# MULTIMODAL

## INFRASTRUCTURE GUIDELINES

METROPLAN

SMART PLANNING MAKES SMART PLACES.

This report was funded in part through grant(s) from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

**Notice of Nondiscrimination**

Metroplan complies with all civil rights provisions of federal statutes and related authorities that prohibit discrimination in programs and activities receiving federal financial assistance. Therefore, Metroplan does not discriminate on the basis of race, sex, color, age, national origin, religion, disability, or income status, in admission or access to and treatment in Metroplan's programs and activities, as well as Metroplan's hiring or employment practices. Complaints of alleged discrimination and inquiries regarding Metroplan's nondiscrimination policies may be directed to La'Kesha Stewart, Title VI/ADA/504 Coordinator, 501 West Markham Street, Suite B, Little Rock, AR 72201, (501) 372-3300, or the following e-mail address: lstewart@metroplan.org. (Hearing and speech impaired may dial 711.)

This notice is available upon request from the Title VI/ADA/504 Coordinator in large print, audiotape or braille.

# ACKNOWLEDGEMENTS

Metroplan is a voluntary association of local governments that has operated by interlocal agreement since 1955. It is the designated metropolitan planning organization under Title 23 of the United States Code. Metroplan has members in five Central Arkansas counties: Faulkner, Grant, Lonoke, Pulaski, and Saline. The organization acts as a unified voice to serve local governments, the public, and the business community by developing plans, convening stakeholders, and providing information and data to address transportation, land use, and environmental issues affecting the region. We would like to thank the many stakeholders who aided in development of these multimodal guidelines.

Thank you to the local agency staff and community members who contributed their time, perspective, ideas, and expertise to the development of the Metroplan Multimodal Infrastructure Guidelines:

## Metroplan

Casey Covington
Daniel Holland
Bernadette Rhodes
La'Kesha Stewart

## Rock Region METRO

Charles Frazier
Donna Bowers

## Steering Committee Members

Jon Honeywell – City of Little Rock
Finley Vinson - City of Conway
David Cook – City of North Little Rock
Sunny Farmahan - ArDOT

Prepared by: Toole Design Group

# TABLE OF **CONTENTS**


**CHAPTER 1:** Purpose of the Guide ..... 01

- How to Use this Guide ..... 03
  - Context ..... 03
  - Design Details ..... 03
  - Role of the Guidelines in Central Arkansas ..... 03
- Major Definitions ..... 04
- Federal, State, and Local Guidelines ..... 05

**CHAPTER 2:** Corridor Types ..... 07

- Introduction ..... 08
- Design Principles ..... 12
  - Safety + Accessibility ..... 12
  - Connections Matter ..... 12
  - Vibrant + Healthy ..... 12
- 1: Downtown Mixed-Use (Including Priority Transit Alternative) ..... 14
- 2: Town Main Street ..... 24
- 3: Urban Residential ..... 32
- 4: Suburban Residential Connector (Including Priority Transit Alternative) ..... 40
- 5: Suburban Commercial ..... 48
- 6: Industrial ..... 58
- 7: Rural Street (2-lane) ..... 68

**CHAPTER 3:** Design Details ..... 76

- Accessing Transit ..... 82
  - AT1: Sidewalk Zones ..... 83
  - AT2: Preferred and Minimum Widths for Sidewalk Zones ..... 85
  - AT3: How to Select and Prioritize Transit Facilities ..... 86
  - AT4: Bus Stops ..... 87
  - AT5: Floating Bus Stop ..... 88
  - AT6: Bus Bulb ..... 90
  - AT7: Median Stop ..... 92
  - AT8: Pullout Stop ..... 94
  - AT9: Sidewalk Stop ..... 96
  - AT10: Dedicated Bus Lanes ..... 98
  - AT11: Bus Stop Boarding and Alighting Areas ..... 100
  - AT12: Bus Stop Signage and General Wayfinding ..... 101
  - AT13: Bus Stop Shelters and Benches ..... 102
  - AT14: Landscaping ..... 103
  - AT15: Bicycle Parking Integration ..... 104
  - AT16: Bus Stop Placement ..... 106

» Bicycle Facilities ..... 108
BF1: How To Select And Prioritize Bicycle Facilities ..... 110
BF2: Bicycle Parking ..... 111
BF3: Separated Bike Lanes ..... 112
BF4: Vertical Separation ..... 114
BF5: Buffered Bike Lane ..... 116
BF6: Striped Bike Lane ..... 117
BF7: Advisory Shoulder ..... 118
BF8: Neighborhood Bikeway ..... 119
BF9 Shared Lane ..... 120
BF10: Multi-Use Path ..... 121
» Intersections and Crossings ..... 122
IC1: Traffic Signal Operations For Pedestrian Mobility ..... 125
IC2: Daylighting ..... 126
IC3: Curb Extensions ..... 128
IC4: Pedestrian Islands ..... 130
IC5: Neighborhood Traffic Circles ..... 132
IC6: Hardened Centerlines ..... 133
IC7: Curb Ramps ..... 135
IC8: Raised Crosswalks ..... 136
IC9: Marked Crosswalks ..... 137
IC10: Driveway Crossings ..... 138
IC11: Raised Intersection ..... 139
IC12: Transit Prioritization at Intersections ..... 140
IC13: Protected Intersections ..... 142
IC14: Bicycle and Signalized Intersections ..... 143
» Curbside Management ..... 145
CM1: Micromobility Hubs ..... 146
CM2: Scooter and Bicycle Share Parking ..... 147
CM3: Electric Vehicle Charging ..... 148
CM4: Food Trucks ..... 149

**CHAPTER 4:** Implementation ..... 151
» Intended to Serve ..... 152

**CHAPTER 5:** Maintenance ..... 155
» Bus Stops and Transit Amenities ..... 156
» Street Furniture and Art ..... 156
» Seasonal Maintenance ..... 157
» Access During Construction ..... 157

# METROPLAN MULTIMODAL INFRASTRUCTURE GUIDELINES


METRO
streetcar
Rock Region
METRO
BLUE LINE
ROCK REGION METRO
EXACT
FARE
REQUERED
412
OPEN

# PURPOSE OF THE GUIDE

01

# PURPOSE OF THE GUIDE

The Central Arkansas Regional Transportation Study (CARTS) Multimodal Infrastructure Guidelines are based on the recognition that our streets not only connect us to jobs, education, shopping, and recreation, but they are also our most active and visible public spaces. Our streets have a tangible impact on the quality of life of our residents, quality of experience of our visitors, success of our local businesses, and competitiveness of our regional economy.  This Guide establishes an approach to street design that prioritizes all users, accommodates all modes, and offers the opportunity for implementing agencies to apply design decisions with consistency, providing predictability in costs and more uniformity in function and style across the region.

# HOW TO USE THIS GUIDE

This Guide is a tool for engineers, planners, elected officials, city managers, and advocates to help achieve a safe, inviting, more equitable regional transportation system. It is both aspirational, reflecting what could be rather than what is today, and inspirational, encouraging communities throughout Central Arkansas to transform their streets into places for people.

Jurisdictions that desire to realize integrated multimodal infrastructure should incorporate this Guide as part of their Master Street Plan and/or bicycle and pedestrian master plans to ensure that the best practices presented here become common practice in their communities.

## Context and Corridor Types

Seven Corridor Types form the basis of this Guide. They have been developed consistent with, and as a supplement to, existing functional classifications to provide additional guidance on selection of design elements. The Corridor Types provide a shortcut to understanding the relationship between a particular street and its adjacent land use context and how various design details are applied.

## Design Details: Flexibility for Decision Makers

This Guide is designed to be useful to a variety of implementers – local governments, Rock Region METRO, the Arkansas Department of Transportation (ArDOT), private developers, and community groups. It describes individual treatments, conditions under which the treatment is appropriate, and specific design guidance. Alternatives are also offered where applicable. These Guidelines become a local implementing agency's standards if incorporated into their Master Street Plan or another codified ordinance.

## Role of Guidelines in Central Arkansas: Local and ArDOT Considerations

Standards for construction, maintenance, and amenities can vary depending on location and what entity owns the right of way. This Guide provides a framework for decision-making based on public input, national best practices, local experience, and new innovation in street design. While it provides an opportunity for partner agencies to leverage resources and provide a more consistent experience for all users throughout the region, decision-making authority resides with the owner.

# MAJOR DEFINITIONS

- **Street:** Travelways for people walking, bicycling, using a wheelchair, scootering, accessing transit, on a bus, in an automobile, or delivering goods. As a place of social and economic exchange, as well as travel, the street includes the public realm adjacent the roadway such as sidewalks, paths, transit stops, greens, and other public gathering spaces.
- **Transit Amenity**: Design and infrastructure features that make the transit experience, whether waiting to board a bus or after alighting, pleasant, comfortable, and predictable. Features include shelters, seating, real-time and static information, lighting, shade, recycling and trash receptacles, appropriate space, and solid surfaces for ease of boarding and alighting at all vehicle doors.
- **Bus Lane**: A designated travelway for transit vehicles, most typically buses. The lane is marked with paint or other textured treatments to distinguish it from traditional travel lanes. Bus lanes can be shared with bicycles.
- **Micromobility**: Bicycles, e-bikes, skateboards, rollerblades, scooters, e-scooters, and other small, adaptable transportation modes or technologies that enable efficient movement over relatively short distances, generally between a quarter-mile up to five miles.
- **Urban Trail**: An off-street travelway designated for people walking, bicycling, running, using other micromobility options, pushing a stroller, or using a wheelchair.
- **Bicycle Facilities**: A variety of travelway types that are specifically designed for people riding bicycles. Guidance provided here should be considered supplemental or complementary to local bicycle master plans, which take precedence.
- **Parking**: On-street and off-street areas specifically designated for the parking of motorized vehicles. Guidance provided here should be considered supplementary or complementary to local parking regulations, which take precedence.

# FEDERAL, STATE AND LOCAL GUIDELINES

Additional sources for standards and guidance are referenced throughout this Guide. These should be used in conjunction with this Guide to assist in making decisions as appropriate.

## ADA: Americans with Disabilities Act:

- United States Access Board's proposed Public Rights-of-Way Accessibility Guidelines (PROWAG)
- 2010 ADA Standards for Accessible Design

## American Association of State Highway and Transportation Officials (AASHTO)

- Guide for the Development of Bicycle Facilities
- Guide for Geometric Design of Transit Facilities on Highways and Streets
- Guide for the Planning, Design, and Operation of Pedestrian Facilities

## Federal Highway Administration (FHWA)

- Federal Highway Administration (FHWA) Bikeway Selection Guide
- The Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD)
- Achieving Multimodal Networks
- Federal Highway Administration (FHWA) Traffic Calming e-Primer 3.7

## The National Association of City Transportation Officials (NACTO)

- NACTO Transit Street Design Guide
- NACTO Urban Bikeway Design Guide
- NACTO Urban Street Design Guide

## LOCAL STANDARDS

- Municipal Master Street Plans
- Rock Region METRO Title VI Program

# CORRIDOR TYPES

# 02

# INTRODUCTION

Corridor Types have been established for framing the various multimodal infrastructure elements that are detailed in this Guide. The Corridor Types span the gamut of land use environments from urban to suburban to rural, articulating how similar design elements may be applied differently in varying contexts.

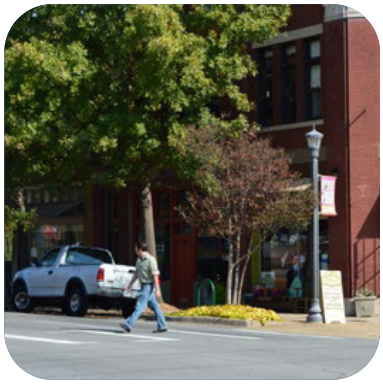
Master Street Plans utilize functional classifications – with designations such as arterial, collector, and local – to determine the design of streets throughout Central Arkansas. While functional classifications do an adequate job of assessing traffic conditions, defining property access to mobility, and determining design elements for efficiently moving motorized traffic, they fall short in providing the gradations necessary for contextual design in the variety of settings that make Central Arkansas communities unique places. By overlaying Corridor Types onto the functional classifications, we achieve a design palette that allows for a more nuanced approach, resulting in multimodal streets that are safe, comfortable, vibrant, and healthy.

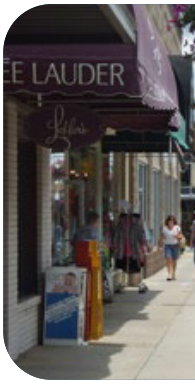
The Corridor Types presented in this Guide are aspirational, reflecting what could be rather than what is today. They are also intended to be inspirational, encouraging communities throughout Central Arkansas to transform their streets into places for people. Jurisdictions that desire to realize integrated multimodal infrastructure should incorporate this Guide as part of their Master Street Plan and/or bicycle and pedestrian master plans to ensure that the best practices presented here become common practice in their communities.

The matrix on the following page provides a correlation between the Corridor Types defined in this Guide and the functional classifications found in the Master Street Plans. This is intended to provide a loose translation between Corridor Type and Functional Classification. Because cities and towns are dynamic and the type and intensity of development, as well as the way in which people use a street, changes over time, it is quite possible that occasionally a street may not “fit” clearly into one category. Consider reviewing the information and design details for all Corridor Types that may be applicable or relevant, think about the use and development trends in the corridor, and use professional judgment in applying design strategies to meet current and emerging needs.

| Corridor Types | Description | Example Functional Classification | Area Examples |
|---|---|---|---|
| **Downtown Mixed-Use** | These are the most urban streets in the region, and are primarily located in downtown Little Rock, North Little Rock, and Conway. They may have a mix of office, commercial, and residential uses, on street parking, and heavy pedestrian traffic. | Principal Arterial<br>Minor Arterial<br>Collector<br>Local Street | Main Street, Little Rock, Capitol, Little Rock; Main Street, North Little Rock; Main Street, Conway |
| **Town Main Street** | These streets are the commercial heart of a small town or rural community and are typically characterized by dense single-floor commercial and retail uses over few blocks. | Principal Arterial<br>Minor Arterial<br>Local Street | Front Street, Lonoke; North Market Street, Benton; Kavanaugh Blvd., Little Rock; Main Street, Cabot |
| **Suburban Residential Connector** | These are through streets that traverse several neighborhoods or small towns and are essential to the flow of people between neighborhoods and to access employment. They are multimodal and accommodate pedestrians, bicyclists and vehicular traffic and may be primary transit routes. They vary in land uses, speed and right-of-way widths. | Minor Arterial<br>Collector | E. Lee Avenue, Sherwood; James Street, Jacksonville; Millwood Circle; Maumelle; College Street, Conway; Shobe Road, Bryant; Chenal Valley Drive |
| **Urban Residential** | The primary role of Urban Residential streets is to facilitate local trips and to contribute to a high quality of life for residents. They are characterized by sidewalks and street trees, slow speeds, and may include bicycle paths or trails, bus stops, and seating or gathering areas. | Local Street | 5th Street, North Little Rock; Maple Street; North Little Rock; Monroe Street, Little Rock; Sevier Street, Benton; E 6th Street, Little Rock; |
| **Suburban Commercial** | Suburban Commercial streets are typically four lane higher-speed roads, characterized by strip commercial land uses and outparcels, and are punctuated by periodic access driveways. Suburban Commercial streets have fewer intersections; the combination of higher speeds and longer distances between signalized crossings can make it difficult for pedestrians, cyclists, and transit users to cross. Suburban Commercial streets should have sidewalks on both sides of the street to accommodate pedestrians and transit users who may be shopping or going to work. | Principal Arterial<br>Minor Arterial | Dave Ward Drive, Conway; Chenal Parkway, Little Rock; Brockington Road, Sherwood; E. McCain Blvd., North Little Rock; Reynolds Road, Bryant; Military Road, Benton |
| **Industrial** | Industrial streets support truck traffic and accommodate the loading and distribution needs of wholesale, construction, commercial, service, and food-processing businesses. Industrial streets typically connect directly to the regional highway system and are some distance from Downtown Mixed Use, Town Main Streets, and Residential streets. Adequate turning radii at intersections is a primary design concern for these streets. Pedestrian traffic tends to be light, however sidewalks and accessible accommodations should be provided. | Varies | Lindsey, Little Rock; Central Airport Road, North Little Rock; Redmond, Jacksonville; Airlane Drive, Benton |
| **Rural Street** | Rural streets are designed to connect small and rural communities over longer distances. Pockets of small town commercial or residential uses are separated by longer distances of rural or agricultural uses. Paved shoulders serve as functional space for bicyclists and pedestrians in the absence of other designated facilities. | Principal Arterial<br>Minor Arterial<br>Major Collector | Highway 89 between Jacksonville and Mayflower; Alexander Road, East of Alexander; Congo Road, North of Benton |

# CENTRAL ARKANSAS CORRIDORS

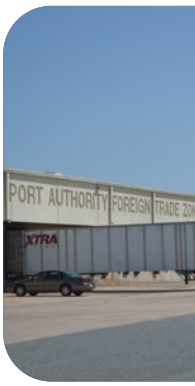










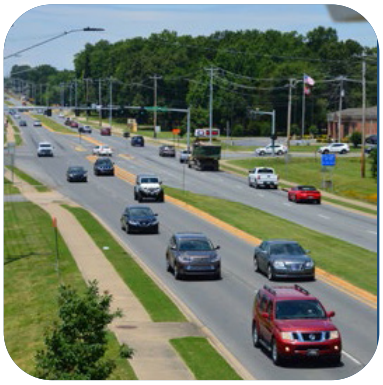


















# DESIGN PRINCIPLES

Responding to needs identified through various outreach efforts with the community – such as Central Arkansas 2050, the Long-Range Metropolitan Transportation Plan, and Move Central Arkansas. Corridor Types and the design details in this Guide are driven by the following imperatives:

## SAFETY + ACCESSIBILITY

Streets should be safe for children and adults, people on bicycles, in wheelchairs, or using micromobility devices, and transit riders. All design features should reinforce local access, appropriate speeds, driver awareness, and ease of use.

## CONNECTIONS MATTER

Streets should be designed for users of all ages and abilities, transit users, bicycle riders, micomobility users, and people who drive. Multimodal design elements ensure streets in Central Arkansas are easy to use, predictable from community to community, and comfortable for everyone.

## VIBRANT + HEALTHY

Streets are equipped with elements that support their role both as paths and as public spaces for interaction and exchange. These elements include lighting, shade trees, seating, trash receptacles, wayfinding, and more.

## CORRIDOR TYPES IN THIS GUIDE

### » Downtown Mixed-Use

High-activity streets in the downtown cores of Little Rock, North Little Rock, and Conway.

### » Town Main Street

Central business district streets in smaller communities.

### » Urban Residential

Residential streets in the urban core of communities.

### » Suburban Residential Connector

Streets that provide key linkages between suburban residential neighborhoods and commercial corridors.

### » Suburban Commercial

Larger, multi-lane streets connecting suburban areas to denser areas of employment, entertainment, and services.

### » Industrial

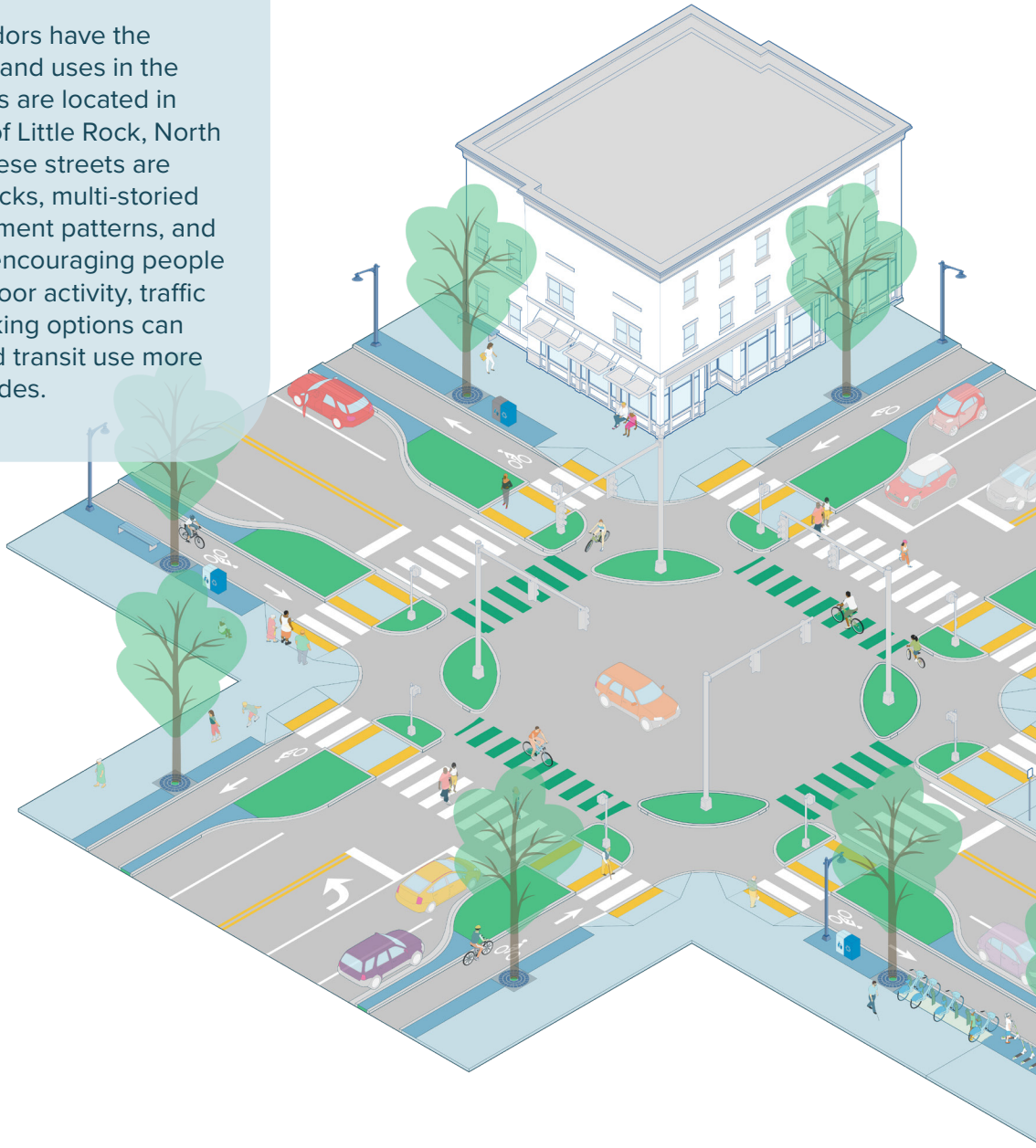
Streets that primarily serve industrial land uses.

### » Rural Street

Streets that connect rural communities to the larger region.

# 01 DOWNTOWN MIXED-USE

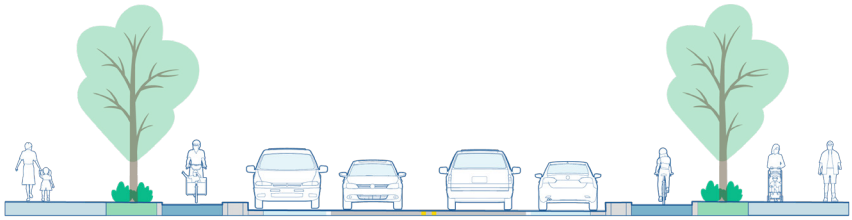
Downtown Mixed-Use corridors have the densest and highest mix of land uses in the CARTS region. These streets are located in the core commercial areas of Little Rock, North Little Rock, and Conway. These streets are defined by walkable city blocks, multi-storied buildings, compact development patterns, and minimal building setbacks, encouraging people to walk. Streetscaping, outdoor activity, traffic congestion, and limited parking options can make walking, bicycling, and transit use more preferred transportation modes.



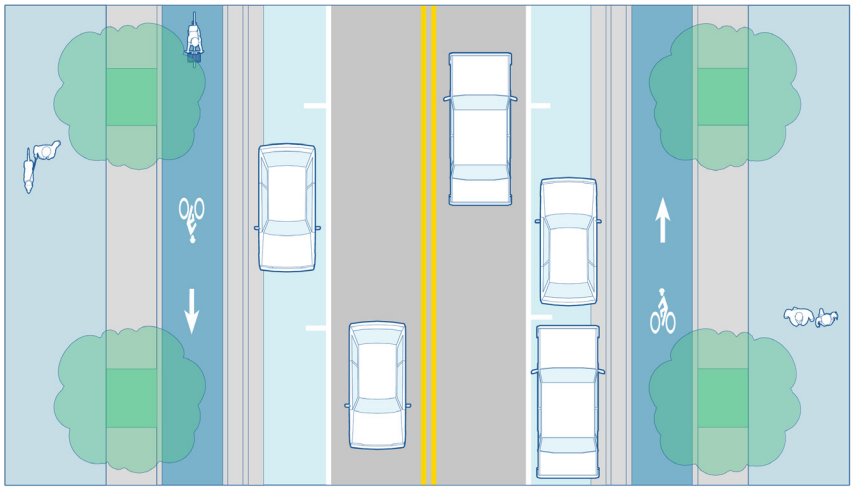
## Example Streets

- Main Street, Little Rock
- Capitol, Little Rock
- Main Street, North Little Rock
- Front Street, Conway

# TYPICAL CROSS SECTION



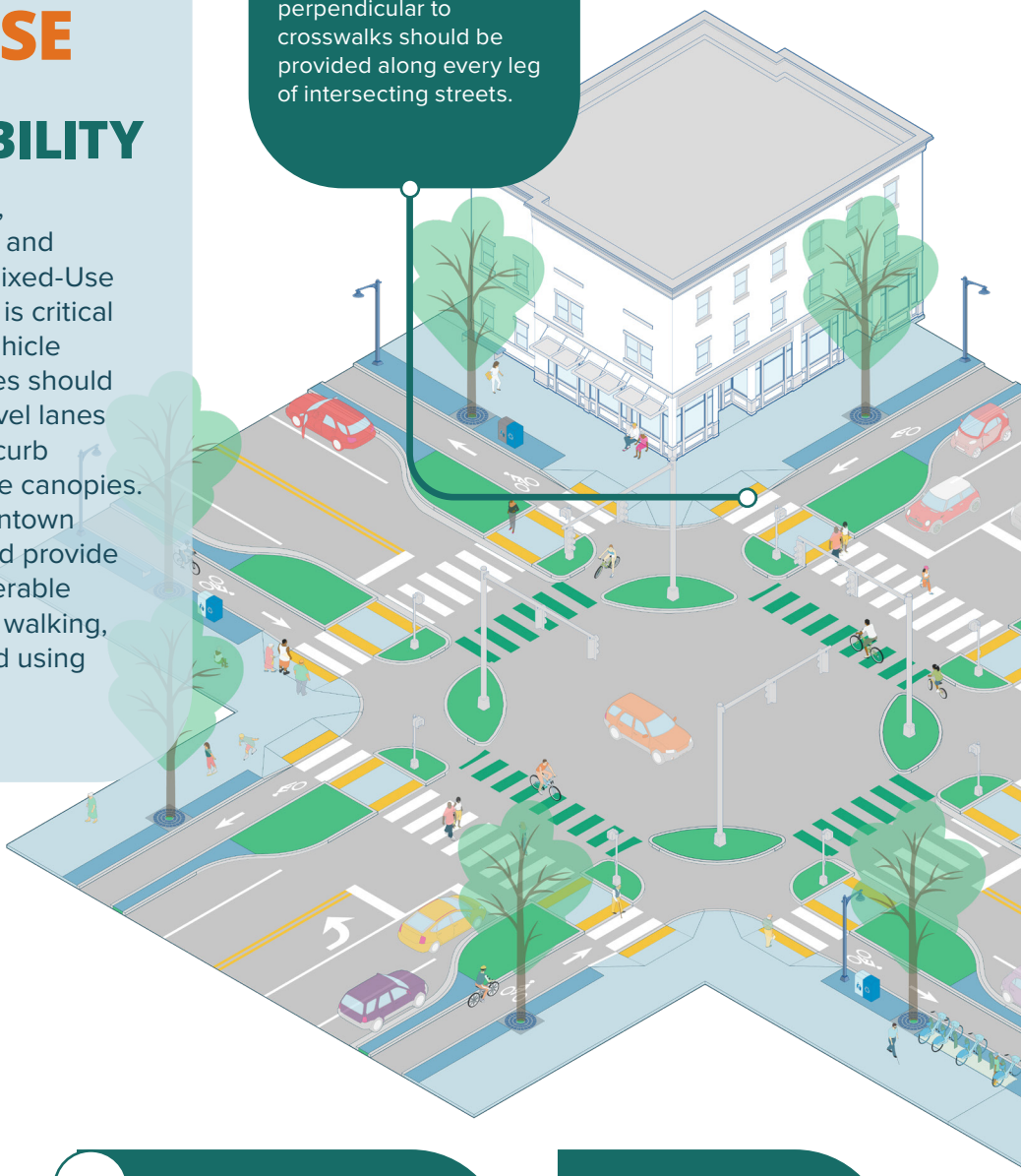
| | SIDEWALK | BUFFER | SEP. BIKE LANE | BUFFER | PARALLEL PARKING | TRAVEL LANES (2) | PARALLEL PARKING | BUFFER | SEP. BIKE LANE | BUFFER | SIDEWALK |
|---|---|---|---|---|---|---|---|---|---|---|---|
| REC | 10' | 5' | 6' | 3' | 8' | 10' | 8' | 3' | 6' | 5' | 10' |
| MIN | 5' | 4' | 5' | 2' | 7' | 9' | 7' | 2' | 5' | 4' | 5' |
| MAX | - | - | 8' | - | 9' | 11' | 9' | - | 8' | - | - |



# 1A DOWNTOWN MIXED-USE

## SAFETY + ACCESSIBILITY

With high volumes of motor vehicles, pedestrians, bicyclists, transit riders, and micromobility users on Downtown Mixed-Use corridors, clear separation of modes is critical for safety. Encouraging low motor vehicle travel speeds through design features should be a priority, including the use of travel lanes no wider than 11', on-street parking, curb extensions, crossing islands, and tree canopies. At complex intersections along Downtown Mixed-Use streets, treatments should provide clear priority and sight lines for vulnerable users of the street, including people walking, riding bicycles, accessing transit, and using other micromobility modes.



### IC7 CURB RAMPS

Curb ramps that are perpendicular to crosswalks should be provided along every leg of intersecting streets.

### IC2 DAYLIGHTING

On-street parking should be prohibited in proximity to intersections and driveways to provide clear sightlines and ensure people in crosswalks are visible to drivers.

### AT11 PICKUP AND DROPOFF ZONES

Accessible parking and loading spaces should be designated near key destinations. Loading zones should be located every block where on-street parking is present. Loading zones should be designed to accommodate rideshare pick-up/drop-off during commute hours, nighttime, and weekends and commercial loading during weekday business hours. On two-way streets, marked loading zones may not be necessary; vehicles may load directly from the street and contraflow vehicles may slowly pass.

### IC8 RAISED CROSSWALKS

Raised crosswalks are ramped speed tables that can be placed at unsignalized intersections with high pedestrian activity or at midblock. Other frequent locations include near schools or pick-up/drop-off zones near an activity center such as a theater or sports venue. Ideal width for the crosswalk is 10', demarcated with paint or textured material, and including detectable warnings and curb ramps at the street edge for pedestrians with impaired vision.

### SIDEWALK LIGHTING

To provide a safe and comfortable public realm, lighting fixtures should be scaled for both pedestrians and vehicles. Light poles and fixture styles may also be used as effective artistic and placemaking elements.

## IC3 CURB EXTENSIONS

Curb extensions should be used in place of on-street parking in proximity to intersections to increase pedestrian visibility, decrease pedestrian crossing distances, and physically prohibit parking too close to the intersection. Curb extensions are also a preferred traffic calming treatment because they slow vehicle travel speeds, add space for landscaping and stormwater infiltration, and provide opportunities for art installations and creative placemaking.

## IC9 MARKED CROSSWALKS

Crosswalks should be located at all signalized intersections and marked with enhanced continental style striping or thermoplastic or textured or colored paving materials consistent with the MUTCD. Crosswalks may also be located at unsignalized intersections and at midblock locations where there is regular pedestrian traffic, such as near activity centers or transit stops. Crosswalks should always connect to a sidewalk with an ADA curb ramp.

## BF4 MATERIALS FOR VERTICAL SEPARATION

Horizontal and vertical separation between bicycle facilities and vehicle travel and parking lanes should be provided. When adjacent to parking lanes, the physical separation should be at least 3' wide to protect users from opening car doors.

## IC4 PEDESTRIAN ISLANDS

Pedestrian islands are typically applied in locations where speeds or volumes of vehicular traffic make pedestrian crossing difficult, or where there are three or more lanes of traffic in one direction. They should be 8-10' wide, and no smaller than 6' to accommodate a person on a bicycle or with a stroller. The crosswalk should "cut through" the median where possible to maintain a level pedestrian pathway. At the intersection, the median should have a "nose" that extends past the crosswalk to provide a visual barrier and slow turning drivers.

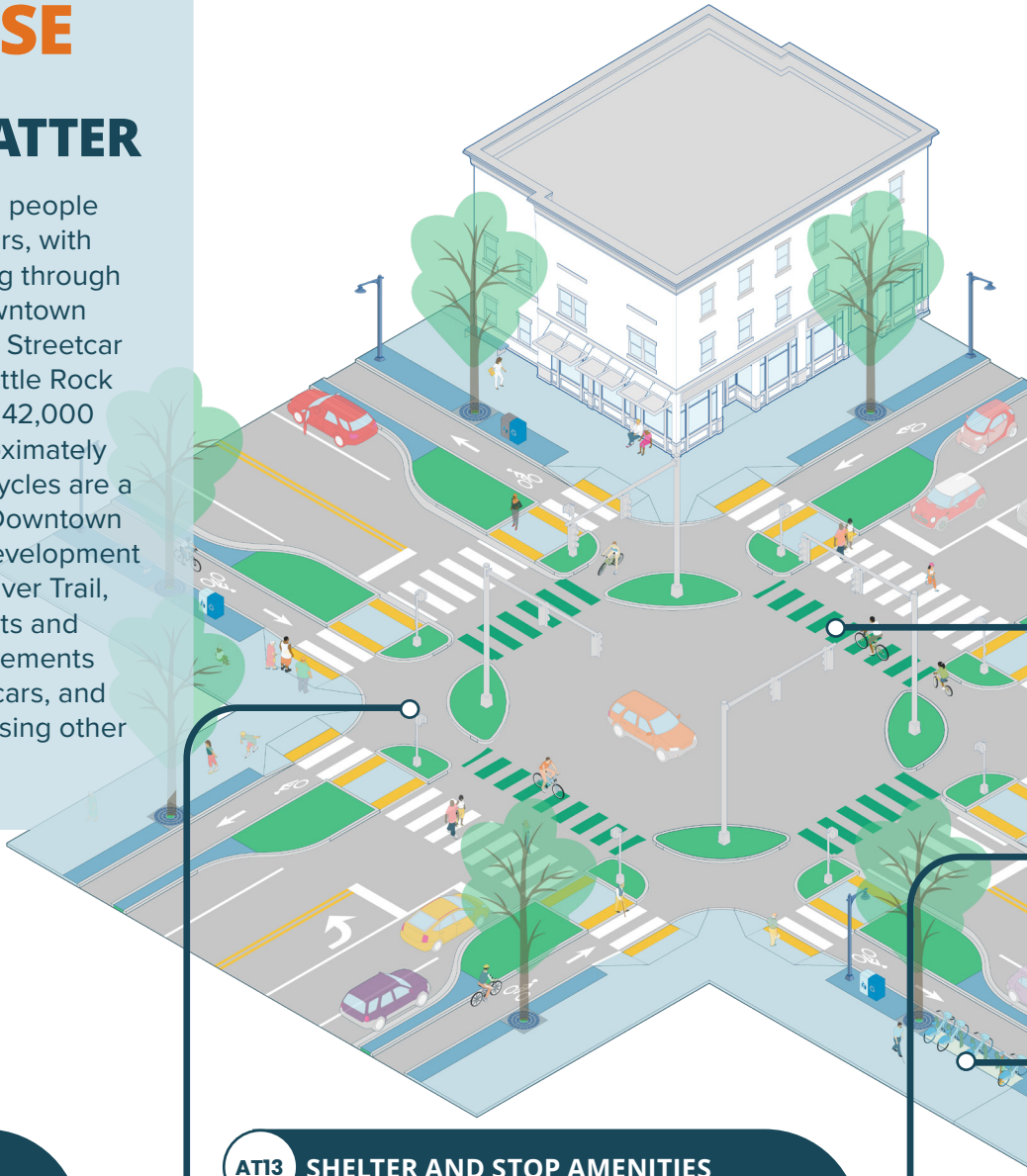
**Vehicle Volume and Operating Speeds**

**AADT: 5,000-15,000**

# 1B DOWNTOWN MIXED-USE

## CONNECTIONS MATTER

Transit plays a critical role in moving people along Downtown Mixed-Use corridors, with all but one METRO bus route running through the River Cities Travel Center in Downtown Little Rock. Additionally, the METRO Streetcar connects the commercial cores of Little Rock and North Little Rock, carrying over 42,000 riders annually and traversing approximately 1,100 miles each week. Similarly, bicycles are a major form of transportation along Downtown Mixed-Use streets. With compact development and the proximity of the Arkansas River Trail, these areas are attractive to bicyclists and other micromobility users. Design elements should give priority to buses, streetcars, and people walking, riding bicycles, or using other micromobility options.



