California Oregon Advanced Transportation Systems (COATS) Phase 7

Incubator Projects

Incubator projects are low-cost research efforts that serve as a potential "proof of concept." Such 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.

The following three incubator projects were originally proposed for COATS Phase 7.

Incubator 1: *Rural Winter Travel Times*

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. Predicting the amount of time it takes to get from point A to point 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. 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. And, for whatever reason, there is no indication of private sector interest in filling this information gap. Can this be done effectively? This is unknown, and the intent of a potentially large project is to find out. The intent of this incubator project is to conduct a preliminary investigation to determine the viability of estimating rural winter travel times.
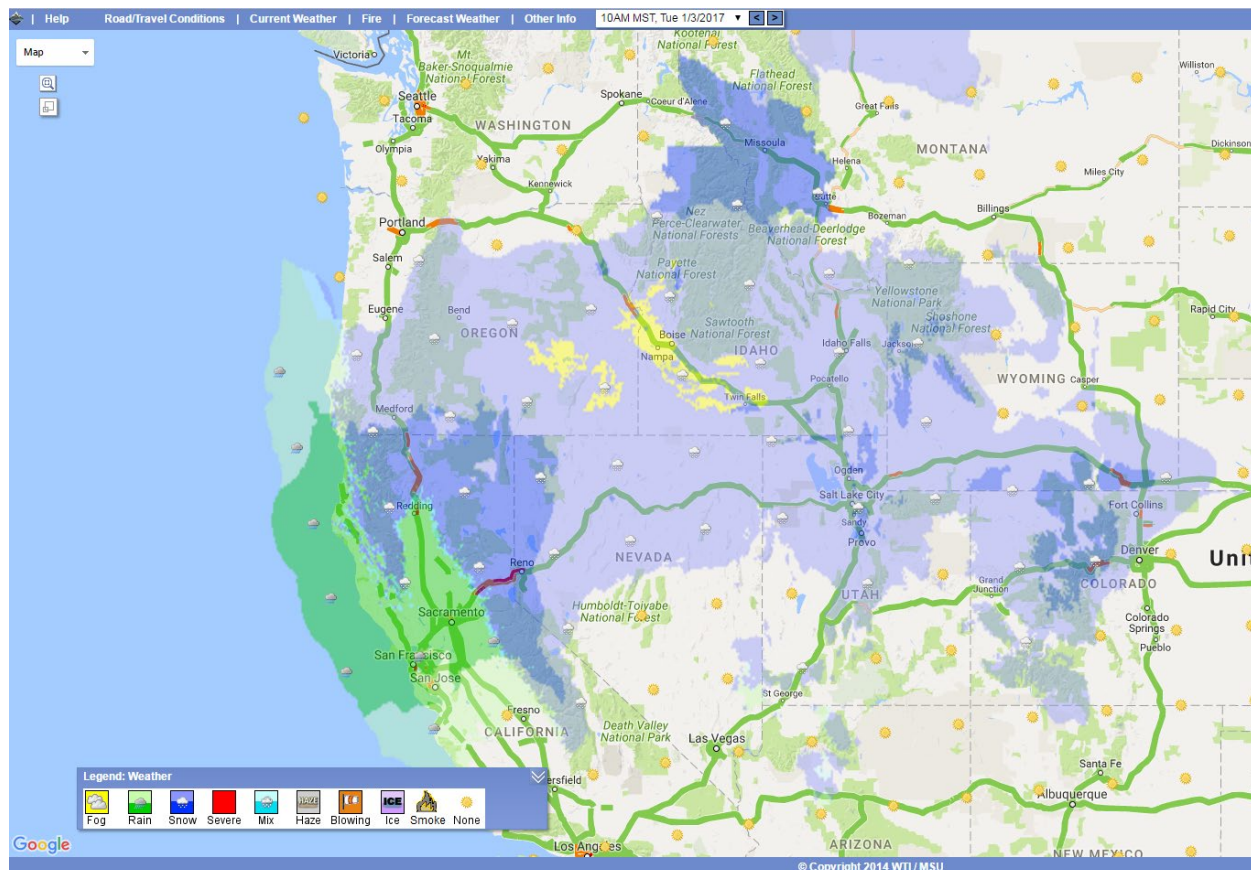
Incubator 2: *Chain-Up Delay Tracking with Bluetooth (Part 2)*

