

**National  
Summit on  
Rural Road  
Safety**

Savannah, GA  
December 6, 2018

# Intersection of Public Health and Transportation



# What we'll cover today:



Rural Health and  
Transportation  
Challenges



Improving Access  
to Health Services



Increasing  
Opportunities for  
Active  
Transportation

# Rural Health and Transportation Challenges

# Challenges in Rural Communities

While rural places vary considerably in geographic scale and character, there are common issues that prevail:

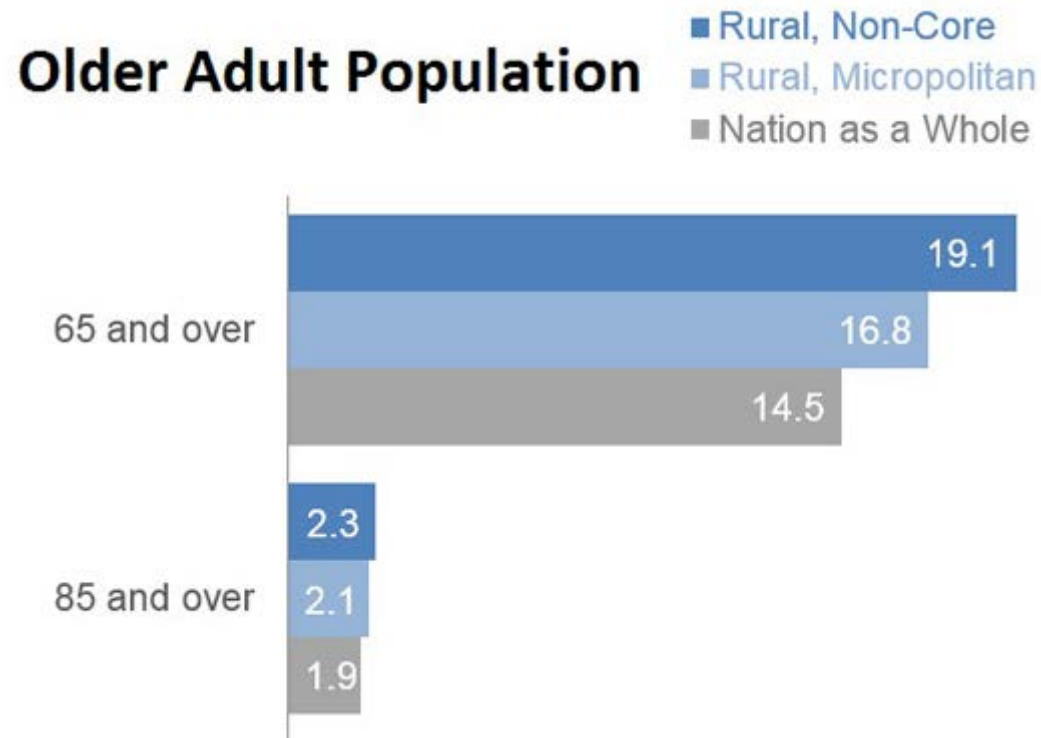
# Health in Rural Communities

- Those living in rural areas are more likely to die from the five leading causes of death than their urban counterparts (CDC) –
  - Heart Disease
  - Cancer
  - Unintentional Injury
  - Chronic Lower Respiratory Disease
  - Stroke
- A higher percentage of these deaths were considered preventable in rural areas than in urban areas



Source: Press Release - Rural Americans at higher risk of death from five leading causes (CDC, 2017)

# Age in Rural Communities



Data above presented as percent of total population in rural non-core areas, rural micropolitan areas, and the nation as a whole

Source: Rural Health Information Hub; Data from American Communities Survey 2012-2016

# Loneliness and Isolation

- Loneliness and isolation is a “predictor of functional decline and death”
- Nearly half of midlife and older adults with annual incomes of less than \$25,000 report being lonely.



Sources: Loneliness and Social Connections: A National Survey of Adults 45 and Older (AARP)  
Loneliness in Older Persons: A predictor of functional decline and death (Perissonoto et al, 2015)

# Dependence on Alternate Modes of Transportation

- “no one walks or bikes here” is a common sentiment
- Not difficult to find evidence of demand for safe and comfortable places to walk and bike
- Many rely on walking, biking and transit out of necessity, even in rural areas





## Funding and Coordination Challenges

- Rural transportation projects (especially those supporting multimodal transportation) don't receive the level of funding they do in urban areas
- Projects can be more complex, with multiple jurisdictions and agencies involved (e.g. County Public Works, Federal Lands, Tribal Governments, etc.)

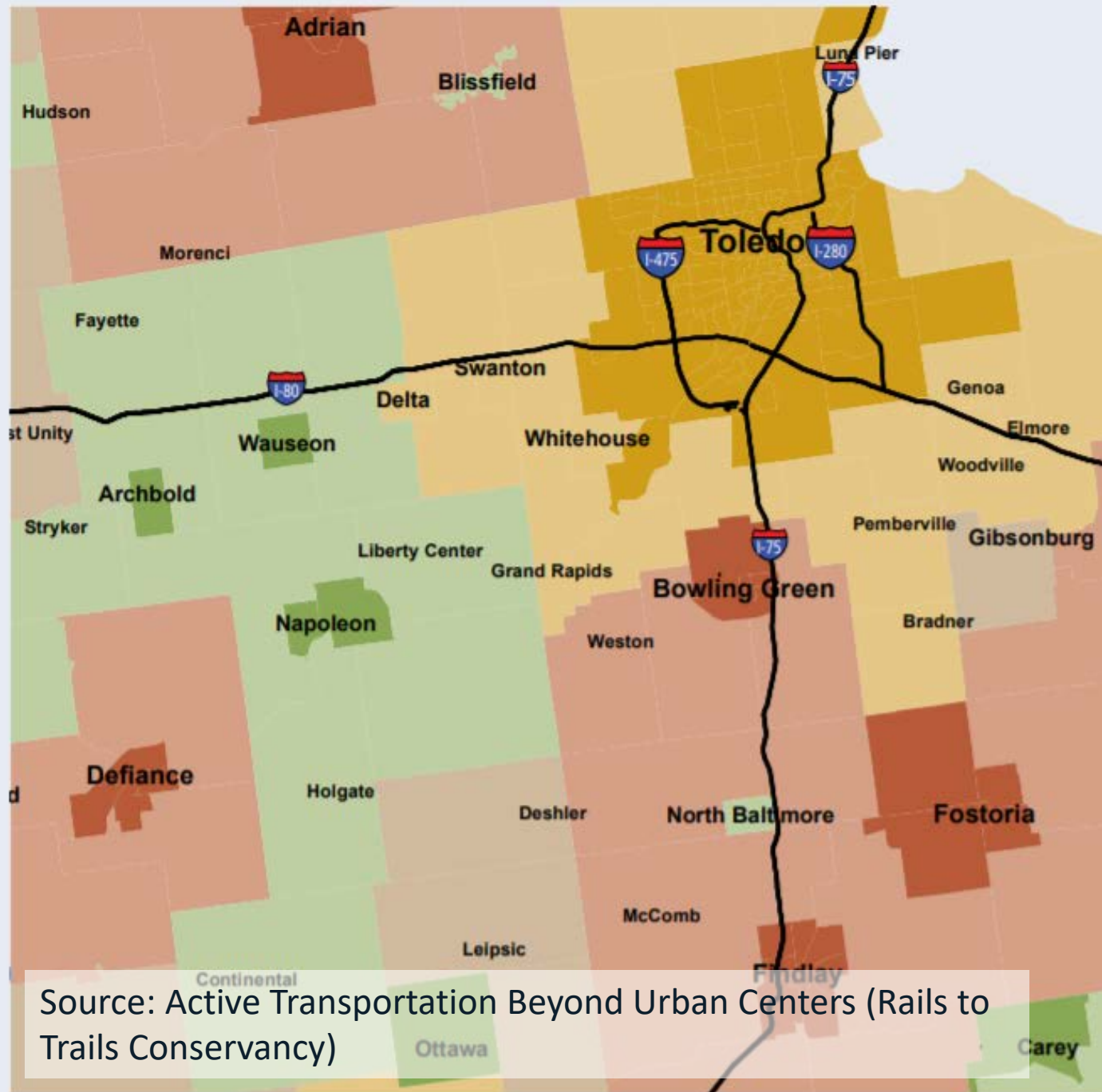


**What health/transportation  
challenges have you  
observed in rural areas?**

# Improving Access to Health Services

# Increasing Opportunities for Active Transportation

# Expanding our Definition of “Rural”



- Large Rural Core** Towns of 10,000 to 50,000, often regional centers.
- Outer Large Rural** Smaller communities from which many people travel to Large Rural Core towns for work, shopping, services or school.
- Small Rural Core** Towns of 2,500 to 10,000, often county seats.
- Outer Small Rural** Smaller communities from which many travel to Small Rural Core towns for work, shopping, services or school.
- Isolated Rural** Communities without strong economic and social links to a town of more than 2,500.

