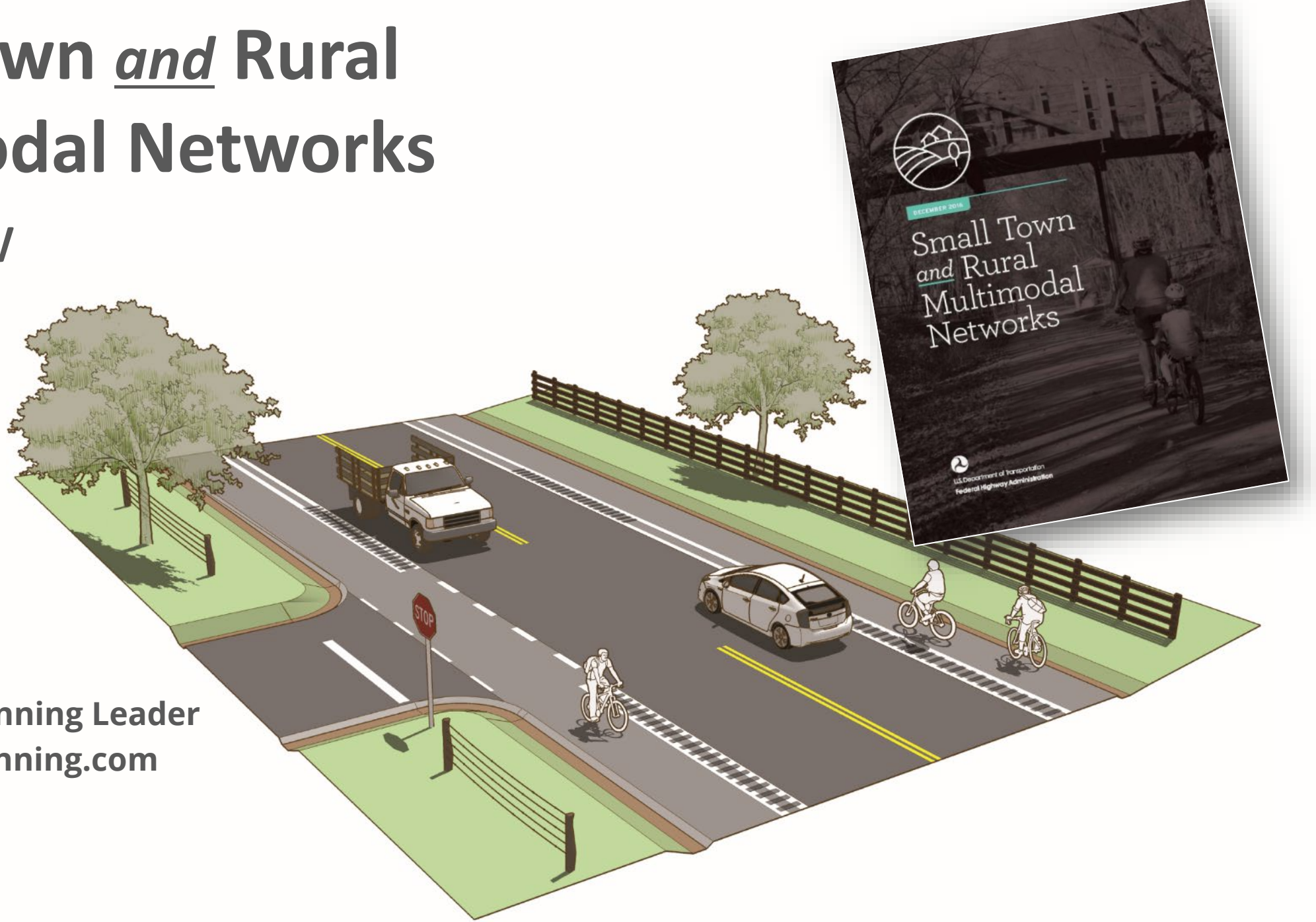
Small Town *and* Rural Multimodal Networks

Overview



October 19, 2018

Phil Goff LEED AP
New England Planning Leader
philgoff@altaplanning.com

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History and Context

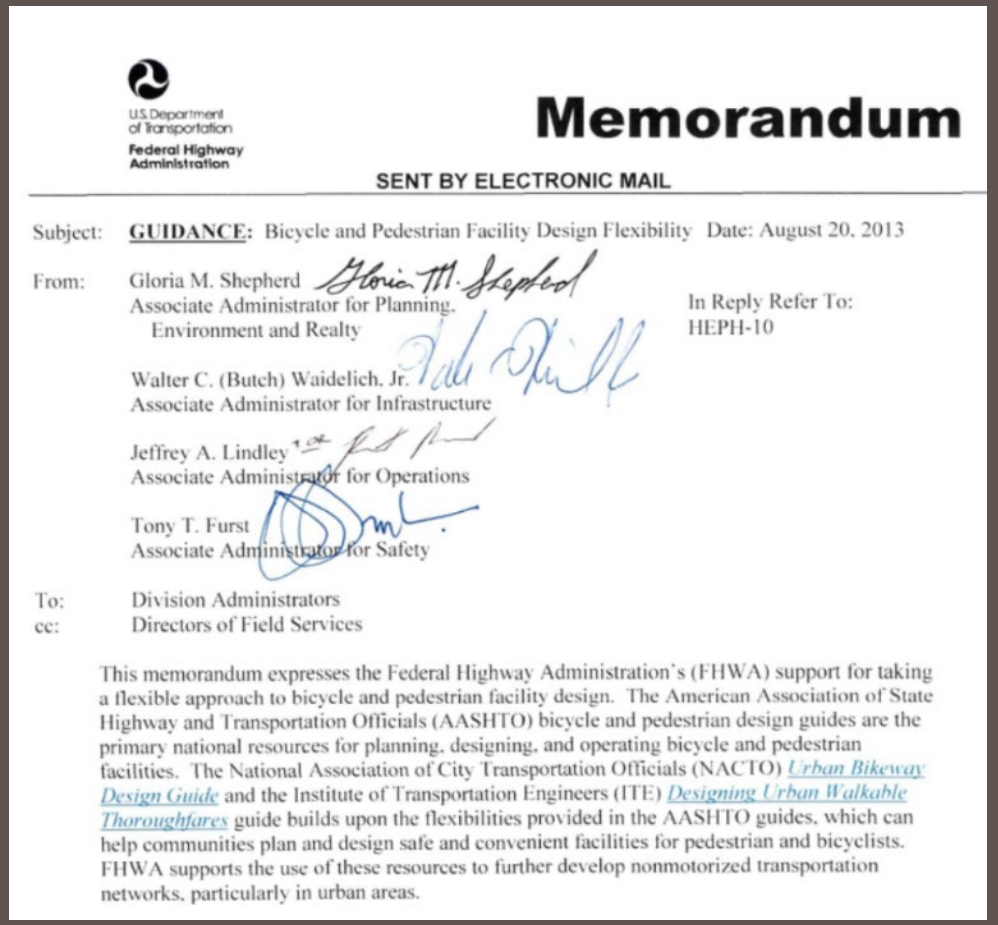
Rural Practice and Multimodal Design Guidelines

Design Guideance

- ITE Walkable Thoroughfares (2010)
- NACTO Urban Bikeway Design Guide (2012)
- NACTO Urban Street Design Guide (2013)

FHWA Design Flexibility Memo (2013)

FHWA supports "taking a flexible approach to bicycle and pedestrian facility design. … The NACTO Urban Bikeway Design Guide, and the Institute of Transportation Engineers (ITE) Designing Walkable Urban Thoroughfares guide builds upon the flexibilities provided in the AASHTO guides, which can help communities plan and design safe and convenient facilities for pedestrian and bicyclists. FHWA supports the use of these resources to further develop nonmotorized transportation networks, particularly in urban areas."



U.S. Department of Transportation
Federal Highway Administration

Memorandum

SENT BY ELECTRONIC MAIL

Subject: **GUIDANCE:** Bicycle and Pedestrian Facility Design Flexibility Date: August 20, 2013

From: Gloria M. Shepherd
Associate Administrator for Planning, Environment and Realty

In Reply Refer To: HEPH-10

Walter C. (Butch) Waidelich, Jr.
Associate Administrator for Infrastructure

Jeffrey A. Lindley
Associate Administrator for Operations

Tony T. Furst
Associate Administrator for Safety

To: Division Administrators
cc: Directors of Field Services

This memorandum expresses the Federal Highway Administration's (FHWA) support for taking a flexible approach to bicycle and pedestrian facility design. The American Association of State Highway and Transportation Officials (AASHTO) bicycle and pedestrian design guides are the primary national resources for planning, designing, and operating bicycle and pedestrian facilities. The National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide* and the Institute of Transportation Engineers (ITE) *Designing Urban Walkable Thoroughfares* guide builds upon the flexibilities provided in the AASHTO guides, which can help communities plan and design safe and convenient facilities for pedestrian and bicyclists. FHWA supports the use of these resources to further develop nonmotorized transportation networks, particularly in urban areas.

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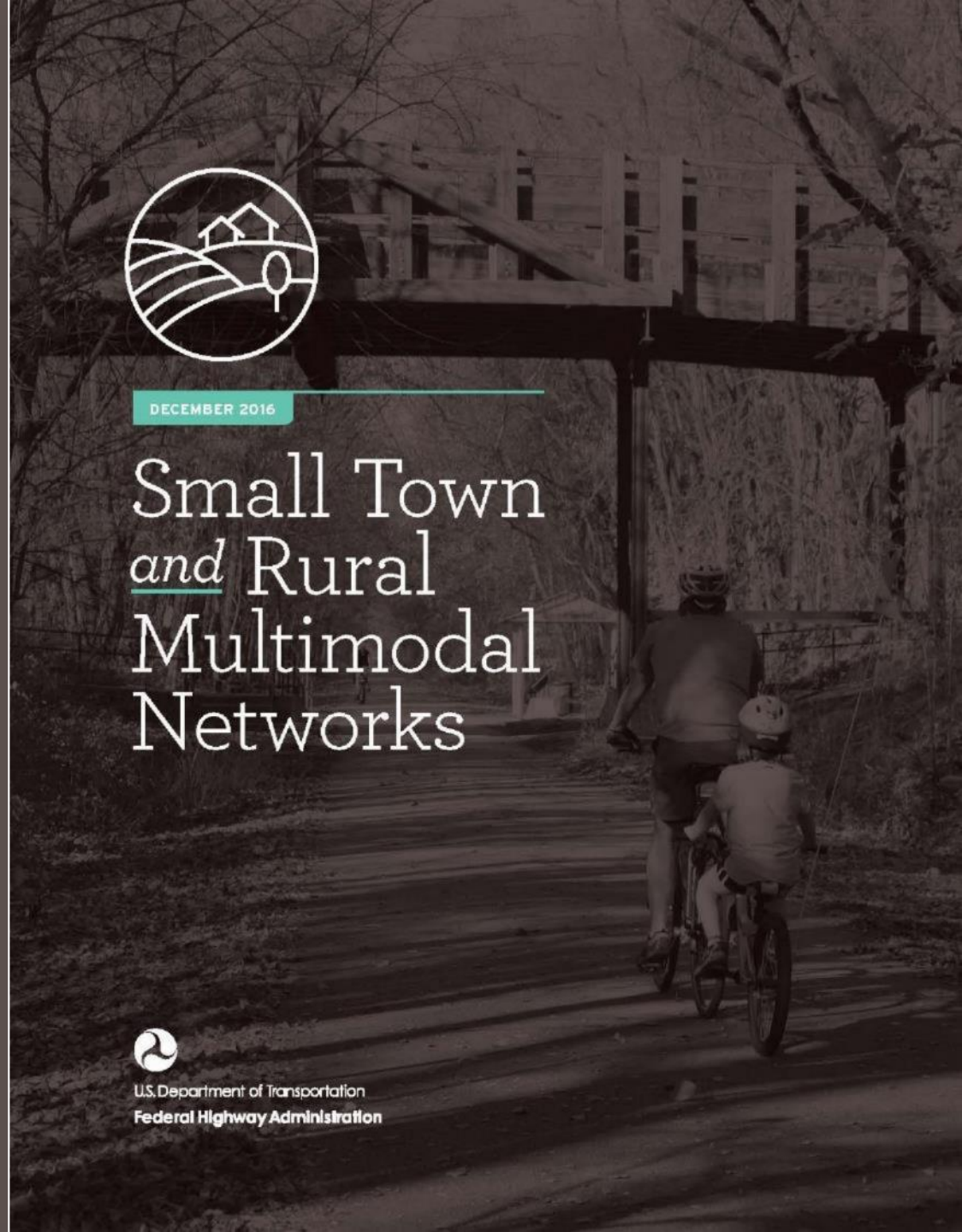
Small Town and Rural Multimodal Networks (2016-17)



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SOURCES: Where did the guide come from?

- AASHTO Flexibility Guide 2004
- AASHTO Bike Guide 2012
- AASHTO Pedestrian Guide 2004
- AASHTO Green Book 2011
- AASHTO Low Volume Roads 2001, 2017
- FHWA Achieving Multimodal Networks 2016
- FHWA Resurfacing Guide 2016
- FHWA MUTCD 2009
- FHWA Separated Bike Lane Guide 2015
- PROWAG 2011, 2013, 2014
- BIKESAFE 2014

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Small Town/Rural Needs

ONE SIZE DOES NOT FIT ALL.

