Ohio Department of Transportation

Multimodal Design Guide

MORPC TAC

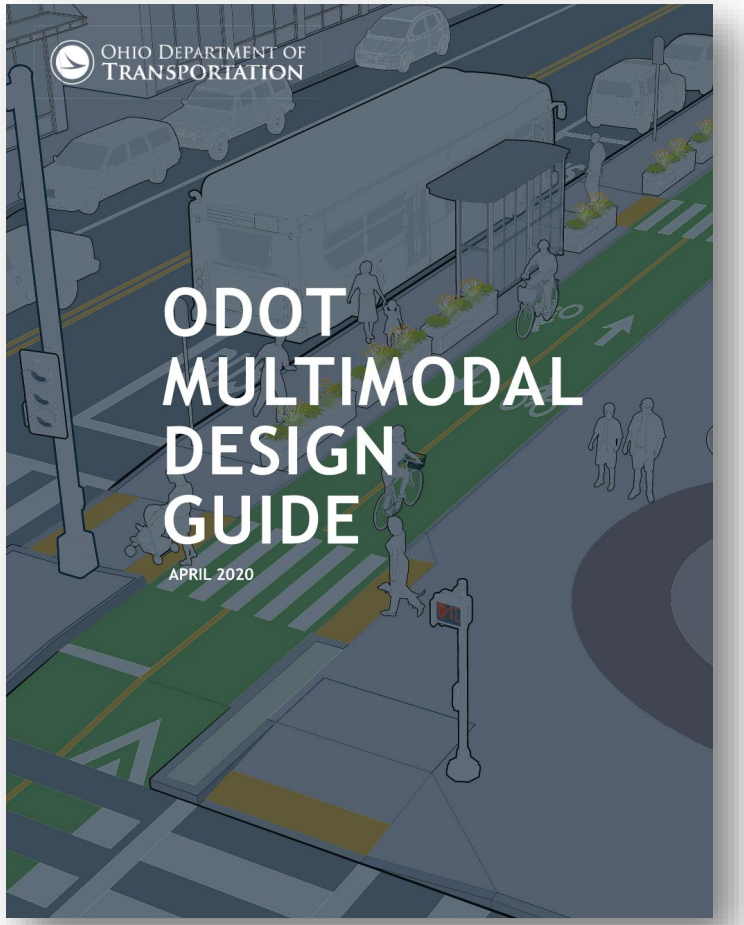
Ohio Department of Transportation

What is the Multimodal Design Guide?

1.1 Purpose

The Multimodal Design Guide (MDG) serves as the primary source for planners and designers implementing pedestrian and bicycle facilities in ODOT right-of-way and as part of the Local Let Process

By providing comprehensive state-of-the-practice design guidance, the MDG aligns with ODOT's current vision, mission, and goals related to walking and bicycling.

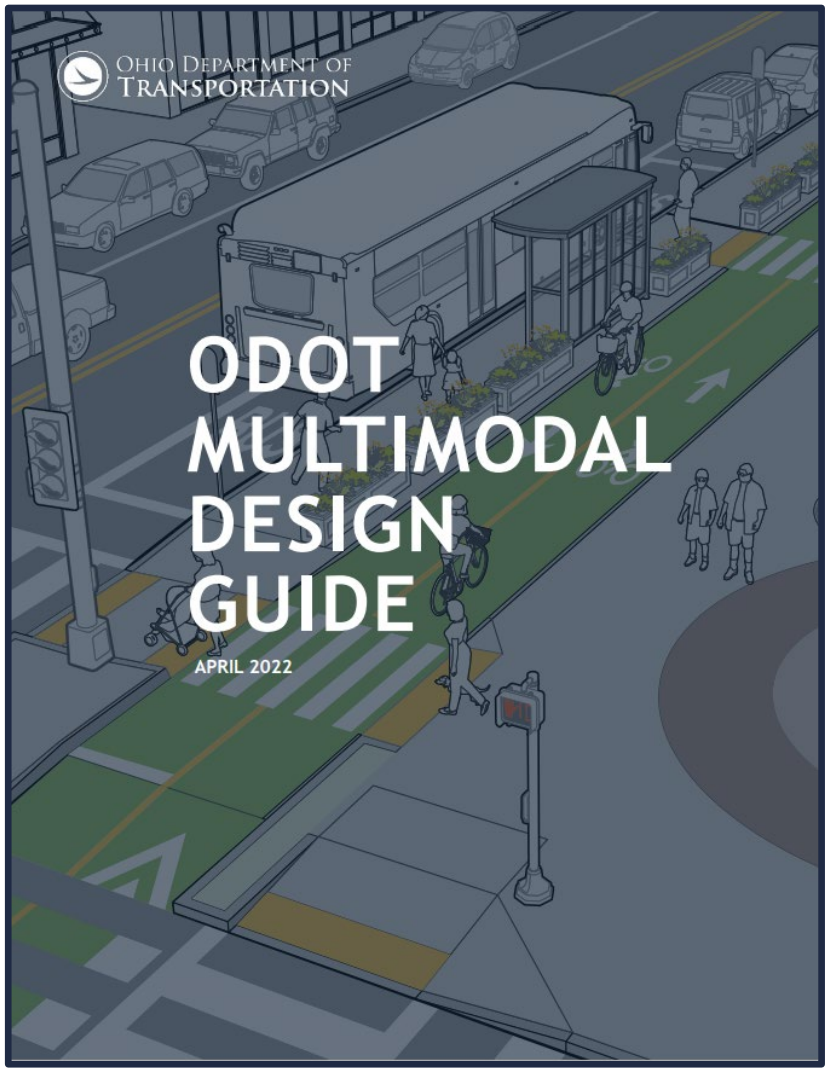


What is the MDG?

ODOT's **premier** bike & ped design resource

Built on **national** best practices

Proven design solutions



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How does the MDG help Ohio?

Helping Ohio

- Safer roads for everyone
- Context Sensitive
- Consistent designs

Helping Ohio

- Consolidated resource

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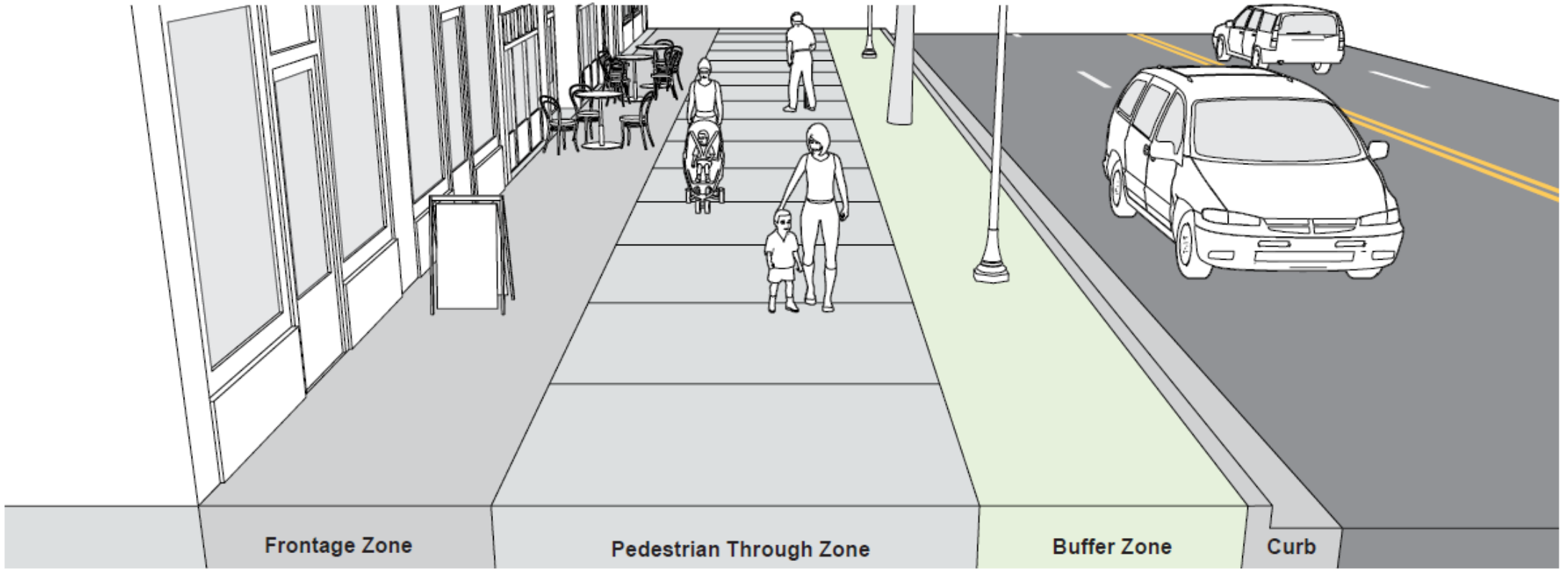
How will the MDG be used?