*As a means of comparison, the urban categories in the adapted version of RUCA classifications are as follows:*

- Urban Core** Cities and close-in suburbs of metropolitan regions with a center city of more than 50,000.
- Outer Urban** Outlying suburbs of metropolitan regions with a center city of more than 50,000.

Source: Active Transportation Beyond Urban Centers (Rails to Trails Conservancy)



# Health + Active Transportation

Bicycling and walking are associated with numerous positive health outcomes, such as...



1. Reduced risk of cardiovascular diseases
2. Reduced risk of several types of cancer
3. Reduced risk of Type 2 diabetes
4. Improved mental health
5. Lower medical expenses

# Agencies Are Prioritizing Active Transportation

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## Health and Transportation: Making the Connection

2016 Status Report

Oregon Department of Transportation

Oregon Health Authority Public Health Division







## Environment Influences Travel Behavior

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- Research demonstrates that the following environmental characteristics are associated with levels of active transportation:
  - High density of street networks
  - Network connectivity
  - Street configuration and design
- These environmental characteristics are linked with positive health outcomes

# Opportunities in Rural Communities

Though in many rural communities, residents live long distances from services, most small towns provide a compact center well-suited for walking and bicycling trips.



1 MILE WALK = 20 MINUTES (3 MPH)

1 MILE BIKE RIDE = 6 MINUTES (10 MPH)



**Allendale, SC**  
Population 3,328



**Palmer, AK**  
Population 6,250



**Rushford, MN**  
Population 2,102



**Ukiah, CA**  
Population 15,956

Source: Small Town and Rural Multimodal Networks Guide, FHWA

# Demand for Biking/Walking Facilities

- Smaller towns and villages are seeing tourist and economic interest in downtown areas, and are seeing more walking and bicycling as a result
- Looking for strategies to improve connections for bicycling and walking, as well as safety measures



## Report from Rails-to-trails Conservancy

- Shares case examples from rural communities and small towns
- Dispels common myths about active transportation in rural communities

## Active Transportation Beyond Urban Centers



Walking and Bicycling in Small Towns and Rural America

So how do we expand  
opportunities for bicycling  
and walking in rural  
communities?

# Focus on Networks

## **COHESION**

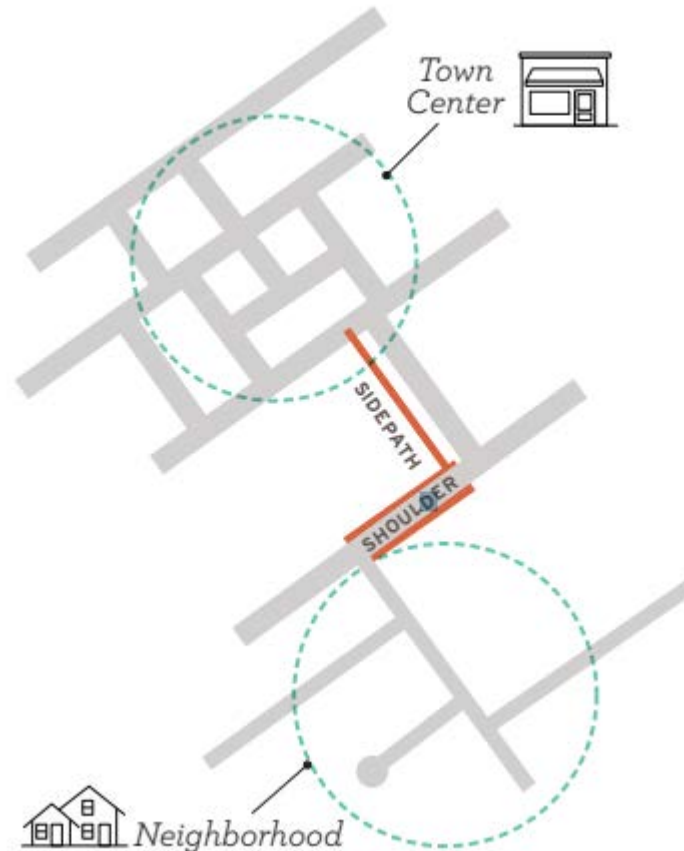
How connected is the network in terms of its concentration of destinations and routes?

## **DIRECTNESS**

Does the network provide direct and convenient access to destinations?

## **ACCESSIBILITY**

How well does the network accommodate travel for all users, regardless of age, income level, or ability?



## **ALTERNATIVES**

Are there a number of different route choices available within the network?

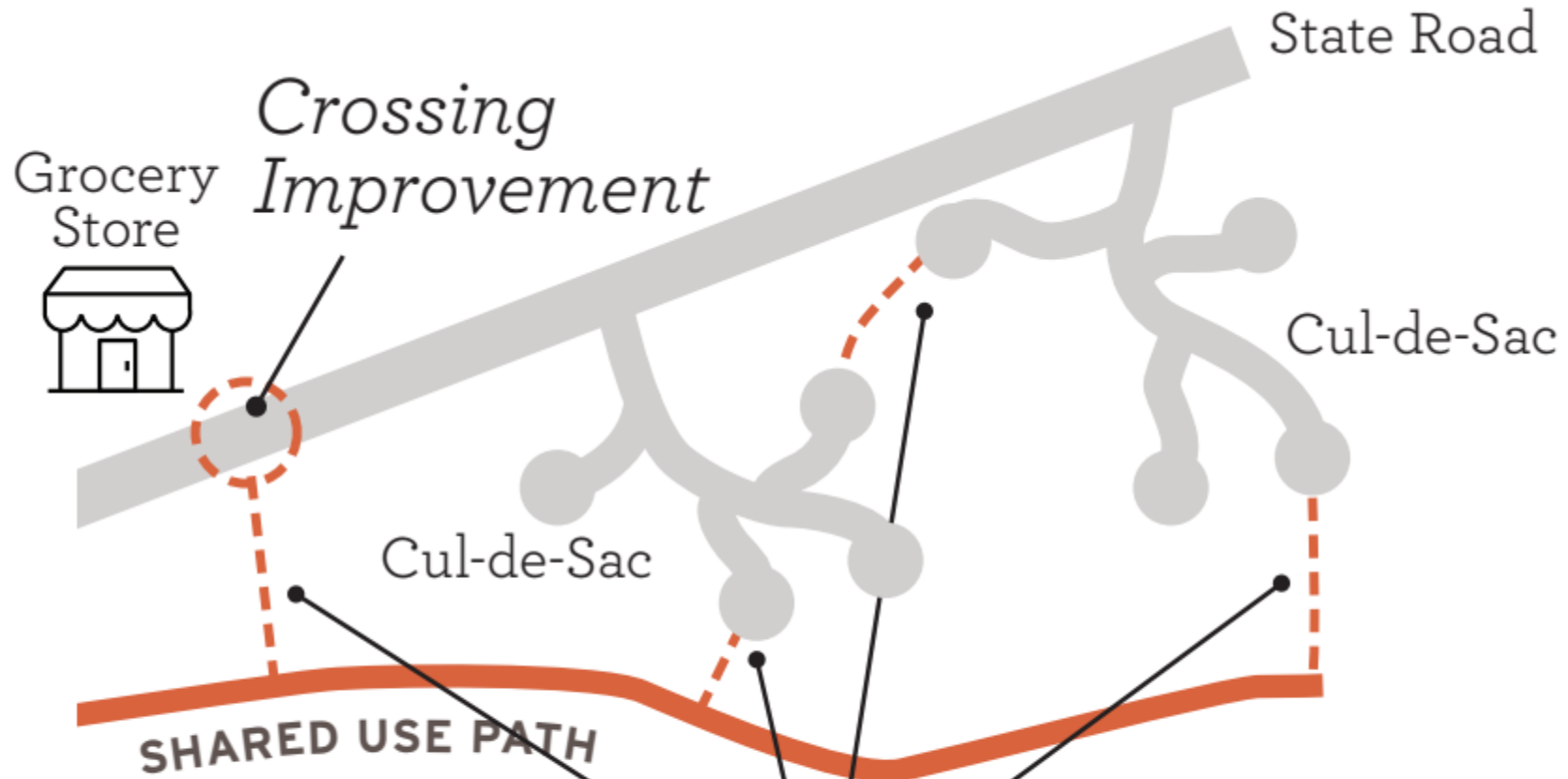
## **SAFETY AND SECURITY**

Does the network provide routes that minimize risk of injury, danger, and crime?