Near Fawndale, California, on northbound I-5 north of Redding, trucks may be required to chain up or are screened to ensure that they have a full set of chains when chain controls are in place. When these chain restrictions are active, there can be a backup of trucks for 5 miles or more, all the way to Pine Grove and beyond. In the four-lane section near Fawndale, the backup consists of one lane of trucks. Closer to Redding, there is a six-lane section that develops a truck queue in the number two and three lanes. Determining accurate delay times that could be displayed on changeable message signs (CMS) before the backup starts may reduce the wait times and backup length, which could improve safety within this corridor. This incubator will utilize yet to be deployed District 2 Bluetooth readers upstream, downstream and within the chain-up area. Using the information from the Bluetooth readers will allow the research team to develop a preliminary prototype algorithm to predict delays through the chain-up area.
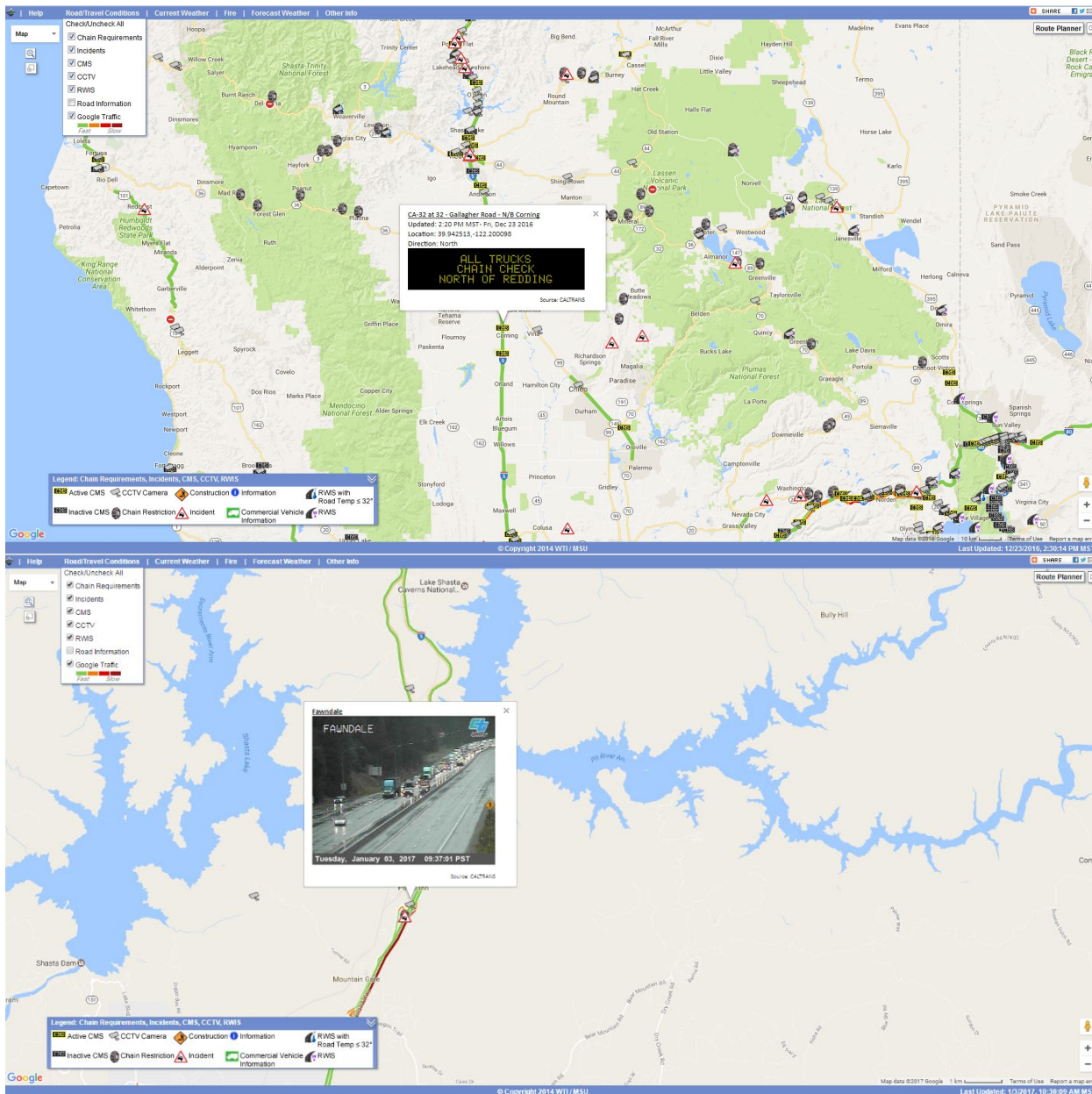
Incubator 3: *Data Quality for Aggregation and Dissemination of DOT Traveler Information: An Analysis of Existing System Best Practices (Part 2)*