How to use this guide:



Relationship to other Standards & Guides

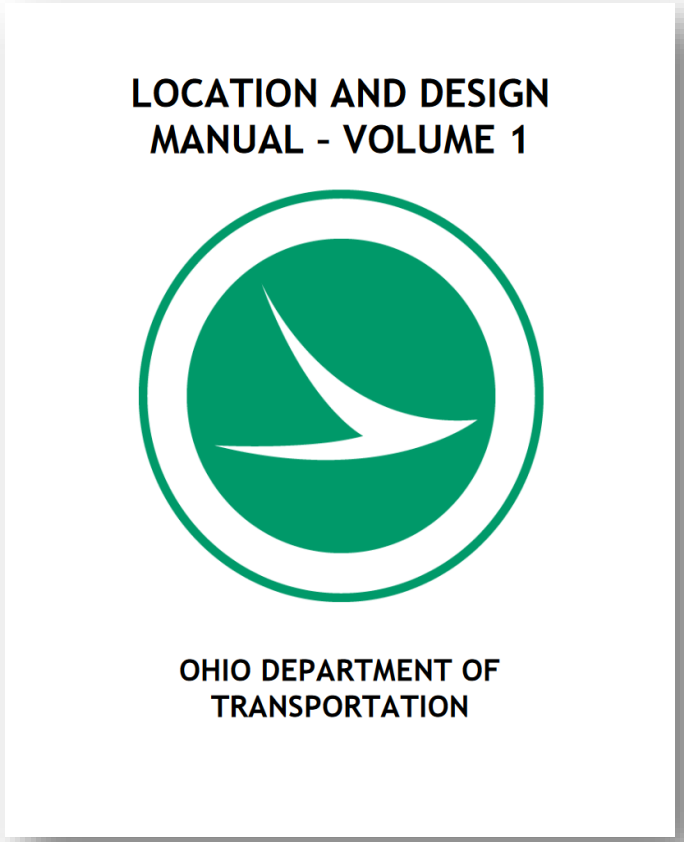
L&D Vol. I

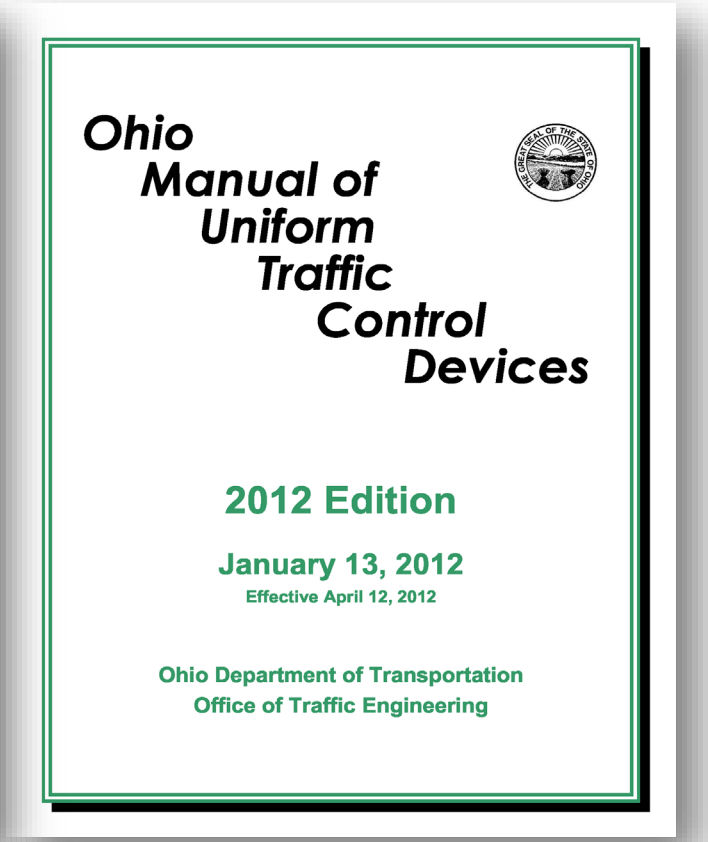
- 306 Pedestrian Facilities
- 702 Shared Use Paths
- 308 On Road Bicycle Facilities

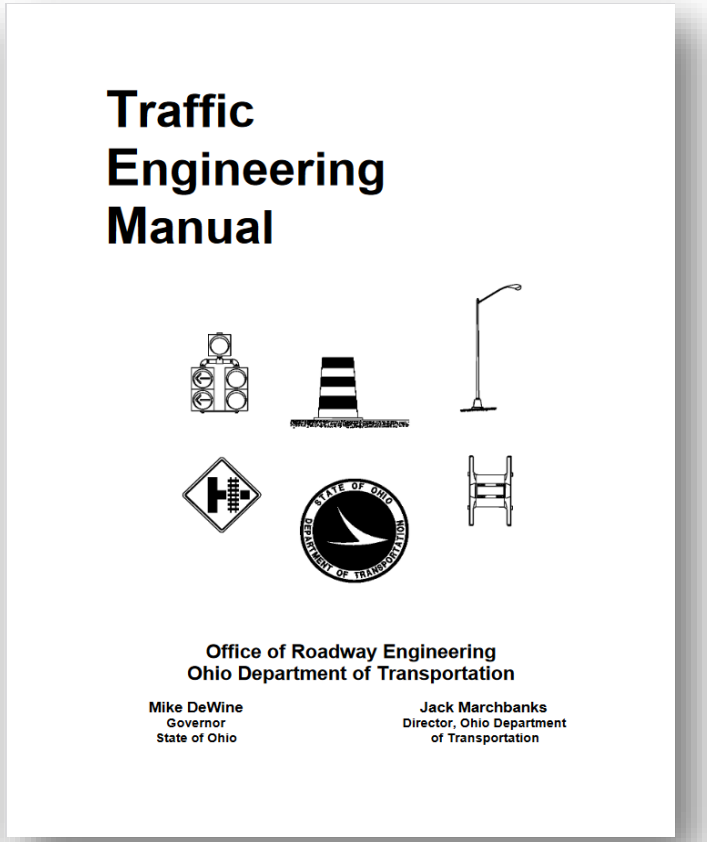
Multimodal Design Guide Outline:

1. Introduction
2. Multimodal Planning & Design Scoping Process
3. Elements of Design
4. Pedestrian Facilities
5. Shared Use Paths
6. On-Road Bicycle Facilities
7. Motor Vehicle Facilities Supporting Multimodal Accommodation
8. Signals, Beacons, and Signs
9. Multimodal Accommodations at Interchanges & Intersections
10. Transit Facilities
11. Rail Crossings
12. Maintaining Pedestrian and Bicycle Facilities

Relationship to other Standards & Guides







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Notable Topics included in the MDG

Table Of Contents

Multimodal Design Guide Outline:

Section 1.4: Definitions

Examples:

Bikeway – Any road, path, or facility intended for bicycle travel which designates space for bicyclists distinct from motor vehicle traffic. A bikeway does not include shared lanes, sidewalks, signed bicycle routes, or shared lanes with shared lane markings, but does include bicycle boulevards.

Crosswalk – The pedestrian accessible route within a street used to cross a street or portion of a street. Further defined in the *Ohio Revised Code*, Section 4511.01(LL), as (1) that part of a roadway at intersections ordinarily included within the real or projected prolongation of property lines and curb lines or, in the absence of curbs, the edges of the traversable roadway; (2) any portion of a roadway at an intersection or elsewhere, distinctly indicated for pedestrian crossing by lines or other markings on the surface; (3) Notwithstanding definitions (1) and (2), there shall not be a crosswalk where local authorities have placed signs indicating no crossing.

2.4 Context Sensitive Design

Chapter 2: Multimodal Planning & Design Scoping Process

LAND USE CONTEXT CLASSIFCATION	RURAL		RURAL TOWN	SUBURBAN		URBAN		URBAN CORE
LAND USE TYPE	*NATURAL*	*AGRICULTURAL*	*RESIDENTIAL OR COMMERCIAL*	*RESIDENTIAL*	*COMMERCIAL*	*RESIDENTIAL*	*COMMERCIAL*	*DOWNTOWN CENTER*

