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# CHAPTER 8

## Non-Motorized Facilities

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Pedestrians and bicyclists are the most vulnerable roadway user. The outcomes of a crash disproportionately impact them compared to motor vehicle occupants. Pedestrians and bicyclists have very different characteristics than motor vehicle drivers and from each other. Understanding and designing for each mode is essential to the creation of a safe transportation system.

### Chapter 8 Topics:

8A Introduction

8B Bicycle Facilities

8C Pedestrian Facilities

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### 8C.8.1.3 Paved or Aggregate Shoulder

A—As discussed in Section 8C.8.1, pedestrians may choose to travel on a roadway shoulder if a sidewalk or sidepath is not provided, or is impassible such as during a snow event.

B—In rural areas where pedestrian travel is expected and other facilities cannot be provided, a paved shoulder should be considered as an option. Paved shoulders are a very effective pedestrian safety tool. The FWAY Toolbox of Countermeasures and Their Potential Effectiveness states that adding a paved shoulder has been shown to have a crash modification factor of 0.29 for pedestrian crashes (in other words, a 71% reduction in crashes) compared to roads with only shared lanes.

C—A Pedestrian Access Route is not required on a shoulder. If land uses in a project corridor suggest that a sidewalk should be installed, but geometric constraints prevent it, a paved shoulder meeting ADA requirements can be installed in its place as a last resort. These types of facilities are also known as “Walkable Shoulders.”

D—The most common situations where a shoulder that meets ADA requirements may need to be implemented is in the transition between urban and rural land use contexts.

E—See Section 8C.9.4.3 for shoulder design recommendations.

### 8C.8.1.4 Motor Vehicle Lane

A—The absence of a sidewalk, sidepath, or shoulder does not mean that walking trips are not happening. If these facilities are unavailable or temporarily impassible, pedestrians may have no option but to travel in the motor vehicle lane.

B—See Section 8C.6 and MnDOT’s Statewide Pedestrian System Plan for information on how to determine whether or not pedestrian activity should be expected. Then, determine if a motor vehicle lane is an appropriate space for walking.

C—A Pedestrian Access Route is not necessarily required in a motor vehicle lane, and motor vehicle criteria will control the design of motor vehicle lanes.

D—However, designers should be aware of situations where people may be walking in the lane. In these cases, additional treatments such as signs, lighting, and traffic calming, may be necessary in areas where pedestrians are sharing with motor vehicles.



### 8C.9.2.3 Grade and Cross Slope

**A**—Steep walkway grades and cross slopes create problems for most pedestrians, especially under adverse weather conditions. To be accessible, design walkways with tolerances for construction so that facilities do not exceed the maximum grades shown in Exhibit 8C-22.

**B**—Where shared use paths and walkways cross highways or streets at a midblock location, the crosswalk should, to the maximum extent feasible, meet the same requirements as intersection crosswalks including grade, cross slope, curb ramps, and detectable warnings.

**C**—In some circumstances where a pedestrian connection needs to be made, but a sidewalk or sidepath is not feasible, a shoulder that meets ADA requirements can be used to fill that gap. See Section 8C.9.4.3 for more discussion of shoulders. In cases where the shoulder is part of the pedestrian network, the shoulder shall meet the same grade and cross slope requirements as any other PAR.

