



Florida Department of Transportation Research

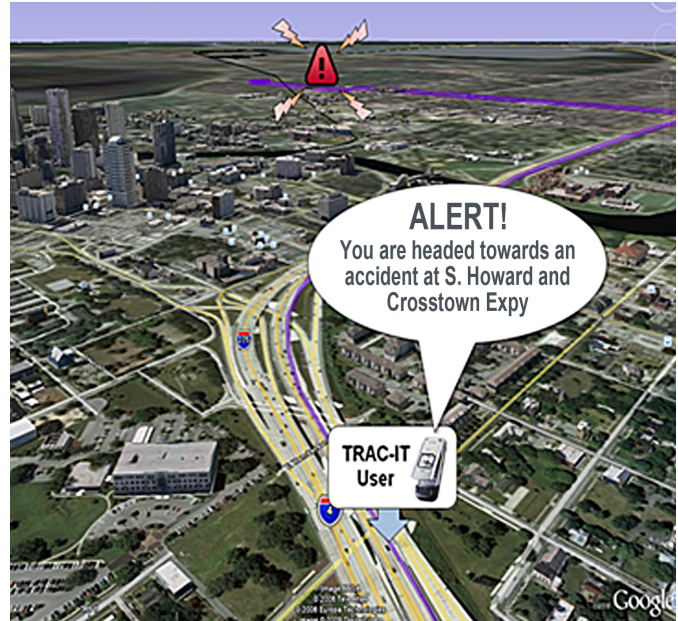
Dynamic Travel Information Personalized and Delivered to Your Cell Phone
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Florida 511 (FL511) is Florida's main system for public travel information. Despite extensive, live coverage of travel conditions on interstates, the FL511 Web site only provides users with links to transit system Web sites. Alerts, delivered only via text message, email, or phone call, are sent for a few interstates and major roads in Florida; they can be so numerous that useful information is lost; and accessing these messages while driving is hazardous. Researchers at the University of South Florida investigated improving FL511, focusing on information delivery that is pertinent, timely, and customized to individual travel behavior.

The researchers had previously developed TRAC-IT, a software system that collects data about a user's travel behavior and delivers real-time, location-based services using GPS-enabled mobile phones. This project enhanced TRAC-IT's abilities by adding Path Prediction technology, by which TRAC-IT creates a profile of a traveler's typical daily movements and provides travel information or alerts based on this profile. For example, TRAC-IT can anticipate that a traveler is likely to drive home after work and provide a travel advisory for the typical route. TRAC-IT supports other modes, such as public transportation, walking, or biking.

The researchers designed a Fast GPS Clustering algorithm that uses location data from GPS-enabled mobile phones to determine points-of-interest the traveler often visits. This algorithm's efficiency, compared to traditional hierarchical clustering, is critical for processing large volumes of GPS data. A Trip Segmentation (TS) algorithm divides GPS data into trips between points-of-interest to produce origin/destination models. A Naïve Bayes classifier predicted probable traveler destinations and departure times.

Researchers extended TRAC-IT's abilities by accessing data from Hillsborough Area Regional Transit's automatic vehicle location (AVL) system and showing how to combine FL511 with transit data to create a multimodal traveler information



Based on their predicted path, the TRAC-IT user receives a travel alert in advance of congestion, while re-routing is still an option.

system. Having one application that informs users about both traffic congestion and public transit options may encourage travelers to use transportation alternatives.

Using the text-to-speech converter of the Android (Google, Inc.) smartphone operating system, researchers produced a mobile application, Traffic Text-to-Speech (TTS) that speaks alerts without driver action, creating a safer interaction between the driver and the alert system. Traffic TTS tracks user speed and waits for a complete stop before notifying the user of pending alerts.

This project showed that Florida's traveler information system can be extended to other data sources, including public transportation, and provide timely, personalized, and appropriate information. Future work can focus on extending FL511 to more roads, integrating more real-time transit information, and deploying project technologies to the public.

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For more information, visit <http://www.dot.state.fl.us/research-center>