Source: Florida DOT Context Classifications Modified by Toole Design

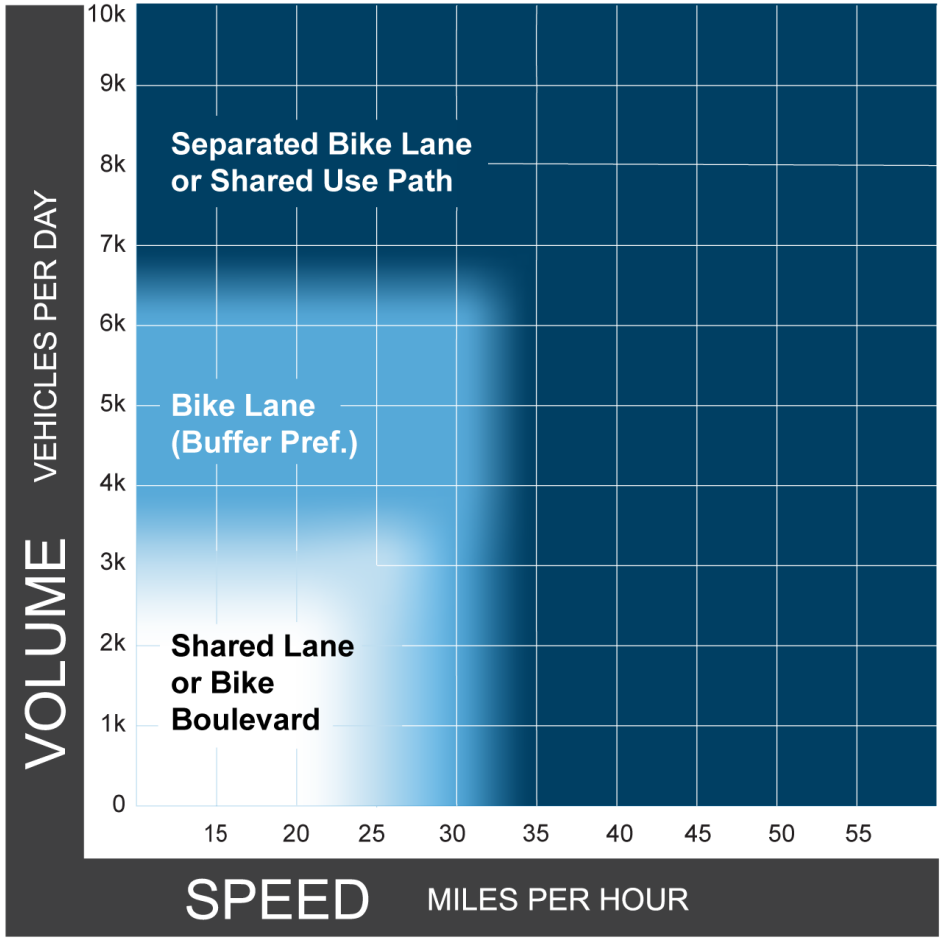
2.5.1 Pedestrian Facilities

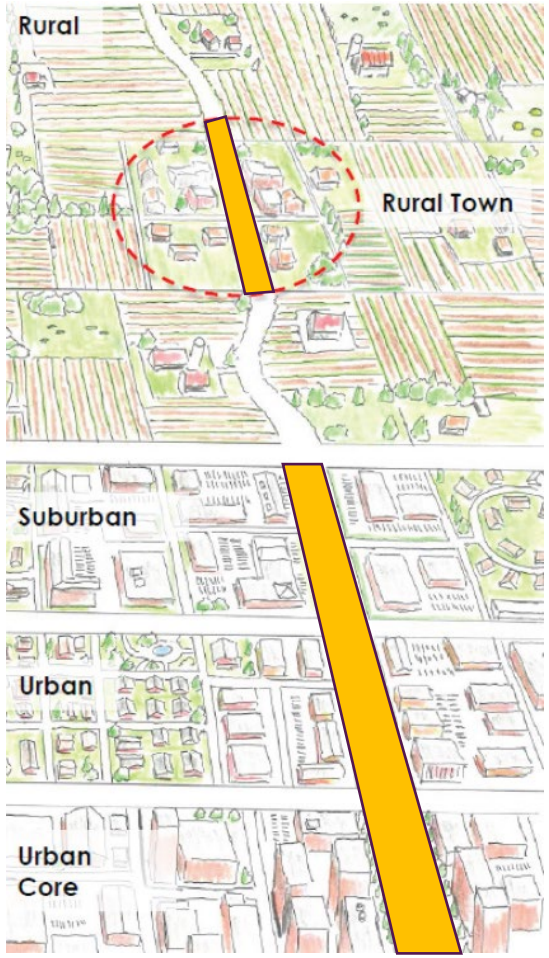
Chapter 2: Multimodal Planning & Design Scoping Process

Land Use Context Classifications	Sidewalk/Walkway
Rural	Paved shoulders
	Shared Streets
	Shared use paths
Suburban	Sidewalks on both sides of the roadway
	Shared use paths
Urban Core, Urban, and Rural Town	Sidewalks on both sides of the roadway
	Shared Streets
	Shared Use Path

2.5.2.1 Preferred Bikeway Type

Urban, Urban Core, Suburban, and Rural Town Contexts





Design User Assumption:
Interested But Concerned Bicyclist

Analysis: Bicycle Level of Traffic Stress (LTS)

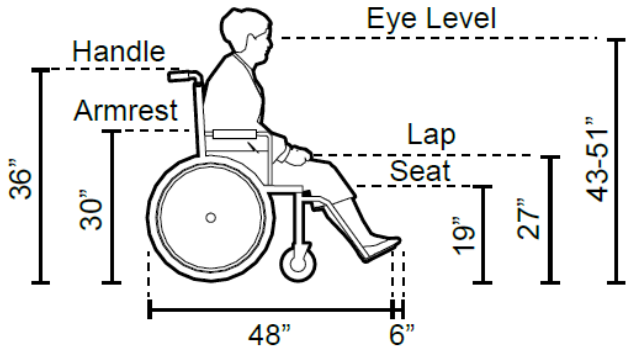
Notes

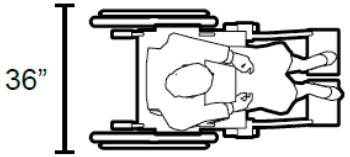
1. *Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.*
2. *See Section 2.8.1 for a discussion of alternatives if the preferred bikeway type is not feasible.*

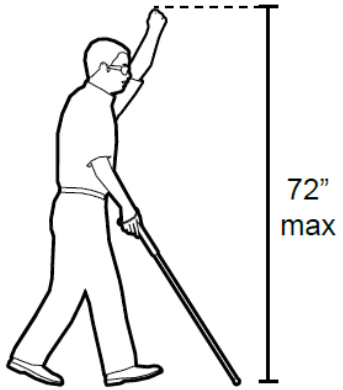
3.6.1 User Operating Space & Facility Widths

Chapter 3 Elements of Design

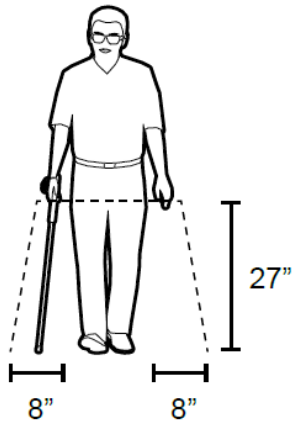
Pedestrian Design User is a typical adult in a wheelchair

