The One-Stop Shop

Traveler Information Tool for Multistate Road Trips

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Real-time traveler information is a valuable tool for protecting and enhancing traveler safety and mobility, especially in rural areas. Knowing about potential safety challenges before a trip—including snow, ice, high winds, fires, and other hazards—is particularly important for rural travelers. These hazards—as well as vehicle crashes and work zones—pose challenges that can degrade mobility.

Information about these challenges, however, generally is scattered over many sources. As a result, many rural travelers may not seek, find, or even be aware of all the information that is available. This lack of awareness about various traveling conditions may result in increased delays and degraded safety.

Research and Solution

In 2010, the California Department of Transportation (Caltrans) and the Western States Rural Transportation Consortium (WSRTC) together launched a proof-of-concept research project to provide traveler information through a single, easy-to-use source. Researchers at the Western Transportation Institute (WTI) at Montana State University created a traveler information tool, the One-Stop Shop,[1] to benefit users in the selected initial region. The WTI team demonstrated the feasibility and attractiveness of a comprehensive application for real-time traveler information in rural areas.

The One-Stop Shop application is an umbrella website of traveler information that can be used as a primary point of reference for trip planning (see Figure 1, above right). The website features an accessible and intuitive interface that allows travelers to plan in-state trips, as well as trips across state borders. Because it was developed as a proof of concept, One-Stop Shop has a scalable design, so that the system can expand to additional routes and states.

"The long-distance traveler doesn't care that he has crossed a state line or district boundary—what he wants is accurate, timely and reliable road condition and weather information all along a route, from beginning to end," observes Ian Turnbull, Chief of the Caltrans Office of Intelligent Transportation Systems Engineering and Support. "The One-Stop Shop finally gives us the ability to get route-oriented, real-time traveler information to the public in an effective manner."

[1] http://oss.weathershare.org.

FIGURE 1 The One-Stop Shop mobile application is available on smartphones and tablets.

Ongoing Research

From the beginning, the team has treated the One-Stop Shop as an ongoing research project and test bed. The team constantly gauges the website's use and usability via online surveys and in-depth tracking and analytics. Team members adopted a hybrid approach that combined systems engineering and spiral development; this has enabled the rapid incorporation of changes into the system in response to feedback from surveys and usage tracking.

FIGURE 2 Posteclipse traffic congestion, shown live on the One-Stop Shop.

Icy conditions, snow, and fallen trees closed Washington State's I-90 to travel in January. Washington State is a member of the Western States Rural Transportation Consortium, which contributed to the development of the One-Stop Shop traveler information tool.

By operating at the edge of change, the One-Stop Shop has addressed many challenges of interface design and deployment that have helped to pave the way for related efforts, such as the popular Caltrans QuickMap, an online map layered with information about traffic speed, lane and road closures, incident reports, changeable message sign contents, camera snapshots, and more.[2]

The project team recently investigated the impact of the 2017 eclipse on system usage in real time (see Figure 2, page 38). The team found that some users observed both the eclipse and its impact on travel from afar; in addition, those who traveled to see the total eclipse in person used the One-Stop Shop in conjunction with their journeys.

The project team also has conducted research on data quality. A beneficial side effect is that this has enabled the project team to identify any emerging problems with the data feeds. On several occasions, the project team has been able to contact the data providers to fix the problems before critical times of use—for example, in advance of a major winter weather event.

The collection, assimilation, and distribution mechanisms for the One-Stop Shop data have covered a large geographic expanse and have required the cooperation of many agencies in several states. The One-Stop Shop was one of the first web-based traveler information portals to integrate information from several state departments of transportation.

The website also incorporates key information from other sources, such as real-time weather information from the National Weather Service and information about congested traffic locations from Google Traffic. These are major accomplishments that have relied on extensive research and development.

[2] http://quickmap.dot.ca.gov/.

Decision-Making Tool

By combining all of these resources, the One-Stop Shop provides motorists with a single, seamless decision-making tool for long-distance travel. When users view a route on the website, they can access features that include the following:

◆ Route planning,
◆ Closed-circuit television images,
◆ Construction activity,
◆ Incident locations,
◆ Current and forecasted weather,
◆ Levels of traffic congestion,
◆ Active fire zones,