LONGER NON-LOCAL TRIP DISTANCES

HEALTH DISPARITIES

HIGHER CRASH RATES (20% of population; 60% of traffic-related fatalities)

INCOME DISPARITIES

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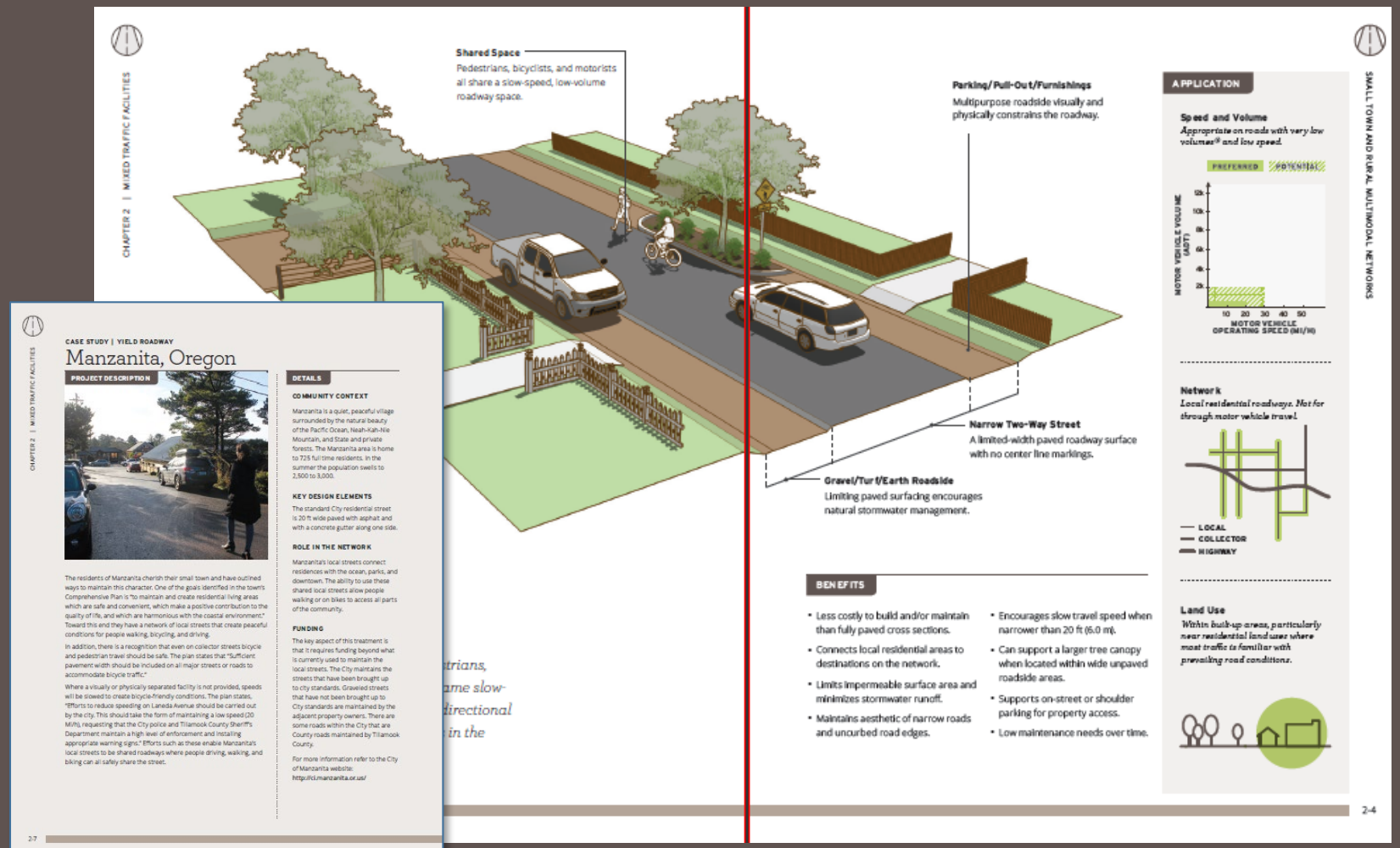
Guide Content

Treatments and Design Topics

Multimodal Facilities / Focus on Networks

- Application
- Benefits
- Case Studies
- Guidance
  - Geometric Design
  - Markings
  - Signs
  - Intersection treatment
  - Implementation
  - Accessibility



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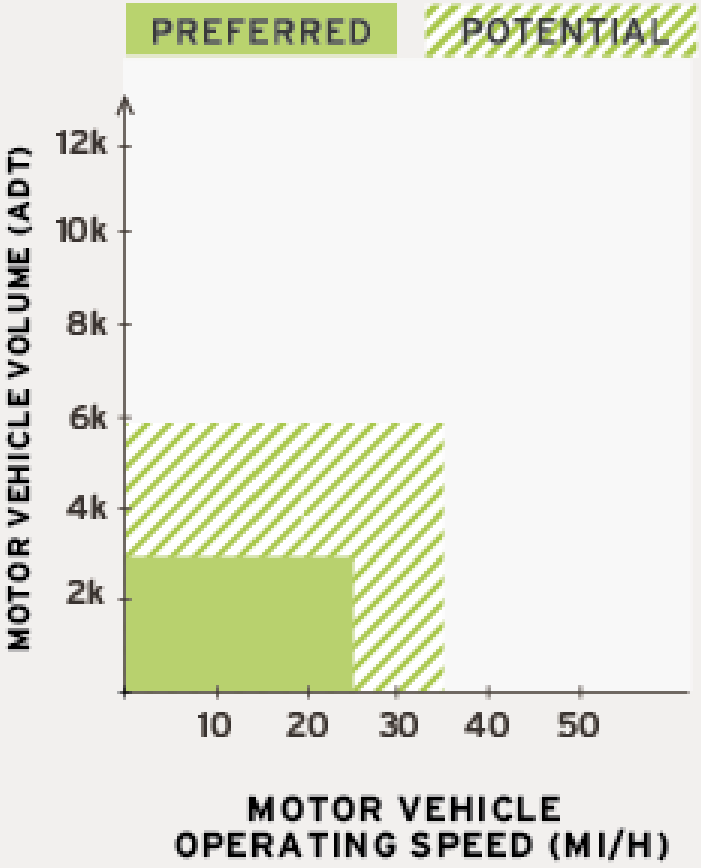
EXAMPLE APPLICATION

Speed and Volume

Most appropriate on streets with low to moderate volumes and moderate speed motor vehicles.



Network

Applies to constrained connections between built-up areas.

LOCAL
COLLECTOR
HIGHWAY

Land Use

For use outside, between and within built-up areas with bicycle and pedestrian demand and limited available paved roadway surface.

OUTSIDE OF BUILT-UP AREAS

WITHIN BUILT-UP AREAS

Applications

1. Mixed Traffic

2. Visually Separated

3. Physically Separated

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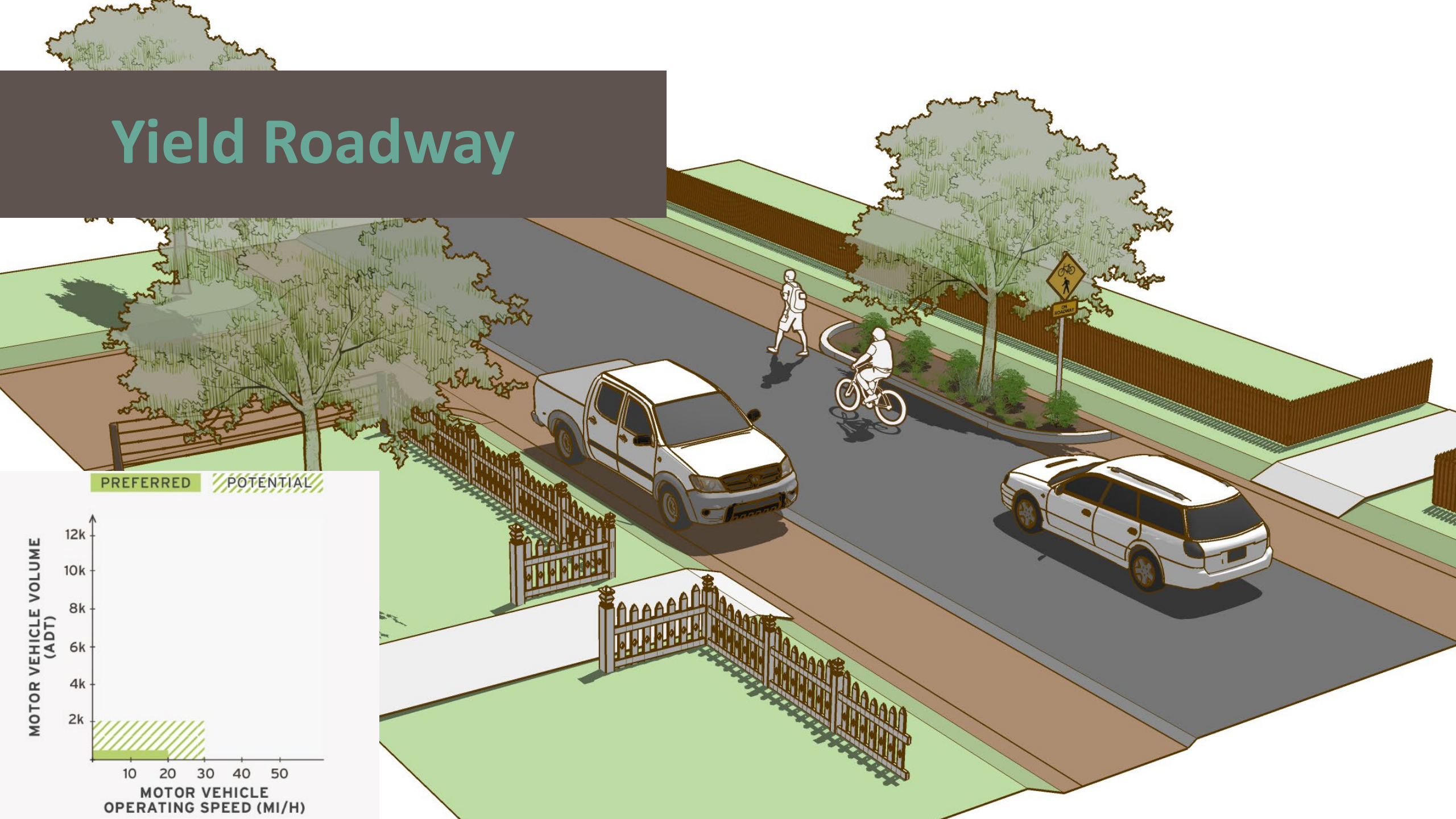
1. Mixed Traffic

Yield Roadway

Bicycle Boulevard

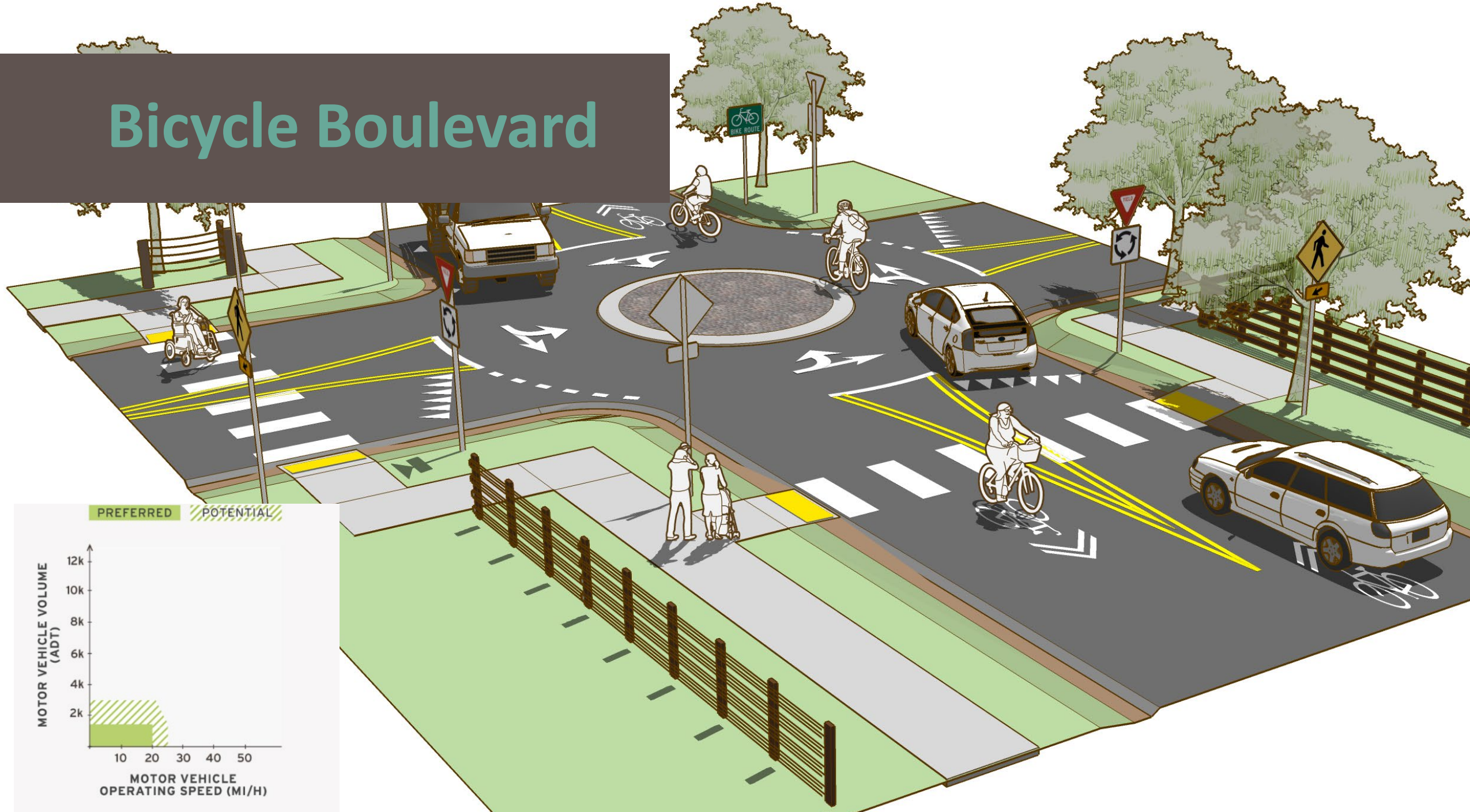
Advisory Shoulder

Yield Roadway



Sisters, OR

Bicycle Boulevard



Bicycle Boulevard – Geometric Design

- **Combine pavement markings, traffic calming measures, and crossing improvements to enhance bicyclist comfort and keep traffic speeds below 25 mph**