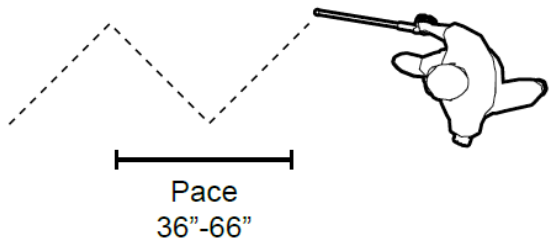






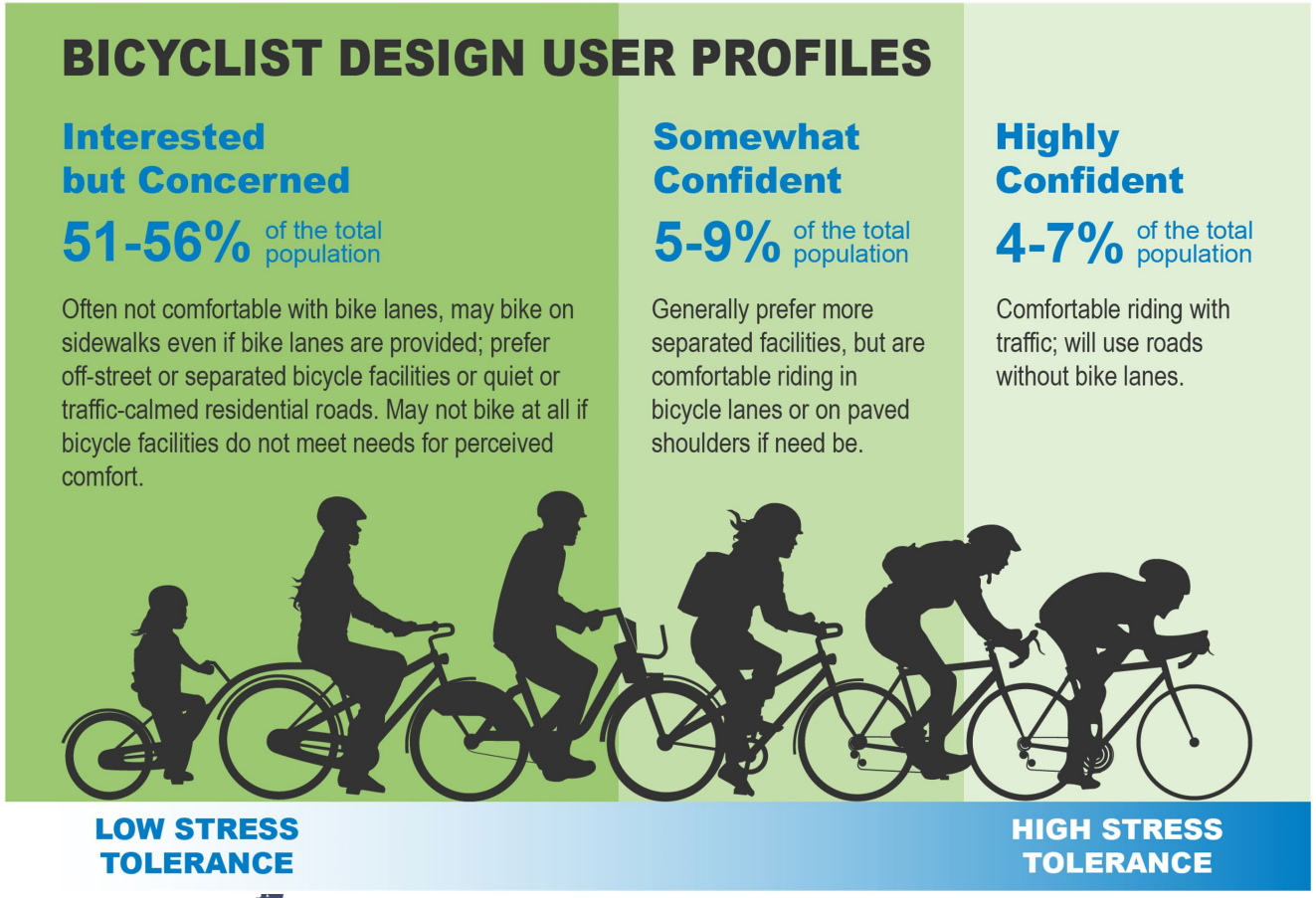
Sight Impaired





3.2.1 User Profiles: Bicyclists

Chapter 3 Elements of Design



Urban, Suburban, Rural Town Contexts

- Design User Assumption: Interested but Concerned

Rural Context

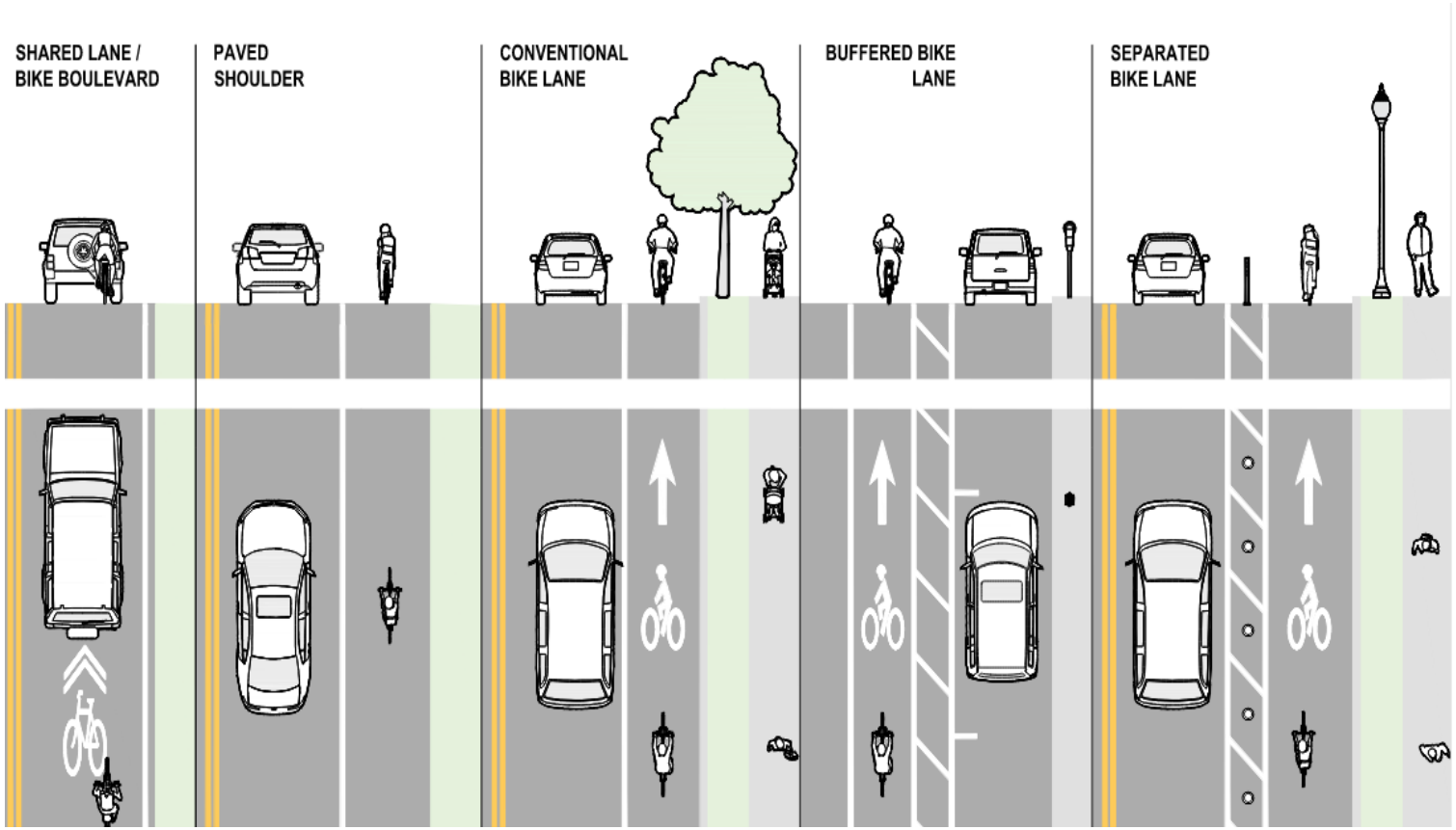
- Design User Assumption: Highly Confident

When we design for the Interested but Concerned User, we accommodate the Somewhat Confident and Highly Confident Riders... in other words we're designing for everyone!

6.3 On Road Bicycle Facilities

Chapter 6: On-Road Bicycle Facilities

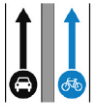
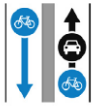
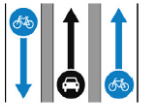
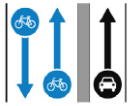
- Bicycle Routes
- Shared Lanes
- Bicycle Boulevards
- Paved Shoulders
- Conventional Bike Lanes
- Buffered Bicycle Lanes
- Raised Bicycle Lanes
- Separated Bicycle Lanes



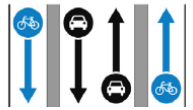
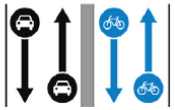
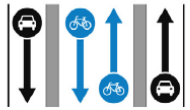
6.3.7. Separated Bicycle Lanes

Chapter 6: On-Road Bicycle Facilities

Configuration on a One-Way Street

Corridor-level Planning Considerations	One-way SBL	Counterflow SBL	One-way SBL Plus Counterflow SBL	Two-way SBL
				
Access to Destinations	Limited access to other side of street		Full access to both sides of street	Limited access to other side of street
Network Connectivity	Does not address demand for counterflow bicycling, may result in wrong way riding	Requires bicyclists traveling in the direction of traffic to share the lane (may result in wrong way riding in the SBL); counterflow progression through signals may be less efficient	Accommodates two-way bicycle travel, but counterflow progression through signals may be less efficient	
Crash Risk	Lower because pedestrians and turning drivers expect concurrent bicycle traffic	Higher because pedestrians and turning drivers may not expect counterflow bicycle traffic		
Intersection Operations	May use existing signal phases; separate bicycle phase may be required depending on vehicle volumes	Typically requires additional signal equipment; separate bicycle phase may be required depending on vehicle volumes		

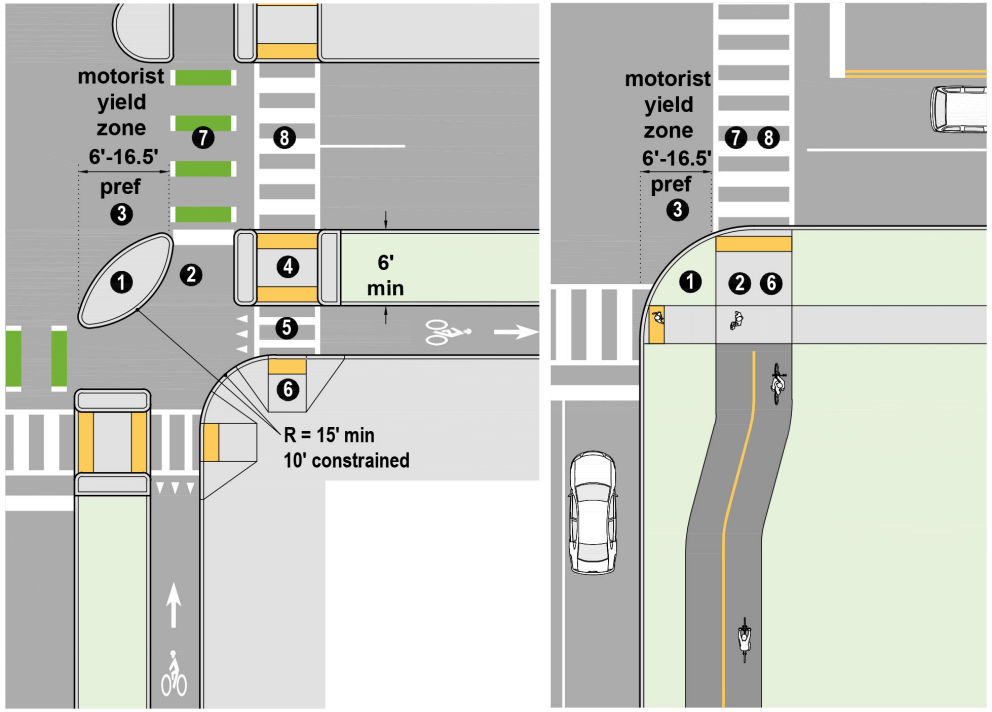
Configuration on a Two-Way Street

Corridor-level Planning Considerations	One-way SBL Pair	Two-way SBL	Median Two-way SBL
			