### IC13 IC14 TRAFFIC SIGNAL OPERATIONS FOR PEDESTRIAN MOBILITY

Conflict points with motor vehicles should be minimized and mitigated through careful design and signal treatments at intersections. Maintaining the grade of the sidewalk and using high visibility paint or thermoplastic will provide clear priority for bicyclists and multi-use path users.

To maintain high levels of comfort and safety through intersections, protected intersections should be provided complete with protected waiting areas, dedicated signal phasing, and bike crossing markings.

### AT13 SHELTER AND STOP AMENITIES

Transit shelters and amenities such as benches, leaning rails, trash and recycling receptacles, signage, and real time information makes transit more comfortable and convenient. Siting of shelters is determined on a case-by-case basis but should be prioritized by ridership and at locations proximate to medical and social services, key municipal facilities, and activity centers. Location of shelters should minimize obstructions of sight lines and must be ADA-compliant. A 5’ long (parallel to curb) by 8’ deep landing zone should be provided at front and rear bus doors. Where sidewalks are at least 15’ wide, shelters can be placed 6’ from the building face to provide an accessible path behind the shelter.

IC1

## BIKE AND MOBILITY CROSSINGS

Intersections should include areas for people riding bicycles and using other micromobility devices to safely wait at red lights ahead of drivers traveling in the same direction. No turn on red restrictions should be combined with leading pedestrian and bike intervals to allow people walking, riding bicycles, and using other micromobility modes to enter the intersection before drivers. Pavement markings should be used to clearly indicate that drivers must yield to pedestrians and bike lane users.

AT5

AT6

## BUS/BIKE CONFLICT MANAGEMENT

At METRO bus stops where on-street parking is present, bus bulbs or floating bus islands should extend into the parking lane. This will allow for boarding and alighting without the need for the bus to leave the travel lane or cross the bike lane, speeding up service and increasing bus accessibility for people with movement disabilities. Bike lanes should continue behind the bus bulb or floating island and in front of the sidewalk, minimizing conflicts between buses and bicyclists.

BF2

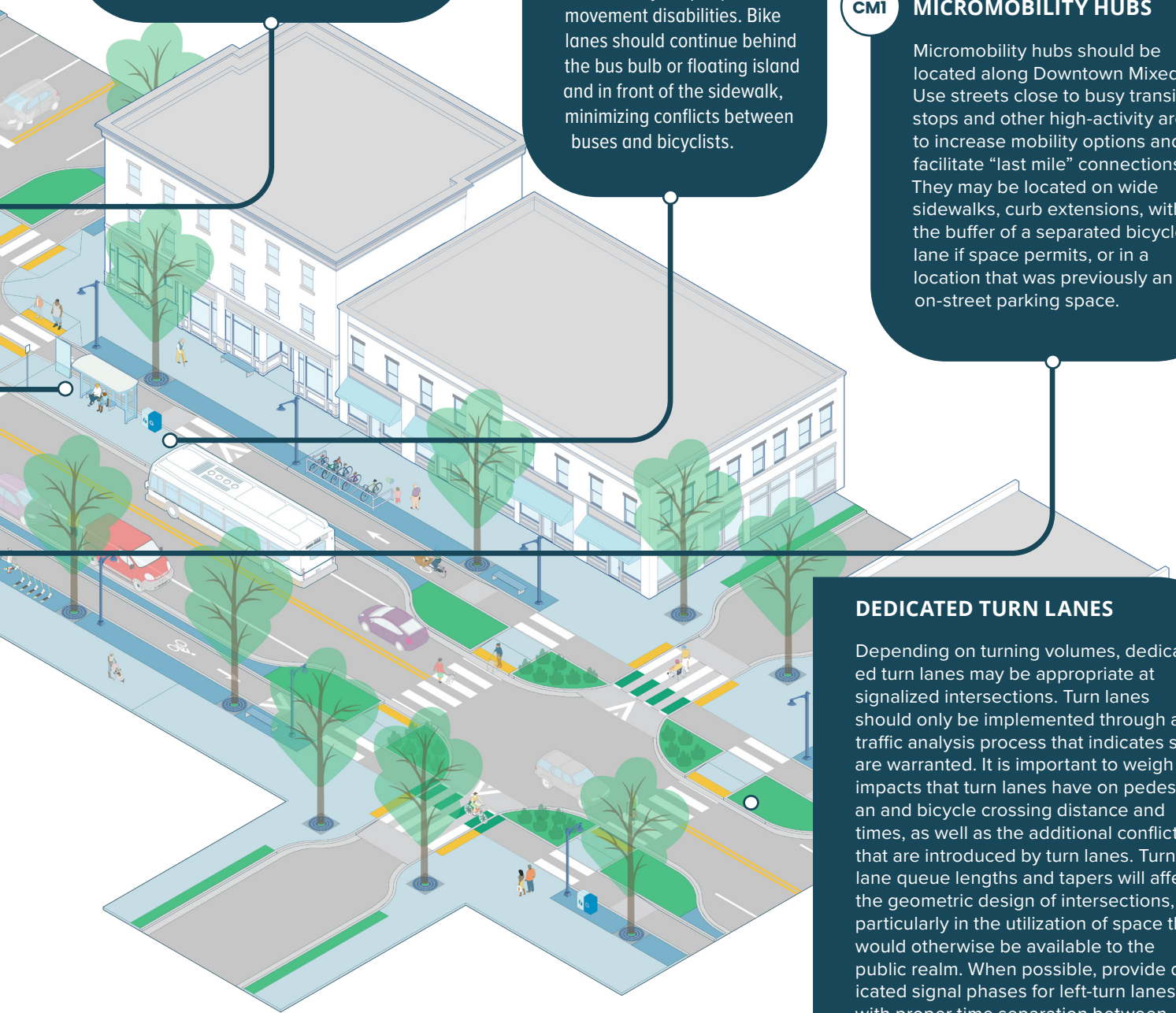
## BICYCLE PARKING

Bike parking should be provided on each block. Where higher demand destinations exist, more bike parking may be necessary. Bike parking may be located in the frontage or amenity zones of the sidewalk, curb extensions, or curbside space where there was previously on-street parking.

CM1

## MICROMOBILITY HUBS

Micromobility hubs should be located along Downtown Mixed-Use streets close to busy transit stops and other high-activity areas to increase mobility options and facilitate “last mile” connections. They may be located on wide sidewalks, curb extensions, within the buffer of a separated bicycle lane if space permits, or in a location that was previously an on-street parking space.



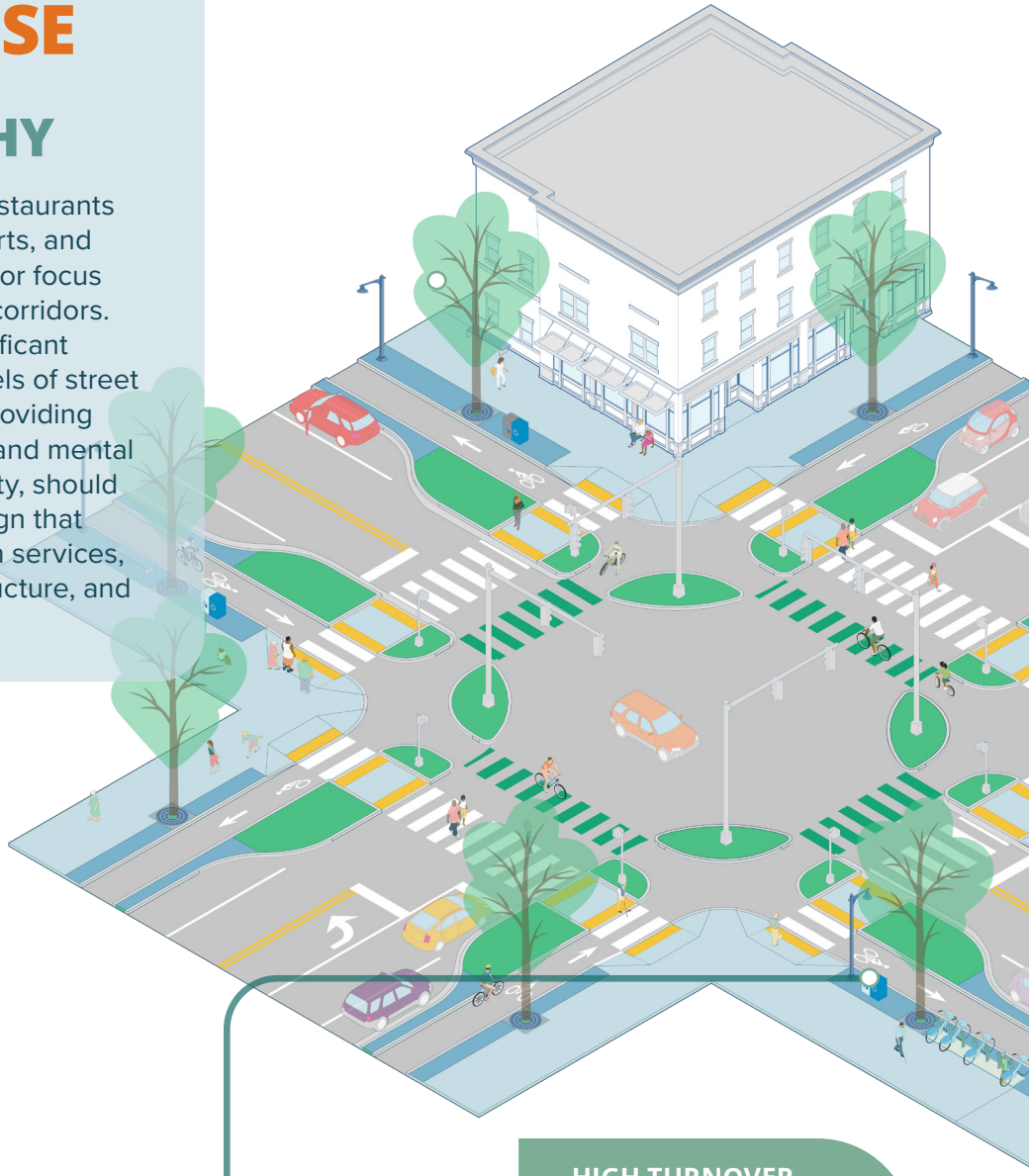
## DEDICATED TURN LANES

Depending on turning volumes, dedicated turn lanes may be appropriate at signalized intersections. Turn lanes should only be implemented through a traffic analysis process that indicates such are warranted. It is important to weigh the impacts that turn lanes have on pedestrian and bicycle crossing distance and times, as well as the additional conflicts that are introduced by turn lanes. Turn lane queue lengths and tapers will affect the geometric design of intersections, particularly in the utilization of space that would otherwise be available to the public realm. When possible, provide dedicated signal phases for left-turn lanes with proper time separation between pedestrian crossing phasing.

# 1C DOWNTOWN MIXED-USE

## VIBRANT + HEALTHY

Celebrating downtown shops and restaurants and thriving arts, entertainment, sports, and cultural destinations should be a major focus of design on Downtown Mixed-Use corridors. These streets should balance a significant volume of person-trips with high levels of street life, activity, and community pride. Providing opportunities for improved physical and mental health, as well as the health of the city, should be central, including intentional design that elevates access to health and human services, outdoor spaces, sustainable infrastructure, and art.



### PUBLIC ART

Public Art provides the opportunity to promote the unique cultural characteristics of a place, foster relationships with local artists, and engender pride in community and public space. Transit shelters, exterior building walls, buffer areas, roadway space, and sidewalks may be used for public art consistent with local ordinances.

### TRASH RECYCLING CONTAINERS

Recycling and trash receptacles should be placed at consistent intervals (every 300') along the street and at all bus stops and micromobility hubs. Ideal placement is in-line with a transit shelter or on a curb extension so that they do not interfere with the accessible pedestrian path.

### HIGH TURNOVER PARKING

On-street parking is commonly located in urban settings and is often metered as a revenue generator. In the Downtown Mixed-Use Corridor Type, on-street parking is typically parallel to the street and should be prohibited in proximity to intersections and driveways to provide clear sightlines and ensure people in crosswalks are visible to drivers. Spaces should be 8' wide (no less than 7') and at least 20' long.

## AT12 SIGNAGE AND WAYFINDING

Within Downtown Mixed-Use corridors, wayfinding signage provides relevant information such as transit stop locations, bicycle parking, and location of key destinations so that people may form a mental map. Wayfinding systems also make it more comfortable for people to walk, and people on foot or bicycle are more likely to patronize downtown businesses. Signage is scaled for pedestrians and is therefore smaller than signage for motorists. It should face toward the sidewalk or pedestrian space and comply with MUTCD standards.

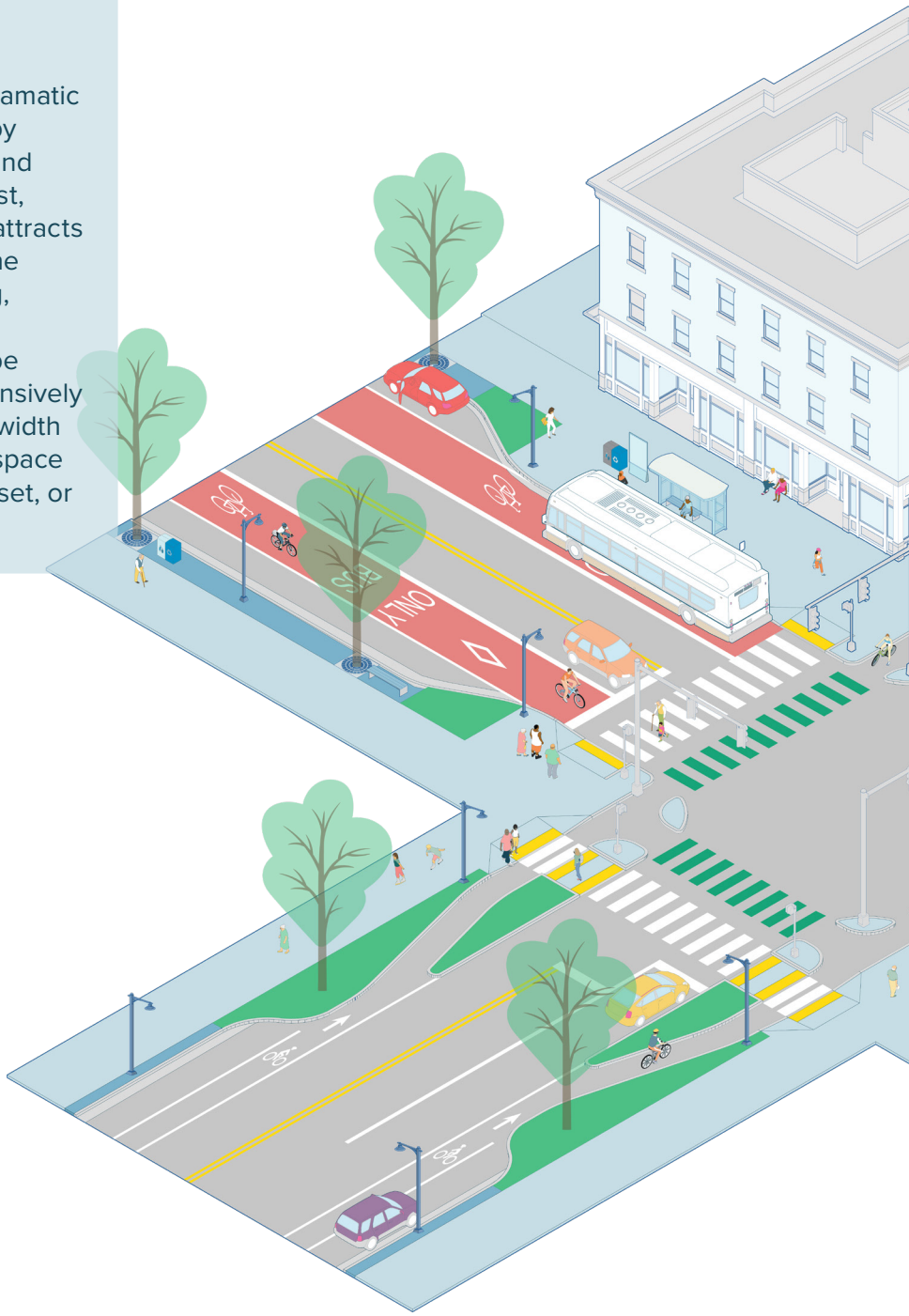
## AT13 BENCHES AND SEATING

Benches and seating should be located in high activity areas, and proximate to healthcare and social services.

# 1D DOWNTOWN MIXED-USE

## PRIORITY TRANSIT ALTERNATIVE

Dedicated bus priority lanes can have a dramatic and meaningful impact on transit service by reducing delay due to congested streets and raising visibility of high quality service. Fast, reliable service keeps existing riders and attracts new ones. It elevates the importance of the mode of transit to the equivalent of driving, and in turn the essential workers who rely on the service. Dedicated bus lanes can be implemented relatively quickly and inexpensively with simple signage and markings. Lane width should be determined by available street space and should be a minimum of 10' wide if offset, or a minimum of 11' wide if curbside.



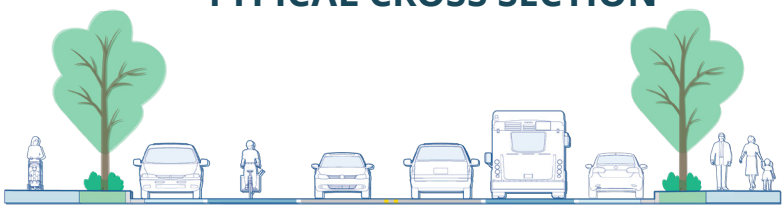

### ATII BUS STOP BOARDING AND ALIGHTING AREAS

All transit stops should be fully ADA accessible, safe, and comfortable. Stops should be well-marked, visible, and provide a clear sight-line between the operator and waiting passengers. Passengers should board and alight the bus in a landing zone. This area is an extension of the existing sidewalk extending to the curb and can be a continuous zone serving all doors of a bus. At minimum the landing zone at all bus doors should be 5' long by 8' deep, parallel to the curb and free of all obstructions including signposts and transit amenities. A curb extension can be used where the sidewalk is not wide enough or on-street parking is present. Shelters, seating, and other amenities should be provided at high-capacity transit stops to provide for the comfort and ease of use of transit riders. Shelters may have particular architectural design features in historic areas and should be sited and designed in consultation with Rock Region METRO.

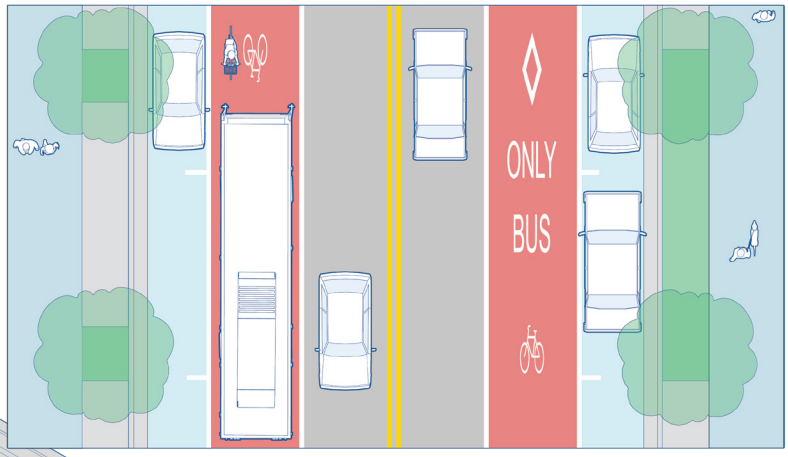
## AT10 DEDICATED BUS LANES

Consider dedicated bus lanes (or "bus priority lanes") on high-delay, high-frequency, and high-ridership corridors to improve speed and reliability of service. Transit signal priority can be used at intersections to allow the bus to "jump the line" of waiting traffic if behind schedule. Bus priority lanes should be a minimum of 11' and may also function as a dedicated bicycle lane.

## TYPICAL CROSS SECTION



| | SIDEWALK | BUFFER | PARALLEL PARKING | SHARED BUS/ BIKE LANE | TRAVEL LANES (2) | SHARED BUS/ BIKE LANE | PARALLEL PARKING | BUFFER | SIDEWALK |
|---|---|---|---|---|---|---|---|---|---|
| REC | 10' | 5' | 8' | 10' | 10' | 10' | 8' | 6' | 6' |
| MIN | 5' | 4' | 7' | 10' | 9' | 10' | 7' | 6' | 6' |
| MAX | - | - | 9' | 12' | 11' | 12' | 9' | 6' | 6' |



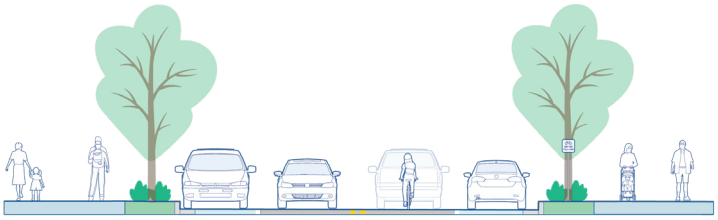
# 02 TOWN MAIN STREET

Town Main Streets are the central streets of smaller communities throughout the CARTS region. These are the historic small town economic centers, comprised of civic, retail, dining, and professional service uses. Town Main Streets are highly walkable, having on-street parking, street trees, and slower traffic speeds. While multimodal infrastructure for walking, bicycling, and transit use usually does exist along Town Main Streets, connectivity of this infrastructure may not reach very far into the community or link to the larger region.

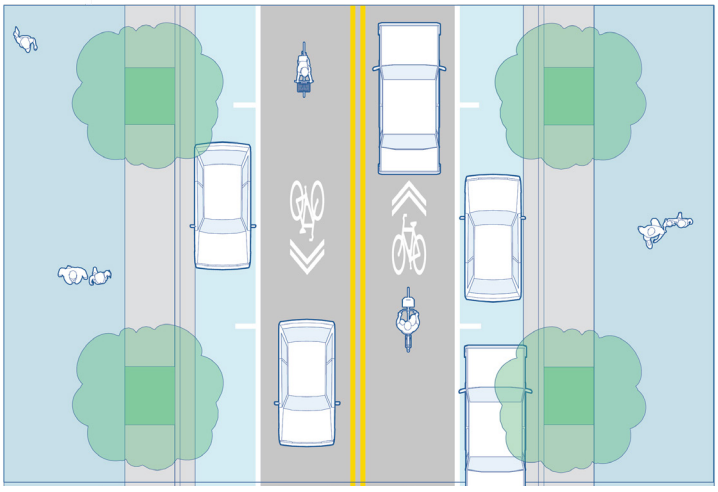
## Example Streets

- Front Street SW, Lonoke
- North Market Street, Benton
- Kavanaugh Blvd, Little Rock
- Main Street, Cabot

# TYPICAL CROSS SECTION



| | SIDEWALK | BUFFER | PARALLEL PARKING | TRAVEL LANES (2) | PARALLEL PARKING | BUFFER | SIDEWALK |
|---|---|---|---|---|---|---|---|
| REC | 12' | 5' | 8' | 10' | 8' | 5' | 12' |
| MIN | 5' | 4' | 7' | 9' | 7' | 4' | 5' |
| MAX | - | - | 9' | 11' | 9' | - | - |



# 2A TOWN MAIN STREET

## SAFETY + ACCESSIBILITY

As the center of activity for many small communities, Town Main Street corridors experience relatively high volumes of vehicular traffic, comprised of both through trips and local trips. Because the destinations found along Town Main Street corridors are attractive to all age groups, design features should encourage low vehicle speeds, including the use of travel lanes no wider than 11', on-street parking, curb extensions, crossing islands, and tree canopies. At complex or simply busy intersections treatments should provide clear priority and sight lines for people who are walking, riding bicycles, accessing transit or using other micromobility modes.

### IC7 CURB RAMPS

Curb ramps that are perpendicular to crosswalks should be provided along every leg of intersecting streets.

### IC2 DAYLIGHTING

On-street parking should be prohibited in proximity to intersecti and driveways to provide clear sightlines and ensure people in crosswalks are visible to drivers.

### PICKUP AND DROPOFF ZONES

Accessible parking and loading spaces should be designated near key destinations. Loading zones should be located every block where on-street parking is present. Loading zones should be designed to accommodate rideshare pick-up/drop-off during commute hours, nighttime, and week-ends and commercial loading during weekday business hours. On two-way streets, marked loading zones may not be necessary; vehicles may load directly from the street and contraflow vehicles may slowly pass.

### IC10 DRIVEWAY CROSSINGS

Where possible, driveways should be consolidated and width narrowed to the minimum needed for design vehicle entry and egress. Priority throughout the driveway crossing should be given to people walking, riding bicycles, and using other micromobility devices while maintaining their continuous path at sidewalk level.

### IC9 RAISED CROSSINGS

Raised crosswalks are ramped speed tables that can be paced at unsignalized intersections with high pedestrian activity or at midblock. Other frequent locations include near schools or pick up/drop off zones near an activity center such as a theater or sports venue. Ideal width for the crosswalk is 10', it is demarcated with paint or textured materials, and includes detectable warnings and curb ramps at the street edge for pedestrians with impaired vision.

### SIDEWALK LIGHTING

To provide a safe an comfortable public realm, lighting fixtur should be scaled for pedestrians and veh Light poles and fixtu styles may also be u as effective artistic a placemaking eleme

ons

IC3

## CURB EXTENSIONS

Curb extensions should be used in place of on-street parking in proximity to intersections to increase pedestrian visibility, decrease pedestrian crossing distances, and physically prohibit parking too close to the intersection. Curb extensions are also a preferred traffic calming treatment because they slow vehicle travel speeds, add space for landscaping and stormwater infiltration, and provide opportunities for art installations and creative placemaking.

IC9

## CROSSWALKS

Crosswalks should be located at all signalized intersections and marked with enhanced continental style striping or thermoplastic or textured or colored paving materials consistent with the MUTCD. Crosswalks may also be located at unsignalized intersections and at midblock locations where there is regular pedestrian traffic, such as near activity centers or transit stops. Crosswalks should always connect to a sidewalk with an ADA curb ramp.

BF4

## VERTICAL SEPARATION

Horizontal and vertical separation between bicycle facilities and vehicle travel and parking lanes should be provided. When adjacent to parking lanes, the physical separation should be at least 3' wide to protect users from opening car doors.

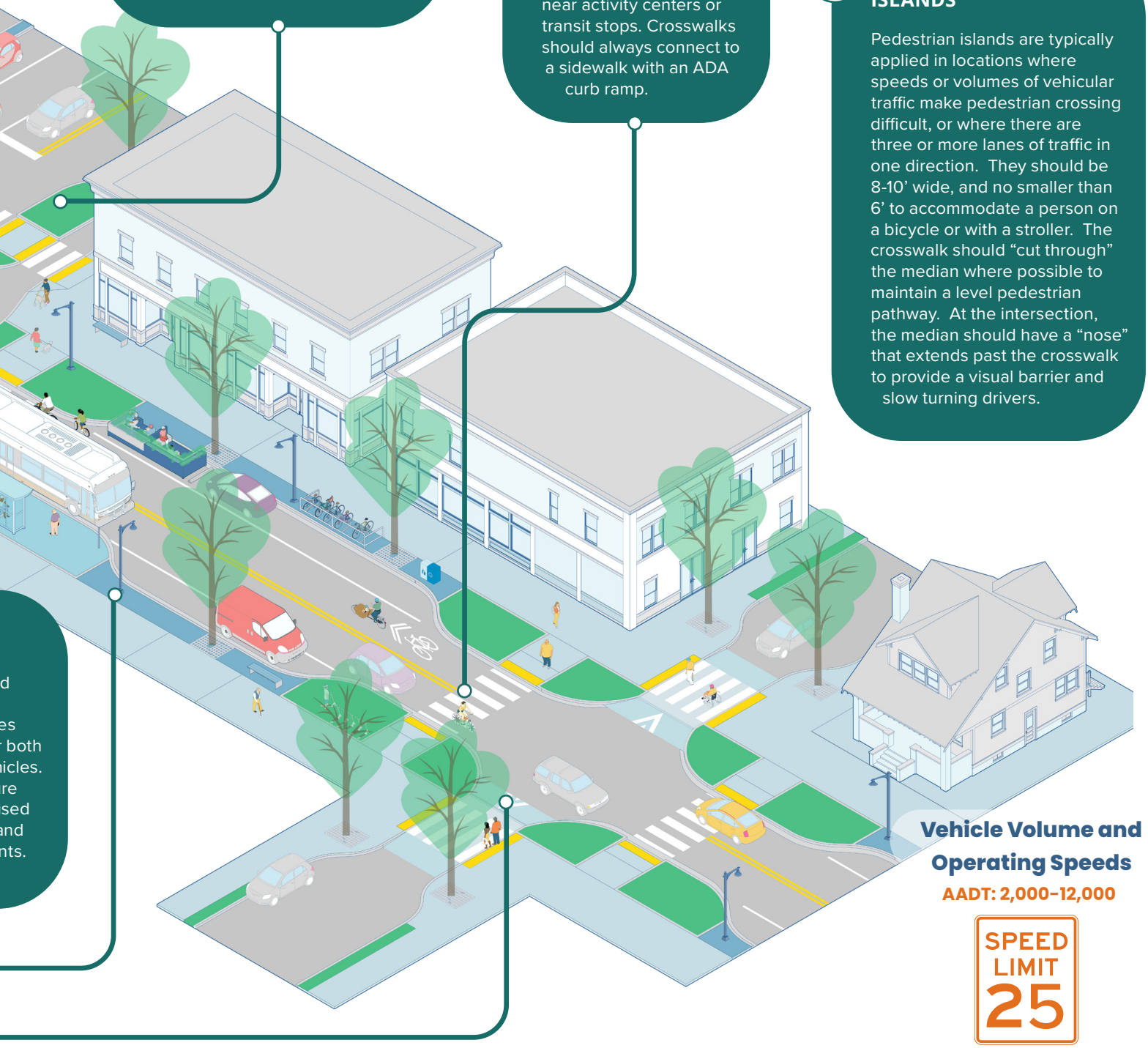
IC4

## PEDESTRIAN ISLANDS

Pedestrian islands are typically applied in locations where speeds or volumes of vehicular traffic make pedestrian crossing difficult, or where there are three or more lanes of traffic in one direction. They should be 8-10' wide, and no smaller than 6' to accommodate a person on a bicycle or with a stroller. The crosswalk should "cut through" the median where possible to maintain a level pedestrian pathway. At the intersection, the median should have a "nose" that extends past the crosswalk to provide a visual barrier and slow turning drivers.

d

es
both
icles.
re
sed
and
nts.



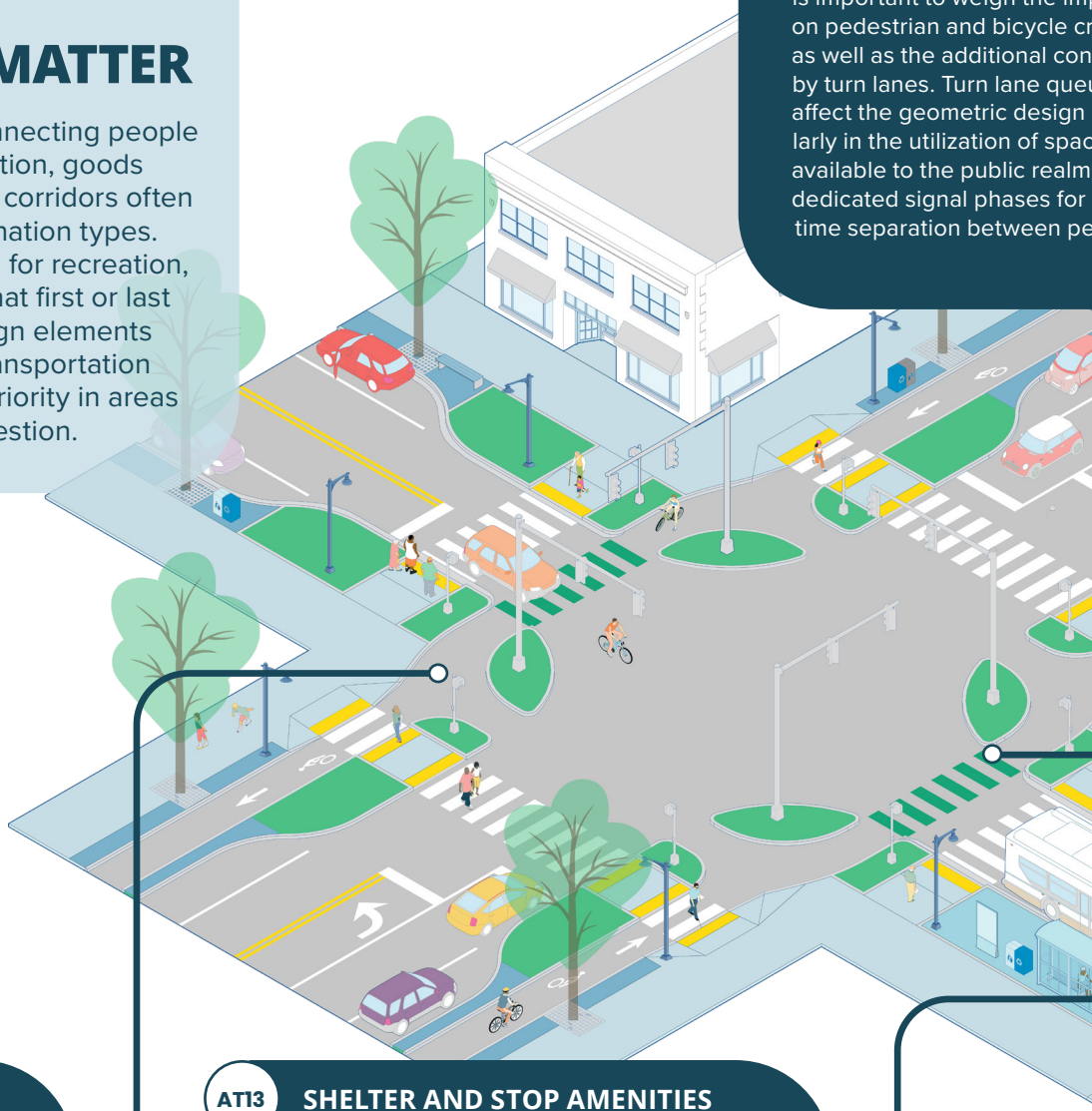
**Vehicle Volume and Operating Speeds**

**AADT: 2,000-12,000**

# 2B TOWN MAIN STREET

## CONNECTIONS MATTER

Transit plays a critical role in connecting people across the region to jobs, education, goods and services. Town Main Street corridors often contain one or all of these destination types. Similarly bicycles are often used for recreation, close commuting, and making that first or last mile connection to transit. Design elements providing for safe multimodal transportation should be provided and given priority in areas with high activity levels or congestion.