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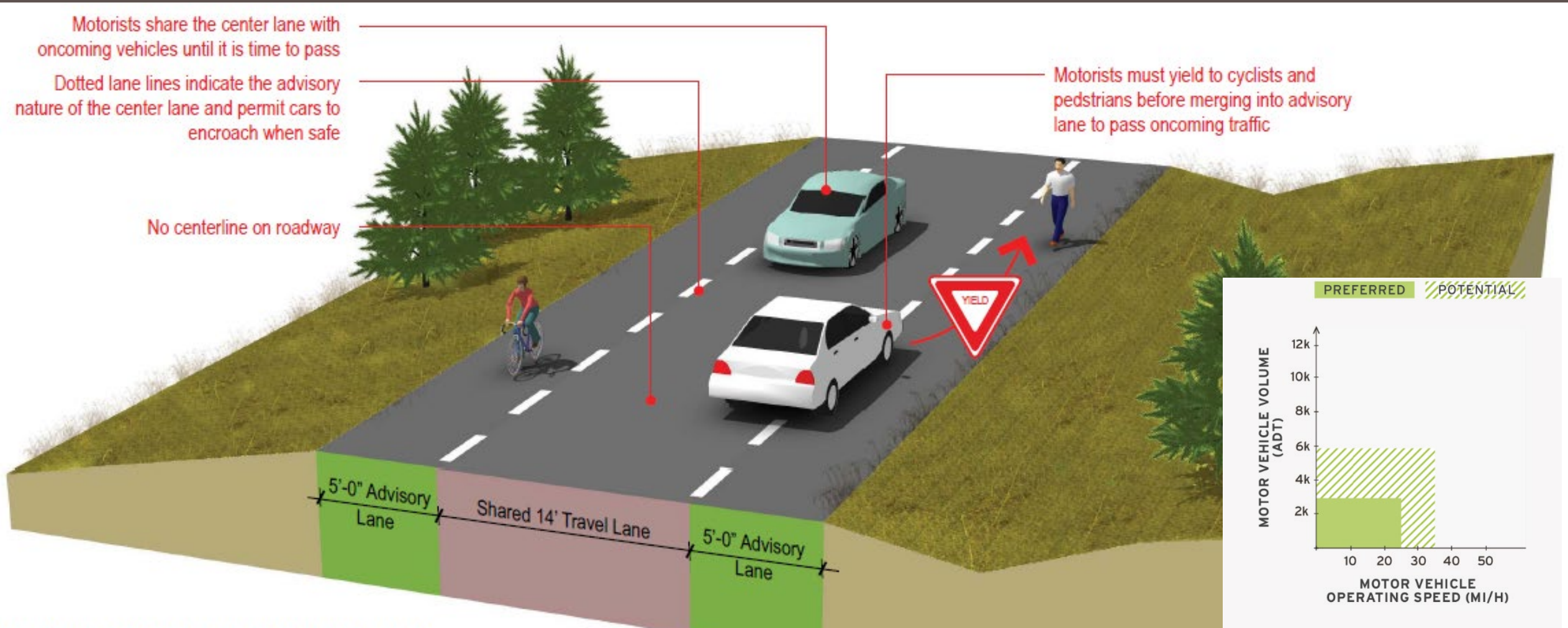
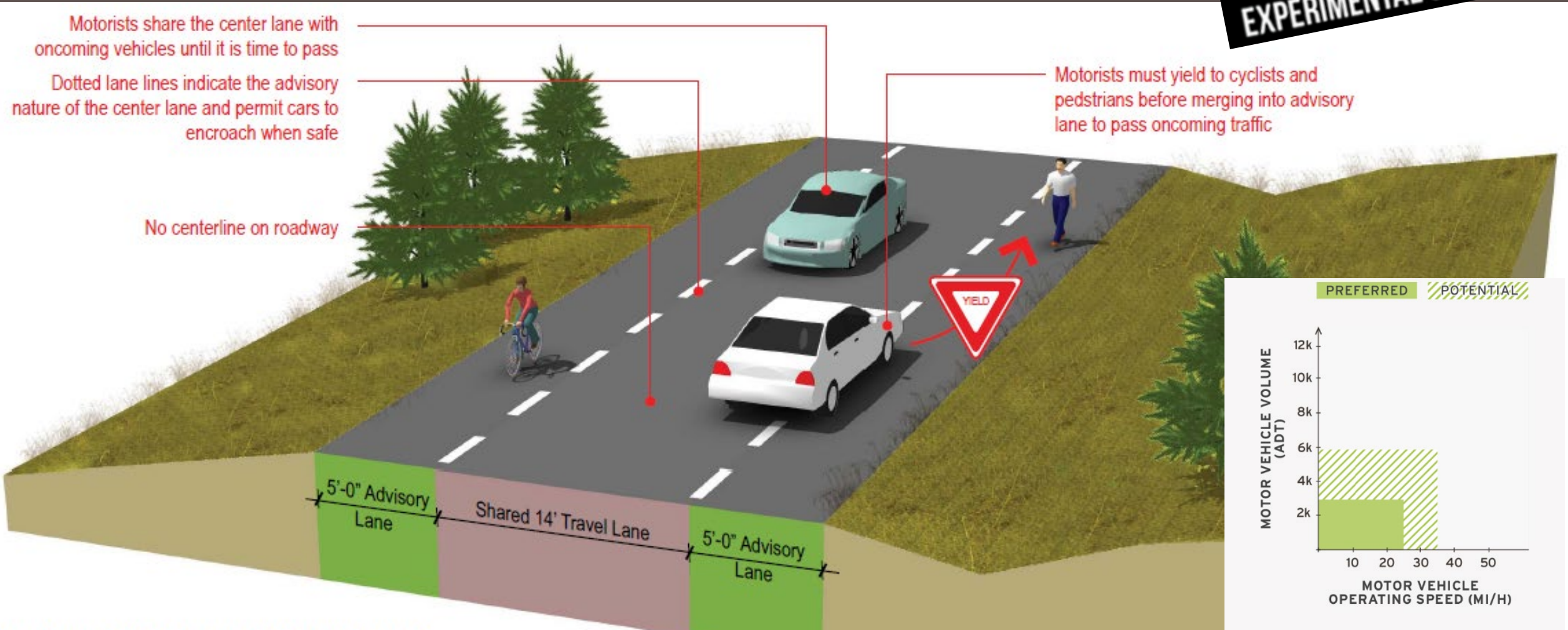
Portland ME

Advisory Shoulder/Yield Roadway



Advisory Shoulder/Yield Roadway

ENGINEERING
ADVISORY
EXPERIMENTAL CONTENT



Advisory Shoulder- Benefits

Benefits

- May reduce motor vehicle travel speeds.
- Increases predictability and clarifies desired lateral positioning of users.
- Functions well within a rural and small town traffic and land use context.
- Provides a delineated space on a roadway otherwise too narrow for dedicated shoulders.
- Minimizes potential impacts to visual or natural resources.
- May function as an interim measure where plans include shoulder widening or traffic calming in the future.

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Advisory Shoulder in Hanover, NH

Cambridge, MA

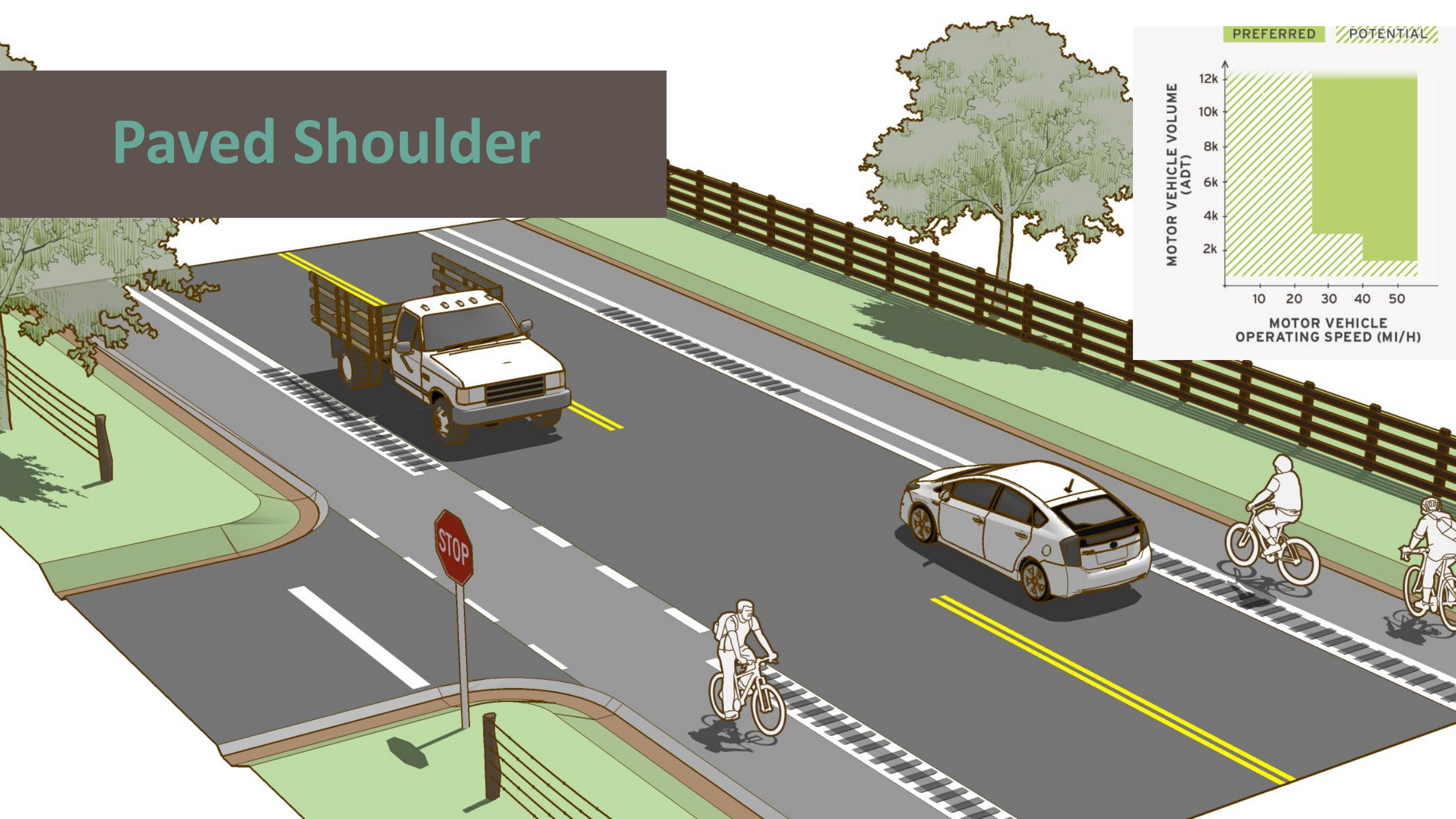
2. Visually Separated

Paved Shoulder

Bike Lane

Pedestrian Lane

Paved Shoulder

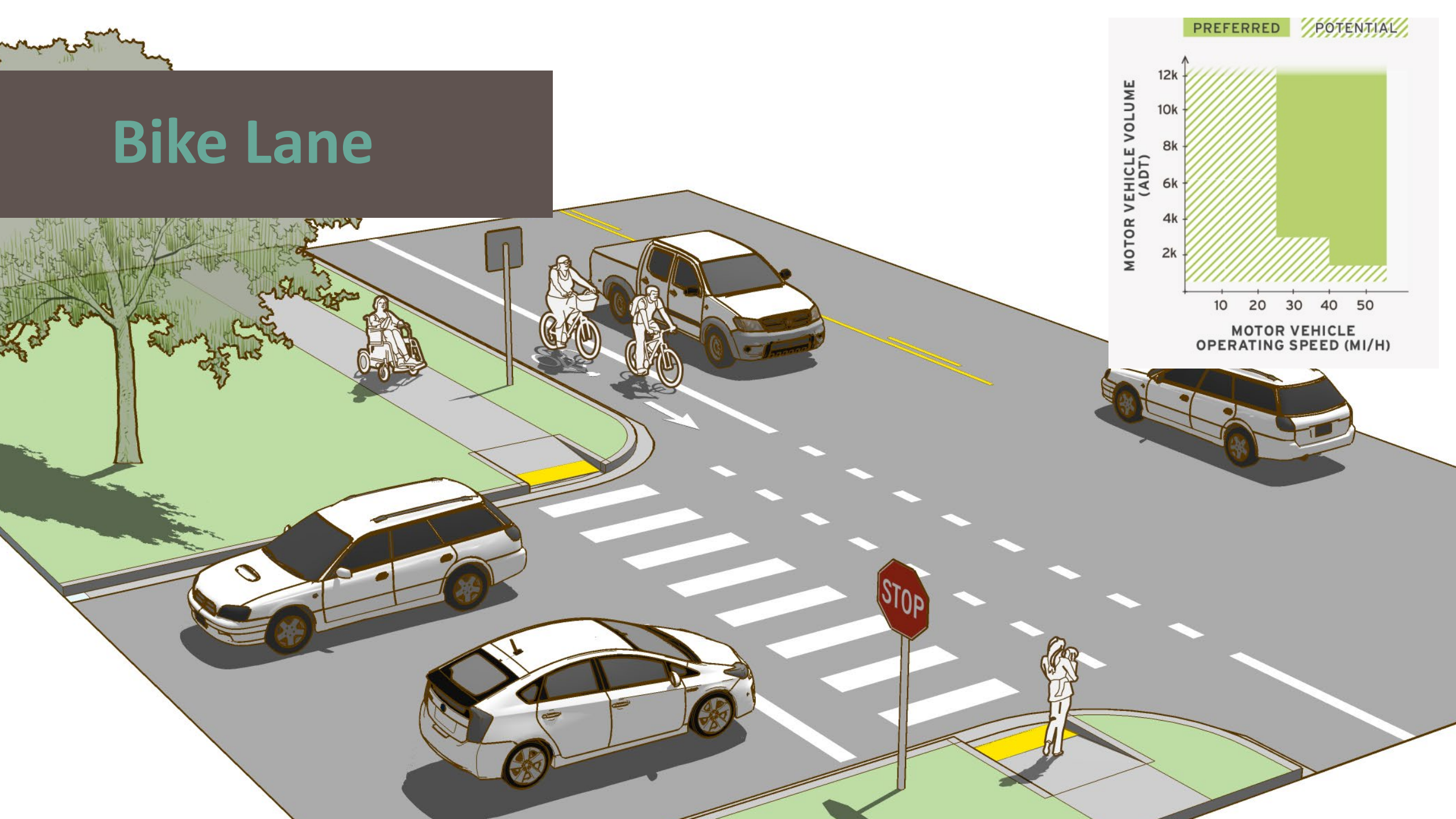


Townsend, MT

ZIPPS TIRES
BROADWATER CNTY
SEPT
AVG PRECIP: .04"
AVG TEMP: 65
35
HELENA
Natural Front

Townsend, MT

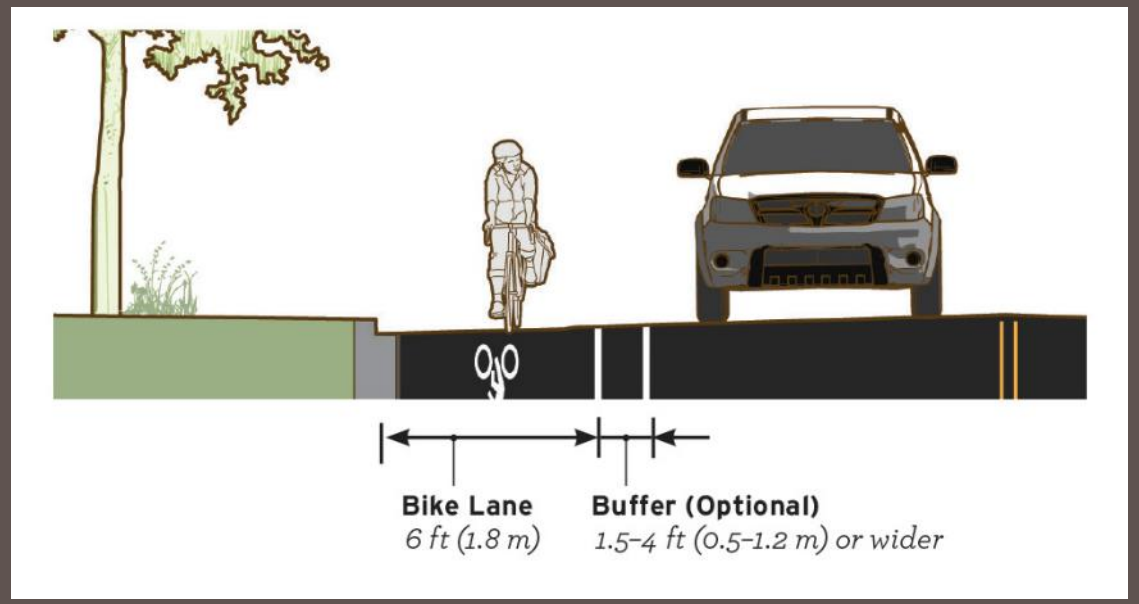
Bike Lane


PREFERRED
POTENTIAL
MOTOR VEHICLE VOLUME (ADT)
12k
10k
8k
6k
4k
2k
10
20
30
40
50
MOTOR VEHICLE OPERATING SPEED (MI/H)
STOP

Bike Lane - Geometric Design

<u>Bike Lane</u>

- The preferred minimum width of a bike lane is 6.5 ft (2.0 m).
- Absolute minimum bike lane width is 4 ft (1.2 m) when no curb and gutter is present or 5 ft (1.5 m) when adjacent to a curbface, guardrail, other vertical surface or on-street parking stalls (AASHTO Bike Guide 2012).



