At the turn of the 20th century, the city of New London, Connecticut was ideal. Its fabric had evolved over the previous century from a small coastal town into a flourishing port development with healthy interconnected neighborhoods. This urban fabric of streets and buildings was disrupted during the mid-1900's when interstate I-95 was constructed just off the center of downtown. Now, 60 years later, New London has not yet recovered from that dramatic alteration; the lands around the interstate are fragmented and vacant, and the northern and southern portions of the city are almost completely cut off from one another.

The north end of New London is home to two prestigious institutions: Connecticut College and the U.S. Coast Guard Academy. The highway has essentially severed the physical connection between the downtown and the north end of the city. The result is that unlike many New England towns, New London does not look, feel or function like a college town nor does it accrue the financial or social benefits of having two of the most important colleges in the country in its backyard.

Dr. Norman Garrick along with project Principal Investigator Peter Miniutti received a CTLS pilot grant to move ahead with an investigation in the form of a three-day charrette utilizing CTLS expertise to help New London form a vision for restoring their downtown. This brief but intensive study allowed the team to assess the existing conditions of the areas adjacent to the interstate and high speed interchange, and begin exploration into opportunities for reconnecting the downtown with the isolated campuses and neighborhoods to the north.

The focus of the charrette was on restoring pedestrian and bicycle connections between the colleges and the downtown by taming
and rationalizing the complex highway junction that stands as an obstructive barrier. The New London Landmarks group joined as a sponsor of the study, and transportation expert Lucy Gibson and architect/urban planner Catherine Johnson were brought onto the team. The team possessed expertise in urban transportation, highway design, architecture, land use planning, ecosystem management, and spatial analysis.

In the interest of efficiency, the team divided itself into three areas of study: the transportation system, the built environment, and the natural environment. Preliminary research was performed in the months leading up to the charrette as each group familiarized itself with the function of their system within the city. Thus, when the charrette began, the groups were able to pool their knowledge and create a comprehensive view of the situation with its many opportunities and limitations.

After presenting the information with participating members of the community, the team was able to gather feedback from the public, gaining a fresh perspective on the issues and filling gaps where information was lacking. Finally, after another day of collaborative work, the team presented some of the solutions that had been discussed; ideas from other cities that had dealt with similar issues, as well as potential steps that could be taken by New London given its unique situation.

Additional information on project CTLS 10-06, *A Vision Plan to Re-connect Downtown New London to the North End*, including the final report, is available on the CTLS web site at www.ctls.uconn/completed projects.

**Principal Investigator:**

Peter Miniutti, L.S.A.S., Associate Professor of Landscape Architecture

**Research Team:**

Norman Garrick, Ph.D., Associate Professor of Civil & Environmental Engineering

Catherine Johnson, Architect and Town Planner

Lucinda E. Gibson, P.E., Principal, Smart Mobility Inc.

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Nicholas E. Lownes, Ph.D., P.E.

**Program Coordinator**

Stephanie G. Merrall
CTLS Awards 2010-11 Research

The Center for Transportation and Livable Systems awarded 2010-2011 research funding to five new one-year full research projects that began in August 2010 and two new six-month pilot projects that began in February 2011. For additional information on these projects and the CTLS research program, please visit our web site.

Full Projects


This project involves a comprehensive and compact study of the built environment in light rail transit station areas in Denver, CO and travel behaviors in both transit-oriented development (TOD) and non-TOD areas in the region. The principal objectives are to provide insight into how different types of transit-oriented development affect travel behavior patterns—specifically reductions in vehicle miles travelled—and to understand what prevents people from living in TOD areas.

**Principal Investigator:** Carol Atkinson-Palombo, Ph.D., Assistant Professor of Geography  
**Research Team:** Robert Cromley, Ph.D., Professor of Geography and Wesley Marshall, Ph.D., Assistant Professor of Civil Engineering, University of Colorado Denver

CTLS 10-02: Effect of Low-Impact Sustainable Transportation Design as a Strategy for Alleviating Stormwater Runoff and Reducing GHG Emissions

The objectives of this research are to examine the potential for low impact transportation design as an option to reduce sewage system costs and environmental greenhouse gas (GHG) and nitrogen releases, and to assess green design alternatives to reduce transportation impacts on combined sewer loading and GHG emissions.