## **COMFORT**

Does the network appeal to a broad range of age and ability levels and is consideration given to user amenities?

Source: Small Town and Rural Multimodal Networks Guide, FHWA



## *Shared Use Path Connections*

Source: Small Town and Rural Multimodal Networks Guide, FHWA

# Options for Bicycle/Pedestrian Facilities

## **Mixed Traffic**

Everyone is sharing the same space

- Yield Roadway
- Bicycle Boulevard
- Advisory Shoulder

## **Visually Separated**

Space separated by pavement markings

- Yield Roadway
- Bicycle Boulevard
- Advisory Shoulder

## **Physically Separated**

Vertical barrier or buffer for separation

- Yield Roadway
- Bicycle Boulevard
- Advisory Shoulder





Who are we designing for?

# Bicyclists aren't all the same

## Strong and Fearless

- Will ride with traffic, regardless of roadway conditions or level of separation



## Enthused and Confident

- Pretty comfortable with traffic but may prefer some separation



## Interested But Concerned

- Would like to ride more, but usually stick to greenways or other separated facilities



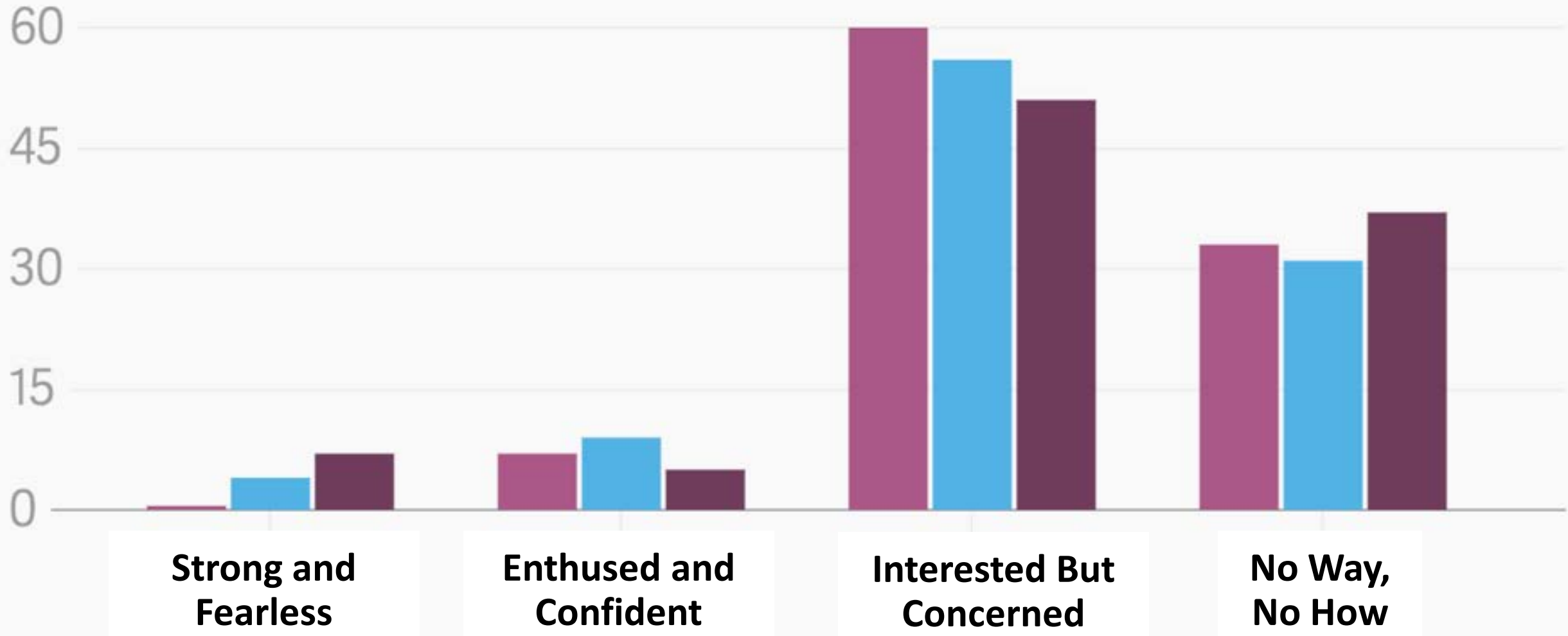
## No Way, No How

- Just won't bike, period



# A Breakdown of the Four Types of Cyclists

■ Geller 2006 ■ Portland 2013 ■ U.S. 2016



# Options for Bicycle/Pedestrian Facilities

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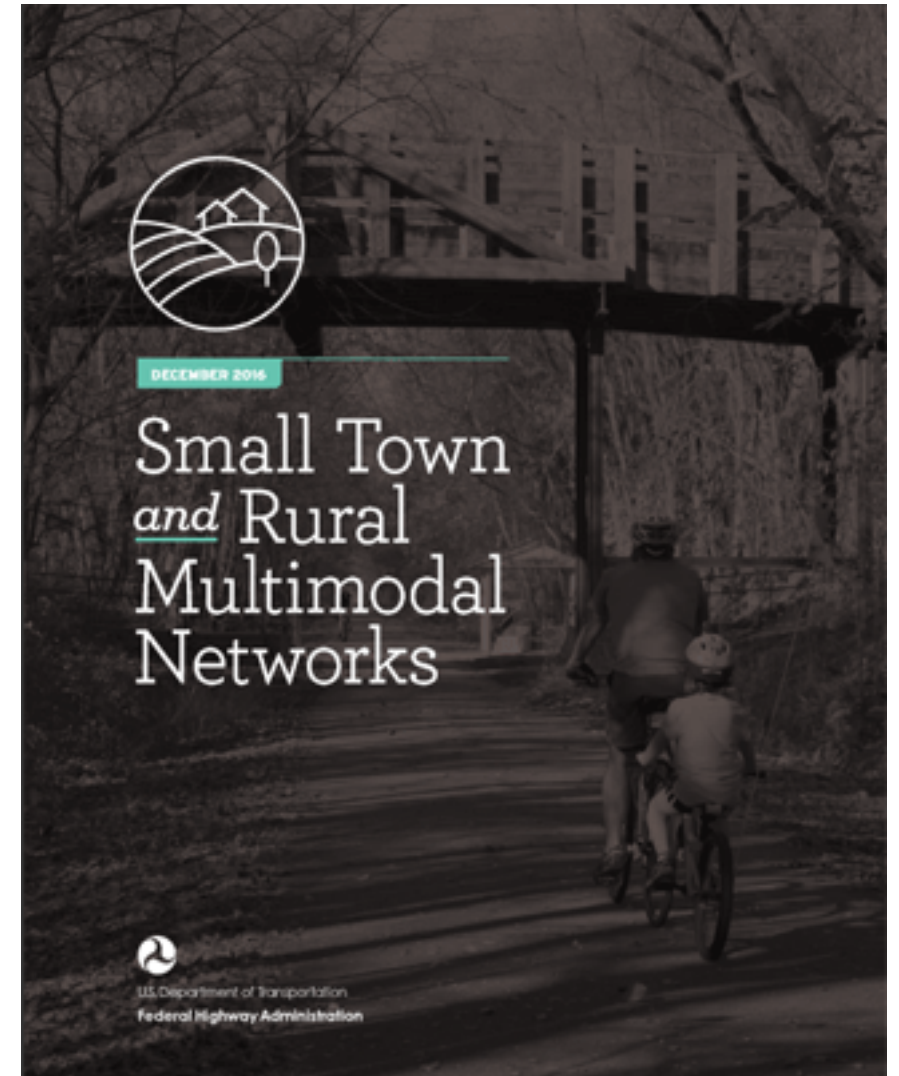
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Vertical barrier or buffer for separation