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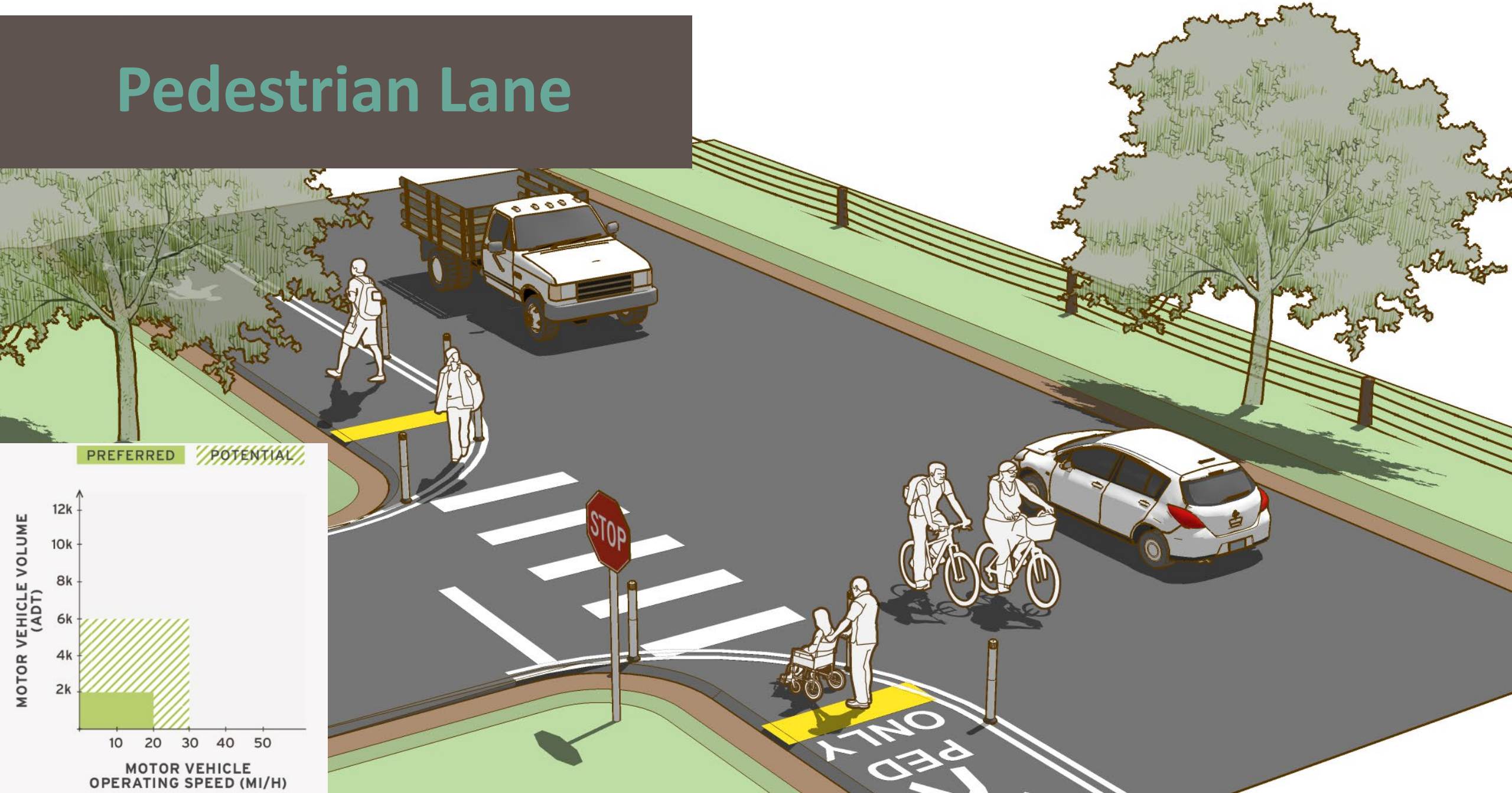
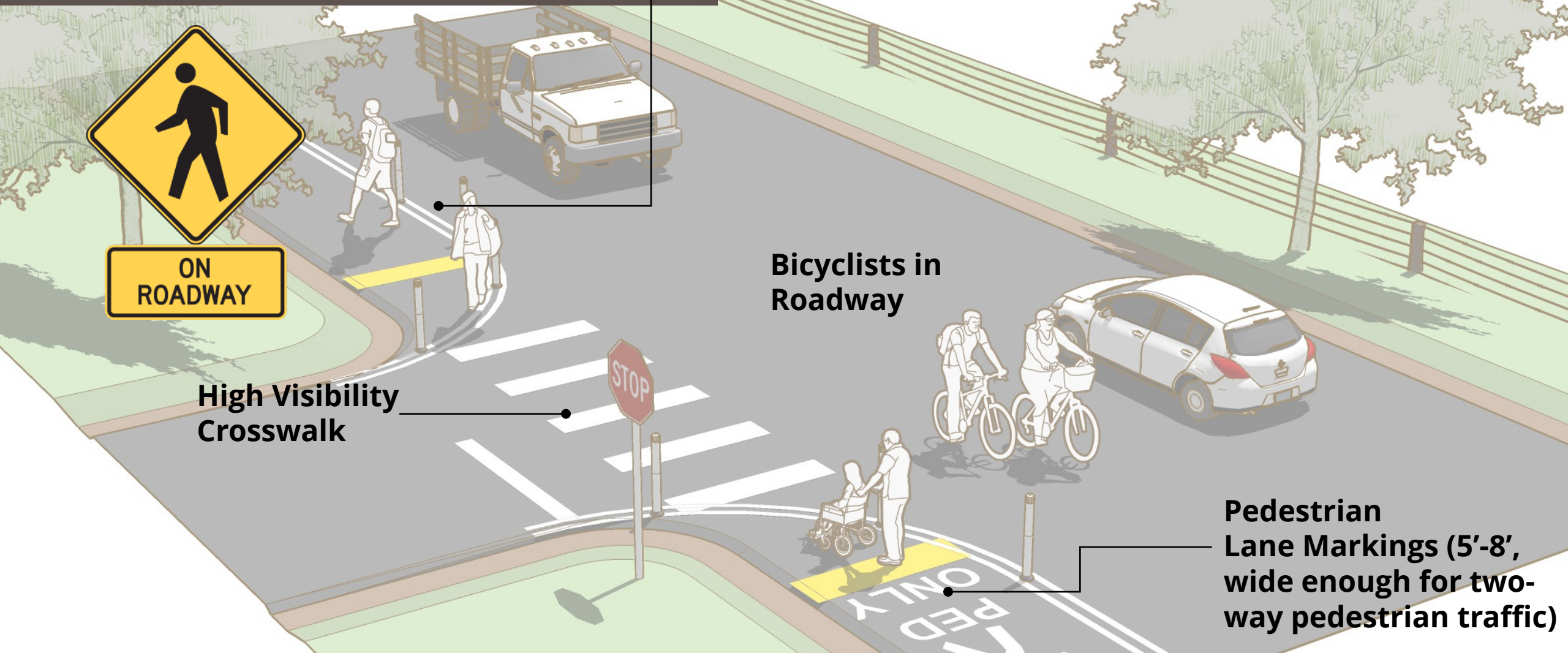
Dover NH

Pedestrian Lane



Pedestrian Lane



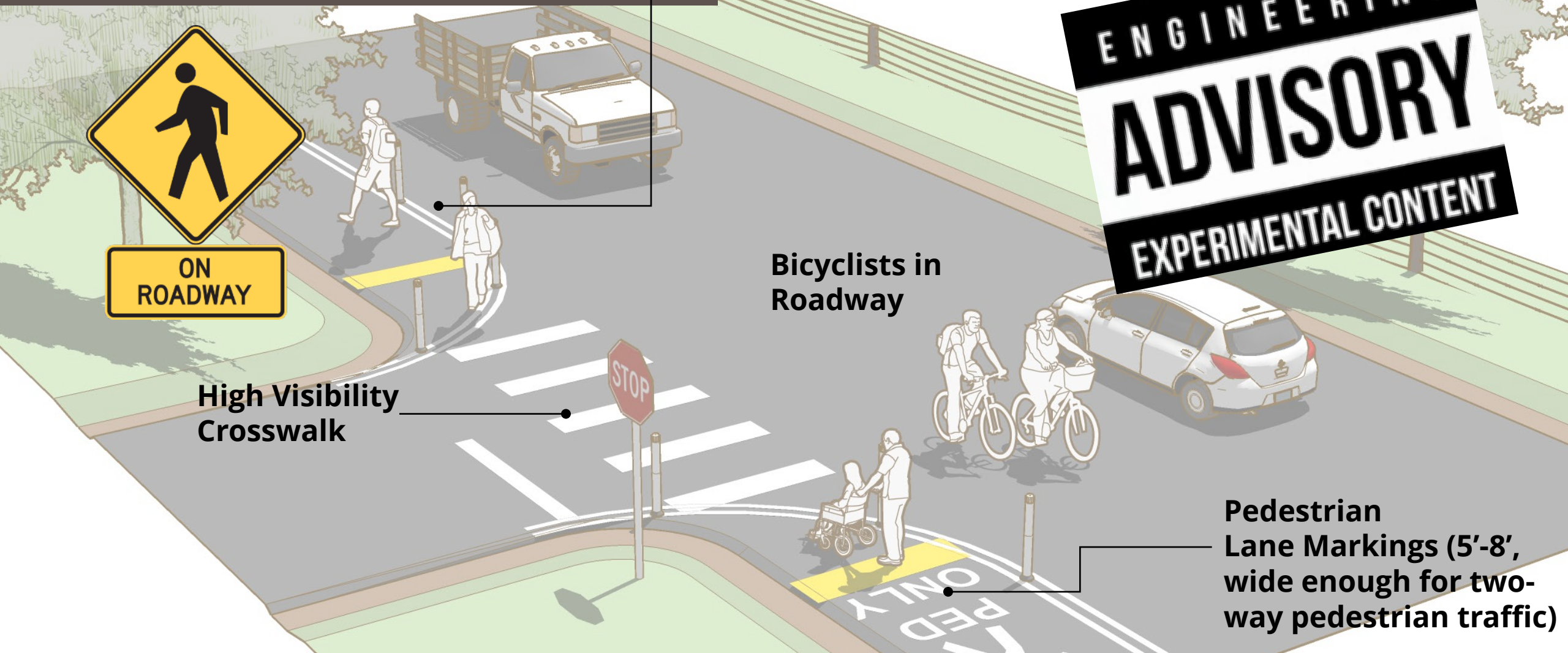
Double Solid Line

Bicyclists in Roadway

High Visibility Crosswalk

Pedestrian Lane Markings (5’-8’, wide enough for two-way pedestrian traffic)

Pedestrian Lane



Double Solid Line

Bicyclists in Roadway

High Visibility Crosswalk

Pedestrian Lane Markings (5'-8', wide enough for two-way pedestrian traffic)

ENGINEERING ADVISORY
EXPERIMENTAL CONTENT

Pedestrian Lane

As part of the planning process, agencies should explore issues and the potential challenges a pedestrian lane may face, including:

- Detectability by people with vision disabilities
- Undesired use by bicyclists
- Accessible cross-slope requirements
- Maintenance strategies, such as sweeping and snow removal