Data quality for traveler information data has generally been handled on an ad-hoc basis, with little or no provision for error notification other than perhaps through user-reporting of observed errors. Weather-related systems such as MADIS, Mesowest and Clarus have applied quality checks to weather sensor data, but these checks don't necessarily transfer to other sensor and data types. Further, these checks may not be applicable to department of transportation RWIS sites in the absence of data from additional sites. Some, including Caltrans District 2, have implemented measures of reliability based on network and file transfer performance. The District 2 Information Relay and the DRISI CWWP2 efforts have also included some checks for bad data in CCTV and other feeds. However, part 1 of this incubator project did not find evidence of any unified, multi-dimensional approaches to data quality for aggregation and dissemination of DOT traveler information. Consequently, the goal of part 2 is to develop best practices for traveler information data quality.

However, since the start of the project, significant staffing changes occurred at the Western Transportation Institute leaving staffing levels substantially reduced. To address the changes, Caltrans' needs, and team member experience, the following incubator projects were then proposed.

Incubator 1: *Traveler Information Data Quality*

The original goal for this incubator project was to develop a set of best practices for traveler information data quality. This was to include best practice methods and algorithms, and a test suite of algorithms. With the above-mentioned staffing changes, this would have been accomplished with the remaining research team member in conjunction with work on spin-off projects. Ultimately, the effect of the staffing changes on the hours and expertise needed to complete this project was significant. The project manager and PTAP deemed this incubator a lower priority for the research team than that of other project work. With that said, this project and its research outcomes are of importance to Caltrans and the topic may still be addressed in the future through other means.

Incubator 2: *Rural Cellular Communications Deployment*

This topic was proposed after several high-profile incidents that significantly impacted rural areas in California. However, it was temporarily set aside until the impact of the recent implementation of the FirstNet Public Safety Communications Network is observed and evaluated.

Incubator 3: *How-To Handbook/Manual for the Western States Forum*

The 2020 Western States Rural Transportation Technology Implementers Forum would have been the 15th annual event. The current COATS research team has been involved with the Forum on the Steering Committee for all but the first two events. The planning and execution of the Forum has been conducted by a four-person steering committee with assistance from an on-site event coordinator. The Handbook is intended to document the Forum in such a way that the event and its standard of excellence can be easily continued even as staffing and other inevitable changes occur. The Handbook is a practical, how-to guide for planning and executing the Western States Forum. A best effort was made to document the necessary activities and what has been done in the past in order to maintain the standards and expectations for the event.

The Handbook includes a description of the Forum with its goals and target audience. It discusses some of the history and background for the event in order to establish a foundation for why the event has been

conducted as it has in the past. The Handbook then goes into detail on specific aspects, such as location, venue, facilities, lodging, and food and beverage services. Information is included on the schedule of events, technical program and agenda, networking, event promotion and marketing, registration, travel assistance, and meeting notebooks. The Handbook also discusses evaluation of the Forum and follow-up activities and includes a list of equipment that is part of the event.

In addition to the information about planning and conducting the Forum, the Handbook also contains a list of past topics, participation history, and sample materials. Original materials that can be minimally edited and used for future events are included in a separate compendium.

This Handbook is dynamic and is meant to be updated after each Forum to keep it current, applicable, and practical.