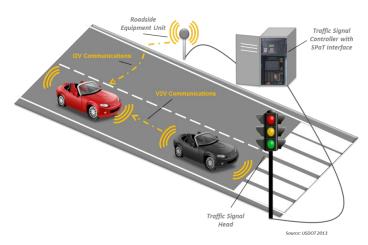# Eco-Approach and Departure at Signalized Intersections

The Eco-Approach and Departure at Signalized Intersections application uses wireless communications to give drivers recommendations that encourage "green" approaches to signalized intersections. The purpose of the application is to increase the fuel economy and reduce the emissions of vehicles traveling through an intersection.

HOW IT WORKS

Signal phase and timing (SPaT) data are broadcast from a roadside unit located at a traffic signal controller to a connected vehicle using wireless communications. The application located in the vehicle uses the data to determine the best speed to reach the next traffic signal on a green light or to come to a stop in the most eco-friendly manner. The application also considers a vehicle's acceleration as it departs from a signalized intersection, as well as engine start-stop technologies.

Concept for Eco-Approach and Departure

Examples of recommendations that may be given to the driver include slowing down early while approaching a red light to reduce idling at an intersection, or modestly speeding up to safely reach an intersection on green.

RECENT AND ONGOING RESEARCH

Initial testing for Eco-Approach and Departure was done in the fall of 2012 as part of the U.S. Department of Transportation's (USDOT) Applications for the Environment: Real-time Information Synthesis (AERIS) program. University of California Riverside (UCR) developed and tested an Eco-Approach and Departure algorithm that showed up to 18 percent fuel savings at the Connected Vehicle Highway Testbed located at the Federal Highway Administration's (FHWA) Turner-Fairbank Highway Research Center in McLean, VA.

The FHWA and Intelligent Transportation Systems (ITS) Joint Program Office are researching ways to create a prototype automated Eco-Approach and Departure (or GlidePath) application. The application will be installed in a research vehicle equipped with systems to control the brake and throttle modules, enabling full-range speed control, independent of the vehicle's cruise control system. This will allow the vehicle to automatically adjust to the speeds the application recommends, reducing the burden on the driver.

REFERENCES

USDOT, AERIS March 2013 Workshop – Eco-Approach and Departure at Signalized Intersections: Field Study and Modeling Presentation. March 2013. Available at: http://www.its.dot.gov/aeris/workshop_presentations.htm.

USDOT, Eco-Signal Operations Concept of Operations. Feb 2014. Available at: http://www.its.dot.gov/aeris/aeris_plan.htm.