Waco, TX

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Seattle, WA

3. Physically Separated

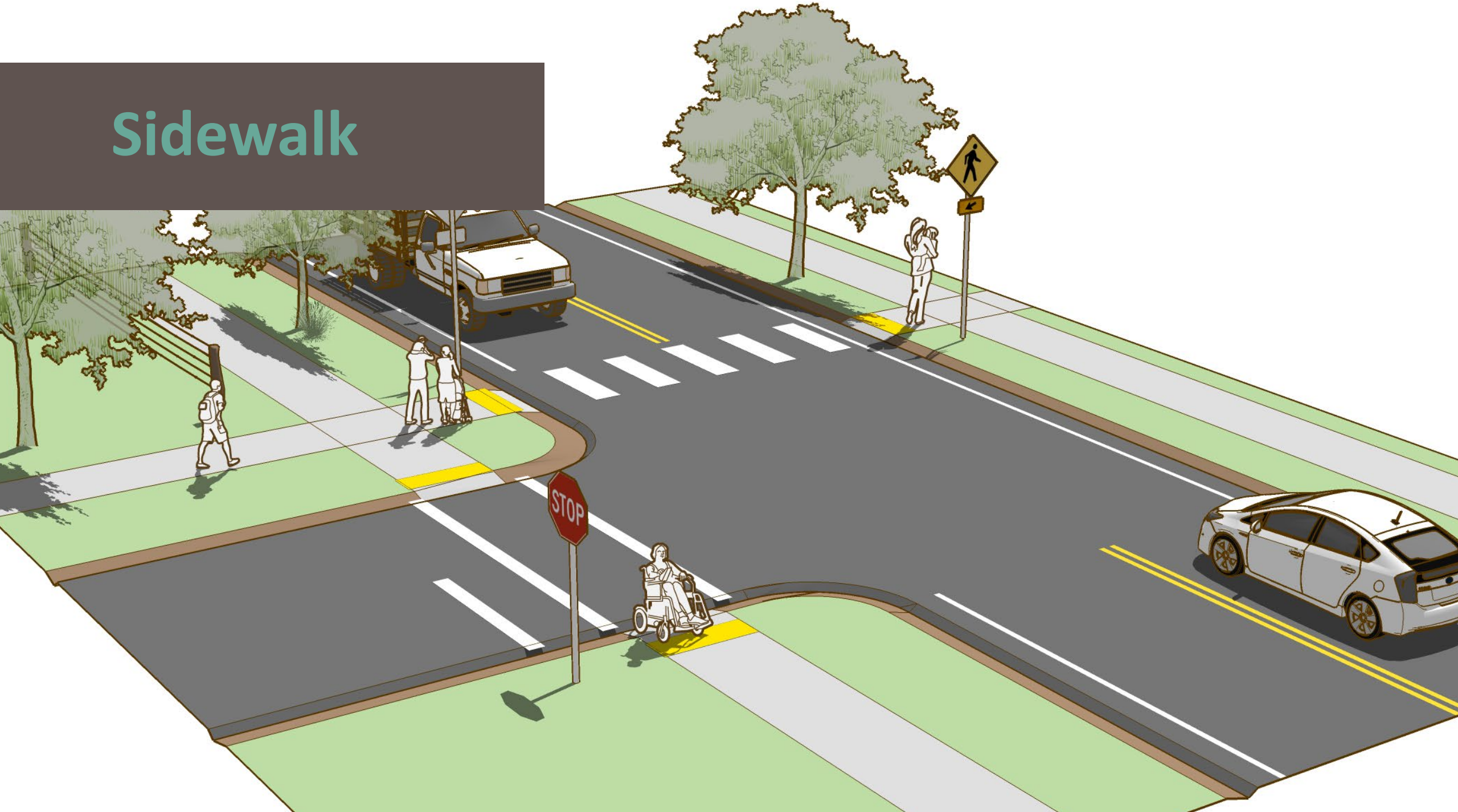
Shared Use Path

Sidepath

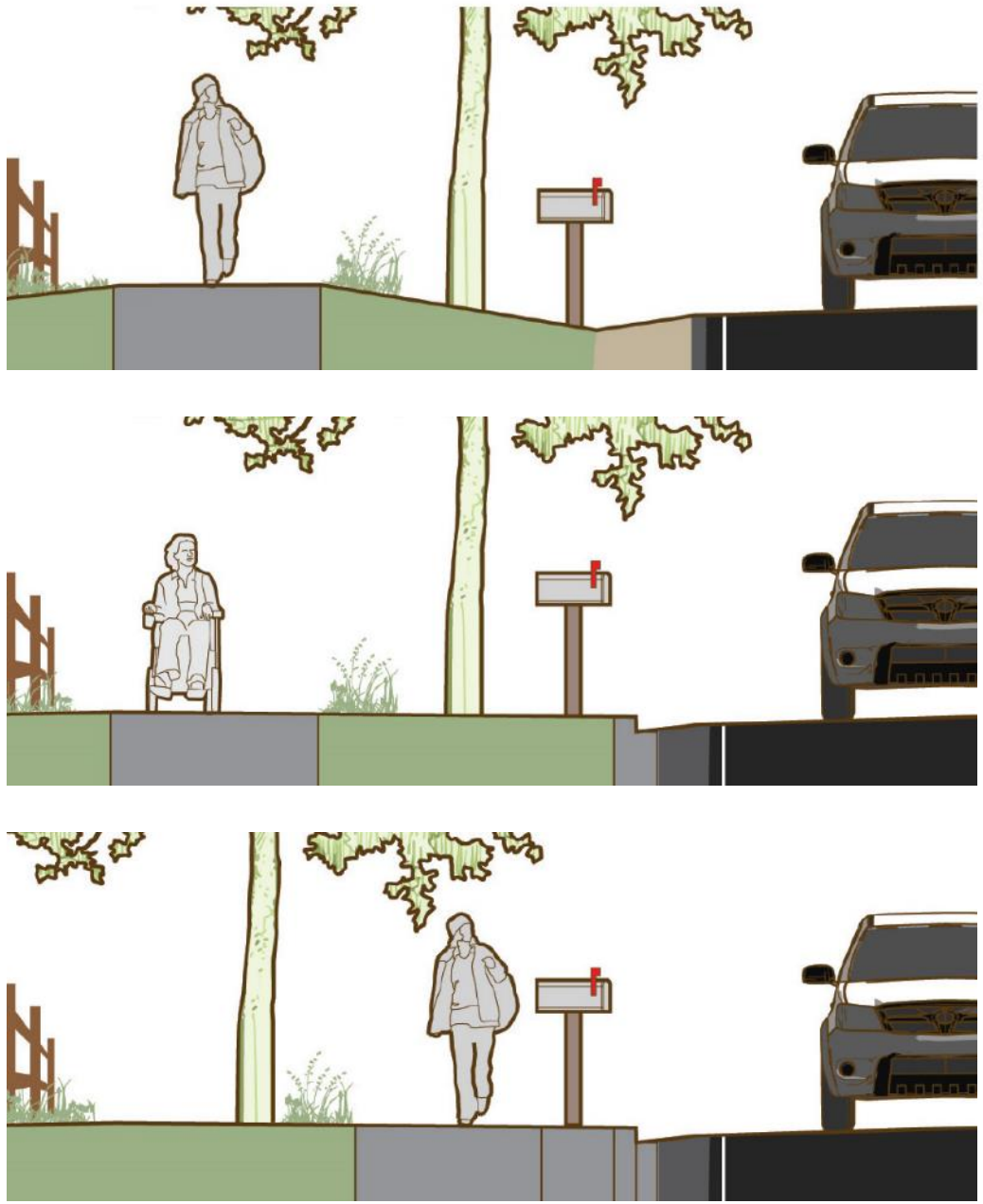
Sidewalks

Separated Bike Lanes

Sidewalk



Sidewalk – Geometric Design



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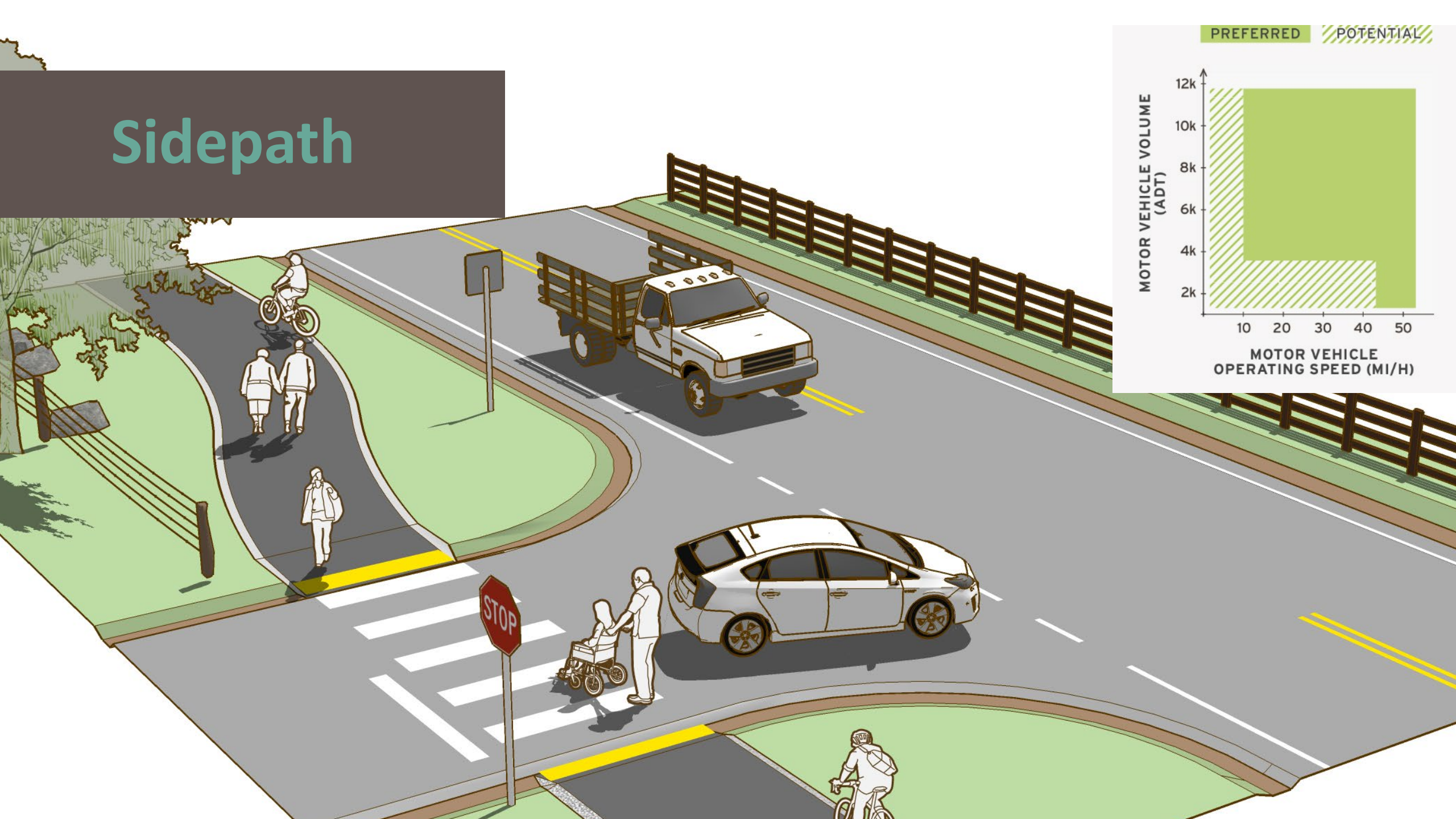
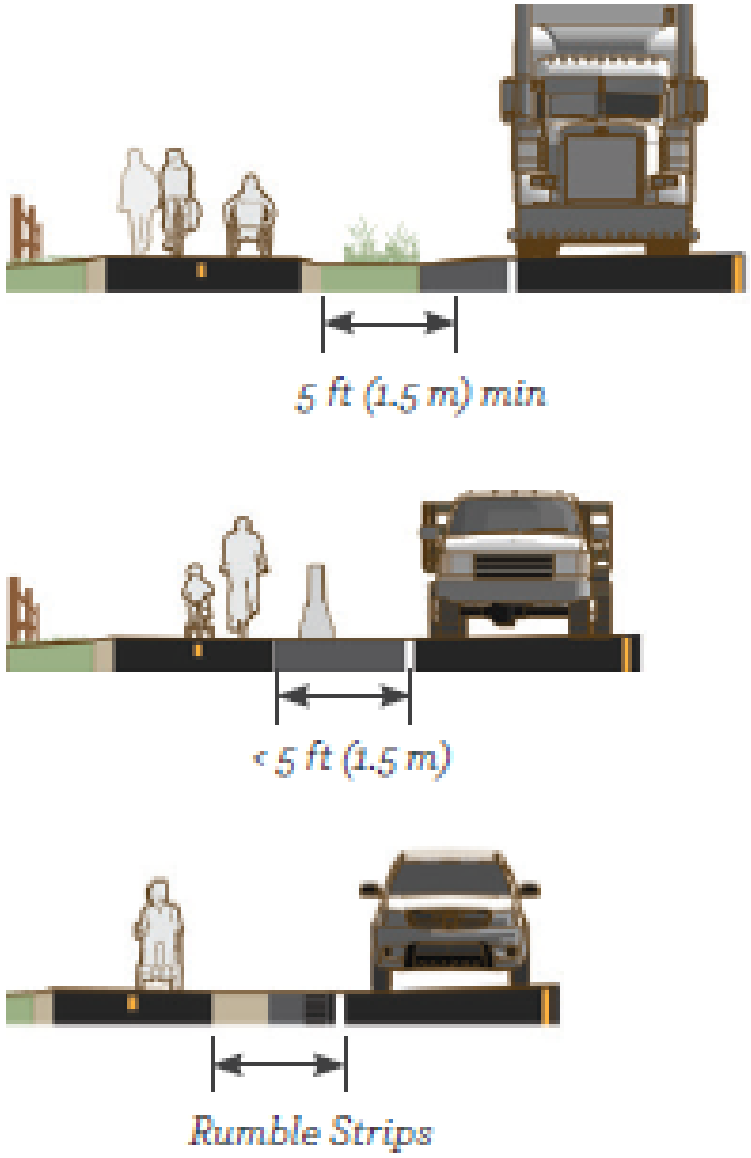
Sidepath


STOP
PREFERRED
POTENTIAL
MOTOR VEHICLE VOLUME (ADT)
12k
10k
8k
6k
4k
2k
10
20
30
40
50
MOTOR VEHICLE OPERATING SPEED (MI/H)

Sidepath – Geometric Design Options

Sidepath

- Minimum recommended pathway width is 10 ft (3.0 m).
- In low-volume situations and constrained conditions, the absolute minimum sidepath width is 8 ft (2.4 m)
- Provide a minimum of 2 ft (0.6 m) clearance to signposts or vertical elements.