### DEDICATED TURN LANE

Depending on turning volum
may be appropriate at signa
lanes should only be implem
analysis process that indicat
is important to weigh the im
on pedestrian and bicycle cr
as well as the additional con
by turn lanes. Turn lane queu
affect the geometric design
larly in the utilization of spac
available to the public realm
dedicated signal phases for
time separation between pe

### IC13 INTERSECTION TREATMENTS FOR BIKE LANES

### IC14

Conflict points with motor vehicles should be minimized and mitigated through careful design and signal treatments at intersections. Maintaining the grade of the sidewalk and using high visibility paint or thermoplastic will provide clear priority for bicyclists and multi-use path users.

To maintain high levels of comfort and safety through intersections, protected intersections should be provided complete with protected waiting areas, dedicated signal phasing, and bike crossing markings.

### AT13 SHELTER AND STOP AMENITIES

Transit shelters and amenities such as benches, leaning rails, trash and recycling receptacles, signage, and real time information makes transit more comfortable and convenient. Siting of shelters is determined on a case-by-case basis but should be prioritized at locations proximate to medical and social services, key municipal facilities, and activity centers. Location of shelters should minimize obstructions of sight lines and must be ADA-compliant. A 5' long (parallel to curb) by 8' deep landing zone should be provided at front and rear bus doors. Where sidewalks are at least 15' wide, shelters can be placed 6' from the building face to provide an accessible path behind the shelter.

## ES

nes, dedicated turn lanes
lized intersections. Turn
nented through a traffic
es such are warranted. It
pacts that turn lanes have
ossing distance and times,
flicts that are introduced
ue lengths and tapers will
of intersections, particu-
e that would otherwise be
. When possible, provide
left-turn lanes with proper
edestrian crossing phasing.

## IC1 BIKE AND MICROMOBILITY CROSSINGS

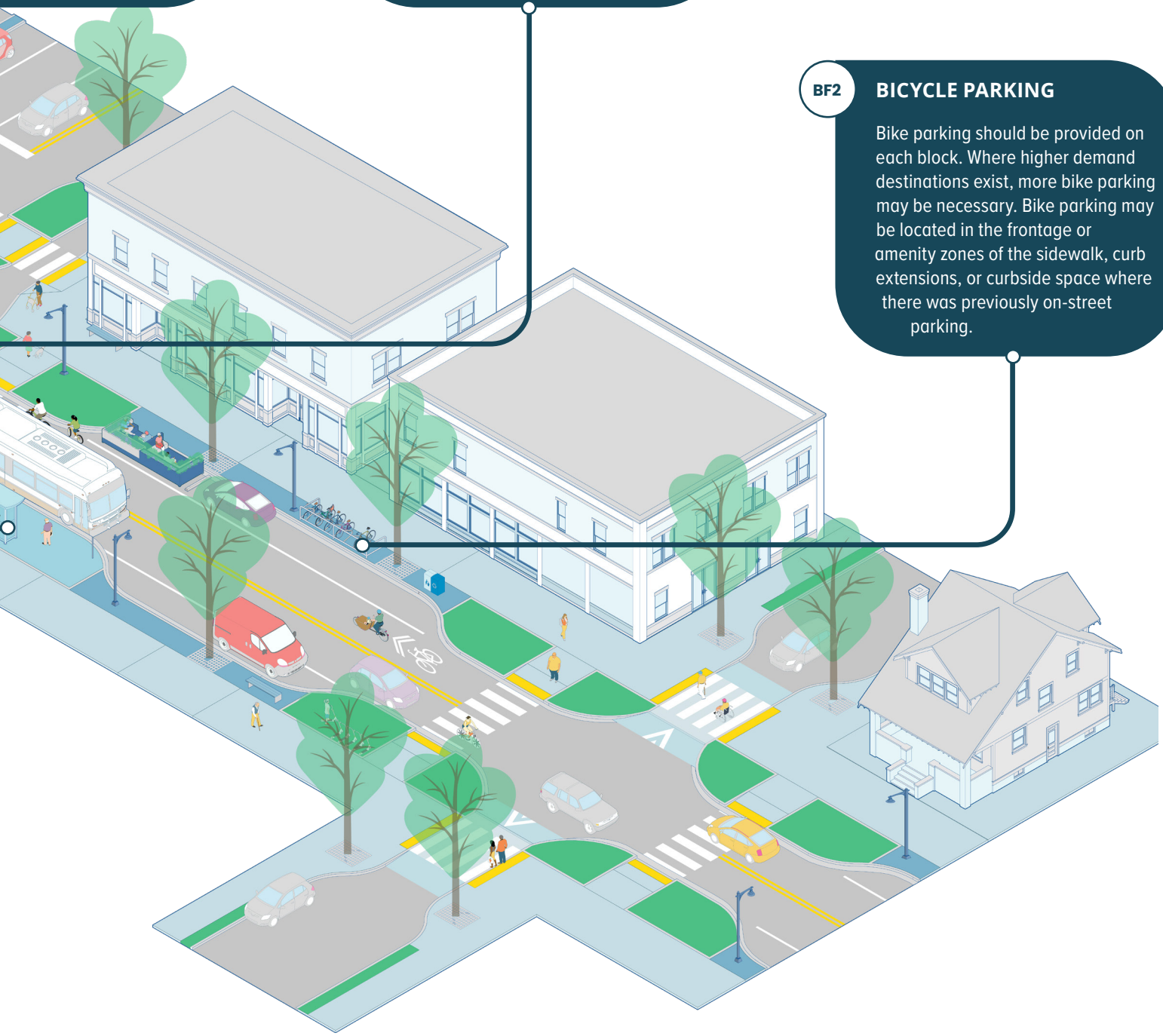
Intersections should include areas for people riding bicycles and using other micromobility devices to safely wait at red lights ahead of drivers traveling in the same direction. No turn on red restrictions should be combined with leading pedestrian and bike intervals to allow people walking, riding bicycles, and using other micromobility modes to enter the intersection before drivers. Pavement markings should be used to clearly indicate that drivers must yield to pedestrians and bike lane users.

## CM1 MICROMOBILITY HUBS

Micromobility hubs should be located along the Town Main Street proximate to high-use transit stops or other high-activity areas to increase mobility options and facilitate “last mile” connections. They may be located on wide sidewalks, curb extensions, within the buffer of a separated bicycle lane if space permits, or in a location that was previously an on-street parking space.

## BF2 BICYCLE PARKING

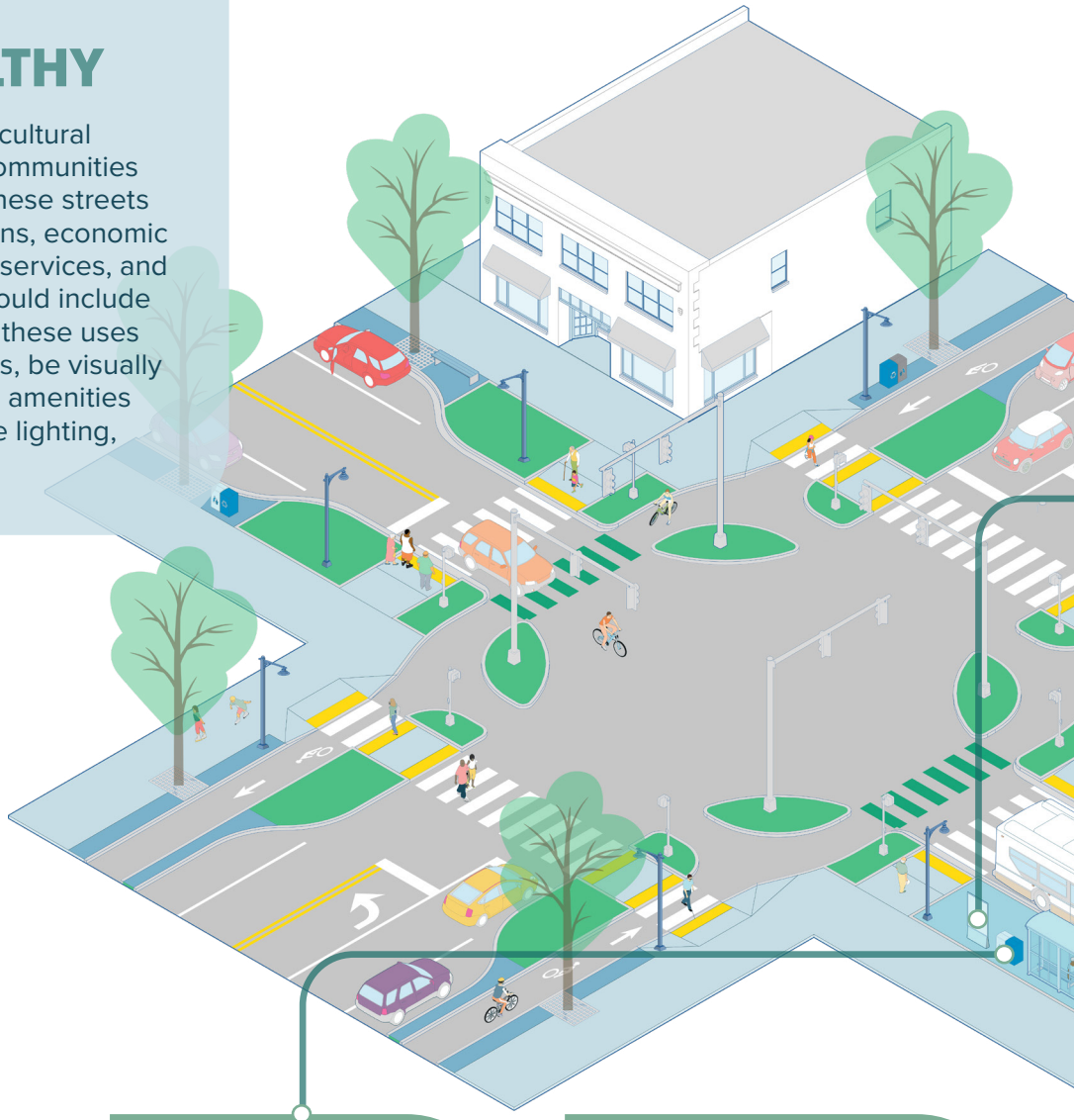
Bike parking should be provided on each block. Where higher demand destinations exist, more bike parking may be necessary. Bike parking may be located in the frontage or amenity zones of the sidewalk, curb extensions, or curbside space where there was previously on-street parking.



# 2C TOWN MAIN STREET

## VIBRANT + HEALTHY

Town Main Streets are often the cultural and economic heart of smaller communities throughout the CARTS region. These streets should facilitate casual interactions, economic exchange, and access to goods, services, and information. Design elements should include and support safe access to all of these uses for people of all ages and abilities, be visually appealing, and offer comfortable amenities such as seating, pedestrian-scale lighting, wayfinding, and art.



### PUBLIC ART

Public Art provides the opportunity to promote the unique cultural characteristics of a place, foster relationships with local artists, and engender pride in community and public space. Transit shelters, exterior building walls, buffer areas, roadway space, and sidewalks may be used for public art consistent with local ordinances.

### TRASH AND RECYCLING CONTAINERS

Recycling and Trash receptacles should be placed at consistent intervals (every 400-500 feet) along the street and at all bus stops and micromobility hubs. Ideal placement is in-line with a transit shelter or on a curb extension so that they do not interfere with the accessible pedestrian path.

### HIGH TURNOVER PARKING

On-street parking is commonly located in urban settings and is often metered as a revenue generator. In the Town Main Street Corridor Type, on-street parking is typically parallel to the street and should be prohibited in proximity to intersections and driveways to provide clear sightlines and ensure people in crosswalks are visible to drivers. Spaces should be 8' wide (no less than 7') and at least 20' long.

AT12

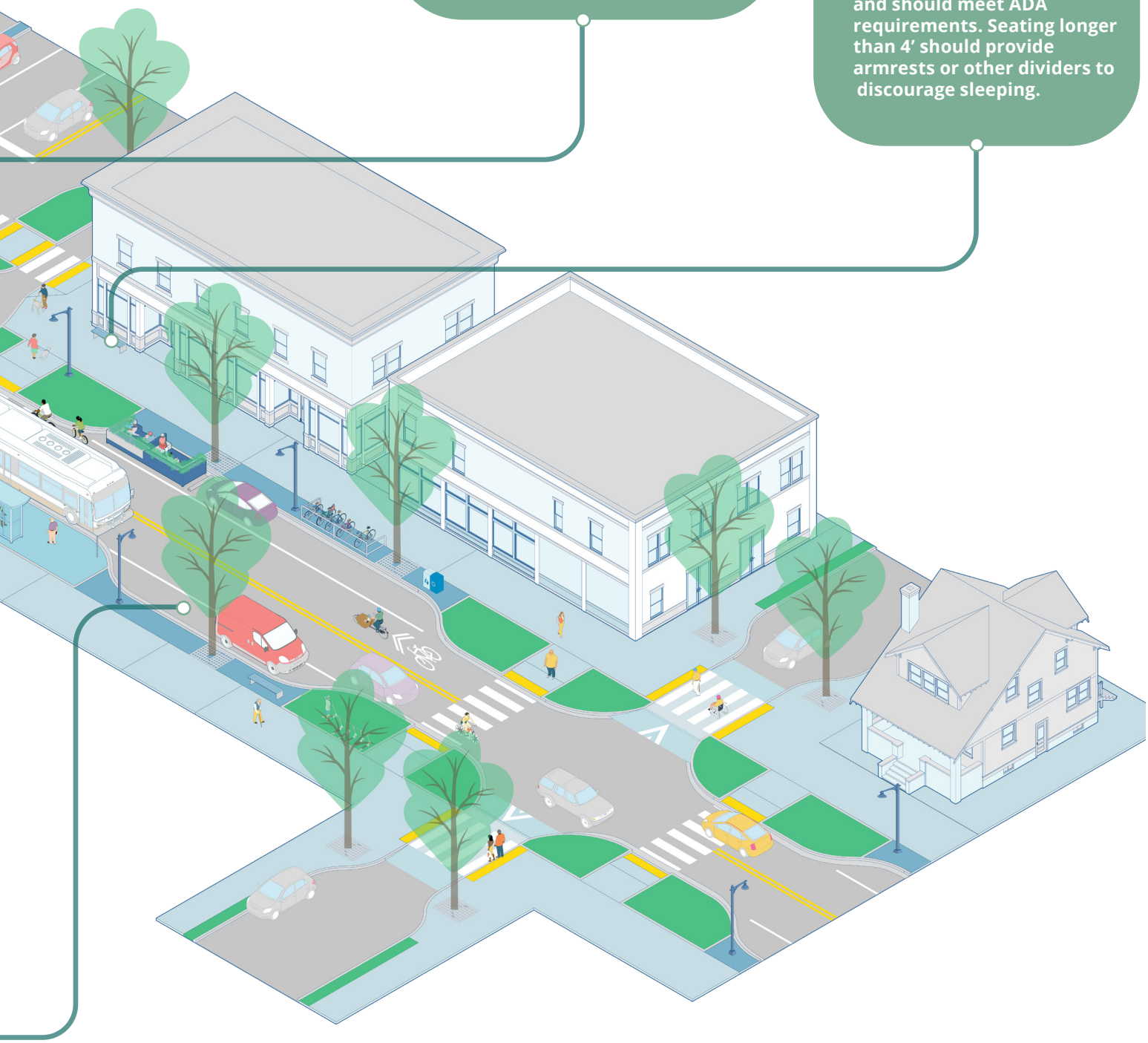
## SIGNAGE AND WAYFINDING

Within Town Main Street corridors, wayfinding signage provides relevant information such as transit stop locations, bicycle parking, and location of key destinations so that people may form a mental map. Wayfinding systems also make it more comfortable for people to walk, and people on foot or bicycle are more likely to patronize businesses. Signage is scaled for pedestrians and is therefore smaller than signage for motorists. It should face toward the sidewalk or pedestrian space and comply with MUTCD standards.

AT13

## BENCHES AND SEATING

**Seating provides a place to rest, wait, or stop and observe surrounding activity. Seating should be provided at regular intervals on Town Main Street corridors, and/or proximate to high activity areas, near healthcare and social services. Bench seating should accommodate at least two people, be affixed to the sidewalk or other permanent structure, and should meet ADA requirements. Seating longer than 4' should provide armrests or other dividers to discourage sleeping.**



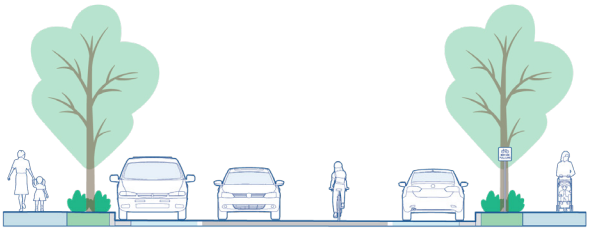
# 03 URBAN RESIDENTIAL

Urban Residential streets are streets defined primarily by single-family residential structures, sitting on smaller lots and addressing the street frontage. These streets are primarily found in older, more dense residential areas of the cities and towns that make up the CARTS region. They are typically narrow, encourage slower traffic, often have formal or informal on-street parking, and are tree-lined. They are streets where activity abounds and life happens from neighbors visiting from their front porches to children playing. Walking and bicycling is commonplace on these streets.

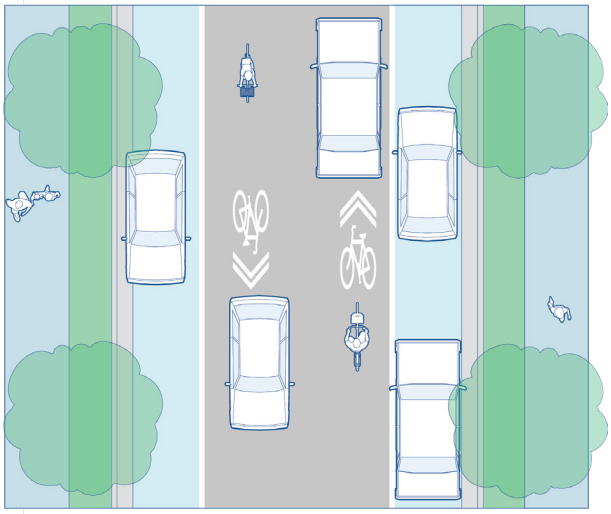
## Example Streets

- 5th Street, North Little Rock
- Maple Street; North Little Rock
- Monroe Street, Little Rock
- Sevier Street, Benton
- E 6th Street, Little Rock

# TYPICAL CROSS SECTION



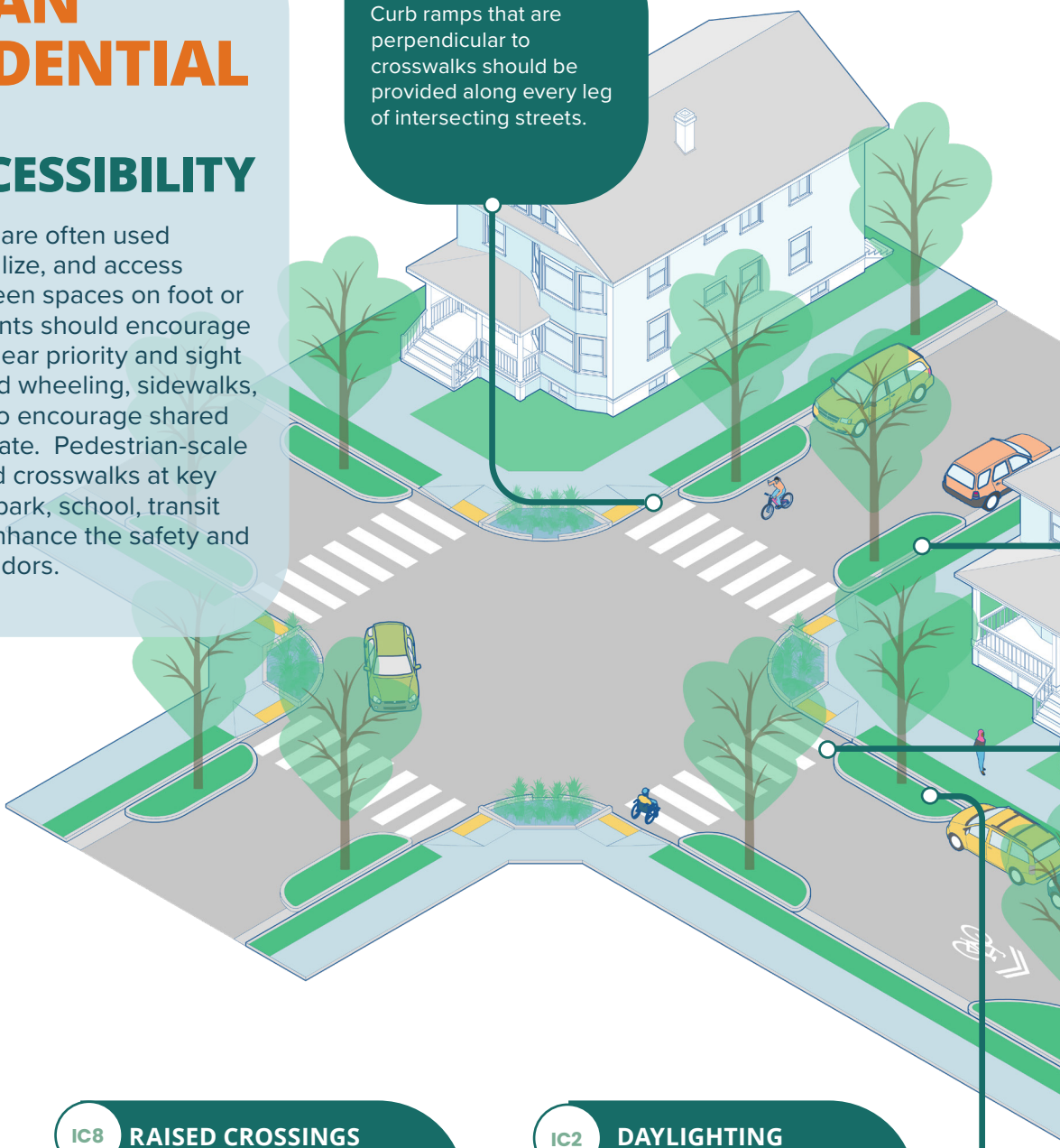
| | SIDEWALK | BUFFER | PARALLEL PARKING | TRAVEL LANES (2) | PARALLEL PARKING | BUFFER | SIDEWALK |
|---|---|---|---|---|---|---|---|
| REC | 6' | 5' | 8' | 9' | 8' | 5' | 6' |
| MIN | 5' | 4' | 7' | 9' | 7' | 4' | 5' |
| MAX | - | - | 9' | 11' | 9' | - | - |



# 3A URBAN RESIDENTIAL

## SAFETY + ACCESSIBILITY

Urban Residential streets are often used by local residents to socialize, and access neighbors' homes and green spaces on foot or by bicycle. Design elements should encourage lower vehicular speeds, clear priority and sight lines for those walking and wheeling, sidewalks, and pavement markings to encourage shared use of streets as appropriate. Pedestrian-scale street lighting and marked crosswalks at key locations (such as near a park, school, transit stop, or other civic use) enhance the safety and accessibility of these corridors.



### IC7 CURB RAMPS

Curb ramps that are perpendicular to crosswalks should be provided along every leg of intersecting streets.

### SIDEWALK LIGHTING

Along Urban Residential streets, a mid-height lighting fixture should be capable of providing safety and comfort to both pedestrians and drivers. Light poles and fixture styles may also be used as effective artistic and placemaking elements.

### IC8 RAISED CROSSINGS

Raised crosswalks are ramped speed tables that can be paced at unsignalized intersections with high pedestrian activity or at midblock. Other frequent locations include near schools or pick up/drop off zones near an activity center such as a theater or sports venue. Ideal width for the crosswalk is 10', it is demarcated with paint or textured materials, and includes detectable warnings and curb ramps at the street edge for pedestrians with impaired vision.

### IC2 DAYLIGHTING

On-street parking should be prohibited in proximity to intersections and driveways to provide clear sightlines and ensure people in crosswalks are visible to drivers.

IC3

## CURB EXTENSIONS

Curb extensions should be used in place of on-street parking in proximity to intersections to increase pedestrian visibility, decrease pedestrian crossing distances, and physically prohibit parking too close to the intersection. Curb extensions are also a preferred traffic calming treatment because they slow vehicle travel speeds, add space for landscaping and stormwater infiltration, and provide opportunities for art installations and creative placemaking.

IC9

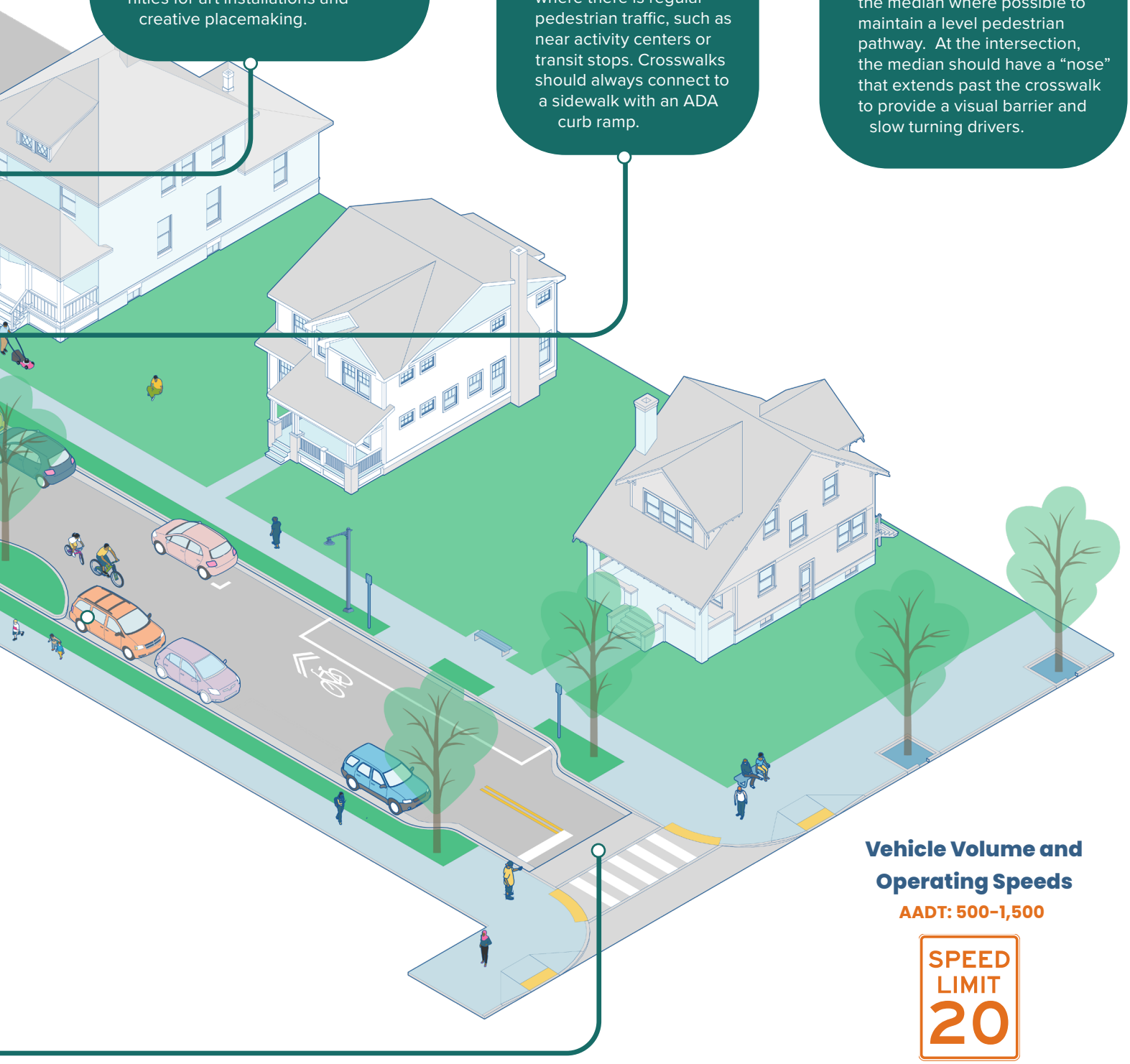
## CROSSWALKS

Crosswalks should be located at all signalized intersections and marked with enhanced continental style striping or thermoplastic or textured or colored paving materials consistent with the MUTCD. Crosswalks may also be located at unsignalized intersections and at midblock locations where there is regular pedestrian traffic, such as near activity centers or transit stops. Crosswalks should always connect to a sidewalk with an ADA curb ramp.

IC4

## PEDESTRIAN ISLANDS

Pedestrian islands are typically applied in locations where speeds or volumes of vehicular traffic make pedestrian crossing difficult, or where there are three or more lanes of traffic in one direction. They should be 8-10' wide, and no smaller than 6' to accommodate a person on a bicycle or with a stroller. The crosswalk should "cut through" the median where possible to maintain a level pedestrian pathway. At the intersection, the median should have a "nose" that extends past the crosswalk to provide a visual barrier and slow turning drivers.



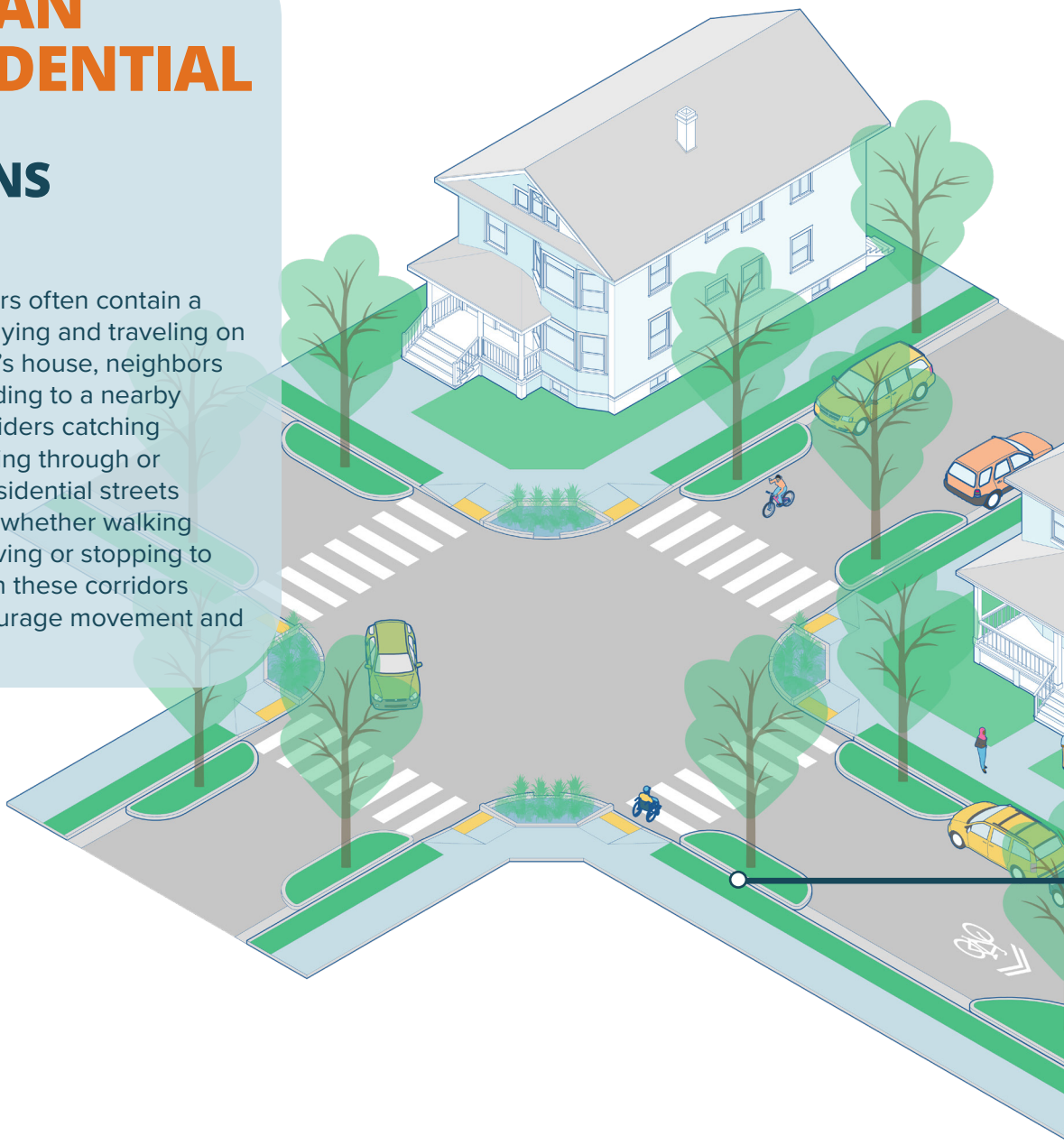
**Vehicle Volume and Operating Speeds**

**AADT: 500-1,500**

# 3B URBAN RESIDENTIAL

## CONNECTIONS MATTER

Urban Residential corridors often contain a mix of users - children playing and traveling on foot or by bike to a friend's house, neighbors visiting neighbors or heading to a nearby commercial area, transit riders catching the bus, and drivers passing through or headed home. Urban Residential streets should prioritize all users whether walking or wheeling, whether moving or stopping to socialize. Infrastructure in these corridors should support and encourage movement and



**BF2**

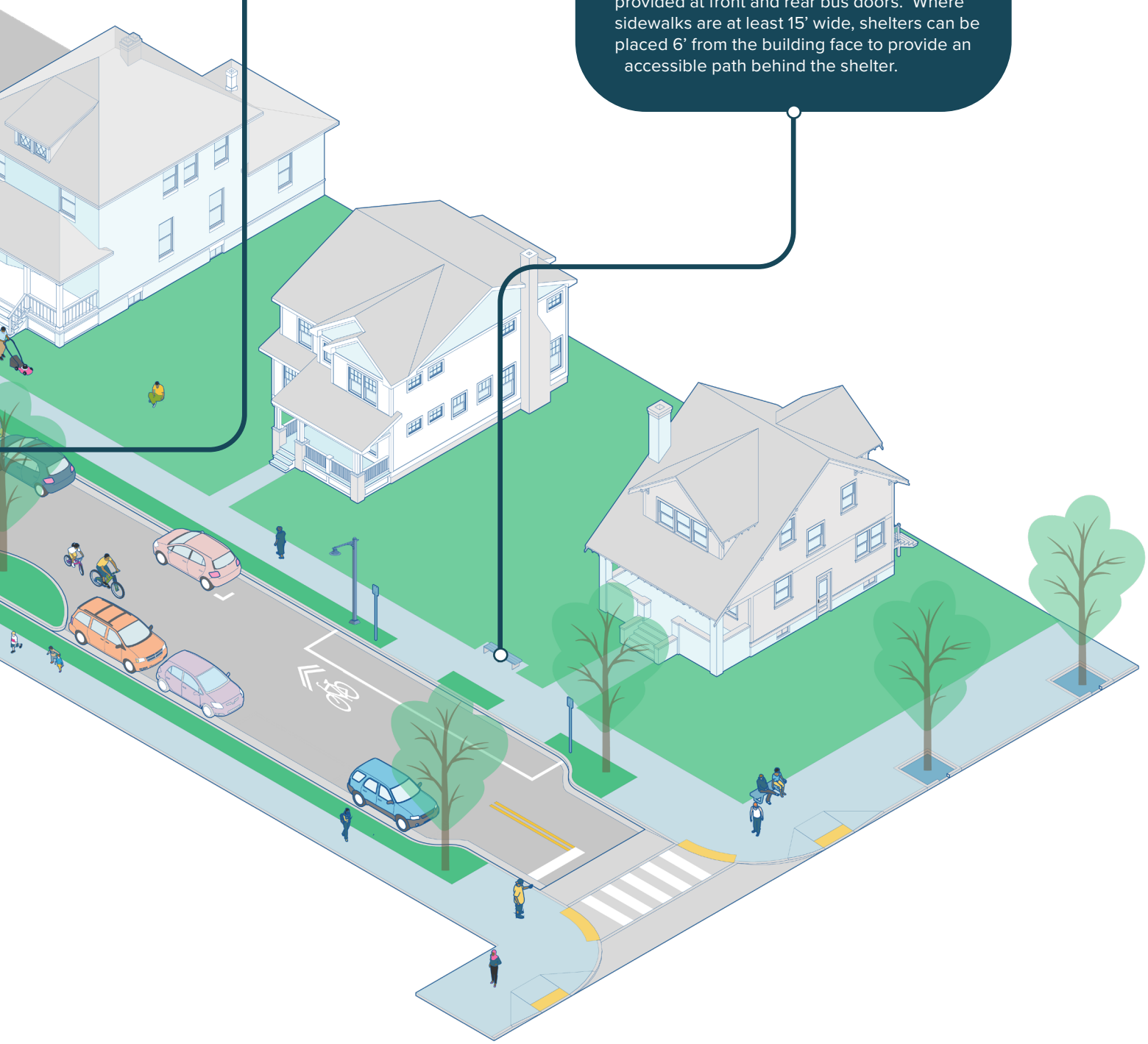
## BICYCLE PARKING

On Urban Residential streets, bike parking should be the responsibility of individual homeowners. However, were neighborhood commercial uses exist, bike parking should be provided in close proximity to destinations.

