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Vehicle to Infrastructure: Letting Cyclists Talk to Signals

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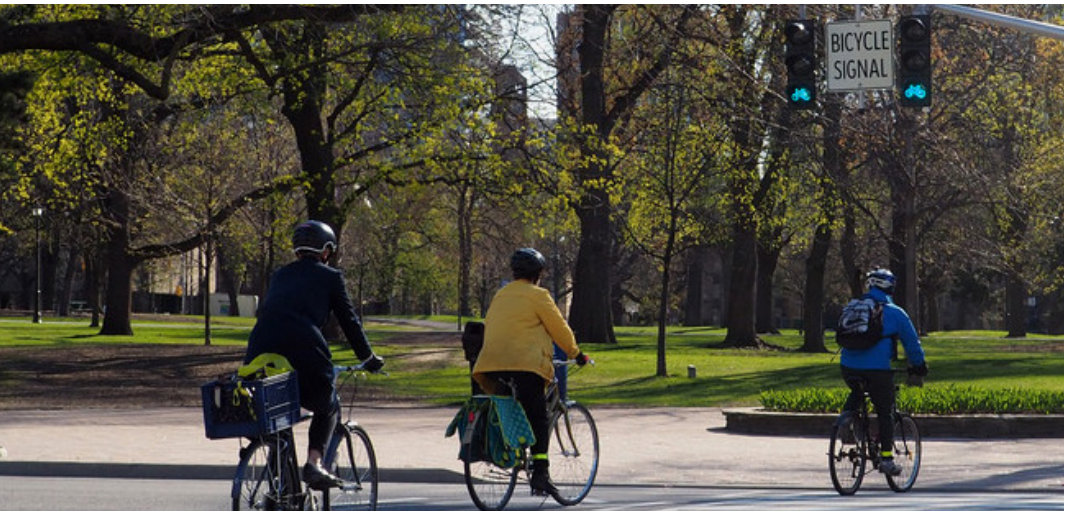

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VEHICLE TO INFRASTRUCTURE:
LETTING CYCLISTS TALK TO SIGNALS

Vehicle to infrastucture (V2X) communication is a form of technology that allows vehicles to communicate with external infrastructure such as street lights. This NITC project focuses on a special V2X system designed to allow bicyclists to communicate with traffic signals. Lead investigator Stephen Fickas, a computer and information science professor at the University of Oregon, developed a smartphone app called "Urban Bike Buddy," along with a specially-designed Bike Connect box that attaches to a traffic signal controller. With the box installed, the app allows a cyclist to alert the signal that they're coming and request a green light in advance of their arrival. The City of Eugene, Oregon gave the team permission to install their hardware at a test signal, the intersection of 18th & Alder in Eugene. Here's how it works:

- Researchers attached the Bike Connect 'box' to the traffic control signal box. The box listens for requests from bicyclists and when one is received, signals the controller through normal means.
- A cyclist downloads the app from the app store and registers using their email account.
- At the start of a trip, the cyclist starts the phone app "Urban Bike Buddy," which can run in the background so they can still use their phone for other things. The app shows a yellow bar to alert the user that communication with the signal controller is established.
- When the cyclist is within a predetermined time to reach the intersection (calculated from distance and speed), the app places a request to the box. When the box acknowledges the request, a green bar is shown on the app.
- The system resets after the bicyclist has crossed the intersection.

This project recognizes that V2X technology does not have to be hidden behind company walls or reserved only for researchers at universities. Instead—given the city's cooperation and buy-in—developing V2X technology can be made an open project available to anyone, and in particular, students wishing to learn more about the Internet of Things and transportation.

At some intersections, it's impossible for cyclists to get a green light without stopping and waiting, even if no one else is there. Researchers at the University of Oregon have developed a system for cyclists to give a signal advance notice of their approach.

V2X: Bringing Bikes into the Mix (#2019-1027)

Stephen Fickas, University of Oregon

Download Final Report: http://nitc.trec.pdx.edu/research/project/1027

UNIVERSITY OF OREGON

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