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Litchfield NH

Laporte, CO
Google Earth
© 2016 Google

Laporte, CO
Google Earth
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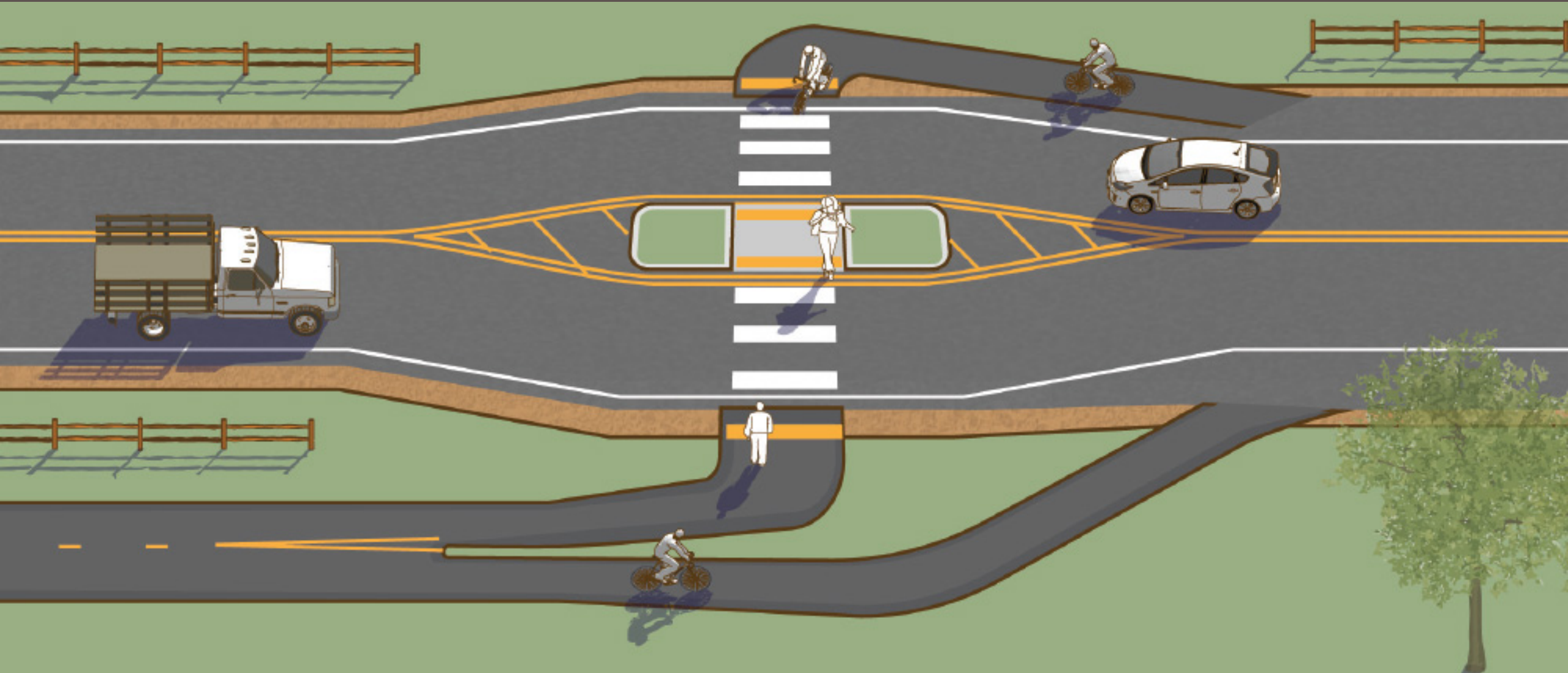
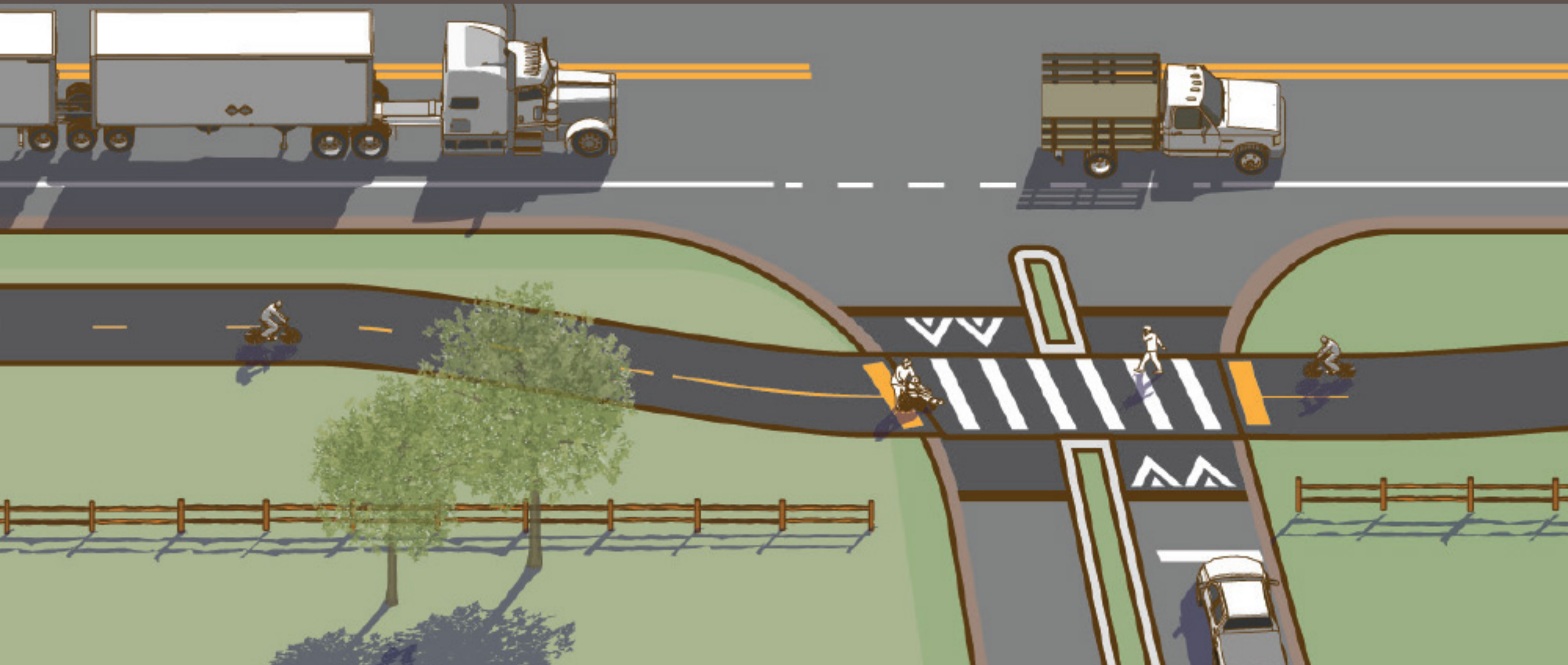
Sidepath - Transitions



