

Spring 2014 ES 401 Project Statements

Sustainable Transportation

The 2011 "Vermont Transportation Energy Report" notes that at 34%, Vermont's transportation sector represents the single largest usage of energy in the state. And while Vermont ranks last in the country in terms of total energy usage, this relative contribution of transportation is higher than the national average (29%). Given that energy usage, and combustion of fossil fuels in particular, are tied to greenhouse gas (GHG) emissions, it is not surprising that transportation is also the largest contributor to the state's GHG emissions, standing at 47%.¹ One contributing factor to these high percentages is the rural character of the state—as classified by the US Census Bureau, the state has only one "Urbanized Area" (Pop. > 50,000) and 16 "Urban Clusters" (pop. between 2,500-50,000), with all but two of these clusters under 10,000 people and the remainder of the state's ~626,000 residents scattered outside of these population clusters.

We will work to define the concept of "sustainable transportation" (ST) together as a class, examining its history and environmental benefits, as well as the difficulties posed by a rural setting. Through our readings and experiences, we will explore the influence of ST on equitable access to services, and familiarize ourselves with funding and policy approaches that promote it. We'll also examine how applied psychology concepts and storytelling approaches can be used to motivate behavioral change—in our case, toward sustainable transportation habits.

There are numerous state, regional and local agencies and organizations working towards sustainable transportation solutions for Vermont and you will have the great opportunity to work with several of them as project partners and to interact with many others as you pursue your research. Your direct partners are the **Rutland Regional Planning Commission (RRPC)** and the **Marble Valley Regional Transit District (MVRTD)**, with assistance from **GoVermont**.

- **RRPC** serves 27 communities and provides assistance on a range of community development activities and issues, including transportation. This regional perspective is particularly important given that our mobility and the nature of our current lifestyles create issues that are not restricted to a single village, town, or city. The RRPC provides leadership and technical expertise to encourage cooperative planning within and among the region's communities and area-wide interests (<http://www.rutlandrpc.org/>). The RRPC coordinates a regional transportation council whose mission is to "promote and support, throughout the Rutland Region, an integrated transportation system that facilitates commerce and communication and enhances quality of life" (<http://www.rutlandrpc.org/transportation.php>).
- **MVRTD** —also known as "The Bus"—operates the largest non-urban public transportation system in the State Vermont and has offered extensive local and regional service for over 37 years. Their mission is to, "provide safe, reliable, accessible and coordinated public transit service to enhance the economic, social and environmental quality of life throughout Rutland County and surrounding communities" (<http://www.thebus.com/>).
- **GoVermont** is a statewide program of the Vermont Agency of Transportation that offers an array of transportation resources (carpool matching, vanpooling, and guaranteed rides home integrated with bus, ferry, train, pedestrian, and cycling routes) to Vermonters with the goal of reducing costs for individuals while also reducing carbon emissions (<http://www.connectingcommuters.org/>). Each spring, GoVermont hosts the "Way to Go Vermont Commuter Challenge"—a weeklong competition to see which businesses and communities in the state can save the most carbon by avoiding single-occupancy vehicle commuting (<http://waytogovt.org/>). The Spring 2014 Way to Go Challenge is scheduled for May 12-16.

¹ http://www.uvm.edu/~transctr/research/trc_reports/UVM-TRC-11-007.pdf

Mapping the “Commutershed” for Enhanced Transportation Efficiency

With guidance from the Vermont Agency of Transportation, transportation planning in the state is framed by an approach called “Travel Demand Management” or TDM. TDM consists of a suite of strategies that aim to make the transportation system more efficient. “TDM treats mobility as a means to an end, rather than an end in itself. It emphasizes the movement of people and goods, rather than motor vehicles, and so gives priority to more efficient modes (such as walking, cycling, ridesharing, public transit)..... It prioritizes travel based on the value and costs of each trip, giving higher value trips and lower cost modes priority over lower value, higher cost travel, when doing so increases overall system efficiency” (<http://www.vtapi.org/tdm/tdm51.htm>).

RRPC’s key research need is for you to work with several existing datasets to provide insights for enhancing connectivity and providing options for smarter and more efficient commuting. The RRPC has two goals for your analyses: 1) to provide information to assist the RRPC with their TDM goals for regional transportation over the long-term and 2) to promote public engagement with more efficient commuting by enhancing participation in the May 2014 Way to Go Commuter Challenge.