**AT3**

## SHELTER AND STOP AMENITIES

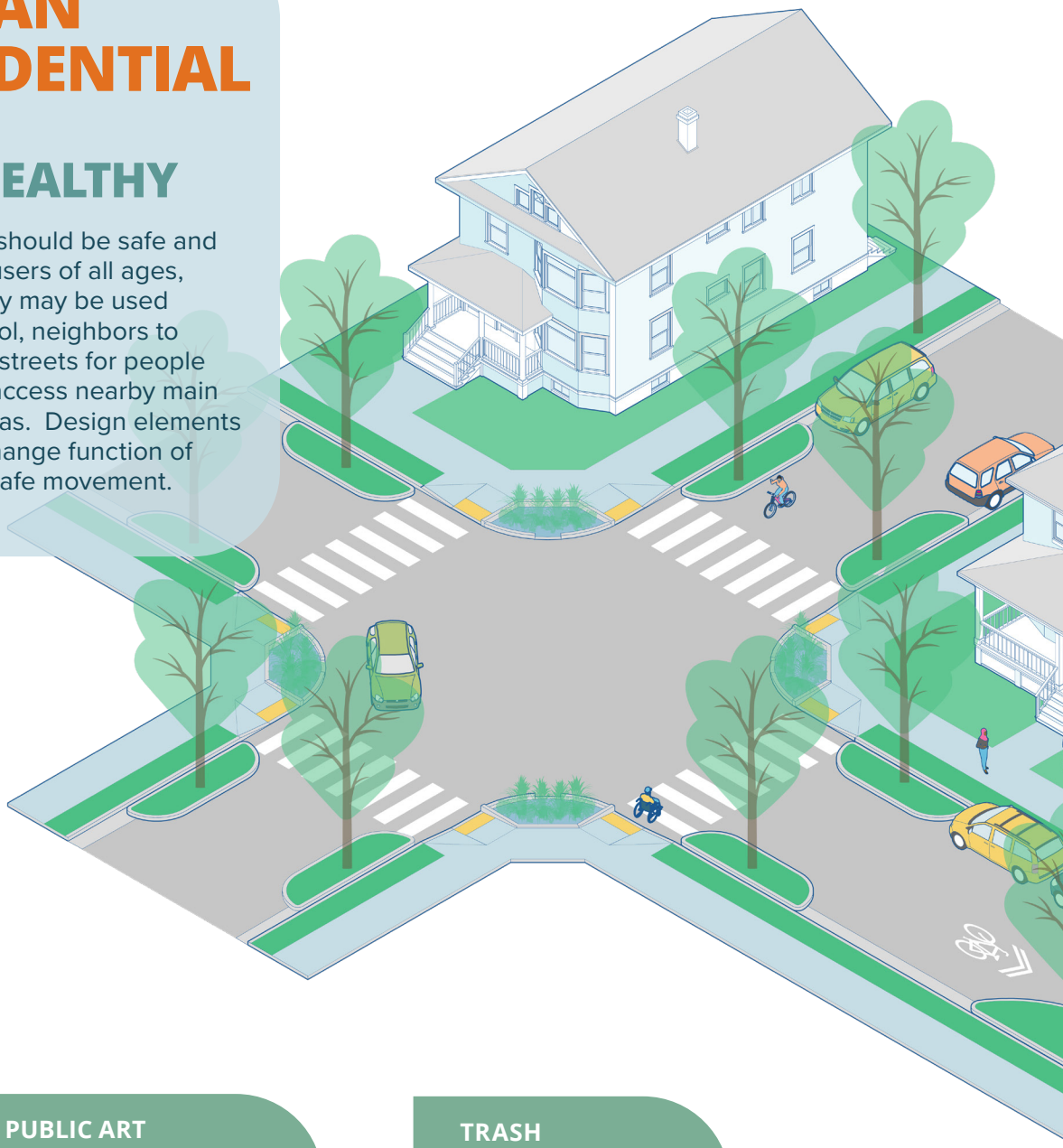
Transit shelters and amenities such as benches, leaning rails, trash and recycling receptacles, signage, and real time information makes transit more comfortable and convenient. Siting of shelters is determined on a case-by-case basis but should be prioritized at locations proximate to medical and social services, and high-density residential areas including apartment complexes. Location of shelters should minimize obstructions of sight lines and must be ADA-compliant. A 5' long (parallel to curb) by 8' deep landing zone should be provided at front and rear bus doors. Where sidewalks are at least 15' wide, shelters can be placed 6' from the building face to provide an accessible path behind the shelter.



# 3C URBAN RESIDENTIAL

## VIBRANT + HEALTHY

Urban residential streets should be safe and inviting to residents and users of all ages, abilities, and modes. They may be used by children to get to school, neighbors to socialize, and as through-streets for people from outside the area to access nearby main streets or commercial areas. Design elements to support the social exchange function of these streets, as well as safe movement.



### PUBLIC ART

Public Art provides the opportunity to promote the unique cultural characteristics of a place, foster relationships with local artists, and engender pride in community and public space. Transit shelters, exterior building walls, buffer areas, roadway space, and sidewalks may be used for public art consistent with local ordinances.

### TRASH RECYCLING CONTAINERS

Recycling and trash receptacles should be provided at any bus stop that also has a shelter, or if it is colated with a micromobility hub. Ideal placement is in-line with the shelter. It should not interfere with the clear pedestrian path or with boarding and alighting areas.

AT12

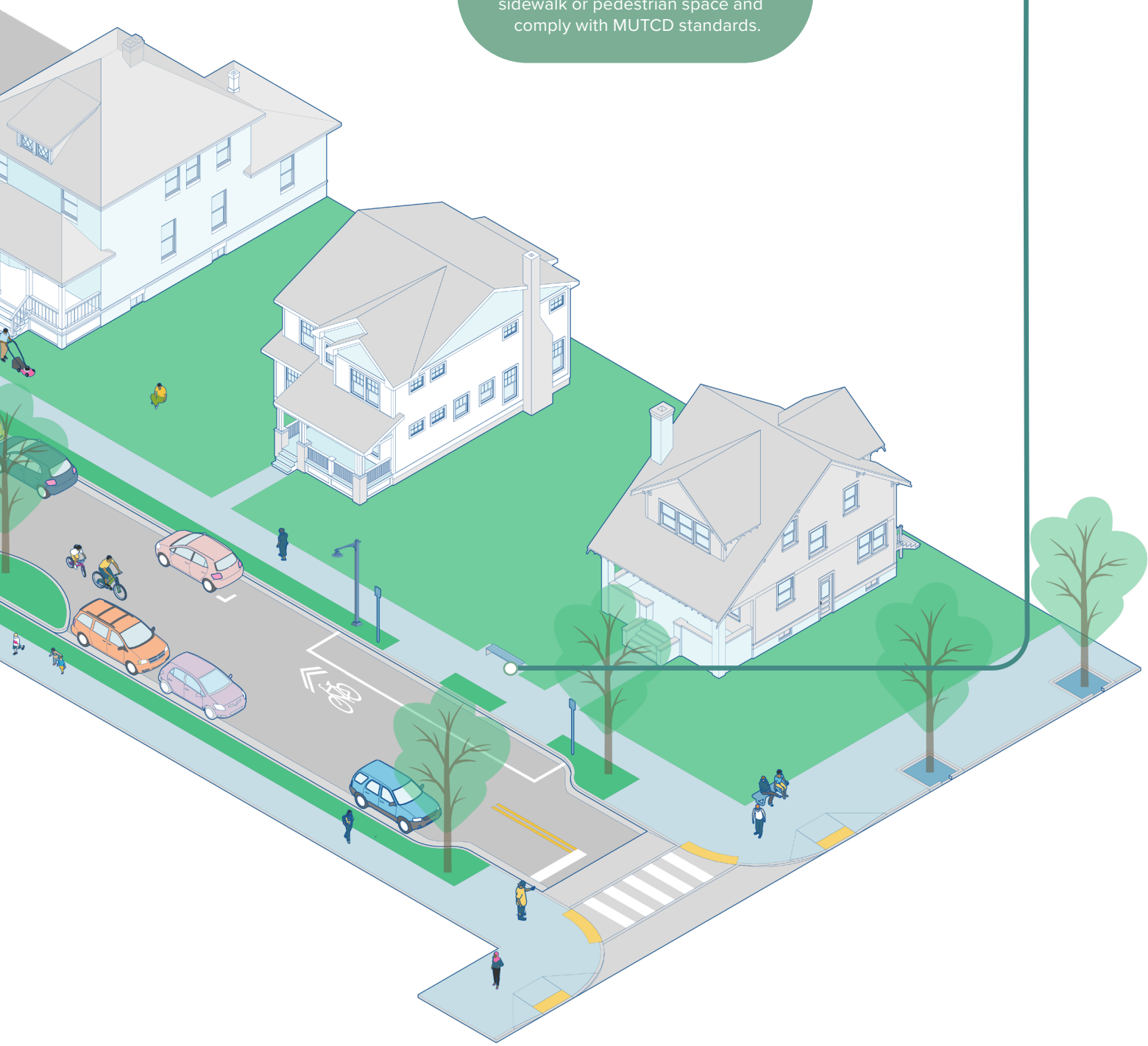
## SIGNAGE AND WAYFINDING

Within Urban Residential corridors, wayfinding signage provides relevant information such as transit stop locations and location of key destinations so that people may form a mental map. Wayfinding systems also make it more comfortable for people to walk, bike, and take transit. Signage is scaled for pedestrians and is therefore smaller than signage for motorists. It should face toward the sidewalk or pedestrian space and comply with MUTCD standards.

AT13

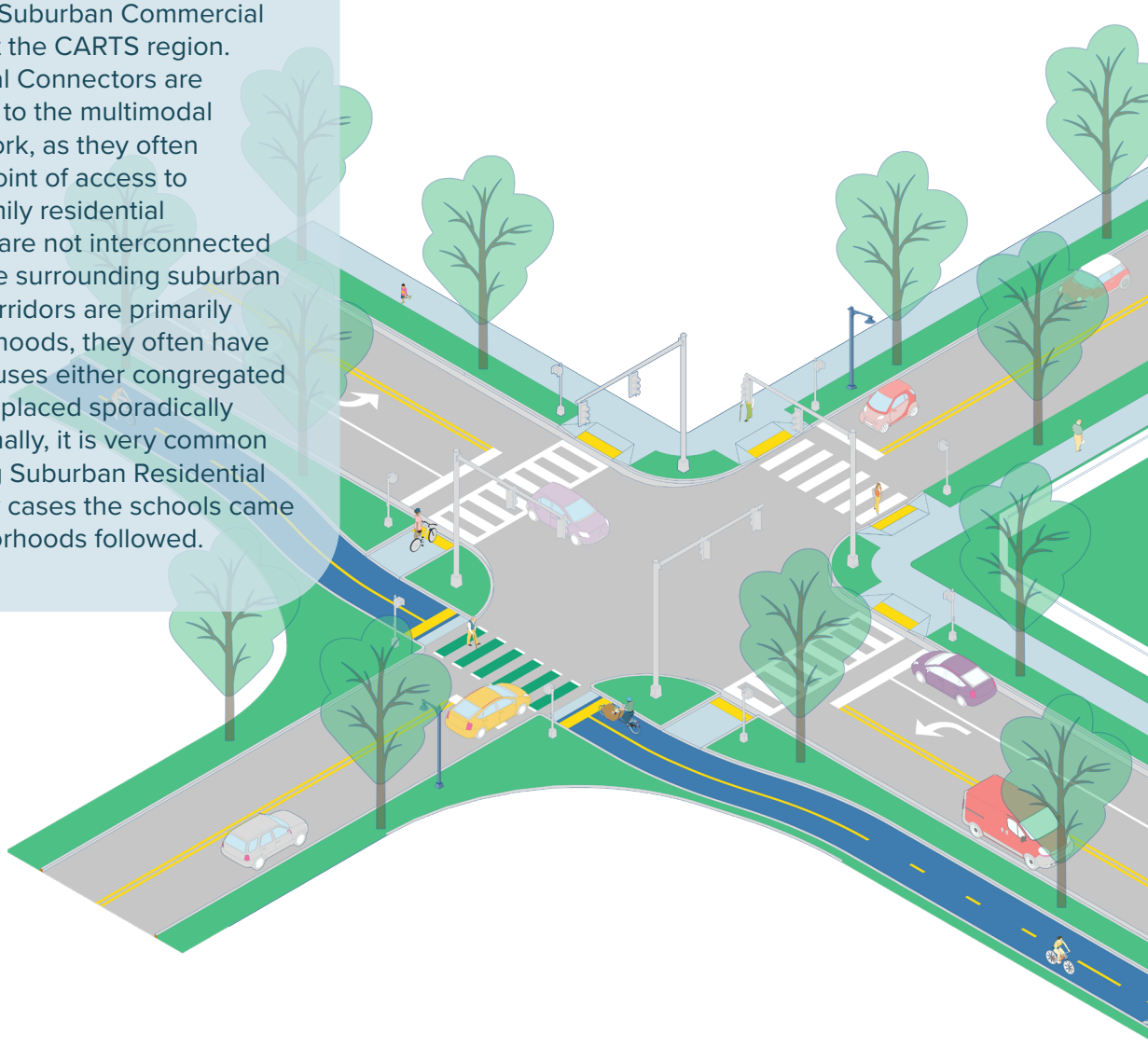
## BENCHES AND SEATING

Benches and seating should be located in high activity areas, and proximate activity centers or at bus stops.



# 04 SUBURBAN RESIDENTIAL CONNECOR

Suburban Residential Connectors provide key linkages between residential neighborhoods and Suburban Commercial corridors throughout the CARTS region. Suburban Residential Connectors are extremely important to the multimodal transportation network, as they often provide the single point of access to numerous single-family residential neighborhoods that are not interconnected to one another or the surrounding suburban area. While these corridors are primarily flanked by neighborhoods, they often have smaller commercial uses either congregated at an intersection or placed sporadically along them. Additionally, it is very common to find schools along Suburban Residential Connectors; in many cases the schools came first and the neighborhoods followed.

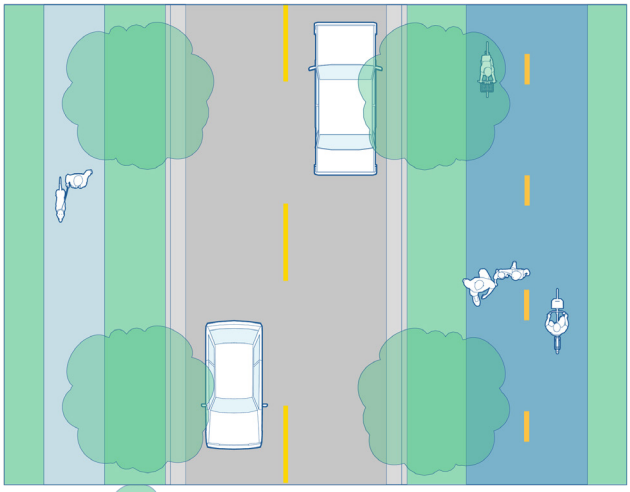


## Example Streets

- E. Lee Avenue, Sherwood
- James Street, Jacksonville
- Millwood Circle; Maumelle
- College Street, Conway
- Shobe Road, Bryant
- Chenal Valley Drive, Little Rock

# TYPICAL CROSS SECTION

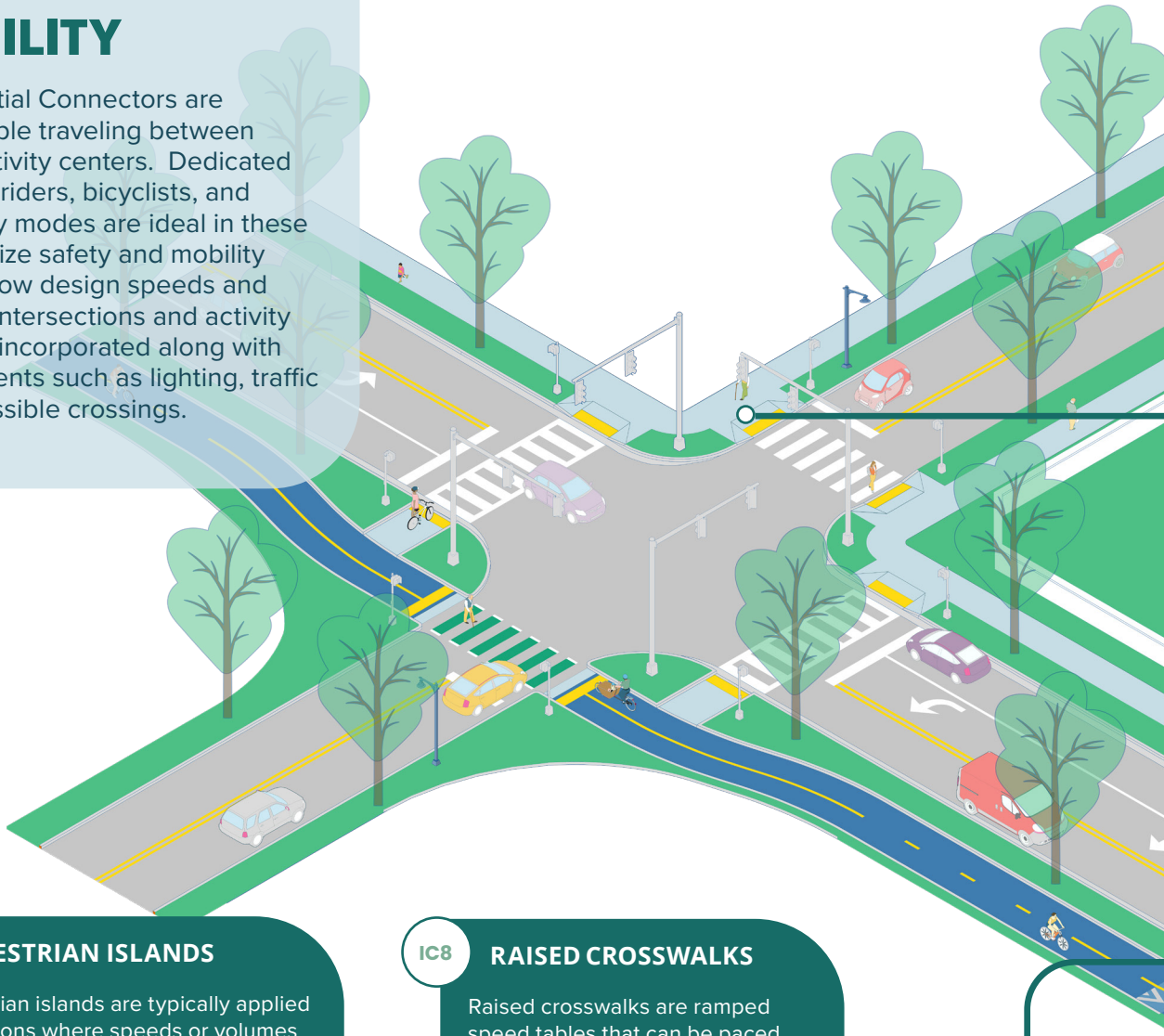
| | SIDEWALK | BUFFER | TRAVEL LANES (2) | BUFFER | MULTI-USE PATH |
|---|---|---|---|---|---|
| REC | 6' | 6' | 11' | 6' | 14' |
| MIN | 5' | 4' | 10' | 4' | 8' |
| MAX | - | - | 12' | - | - |



# 4A SUBURBAN RESIDENTIAL CONNECOR

## SAFETY + ACCESSIBILITY

Suburban Residential Connectors are often used by people traveling between residences and activity centers. Dedicated facilities for transit riders, bicyclists, and other micromobility modes are ideal in these corridors to maximize safety and mobility for these users. Slow design speeds and clear sightlines at intersections and activity centers should be incorporated along with other design elements such as lighting, traffic calming, and accessible crossings.



### IC8 PEDESTRIAN ISLANDS

Pedestrian islands are typically applied in locations where speeds or volumes of vehicular traffic make pedestrian crossing difficult, or where there are three or more lanes of traffic in one direction. They should be 8-10' wide, and no smaller than 6' to accommodate a person on a bicycle or with a stroller. The crosswalk should "cut through" the median where possible to maintain a level pedestrian pathway. At the intersection, the median should have a "nose" that extends past the crosswalk to provide a visual barrier and slow turning drivers.

### IC8 RAISED CROSSWALKS

Raised crosswalks are ramped speed tables that can be paced at unsignalized intersections with high pedestrian activity or at mid-block. Other frequent locations include near schools or pick up/drop off zones near an activity center such as a theater or sports venue. Ideal width for the crosswalk is 10', it is demarcated with paint or textured materials, and includes detectable warnings and curb ramps at the street edge for pedestrians with impaired vision.

IC7

## CURB RAMPS

Curb ramps that are perpendicular to crosswalks should be provided along every leg of intersecting streets.

IC9

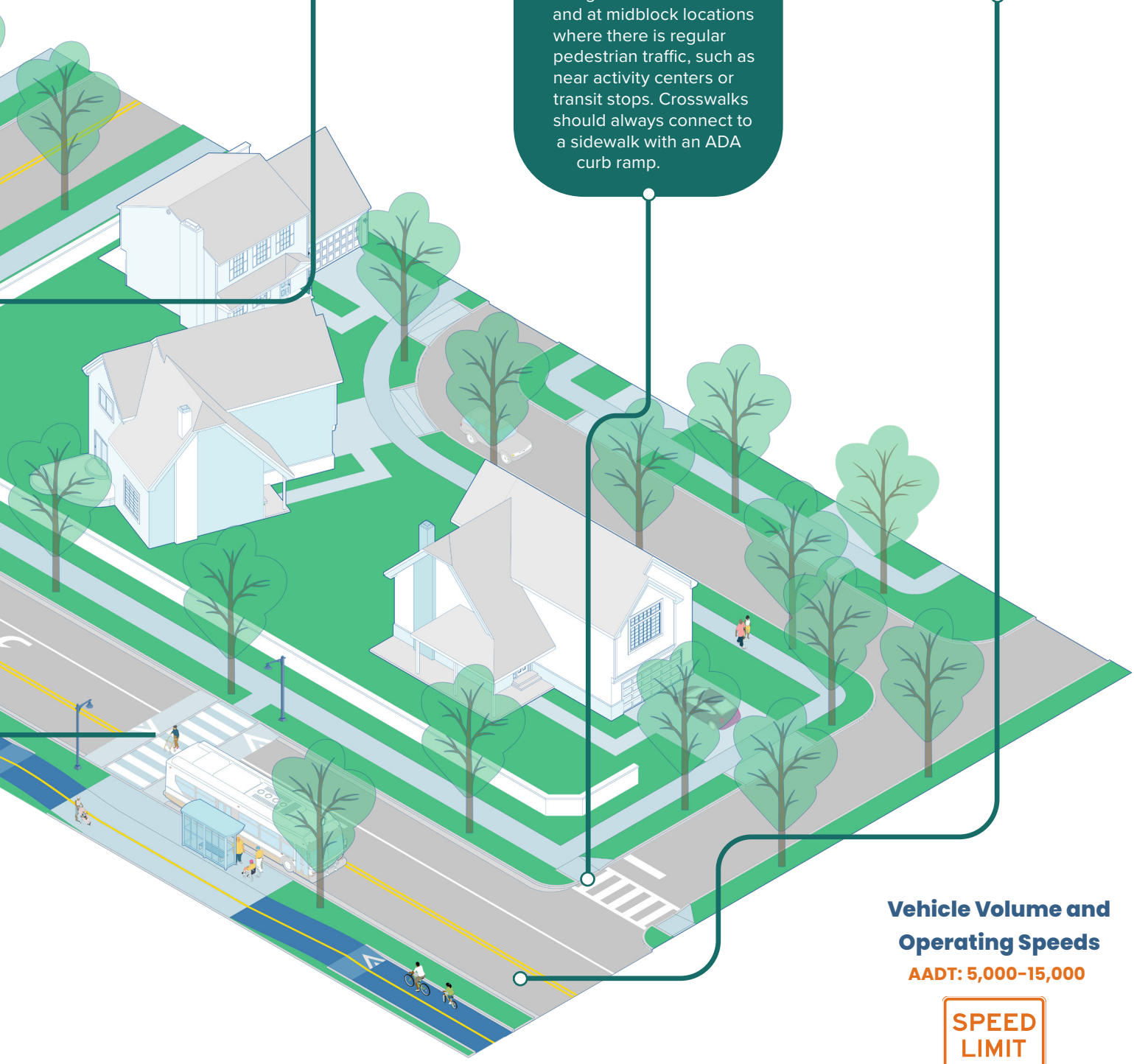
## CROSSWALKS

Crosswalks should be located at all signalized intersections and marked with enhanced continental style striping or thermoplastic or textured or colored paving materials consistent with the MUTCD. Crosswalks may also be located at unsignalized intersections and at midblock locations where there is regular pedestrian traffic, such as near activity centers or transit stops. Crosswalks should always connect to a sidewalk with an ADA curb ramp.

BF4

## VERTICAL SEPARATION

Horizontal and vertical separation between multi-use paths and vehicle travel lanes should be provided. This physical separation can be a painted buffer with delineators, concrete islands, or landscaped verges.



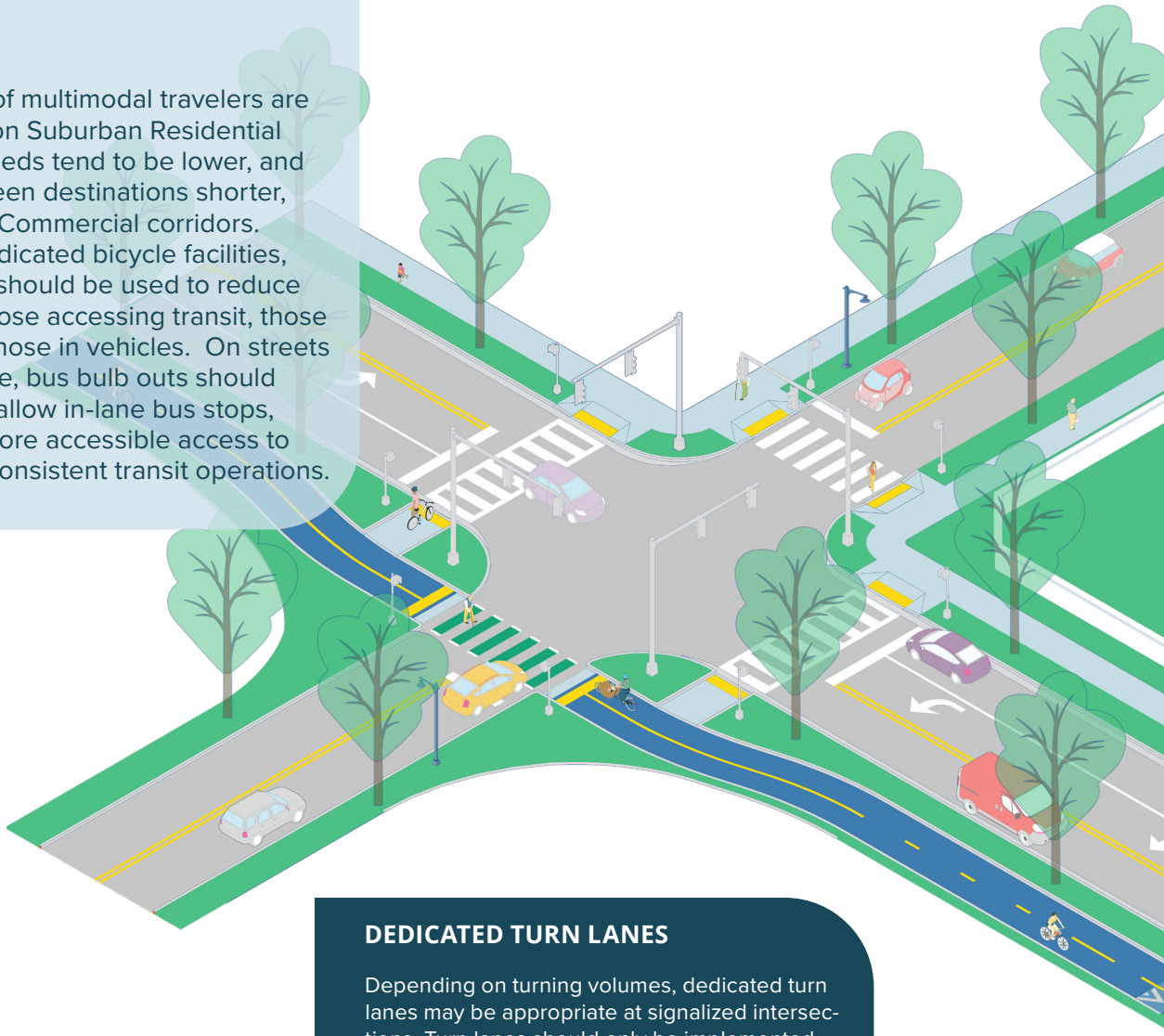
**Vehicle Volume and Operating Speeds**

**AADT: 5,000-15,000**

# 4B SUBURBAN RESIDENTIAL CONNECOR

## CONNECTIONS MATTER

A broader variety of multimodal travelers are likely to be found on Suburban Residential Connectors as speeds tend to be lower, and the distance between destinations shorter, than on Suburban Commercial corridors. On streets with dedicated bicycle facilities, floating bus stops should be used to reduce conflicts among those accessing transit, those on a bicycle, and those in vehicles. On streets with no bicycle lane, bus bulb outs should be constructed to allow in-lane bus stops, facilitating safer, more accessible access to transit, and more consistent transit operations.



### DEDICATED TURN LANES

Depending on turning volumes, dedicated turn lanes may be appropriate at signalized intersections. Turn lanes should only be implemented through a traffic analysis process that indicates such are warranted. It is important to weigh the impacts that turn lanes have on pedestrian and bicycle crossing distance and times, as well as the additional conflicts that are introduced by turn lanes. Turn lane queue lengths and tapers will affect the geometric design of intersections, particularly in the utilization of space that would otherwise be available to the public realm. When possible, provide dedicated signal phases for left-turn lanes with proper time separation between pedestrian crossing phasing.

BF10 AT11

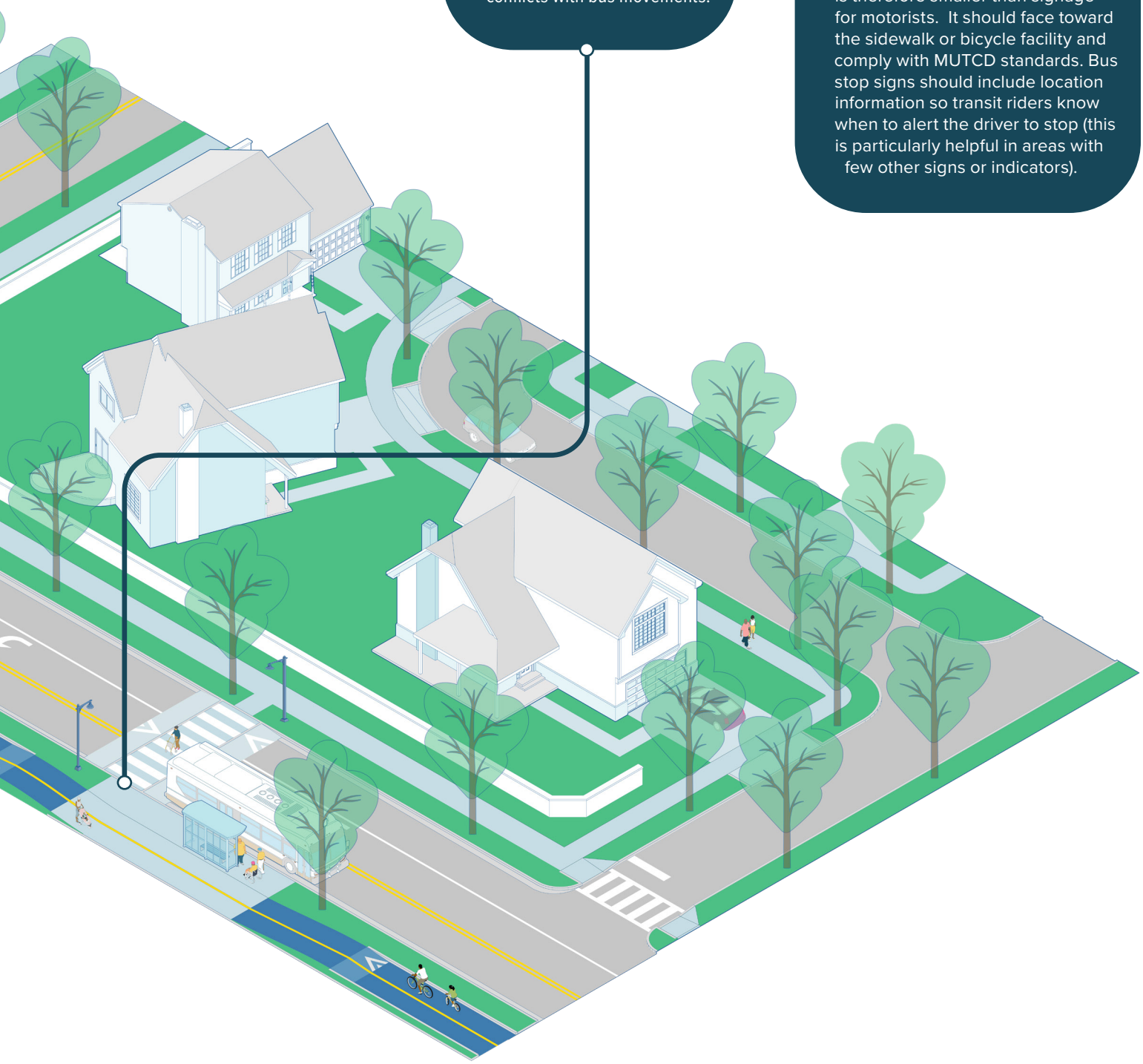
## BUS/BIKE CONFLICT MANAGEMENT

Along METRO bus routes where a separated multi-use path is provided, the path should run behind the bus stop. This provides direct access between the bus stop and bus while eliminating bicycle conflicts with bus movements.