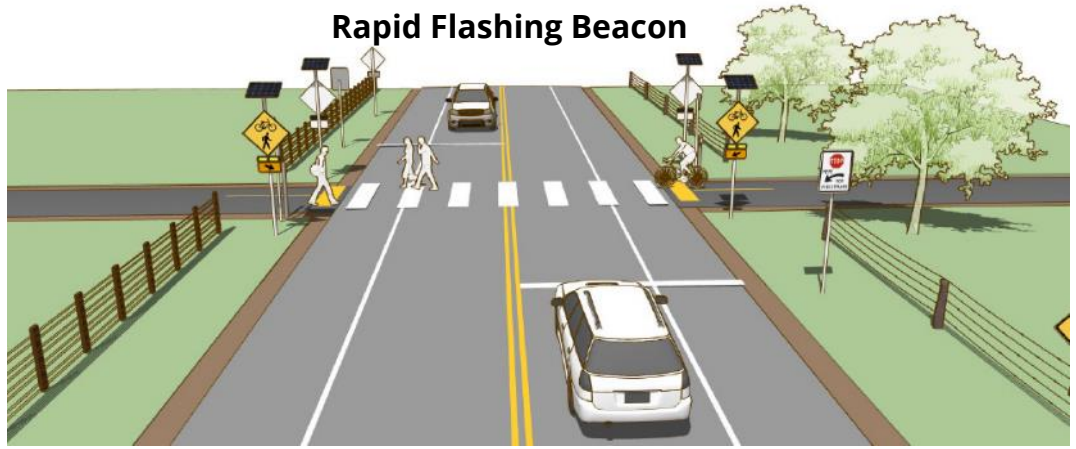
Sidepath - Intersections



Sidepath/Shared Use Path – Intersections

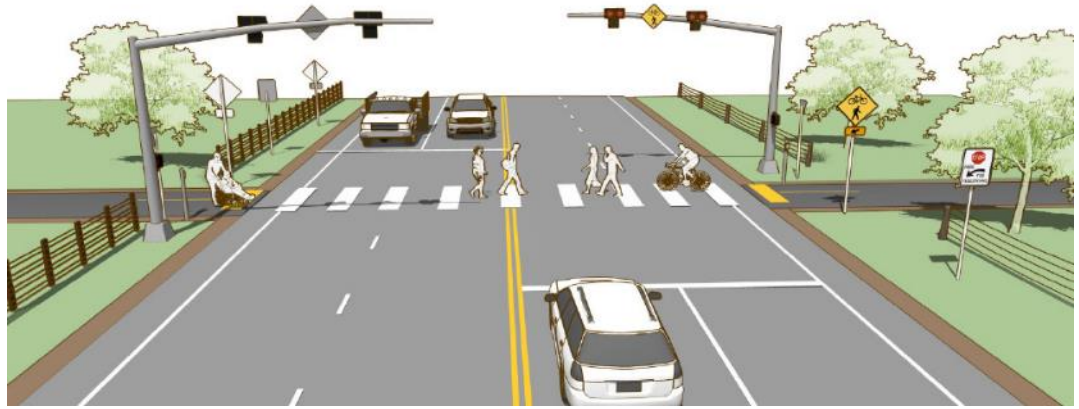
Marked Crosswalk

Rapid Flashing Beacon

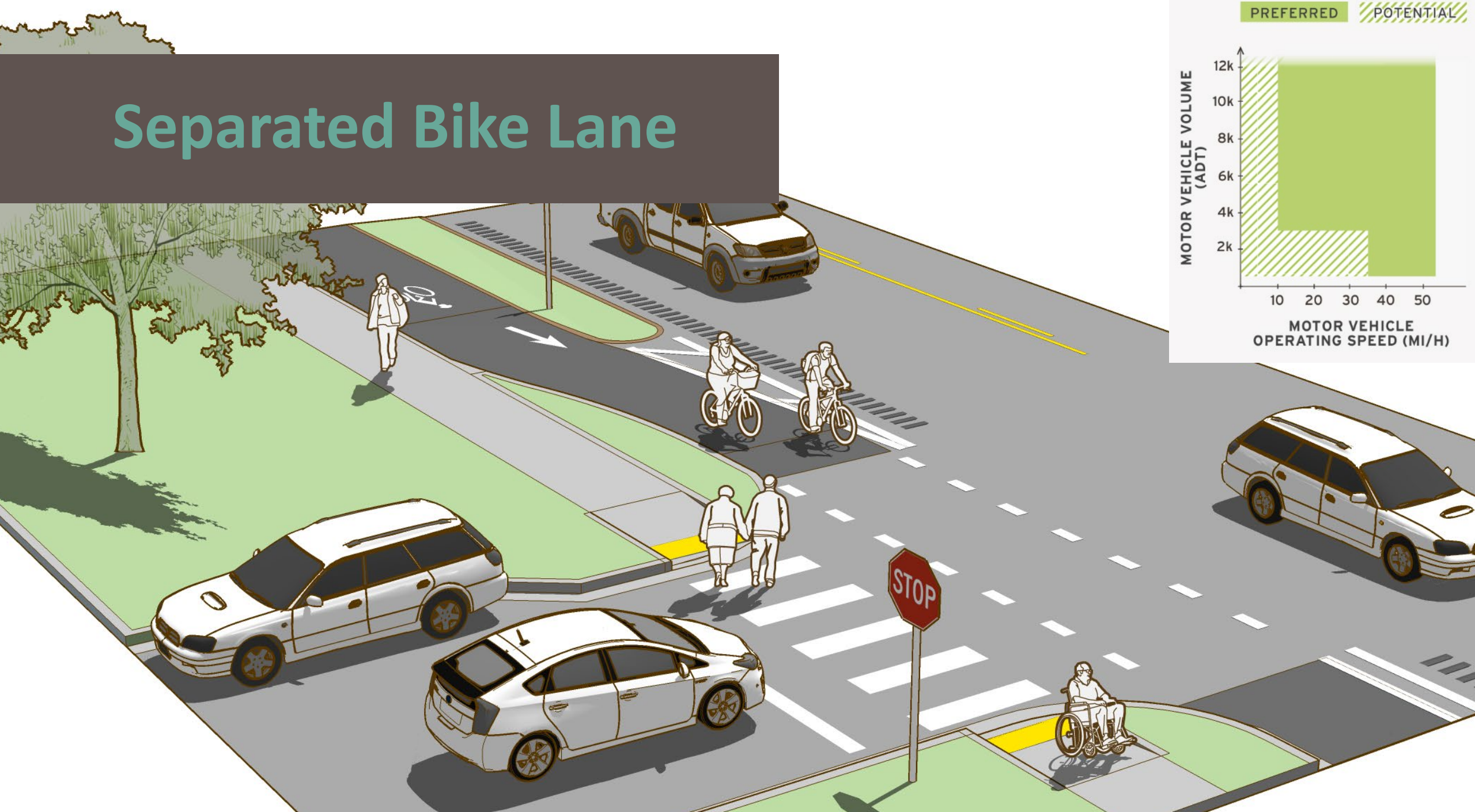


Median Safety Island

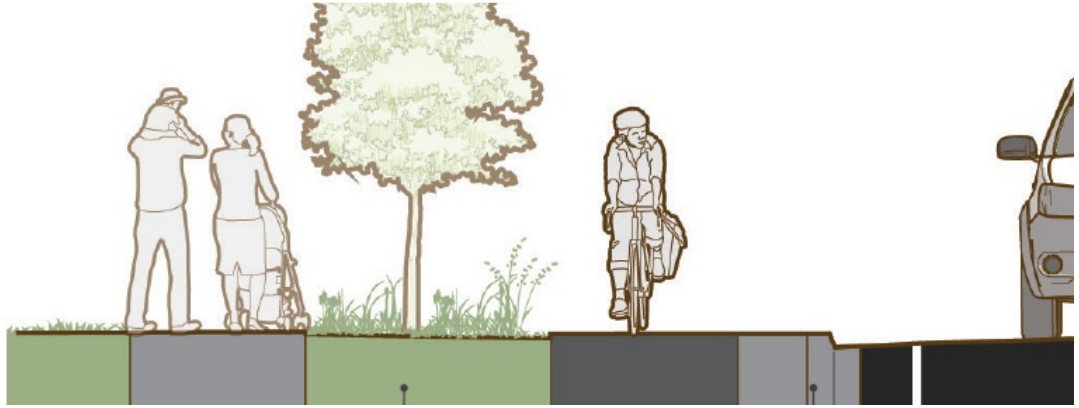
Pedestrian Hybrid Beacon

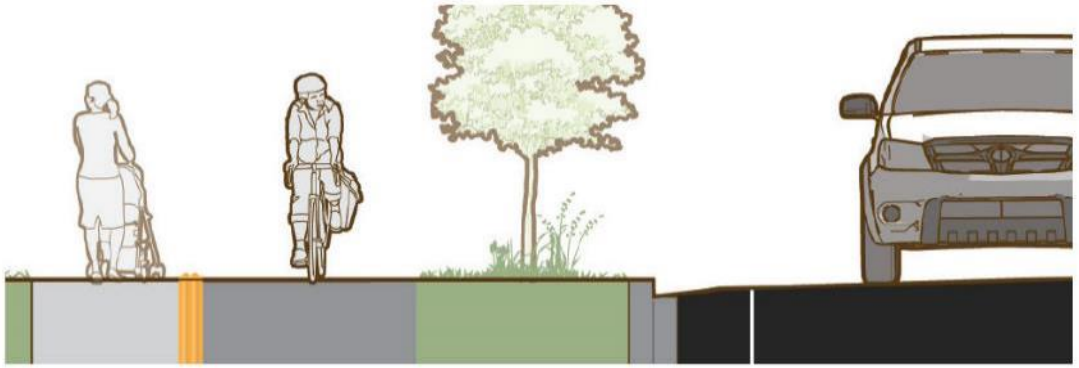


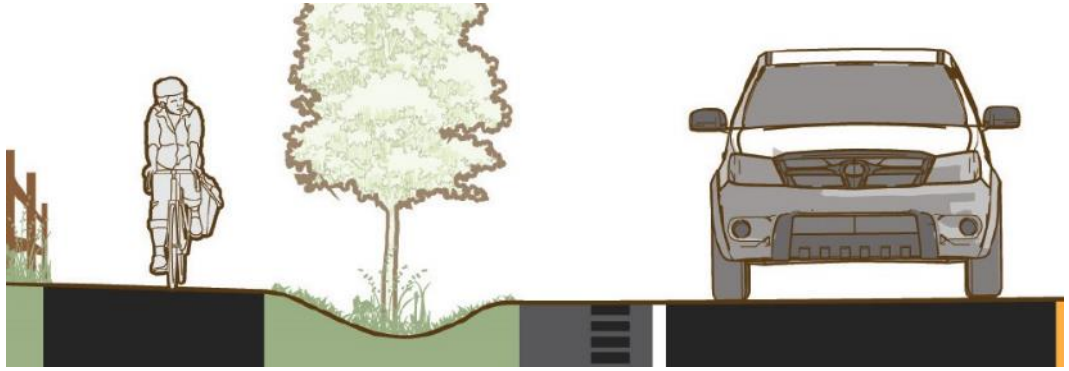
Separated Bike Lane

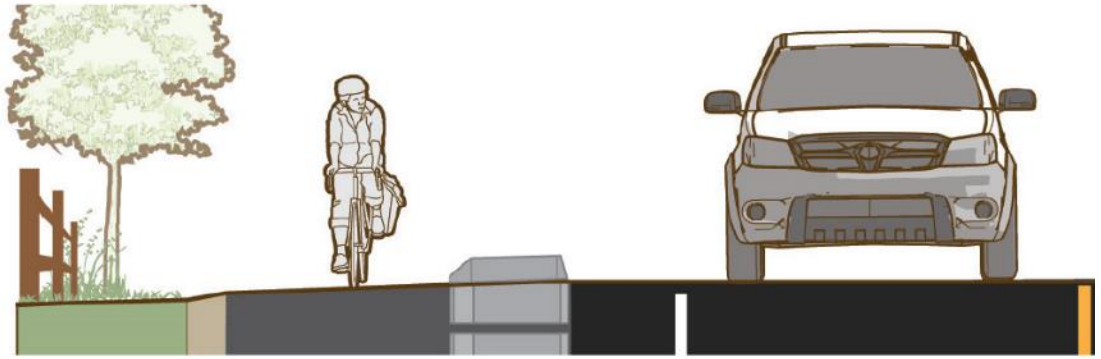


Separated Bike Lane – Geometric Design









Separated Bike Lane – Intersections

Bend In

- Position bicyclists closer to turning vehicles to increase visibility prior to the turn.

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PLANNING + DESIGN

Separated Bike Lane – Intersections

Bend Out

- **Provide space for right-turning vehicles to yield to bicyclists.**

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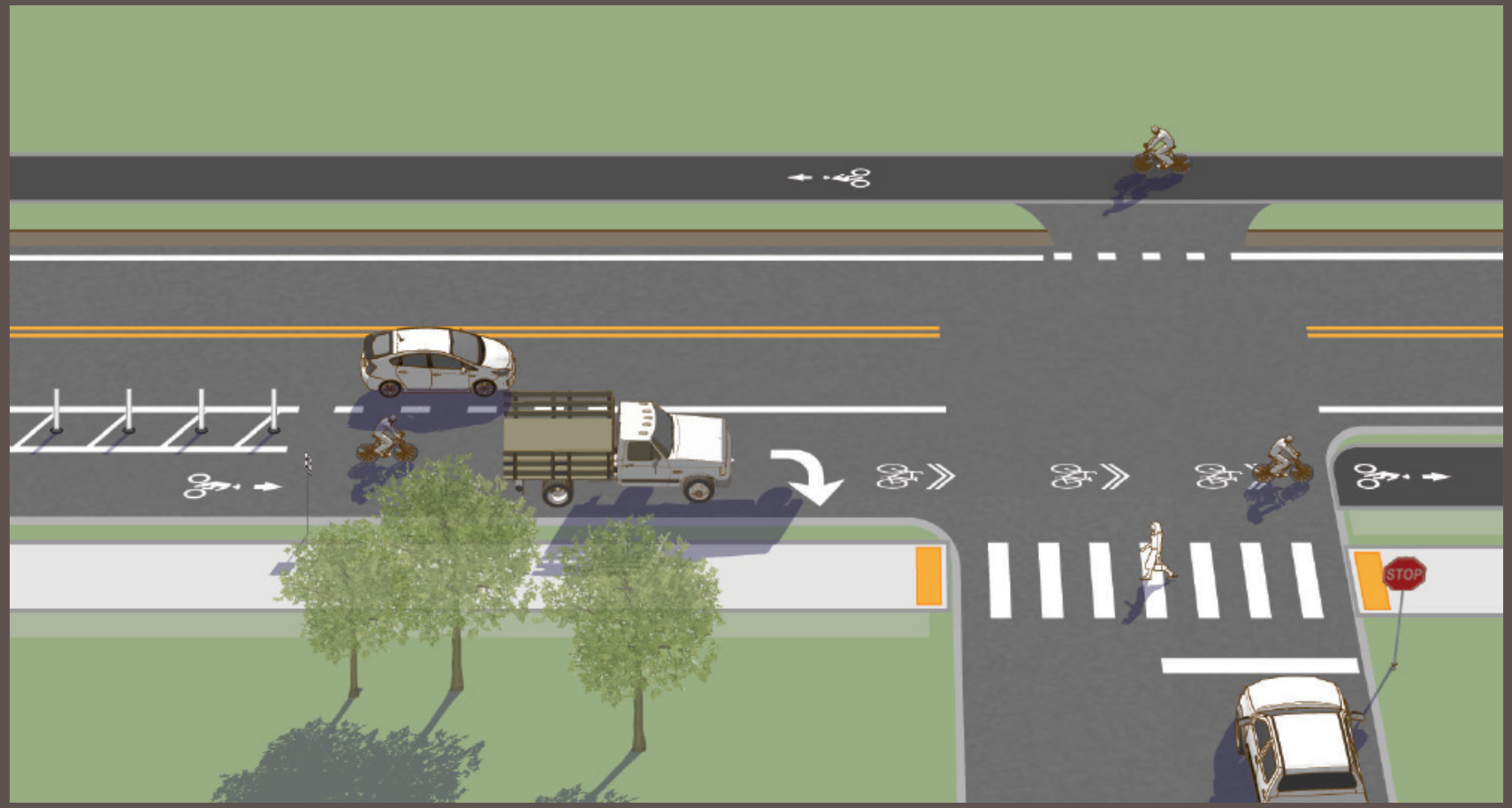
Separated Bike Lane – Intersections

Mixing Zone

- Shared turn lane with motor vehicles and bicyclists. Shared turn lane with motor vehicles and bicyclists.



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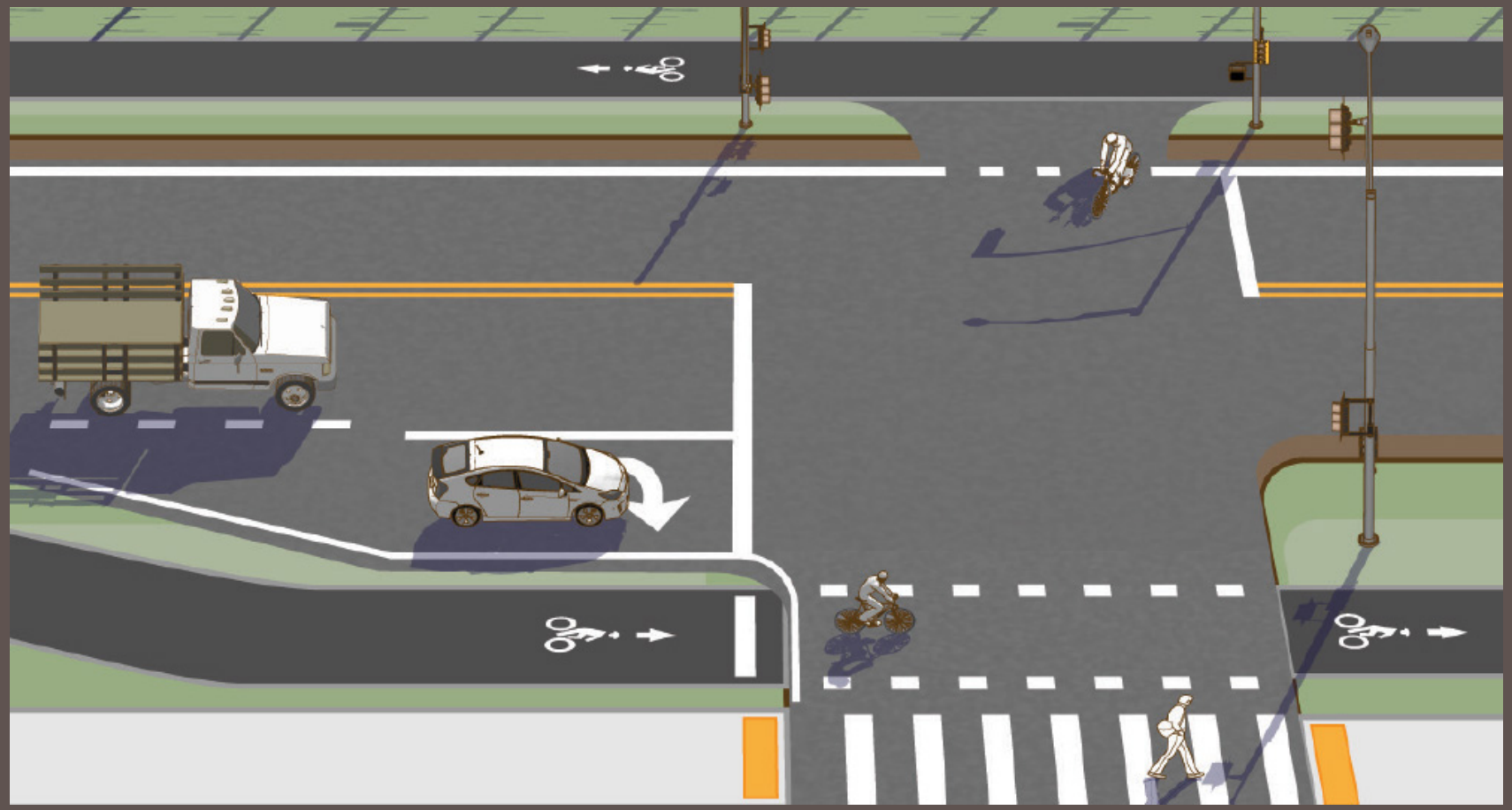
Separated Bike Lane – Intersections

<u>Protected Signal Phase</u>

- **Separate conflicting movements in time.**



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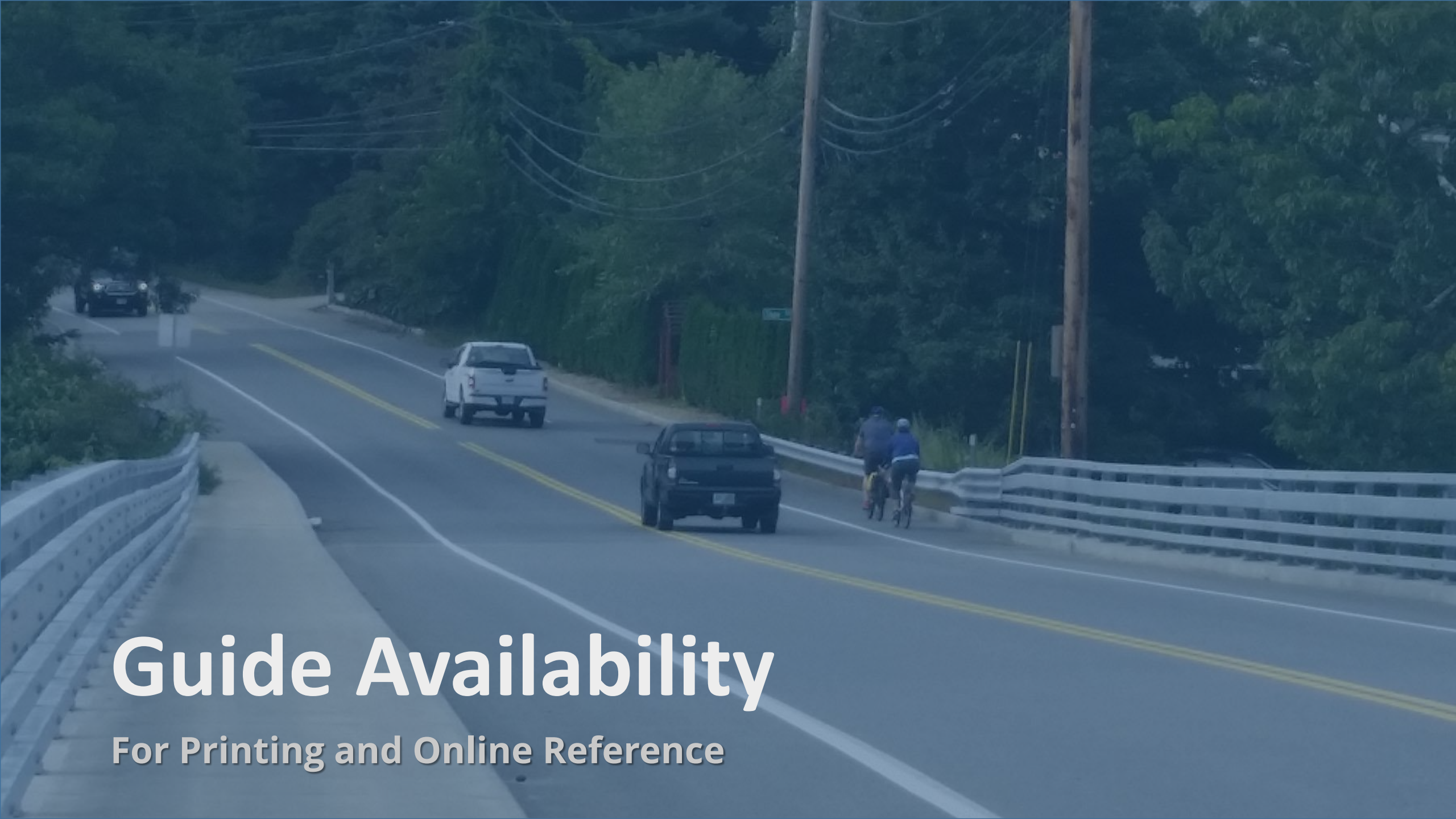
Jackson Hole,