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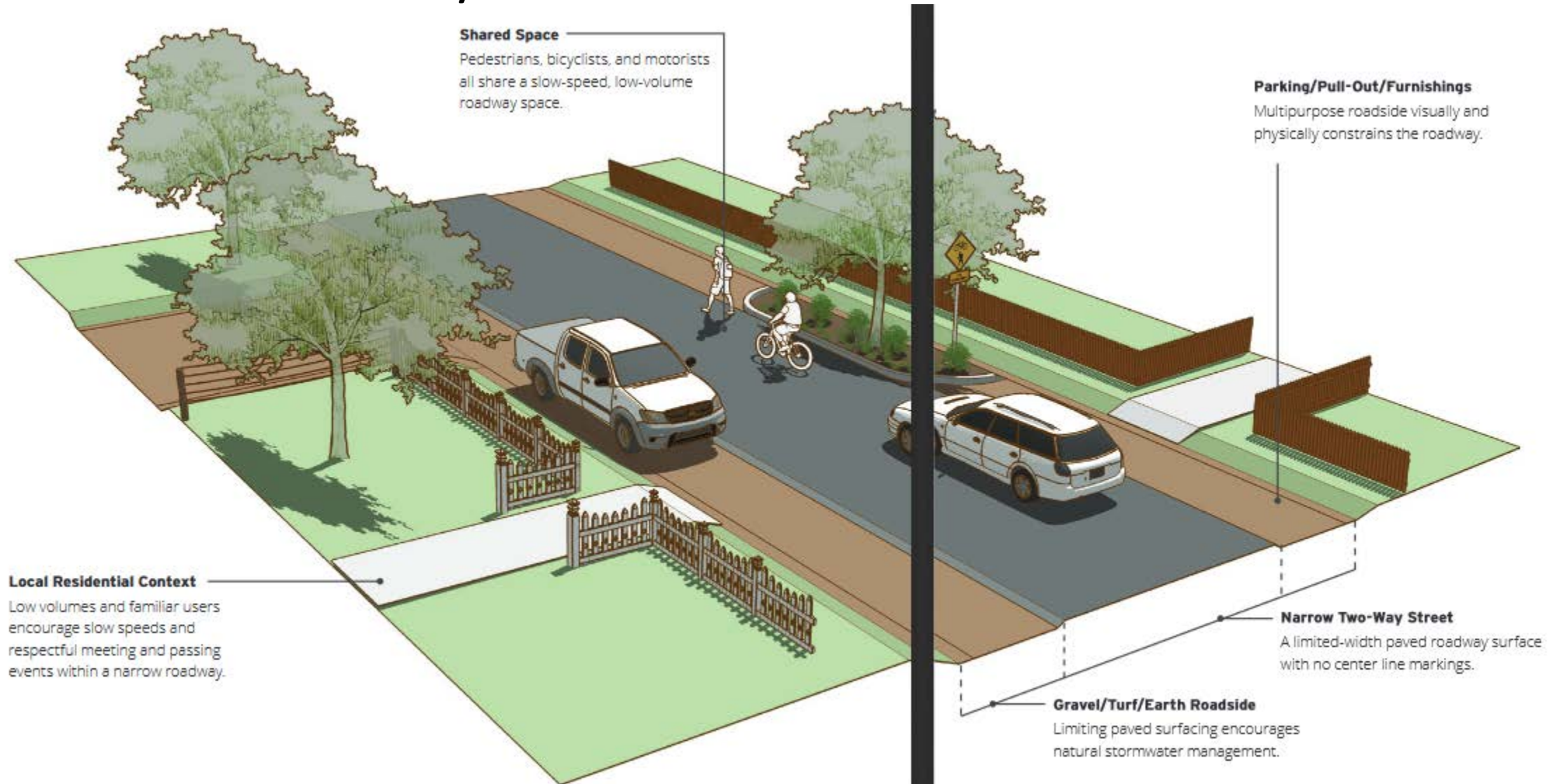
# FHWA Small Town and Rural Multimodal Networks Guide

- Next set of slides walks through three groups of facility types developed by Alta Planning and Design and FHWA in their guide
- Excellent resource with lots of detail on specific treatments and considerations



[https://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/publications/small\\_towns/](https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/)

# Mixed Traffic Yield Roadway

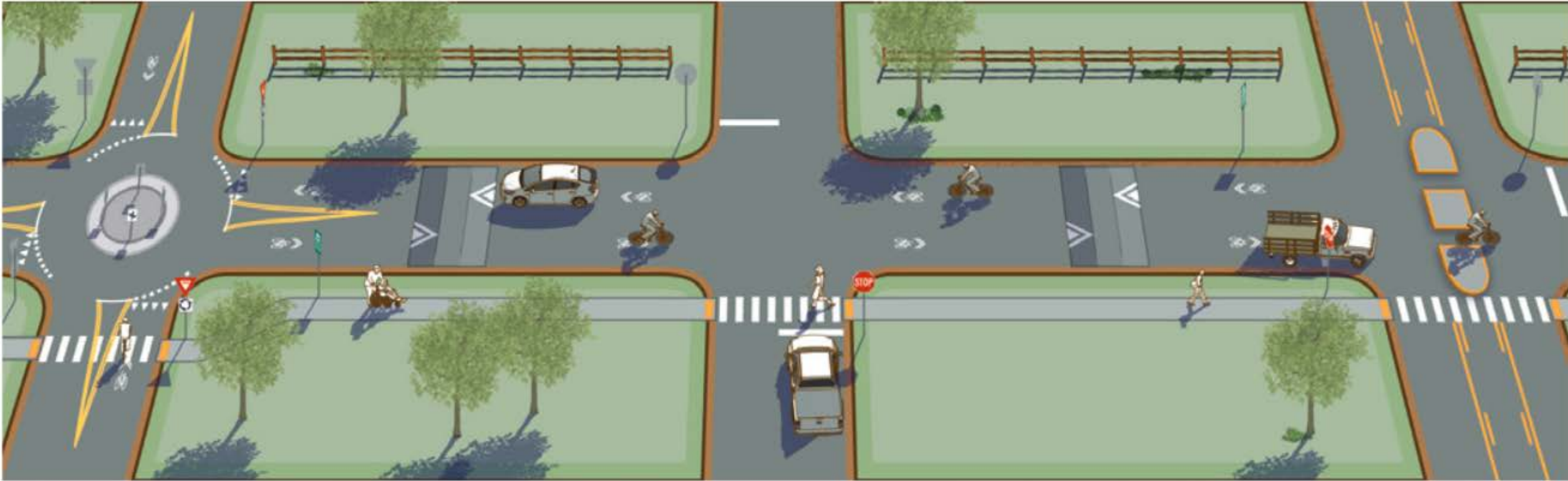


## Mixed Traffic Yield Roadway

- Ideal for low volume and low speed conditions
- Simple signage can help, but pavement markings not recommended
- Many neighborhood streets serve this function already



# Mixed Traffic Bicycle Boulevard



**Figure 2-5.** Bicycle boulevards combine road markings, traffic-calming measures, and crossing improvements designed to enhance the comfort and priority of bicyclists traveling along the route.

