AASHTO Innovation Initiative

[Proposed] Nomination of Innovation Ready for Implementation

# Sponsor

## Nominations must be submitted by an AASHTO member DOT willing to help promote the innovation. If selected, the sponsoring DOT will be asked to promote the innovation to other states by participating on a Lead States Team supported by the AASHTO Innovation Initiative.

1. Sponsoring DOT (State): Michigan DOT

2. Name and Title: Carissa McQuiston

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# Innovation Description (10 points)

## The term “innovation” may include processes, products, techniques, procedures, and practices.

3. Name of the innovation:

Pedestrian Gateway Treatment

4. Please describe the innovation.

A pedestrian gateway installation is the use of In-Street Pedestrian Crossing (R1-6) signs installed at a crosswalk by placing them on the edge of the road and on all lane lines. This requires all drivers to drive between two signs. The perceived narrowing of the road is one factor influencing the treatments efficacy. However, the message also has been shown to influence efficacy even more. Double-sided signs are recommended because they increase the likelihood that drivers will see a sign in heavy traffic conditions. A pedestrian gateway treatment can be constructed from three types of elements: A R1-6 sign mounted in the roadway on a curb type base, and a flexible delineator post mounted on the white lane line, and a R1-6 sign flush mounted on a curb on a median island, or curb extension. A yellow base should be used when the R1-6 sign is mounted on a yellow line. A delineator should be the same color as the R1-6 sign and should have reflective markings. It is permissible to place these R1-6 signs on the edge of a refuge island or curb extension.

5. What is the existing baseline practice that the innovation intends to replace/improve?

The existing baseline practice is crosswalks with no countermeasures.

6. What problems associated with the baseline practice does the innovation propose to solve?

Nationwide, there were more than 4,700 pedestrian fatalities in 2013, with 148 such fatalities in Michigan. Enhancing pedestrian safety is one of the main goals of Michigan’s Toward Zero Deaths statewide safety campaign, and improving the rates at which drivers yield to pedestrians at crosswalks is an important part of that campaign. The strategies identified in Michigan Manual on Uniform Traffic Control Devices have limited effectiveness, particularly at sites with more than one travel lane in each direction. Furthermore, the existing countermeasures, such as rectangular rapid flash beacon and pedestrian hybrid beacon, are effective but are too expensive for widespread implementation. The pedestrian gateway treatment is a promising, effective, and less-expensive option. The installation of gateway treatment produced consistent and sustained driver yielding compliance rates that were significantly higher than baseline (crosswalks without treatment). This may indicate that the application effects driver behavior and there may be system-wide awareness gained by implementing these treatments.

7. Briefly describe the history of its development.

MDOT conducted two research projects to evaluate the effectiveness of the treatment in its various configurations, both initially and over the course of a spring-through-fall test period. In addition, since the pedestrian gateway treatment includes in-street signs, MDOT investigated the likelihood of the signs’ survival and the effectiveness of a partial treatment if one sign is struck down by a vehicle.

8. What resources—such as technical specifications, training materials, and user guides—have you developed to assist with the deployment effort? If appropriate, please attach or provide weblinks to reports, videos, photographs, diagrams, or other images illustrating the appearance or functionality of the innovation (if electronic, please provide a separate file). Please list your attachments or weblinks here.

Below is a link to the Pedestrian Gateway Treatment User Guide with pictures, installation schematics and application details for specific location geometries. <http://mdotcf.state.mi.us/public/tands/Details_Web/mdot_user_guide_gateway_treatment.pdf>

Attach photographs, diagrams, or other images here. If images are of larger resolution size, please provide as separate files.

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# State of Development (40 points)

## Innovations must be successfully deployed in at least one State DOT. The AII selection process will favor innovations that have advanced beyond the research stage, at least to the pilot deployment stage, and preferably into routine use.

9. How ready is this innovation for implementation in an operational environment? Please select from the following options. Please describe.

Prototype is fully functional and yet to be piloted

Prototype has been piloted successfully in an operational environment

Technology has been deployed multiple times in an operational environment

Technology is ready for full-scale implementation

Installations of the pedestrian gateway treatment were installed in the late spring of 2015 at 20 locations in mostly Southwest Michigan. These installations were removed when snow plowing activities began and re-installed in the spring of 2016 for additional data collection. Also, in 2016 locations in Grand Rapids and Ann Arbor Michigan were added. The Ann Arbor sites were included to contribute additional speed data to the study. These two new cities added 8 new installations. Additionally, a location was added in Houghton MI using this treatment on their downtown main street (DOT jurisdiction). Applications of this treatment continue to be evaluated for appropriateness per the attached User Guidelines on DOT owned roadways.

10. What additional development is necessary to enable implementation of the innovation for routine use?

There is no additional development necessary – just installations at appropriate locations per the developed guidelines. Consistent and proper installations will make this treatment more common place and further increase pedestrian safety and awareness.

