

Western States Rural Transportation Consortium

Incubator Project Request Form

A. PROJECT INFORMATION

Title:

Winter Travel Times

Problem Statement:

Reliable and predictable travel between urban centers is very desirable as our society and economy becomes more distributed and interdependent. While travel time prediction and display is currently routine within urban areas, nothing exists to address rural travel. A system is needed to *accurately* predict and disseminate the travel times between urban centers in all weather and highway conditions.

Background:

Winter storms, accidents, wildfires and other major events can have a dramatic negative effect on goods and people movement on our interstate corridors. Year-round use of these facilities can be enhanced by accurate rural travel times between cities. Past Caltrans and WSRTC projects have made impressive improvements in the availability of traveler information and weather data so that better trip planning decisions can be made. One Stop Shop and WeatherShare are just two examples of information sources that facilitate pre-trip planning across an entire region or route. Significant time and energy has been expended in identifying and collecting the large amounts of data needed to bring these projects to fruition. This proposal, makes use of this and other data to provide significant additional benefit to the motoring public and goods movement community.

Predicting the amount of time it takes to get from City A to City B can be extremely challenging during winter storms or other non-recurring events. However, being able to accurately do this yields very valuable information for the rural traveler. It provides highway users with a way to quickly evaluate the merits and disadvantages of using a particular route over another. In addition, it allows some measure of predictability to those travelers who are in the midst of a trip when severe weather closes in. While there are many large private companies that are likely capable of providing this kind of information to the rural traveler, to date none has. Limited scope offerings, such as over a mountain pass, have not yielded information that was accurate during winter conditions. Is this something that we can do and do effectively? This is unknown, but this proposed incubator project lays the groundwork to find out if travel time can be accurately determined across a long stretch of rural roadway.

Objective:

Long-Term Objective: To improve the ability of drivers to plan travel, choose routes and estimate travel times during winter weather and other difficult to predict events. This will eventually take the form of a system that delivers accurate, timely and reliable travel times between cities with a focus on two multistate corridors. The proposed corridors are Interstate 80 between San Francisco and the Nevada/Utah border and along Interstate 5 between our southern border with Mexico and the Canadian border.

The travel times developed must be accurate during all types of environmental conditions such as: winter weather, large fires, construction activities, accidents, etc. – any condition that would affect the travel time between cities of interest along each targeted route. The system must deal with both freight (i.e., truck) travel times and car travel times and convey those different times to drivers. As the predicted travel time changes, such as from an accident or chain restriction change, the system must notify drivers of the change and the expected effect on their travel. The system must use all effective means to communicate with drivers, including: Changeable Message Signs, Highway Advisory Radio, communication with each vehicle directly where possible (On-Star, DSRC), communication with personal digital devices, web based display on traveler information platforms such as One Stop Shop, mobile web utilizing voice notification, third party partnering and any other means that is deemed useful and practical.

Some additional information that should be made available to drivers in real-time includes: queue times at chain on and off areas, construction queue times, accident queue times, snow plow probe road conditions and snow plow probe semi real-time images. In short, the objective is to take the existing traveler information systems to the next level. Providing more prediction and enroute notification without constantly monitoring a website during a trip. All of this needs to be accomplished without encouraging users to become distracted from their primary activity – driving.

Objective for this Incubator Project: To take some of the first steps in realizing the long-term objective above.

First, determine how accurate a travel time needs to be in order to be valuable to the driver. In other words, what level of accuracy is required for a travel time to be "perceived reliable" by drivers so that they will alter their behavior based on that information. This must take into account differing expectations for the different types of conditions outlined above. For example, drivers may have a different accuracy "threshold" for travel times during a significant winter storm as opposed to a clear, sunny day. That will set the minimum requirements for a useful system. Then develop a set of practical performance measures and methods for determining if a travel time over a given segment of rural highway meet the requirement.

Second, conduct a thorough search for third party data collection providers and in-vehicle system providers that would be able to develop and provide accurate rural travel times. Make contact with these providers to gauge their interest in participating with us in test bed demonstrations. Then attempt to determine each provider's ability to meet the performance measures developed earlier.

Third, investigate and identify six to ten highway segments within the WSRTC area that are good candidates for an actual travel time test bed. The segments need to be limited enough so that they are practical to analyze during a follow on project. Examples could be a mountain pass, a busy chain-on area, etc. As part of the investigation, identify regional and local agencies that have relevant data available and how it can be used. Also, gauge their interest in participating with us in test bed travel time demonstrations.

Fourth, take a first pass at developing a methodology for developing segment travel times during all highway conditions. That methodology may be a complex hybrid of various data sources including when an operational transition occurs, i.e., a chain restriction changes. Or it may be as simple as contracting the service out to a data provider who is willing to participate - then the focus would shift to implementing a methodology for verifying accuracy.

Description of Work:

See "Objective for this Incubator Project".

Deliverable:

See "Objective for this Incubator Project".

Known Related Research / Project:

To be determined by project.

Contacts / Resources:

To be determined by project.

Potential Research Organization:

Western Transportation Institute, Montana State University, Bozeman. Other research partners may be a good fit for parts of the effort.

Could other states use the results?

Yes. This work should be applicable to any state interested in inter-city winter traveler information.

Estimated Cost:

Unknown.

Estimated Time:

Unknown.

B. SUBMITTAL INFORMATION

Submitted By:

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Chair, Rural Program Steering Committee, Caltrans

State:

California

Submittal Date:

May 26, 2016

In summary, incubator projects provide limited time, scope and monetary resources to investigate current rural ITS challenges and technology needs. Incubator projects are not intended to completely resolve the issue being researched, but rather to better understand the complexities of the issue, provide recommendations for next steps and potentially provide a "proof of concept" solution. Demonstrated in the rural context outside of both urban and metropolitan areas, the incubator projects are designed to provide answers to challenges pressing rural ITS practitioners. Current and previous incubator projects can be found here: <http://westernstates.org/Projects/Default.html>

- **Title** – Preferably in 10 words or less.
- **Problem Statement** – Provide a brief description of the problem that needs to be investigated and why this issue is important.
- **Background** – Detail how the problem developed or was identified.
- **Objective** - What needs to be accomplished with this project?
- **Description of Work** – What work needs to be done to successfully achieve the objective?
- **Deliverable** – What products are expected from this work?
- **Known Related Research / Projects** – Is there or has there already been similar research / projects related to the problem that could be used as a starting point for this project?
- **Contacts / Resources** – Are there contacts available to provide further information related to this project? Are there any resources available that you know of to help augment the project?
- **Potential Research Organization** - Which organization would be capable of delivering the project?
- **Could other states use the results?** - Is this project broadly applicable to other states?
- **Estimated Cost** - Ballpark estimate of cost to perform project.
- **Estimated Time** – Ballpark estimate of time to perform project.
- **Submitted By** – The person who wrote the details in this form.
- **State** – The state that the submitter is from.
- **Submittal Date** – The date this form was submitted.