AT12

## WAYFINDING

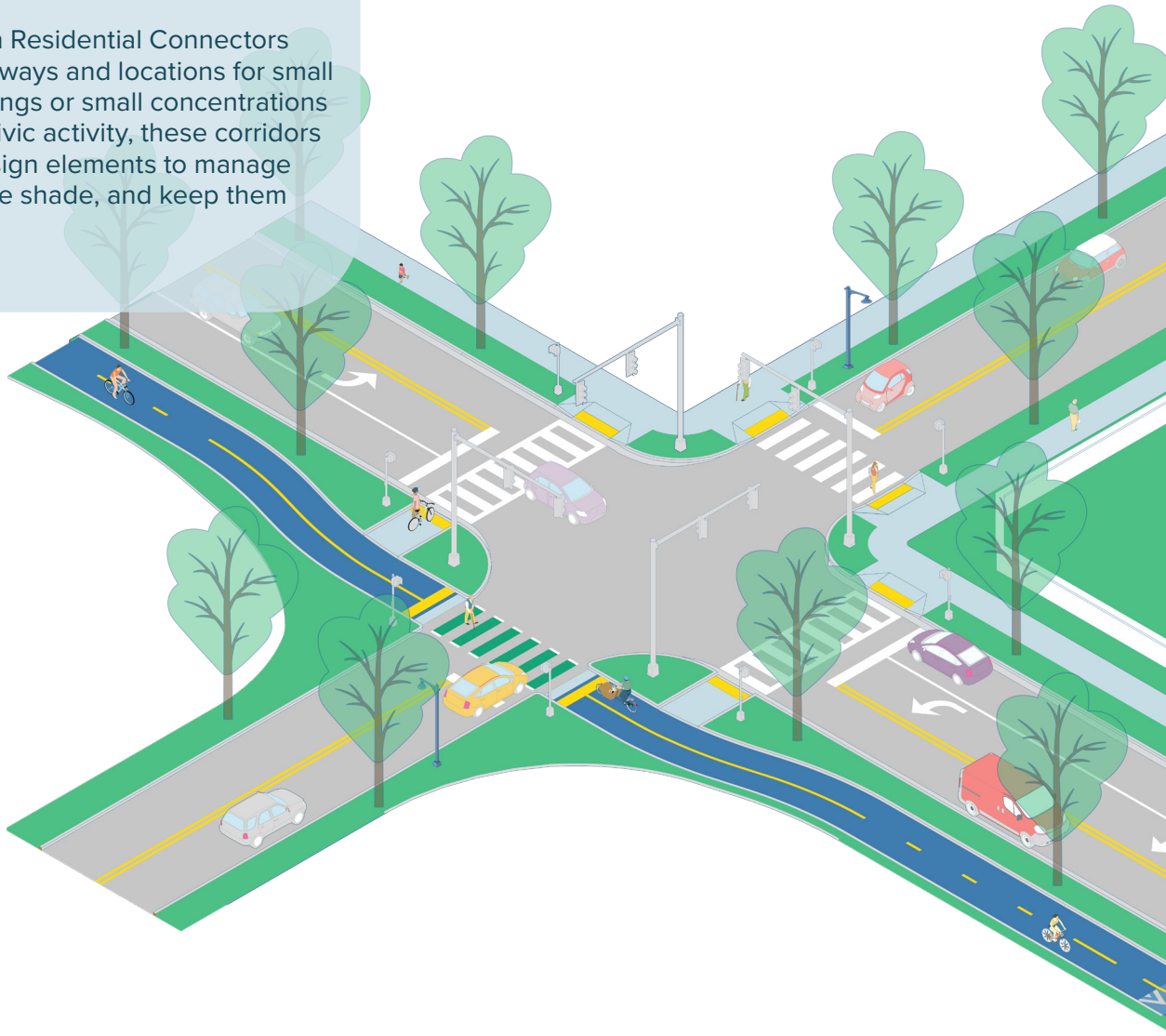
Within Suburban Residential corridors, wayfinding signage provides relevant information such as transit stop locations and location of key destinations so that people may form a mental map. Wayfinding systems also make it more comfortable for people to walk, bike, and take transit. Signage is scaled for pedestrians and is therefore smaller than signage for motorists. It should face toward the sidewalk or bicycle facility and comply with MUTCD standards. Bus stop signs should include location information so transit riders know when to alert the driver to stop (this is particularly helpful in areas with few other signs or indicators).



# 4C SUBURBAN RESIDENTIAL CONNECTOR

## VIBRANT + HEALTHY

Because Suburban Residential Connectors serve as both pathways and locations for small community gatherings or small concentrations of commercial or civic activity, these corridors should include design elements to manage stormwater, provide shade, and keep them free of litter.

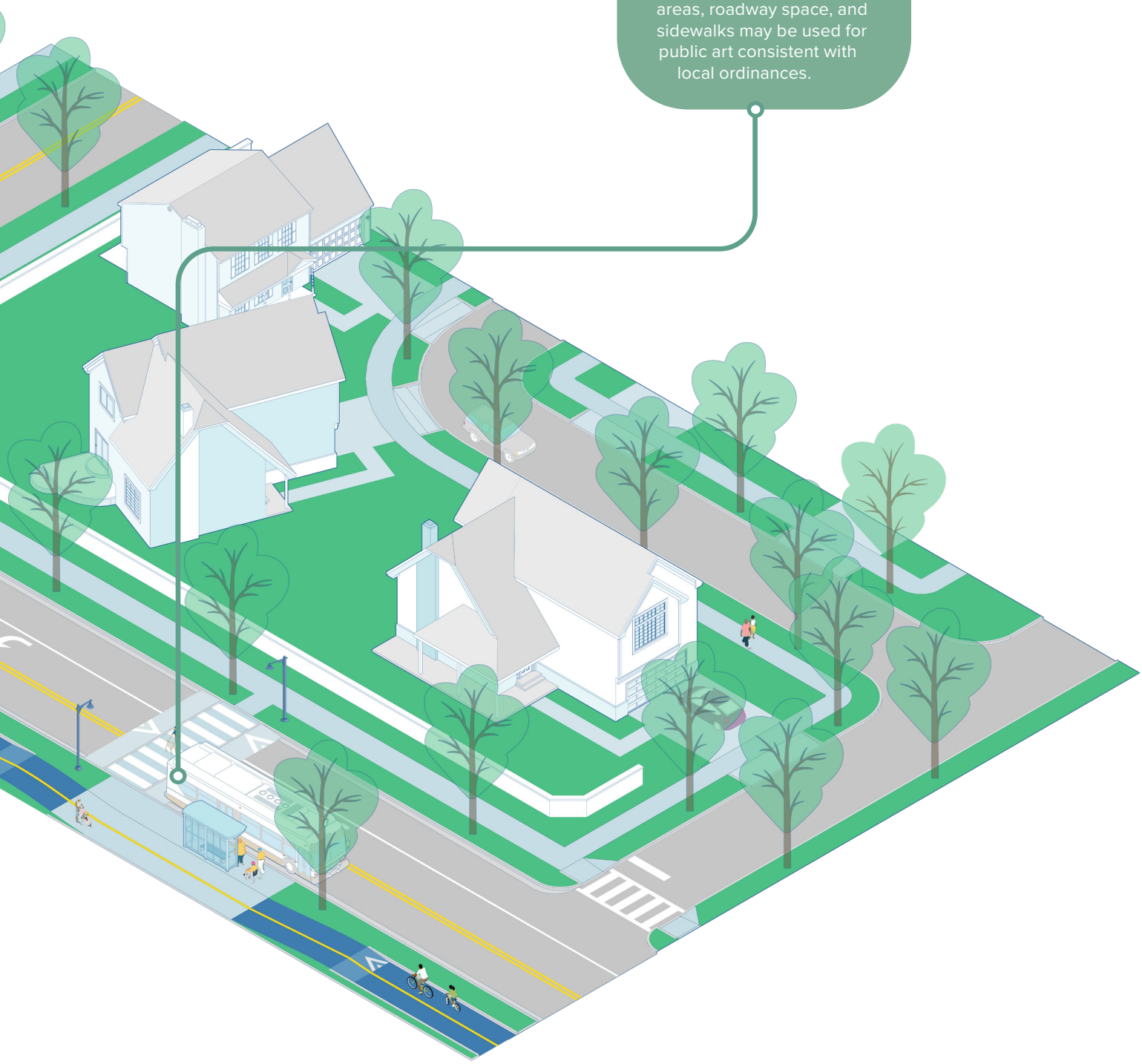


### SIDEWALK LIGHTING

Along Suburban Residential Collectors, a mid-height lighting fixture should be capable of providing safety and comfort to both pedestrians and drivers. Light poles and fixture styles may also be used as effective artistic and placemaking elements.

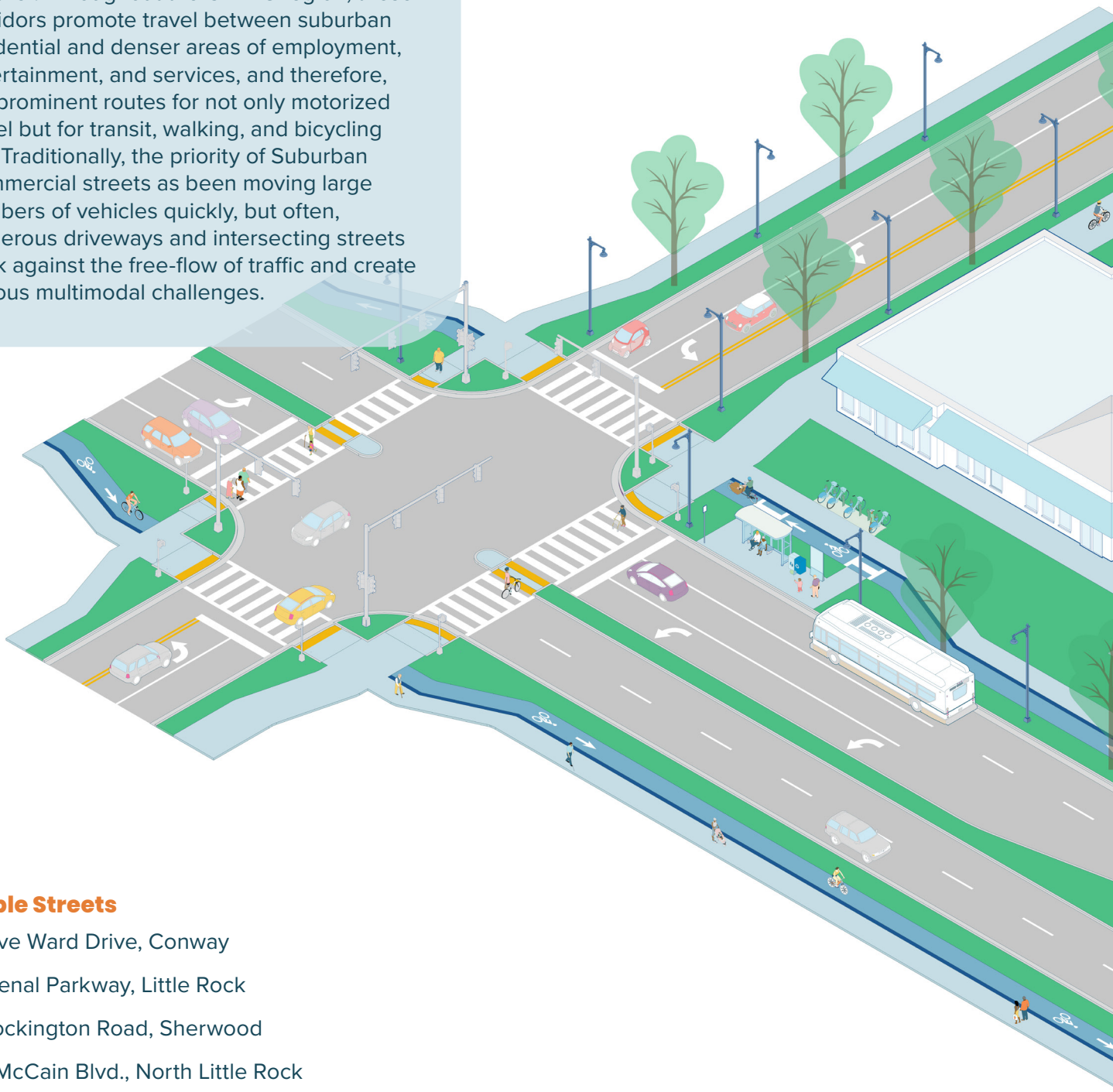
### TRASH RECYCLING CONTAINERS

Public Art provides the opportunity to promote the unique cultural characteristics of a place, foster relationships with local artists, and engender pride in community and public space. Transit shelters, exterior building walls, buffer areas, roadway space, and sidewalks may be used for public art consistent with local ordinances.



# 05 SUBURBAN COMMERCIAL

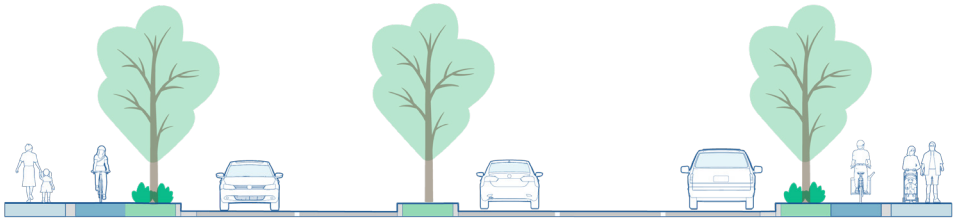
Suburban Commercial corridors are larger, multi-lane streets having a variety of land use types that are rarely mixed with one another. Throughout the CARTS region, these corridors promote travel between suburban residential and denser areas of employment, entertainment, and services, and therefore, are prominent routes for not only motorized travel but for transit, walking, and bicycling too. Traditionally, the priority of Suburban Commercial streets as been moving large numbers of vehicles quickly, but often, numerous driveways and intersecting streets work against the free-flow of traffic and create various multimodal challenges.



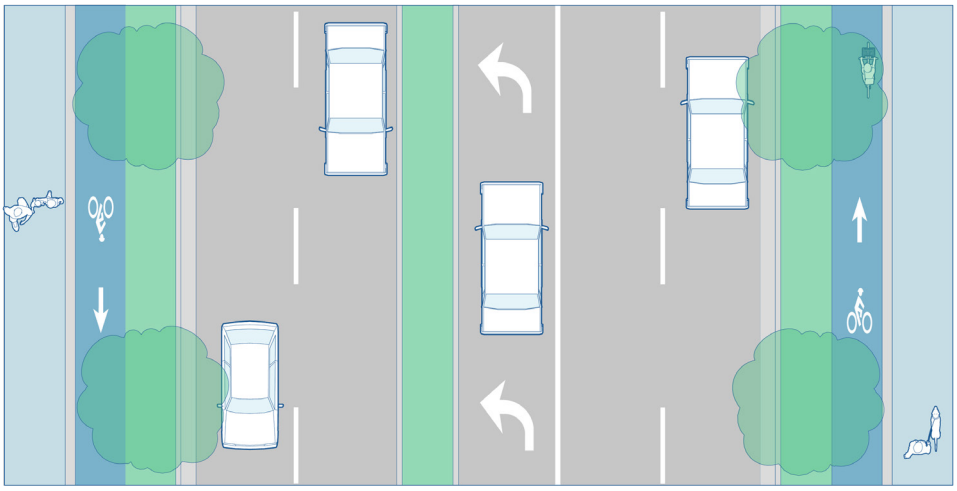
## Example Streets

- Dave Ward Drive, Conway
- Chenal Parkway, Little Rock
- Brockington Road, Sherwood
- E. McCain Blvd., North Little Rock
- Reynolds Road, Bryant
- Military Road, Benton

# TYPICAL CROSS SECTION



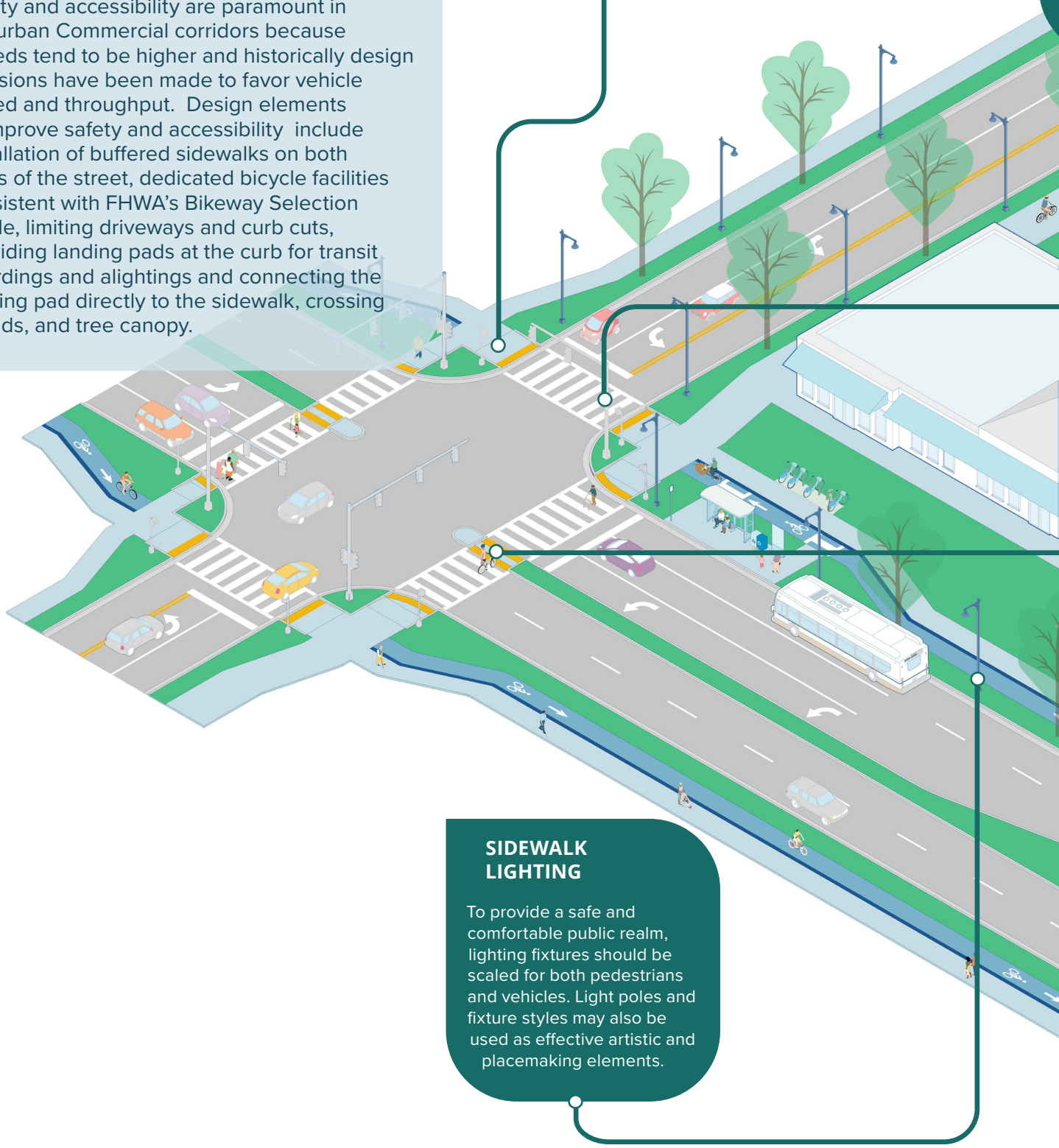
| | MULTI-USE DIRECTIONAL PATH | BUFFER | TRAVEL LANES (2) | LANDSCAPE MEDIAN | TRAVEL LANES (3) | BUFFER | MULTI-USE DIRECTIONAL PATH |
|---|---|---|---|---|---|---|---|
| REC | 14' | 6' | 11' | 6' | 11' | 6' | 14' |
| MIN | 8' | 4' | 10' | 4' | 10' | 4' | 8' |
| MAX | - | - | 12' | - | 12' | - | - |



# 5A SUBURBAN COMMERCIAL

## SAFETY + ACCESSIBILITY

Safety and accessibility are paramount in Suburban Commercial corridors because speeds tend to be higher and historically design decisions have been made to favor vehicle speed and throughput. Design elements to improve safety and accessibility include installation of buffered sidewalks on both sides of the street, dedicated bicycle facilities consistent with FHWA's Bikeway Selection Guide, limiting driveways and curb cuts, providing landing pads at the curb for transit boardings and alightings and connecting the landing pad directly to the sidewalk, crossing islands, and tree canopy.



**IC7 CURB RAMPS**

Curb ramps that are perpendicular to crosswalks should be provided along every leg of intersecting streets.

**IC9**

**SIDEWALK LIGHTING**

To provide a safe and comfortable public realm, lighting fixtures should be scaled for both pedestrians and vehicles. Light poles and fixture styles may also be used as effective artistic and placemaking elements.

## CROSSWALKS

Crosswalks should be located at all signalized intersections and marked with enhanced continental style striping or thermoplastic or textured or colored paving materials consistent with the MUTCD. Crosswalks may also be located at unsignalized intersections and at midblock locations where there is regular pedestrian traffic, such as near activity centers or transit stops. Crosswalks should always connect to a sidewalk with an ADA curb ramp.

## IC4 PEDESTRIAN ISLANDS

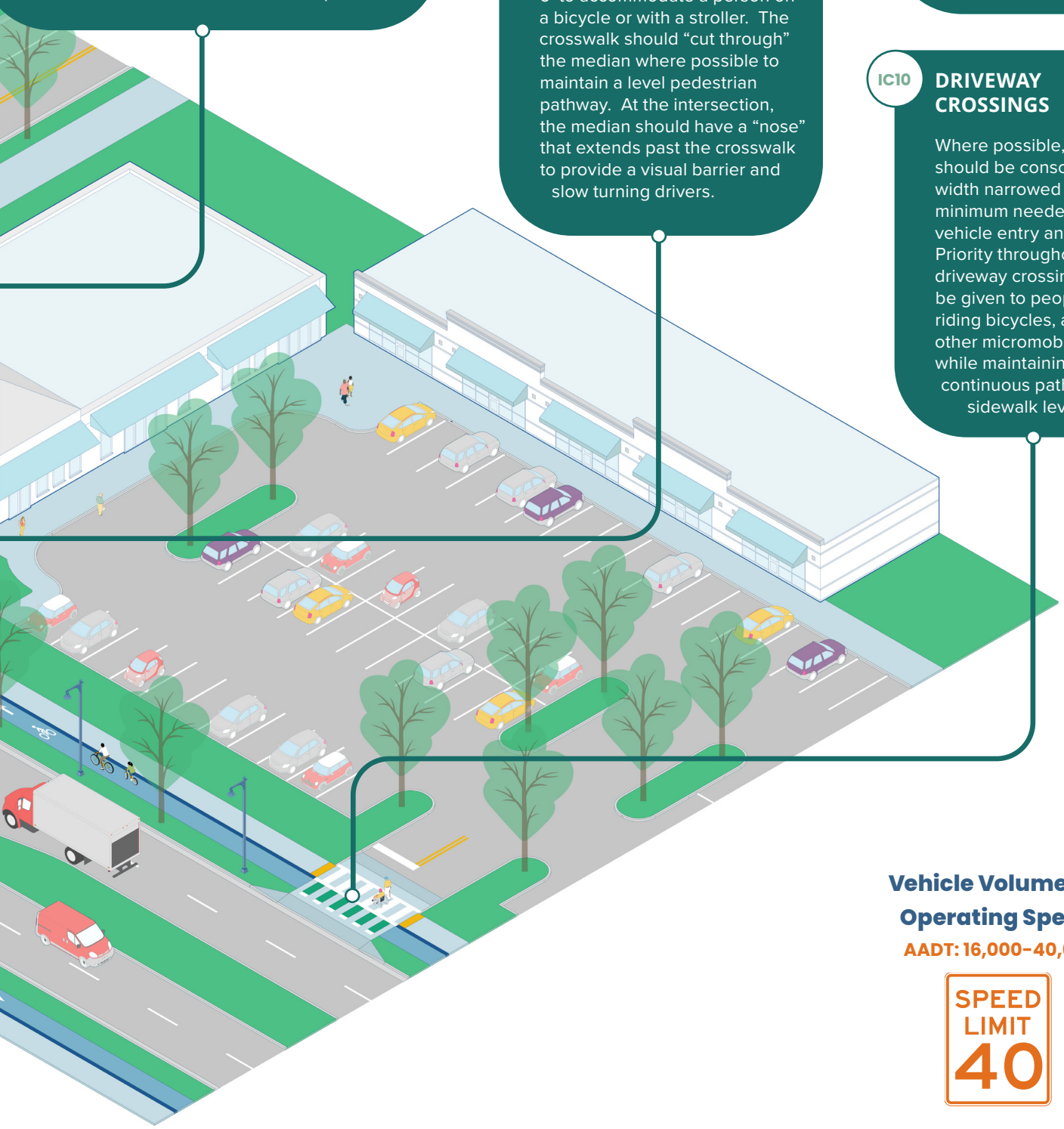
Pedestrian islands are typically applied in locations where speeds or volumes of vehicular traffic make pedestrian crossing difficult, or where there are three or more lanes of traffic in one direction. They should be 8-10' wide, and no smaller than 6' to accommodate a person on a bicycle or with a stroller. The crosswalk should "cut through" the median where possible to maintain a level pedestrian pathway. At the intersection, the median should have a "nose" that extends past the crosswalk to provide a visual barrier and slow turning drivers.

## BF4 VERTICAL SEPARATION

Horizontal and vertical separation between multi-use paths and vehicle travel lanes should be provided. This physical separation can be a painted buffer with delineators, concrete islands, or landscaped verges.

## IC10 DRIVEWAY CROSSINGS

Where possible, driveways should be consolidated and width narrowed to the minimum needed for design vehicle entry and egress. Priority throughout the driveway crossing should be given to people walking, riding bicycles, and using other micromobility devices while maintaining their continuous path at sidewalk level.



**Vehicle Volume and Operating Speeds**

**AADT: 16,000–40,000**

# 5B SUBURBAN COMMERCIAL

## CONNECTIONS MATTER

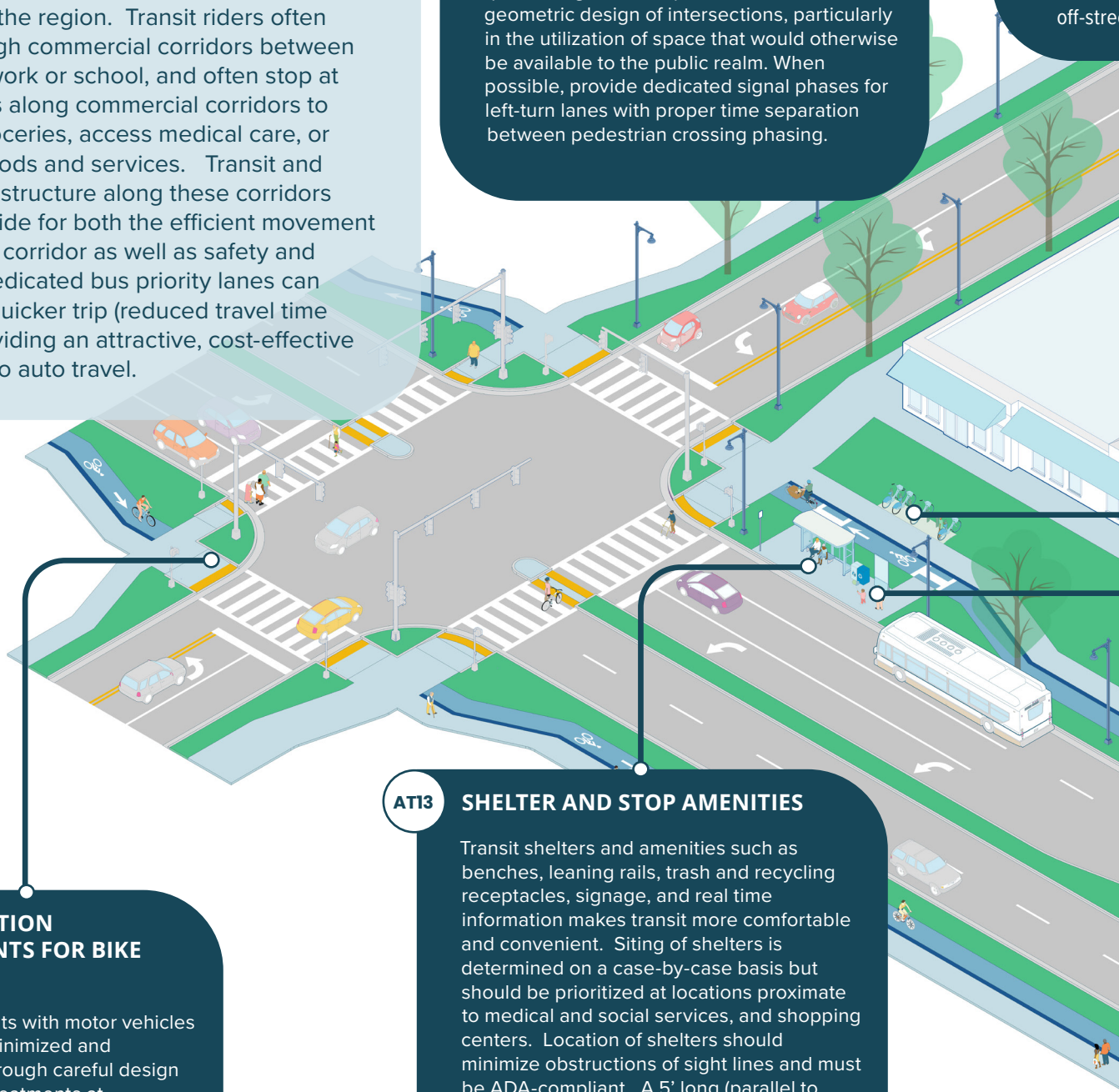
Transit plays a critical role in moving people throughout the region. Transit riders often travel through commercial corridors between home and work or school, and often stop at destinations along commercial corridors to shop for groceries, access medical care, or for other goods and services. Transit and bicycle infrastructure along these corridors should provide for both the efficient movement through the corridor as well as safety and comfort. Dedicated bus priority lanes can facilitate a quicker trip (reduced travel time overall) providing an attractive, cost-effective alternative to auto travel.

### DEDICATED TURN LANES

Depending on turning volumes, dedicated turn lanes may be appropriate at signalized intersections. Turn lanes should only be implemented through a traffic analysis process that indicates such are warranted. It is important to weigh the impacts that turn lanes have on pedestrian and bicycle crossing distance and times, as well as the additional conflicts that are introduced by turn lanes. Turn lane queue lengths and tapers will affect the geometric design of intersections, particularly in the utilization of space that would otherwise be available to the public realm. When possible, provide dedicated signal phases for left-turn lanes with proper time separation between pedestrian crossing phasing.

BF2 BICYCL

Within Sub
corridors,
provided
to the size
be consol
properties
entrances
pathways
one or mo
off-stre



IC1 **INTERSECTION TREATMENTS FOR BIKE LANES**

Conflict points with motor vehicles should be minimized and mitigated through careful design and signal treatments at intersections. Safety for bicyclists should always be paramount; where physical separation cannot be provided, the speed of vehicles should be controlled.

AT13 **SHELTER AND STOP AMENITIES**

Transit shelters and amenities such as benches, leaning rails, trash and recycling receptacles, signage, and real time information makes transit more comfortable and convenient. Siting of shelters is determined on a case-by-case basis but should be prioritized at locations proximate to medical and social services, and shopping centers. Location of shelters should minimize obstructions of sight lines and must be ADA-compliant. A 5' long (parallel to curb) by 8' deep landing zone should be provided at front and rear bus doors. In locations where the sidewalk is set back from the travel lanes, a sidewalk connection should be provided to the curb.

## E PARKING

burban Commercial
bike parking should be
for each property and scaled
e of the use. Bike parking can
idated between adjacent
s and located near building
, along logical access
, and/or take the place of
ore parking spaces within an
et parking lot or garage.

BF3

## BUS/BIKE CONFLICT MANAGEMENT

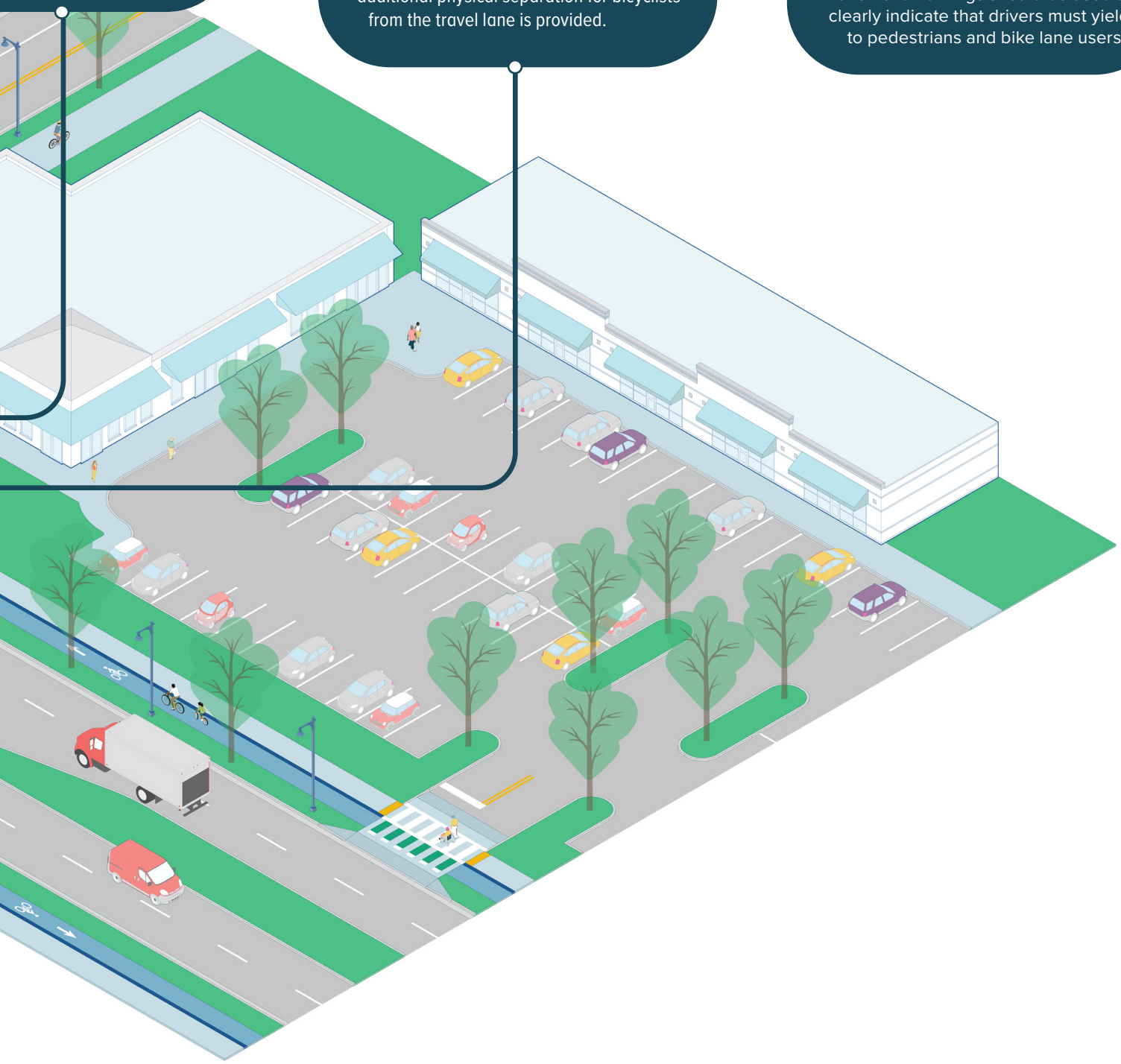
At METRO bus stops, the separated directional bike lane should bend out to create a bus bulb or floating bus island. This will allow for boarding and alighting without the need for the bus to leave the travel lane or cross the bike lane, speeding up service and increasing bus accessibility for people with movement disabilities. Conflicts between buses and bicyclists will be eliminated while additional physical separation for bicyclists from the travel lane is provided.