FIGURE 3 The One-Stop Shop covers an 11-state region. This screenshot from early 2017 displays a snow forecast across multiple states.
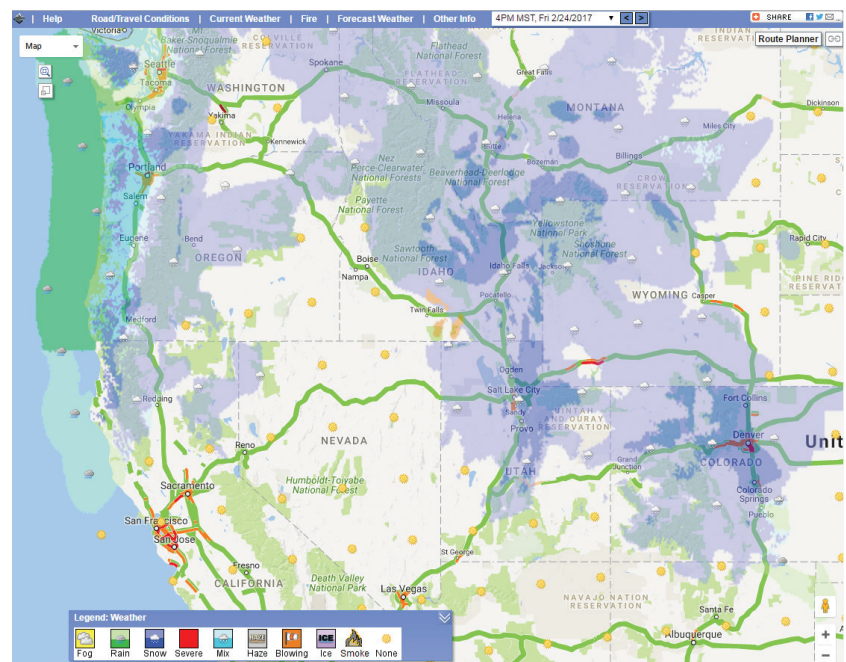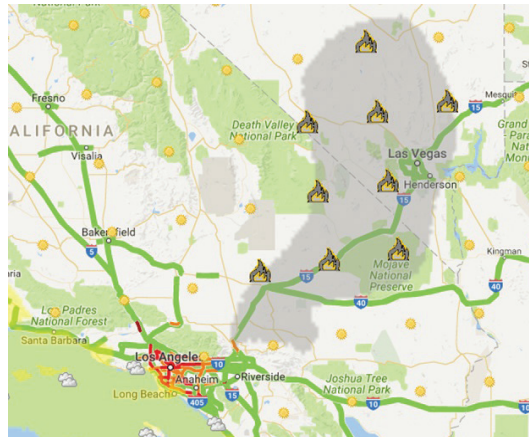
- ◆ Chain requirements,
- ◆ Elevation profiles,
- ◆ Rest areas, and
- ◆ Points of interest.

Expanding Access

Caltrans, WTI, and their partners launched the original One-Stop Shop web application in 2011, providing traveler information to the four-state region of California, Oregon, Washington, and Nevada. In 2014, coverage expanded significantly to seven more Western states: Arizona, Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming (see Figure 3, page 39). With the size of this new coverage area, the One-Stop Shop enables travelers to see current and projected conditions for long-distance routes such as Seattle, Washington, to San Diego, California; or Denver, Colorado, to Boise, Idaho.

The application serves a range of users, especially those who need information about real-time conditions—for example: local, regional, and long-distance travelers; local and state transportation agency personnel; emergency responders; and commercial vehicle operators.

At the end of 2016, the application went mobile, again expanding access.[3] The mobile site is available on smartphones and tablets and is attracting a broader audience. In addition, the mobile app gives travelers easy access to updates—although motorists are urged not to use the app while driving.

Benefits

The One-Stop Shop offers numerous benefits to individual and institutional users:

- ◆ Protecting and enhancing traveler safety and mobility in rural areas;
- ◆ Enabling travelers to "know before they go," so that they can make well-informed travel decisions;

[3] http://oss.weathershare.org/m/.

- ◆ Reducing the impacts of nonrecurring congestion and unexpected delays; and
- ◆ Enhancing the capability of the agencies that manage the transportation system.

User feedback and usage statistics suggest that travelers have found the One-Stop Shop particularly helpful during holiday periods and during severe storms—especially when both may occur simultaneously. For example, in December 2015, the desktop version of the One-Stop Shop hosted more than 63,000 user sessions for the month, with nearly 6,200 of the sessions—or almost 10 percent—occurring on Christmas Eve.

Usage continues to grow. In January 2017, during a bad weather season that included heavy, ongoing rains on the West Coast, the One-Stop Shop hosted 128,730 user sessions—an all-time record for monthly usage.

The One-Stop Shop also has proved beneficial to the agencies that plan and coordinate emergency response activities (see Figure 4, above left). After lightning-induced fires in Northern California this year, a dispatcher at the Caltrans Traffic Management Center reported that the One-Stop Shop "was instrumental in gauging where the fires could be headed, based on wind speed. This allowed our center to be better prepared for all of the many what-if situations."

Recognizing these benefits, as well as the project's pioneering use of transportation technologies, ITS America selected the One-Stop Shop as the winner of its Best of ITS Award for 2014 in the category of Best New Innovative Practice—Research, Design, and Innovation.

Caltrans funded the One-Stop Shop research, and WSRTC supported the ongoing research and development. In addition, the Federal Highway Administration provided funding for an early project task related to road weather information.