

Pedestrian Signal Timing Can Be Improved Through Control Strategies at Intersections

Sirisha Kothuri, Ph.D., Chris Monsere, Ph.D.

Pedestrians often have to wait longer than drivers for the light to change. Increased delay for pedestrians can lead to noncompliance, which can have a negative impact on safety. Most planning efforts geared toward those on foot have tended to focus on safety, but pedestrian efficiency is also important.

Sirisha Kothuri, a research associate in civil engineering at Portland State University, is the principal investigator on the project Improving Walkability Through Control Strategies at Signalized Intersections. It is an extension of her doctoral dissertation work.

Kothuri and co-investigator Edward Smaglik of Northern Arizona University will present their work Sunday, Jan. 8 in a workshop at the TRB conference. Their research looked at pedestrian strategies around the country to determine if they were primarily safety or efficiency measures.

“Generally, pedestrian strategies, if they exist at all, are safety based,” Kothuri said.

So the first task was to identify efficiency-based strategies for pedestrians. Then the research team undertook a simulation approach, simulating an intersection using ASC/3 signal controller software.

They looked at different strategies for efficiency and identified what the impacts of each strategy were to all users: pedestrians, cyclists, motor vehicles and heavy vehicles.

“With this project we tried to focus on reducing delay. When and where are efficiency measures most applicable: at certain times of the day, certain types of intersections?” Kothuri said.

Based on the simulation study researchers were able to get

a fairly good assessment of the delays experienced by the different users. Using that knowledge, they came up with a scale and a guidebook for practitioners on which measures would be best used when, and what sorts of delays to expect for vehicles and pedestrians.

Researchers also came up with a new algorithm, a pedestrian priority algorithm. They tested it in the simulation environment, then used the learning from that to deploy the algorithm in three different cities: Mesa and Flagstaff, Arizona, and Portland, Oregon.

In these cities, they conducted before-and-after studies to learn exactly how much the algorithm reduces pedestrian delay.

“The whole idea is to provide a toolbox for practitioners: One size does not fit all,”

Kothuri said. Each city has different strategies. Those strategies can also change based on time of day. Practitioners must understand what the operation objective is and tailor their strategy based on that.

The products of this research are intended to provide practitioners with the tools they need to make these decisions.

The project also serves to highlight the idea that transportation professionals should think about pedestrians as an important aspect of traffic.

ABOUT THE AUTHORS


The research team consisted of Sirisha Kothuri and Chris Monsere of Portland State University and Edward Smaglik of Northern Arizona University.

ABOUT THE FUNDERS

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THE REPORT and RESOURCES

For more details about the study, download the full report ReportTitle at nitc.trec.pdx.edu/research/project/782

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