



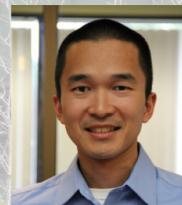
### Lisa Aultman-Hall, TRC Faculty

During 2012-2013, I had the privilege of being a visiting scholar at the Institute of Transportation Studies at the University of California Davis. While I was there, I focused on research as well as visited numerous Transportation Centers throughout the west. My research work included the launch of a new one-year monthly survey of long-distance and overnight travel, as well as continued work on travel behavior, bicycle transportation, and livability.

I visited 20 National Parks with a keen eye towards how parks are unique parts of the transportation system and often leaders in transportation change. Pictured left, I am visiting TRC and RSENR alumni Dr. Peter Pettengill at Grand Canyon National Park, where he is now serving as an Outdoor Recreation Planner in Science and Resource Management for the National Park Service.

Davis (population 66,000) itself was an interesting target of study. It boasts 55 miles of bicycle paths, 4 bike overpasses, 13 tunnels, and approximately 50 miles of on-road bicycle lanes. Certainly infrastructure is needed to advance bicycle transportation, but recent research at UVM, UC Davis, and elsewhere indicates that social factors beyond infrastructure, weather, and topography are critical.

On repeated occasions, I was looked to for expertise on rural transportation and land use challenges. This recognition for Vermont stems undoubtedly from our focused use of the US DOT UTC funds to seed research related to sustainable transportation systems.



### Brian Lee, TRC Faculty

In the summer of 2012, Meghan Cope (Professor and Chair, Geography) and I conducted qualitative research in Phase 2 of "Teens and Transportation: Exploring the mobility of high school youth in Chittenden County," funded by the New England University Transportation Center. Phase 1, completed in 2011, focused on a pair of parent and youth travel surveys.

Because the relationship between teens and transportation is a relatively understudied area, we chose a mixed-methods approach and developed new data collection and analysis techniques drawn from different streams of research related to transportation to help identify themes and provide insights.

In Phase 2, we invited a small group of teens who, along with their parents, completed the Phase 1 surveys to take part in four intensive participatory exercises: 1) Focus group discussions, 2) Individual computer mapping, 3) Group paper mapping, and 4) Individual "text message review." In the "text message review," each teen was asked to search through their phones for recent messages related to travel (such as planning activities and getting rides). We developed this new data collection technique to use text messages as anchored entry points into the teens' lives, which led us to a suite of communication tools ranging from talking in school hallways to various other electronic means.

Using preliminary findings from the Phase 1 surveys as starting points for the participatory exercises, we explored the influence of the transportation and land use system on teen travel behavior, examined how they get around and organize their activities, and assessed the roles that different technologies (text messaging, social media, mobile Internet access) play in their digital lives. The two phases resulted in a rich collection of data on teen travel behavior from multiple perspectives. We are in the process of compiling the analysis and findings and expect to publish multiple papers from this work.

### New England Transportation Consortium

TRC is proud to continue to host the New England Transportation Consortium (NETC). NETC is a partnership of the six New England state DOTs, which share research initiatives that support financial leveraging opportunities, stronger partnerships between university faculty and state DOTs, and research dissemination. NETC coordinator Amanda Hanaway-Corrente organized an end-of-year strategic planning retreat where DOT and university representatives from the region came together to discuss research needs and foci, and to establish a new vision for NETC work in the coming years.