Access to Destinations	Full access to both sides of street	Limited access to other side of street	Limited access to both sides of street
Network Connectivity	Accommodates two-way bicycle travel		
Crash Risk	Lower because pedestrians and turning drivers expect concurrent bicycle traffic	Higher because pedestrians and turning drivers may not expect counterflow bicycle traffic	Higher because pedestrians and turning drivers may not expect counterflow bicycle traffic, but median location may improve visibility and create opportunities to separate conflicts
Intersection Operations	May use existing signal phases; separate bicycle phase may be required depending on vehicle volumes	Typically requires additional signal equipment; separate bicycle phase may be required depending on vehicle volumes	

6.5.2 SBL (& Sidepath) Intersection Design

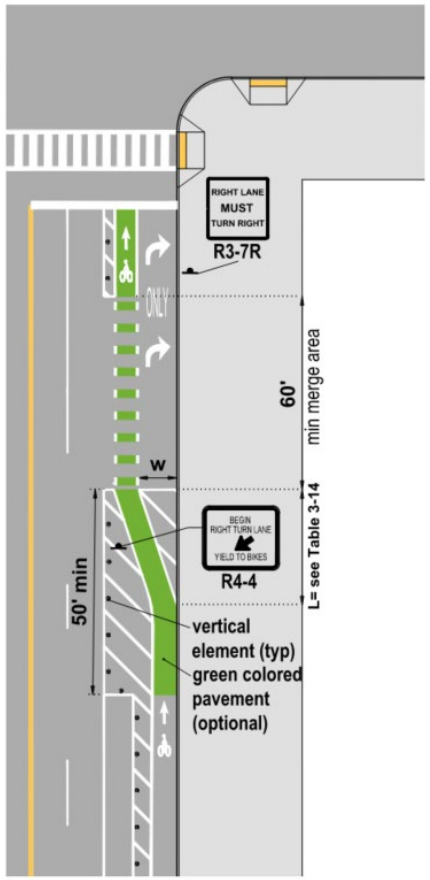
Chapter 6: On-Road Bicycle Facilities

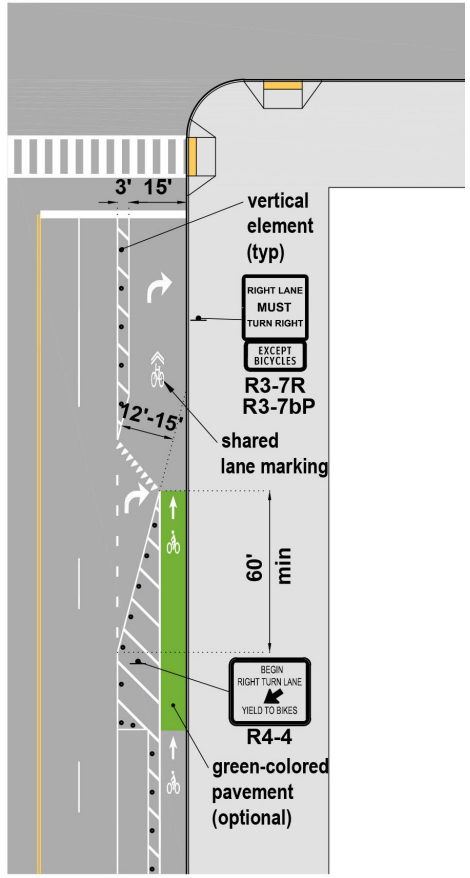
Protected Intersections Preferred



1. corner island
2. forward bicycle queuing area
3. motorist yield zone
4. pedestrian refuge island
5. pedestrian crossing of the separated bike lane
6. pedestrian curb ramp
7. bicycle crossing of travel lanes
8. pedestrian crossing of travel lanes

Mixing Zone Options for Constrained Conditions

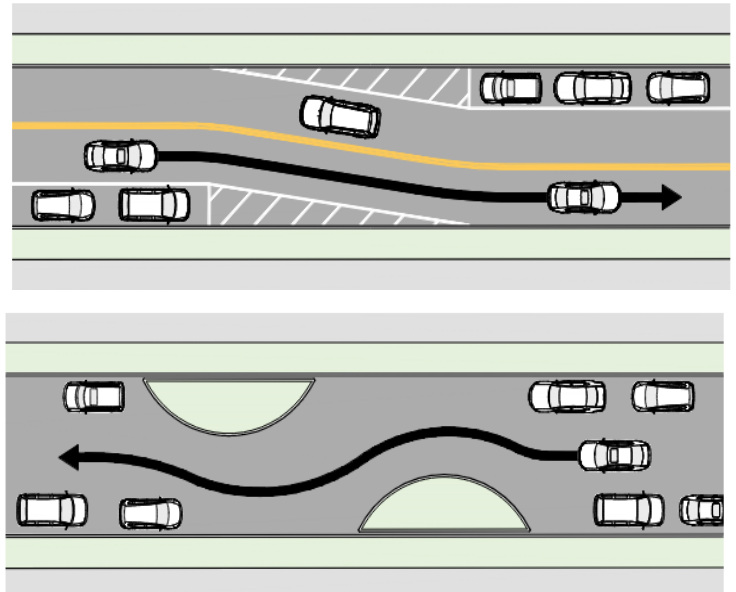




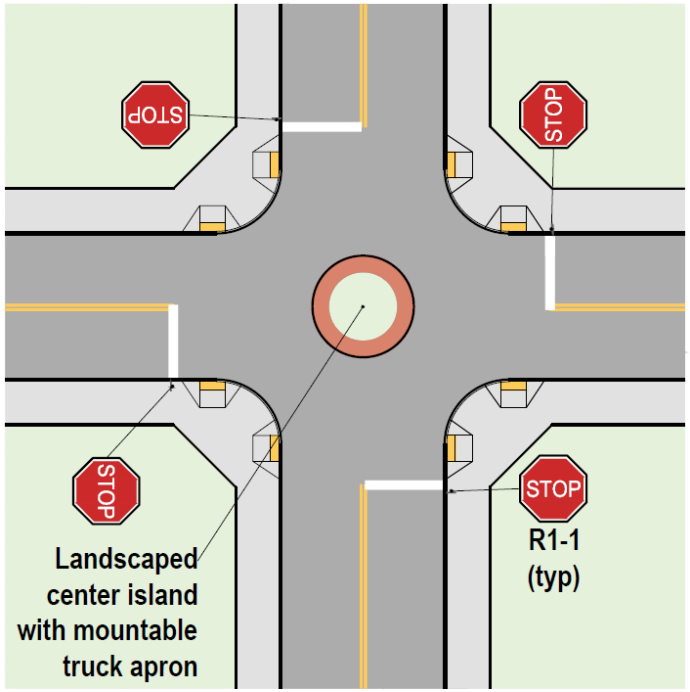
7.8.2 Horizontal Deflection

Chapter 7: Motor Vehicle Facilities Supporting Multimodal Accommodation

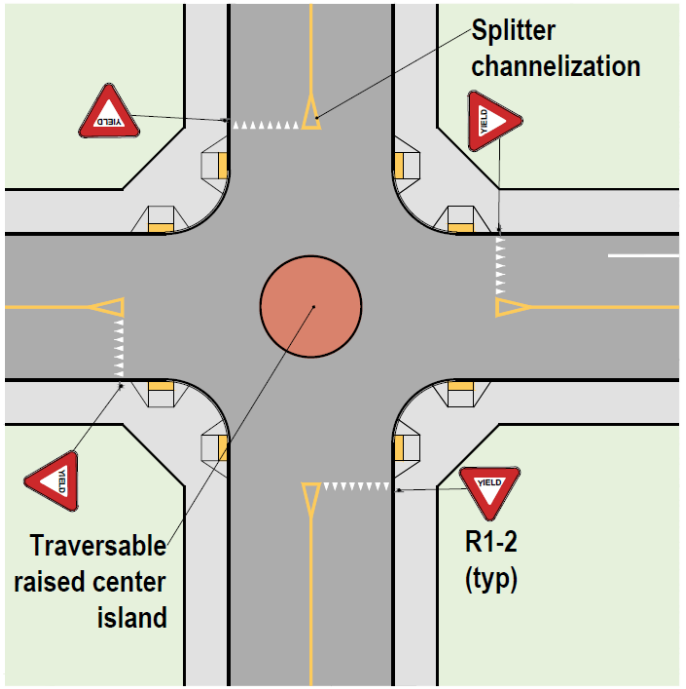
Lateral Shifts & Chicanes



Traffic Circles



Mini- and Modern Roundabouts



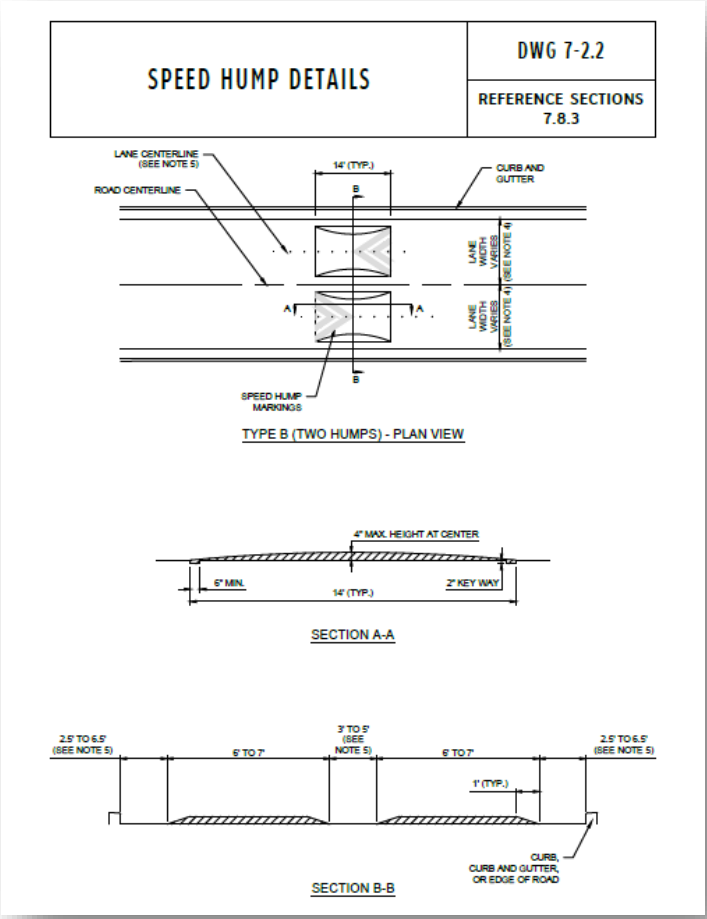
7.8.3 Vertical Deflection

Chapter 7: Motor Vehicle Facilities Supporting Multimodal Accommodation

Vertical deflection as a traffic calming measure is only permitted across local and collector streets where posted speeds are less than 35 mph and where roadway grades do not exceed 8%.

