

Portable, solar-powered tag readers could improve traffic management

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A portable, solar-powered tag reader that collects data to monitor traffic flow.
Credit: Rensselaer/ Jeffrey Wojtowicz

As part of their ongoing effort to improve traffic management in New York state and across the country, a team of transportation researchers will be testing an array of wireless, solar-powered readers to monitor traffic flow. In the coming months, the units will be deployed to collect traffic data during the morning commute on busy Capital Region roads.

The portable units, which are based on the same technology as E-ZPass tag readers, could eventually be used to provide valuable data for a

variety of applications, from decreasing congestion in work zones to assisting emergency evacuations.

The research is funded through a \$3.9 million grant from the Federal Highway Administration to the Center for Infrastructure and Transportation Studies (CITS) at Rensselaer Polytechnic Institute. The project also includes collaborators from the New York State Department of Transportation, the New York State Thruway Authority, Mark IV Industries Inc., Annese & Associates, and North Carolina State University.

"We hope to use this technology to enable better management of our traffic system," said William "Al" Wallace, CITS director and professor of decision sciences and engineering systems at Rensselaer. In collaboration with Mark IV Industries, he and Jeffrey Wojtowicz, a research engineer in civil and environmental engineering at Rensselaer, have developed a prototype reader that is powered by solar panels, collects data on a laptop computer, and then sends the information wirelessly back to a server. The portable device sits on a trailer that can be transported by a vehicle with a normal-duty hitch.

Beginning in mid-November, the team plans to deploy one test device to begin the initial collection of data. Then in early spring, the researchers will deploy six units across the Capital District Testbed area -- a busy stretch of road along Route 4 in Rensselaer County. Federal funding for the Testbed was secured with the help of Congressman Michael R. McNulty.

"This is the first field experiment of its kind," Wallace said. "The goal here is to collect data, analyze it, and find out if this really works."

Traffic monitoring using E-ZPass tags began in 1994 when the Thruway Authority and TRANSCOM developed and deployed 15 permanent

reader sites downstate. These sites were integrated into a system called "TRANSMIT" that provides traffic information to transportation agencies.

TRANSMIT and the Rensselaer-led pilot project are separate systems from the E-ZPass toll collection system. Similar to the TRANSMIT system, this new project requires that any identifiable information from tags be automatically encrypted.

The TRANSMIT system has been expanded to include 26 newly installed readers at strategic locations around the Capital Region. But there are no functioning portable, wireless, and solar-powered units in use today, according to Wallace.

The portable units could be particularly useful for decreasing congestion and providing travel time estimates in work zones, at special events, and during emergency evacuations. And planners could potentially deploy a network of readers to monitor driving route choices, helping them decide where to place new roads or other construction projects, such as malls and housing developments.

This Capital District Testbed is the same area where the researchers recently tested their Advanced Traveler Information System (ATIS), a dynamic routing system that collects real-time traffic data and uses it to alert drivers about congested roadways, offering alternative routes to avoid problem areas. ATIS consists of a personal digital assistant (PDA) device with a global positioning system (GPS) that is part of a wireless computer network. The network collects and processes traffic data from the device and feeds the results back to the driver through an electronic voice mechanism.

About 30 participants in the original ATIS project have volunteered to use the systems to collect data during the new experiment, which will

help calibrate the solar-powered readers, Wojtowicz said.

Source: Rensselaer Polytechnic Institute

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