**Principal Investigator:** Joseph Bushey, Ph.D., Assistant Professor of Civil & Environmental Engineering  
**Research Team:** Carol Atkinson-Palombo, Ph.D., Assistant Professor of Geography, Adam Zofka, Ph.D., Assistant Professor of Civil & Environmental Engineering and Eric Jackson, Ph.D., Assistant Research Professor, Connecticut Transportation Institute

CTLS 10-03: Assessing the Relationship between Transportation Mode Choice and Transportation Land Consumption

The goal of this study is to develop models relating mode choice to the amount of land used for transportation in a city. With the increased emphasis being placed on building transit oriented developments in Connecticut and across the country, there is an immediate need to improve our knowledge relating to the efficient use of land in dense urban places and how this land allocation is affected by mode choice in our transportation system.

**Principal Investigator:** Norman Garrick, Ph.D., Associate Professor of Civil & Environmental Engineering  
**Co-Researcher:** Alexander Vias, Ph.D., Associate Professor of Geography
CTLS 10-04: Developing an Index for Comparing Sustainability of Statewide Transportation Systems

This research investigates how the concept of sustainability relates to the transportation enterprise and use the knowledge about transportation and sustainability to create an index that measures sustainable transportation for states. The index will contain economic, environmental, and social components of transportation that reflect the changing priorities of US policymakers.

Principal Investigator: Norman Garrick, Ph.D., Associate Professor of Civil & Environmental Engineering
Co-Researcher: Carol Atkinson-Palombo, Ph.D., Assistant Professor of Geography

CTLS 10-05: Transportation System Sustainability and Adaptation Using Physarum Polycephalum

Recently, researchers in Japan and the U.K. have discovered that a particular species of mold, *Physarum polycephalum*, or “Slime Mold” has the unique ability to replicate transportation networks. The research objectives of this proposal are to investigate, quantify and model the network adaptation of *P. polycephalum* and to apply the information to an analysis of the Connecticut interstate highway and rail network. Further, an outreach experiment for middle school students will be developed and a website will be created to disseminate results and provide materials for educators to conduct the activity.

Principal Investigator: Nicholas Lownes, Ph.D., Assistant Professor of Civil & Environmental Engineering

Pilot Projects

CTLS 11-01: Critical Technologies for Grid Integration of Electric Vehicles—Moving Towards Sustainable Transportation and Smart Grid

The objective of this project is to provide preliminary theoretical and practical solutions that eliminate the negative impact of high electric vehicle (EV) penetration and explore optimized uses of EVs for the grid, including base load generation, peak demand supply, spinning reserves, and grid security & power quality improvements.

Principal Investigator: Peng Zhang, Ph.D., Assistant Professor of Electrical and Computer Engineering
Co-Researcher: Bing Wang, Ph.D., Assistant Professor of Computer Science and Engineering

CTLS 11-02: Sustainable and Livable Transportation Systems for Smart Growth: Linking Electric Vehicles to Adoption of Off-Peak Electricity Rates

This project looks to evaluate the economic and environment benefits that would accrue to Connecticut if utilization of all-electricity vehicles is linked to charging them during off-peak periods. The study proceeds on the basis of a proof of thesis that early adaptors of electric will have vested interests in switching to peak and off-peak rates; this switch will contribute to cleaner generation of electricity while curbing automotive emissions.

Principal Investigator: Fred Carstenson, Ph.D., Professor of Economics and Director, Connecticut Center for Economic Analysis
Co-Researcher: Peter Gunther, Senior Research Fellow, Connecticut Center for Economic Analysis
Faculty and Staff Equipment Competition

In April, the Center for Transportation and Livable Systems granted two funding awards through the 2011 Faculty and Staff Equipment Competition. The competition provided UConn faculty and staff the opportunity to apply for funds to purchase laboratory or field equipment to be used in conjunction with CTLS research, education and outreach initiatives.

Individuals or teams were eligible to request funding for a single piece of equipment or a combination of integrated equipment that would support the CTLS theme.

Applicants were required to submit proposals outlining how the equipment would help meet CTLS needs in sustainable transportation system research. Proposals were evaluated by a review panel to determine the extent to which they met the following award criteria:

- Relevance of the equipment to research that will support the CTLS theme of Sustainable and Livable Transportation Systems
- Ability of the equipment to support collaborative research in more than one CTLS focus area
- Potential for the equipment to help leverage CTLS support with other external funding sources

Based upon the panel’s review, proposals submitted by Dr. Adam Zofka and Donna Shea were selected.