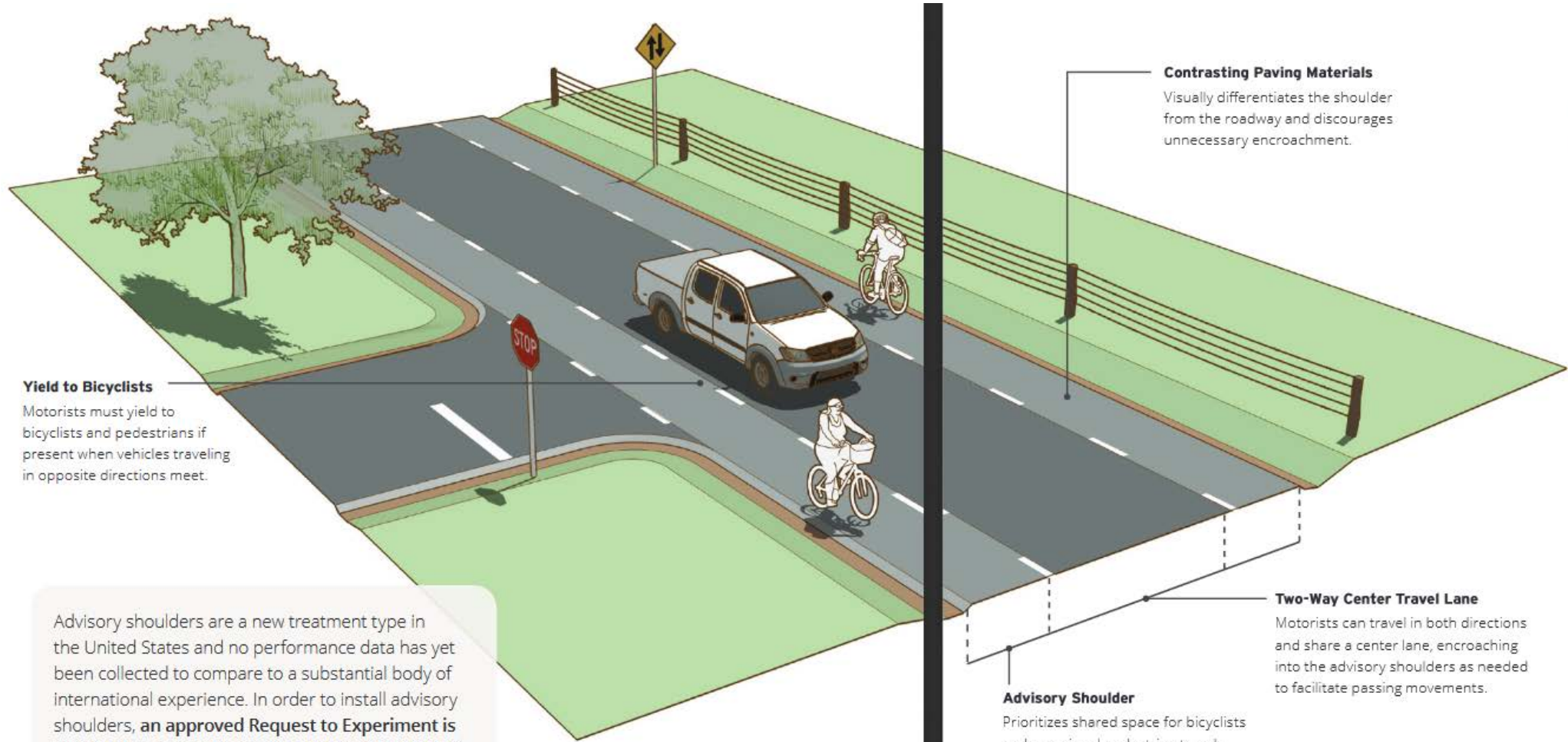


# Mixed Traffic Bicycle Boulevard

- Low speed is critical
- Partner with emergency/fire response
- Volumes may be higher, and pedestrians may need additional separation (e.g. sidewalks)



# Mixed Traffic Advisory Shoulder



## Yield to Bicyclists

Motorists must yield to bicyclists and pedestrians if present when vehicles traveling in opposite directions meet.

Advisory shoulders are a new treatment type in the United States and no performance data has yet been collected to compare to a substantial body of international experience. In order to install advisory shoulders, **an approved Request to Experiment is required** as detailed in Section 1A.10 of the MUTCD. FHWA is also accepting requests for experimentation with a similar treatment called "dashed bicycle lanes."

## Contrasting Paving Materials

Visually differentiates the shoulder from the roadway and discourages unnecessary encroachment.

## Two-Way Center Travel Lane

Motorists can travel in both directions and share a center lane, encroaching into the advisory shoulders as needed to facilitate passing movements.

## Advisory Shoulder

Prioritizes shared space for bicyclists and occasional pedestrian travel.

# Mixed Traffic

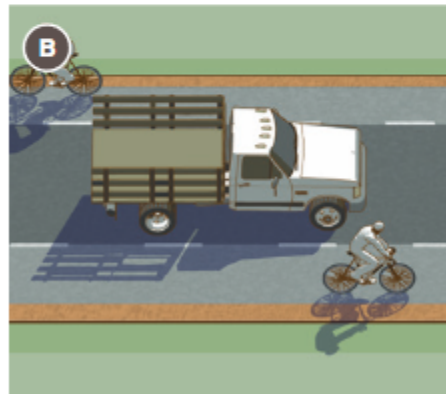
## Advisory Shoulder

Table 2-2. Interactions when vehicles traveling in opposite directions meet by two-way center turn lane width.

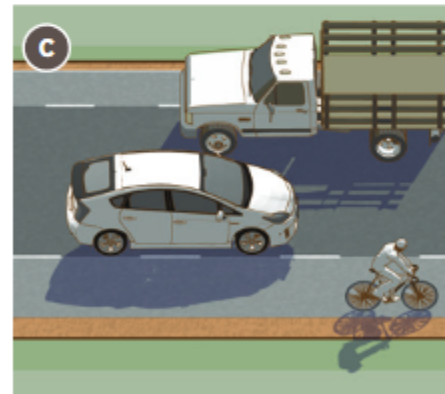
	Two-Way Center Travel Lane Width	Impact on Advisory Shoulder Encroachment When Vehicles Traveling in Opposite Directions Meet
<b>B</b> Practical minimum width	10 ft (3.0 m)	Requires vehicle encroachment into the advisory shoulder space when vehicles traveling in opposite directions meet.
<b>C</b> Preferred minimum width	13.5 ft (4.5 m)	Two passenger cars are physically able to meet each other within the center lane at very low speed. In practice, vehicles will encroach into the advisory shoulder.
Preferred maximum width	16 ft (4.9 m)	Permits two passenger cars to pass within the center lane at modest speeds without encroaching into the advisory shoulder.
<b>D</b> Absolute maximum width	18 ft (5.5 m)	This width is equivalent to two 9 ft (2.7 m) travel lanes and regular encroachment into the advisory shoulder space may not be necessary.

Implementing agencies should be advised that the above dimensional guidance is intended to facilitate implementation on common roadway widths in the U.S. As with most treatments, more overall width is preferable to constrained circumstances.

10 ft (3.0 m) Center Travel Lane



13.5 ft (4.5 m) Center Travel Lane



18 ft (15.5 m) Center Travel Lane

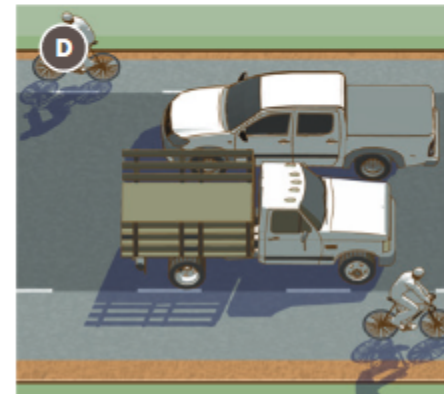


Figure 2-12. Total roadway width affects the number of road users that can meet and pass simultaneously. Wider roadways allow for more simultaneous interactions and can support higher volumes of motor vehicles.