Guide Availability

For Printing and Online Reference

FHWA Publication Distribution

PDF Download:

- **https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/**

Publication No: FHWA-HEP-17-024

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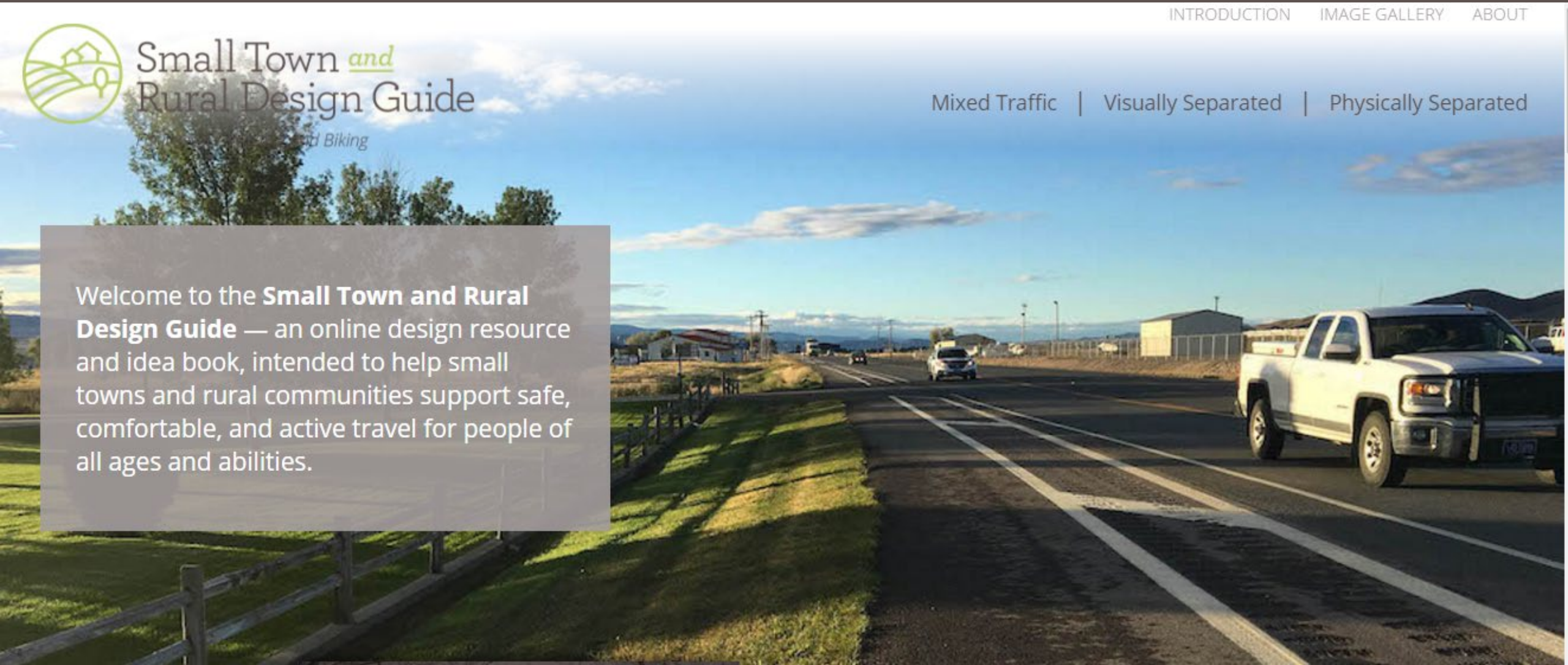


Small Town and Rural Design Guide

Facilities for Walking and Biking

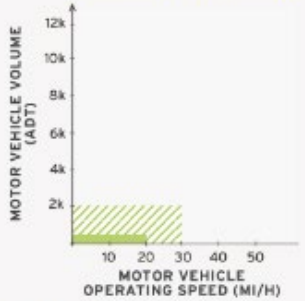
MIXED TRAFFIC

Yield Roadway

A **yield roadway** is designed to serve pedestrians, bicyclists, and motor vehicle traffic in the same slow-speed travel area. Yield roadways serve bidirectional motor vehicle traffic without lane markings in the roadway travel area.

APPLICATION

PREFERRED POTENTIAL



Speed and Volume
Most appropriate on streets with low volumes and low speed.

Network
Local residential roadways. Not for through motor vehicle travel.

Land Use
Within built up areas, particularly near residential land uses where most traffic is familiar with prevailing road conditions.

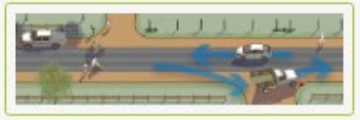
Geometric Design

Two-Way Travel Lane

The paved two-way travel lane should be narrow to encourage slow travel speeds and require courtesy yielding when vehicles traveling in opposite directions meet.

- Total traveled way width may vary from 12 ft (3.6 m)–20 ft (6.0 m).
- Traveled way width below 15 ft (4.5 m) or below function as a two-way singlelane roadway and should follow the guidance of the **AASHTO Low Volume Roads 2001**.
- When width is 15 ft (4.5 m) or narrower, **provide pull-out areas every 200–300 ft** to allow for infrequent meeting and passing events between motor vehicles. Pull-out areas may be established in the parking lane or roadside area.
- Access for emergency vehicles should be provided. There is no single fire code standard for local roads; however, a range of clear widths for parking and deploying fire department apparatus is between 16–20 ft (5.0–6.0 m). Designers should provide an opening of this width every 200–300 ft (600–91 m).

Figure 2-2. *A travel area width of 16–18 ft (4.8–5.5 m) is appropriate for low volumes of twoway traffic and may require slowing when vehicles traveling in opposite directions meet. A travel area of 12–15 ft (3.6–4.5 m) is too narrow for two motor vehicles to pass, and one vehicle may need to pull into a parking lane, pull-out, or driveway area to let the other proceed.*



Roadside

If desired, parking may be located on the paved roadway surface or on gravel or soil shoulders outside of the paved roadway. The parking lane may also serve as a pull-out area while yielding.

- When possible, the parking lane should be constructed with a contrasting material to differentiate the lane from the travel area. Bituminous, crushed stone, gravel, and turf shoulders can be used as contrasting materials to the travel area (**AASHTO Green Book 2011, p. 4-13**).
- Trees may be planted within the roadside area at regular intervals to visually and physically narrow the corridor, add to the aesthetic environment, and encourage slow speeds.

Markings

No markings are necessary to implement a yield roadway.

- Do not mark a center line within the travel area. The single two-way lane introduces helpful traffic friction and ambiguity, contributing to a slowspeed operating environment.

Signs

Use signs to warn road users of the special characteristics of the street. Potential signs include:

- A PEDESTRIAN (W11-2) warning sign with ON ROADWAY legend plaque. See Figure 2-3.
  - Use a Two-Way Traffic warning sign (W6-3) to clarify two-way operation of the road if any confusion exists. See Figure 2-3.

W11-2

W6-3

Figure 2-3. *Pair a W11-1, W11-2, or W11-15 warning sign with a custom legend plaque to inform road users that shared use by pedestrians and/or bicyclists might occur.*

Intersections

At uncontrolled crossings of local streets, no special treatment is necessary. The additional space within the intersection area offers queuing opportunities when vehicles traveling in opposite directions meet.

- Consider parking prohibitions of 20–50 ft (6.0–15.0 m) in advance of intersections. This is particularly helpful to accommodate large vehicle turning movements.
- Provide adequate stopping sight distance around curves and at uncontrolled intersections. Values of stopping sight distance for two-way single-lane roads should be twice the stopping sight distance for a comparable two-lane road.

Implementation

In rural communities with a disconnected street network, local streets are the only viable connection to a scene of an emergency. Implementing agencies should work closely with emergency response stakeholders.

Sisters, OR – *Population 2,170*
Western Transportation Institute

Accessibility

Yield roadways allow motor vehicles, bicyclists, and pedestrians to share the same space. On very low-volume and low-speed streets, pedestrians and bicyclists may be comfortable using the roadway with the occasional vehicle. If this facility is intended for use by pedestrians, it must meet accessibility guidelines for walkways.

Ennis, MT – *Population 850*
Western Transportation Institute

YIELD ROADWAY CASE STUDY

Manzanita, Oregon

The residents of Manzanita cherish their small town and have outlined ways to maintain this character. One of the goals identified in the town's Comprehensive Plan is "to maintain and create residential living areas which are safe and convenient, which make a positive contribution to the quality of life, and which are harmonious with the coastal environment." Toward this end they have a network of local streets that create peaceful conditions for people walking, bicycling, and driving.

In addition, there is a recognition that even on collector streets bicycle and pedestrian travel should be safe. The plan states that "Sufficient pavement width should be included on all major streets or roads to accommodate bicycle traffic."

Where a visually or physically separated facility is not provided, speeds will be slowed to create bicycle-friendly conditions. The plan states, "Efforts to reduce speeding on Laneda Avenue should be carried out by the city. This should take the form of maintaining a low speed (20 Mi/h), requesting that the City police and Tillamook County Sheriff's Department maintain a high level of enforcement and installing appropriate warning signs." Efforts such as these enable Manzanita's local streets to be shared roadways where people driving, walking, and biking can all safely share the street.

Selected Examples

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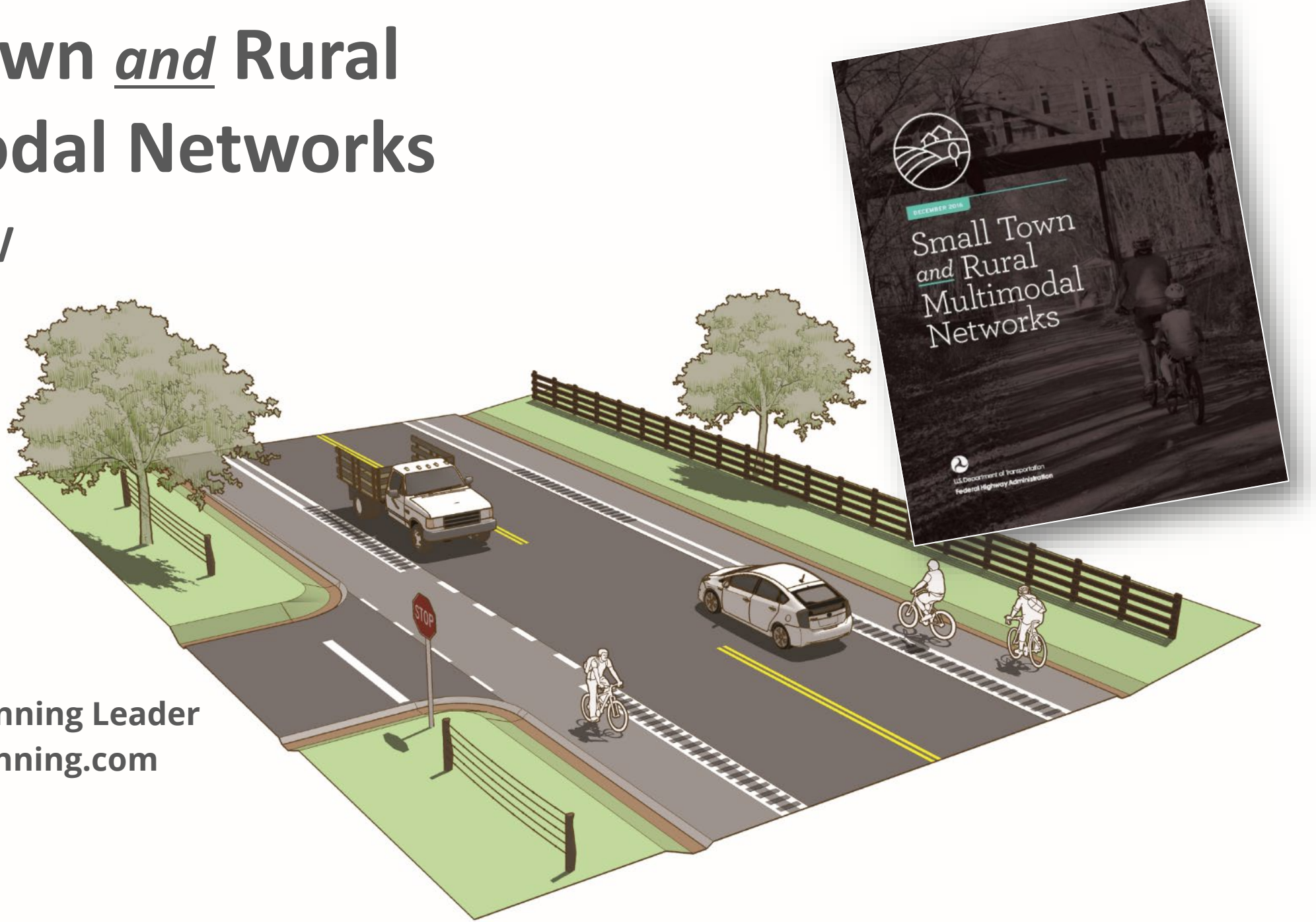
Small Town *and* Rural Multimodal Networks

Overview



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