These datasets include:

- [Longitudinal Employer-Household Dynamics](#) (LEHD) data from the US Census Bureau that identify a given individual’s location of residence (“origin”) and location of employment (“destination”) at the block level
- [Way to Go Vermont](#) survey data, which include commute distances and modes for participants in the statewide week-long event that encourages non-single occupancy vehicle (non-SOV) commuting
- [GoVermont](#) rideshare data which includes ride-matching activity summaries
- [VTrans Public Service Indicator Reports](#) providing number of boardings per day

You are challenged to design a strategy to integrate and analyze the above datasets. The LEHD data will allow you to identify clusters and patterns (e.g. groups of people living in close proximity and commuting to the same / proximate places of employment) for the 27 towns under the RRPC’s purview, which you can then compare to existing infrastructure for non-SOV travel to illuminate where additional connections might be needed. The remaining three datasets will allow you to characterize current utilization of non-SOV options by residents in these towns. Use your county-wide research to identify towns that—based on a set of criteria you can define—you would predict as being particularly amenable to further engagement with more efficient and sustainable transportation behavior (e.g. gaps in existing options where additional resources and infrastructure could have the largest impact, increasing levels of current transit use).

For this subset of communities, you are asked to devise community-based social marketing strategies with the goal of increasing participation in the May 2014 Way to Go Commuter Challenge in the short-term, and hopefully fostering a behavior shift towards non-SOV travel in the long-term. You will need to learn about these communities and determine what messages will resonate with them. Throughout the seminar we will be exploring the power of storytelling for advancing sustainability issues, so this should be part of your marketing campaign (e.g. telling the story of towns that have been successful Way to Go participants in the past and what led to their success).

Additional research questions could include:

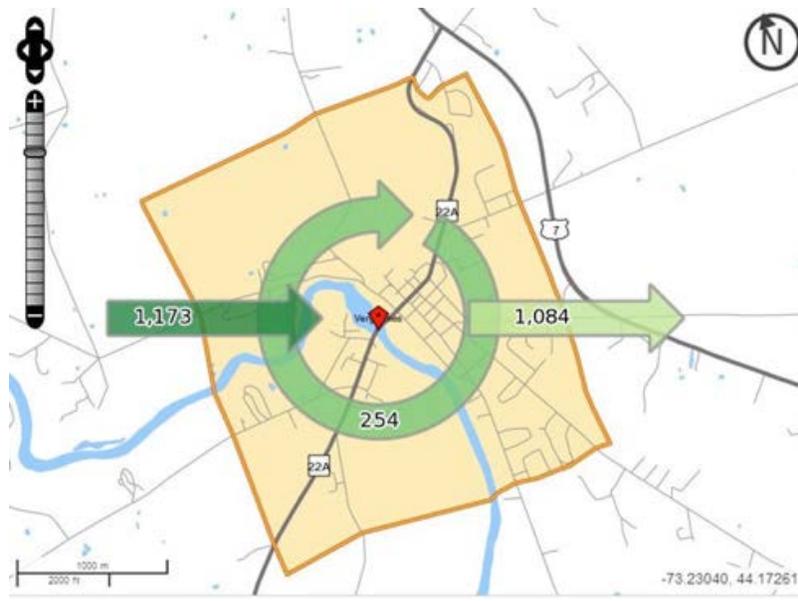
- Most transportation efficiency efforts start by targeting large employers, but many planners recognize the need to also work with residential communities. While the business approach may still be appropriate for parts of Rutland County (and you can connect with Group #2 on this for Rutland City), the data may highlight opportunities for neighborhood level engagement. This is challenging given the

lack of managerial structure within a cluster of neighbors—what models from elsewhere or creative strategies can you identify?

- Through both your research and conversations in select communities, can you suggest the optimal means for making connections where they are needed – adding additional bus routes, adding or relocating Park-and-Rides, establishing rideshare cohorts or vanpools, adding bike lanes or sidewalks, installing end-of-trip infrastructure (racks, showers, etc.) to encourage multi-modal bike/ped connections, etc.? What are the pros/cons of these various options?

Project Resources:

- The Addison County Regional Planning Commission (ACRPC) has developed a beta-version of a web tool that utilizes the LEHD data to identify the most likely route from home to work.
- Rutland Regional Transportation Plan: <http://www.rutlandrpc.org/publicationstrans.php>
- Fall 2012 ES 401 projects, available at: <http://www.middlebury.edu/academics/es/work/communityconnectedlearning/envs0401/archive>
- Storytelling & Sustainability workshop (in-class) on 2/27
- Interviewing workshop (in-class) on 3/4; interview reference document on Moodle site
- Recording equipment available through library; recording space available through the Vermont Folklife Center; recording and editing space available in campus computing labs and the Film and Media Cultures Department



Example Inflow/ Outflow Data for Vergennes, VT from On the Map LEHD 2010 US Census Data. Fall 2012 ES 401.