### TRC Reports

#### Integrated Land Use, Transportation and Environmental Modeling

- Authors: Sullivan, James; Mika, Anna; Fraker, Joe; Hershey, David; Hathaway, Kevin; Lawe, Stephen | TRC Report #12-003

#### Intelligent Traffic Signals: Extending the Range of Self-Organization in the BML Model

- Authors: Danforth, Chris; Brown, Daniel | TRC Report #12-005

#### Social Network Analysis of Sustainable Transportation Organizations

- Authors: Watts, Richard; Witham, Aaron | TRC Report #12-008

#### The Social Construction and Framing of Tailpipe Emissions in the Media

- Authors: Watts, Richard; Maddison, Jonathan; Macias, Thomas; Witham, Aaron | TRC Report #12-010

#### Environmental Concern, Social Capital and the Social Context of Tailpipe Emissions-Related Knowledge in Northern Climates

- Authors: Macias, Thomas; Nelson, Elysia; Watts, Richard | TRC Report #12-011

#### Spatial Extent of the Impact of Transported Road Materials on the Ecological Function of Forested Landscapes

- Authors: Neher, Deborah; Asmussen, David; Williams, Kristin | TRC Report #12-012

#### Transportation Education Demonstration Pilot Program

- Authors: McRae, Glenn | TRC Report #12-013

#### Vermont Travel Model 2011-2012 (Year 4) Report

- Authors: Sullivan, James | TRC Report #12-015

#### Refugees and Transportation in Vermont: Travel Behaviour and Critical Questions Based on Gender, Age and Transportation Hierarchies

- Authors: Bose, Pablo S. | TRC Report #13-002

#### Multi-Scale Model of the US Transportation Energy Market for Policy Assessment

- Authors: Eppstein, Margaret; Rizzo, Donna; Marshall, Jeffrey | TRC Report #13-004

#### Optimization of Snow Removal in Vermont

- Authors: Dowds, Jonathan; Sullivan, James; Scott, Darren; Novak, David | TRC Report #13-005

#### New VTrans Cooperative Research

##### Long-Term and Short-Term Measures of Roadway Snow and Ice Control (RSIC) Performance

- James Sullivan, PI

##### Strategic Location of Satellite Salt Storage for Roadway Snow and Ice Control in Vermont

- James Sullivan, PI

##### Development of GIS Tools to Optimize Identification of Road Segments Prone to Flood Damage

- Austin Troy, PI

##### Statewide Analysis of Guardrails, Curves and Crashes

- Brian Lee, PI

Quantifying the Vulnerability of Vermont Bridges to Seismic Loading - Mandar Dewoolkar, PI

### 2012 Outstanding Student of the Year: Tyler Feralio



Tyler Feralio was named the University Transportation Center 2012 Student of the Year. Tyler Feralio received his bachelor's and master's degrees in mechanical engineering from Rensselaer Polytechnic Institute in 2004 and 2005, respectively. His thesis work involved computational modeling of an internal combustion engine. He then worked at Honda Research and Development as a design engineer in the chassis group. From there he transitioned to designing aftermarket suspensions for all terrain vehicles for a small company in the Northeast.

He decided to return to academia in order to shift his focus to more environmentally conscious endeavors. He enrolled at the University of Vermont in August 2009 in the Department of Civil and Environmental Engineering. His current research focus is on quantifying and modeling the differences in particulate emissions from light duty diesel engines fueled by diesel and biodiesel fuels.

Tyler's UVM advisor commented that his hands-on mechanical skills, organizational abilities, and ability to quickly master new concepts, combined with his enthusiasm and dedication to his research project have resulted in the very significant development of our unique light-duty diesel particulate emissions sampling apparatus in the TAQ Lab that will be a valuable resource to future UVM students studying vehicle emissions and their control.

Dissertation Title: Prediction of Transient Diesel and Biodiesel Particulate Emissions Through the Use of an Artificial Neural Network

"Participating in TRC seminars, transportation conferences and courses like 'Critical Issues in Transportation' provided me with firm grasp of current issues in transportation and transportation governance"



Right: Upon finishing her master's work this summer, TRC scholar Phoebe Spencer will be enrolled as a doctoral candidate at UVM in the Rubenstein School for Environment and Natural Resources to continue her studies in non-motorized transportation.



