

# Leveraging Sensor-Based Vehicle Trajectory Construction in Existing Traffic Signal Infrastructure

Chris Day

Assistant Professor, Iowa State University, cmday@iastate.edu

Rob Helt

City of Colorado Springs, rhelt@springsgov.com

Dan Sines

City of Colorado Springs, dsines@springsgov.com

In recent years, many advanced control concepts for traffic signals have been proposed that make use of enhanced information about vehicle speeds and positions. Such information is anticipated to be yielded by connected vehicles, which will require time to become widely available. Similar albeit imperfect information can be extracted from existing detection systems, but most signal controllers are unable to directly access that information. This presentation examines preliminary results from a system that integrates vehicle speed and position data from a radar detection system directly into the actuated control logic, using an algorithm that seeks to minimize impacts of dilemma zones as well as reduce stops. Preliminary results from field implementation at three intersections yielded a 98% reduction in dilemma zone vehicles and a 38% reduction in stops, based on visual observation of traffic. By August 2019, additional results should be obtained to additionally validate the control method. The presentation concludes by presenting plans for future development of the control concept.

*Keywords:* Traffic signals, Traffic control, Vehicle trajectory data