Virtual traffic lights as in-car systems go with the real road flow

January 16 2015, by Nancy Owano

Researchers have been working on a system of virtual traffic lights positioned inside the car which could give time back to commuters. For workers who make their way through daily traffic, the proposal is interesting enough: traffic lights on a windshield to get you home faster. Virtual traffic lights appear on the driver's dashboard and explain with green and red arrows in which direction they can safely travel but they disappear once the junction has been crossed, said a report in CNN.

Researchers feel that their new traffic light system could reduce the travel time of urban commuters 40 percent by replacing real-world

traffic lights with a system showing signals inside a motorist's car. Customized instructions might be projected onto the windshield or shown on a dashboard display. Lights will be created on demand when two cars are trying to cross an intersection and they will be turned down "as soon as we don't need them," said Carnegie Mellon electrical and computer engineering Prof. Ozan Tonguz, who helped to develop the technology. The team's concept has traffic lights changing colors according to real road conditions rather than a preset pattern. Chris Davies, executive editor for *SlashGear*, wrote that "With cars that periodically announce their location, direction, speed, and other metrics to those nearby, as well as a general set of traffic management rules, intersections could be dynamically managed." Tonguz said, "Since cars can talk to each other, we can manage the traffic control at intersections without infrastructure-based traffic lights."

The effort could be another step forward in a general initiative toward vehicle-to-vehicle (V2V) communications, using "connected vehicles" technologies. "Leveraging the new vehicle-to-vehicle (V2V) communication capability of modern cars we propose to design and validate an alternative scheme of urban traffic control that envisions TL as in-vehicle virtual signs, enabling ubiquity of signalized intersections, and defining the synchronization of light phases, cycle durations and green splits based on distributed and self-organization techniques that govern a vehicular ad hoc network (VANET)."

The virtual light is delivered to the driver through a display unit. Prof. Tonguz said, for example, when the driver is looking through the windshield, he sees that going straight is a green light, and turning right is a red light. "It is as if we are giving additional life to people," life that is otherwise "wasted on the road." Virtual Traffic Lights (VTL) LLC is the group behind the system, founded by Prof. Tonguz with co-founders Dr. Michel Ferreira and Dr. Luis Damas. The group carries expertise in vehicular networks, intelligent transportation systems, vehicular human-

machine interfaces, wireless networking security and traffic management. The group said its technology proved to increase traffic flows in urban areas by 60 percent during rush hours.

"Our preliminary simulations of this self-organizing traffic paradigm show a potential to increase the average flow rates substantially (up to 60%, compared with a city-level physical TL system), in addition to rendering traffic control and management more ubiquitous and cost-effective."

Reducing the commute time of urban workers, mitigating congestion, and lessening carbon footprint of cars are some of the benefits such a system could deliver, but the concept of virtual traffic lights could also be an important building block for research efforts on autonomous driving.

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