### Nathan Belz

PhD candidate Nathan Belz was putting the final touches on his dissertation when he was offered a position as Assistant Professor at the University of Alaska Fairbanks. His dissertation, Planning and Operational Models for Single-Lane Roundabouts, was supervised by his advisor Dr. Aultman-Hall. Belz also worked closely with Dr. Brian Lee, including collaborating on a paper on car sharing in Vermont for which Belz and Lee won a Transportation Research Board paper award. Belz also won Vermont's UTC Student of the Year in 2010. These awards reflect Belz's passion for his work in transportation and were instrumental in Belz receiving faculty positions interviews even before his dissertation was accepted.

Belz's research included collection of video data at roundabouts in Vermont, Maine, New Hampshire, and New York. Using video-based real-world data of traffic operations, Belz identified types of driver behavior that are inconsistent with the traffic theories on which existing roundabout models are based. He documented the levels of priority-taking and priority-abstaining. Given that existing models do not account for these driver behaviors, Belz developed a new cellular automata model called CARsim in partnership with fellow graduate student Jim Montague, Dr. Aultman-Hall, and Dr. Chris Danforth.

Also during his time at UVM, Belz contributed to and published research on transportation applications of Geographic Information Systems, transit planning and ridesharing in Vermont, livability in small urban and rural communities, and second-by-second driver behavior using in-vehicle instrumentation. Belz will move to Alaska to start his faculty position in August. There, he will continue his roundabout research as well as research on spatial analysis, land use, sustainability, and livability—all of which have roots in his many successful partnerships at the UVM TRC.



# TRC UNIVERSITY OF VERMONT TRANSPORTATION RESEARCH CENTER

ANNUAL REPORT 2012-2013



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**A Year-End Message from the TRC**

The 2012–2013 year was another extraordinary one for the TRC. Our new research endeavors included the USDOT-funded project “Rapid Exploitation of Commercial Remotely Sensed Imagery for Disaster Response and Recovery,” and two intercity travel surveys with our Vermont partner, Resource Systems Group, Inc. We celebrated as the first student completed our graduate certificate in Sustainable Transportation Systems. Participation numbers at our outreach and educational events increased. Our workforce development programs continued to expand in Vermont, and we are participating regionally and nationally in advancing the infrastructure to support a twenty-first century workforce for the transportation sector.

We extend our warmest thanks and best wishes to Dr. Austin Troy for his two years of service as director of the TRC. Dr. Troy has been a close faculty partner of the TRC since its inception. He assisted UVM Administration with planning for the Center before it opened in July 2006. He has served as a member of the faculty advisors from 2006 until his appointment as director in 2011. He was principal investigator for one of the TRC’s original Signature Projects, which focused on integrated land use and transportation modeling. We look forward to new partnerships with him at his new home institution, the Urban and Regional Planning Program at the University of Colorado, Denver.

The TRC continues to grow our capacity to provide sustainable transportation expertise and education within Vermont and beyond. We are proud to be recognized as filling key niches in research for rural and micropolitan areas, creative partnerships for workforce development, and quality research program management.

Lisa Aultman-Hall, Margo Baxter, Matt Conger, Jonathan Dowds, Amanda Hanaway-Corrente, Brian Lee, Jacob Leopold, Michelle McCulcheon-Schour, Thomas McGrath, Glenn McRae, Sean Neely, Jordan Posner, Karen Sentoff, James Sullivan, Austin Troy, Kathleen Zink



**A Message from the Director**

During the past year at the Transportation Research Center, we continued to build on our solid foundation to advance quality research and education in sustainable transportation systems, gaining recognition and prominence among our peers. The TRC’s incredible network of Vermont supporters has facilitated steady advancements in our sustainable transportation focus.

Witnessing our graduate certificate program grow has been particularly satisfying. Our research team continues to produce world-class scholarship, and we have added to and diversified our funding portfolio. The TRC’s relationships with the university and the state of Vermont are strong. We are proud of our workforce development leadership and our communications efforts that strive to initiate widespread discussions about sustainable transportation.