Engaging Business Clusters with Transportation Opportunities

MVRTD's Unlimited Access Program is a key community engagement strategy that not only enhances ridership and awareness of non-SOV options, but also brings in funding support. Through this program, area learning institutions and businesses pay a fee to MVRTD and in exchange offer their students and employees a pass for unlimited usage of The Bus' transit services (e.g., a College ID serves as a bus pass). Three years ago, MVRTD entered into this type of agreement with the Rutland area learning institutions (Community College of Vermont, the Vermont Adult Learning Center and Castleton, Green Mountain, and Saint Joseph's Colleges) to great success. They also recently were able to sign-on the Rutland Regional Medical Center to this program for a 8-month trial basis.

MVRTD's key research need is to identify a strategy to engage more businesses in the Unlimited Access Program. In particular, there is a cluster of over a dozen businesses in an industrial park near the Rutland Regional Airport that MVRTD has identified as having a high potential for garnering new—and better servicing current—users of public transportation.

Research questions include:

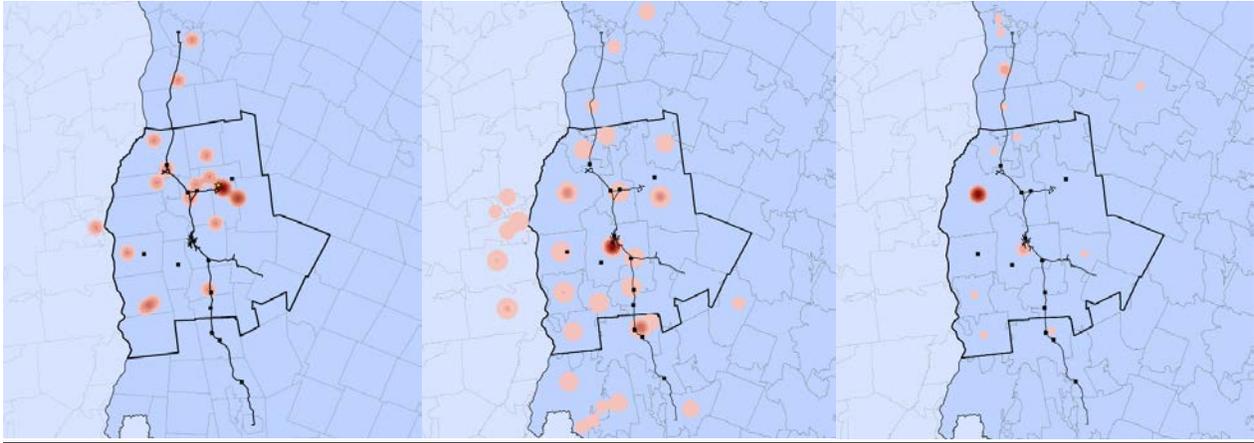
- How might you strategically assess 1) the likelihood of a business to participate and 2) the feasibility of participation by employees given the range of current transit options?
- Since both financial and human resources are involved, you will need to develop a compelling case for businesses to participate in the Unlimited Access Program. What would the benefits to them and their employees be if they participated in this program? How would you frame the program for each specific business? What can MVRTD data on current transit usage by the employees of these businesses tell you?
- Work with willing businesses to survey their employees to identify potential barriers to participation (e.g. timing of bus offerings not matching shifts, routing considerations, unawareness of options, etc.). For this line of inquiry, our partners have requested you use an existing state-level survey for businesses. What questions might you add to tailor the survey to local considerations? What approaches might you use if you aren't able to gain access to employees for surveying?
- Building off of the work of Group #1, how would you make a more detailed (higher spatial resolution) map of the commutershed for the industrial park businesses (e.g. employee address level vs. their approach at the census block level)? Are there any obvious gaps in connectivity that could be addressed to make ridership more accessible for employees of these businesses?
- Throughout the seminar we will be exploring the power of storytelling for advancing sustainability issues, so this should be part of your case-making for businesses. Giving voice to the stories of people who rely on and benefit from the local and regional transit services would be compelling for increased participation. Identify through your interactions with these businesses what the most compelling stories would be (e.g. financial savings or other co-benefits as told by Unlimited Access participants from area learning institutions and the Rutland Regional Medical Center, needs as expressed by business employees, etc.).

Similar to Group #1, while increased business participation in the Unlimited Access Program is the short-term goal, your work will be an important starting point for broader engagement in the range of non- SOV travel opportunities.

Project Resources:

- Business Tracking Google Doc, a statewide database of outreach efforts at businesses, organized by county

- Vital Communities current working business survey
- MVRTD transit usage data
- Fall 2012 ES 401 projects, available at:
<http://www.middlebury.edu/academics/es/work/communityconnectedlearning/envs0401/archive>
- Storytelling & Sustainability workshop (in-class) on 2/27
- Interviewing workshop (in-class) on 3/4; interview reference document on Moodle site
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Example Employee Density Analyses from Fall 2012 ES 401 for Specific Employers