IC13

IC14

## BIKE AND MICROMOBILITY CROSSINGS

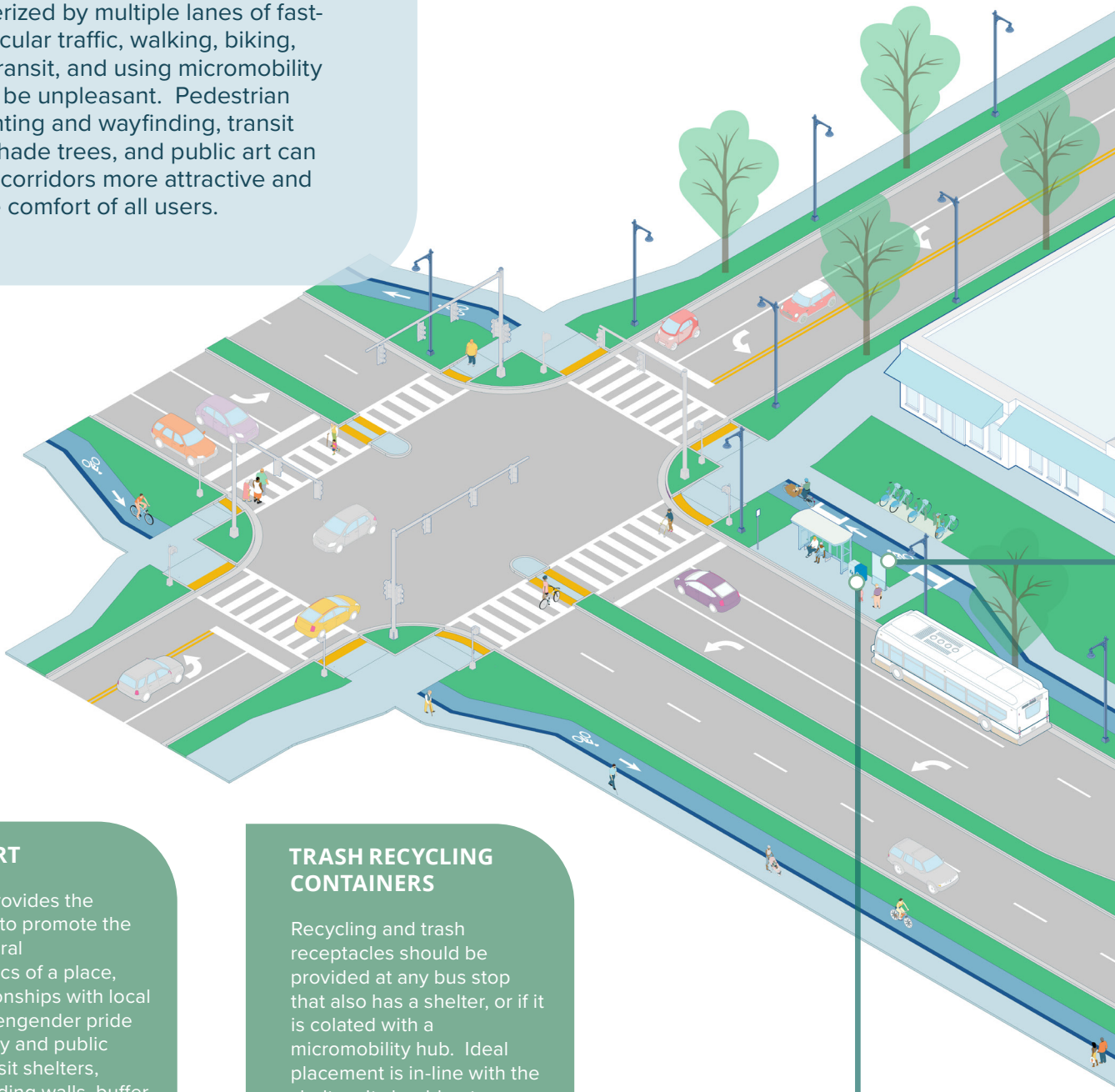
Intersections should include areas for people riding bicycles and using other micromobility devices to safely wait at red lights ahead of drivers traveling in the same direction. No turn on red restrictions should be combined with leading pedestrian and bike intervals to allow people walking, riding bicycles, and using other micromobility modes to enter the intersection before drivers. Pavement markings should be used to clearly indicate that drivers must yield to pedestrians and bike lane users.



# 5C SUBURBAN COMMERCIAL

## VIBRANT + HEALTHY

Because Suburban Commercial corridors are characterized by multiple lanes of fast-moving vehicular traffic, walking, biking, waiting for transit, and using micromobility devices can be unpleasant. Pedestrian oriented lighting and wayfinding, transit amenities, shade trees, and public art can make these corridors more attractive and increase the comfort of all users.



### PUBLIC ART

Public Art provides the opportunity to promote the unique cultural characteristics of a place, foster relationships with local artists, and engender pride in community and public space. Transit shelters, exterior building walls, buffer areas, roadway space, and sidewalks may be used for public art consistent with local ordinances.

### TRASH RECYCLING CONTAINERS

Recycling and trash receptacles should be provided at any bus stop that also has a shelter, or if it is colated with a micromobility hub. Ideal placement is in-line with the shelter. It should not interfere with the clear pedestrian path or with boarding and alighting areas.

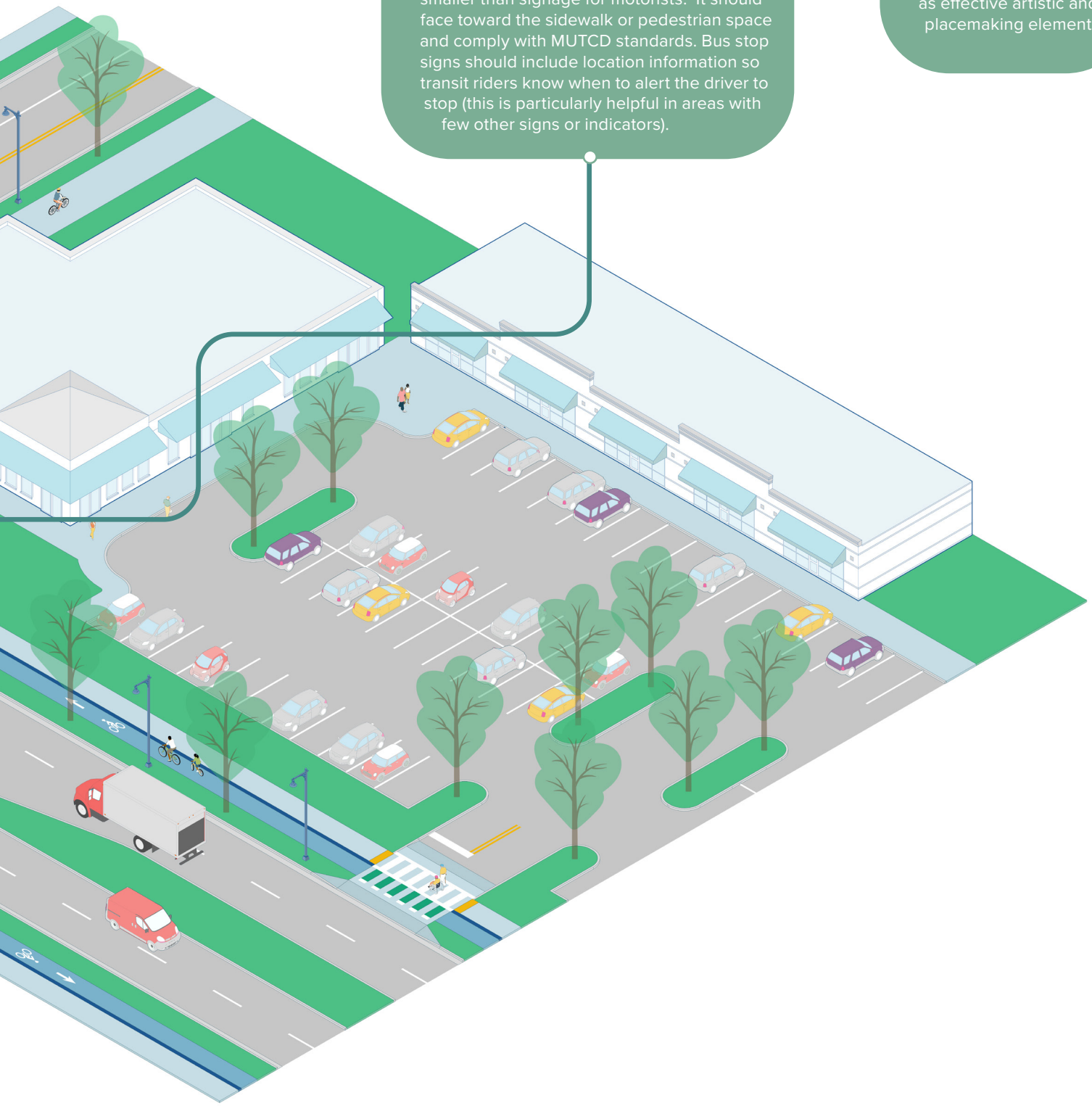
AT12

## SIGNAGE AND WAYFINDING

Within Suburban Commercial corridors, wayfinding signage provides relevant information such as transit stop locations and location of key destinations so that people may form a mental map. Wayfinding systems also make it more comfortable for people to walk, bike, and take transit. Signage is scaled for pedestrians and is therefore smaller than signage for motorists. It should face toward the sidewalk or pedestrian space and comply with MUTCD standards. Bus stop signs should include location information so transit riders know when to alert the driver to stop (this is particularly helpful in areas with few other signs or indicators).

## SIDEWALK LIGHTING

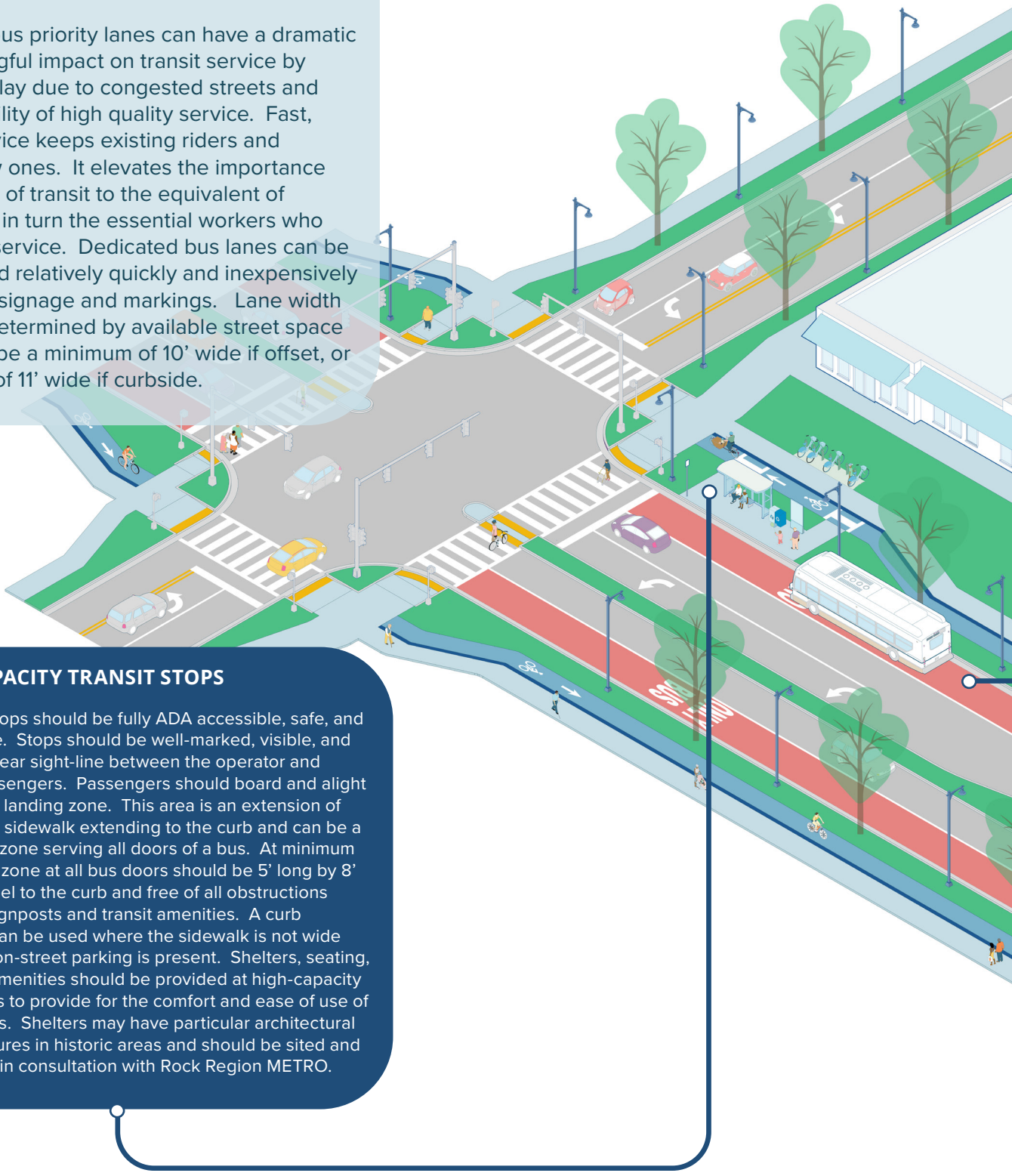
To provide a safe and comfortable public realm, lighting fixtures should be scaled for both pedestrians and vehicles. Light poles and fixture styles may also be used as effective artistic and placemaking elements.



# 5D SUBURBAN COMMERCIAL

## PRIORITY TRANSIT ALTERNATIVE

Dedicated bus priority lanes can have a dramatic and meaningful impact on transit service by reducing delay due to congested streets and raising visibility of high quality service. Fast, reliable service keeps existing riders and attracts new ones. It elevates the importance of the mode of transit to the equivalent of driving, and in turn the essential workers who rely on the service. Dedicated bus lanes can be implemented relatively quickly and inexpensively with simple signage and markings. Lane width should be determined by available street space and should be a minimum of 10' wide if offset, or a minimum of 11' wide if curbside.



AT11
AT13

### HIGH CAPACITY TRANSIT STOPS

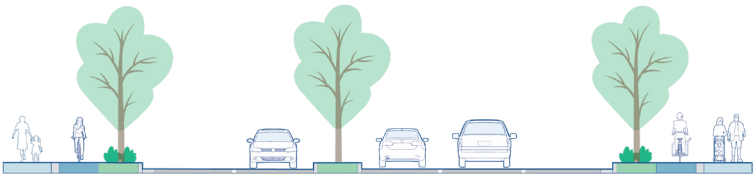
All transit stops should be fully ADA accessible, safe, and comfortable. Stops should be well-marked, visible, and provide a clear sight-line between the operator and waiting passengers. Passengers should board and alight the bus in a landing zone. This area is an extension of the existing sidewalk extending to the curb and can be a continuous zone serving all doors of a bus. At minimum the landing zone at all bus doors should be 5' long by 8' deep, parallel to the curb and free of all obstructions including signposts and transit amenities. A curb extension can be used where the sidewalk is not wide enough or on-street parking is present. Shelters, seating, and other amenities should be provided at high-capacity transit stops to provide for the comfort and ease of use of transit riders. Shelters may have particular architectural design features in historic areas and should be sited and designed in consultation with Rock Region METRO.

AT10

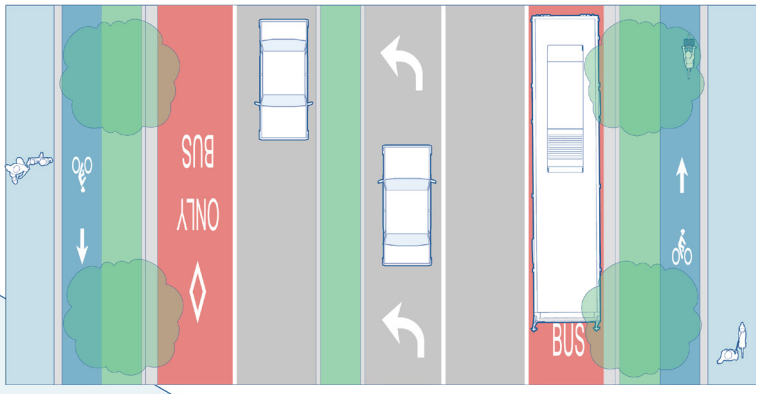
## BUS PRIORITY LANES

Consider bus priority lanes on high-delay, high-frequency, and high-ridership corridors to improve speed and reliability of service. Transit signal priority can be used at intersections to allow the bus to "jump the line" of waiting traffic if behind schedule. Bus priority lanes should be a minimum of 11' and may also function as a dedicated bicycle lane.

## TYPICAL CROSS SECTION

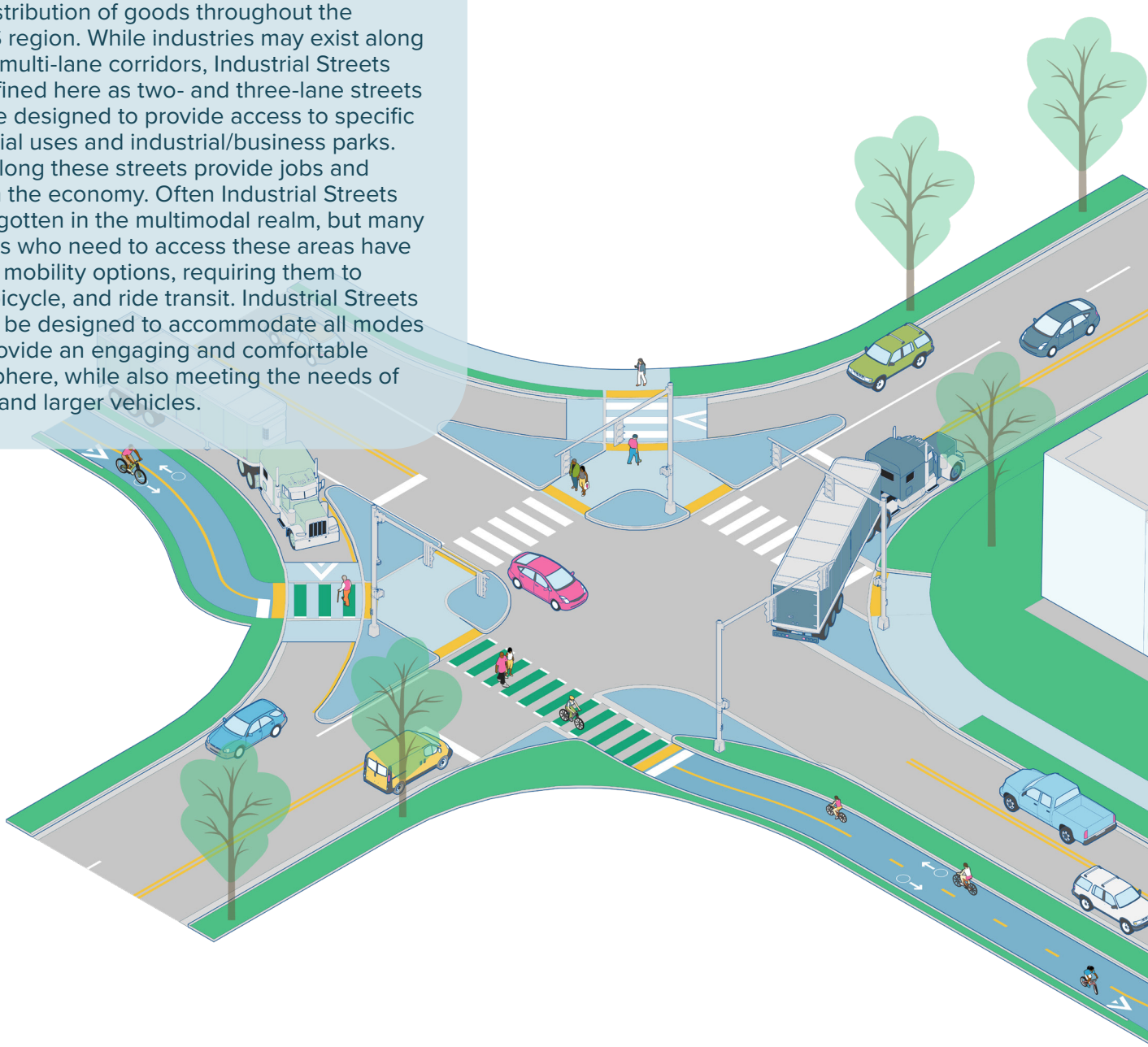


| | MULTI-USE DIRECTIONAL PATH | BUFFER | TRAVEL LANES (2) | LANDSCAPE MEDIAN | TRAVEL LANES (3) | BUFFER | MULTI-USE DIRECTIONAL PATH |
|---|---|---|---|---|---|---|---|
| REC | 14' | 6' | 11' | 6' | 11' | 6' | 14' |
| MIN | 8' | 4' | 10' | 4' | 10' | 4' | 8' |
| MAX | - | - | 12' | - | 12' | - | - |



# 06 INDUSTRIAL

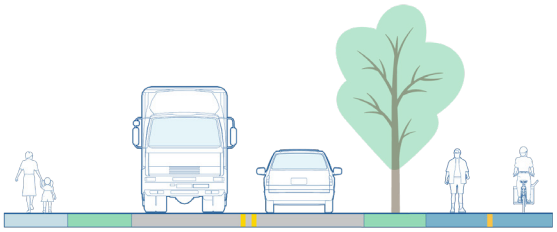
Industrial Streets are essential for the delivery and distribution of goods throughout the CARTS region. While industries may exist along larger, multi-lane corridors, Industrial Streets are defined here as two- and three-lane streets that are designed to provide access to specific industrial uses and industrial/business parks. Uses along these streets provide jobs and sustain the economy. Often Industrial Streets are forgotten in the multimodal realm, but many workers who need to access these areas have limited mobility options, requiring them to walk, bicycle, and ride transit. Industrial Streets should be designed to accommodate all modes and provide an engaging and comfortable atmosphere, while also meeting the needs of trucks and larger vehicles.



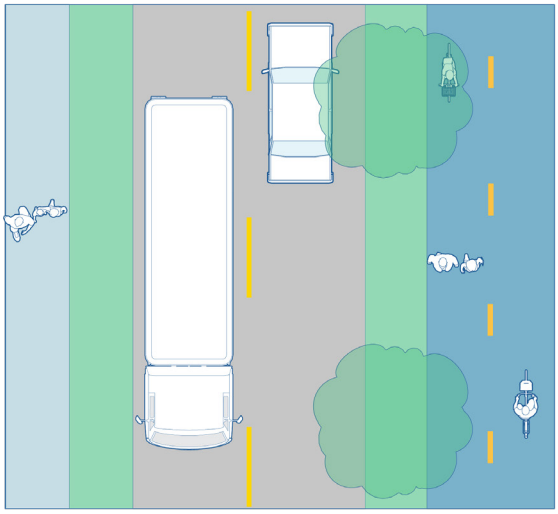
## Example Streets

- Lindsey, Little Rock
- Central Airport Road, North Little Rock
- Redmond, Jacksonville
- Airlane Drive, Benton

# TYPICAL CROSS SECTION



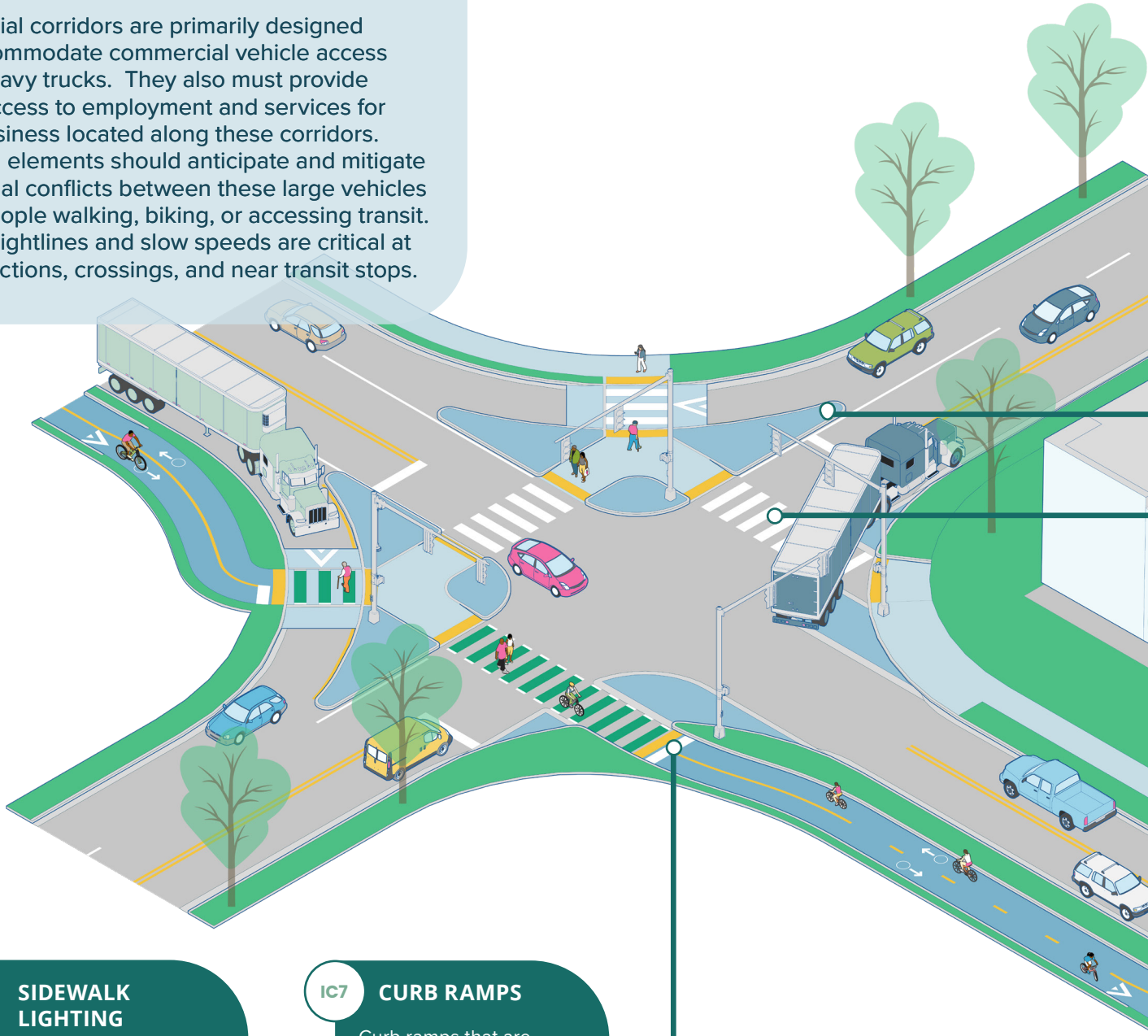
| | SIDEWALK | | TRAVEL LANES (2) | BUFFER | MULTI-USE PATH |
|---|---|---|---|---|---|
| REC | 6' | | 12' | 6' | 14' |
| MIN | 5' | | 11' | 4' | 8' |
| MAX | - | | 12' | - | -' |



# 6A INDUSTRIAL

## SAFETY + ACCESSIBILITY

Industrial corridors are primarily designed to accommodate commercial vehicle access and heavy trucks. They also must provide safe access to employment and services for the business located along these corridors. Design elements should anticipate and mitigate potential conflicts between these large vehicles and people walking, biking, or accessing transit. Clear sightlines and slow speeds are critical at intersections, crossings, and near transit stops.



### SIDEWALK LIGHTING

To provide a safe and comfortable public realm, lighting fixtures should be scaled for both pedestrians and vehicles. Light poles and fixture styles may also be used as effective artistic and placemaking elements.

### IC7 CURB RAMPS

Curb ramps that are perpendicular to crosswalks should be provided along every leg of intersecting streets.

IC3

## CURB EXTENSIONS

Truck aprons should be used to provide two different turning radii for various size vehicles at the same intersection. Passenger vehicles will use the smaller radii without touching the apron, while larger vehicles will mount the apron. In both cases, turning speeds will be reduced and the effective pedestrian crossing distance will be shortened.

IC9

## CROSSWALKS

Crosswalks should be located at all signalized intersections and marked with enhanced continental style striping or thermoplastic or textured or colored paving materials consistent with the MUTCD. Crosswalks may also be located at unsignalized intersections and at midblock locations where there is regular pedestrian traffic, such as near activity centers or transit stops. Crosswalks should always connect to a sidewalk with an ADA curb ramp.

BF4

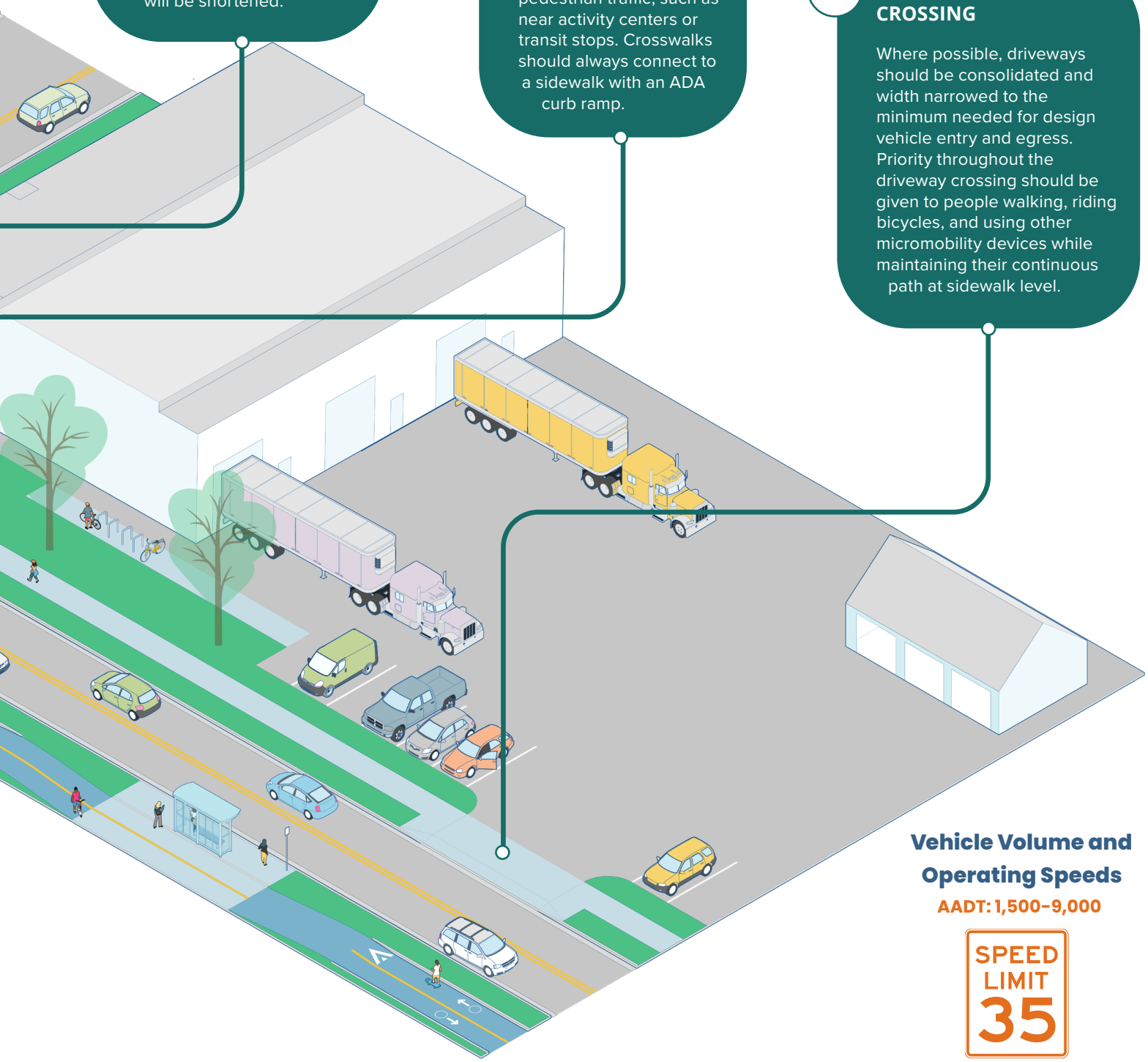
## VERTICAL SEPARATION

Horizontal and vertical separation between multi-use paths and vehicle travel lanes should be provided. This physical separation can be a painted buffer with delineators, concrete islands, or landscaped verges.

IC10

## DRIVEWAY CROSSING

Where possible, driveways should be consolidated and width narrowed to the minimum needed for design vehicle entry and egress. Priority throughout the driveway crossing should be given to people walking, riding bicycles, and using other micromobility devices while maintaining their continuous path at sidewalk level.



### Vehicle Volume and Operating Speeds

**AADT: 1,500–9,000**

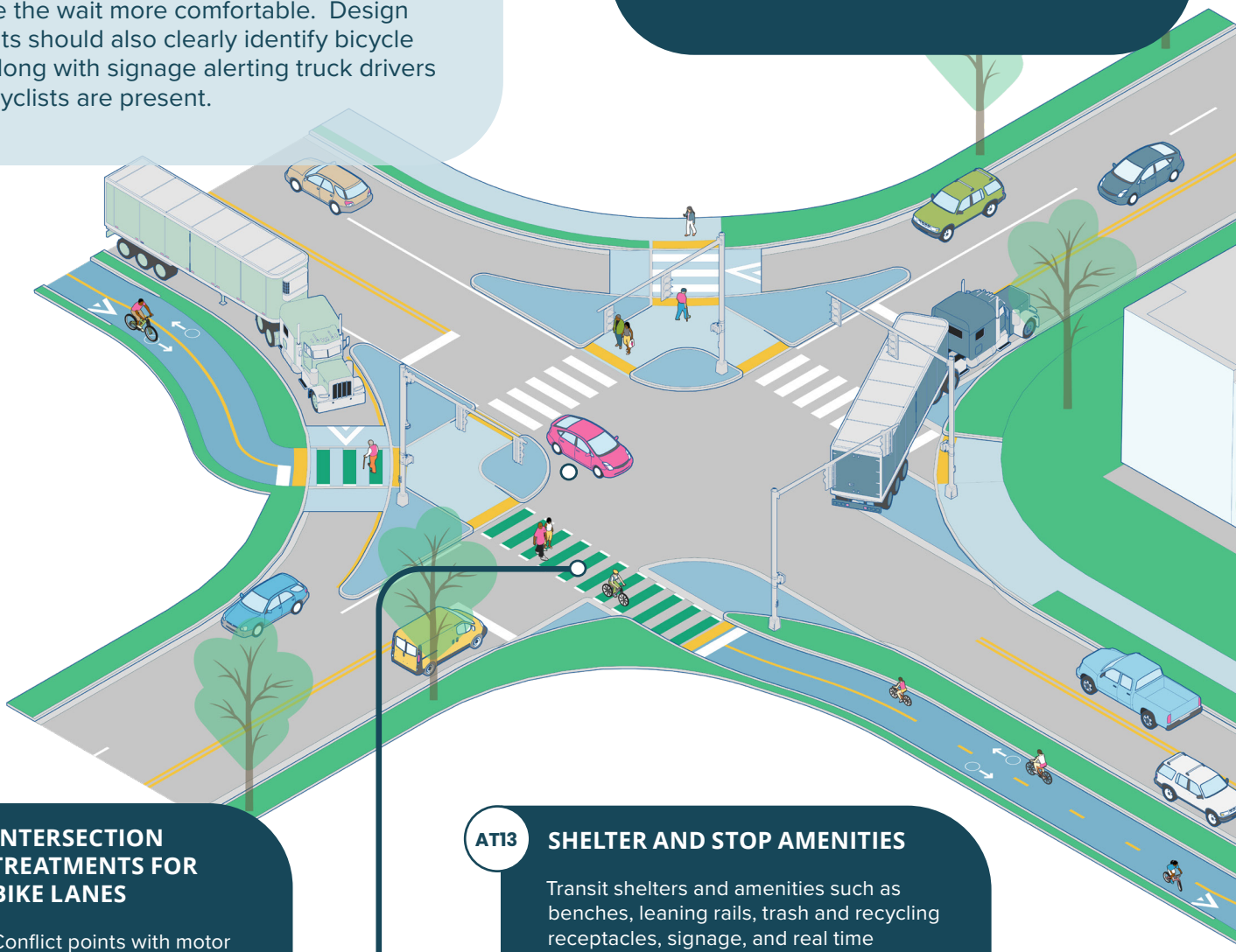
# 6B INDUSTRIAL

## CONNECTIONS MATTER

Industrial corridors often have wider paved roadway and larger driveways to accommodate heavy vehicles. Along bus routes, amenities such as shelters, benches, lighting, and recycling/trash receptacles should be provided to make the wait more comfortable. Design elements should also clearly identify bicycle lanes along with signage alerting truck drivers that bicyclists are present.