We were very excited this year to see the growth of our efforts within the New England region as a whole. The TRC organizes the New England Transportation Consortium, which coordinates a research agenda for the six state DOTs. The Clean Cities Coalition housed at the TRC was part of a successful US Department of Energy grant with four other New England coalitions that will develop a regional “Clean Fleets” recognition program. The TRC is planning to expand its workforce development efforts throughout New England, in addition to continuing to support a national strategy. This year, our faculty worked with researchers and educators in Connecticut, New Hampshire, Maine, and Quebec, as well as others outside our region. We continue to build capacity and partnerships in New England.

All of this makes it particularly difficult to know that I will no longer have the opportunity to work with this incredible staff and network directly as I will be joining the faculty at the University of Colorado, Denver in the fall. I am confident that the TRC will continue to strongly and successfully pursue its research, education, and outreach mission.

Best Wishes,  
Dr. Austin Troy

**July 2012**

Summer Seminars: Vermont’s Future Electric Vehicle Fleet; The Future of Regional Public Transportation in Vermont

Amanda Hanaway-Corrente (TRC) serves on the panel, “Raising the Profile of Research” at the AASHTO Research Advisory Committee (RAC) Annual Meeting in Burlington, VT with US DOT Deputy Administrator Gregory D. Winfree

**August 2012**

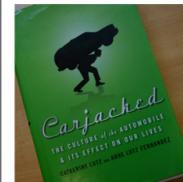
TRC faculty Brian H.Y. Lee and PhD candidate Nathan Belz awarded the TRB Fred Burggraf Award

Summer Seminar: Certification for Sustainable Transportation and Green Coach

TRC hosts the National Summer Transportation Institute for high school students

**September 2012**

Burack Lecture: Catherine Lutz, Professor of Anthropology and International Studies, Brown University presented “Inequality, Myth, and the American Automobile System.” The event was co-sponsored with the UVM Global and Regional Studies Program



Vermont Clean Cities Coalition releases PEV readiness findings report for Vermont

**October 2012**

Glenn McRae (TRC) presents on the results of the National Summit on Transportation Workforce Development at the National Transportation Training Directors Annual Meeting in Seattle

National Alternative Fuel Vehicle Odyssey Day on the Church Street Marketplace in Burlington, VT, sponsored by the Vermont Clean Cities Coalition

**November 2012**

Forum: “Current Issues in Burlington Transportation” with Miro Weinberger, Mayor of Burlington, VT

Seminar: Dr. Britt Holmen on “Unregulated Tailpipe Emissions from a Light-Duty Hybrid-Electric Vehicle Operating Under Real-World Grade” at sabbatical host UC Davis ITS

**December 2012**

Dr. Brian H.Y. Lee hosts panel on “The Future of Transportation Funding in Vermont” with Secretary Brian Searles (VTrans), Burlington City Council President Joan Shannon, Michele Boomhower (CCRPC/MPO), and, FHWA VT District Administrator Matthew Hake (not shown).

Phoebe Spencer earns first certificate of graduate study in Sustainable Transportation Systems

TRC is awarded a \$750,000 US DOT research grant entitled “Rapid Exploitation of Commercial Remotely Sensed Imagery for Disaster Response and Recovery”

**January 2013**

Seminar: “Made for Walking: Density and Neighborhood Form” with Vermonter Julie Campoli, author of Made for Walking: Density and Neighborhood Form

Transportation Systems Academies initiate at three high schools as final step in four-year pilot to attract and prepare new generation of transportation workers

**February 2013**

Burack Lecture: “How Should We Grow? Using GIS to Forecast Future Urban Growth Patterns and their Impacts,” by Dr. John Landis (University of Pennsylvania)



Seminar: Clean Fleets Solutions, featuring Larry Beaulieu, UPS East Region Automotive Manager, discussing the many efforts of the company in improving their efficiency and fuel consumption, from alternative fuel use, anti-idling efforts, and safety measures.