High Volume Network Attached Storage for Photolog Libraries

Awardees: Adam Zofka, Professor of Civil Engineering, John Ivan, Professor of Civil Engineering, and Eric Jackson, Assistant Research Professor at the Connecticut Transportation Institute

Photolog libraries have been collected annually since the 1970’s by the Connecticut Department of Transportation. The libraries provide unrestricted virtual access to the entire state highway system in Connecticut and contain front and pavement images as well as geometric data and other measurements. Researchers have been using Photolog data and images to conduct temporal inventories of highway elements, such as number and type of access driveways, presence of sidewalks, on-street parking, guiderails, pavement condition, roadside hazards and building setbacks. Such temporal databases are very unique and not available anywhere else in Connecticut. When these time-stamped databases are combined with other transportation and social data, such as accidents reports, construction materials, bus ridership, etc, their impact can be directly interpreted and quantified.

With the CTLS award, the team will acquire a high-volume (48TB) Network Attached Storage (NAS) server that will be installed in the CTLS Transportation Systems Laboratory to hold and manage Photolog libraries. Currently, a one-year Photolog library occupies approximately 4TB. The entire Photolog data is currently stored on three separate mini-servers and run by the service application installed on the separated server managed by the Civil and Environmental Engineering (CEE) Department. This arrangement, although working well at the current moment, is rather temporary, fairly unreliable, requires high-maintenance and annual or bi-annual investment into a new server. The NAS will provide more centralized and permanent storage that is easy to expand in the future. The entire Photolog service will be run internally on the NAS server, eliminating the need for the CEE server, simplifying operations and reducing network traffic.

Over the years, the Photolog data have served as an invaluable resource to dozens of state and federally funded projects at the University of Connecticut. With the rapid development in digital imaging and data acquisition in the last decade, the demand for Photolog storage sharply increased. While many studies have previously used Photolog resources, there is still a vast potential for the new inter-disciplinary projects – both state and federal, that are aligned with the theme of the Center for Transportation and Livable Systems.

continued on next page
Sustainable transportation planning requires a comprehensive evaluation of many aspects of human activity.

Data on traffic activity on state and local roadways is one of several important indicators in conducting a sustainable transportation evaluation. Traffic data collection equipment will allow researchers, students and local municipal officials the opportunity to collect and analyze this data to support future sustainability research and state and local planning initiatives.

With the CTLS award, the Technology Transfer Center will purchase four new traffic counters with corresponding software and field kits to support a free loan program. The equipment will be owned by CTLS and housed at the Technology Transfer Center (T2 Center). T2 Center staff will manage the loan program and the analysis software will be installed in both the T2 Center and in the CTLS Transportation Systems Laboratory.

When the traffic collection equipment is not being used to support research focused on Sustainable Transportation, CTLS will provide an additional value added opportunity for local agencies to collect data to support safety initiatives; thereby creating a valuable community outreach collaboration between the T2 Center and the Center for Transportation and Livable Systems.

CTLS Announces TURF Recipients

Five students have been awarded research fellowships through CTLS’s new Transportation Undergraduate Research Fellowship (TURF) program. The program provides students a $2,500 fellowship in summer 2011 funding to conduct studies that support the CTLS theme of Sustainable and Livable Transportation Systems under the guidance of a CTLS-affiliated advisor. The TURF selection process required students write an independent research proposal and develop a detailed plan for executing the work over the summer. At the close of their research in August, the students will have an opportunity to present on their activities and efforts.

Congratulations to:

Bryan Blanc (Advisor, Norman Garrick)
How Parking Affects Sustainable Transportation Decision Making

Nathan A. Bruce (Advisor, Carol Atkinson-Palombo)
Spacio-Temporal Analysis of Land Cover Change and Its Impact on Flooding Upstream of Hartford Connecticut

Corey Hollmann (Advisor, John Ivan)
Locating and Evaluating Location with Certain Roadway and Roadside Characteristics

Nicholas Rizner (Advisor, Norman Garrick)
How Mode Choice Has Affected the Sustainability of the World We Live In: A Case Study of Lowell, MA

Jonathan Seery (Advisor, Nicholas Lownes)
Transit Systems Information Flow and Distribution to Ridership
Jason Zheng Named CTLS Student of the Year

The Center for Transportation and Livable Systems was pleased to name Jason Zheng as the CTLS Outstanding Student of the Year for 2010.