11. Are other organizations using, currently developing, or have they shown interest in this innovation or of similar technology??  Yes  No

If so, please list organization names and contacts. Please identify the source of this information.

|  |  |  |  |
| --- | --- | --- | --- |
| **Organization** | **Name** | **Phone** | **Email** |
| Florida Department of Transportation | Alan El-Urfali | XXX-XXX-XXXX | Click or tap here to enter text. |
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# Potential Payoff (30 points)

## Payoff is defined as the combination of broad applicability and significant benefit or advantage over baseline practice .

12. How does the innovation meet customer or stakeholder needs in your State DOT or other organizations that have used it?

Pedestrian gateway treatment meets stakeholder needs in terms of both performance and cost. The cost of pedestrian gateway treatment is only $1,200 to $1,800 for a six-sign configuration, in comparison with installation costs of $20,000 and $100,000 for rectangular rapid flash beacon and pedestrian hybrid beacon, respectively. The pedestrian gateway configuration significantly improved driver yielding rates at several sites. Under baseline conditions (that is, without the pedestrian gateway treatment), many locations had yield rates of less than 10 percent. After installation of the signs, yield rates increased to more than 90 percent in some circumstances. The pedestrian gateway treatment also had a traffic-calming effect, leading to speed reductions of between 4 and 10 mph, even when pedestrians were not present.

13. Identify the top three benefit types your DOT has realized from using this innovation. Describe the type and scale of benefits of using this innovation over baseline practice. Provide additional information, if available, using quantitative metrics, to describe the benefits.

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| **Benefit Types** | **Please describe:** |
| Improved Safety | The pedestrian gateway configuration significantly improved driver yielding rates at several sites. Under baseline conditions (that is, without the pedestrian gateway treatment), many locations had yield rates of less than 10 percent. After installation of the signs, yield rates increased to more than 90 percent in some circumstances. The pedestrian gateway treatment also had a traffic-calming effect, leading to speed reductions of between 4 and 10 mph, even when pedestrians were not present. |
| Cost Savings | Cost savings – based on driver yielding compliance, in the appropriate locations, utilizing a pedestrian gateway treatment instead of a RRFB or Pedestrian Hybrid Beacon was the difference of an approximate $1,200-$1,800 six-sign configuration and the $20,000 to $100,000 approximate cost of the RRFB and PHB respectively. The pedestrian gateway treatment significant results demonstrated the efficacy of the this and that utilizing this instead of the higher cost treatments are cost saving and an effective safety tool. |
| Choose an item. | Click or tap here to enter text. |

Provide any additional description, if necessary:

Click or tap here to enter text.

14 How broadly might this innovation be deployed for other applications. in the transportation industry (including other disciplines of a DOT, other transportation modes, and private industry)?

This treatment is already being discussed with local agencies and statewide amongst MDOT regions. Some areas are currently utilizing the treatments and expanding their use (urban, local, areas) while others are moving towards these installations to solve some of the pedestrian safety issues that they are facing. The User Guideline is being actively shared within MDOT, with local agencies and community groups interested in installing proven technology for safety.

# Market Readiness (20 points)

## The AII selection process will favor innovations that can be adopted with a reasonable amount of effort and cost, commensurate with the payoff potential.

15. What specific actions would another organization need to take along each of the following dimensions to adopt this innovation?

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| **Check boxes that apply** | **Dimensions** | **Please describe:** |
|  | Gaining executive leadership support | Click or tap here to enter text. |
|  | Communicating benefits | Click or tap here to enter text. |
|  | Overcoming funding constraints | Click or tap here to enter text. |
|  | Acquiring in-house capabilities | Click or tap here to enter text. |
|  | Addressing legal issues (if applicable) (e.g., liability and intellectual property) | Click or tap here to enter text. |
|  | Resolving conflicts with existing national/state regulations and standards | Placement of the R1-6 signs on the outside top of curbs is currently restricted by the MUTCD. The agencies currently require permission to experiment from FHWA. |
|  | Other challenges | Click or tap here to enter text. |

16. Please provide details of cost, effort, and length of time expended to deploy the innovation in your organization.

**Cost**: The estimated cost of a six-sign installation of the R1-6 in a pedestrian gateway configuration is between $1,800-$2,000.

**Level of Effort**: MDOT has developed ‘User Guide for R1-6 Pedestrian gateway Treatment For Pedestrian Crossings’ to aid with deployment. Flexible delineators can be procured from vendors. The only action needed would be if agencies wanted to install the R1-6 signs on the outside top of curbs (it is allowable already on island curbs), the agencies currently require permission to experiment from FHWA.

**Time**: The effort is minimum, a permanent installation (where the signs are mounted in a removable curb or into the pavement surface – but can be removed and capped per needs) is quick to install in the roadway (can be done within an hour – but follow manufacturer’s guidelines) and the signs would need to be replaced as they are damaged.

17. To what extent might implementation of this innovation require the involvement of third parties, including vendors, contractors, and consultants? If so, please describe. List the type of expertise required for implementation.

Procurement of R1-6 signs. Many sign fabrication and traffic control supply companies supply these signs and flexible delineators currently.