

What are the potential safety impacts of sidewalks along a roadway?



A roadway cross section being considered for a four-lane undivided to three-lane (four- to three-lane) conversion can incorporate a number of different components. One of these components could be the addition or alteration of sidewalk facilities. This summary provides information about the guidance on and potential safety impacts of sidewalks.

SIDEWALKS



Sidewalks are a typical component of urban and suburban roadway cross sections. They remove pedestrians from the roadway travel lanes or shoulders and separate these vulnerable users from motorized traffic and bicyclists. Sidewalks can serve pedestrians that are traveling locally or for longer distances.

An important reference related to sidewalks is the American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, 2nd Edition (AASHTO 2021). This document provides guidance on the provision of pedestrian facilities (e.g., sidewalks), including their impacts on intersections, and the provision of midblock or grade-separated crossings to facilitate pedestrian travel.

The following are some of the factors to consider when sidewalks are included as part of a roadway cross section conversion:

- Sidewalks provide a dedicated travel area for the most vulnerable road users.

- Pedestrian facilities should be designed to accommodate differently-abled pedestrians. In Iowa, the details of these designs are included in Chapter 12 of both the Iowa DOT Design Manual (Iowa DOT 2019) and the Iowa Statewide Urban Design and Specifications (SUDAS) program (SUDAS 2024). The basis of the recommendations and guidance provided in these documents has been a Proposed Rule issued by the Architectural and Transportation Barrier Compliance Board on July 26, 2011, titled Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (commonly referred to as PROWAG). At the time this summary was written, however, the content of a version published on August 8, 2023, was being evaluated for use in Iowa.

- The proximity of sidewalks to on-street parking may impact their width to account for car doors opening and pedestrian flow.
- Firm, stable, and slip-resistant surfaces shall be used to meet the requirements related to full accessibility noted above. This requirement also discourages pedestrians’ use of the vehicle travel way.
- Mixing pedestrian and bicycle traffic on a sidewalk may lead to an increase in conflicts and crashes between these users.
- Removing pedestrian traffic from the roadway travel lanes can be expected to reduce crashes.

SIDEWALK CRASH STUDY RESULTS



A limited number of studies have attempted to evaluate the safety impacts of sidewalks for various road users, and none of these were focused specifically on four- to three-lane conversion projects. One study found that the presence of a sidewalk increased bicycle crashes between 53 and 209 percent along urban four- and six-lane divided roadways, respectively (Raihan et al. 2019). The researchers speculated that this outcome might, in part, be the result of increased conflicts between bicyclists and pedestrians using the sidewalk and of drivers’ lack of awareness of bicyclists along a sidewalk when a bicycle lane is not present.



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Sidewalk adjacent to a three-lane roadway

Another study, however, found that the absence of a sidewalk along a roadway is one of the main factors that impacts the expected number of pedestrian crashes. Other factors that were found to impact pedestrian crashes include traffic volume, roadway classification, and area population. The researchers estimated the risk of a pedestrian crash to be 167 times greater when a sidewalk was not present (Abou-Senna et al. 2022).

Gan et al. (2005) also reported a 65 to 89 percent reduction in crashes involving pedestrians when sidewalks are present along roadways. Citing these and other crash reduction figures, the Federal Highway Administration describes sidewalks as a Proven Safety Countermeasure (FHWA 2021).

SUMMARY



The improvement, alteration, and/or addition of sidewalk facilities is a typical consideration during roadway cross section conversion projects. Some of the factors related to pedestrian facilities that might be considered are described in this document. The research related to the safety impacts of sidewalks is limited but generally indicates that sidewalks result in positive outcomes.