# Hanover, New Hampshire

## PROJECT DESCRIPTION



## DETAILS

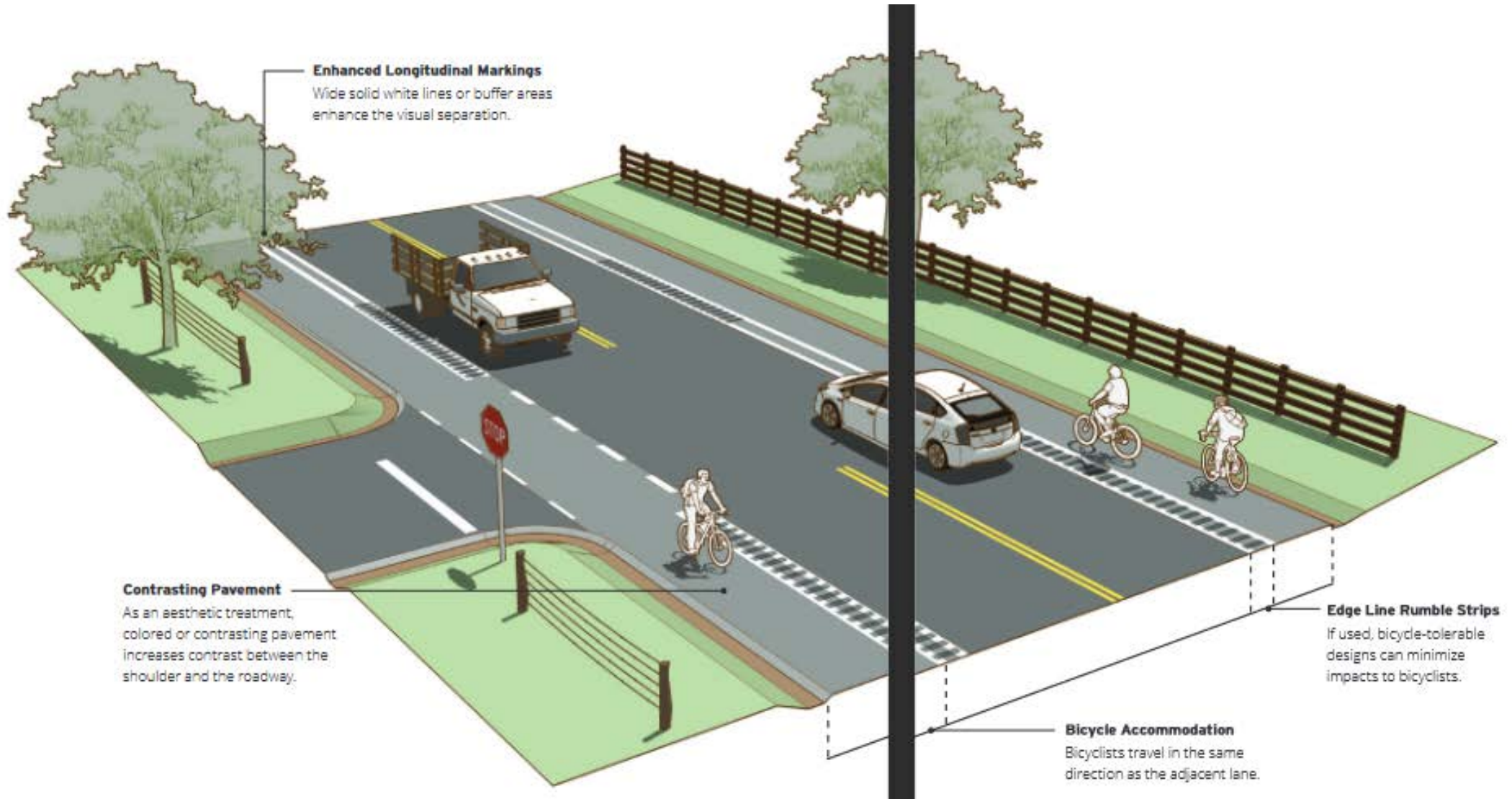
### COMMUNITY CONTEXT

Hanover, NH, is a town of approximately 11,000 with 8,000 living in the town center. Hanover is home to Dartmouth College with a student population of 6,300. Hanover is located on the Connecticut River and has a dense built-up area surrounded by small suburban neighborhoods that transition quickly to a very rural setting.

### KEY DESIGN ELEMENTS

The advisory shoulders project was built on a low-volume, low-speed, residential road. Implementation included pavement markings and signs.

# Visually Separated Paved Shoulder



# Visually Separated Paved Shoulders

- Can be appropriate for walking and bicycling in certain contexts (even higher speed/volume settings)
- Wide paved shoulders can reduce crash risk for motor vehicles as well as other road users
- Ideal for short connections rather than primary walking routes
- Maintenance can impact safety for bicyclists



# A Note on Rumble Strips

- Can be effective for reducing roadway departure crashes
- Negative impacts on bicyclists
- If used, prioritize remaining shoulder width (4 feet is the absolute minimum, but more should be considered)
- Incorporate gaps of 10-12 feet every 40-60 feet
- Center-line rumble strips can reduce vehicle passing distance; important to understand impacts on bicyclists





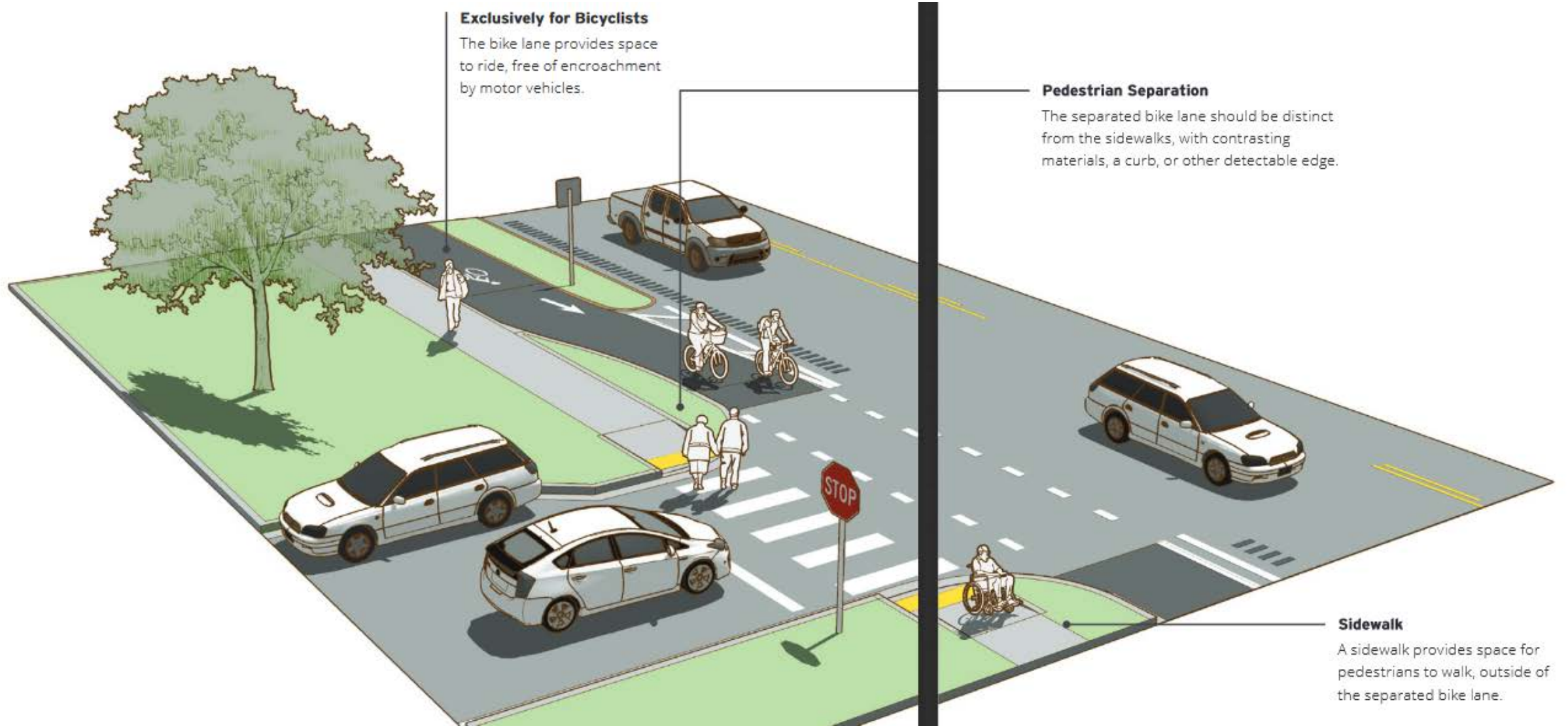


## Visually Separated Bicycle Lanes

- Generally sufficient for roads with speeds under 40mph and less than 10K ADT, but many other factors will impact application
- Prioritize transition zones and intersections (bicycle lanes can be “dropped” unexpectedly)
- Buffers can be added to increase safety and comfort



# Physically Separated Separated Bike Lane



## Exclusively for Bicyclists

The bike lane provides space to ride, free of encroachment by motor vehicles.

## Pedestrian Separation

The separated bike lane should be distinct from the sidewalks, with contrasting materials, a curb, or other detectable edge.