### DEDICATED TURN LANES

Depending on turning volumes, dedicated turn lanes may be appropriate at signalized intersections. Turn lanes should only be implemented through a traffic analysis process that indicates such are warranted. It is important to weigh the impacts that turn lanes have on pedestrian and bicycle crossing distance and times, as well as the additional conflicts that are introduced by turn lanes. Turn lane queue lengths and tapers will affect the geometric design of intersections, particularly in the utilization of space that would otherwise be available to the public realm. When possible, provide dedicated signal phases for left-turn lanes with proper time separation between pedestrian crossing phasing.



BF10

### INTERSECTION TREATMENTS FOR BIKE LANES

Conflict points with motor vehicles should be minimized and mitigated through careful design and signal treatments at intersections. Safety for bicyclists should always be paramount; where physical separation cannot be provided, the speed of vehicles should be controlled.

AT13

### SHELTER AND STOP AMENITIES

Transit shelters and amenities such as benches, leaning rails, trash and recycling receptacles, signage, and real time information makes transit more comfortable and convenient. Siting of shelters is determined on a case-by-case basis and includes consideration of ridership and frequency of service. Location of shelters should minimize obstructions of sight lines and must be ADA-compliant. A 5' long (parallel to curb) by 8' deep landing zone should be provided at front and rear bus doors.

BF2

## BICYCLE PARKING

Bike parking should be provided in close proximity to commercial destinations, activity centers or large employers.

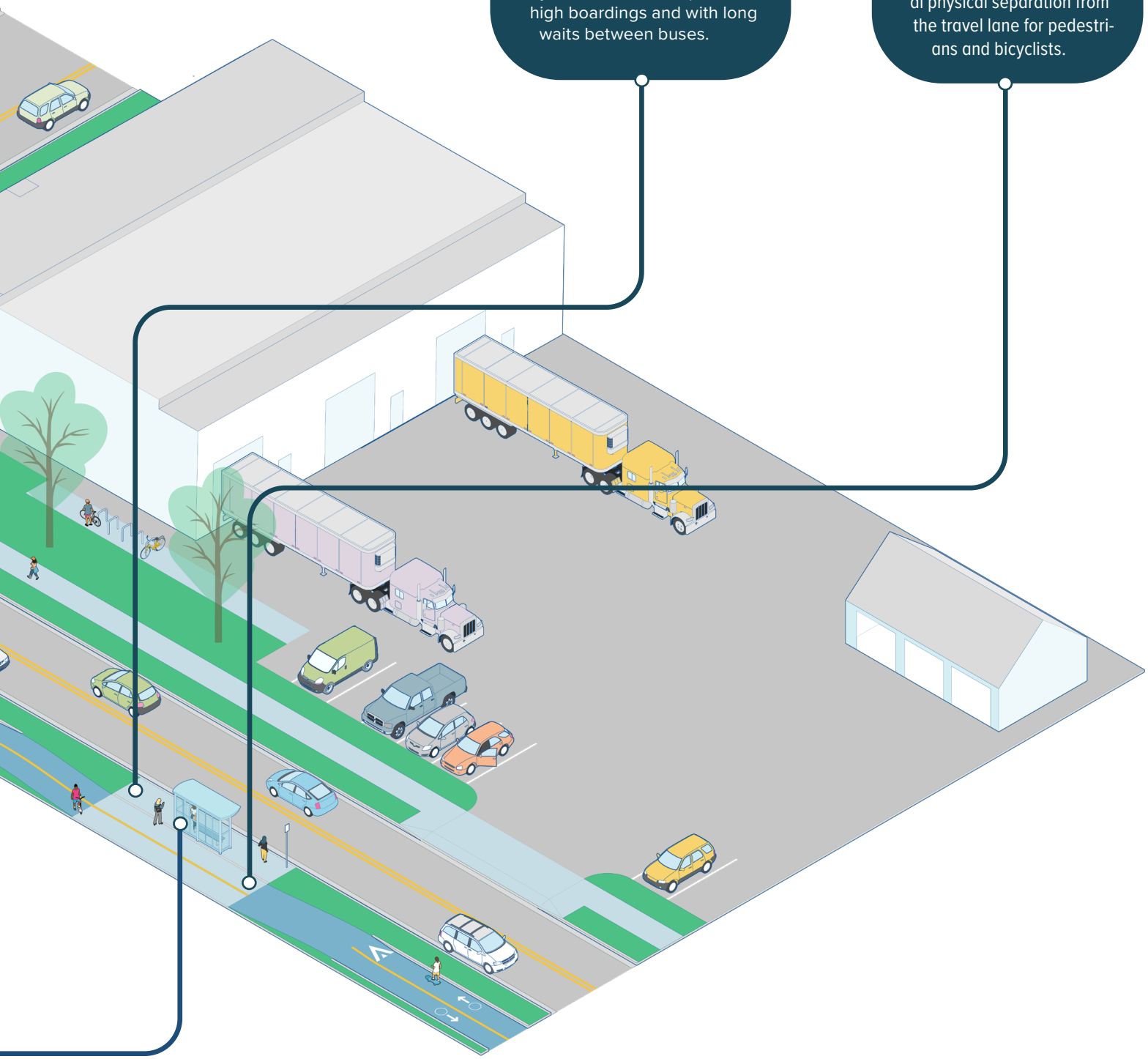
## TRANSIT STOPS

All transit stops should be fully ADA accessible, safe, and comfortable. Stops should be well-marked, visible, and provide a clear sight-line between the operator and waiting passengers. Simple signed stops without shelters or other amenities may be appropriate along lower volume routes and where sidewalks are narrow. Shelters and seating should by considered at stops with high boardings and with long waits between buses.

AT11

## BUS/BIKE CONFLICT MANAGEMENT

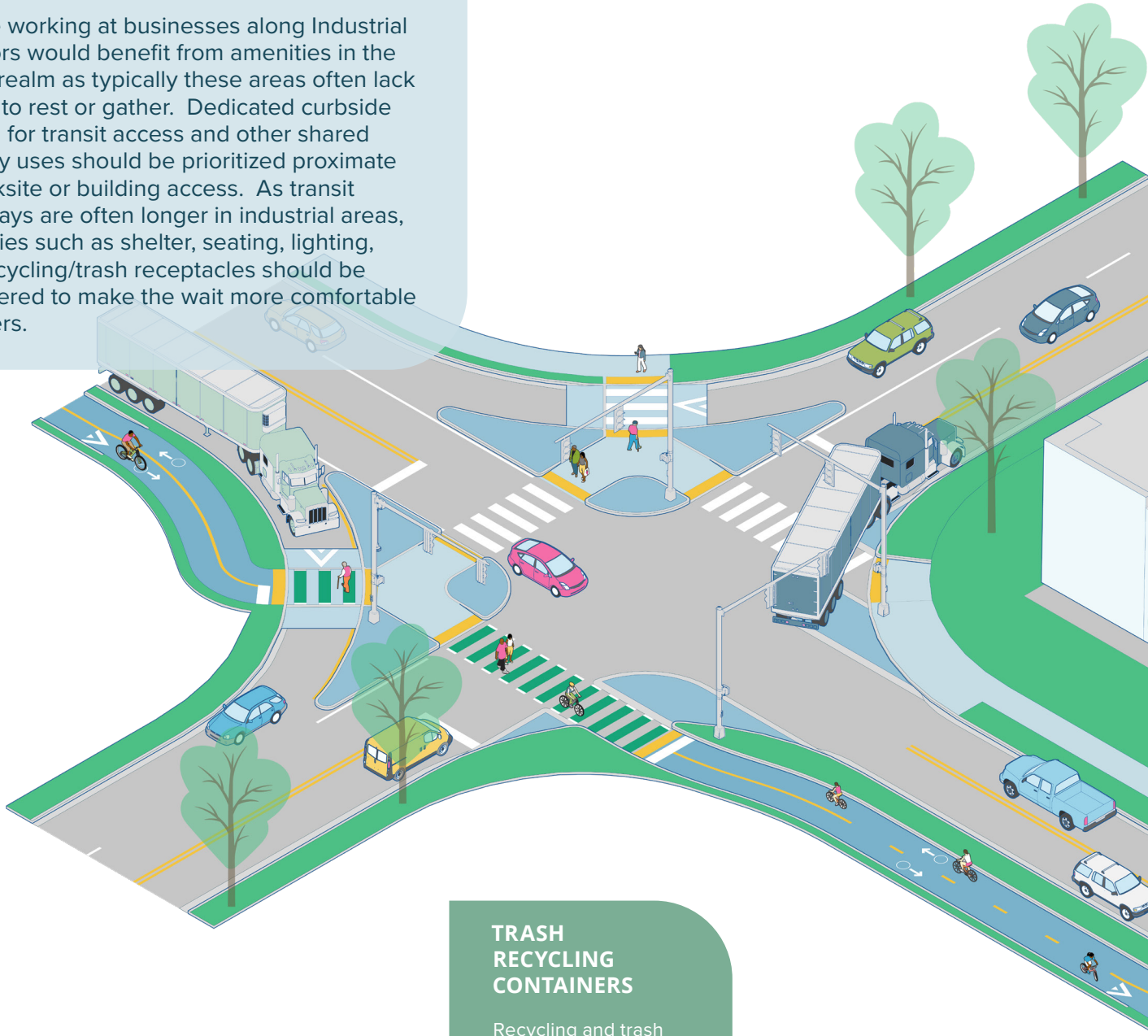
Along METRO bus routes where a bicycle facility is provided, the bicycle facility should run behind the bus stops This provides direct access between the bus stop and bus while eliminating bicycle conflicts with bus movements. The bus stop also provides additional physical separation from the travel lane for pedestrians and bicyclists.



# 6C INDUSTRIAL

## VIBRANT + HEALTHY

People working at businesses along Industrial corridors would benefit from amenities in the public realm as typically these areas often lack places to rest or gather. Dedicated curbside spaces for transit access and other shared mobility uses should be prioritized proximate to worksite or building access. As transit headways are often longer in industrial areas, amenities such as shelter, seating, lighting, and recycling/trash receptacles should be considered to make the wait more comfortable for riders.



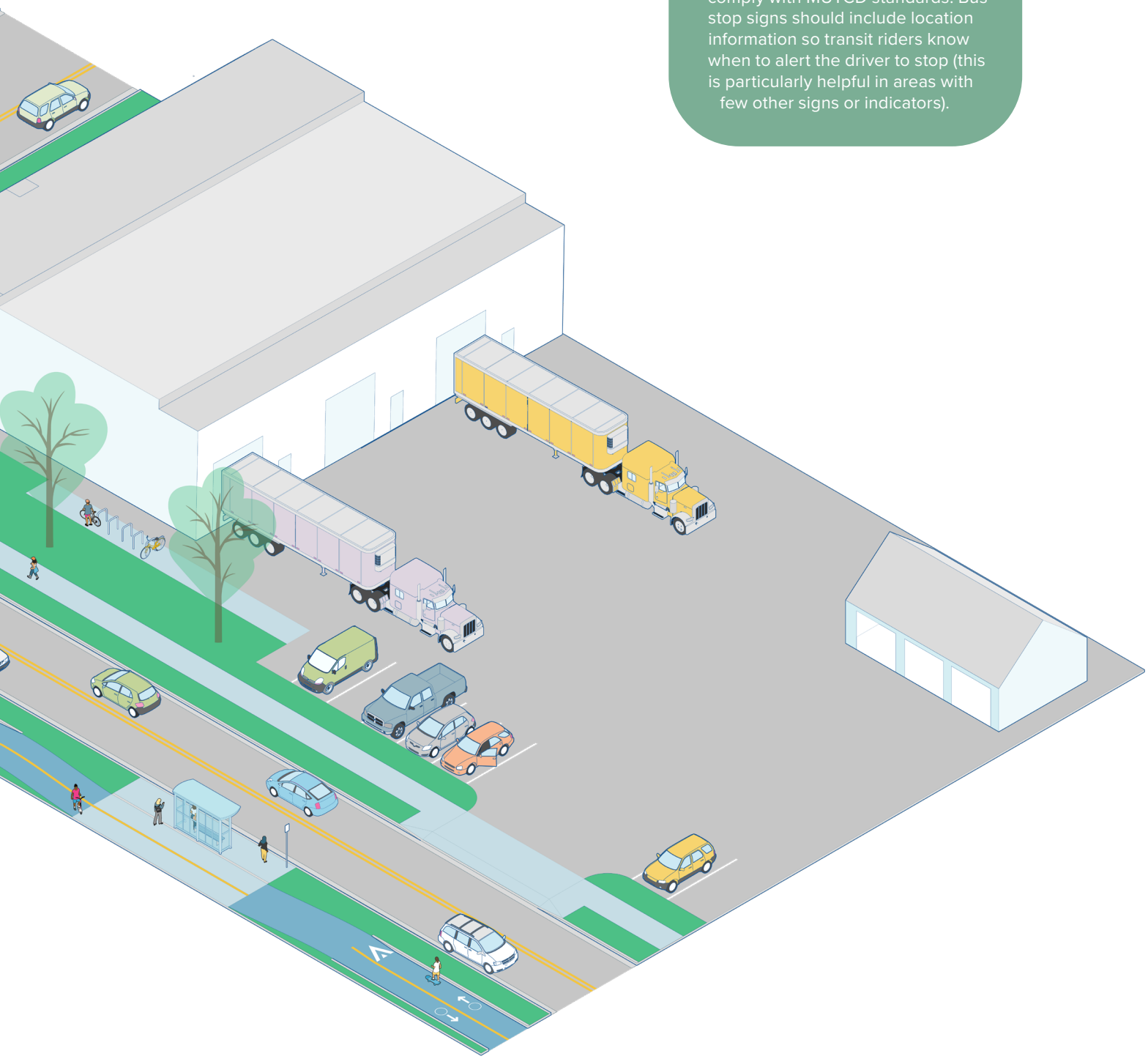
### TRASH RECYCLING CONTAINERS

Recycling and trash receptacles should be provided at any bus stop that also has a shelter. Ideal placement is in-line with the shelter. It should not interfere with the clear pedestrian path or with boarding and alighting areas.

AT12

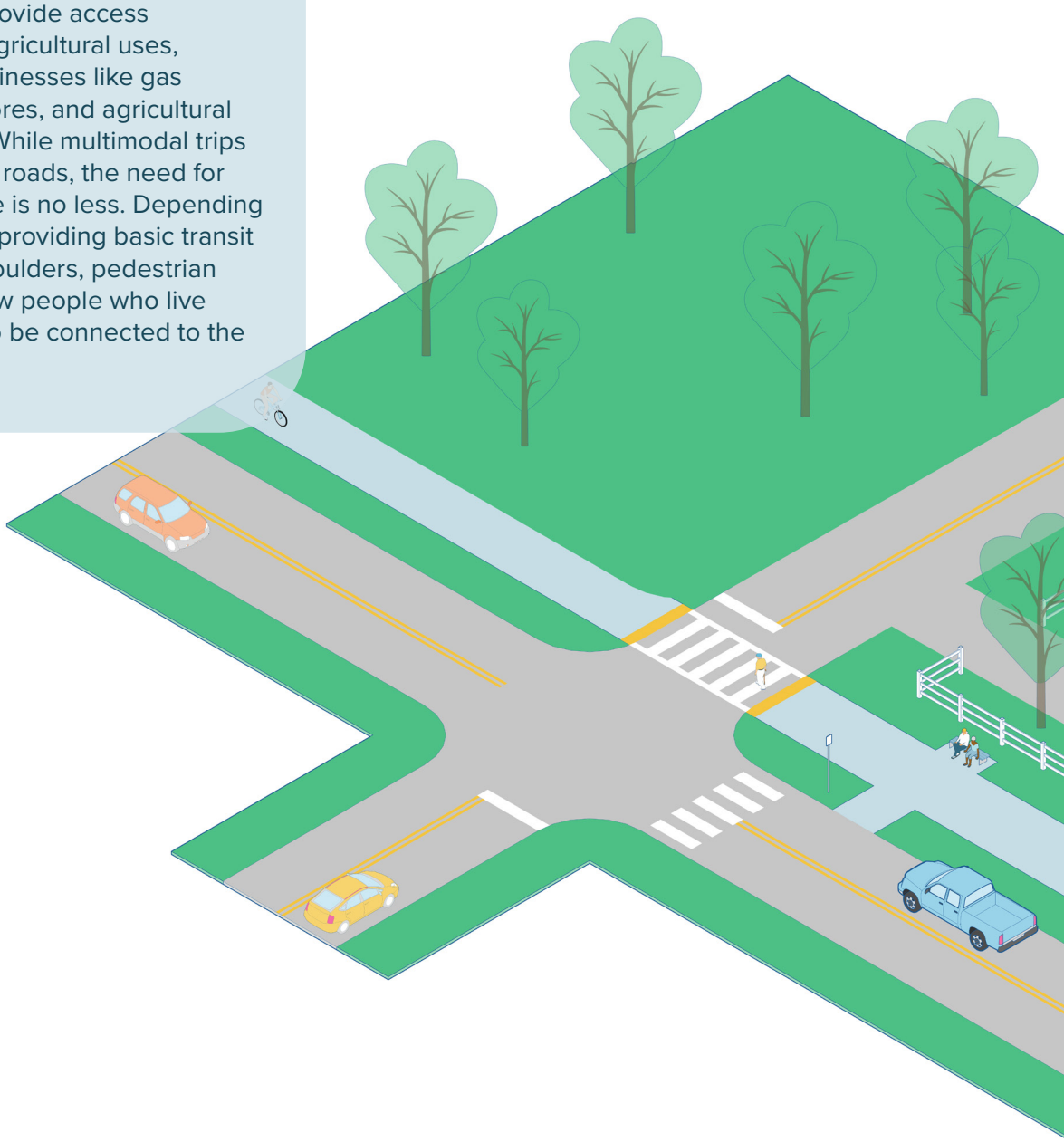
## SIGNAGE AND WAYFINDING

Within industrial corridors, wayfinding signage provides relevant information such as transit stop locations and location of key destinations so that people may form a mental map. Wayfinding systems also make it more comfortable for people to walk, bike, and take transit. Signage is scaled for pedestrians and is therefore smaller than signage for motorists. It should face toward the sidewalk or bicycle facility and comply with MUTCD standards. Bus stop signs should include location information so transit riders know when to alert the driver to stop (this is particularly helpful in areas with few other signs or indicators).



# 07 RURAL STREET

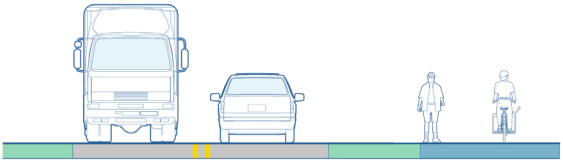
Rural Streets connect communities throughout the CARTS region and provide access to larger lot residential, agricultural uses, and service-oriented businesses like gas stations, convenience stores, and agricultural equipment dealerships. While multimodal trips may be fewer along rural roads, the need for appropriate infrastructure is no less. Depending on context and demand, providing basic transit stop amenities paved shoulders, pedestrian lanes, and sidepaths allow people who live and work in rural areas to be connected to the larger region.



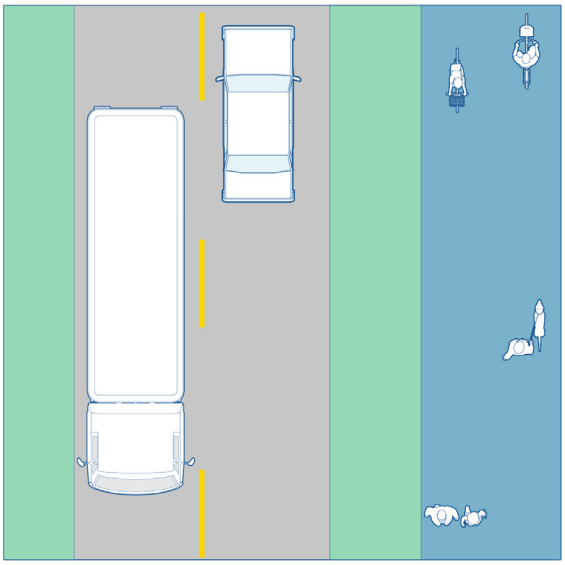
## Example Streets

- Highway 89 between Jacksonville and Mayflower
- Alexander Road, east of Alexander
- Congo Road, north of Benton

# TYPICAL CROSS SECTION



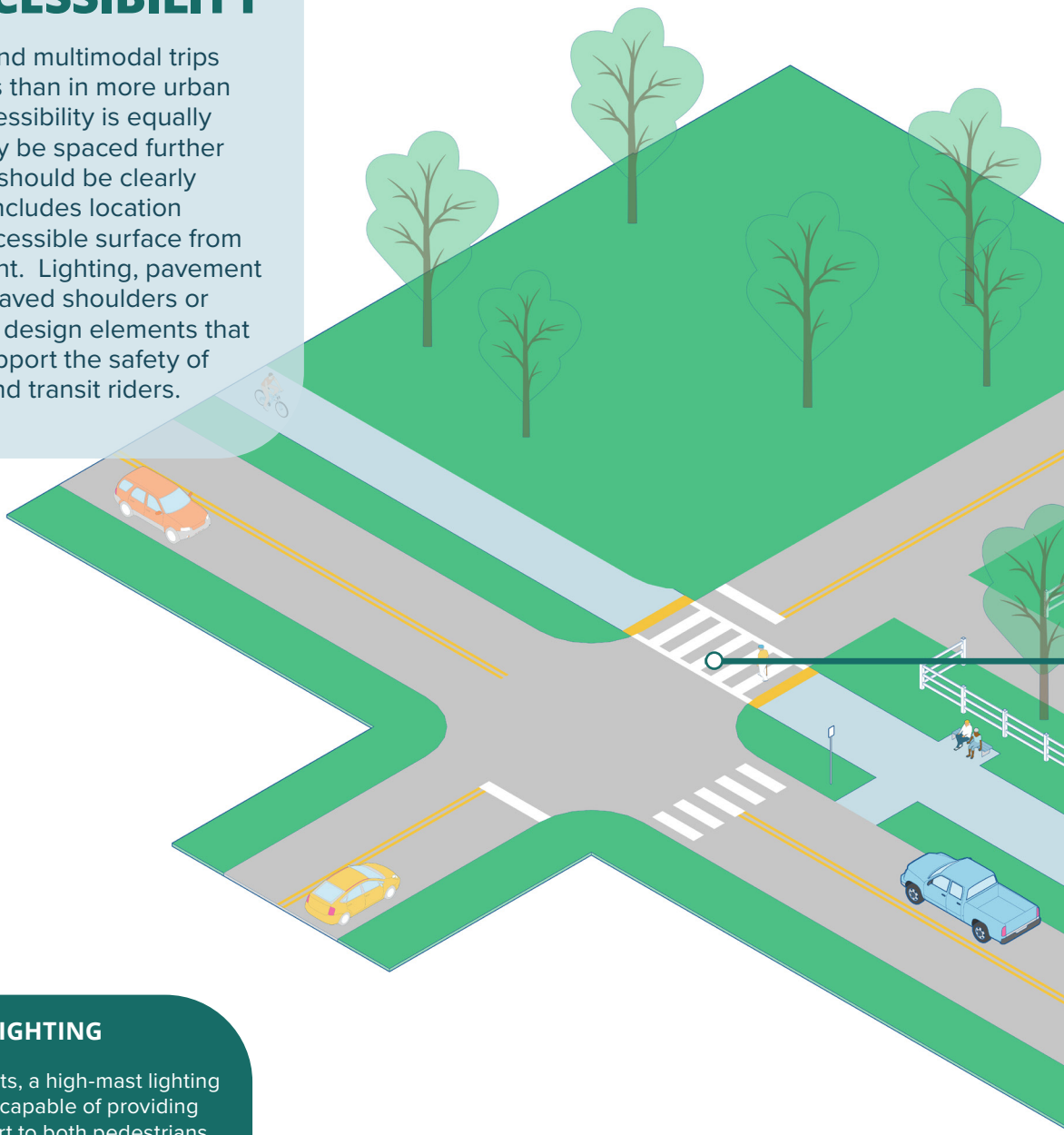
| | | TRAVEL LANES (2) | BUFFER | MULTI-USE PATH |
|---|---|---|---|---|
| REC | | 11' | 8' | 14' |
| MIN | | 10' | 5' | 8' |
| MAX | | 12' | - | - |



# 7A RURAL STREET

## SAFETY + ACCESSIBILITY

While transit boardings and multimodal trips in rural areas may be less than in more urban locations, safety and accessibility is equally important. Bus stops may be spaced further apart, but each bus stop should be clearly marked with a sign that includes location information and a flat, accessible surface from which to board, or to alight. Lighting, pavement markings, signage, and paved shoulders or sidepaths are among the design elements that may be considered to support the safety of pedestrians, bicyclists, and transit riders.



### SIDEWALK LIGHTING

Along Rural Streets, a high-mast lighting fixture should be capable of providing safety and comfort to both pedestrians and drivers. Engineering judgment should be used in the placement of lighting along Rural Streets, but it would be most appropriate in the vicinity of commercial developments and at roundabouts and major intersections

IC9

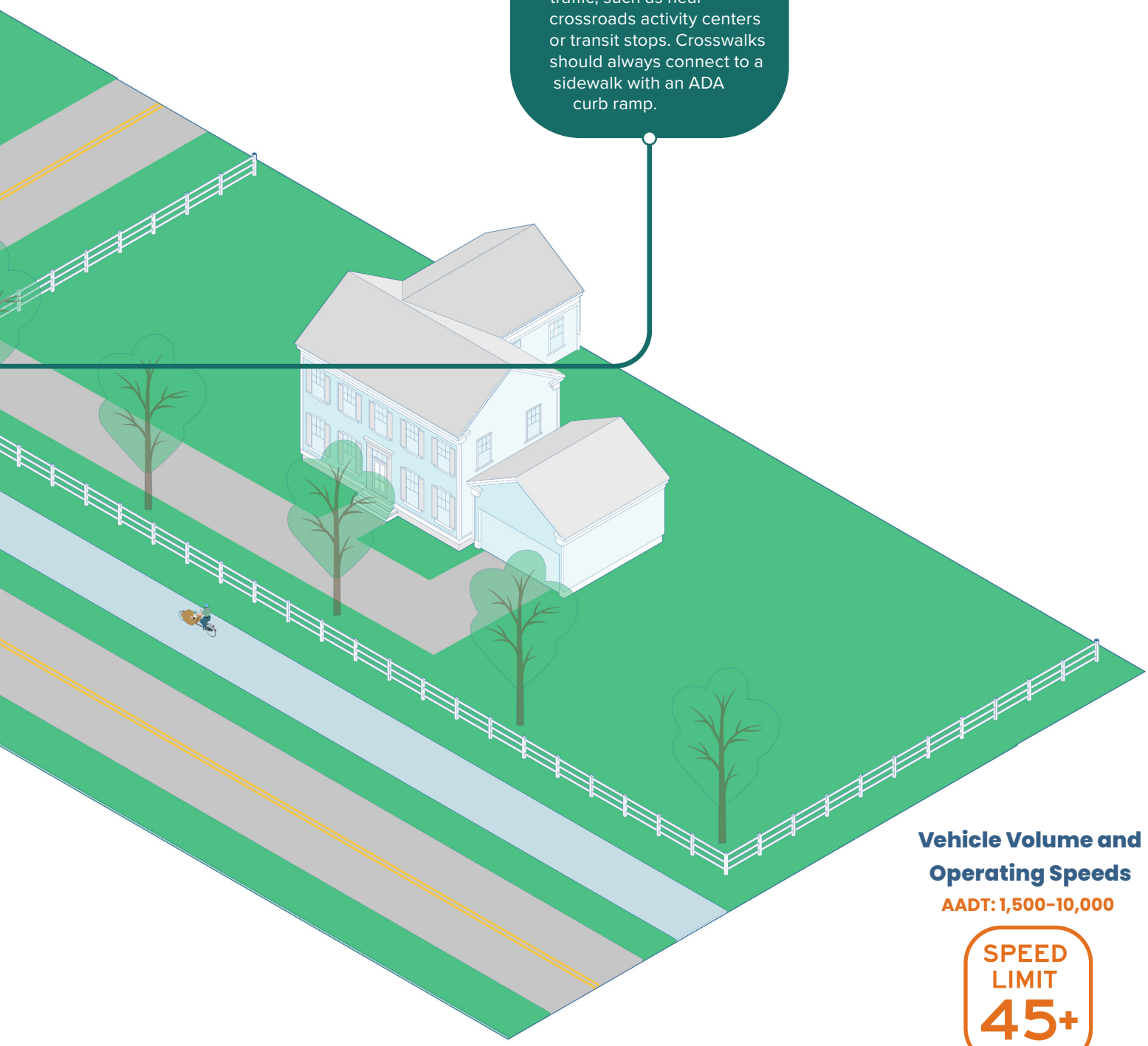
## CROSSWALKS

Crosswalks should be located at all signalized intersections and marked with enhanced continental style striping or thermo-plastic or textured or colored paving materials consistent with the MUTCD. Crosswalks may also be located at unsignalized intersections and at midblock locations where there is regular pedestrian traffic, such as near crossroads activity centers or transit stops. Crosswalks should always connect to a sidewalk with an ADA curb ramp.

BF4

## VERTICAL SEPARATION

Horizontal and vertical separation between multi-use paths or pedestrian lanes and vehicle travel lanes should be provided. On Rural Streets where speeds are in excess of 40 mph, this physical separation should be a combination of paint and a solid concrete vertical barrier.



**Vehicle Volume and Operating Speeds**

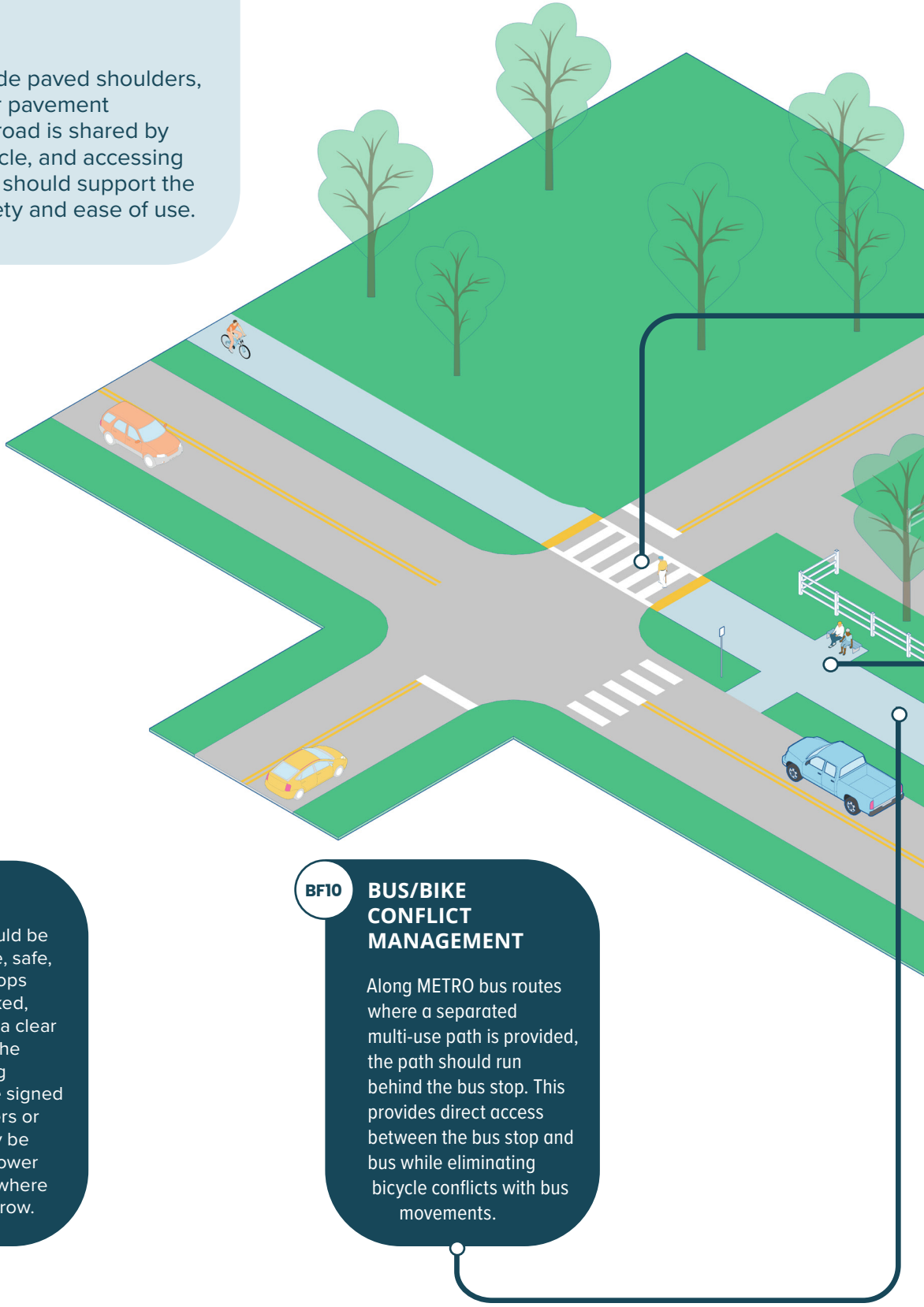
**AADT: 1,500–10,000**

SPEED LIMIT 45+

# 7B RURAL STREET

## CONNECTIONS MATTER

Rural corridors may include paved shoulders, sidepaths or trails, and/or pavement markings to indicate the road is shared by people on foot, on a bicycle, and accessing transit. Design elements should support the mulitmodal traveler's safety and ease of use.



**AT13 TRANSIT STOPS**

All transit stops should be fully ADA accessible, safe, and comfortable. Stops should be well-marked, visible, and provide a clear sight-line between the operator and waiting passengers. Simple signed stops without shelters or other amenities may be appropriate along lower volume routes and where sidewalks are narrow.

**BF10 BUS/BIKE CONFLICT MANAGEMENT**

Along METRO bus routes where a separated multi-use path is provided, the path should run behind the bus stop. This provides direct access between the bus stop and bus while eliminating bicycle conflicts with bus movements.

