Gateway Treatment Research Project for Pedestrian Crossings
MDOT Gateway Treatment became a Focus Innovation in October 2017
Focus Technologies

Pedestrian Gateway
3 Simple Signs to Save Lives

How much?
Less than $2000

How Long?
About 2 hours

Why?
Immediate Results
Drivers Yield Intuitively
Works Almost Anywhere
What is the Gateway Treatment?

- A gateway installation or the R1-6 signs can be installed at a crosswalk by:
  - Placing them on the edge of the road* and on all lane lines.
  - This requires drivers to drive between two signs.
  - The message has been shown to influence the effectiveness of the treatment.
Effectiveness:

- Driver yielding compliance increases
- Speed reductions were realized – traffic calming effect
- Slowing at the dilemma zone
- Speed reductions over time

What We Learned

Gateway treatment makes crosswalks safer for pedestrians

Pedestrian safety is an important issue for MDOT, but getting drivers to yield to pedestrians consistently at crosswalks is a significant challenge. The gateway treatment, which consists of yield signs installed both at the edge of the roadway and between travel lanes, is an inexpensive strategy to increase driver yielding rates. Two research projects evaluated and confirmed the strategy’s effectiveness and durability.

Problem

Nationwide, there were more than 5,000 pedestrian fatalities in 2015, with 4,000 fatalities in Michigan. Establishing pedestrian safety is one of the main goals of Michigan’s Toward Zero Deadly pedestrian safety campaign, and improving the area at which drivers yield to pedestrians or re-establishes an important part of that campaign. However, the available strategies for achieving this goal—which are prescribed by the Michigan Manual on Uniform Traffic Control Devices—have limited effectiveness, particularly in situations with more than one pedestrian in each direction. The conical, rigid flash beacon and pedestrian hybrid beacon are more effective, but with installation costs of $100,000 to $150,000, respectively, they are too expensive for widespread implementation.

The gateway treatment is a promising and low-cost option, costing only $1,200 to $4,000 for a site-specific configuration. MDOT conducted two research studies.
Factors contributing to effectiveness:

- Gap Size
- Speed Limit
- The yielding rates are much higher for gateways
- R1-6 signs installed with a removable curb type base seem to survive better than those bolted to a flush base
What We Learned

• **General Guidance:**
  - Signs and delineators should be installed 1.5 feet to 50 feet in advance of the crosswalk
  - Sign shall follow local law
  - At locations with a median or pedestrian refuge island, in-street signs on top of the median or refuge island are allowed
  - If two crosswalks exist at an intersection, the gateway need only be placed on the approach legs of the roadway.
  - No portion of the sign or sign base shall be in the crosswalk or on the crosswalk lines.
    - In many cases placing signs further back will increase survival
  - A refuge island and advance yield lines are recommended where AADT is 12,000 or greater.
What We Learned

- **Survivability:**
  - Signs need to be removed before plowing season.
  - When on street parking present curb extensions are recommend.
  - Multilane roads consider delineator posts in place of R6-1.
  - Removeable curb base vs flush base.
  - Setback distance.
Project Goals

- Determine driver yielding compliance rates
- Determine how, when and where treatment should be used
- Determine the cost benefits of the treatment compared to other treatments
- Determine the effect the treatment has on speed reductions
Project Specifics

- 20+ Locations
- Flexible Delineators
- Mounted in street
- Permission to experiment – Installations on top of the curb
- Edge lines

- Schedule
  - Project began: 2013
  - Sites chosen: 2014
  - Installation: 2015
    - Project extended in 2016
  - Final results: 2017
Total height (including base): 42.5”
Post height (rubber): 7”
Sign width: 10”
Decal width: 8”
Base length: 40.5”
Base width: 11.5”

Total height (including base): 46.5”
Post height (white triangle): 10.5”
Sign width: 12”
Sign/decal width: 12”
Base length: N/A (flush plate mounting)
Base width: N/A (see above)

Total height (including base): 42.5”
Post height: 5”
Sign width: 12”
Sign/decal width: 12”
Base length: 36”
Base width: 8”
Some Examples from the Study:

• Following are locations with:
  – Initial collected data (compliance rates)
  – Study findings on yielding compliance/speed data
  – Installation guidance from the Final User Guide
#1 - Rose Street at KVCC

Initial Data – Uncontrolled Midblock Crossing

Full Gateway treatment

Gateway treatment with City Post
#1 - Rose Street at KVCC

Initial data - Baseline

![Graph: Rose Street at KVCC - Midblock Crossing](image)
#1 - Rose Street at KVCC

Initial Data - Gateway Treatment
#1 - Rose Street at KVCC

Initial Data - Gateway with City Post
Between 70% and 90% compliance rate on roads with posted speeds of 30 mph or lower with ADT up to 25,000
#3 – West Michigan Ave & Grand St.

Initial Data – Full Intersection

- Four lane undivided
- Parking on both sides
- Two-way STOP controlled
#3 – West Michigan Ave & Grand St.

Initial Data – Full Intersection
Between 55% and 80% compliance rate on roads with posted speeds of 30 mph or lower with ADT up to 25,000.
Other Site Types in Final User Guide:

- Three-Lane Configuration with Refuge Island
- Three-Lane Configuration w/out Refuge Island
- Two-Lane Configuration with Median Island and Bike Lanes
- Two-Lane Configuration with Curb Extensions
### Speed Data Summary:

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<th>Location</th>
<th>Speed Reduction at Crosswalk</th>
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Questions??