## Sidewalk

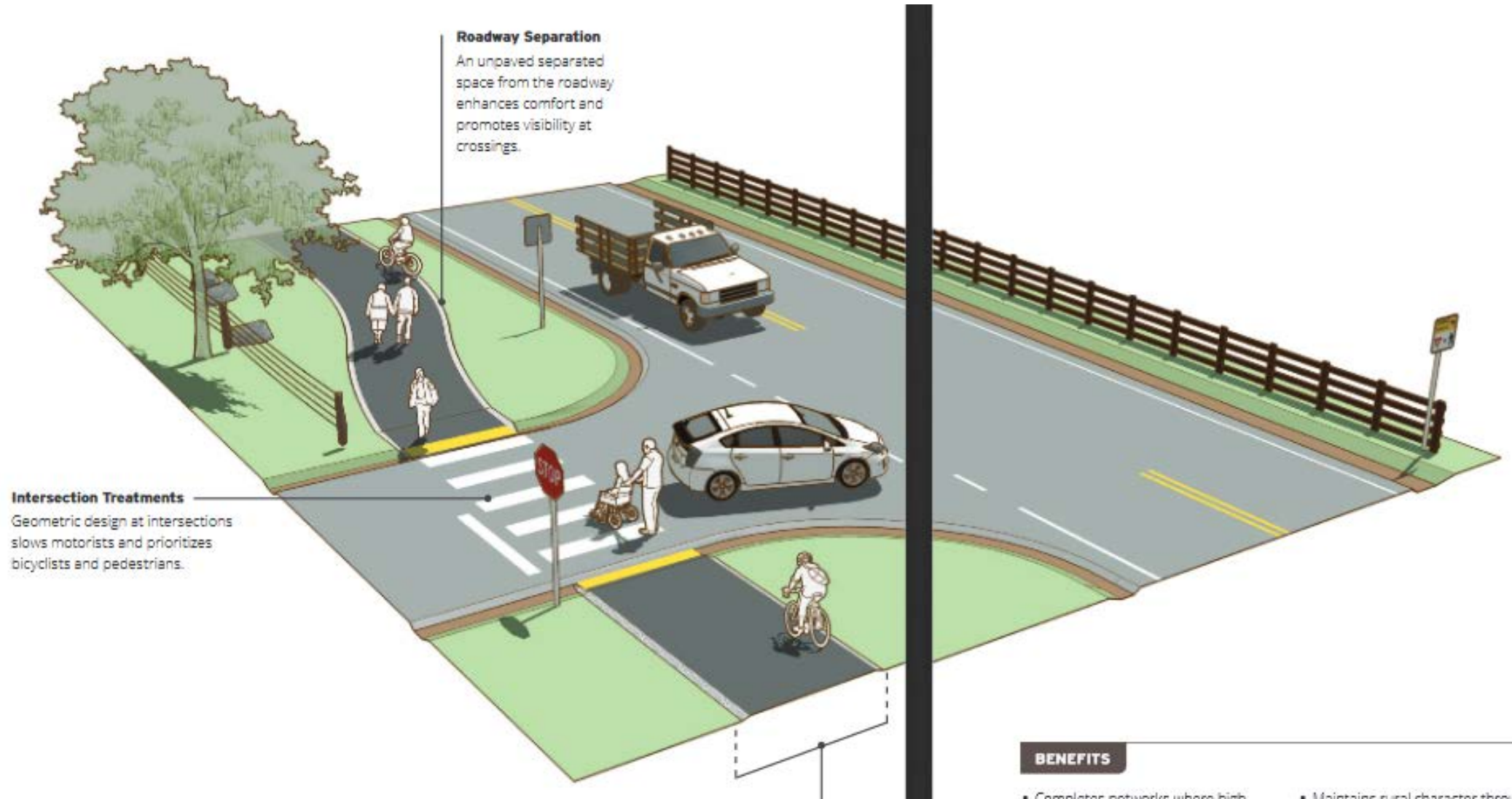
A sidewalk provides space for pedestrians to walk, outside of the separated bike lane.

## Physically Separated Separated Bike Lane

- Many variations in design; more guidance is forthcoming
- Ideal for separating pedestrians and bicyclists, especially if there are higher-speed recreational or commuter bicyclists (or larger volumes)
- More applicable in rural village or small town setting



# Physically Separated Shared Use Paths and Sidepaths

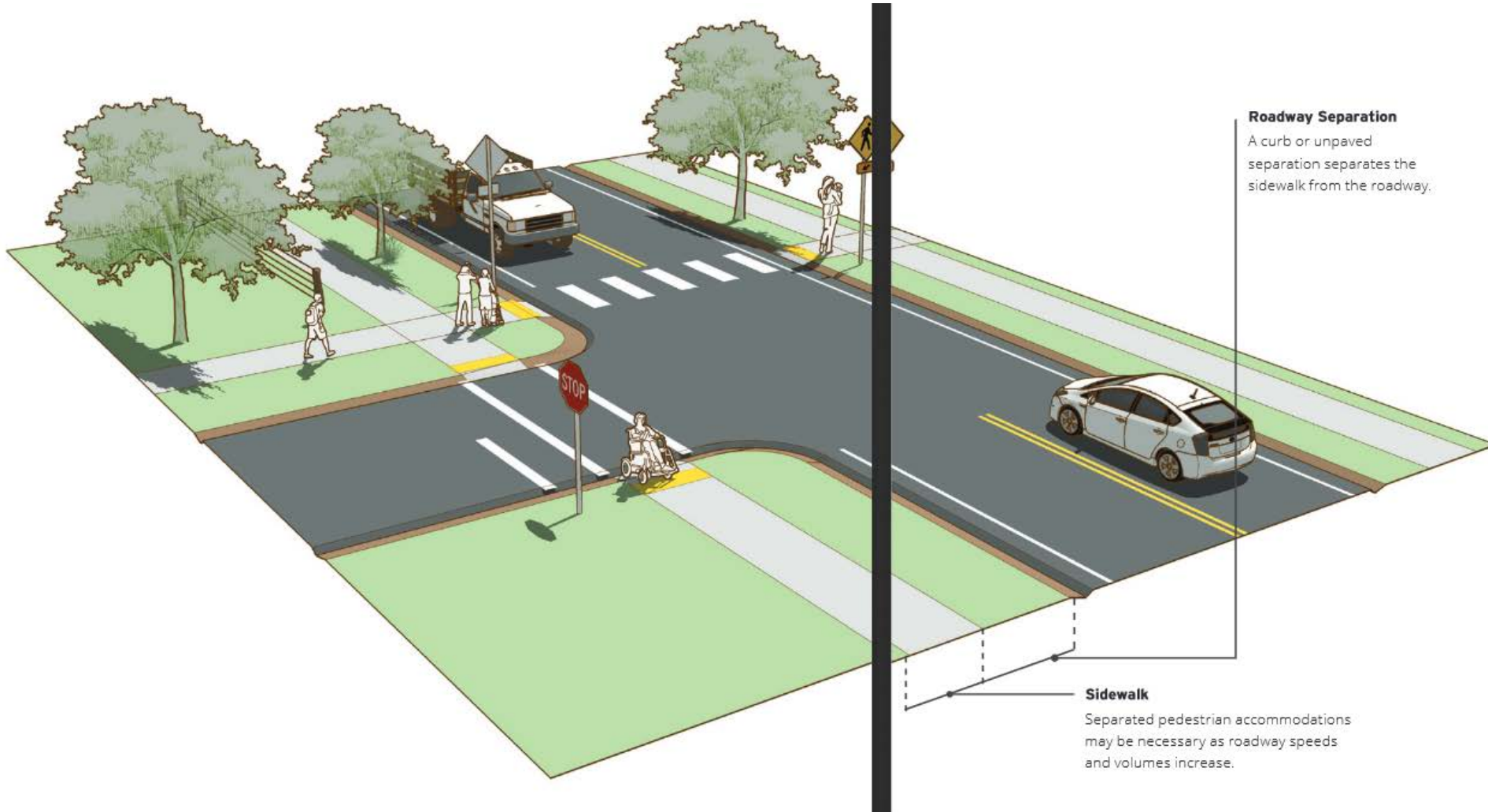


## Physically Separated Shared Use Paths and Sidepaths

- Applicable in many settings; ideal for low-stress connections
- Bi-directional paths need sufficient width for all users to operate
- Provide sufficient buffer separation from traffic
- Prioritize design of crossings, especially midblock and near intersections



# Physically Separated Sidewalks



# Options for Bicycle/Pedestrian Facilities

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# Importance of Crosswalk Design

