



SPR RESEARCH PROGRAM

SECOND-STAGE PROBLEM STATEMENT

FY 2008-09

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I. PROBLEM NUMBER

PEA-09-07

II. PROBLEM TITLE

Feasibility Study of a Web-Based Household Activity Planner to Reduce Household Vehicle Travel, Reduce Greenhouse Gas Emissions, and Improve Transportation Service Provision

III. RESEARCH PROBLEM STATEMENT

The need to reduce greenhouse gas (GHG) emissions will be the defining challenge for transportation agencies over the next several decades. To achieve the state goal of reducing GHG emissions to 75% of 1990 levels by 2050, it is necessary to substantially reduce the per capita vehicle miles traveled (VMT). Previous research in travel behavior has shown that a significant percentage of household VMT can be attributed to *excess travel*, i.e. inefficient trip planning. For instance, excess travel results when multiple household activities such as shopping, going to the gym and meeting someone downtown for lunch, are not chained together in a single trip, but represent individual trips for each activity. If two households have the same activities planned, the household that does not efficiently plan their trips will have much higher VMT than the household that does trip chaining.

Often, excess travel can be the result of a lack of better information about activity destinations, travel modes, and routes. For instance, Zhang (2007) showed that the total VMT, in a representative US metro area, could be reduced by more than 12% if a traveler is provided with better route information. In Oregon, the *Drive Less, Save More* campaign has proven effective at motivating some residents to chain trips and reduce VMT. This campaign, however, focuses on advertising to let the public know they can save money by driving less, but does not provide interactive trip chaining information. Given the already proven willingness of some residents to drive less, there is great potential for an informational tool that provides people with the necessary information to combine activities, chain trips, and further reduce their VMT.

In the past, traditional paper- and interview-based methods for disseminating travel information has proven to be labor-intensive and to only reach a small number of households. Fortunately, the wide availability of internet services, advances in web-based applications, and availability of transportation-land use data now offer opportunities for greatly expanding access to activity and travel planning services. A web-based household activity planner will conceivably allow users to enter their activities, schedule requirements, priorities, and/or destinations into the web interface, and the service will provide suggestions for trip chaining, travel mode, routing, and even schedules and destinations if they are not specified by the users. All the information about the suggested activity locations and travel tours may be displayed on an online map. This web-based service can also provide feedback on savings in travel distance, time, cost, energy consumption, and GHG emissions.

Given Oregon's emission reduction targets, methods for reducing the total number of trips of a household, VMT and resulting greenhouse gases, need to be explored. There is currently little understanding of the potential use, applicability, feasibility and household behavioral impacts of a web-based household activity planner. If such a tool was found to be effective at reducing household VMT, the eventual implementation of such a program could reduce GHG emissions from transportation in Oregon.

IV. RESEARCH OBJECTIVES

The ultimate goal of this research is to establish the feasibility of an intelligent web-based service that people can use to plan their (monthly, weekly, or daily) activities and travel so that total household VMT and GHG emissions can be reduced.

The research project has the following specific objectives

1. Conduct market analysis regarding who, how, and how often people would use the service, what service people need, and what particular household activity planning tools will be useful. The general public accessibility of and support for this service will also be evaluated.

2. Investigate the general feasibility of such a service including potential technical constraints (if any), intelligence options, location and availability of data, affordability, and overall scale.

V. WORK TASKS, COST ESTIMATE AND DURATION

Under the supervision of a technical advisory committee, this project will build upon past and current work by ODOT and the research team in the areas of travel behavior, auto travel demand management, GHG emission reductions, and web-based program development. The total project cost estimate is \$105,000 with a 12-month schedule. Since the submitters will also develop a proposal to leverage OTREC funding, the actual project cost to ODOT would be \$52,500 if it is also funded by OTREC.

ID	Task
1.	Literature Review: Conduct a thorough review of US and international literature on the methods and applications of household activity planning (or other similar) services, and their effectiveness in reducing VMT and GHG emissions. Investigate computer technologies that can support the proposed web-based system.
2.	Data Source Investigation: Investigate the location, availability, and format of various land use and transportation data that will be required to develop the proposed household activity planner.
3.	Market Analysis: Conduct market analysis regarding who, how, and how often people would use the service, what service people need, and what particular household activity planning tools would be useful.
4.	Feasibility Study: Based on the results from the market analysis, study the feasibility of the activity-planning services that are preferred by the users. According to Tasks 1 and 2 findings, the feasibility study will consider data availability, technological constraints, design/implementation costs, and managerial challenges.
5.	Design Recommendations: Formulate a preliminary design that will only include recommendations for the types of services provided, the sources and storage options of supporting data, computer algorithms that produce household activity plans, and the integration of the web-based system into existing ODOT services.
6.	Final Report: Prepare the draft final report for review and comments. Address any comments or concerns and finalize the report.

VI. IMPLEMENTATION

Provide information to help ODOT determine if the proposed web-based household activity planner is feasible, and discuss the significant household and statewide benefits of such a program given the overall costs. In addition, implementation will also include:

1. Presenting research findings to ODOT staff, advisory committees, the OTC, and at other meetings/seminars;
2. Preparing written and visual materials for inclusion in ODOT documents and web pages where appropriate;
3. Presenting project-related papers at professional conferences and publishing them in professional journals.

VII. POTENTIAL BENEFITS

Researching the feasibility of this web-based activity planner will advance ODOT's knowledge about how such a system could be used, who will use it, how it would be developed and the potential changes in household travel behavior as a result of the use of the system. This information can be used to decide if such a program would be beneficial in Oregon and to ODOT. If such a service is found to be feasible and is eventually implemented, ODOT will act as a leader in assisting the public to improve their travel patterns to cope with rising travel costs and congestion by reducing the total number of trips and VMT. By reducing VMT and congestion, greenhouse gas emissions can also be significantly reduced. The travel data and information on household activity patterns gathered through this web-based service will help ODOT and other transportation agencies improve their transportation models, identify transportation system needs, and identify the most productive transportation investments.

VIII. SUBMITTED BY

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