5-2018

Eliminating the Right Hook: Safer Intersections for Bikes

Sirisha Kothuri
Portland State University, skothuri@pdx.edu

Andrew Kading
Portland State University, andykading@hotmail.com

Andrew Schrope
Portland State University

Kelly White
Portland State University

Edward Smaglik
Northern Arizona University

See next page for additional authors

Recommended Citation

Kothuri, S., Kading, A., Schrope, A., White, K., Smaglik, E., Aguilar, C., Gil, W. Eliminating the Right Hook: Safer Intersections for Bikes. Project Brief NITC-RR-897. Portland, OR: Transportation Research and Education Center (TREC), 2018.

NITC
NATIONAL INSTITUTE for TRANSPORTATION and COMMUNITIES

ELIMINATING THE RIGHT HOOK:
SAFER INTERSECTIONS FOR BIKES

Bicycling and walking, especially in urban areas, can be a means to alleviate congestion, lower emission levels and improve personal health. Intersections are locations where a variety of travel modes converge, thus increasing the potential for conflicts.

Many bicycle-vehicle crashes occur at intersections. A common crash type involving bicycles at intersections is the "right-hook," where a right-turning vehicle collides with a through bicyclist. Intersections are also a source of increased stress for many bicyclists where the interactions with cars are more pronounced. Geometric treatments such as pavement markings, bike boxes, colored lanes, and shared right-turn lane designs have been implemented in attempts to alleviate the problem, but this is the first study to examine signal control strategies.

Recommended signal timing treatments to prevent right hook crashes include:

- Bicycle-specific signals
- Exclusive bicycle phases
- Leading bike intervals

While exclusive phasing eliminates the bicycle-vehicle conflict by separating the phases and restricting turns, the trade-off is a decrease in efficiency at the intersection with increased delays for all users. An emerging operational treatment at intersections is to provide a split leading bicycle interval, with concurrent green for bicycles, pedestrian walk, and through vehicles while restricting or delaying the right turn for vehicles. After a certain time, the restriction on turns is lifted. The same treatment could be used for pedestrians and offers advantages over the traditional leading bike and pedestrian intervals in that there is no lost time for through vehicles.

This project investigated how to alleviate bicycle-vehicle conflicts at intersections through signal control strategies; a novel approach using advanced technology which could help to improve transportation safety and efficiency for all road users.

PROJECT TITLE
Addressing Bicycle-Vehicle Conflicts with Alternate Signal Control Strategies (#2017-897)

INVESTIGATORS
Sirisha Kothuri, Ph.D, Christopher Monsere, Ph.D, and Krista Nordback, Ph.D; Portland State University

LEARN MORE
Download the report and related materials: http://nitc.trec.pdx.edu/research/project/897

This study was funded by the National Institute for Transportation and Communities (NITC). NITC is one of five U.S. Department of Transportation national university transportation centers. Housed at Portland State University, NITC is a program of the Transportation Research and Education Center (TREC). This Portland State-led research partnership includes the University of Oregon, Oregon Institute of Technology, University of Utah and new partners University of Arizona and University of Texas at Arlington.