Risk of crashes increases with

- More lanes
- More traffic
- Higher speeds

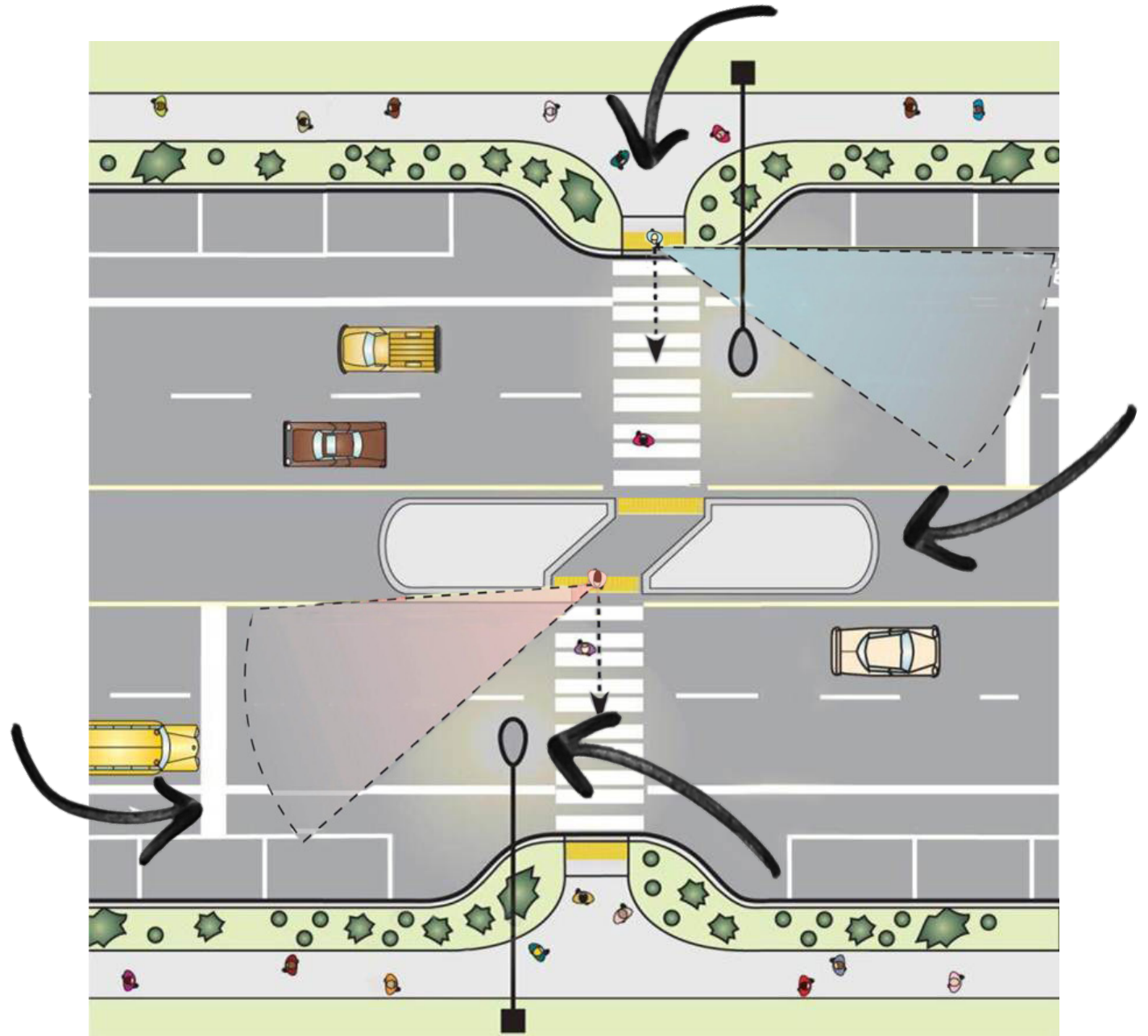
Drivers may not expect to see pedestrians and bicyclists in rural environments





# Improving Safety at Crosswalks

Crossings on high speed rural roads need more than just painted crosswalks



# Guide for Improving Safety at Uncontrolled Locations (FHWA)

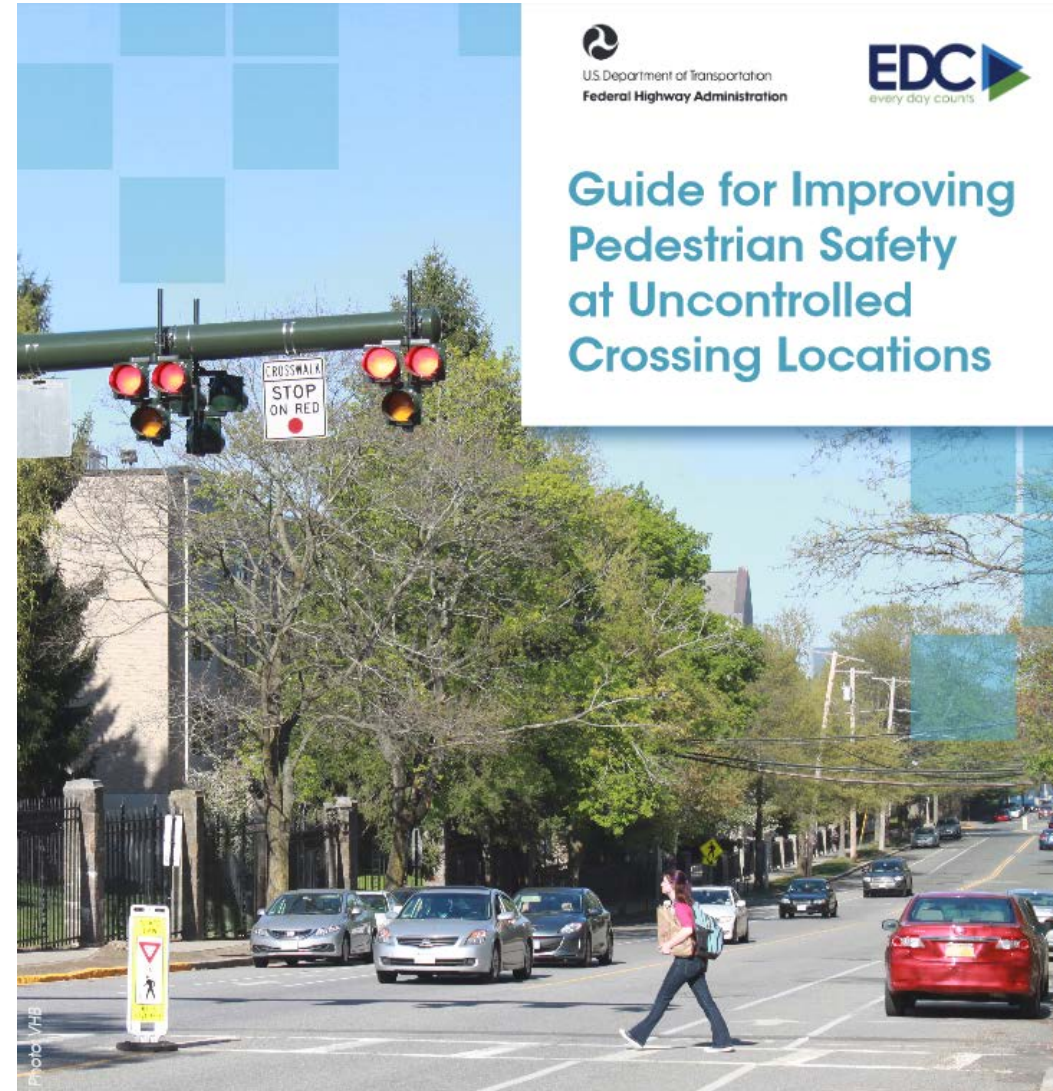
- 1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
- 2 Raised crosswalk
- 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- 4 In-Street Pedestrian Crossing sign
- 5 Curb extension
- 6 Pedestrian refuge island
- 7 Rectangular Rapid-Flashing Beacon (RRFB)\*\*
- 8 Road Diet
- 9 Pedestrian Hybrid Beacon (PHB)\*\*

# Guide for Improving Safety at Uncontrolled Locations (FHWA)

Six-step process helps agencies:

- Collect data on crossings
- Inventory conditions and prioritize
- Analyze safety concerns and factors
- Select countermeasures
- Implement projects
- Evaluate and monitor results

[https://www.fhwa.dot.gov/innovation/everydaycounts/edc\\_4/step.cfm](https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/step.cfm)



# Thank You!

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