Jason is a second year Master’s student studying transportation and urban engineering at the University of Connecticut. He has a bachelor’s degree in civil engineering with a minor in landscape architecture, also from UConn, and has a strong interest in urban geography and planning. This diverse multi-disciplinary background reflects his personal philosophy that a holistic approach is the best strategy for tackling the complex problems of the modern world. He is a member of Beta Theta Pi, the Institute of Transportation Engineers, and an affiliate of the Congress for the New Urbanism.

Jason’s current research focuses on creating and testing the Transportation Index for Sustainable Places (TISP)—an index designed to gauge the nation’s transportation systems in terms of broad sustainable goals and outcomes. The TISP identifies twelve key elements to assess the impacts transportation has on the environment, society, and economy, and will ultimately be used to measure each state’s performance for transportation sustainability. Jason has presented the results from this work at several regional and national conferences, including the 2011 Annual Meeting of the Transportation Research Board.

As CTLS Outstanding Student of the Year for 2010, Jason received an award of $1,000 and was honored with a certificate in January at the Council of University Transportation Center’s Annual Banquet, held in conjunction with the TRB Annual Meeting in Washington, D.C.

Toying with the Building Blocks of Planning

In late summer 2010, a group from the University of Connecticut Civil & Environmental Engineering Department conducted a fun and educational pre-college outreach learning activity for a gathering of 4th and 5th grade students at the East Hampton (CT) Public Library. Their objective was to introduce the grade-schoolers to some of the issues involved in transportation and community planning.

The UConn team, which included CTLS Director Nicholas Lownes and graduate students Kelly Bertolaccini and Alex Bernier, created a unique lesson plan utilizing special components of the popular LEGO® block system to demonstrate the impact of transportation on the way cities develop.

During their visit the team briefly explained general concepts of transportation engineering to the young audience, such as how community design reflects the transportation systems available. They also discussed some of the many elements of interest to transportation professionals, including the interactions of pedestrians, vehicles and transit systems such as cars, planes and trains, and even oil pipelines.

The team then built three different transportation networks from the LEGO®s representing systems that favor cars, bikes/pedestrians, and public transit, and allowed the youngsters to imagine and create their own LEGO cities around the roads and rail lines. This engaging opportunity to “engineer” and construct their own community plans quickly helped the kids recognize some of the real challenges associated with different types of transportation systems.

A few weeks later the team presented their LEGO activity to the “Know Your Town Fair” in Mansfield (CT), where several teachers expressed an interest in re-creating the lesson in their own classrooms.
The U.S. Department of Transportation supports a network of University Transportation Centers throughout the nation to advance technology and expertise in transportation through combined efforts of research, education, and technology transfer. Within the federal SAFETEA-LU legislation, the Center for Transportation and Livable Systems (CTLS) was designated the University of Connecticut’s University Transportation Center.

CTLS Researchers at Livable Communities Conference

Several CTLS researchers showcased their work through poster sessions presented at the Transportation for Livable Communities conference sponsored by the Transportation Research Board in October 2010 in Washington, D.C.

**Reversing Urban Sprawl: A Reclaimability Approach to Reviving Downtown Brownfields**, Project CTLS 08-03, Maria Chrysochoou, Contributing Authors: Geeta Dahal, Kweku Brown, Norman Garrick, Catalina Granda-Carvajal, Kathleen Segerson and Amvrossios Bagtzoglou

**Green Modes of Transportation for the Delivery of Fast Food in Connecticut’s Mixed-Use Developments**, Project CTLS 08-02, Peter Miniutti, Contributing Author: Cynthia Reynolds

**Value of Transit: Paying for Place-Making**, Project CTLS 08-04, Abigail Osei-Asamoah, Contributing Authors: Garrett Bolella and Nicholas Lownes

**Developing a Metric for Transportation Sustainability to Support Livable Communities**, Project CTLS 10-04, Jason Zheng, Contributing Authors: Norman Garrick, Carol Atkinson-Palombo and Chris McCahill