TRC scholar Ben Carlson chosen for a Presidential Management Fellowship

Seminar: Dr. Lisa Aultman-Hall delivers seminar on Transportation and Livability at UC Berkeley, which focuses on rural aspects of the livability challenge

**March 2013**

TRC Research Expo presenting research and programs of the TRC and partners with featured speaker and UVM alumnus Michael Lewis, RI DOT Director and AASHTO President

TRC hosts National Career Pathway Certification Workshop to strengthen Transportation Workforce Development network

**April 2013**

UVM Student Research Conference features 15 presentations by graduate students on transportation

Burack Lecture: “Low Carbon Transportation Fuels: Climate Change and Energy Security,” by Dr. Jonathan Rubin (University of Maine)

**May 2013**

Seminars: AARP’s initiative on Livable Communities and Transportation and Assessing the Effects of Unpaved Roads on Lake Champlain Water Quality (UVM Professor Beverley Wemple)

TRC researcher James Sullivan represents the TRC at the 2013 AASHTO GIS-T Symposium in Boise, Idaho

**June 2013**

Seminar: Transportation Surveys: Attitudinal Changes and Trends in Chittenden County, VT, 2000–2012



**A MESSAGE FROM THE GOVERNOR**

We all recognize that a strong multimodal transportation system is essential to Vermont’s economic and workforce development, and is integral to our community character and quality of life.

The leadership and academic excellence of the University of Vermont Transportation Research Center (TRC) helps ensure that Vermont is meeting 21st century transportation challenges through rigorous research, data, innovation, and creativity.

The TRC is also a great example of the kind of partnership between state government, our higher education institutions, and private enterprise that I encourage.

Working closely with the Vermont Agency of Transportation and others, the TRC helps to address real-world transportation needs, while producing graduates who utilize skills in state, regional, and local government, private companies, and nonprofits throughout Vermont and beyond.

I congratulate the UVM TRC on its accomplishments and look forward to this continuing partnership.

Sincerely,

Governor Peter Shumlin

**TRC BY THE NUMBERS**

Graduate students funded	<b>30</b>
Undergraduate researchers	<b>24</b>
Active VTrans partnerships	<b>22</b>
Attendees at UVM TRC hosted events	<b>2335</b>
Conferences, workshops & hosted events	<b>25</b>
Transportation research reports	<b>11</b>

**TRC PROGRAMS AND CONTACTS**

- **University Transportation Center** – Lisa Aultman-Hall
- **Transportation Education Development Pilot Program** – Glenn McRae
- **Graduate Education Certificate Program** – Glenn McRae
- **Vermont Clean Cities Coalition** – Tom McGrath
- **New England Transportation Consortium** – Amanda Hanaway-Corrente
- **VTrans RAC** – Amanda Hanaway-Corrente
- **VTrans Statewide Travel Demand Model** – James Sullivan
- **UVM Transportation Air Quality Lab** – Britt A. Holmén

**WORKFORCE DEVELOPMENT**

The first grant of the TRC’s Transportation Education Development Pilot Program was brought to a successful conclusion in June 2013. Four key initiatives supported the testing of a strategic effort in the continuum of transportation careers. These initiatives included programs targeting high school and community college levels, addressing the needs of mature workers, and attracting and transitioning workers from other fields into transportation. The final component tested technology for growing leadership and management capacity among incumbent transportation workers in DOTs.

The TRC’s Workforce Development initiatives also included hosting a National Summer Transportation Institute that was visited by FHWA’s Associate Administrator for Civil Rights Warren Whitlock; as well as presentations on the outcomes of the National Transportation Workforce Summit at the annual meetings of the National Transportation Training Directors and the Transportation Research Board.

**FINANCES**

**FUNDING BY SOURCE**

