and client development skills are a plus. A Master’s Degree can substitute for some experience. Excellent computer, written, and communication skills and experience with impact studies and Synchro software required.

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FAX: (617) 482-7417
jobs@hshassoc.com

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