Options include:

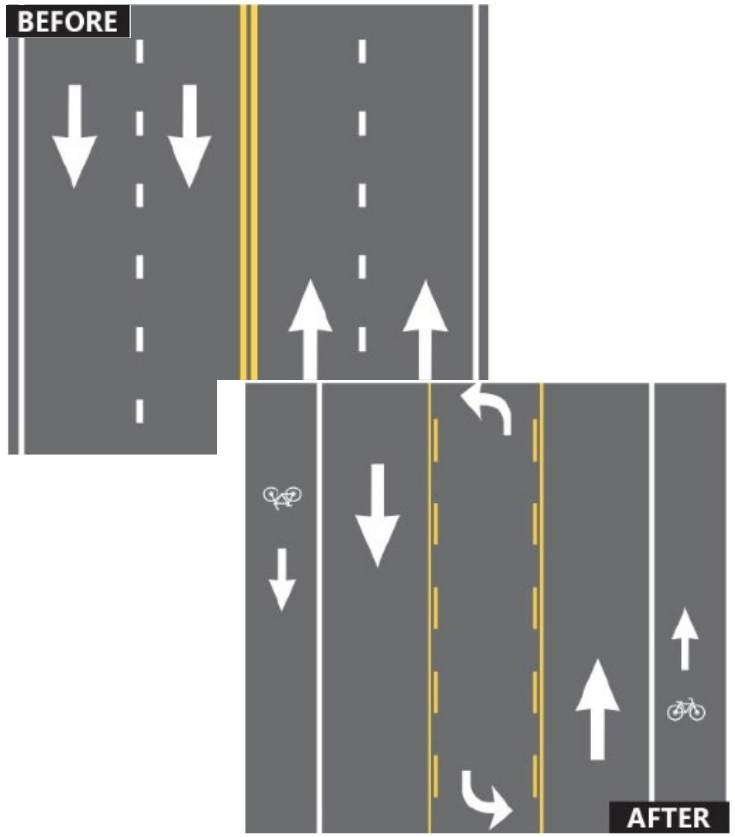
- Speed Humps
- Raised Crossings
- Speed Tables



7.8.4 Street Width Reduction

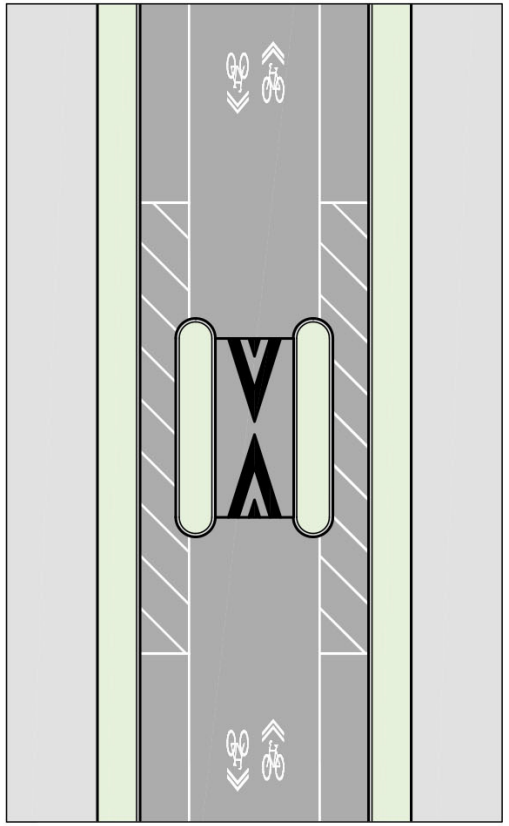
Chapter 7: Motor Vehicle Facilities Supporting Multimodal Accommodation

Road Diet



Yield Streets

One-Lane Pinch Points

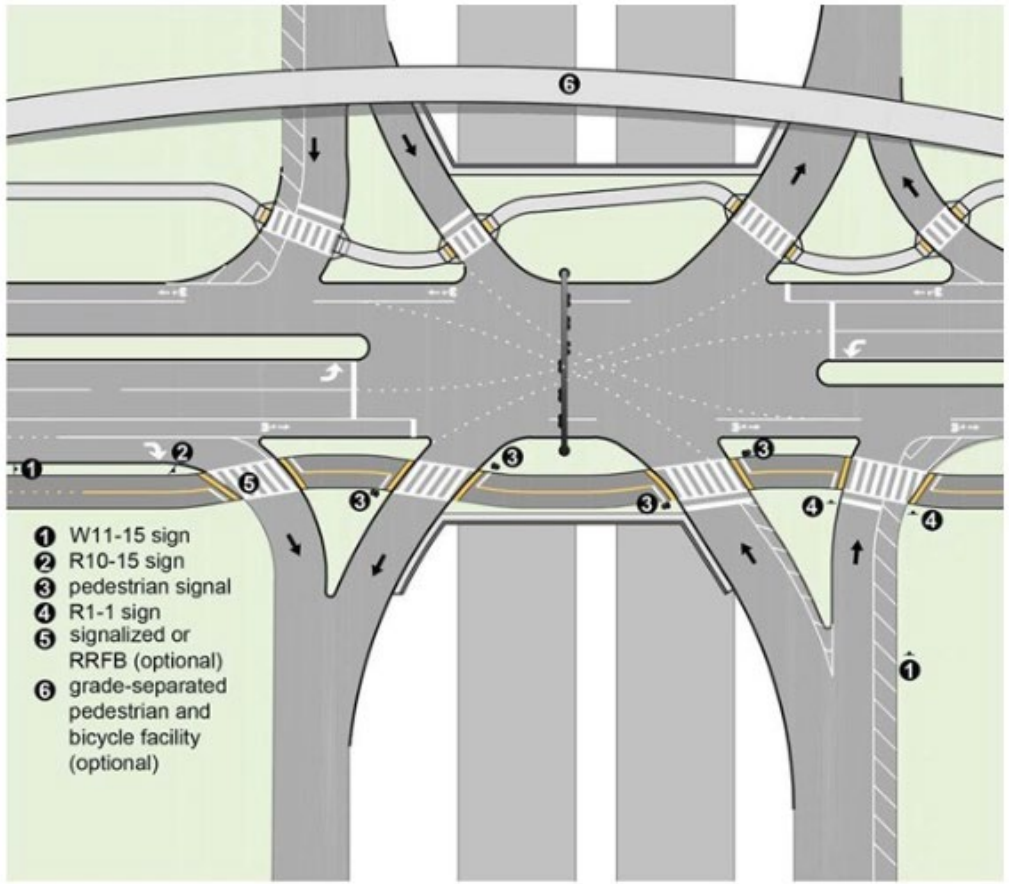


9.3 Interchanges

Chapter 9:Multimodal Accommodations at Interchanges & Intersections

- Diamond Interchanges
- Cloverleaf Interchanges
- Single Point Urban Interchanges (SPUI)
- Diverging Diamond Interchanges (DDI)