#### Exhibit 8C-22

#### Walkway Running Grades and Cross Slopes

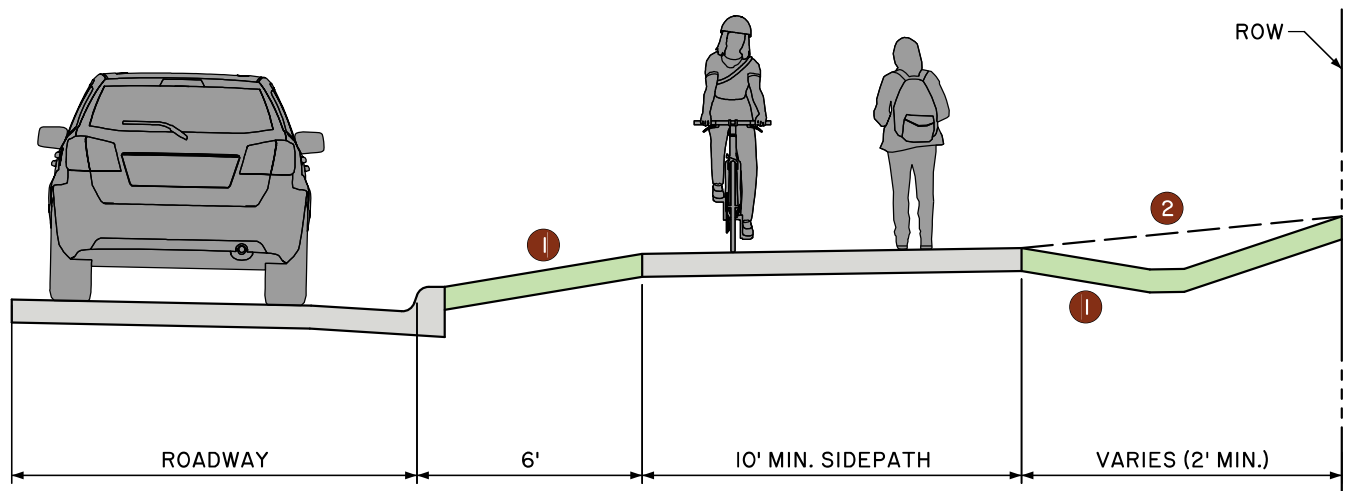
Walkway Location and Function	Desirable Running Grade <sup>1</sup>	Desirable Cross Slope	Maximum Running Grade <sup>2</sup>	Maximum Cross Slope <sup>2</sup>
Walkway parallel with roadway	≤ 5%	1.5%	May exceed 5%, but must be less than or equal to roadway grade	2%
Recreational trail that functions as a walkway	≤ 5%	1.5%	5%	2%
Crosswalk with yield or stop sign for drivers <sup>3</sup>	≤ 5% or max. extent feasible	1.5% or max. extent feasible	5%	2%
Crosswalk without yield or stop sign for drivers <sup>3</sup>	≤ 5% or max. extent feasible	1.5% or max. extent feasible	5%	5%
Paved shoulder where pedestrian travel is expected <sup>4</sup>	≤ 5%	1.5% or max. extent feasible	Equal to roadway grade	2%
Walkway crossing a driveway	≤ 5%	1.5%	Equal to roadway grade	2%
Midblock crosswalk	n/a	n/a	Less than or equal to roadway cross slope, may not exceed 5%	Equal to roadway grade

#### Notes:

1. While it may not be feasible in typical alterations projects, desirable grades should be scoped when significant grading is part of the project.
2. The grades listed in these columns are maximum constructed grades. Designers must take construction tolerances into account to ensure finished surfaces do not exceed the maximum grade allowed. In cases where designs must exceed the maximum grade due to safety, topography or operations concerns, always design to the maximum extent feasible and document decisions in the project files.
3. A traffic signal with a green phase is not considered yield or stop condition by PROWAG.
4. Applies only to outside shoulders (e.g., not median shoulder). PAR is not necessarily required on a shoulder, and typically would occur within urban or suburban context zones. If roadway is on superelevation, it may not be feasible for the shoulder to be designed to meet PAR requirements and a separate pedestrian facility is likely needed.

## Exhibit 8C-32

### Sidepath Dimensions



#### NOTES:

- 1 THIS CONSTRAINED SIDEPATH EXAMPLE INCLUDES INSLOPES TO BOTH PROMOTE DRAINAGE AWAY FROM THE SIDEPATH AND FUNCTION AS A RECOVERABLE AREA.
- 2 TO PREVENT PONDING/ICING, CONSIDER PROVIDING AN INTERCEPTOR DITCH UPHILL FROM SIDEPATH WHERE NECESSARY.

### 8C.9.4.3 Paved Roadway Shoulders

**A**—Pave and construct shoulders to facilitate use by pedestrians where critical connections are needed within a network, but a sidewalk or sidepath is not feasible at the time of the project. Serving as a pedestrian facility is not the primary purpose of a roadway shoulder, however, they can provide additional safety for pedestrian when another facility is not available.

**B**—Paved shoulders should have at least 4 feet of clear, walkable space exclusive of rumble strips.

**C**—Paved shoulders in areas where pedestrian travel is expected should have the same cross slope as the mainline which is usually 2% except in superelevated areas.

**D**—Contexts where paved shoulders should be designed for pedestrian use include:

1. where there is seasonal pedestrian traffic, such as in and around resorts and lakeside areas,
2. at the transition at the edge of a small town from a sidewalk or sidepath to a paved shoulder, and
3. to provide access to the last few developed parcels in a community where pedestrian travel is expected but adding curb and gutter to provide a sidewalk may not be feasible.