

# Agencies Design Raised Crosswalks for Snow, Rain, and Heavy Vehicles

## KEY ELEMENTS:



### Pedestrian Crosswalk Improvements



### Maintenance Practices

Raised crosswalks reduce vehicle speeds, promote driver yielding, and enhance the conspicuity of uncontrolled pedestrian crossings. They can also reduce pedestrian crashes up to 45 percent. However, agencies may have concerns about addressing winter maintenance, drainage effects, and emergency and transit vehicle routing when implementing raised crosswalks. While these factors are important to consider, raised crosswalks can still be effective in a variety of sites and climates.

## WINTER MAINTENANCE

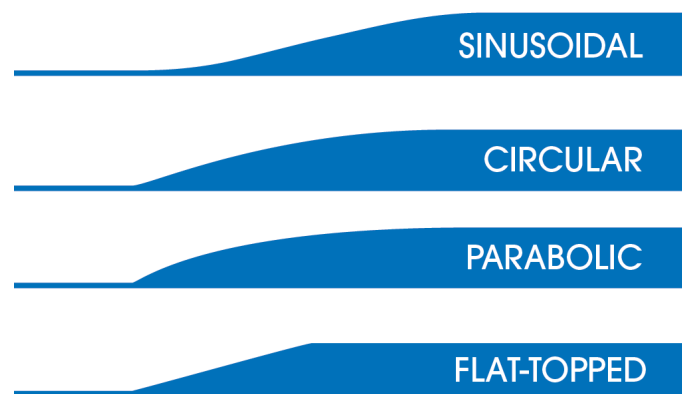
Concerns surrounding winter maintenance are often a primary cause for hesitance when an agency considers implementing a raised crosswalk. These concerns include the maintenance equipment damaging the raised crosswalk and vice versa.

A traffic calming survey in over 250 Canadian municipalities found that 79 percent of agencies reported no deterioration in infrastructure due to snow removal.<sup>1</sup> However, if concerns persist, there are potential solutions. The design of the profile of a raised crosswalk allows for approach slopes that are either straight, parabolic, or sinusoidal. A slope with a sinusoidal profile is easier for snowplows to maneuver while adequately removing snow and ice from the crosswalk. Additionally,

the New York City Department of Transportation recommends using signage to alert winter maintenance vehicle operators to the raised crossing.<sup>2</sup>

The City of Cambridge, Massachusetts implemented raised crosswalks on Berkshire Street and Granite Street.<sup>3</sup> The City installed bollards at the edges of the raised crosswalk on Granite Street to alert snowplow operators to its presence and location. The City has not noted any maintenance problems at either location and continues to monitor them, especially throughout the winter months.

Snowplow operators must adapt their usual methods when they encounter a raised crosswalk, adjusting the positioning of the blade to avoid damaging the crosswalk. This can require additional time clear the roadway and may affect winter maintenance activities.



Source: FHWA

Figure 1. Graphic. There are several options for raised crosswalk profiles. The sinusoidal profile (top example) is easiest for snowplows to maneuver due to its curving slope that transitions gently from the road surface to the top of the raised crosswalk.

## Case Study: Raised Crosswalk Design Considerations

STEP: [https://safety.fhwa.dot.gov/ped\\_bike/step/](https://safety.fhwa.dot.gov/ped_bike/step/)

### INCORPORATING DRAINAGE

Winter maintenance concerns may only affect a portion of agencies, however, all agencies should consider drainage when implementing raised crosswalks. Raised crosswalks can disrupt existing drainage patterns because they extend from curb to curb across the entire width of the roadway. Roadway grade and existing infrastructure are important characteristics that can affect a raised crosswalk's impact on drainage.<sup>4</sup>

A raised crosswalk should be placed so existing catch basins are located immediately upstream of the crossing. Depending on the existing infrastructure, additional catch basins may be required. The Georgia DOT Pedestrian and Streetscape Guide recommends covering the grates of flat caps as an alternative measure for trench drains. This creates a continuous walking surface from curb to curb.<sup>5</sup>

### EMERGENCY VEHICLE ROUTES

Raised crosswalks are typically not recommended on primary emergency vehicle routes due to their effect on vehicle speeds. The Institute of Transportation Engineers estimates that a raised crosswalk will result in approximately 3 seconds of delay for a standard fire truck.<sup>6</sup> However, most fire departments prefer raised crosswalks over vertical deflection

measures such as speed humps. Agency discussions with public safety and emergency response stakeholders should consider the tradeoffs between reduced emergency vehicle speed and increased pedestrian safety.

### TRANSIT VEHICLE ROUTES

Agencies should also consider the placement of raised crosswalks along transit routes because of the potential effect on transit vehicle speeds. The FHWA Traffic Calming ePrimer notes that raised crosswalks can be used on bus routes where the operating speed is 25 miles per hour (mph) or lower (raised crosswalks can normally be implemented on roadways up to 30 mph). Additionally, raised crosswalks should not be placed near bus stops. This is to avoid the risk of passengers falling while transitioning between sitting and standing as the bus traverses the raised crosswalk.<sup>7</sup>



Figure 2. Photo. Raised crosswalk in Chicago with additional drainage grates added upstream of crossing.

### References

<sup>1</sup>"Traffic Calming Speed Humps and Speed Cushions," NACTO, Presentation, 2011, <https://nacto.org/wp-content/uploads/2012/06/Berth-od-C-2011.pdf>

<sup>2</sup>Traffic Calming Design Guidelines, New York City Department of Transportation, 2020, <https://www1.nyc.gov/html/dot/html/pedestrians/trafic-calming.shtml#raisedcrossings>

<sup>3</sup>Berkshire Street Traffic Calming, PEDSFAE, n.d., [http://www.pedbikesafe.org/pedsafe/casestudies\\_detail.cfm?CM\\_NUM=7&CS\\_NUM=22](http://www.pedbikesafe.org/pedsafe/casestudies_detail.cfm?CM_NUM=7&CS_NUM=22)

<sup>4</sup>Raised Crosswalks, City of San Francisco, 2015, [https://www.sfbetterstreets.org/find-project-types/pedestrian-safety-and-traffic-calming/traf\\_fic-calming-overview/raised-crosswalks/](https://www.sfbetterstreets.org/find-project-types/pedestrian-safety-and-traffic-calming/traf_fic-calming-overview/raised-crosswalks/)

<sup>5</sup>Traffic Calming ePrimer, Module 3, FHWA, February 2017, [https://safety.fhwa.dot.gov/speedmgt/ePrimer\\_modules/module3pt2.cfm](https://safety.fhwa.dot.gov/speedmgt/ePrimer_modules/module3pt2.cfm)

<sup>6</sup>Pedestrian and Streetscape Guide, GDOT, April 2019, <http://www.dot.ga.gov/PartnerSmart/DesignManuals/TrafficOps/GDOT%20Pedestrian%20and%20Streetscape%20Guide.pdf>

<sup>7</sup>Traffic Calming Fact Sheets – Speed Table/Raised Crosswalks, ITE, May 2018, <https://www.ite.org/pub/?id=2c8edbf0c48-b1f3-c506-9e8e72dd3922>