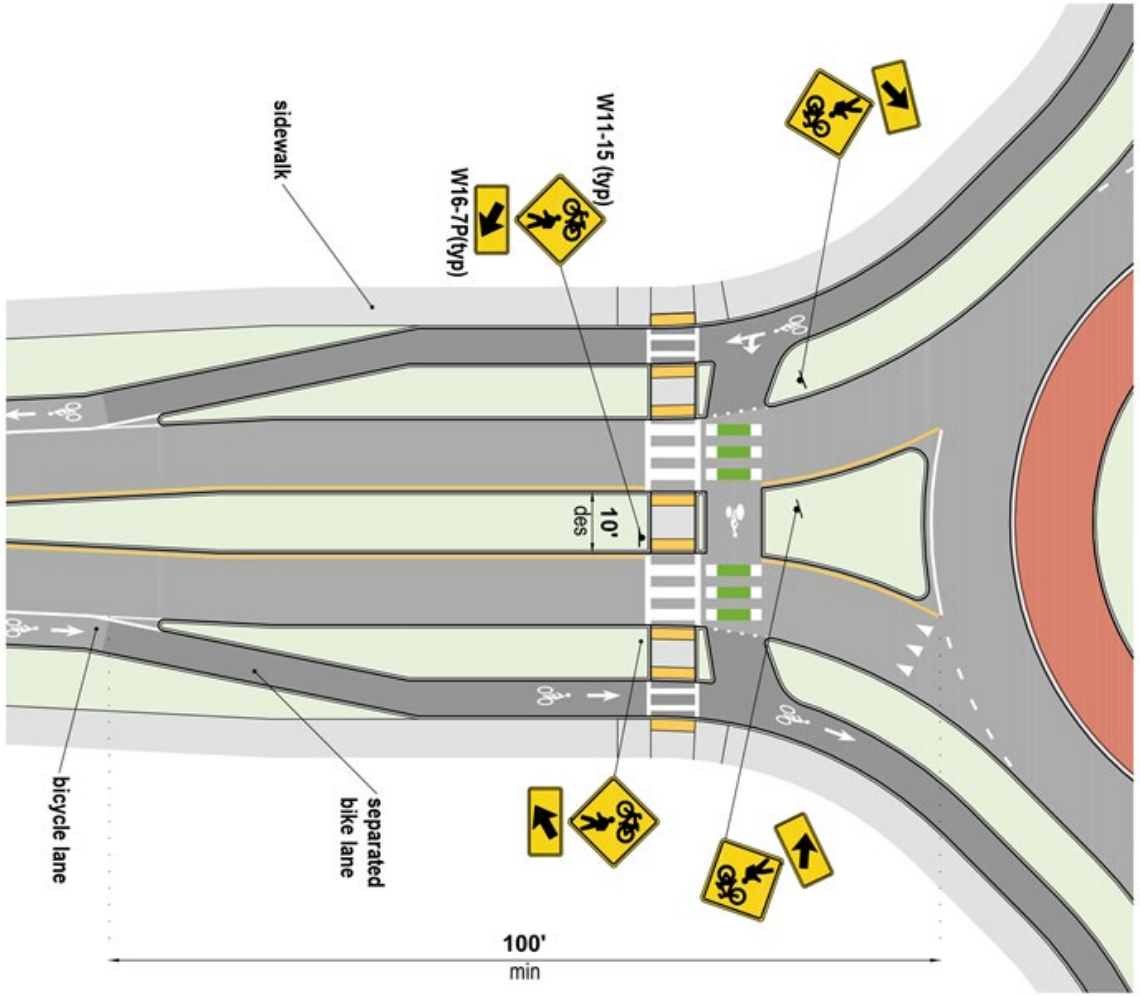
Figure 9-5: Various Bicycle and Pedestrian Treatments at a SPUI



9.4 Alternative Intersections

Chapter 9:Multimodal Accommodations at Interchanges & Intersections

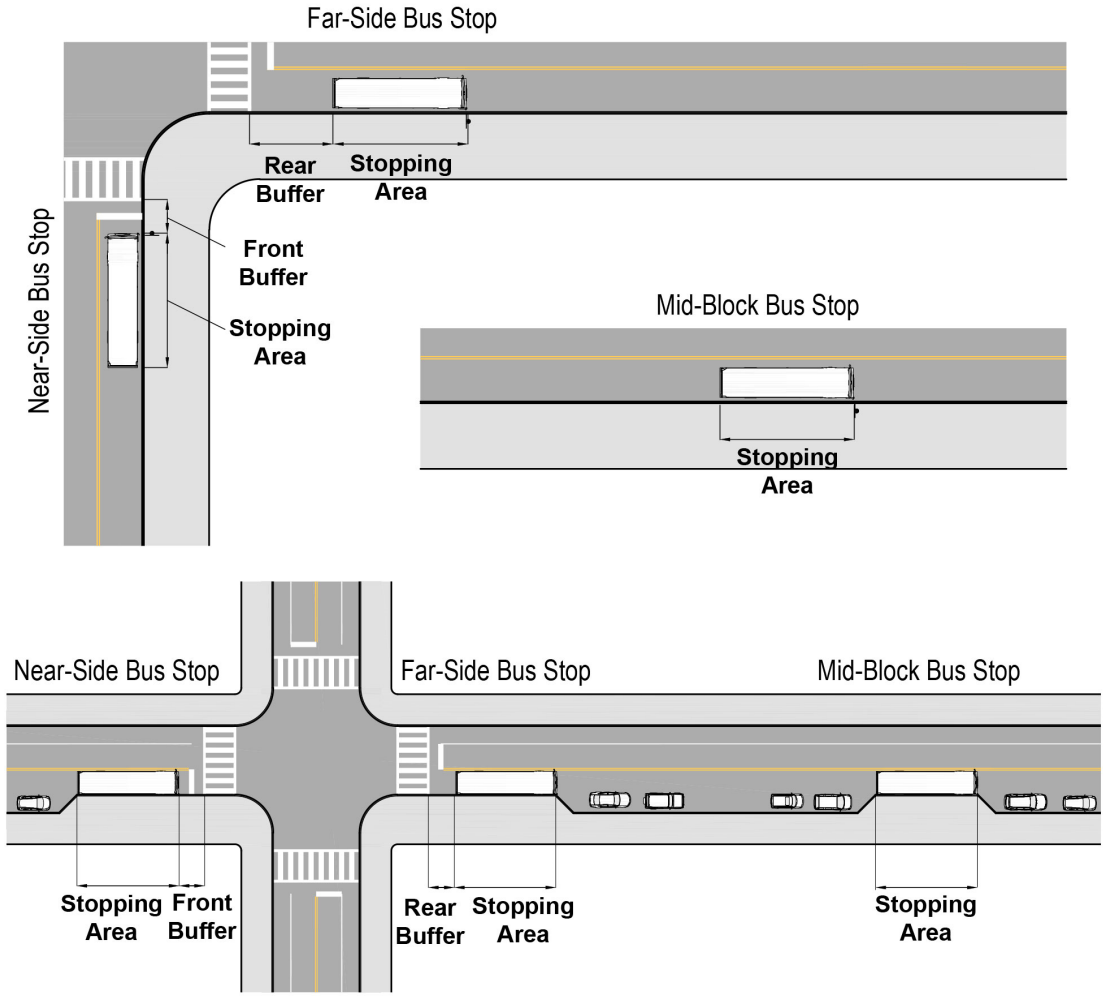
- Median U-Turn (MUT) Intersections
- Restricted Crossing U-Turn (RCUT) Intersections
- Displaced Left Turn (DLT) Intersections
- Roundabout Intersections



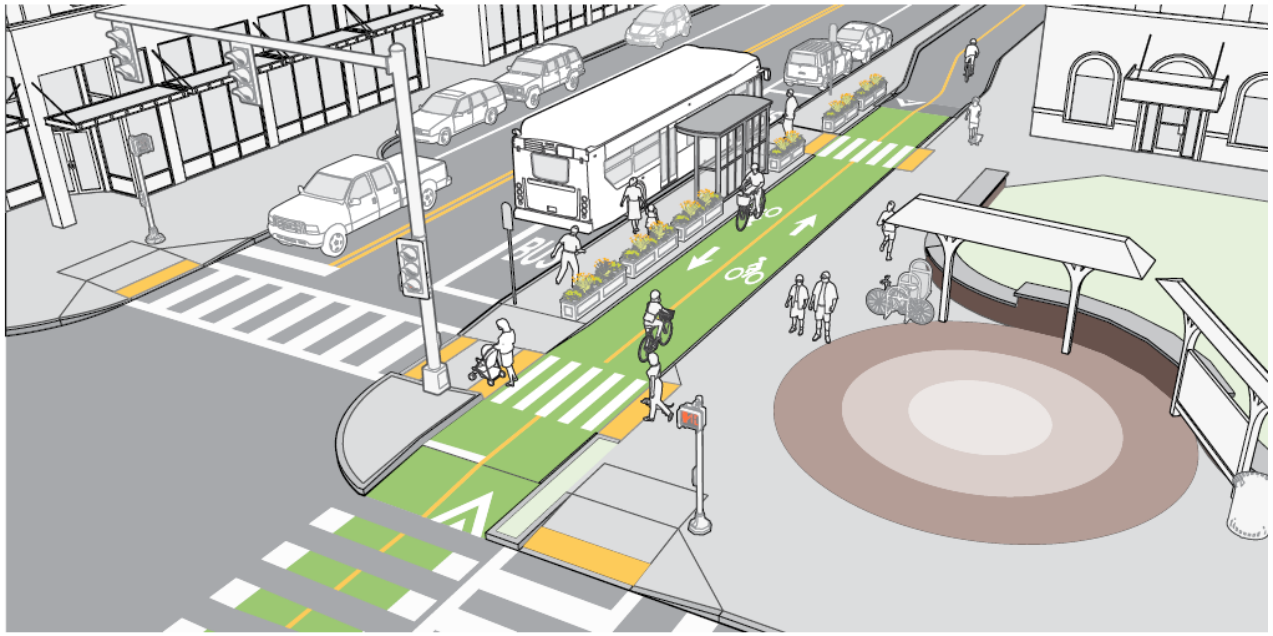
10.4 Locating Bus Stops

Chapter 9: Transit Facilities

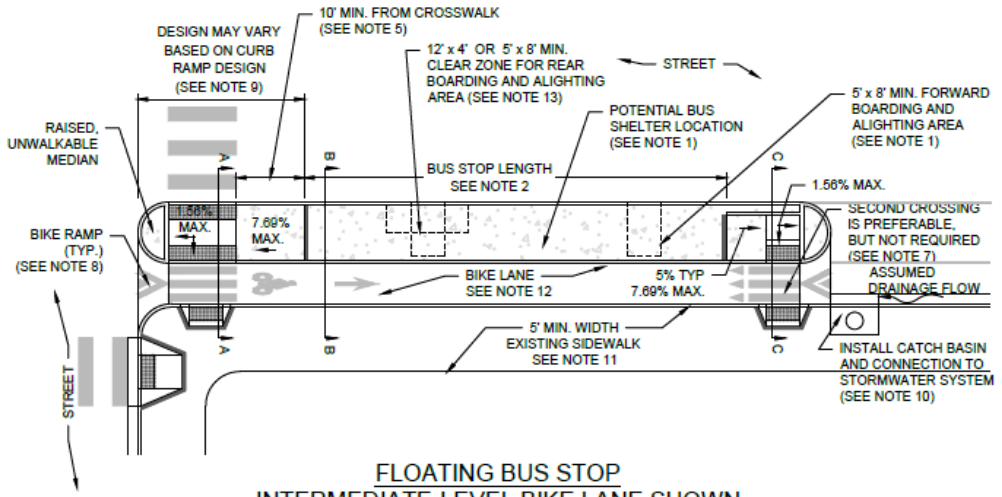
- Stop Placement
  - Far-Side
  - Near-Side
  - Mid-Block
- Stop Configuration
  - In-Lane Bus Stops
  - Pull-Out Bus Stops



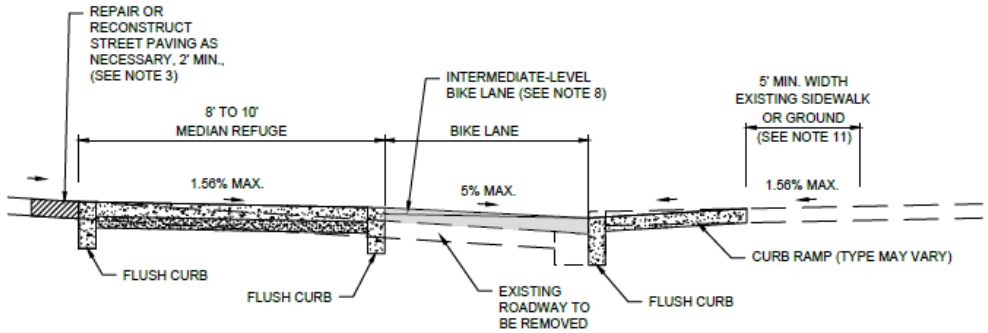
10.5 Integrating Bicycle Facilities with Transit



FLOATING BUS STOP DETAILS	DWG 10-1.1
	REFERENCE SECTIONS 4.5.3, 6.3.7, 6.3.8, 6.5.2, 7.2, 10.5



FLOATING BUS STOP
INTERMEDIATE-LEVEL BIKE LANE SHOWN



SECTION A-A
FLOATING BUS STOP INTERSECTION CROSSWALK

Chapter 12: Maintenance

12.2 Management Approaches

12.3 Types of Maintenance

12.4 Winter Maintenance

12.5 Additional Resources

Pickup truck with plow
Approximate Width: 8.5 ft./2.6 meters
Walkway/Bikeway Facility Types: Trails, side paths, 2-way separated bike lanes

Skid loader with snow blower
Approximate Width: 4 ft./1.2 meters
Walkway/Bikeway Facility Types: Walkways, trails, side paths, 2-way separated bike lanes, 1-way separated bike lanes

Miniature tractor with snow blower
Approximate Width: 4 ft./1.2 meters

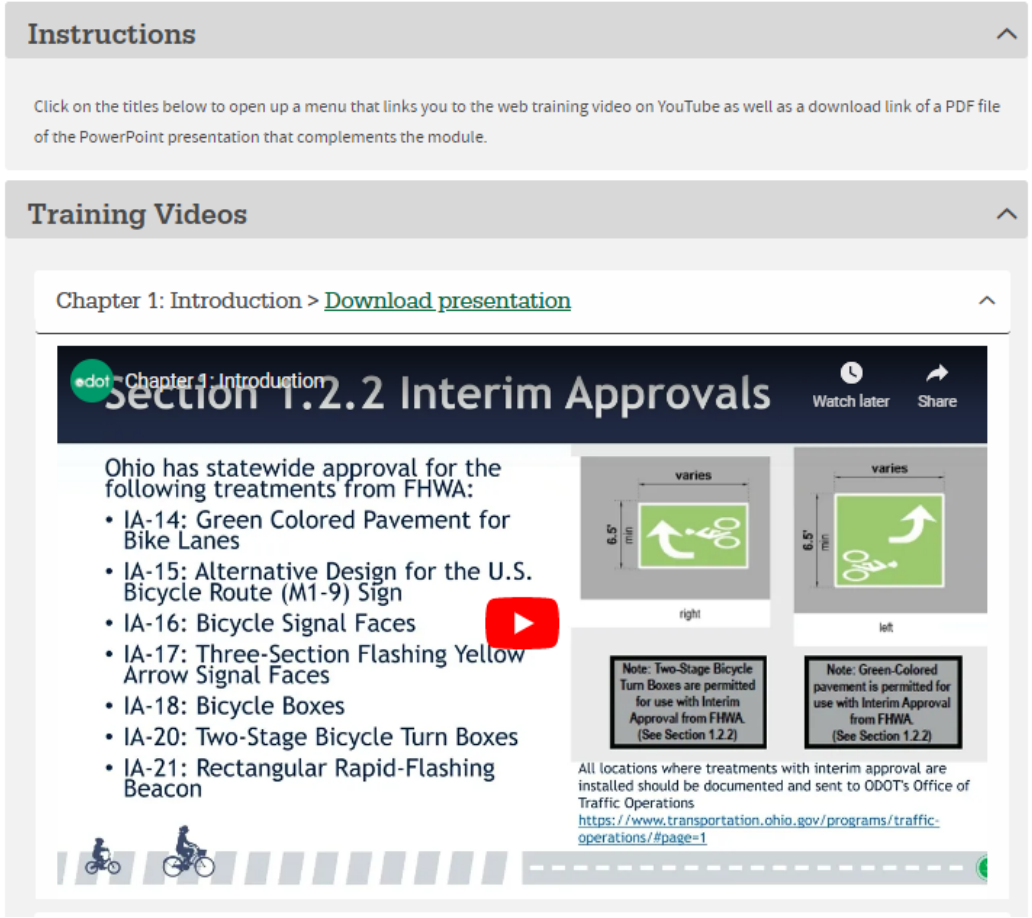
Lawn mower tractor (converted to winter maintenance vehicle) with broom

Multimodal Design Guide

Training

MDG 101 Training Videos:

Serve as a series of recorded videos providing an overview of what is in the guide and where to find content.



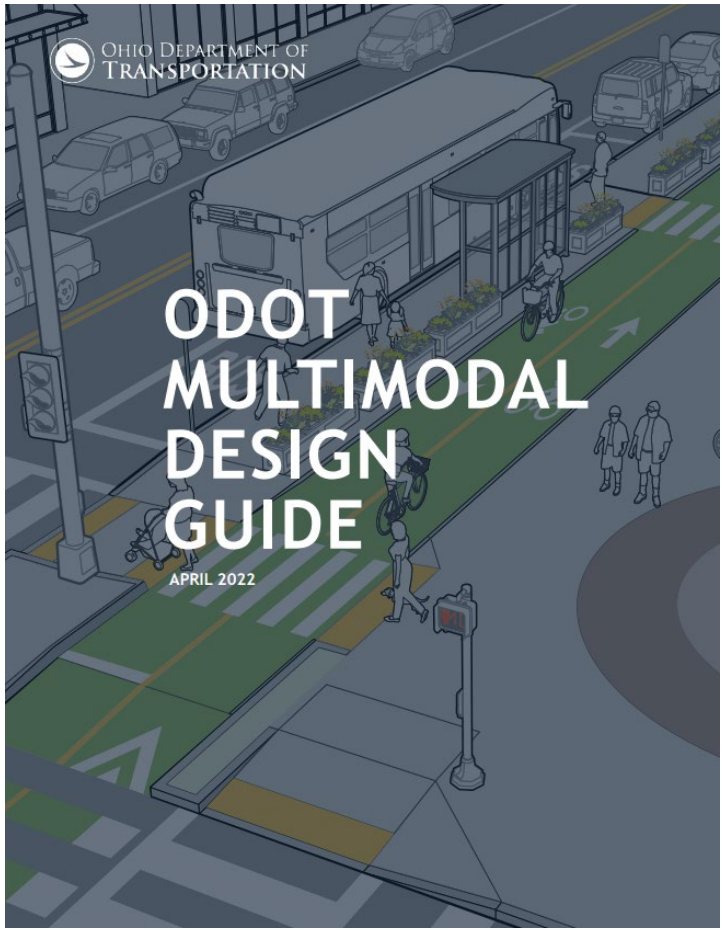
Multimodal Design Guide

Training

MDG 201 Live Trainings:

Serve as a live (but virtual) opportunity for a deeper dive on the MDG and training on applying the design guidance in practice.

- Consists of two, 3-hour training sessions offered over two days
- 201 training sessions on December 6 & 7 and January 25 & 26 will be open to local practitioners, consultants, and partners



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