BF10

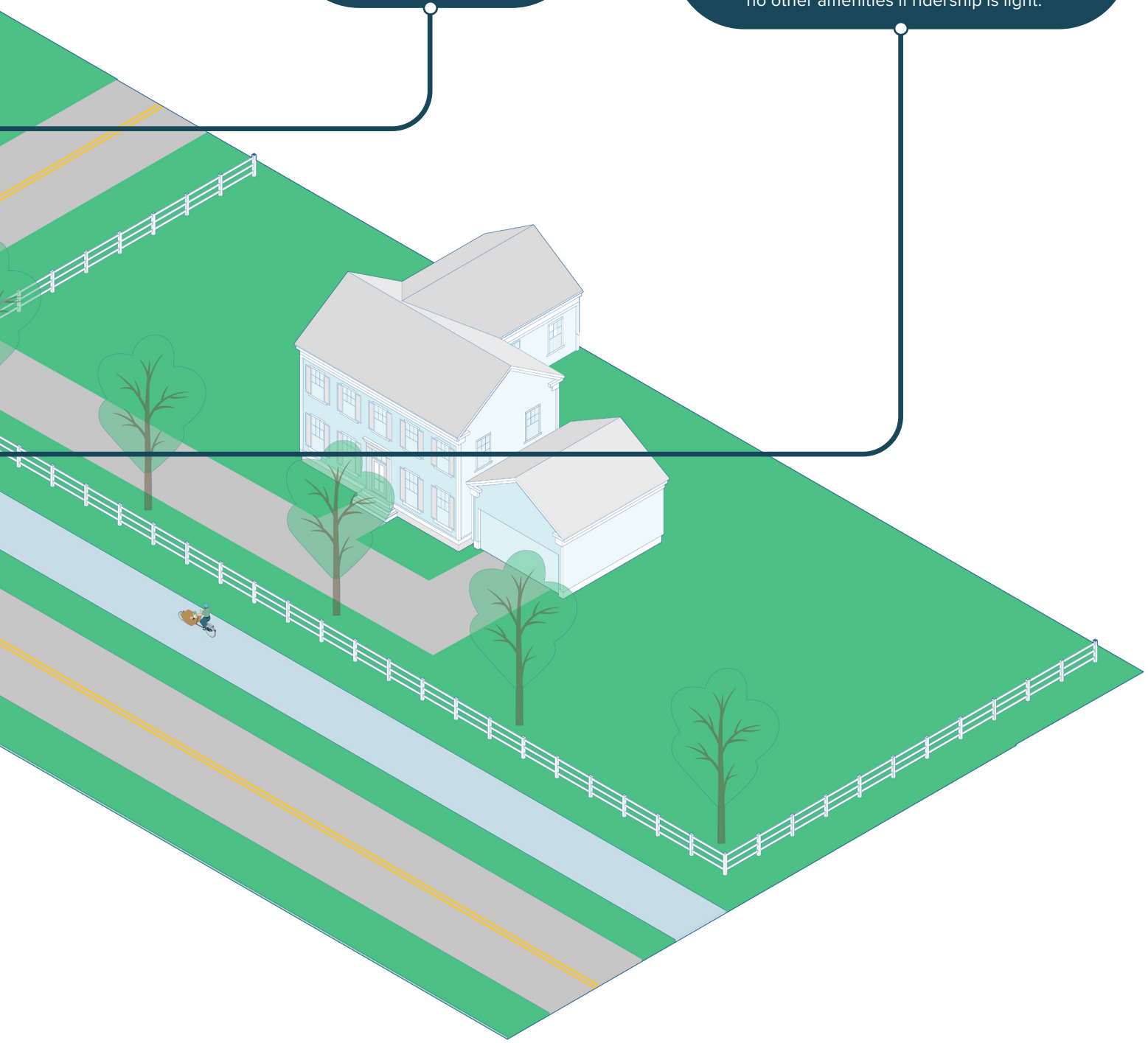
## INTERSECTION TREATMENTS FOR BIKE LANES

Conflict points with motor vehicles should be minimized and mitigated through careful design. Safety for trail users should always be paramount; where physical separation cannot be provided, the speed of vehicles should be controlled.

AT13

## SHELTER AND STOP AMENITIES

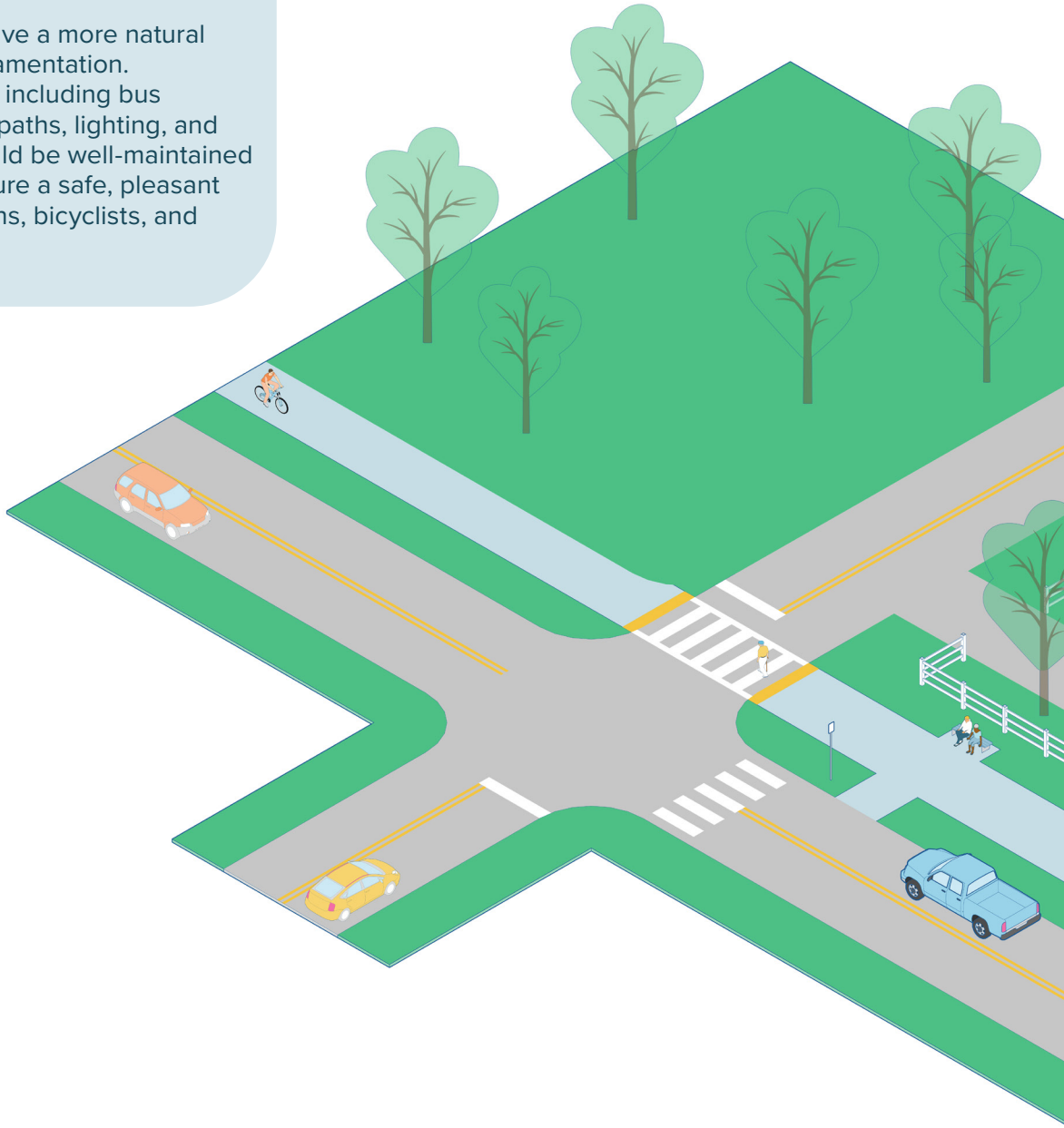
Transit shelters and amenities such as benches, leaning rails, trash and recycling receptacles, signage, and real time information makes transit more comfortable and convenient. Siting of shelters is determined on a case-by-case basis and includes consideration of ridership and frequency of service. Location of shelters should minimize obstructions of sight lines and must be ADA-compliant. A 5' long (parallel to curb) by 8' deep landing zone should be provided at front and rear bus doors. Along Rural corridors, however, transit stops may simply be a sign with no other amenities if ridership is light.



# 7C RURAL STREET

## VIBRANT + HEALTHY

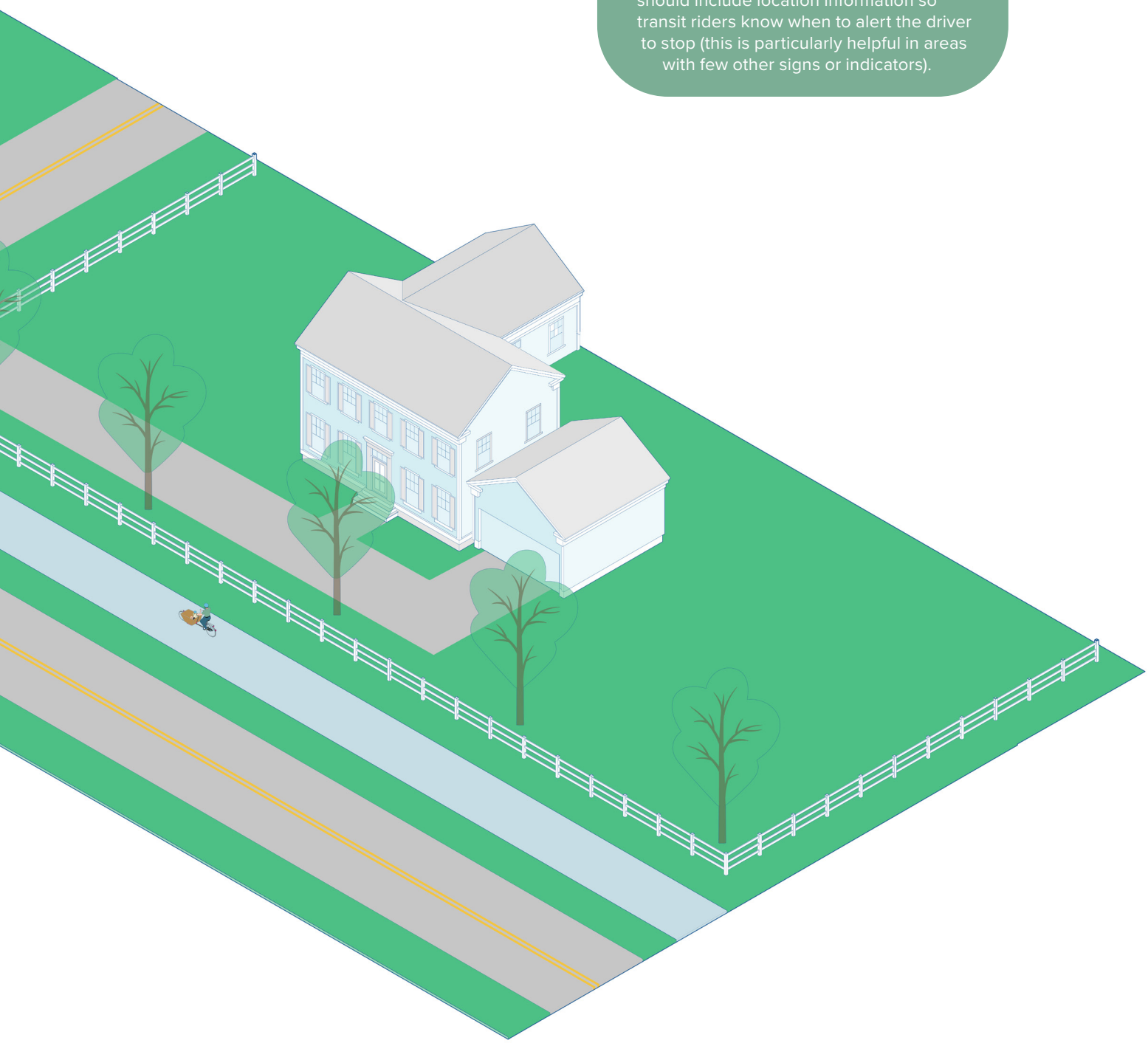
Rural corridors tend to have a more natural look with less flair or ornamentation. Multimodal infrastructure including bus pads and amenities, sidepaths, lighting, and pavement generally should be well-maintained and free of debris to ensure a safe, pleasant experience for pedestrians, bicyclists, and people accessing transit.



AT12

## SIGNAGE AND WAYFINDING

Within Rural corridors, wayfinding signage provides relevant information such as transit stop locations and location or direction of key destinations so that people may form a mental map. Wayfinding systems also make it more comfortable for people to walk, bike, and take transit. Signage is scaled for pedestrians and is therefore smaller than signage for motorists. It should face toward the sidewalk or bicycle facility and comply with MUTCD standards. Bus stop signs should include location information so transit riders know when to alert the driver to stop (this is particularly helpful in areas with few other signs or indicators).



# 7D RURAL STREET

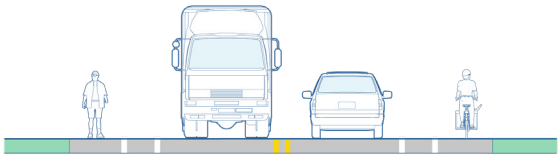
## MOBILITY ALTERNATIVES

Rural Streets provide challenges to pedestrian and cyclist mobility. Design alternatives to a shared use path can be more affordable and also feasible to adapt within existing roadway.

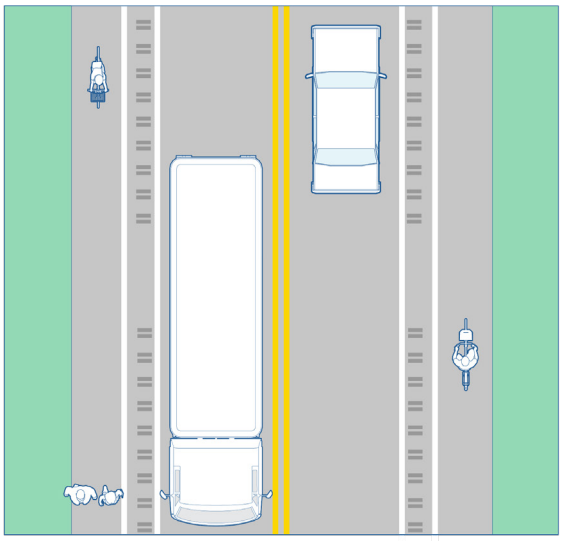
## PAVED SHOULDERS

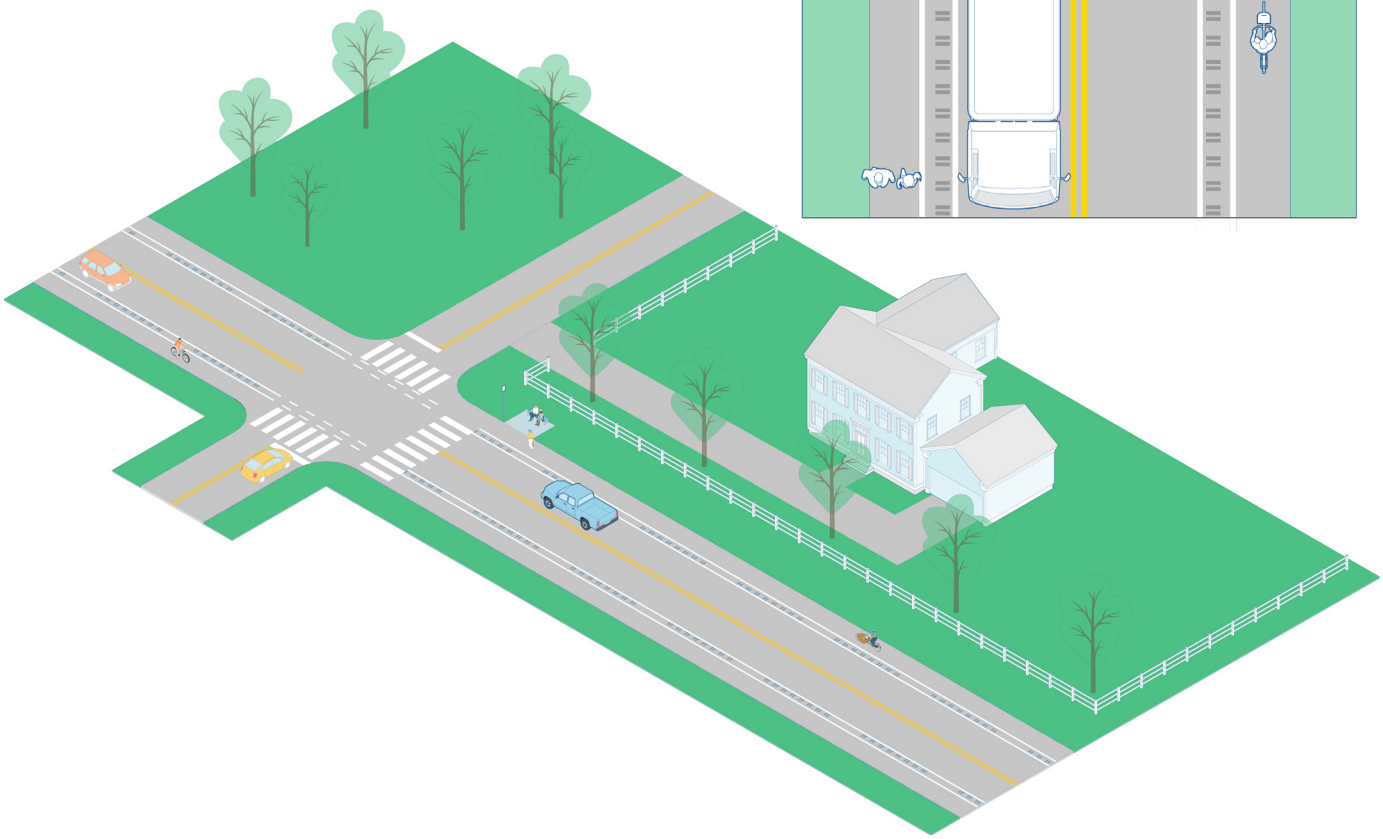
Paved shoulders serve as a space for cyclists and pedestrians to travel when no other facilities are present. They can be enhanced with edge line rumble strips and buffer markings to improve visual separation on roadways with higher speeds and traffic volumes. Rumble strips should be designed with breaks to allow bicyclists to enter and exit shoulders without risk of damage to their bicycle or injury to themselves. Also, shoulders should be maintained to ensure road debris does not pose a risk to bicyclists.

### TYPICAL CROSS SECTION



| | SHOULDER | BUFFER | TRAVEL LANES (2) | BUFFER | SHOULDER |
|---|---|---|---|---|---|
| REC | 5' | 3' | 11' | 3' | 5' |
| MIN | 5' | 1' | 10' | 1' | 5' |
| MAX | 8' | 4' | 12' | 4' | 8' |

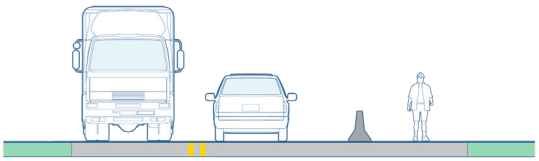




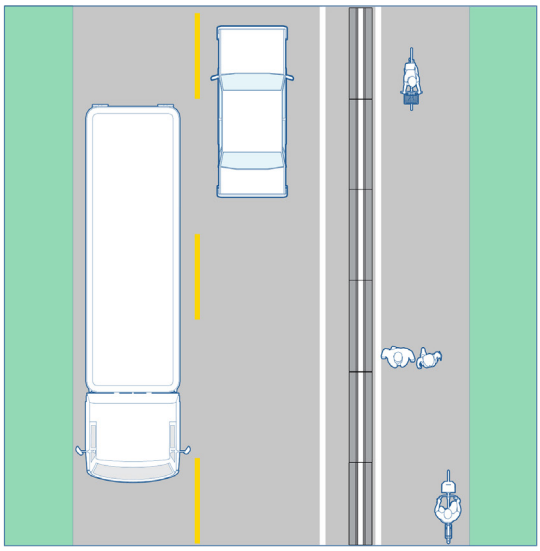
# PEDESTRIAN LANE

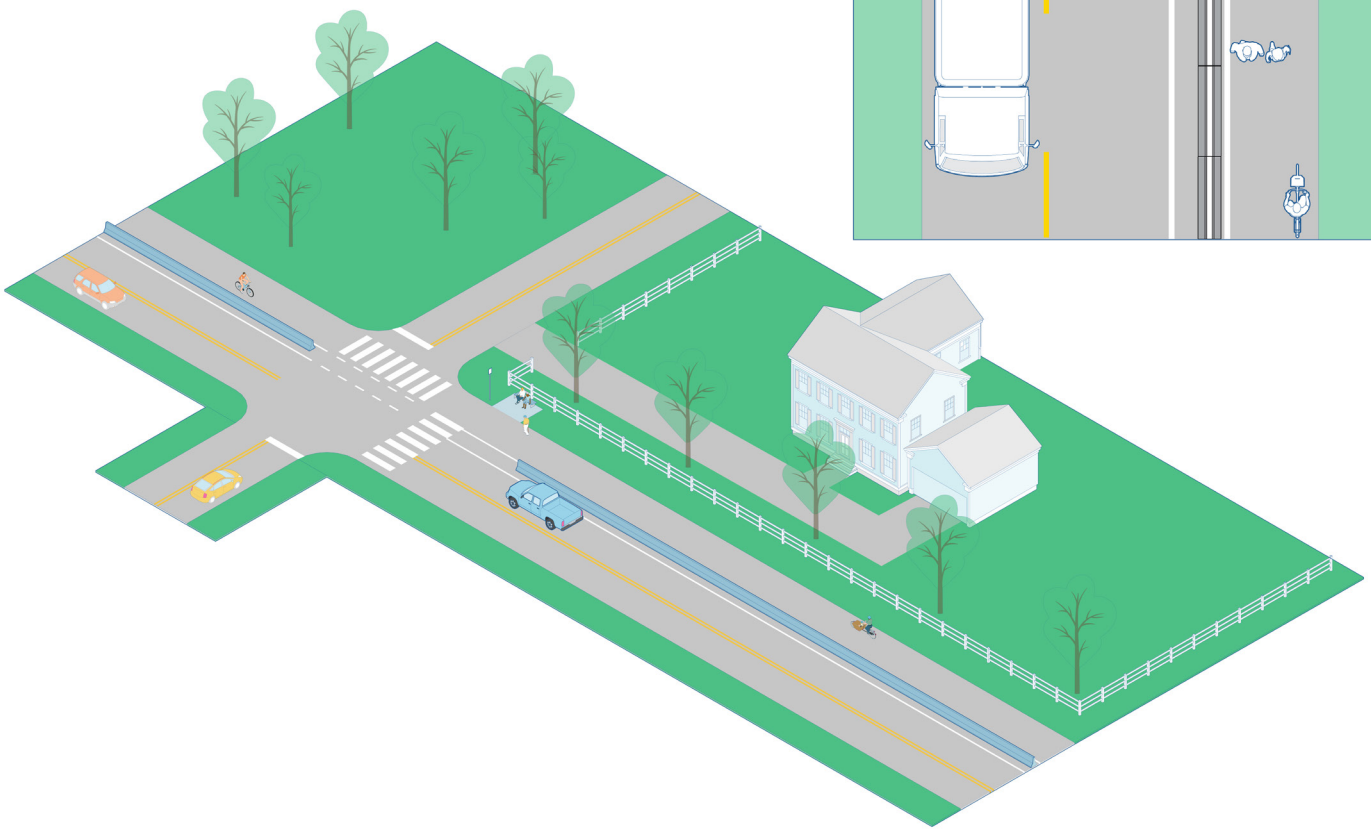
Pedestrian lanes may be appropriate on roads with low to moderate speeds and volume. They are considered temporary or interim solutions. A double white line buffer and vertical element can create comfort and visual separation for pedestrian and cyclists.

## TYPICAL CROSS SECTION



| | | TRAVEL LANES (2) | BUFFER | PEDESTRIAN LANE | |
|---|---|---|---|---|---|
| REC | | 11' | 6' | 14' | |
| MIN | | 10' | 4' | 8' | |
| MAX | | 12' | - | - | |





# DESIGN DETAILS

03

This chapter provides additional detail and specificity about the many elements referenced in Chapter 2, Corridor Types. It provides specific information, guidance, and additional references related to the design and construction of streets and roadways in Central Arkansas. This document, particularly when integrated into local master street plans, provides design flexibility to achieve outcomes that improve the public realm, and support safe use of all modes of transportation. **Guidelines should be implemented with common sense and engineering judgment.**

## HOW TO USE THE DETAIL DICTIONARY:

Each design corresponds to a color-coded and categorized identification icon shown on the corridor types. To ensure consistent use of methods and materials, make budgets more predictable, and promote safe use of all transportation modes in Central Arkansas, practitioners and implementers should reference the details in this chapter. The following categories are included:

- **AT - Access to Transit:** This section includes details related to placement and design of bus stops, amenities, and connecting infrastructure.
- **BF - Bicycle Facilities:** This section includes guidance on when and where to apply various bicycle facilities and supporting infrastructure.
- **IC - Intersections and Crossings:** This section addresses design details related to types of and selection criteria for intersection crossings for pedestrians, bicyclists, micromobility users, and those accessing transit.
- **CM - Curbside Management:** Design strategies relating to balancing of competing interests at the curb is addressed in this section.

Guidance for many of the more complex design details are organized by use, guidance, additional considerations, and resources to assist the reader in application of the guidance.

### USE

Design strategies are applicable in various contexts. ***Use*** describes specific conditions where a design strategy many be warranted.

### GUIDANCE

***Guidance*** includes information specific to the design detail that will aid the implementing agency in resolving a challenge, usually among roadway users, while prioritizing safety, accessibility, respect for all modes, and quality of the space.

### ADDITIONAL CONSIDERATIONS

***Additional Considerations*** provide advice generally, or specific to certain contexts or conditions. They are important, but less so than the information included in ***Guidance***.

### RESOURCES

For each design detail, ***resources*** are referenced where the reader can find additional details, national best practice, and/or federally-endorsed guidelines and standards.

## ACCESS TO TRANSIT


**AT1** Sidewalk Zones

**AT2** Preferred and Minimum Widths for Sidewalk Zones

**AT3** How to Select and Prioritize Transit Facilities

**AT4** Bus Stops

**AT5** Floating Bus Stop

**AT6** Bus Bulb

**AT7** Median Stop

**AT8** Pull-Out Stop

**AT9** Sidewalk Stop

**AT10** Dedicated Bus Lanes

**AT11** Bus Stop Boarding and Alighting Areas

**AT12** Bus Stop Signage and General Wayfinding

**AT13** Bus Stop Shelter and Benches

**AT14** Landscaping

**AT15** Bicycle Parking Integration

**AT16** Bus Stop Placement


## BICYCLE FACILITIES


**BF1** How To Select And Prioritize Bicycle Facilities

**BF2** Bicycle Parking

**BF3** Separated Bike Lanes

**BF4** Vertical Separation

**BF5** Buffered Bike Lane

**BF6** Striped Bike Lane

**BF7** Advisory Shoulder

**BF8** Neighborhood Bikeway

**BF9** Shared Lane

**BF10** Multi-Use Path

## INTERSECTIONS AND CROSSINGS

- **IC1** Traffic Signal Operations For Pedestrian Mobility
- **IC2** Daylighting
- **IC3** Curb Extensions
- **IC4** Crossing Islands
- **IC5** Neighborhood Traffic Circles
- **IC6** Hardened Centerlines
- **IC7** Curb Ramps
- **IC8** Raised Crosswalks
- **IC9** Marked Crosswalks
- **IC10** Driveway Crossings
- **IC11** Raised Intersection
- **IC12** Transit Prioritization at Intersections
- **IC13** Protected Intersections
- **IC14** Two-Stage Turn Box

## CURBSIDE MANAGEMENT

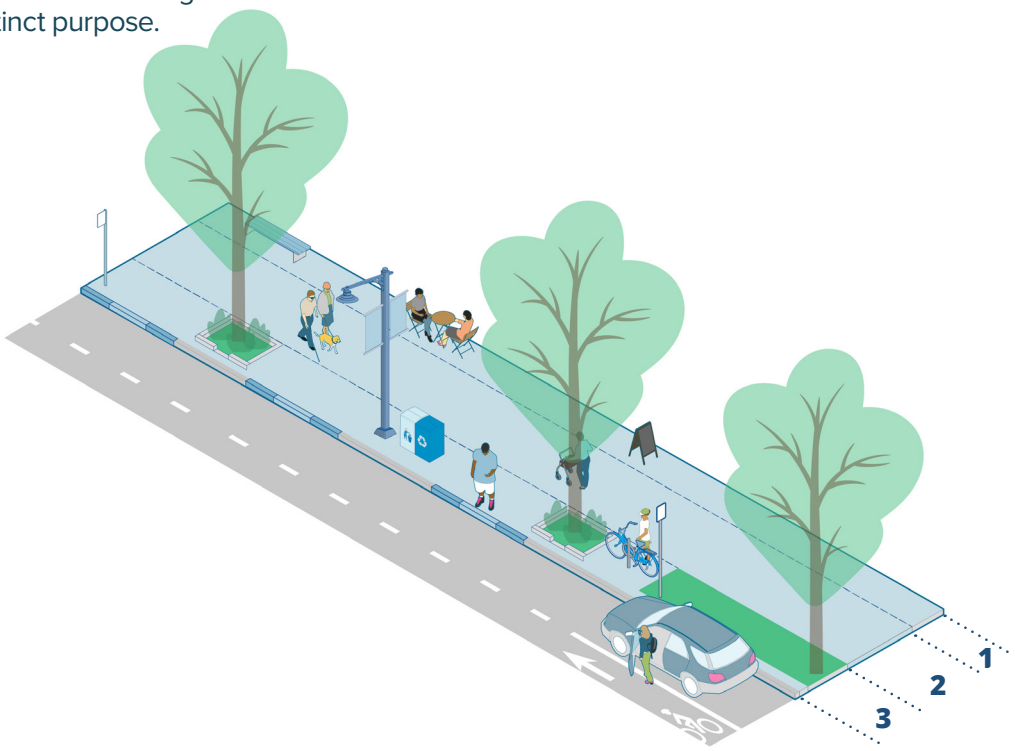
- **CM1** Mobility Hubs
- **CM2** Scooter and Bicycle Share Parking
- **CM3** Electric Vehicle Charging
- **CM4** Food Trucks

# ACCESS TO TRANSIT

# AT1: SIDEWALK ZONES

Sidewalks should be highly functional, vibrant public spaces, as they serve as the principal infrastructure for pedestrian mobility. Sidewalks are where people walk and wheel, access transit, engage with each other, and truly experience the communities of Central Arkansas. As such, they should be spaces that promote connectivity, physical activity, access to destinations, and intermodal trips with motorized vehicles, transit, bicycling, and other micromobility options.

For a sidewalk to be functional, it is important to realize that the sidewalk itself is comprised of three primary zones, each with a different role in the pedestrian experience. These zones are described below. The width and character of these zones will fluctuate based on the Corridor Type in which they are applied, driven specifically by mobility priorities and surrounding land use context. While the boundaries between the three zones can be fluid, each zone serves a distinct purpose.

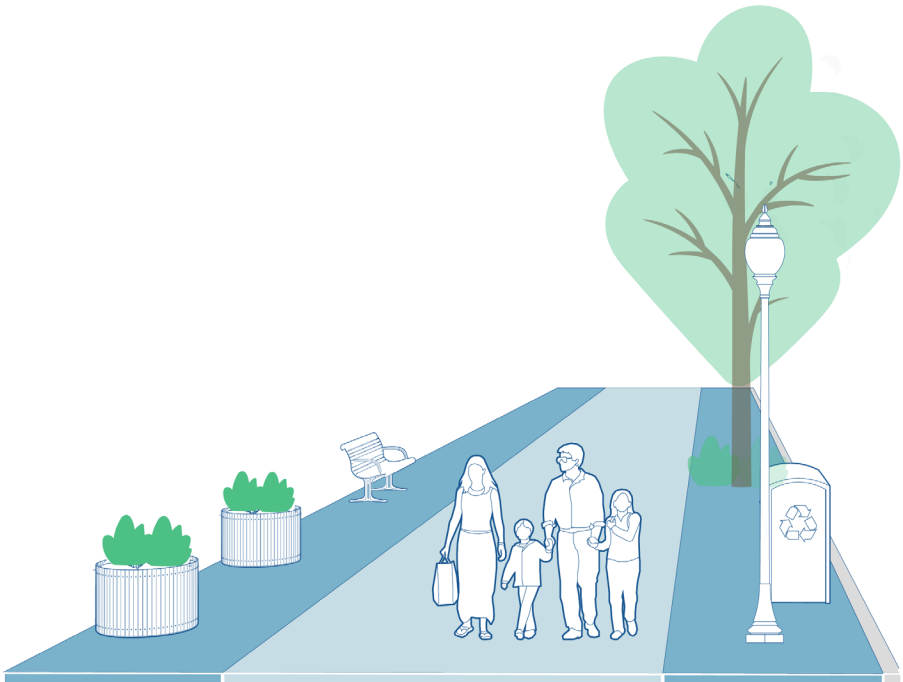



**1. FRONTAGE ZONE:** The Frontage Zone is located furthest from the curb, occupying the space closet to the building face. In commercial areas, the Frontage Zone may include architectural features, outdoor displays, café seating, awnings, signage, and other appurtenances that activate building frontages. In residential areas, the Frontage Zone may consist of front porches, stoops, lawns, or other landscape elements that extend from the front door to the sidewalk edge. Depending on context, need, and demand, Frontage Zones may vary in width from just a few feet to a much wider area.

**2. ACTIVE TRAVEL ZONE:** The Active Travel Zone is the portion of the sidewalk where people can walk and wheel in a continuous, direct path, safe from conflicts with other travel modes and unencumbered by street furnishings, frontage improvements, and other obstacles. Special attention should be given to avoid obstacles that are added over time within and adjacent to the Active Travel Zone. Gradual individual additions can add up, resulting in a crowded, uncomfortable, and/or unsfae walking and wheeling environment.

**3. AMENITY ZONE:** As the location for street furnishings, pedestrian-scale lighting, bike parking, transit stops and shelters, and other amenities, this zone supports pedestrians as they travel along the sidewalk and transition to/from other modes at the curb. Additionally, this zone assists motorists, bicyclists, and people using other micromobility modes by housing signage, wayfinding, and street lighting.

# AT2: PREFERRED AND MINIMUM WIDTHS FOR SIDEWALK ZONES



| Street Type | Frontage Zone<br>Min \| **Pref** \| Max | Active Travel Zone<br>Min \| **Pref** \| Max | Amenity Zone<br>Min \| **Pref** \| Max | Total<br>Min \| **Pref** |
|---|---|---|---|---|
| Downtown Mixed-Use | 0' \| **4'** \| 8' | 8' \| **12'** \| - | 5' \| **8'** \| 12' | 13' \| **24'** |
| Town Main Street | 0' \| - \| 8' | 8' \| **12'** \| - | 5' \| **6'** \| 12' | 13' \| **18'** |
| Urban Residential Street | - | 5' \| **8'** \| 12' | 2' \| **4'** \| 12' | 7' \| **12'** |
| Suburban Residential Connector | - | 5' \| **6'** \| 14' | 2' \| **4'** \| 12' | 7' \| **10'** |
| Suburban Commercial | 0' \| - \| 4' | 5' \| **8'** \| 14' | 2' \| **8'** \| 12' | 7' \| **16'** |
| Industrial Street | - | 5' \| **6'** \| 12' | 2' \| **6'** \| 12' | 7' \| **12'** |
| Rural Road | - | 5' \| **6'** \| 12' | 2' \| **6'** \| 12' | 7' \| **12'** |

6" Curb

**Some Corridor Types may not have every sidewalk zone.*

Sidewalk zones will vary in width depending on the Corridor Type, available right of way, modes to be served, scale of adjacent buildings, and the intensity and type of uses expected along a particular street segment. A balanced approach to determining the widths of the various zones and the sidewalk itself should consider the character or context of the surrounding area, anticipated pedestrian activity, and the needs and demands of multimodal transportation on the corridor. For instance, if a street is part of a high-ridership transit route, then the amenity zone may need to be larger to accommodate larger shelters, more seating, and additional room for boarding and alighting. Similarly, if the street has a large number of retail and restaurant uses, then additional frontage zone width would be appropriate for window shopping and outdoor dining.

# AT3: HOW TO SELECT AND PRIORITIZE TRANSIT FACILITIES

Transit amenities such as shelters, benches, lighting, recycling and trash receptacles, and informational signage not only contribute to the transit system's overall accessibility and ease of use but also signify safety, security, courtesy, respect, and dignity. Many of Central Arkansas' most essential workers use transit service to get to work. Whether one relies on public transit or chooses to take transit in combination with walking or wheeling, transit riders both deserve and appreciate amenities similar to those provided for other modes.

## GUIDANCE

- Allocation of transit amenities should be consistent with policies outlined in Rock Region METRO's Title VI Program.
- Amenities should be placed in the right of way. If amenities are placed on private property, an easement, joint use agreement or other permission should be obtained prior to permitting and installation. To the extent feasible, permission should be secured for the useful life of the capital asset if FTA funds are used.
- If transit amenities must be removed from a bus stop, they should be reinstalled elsewhere.
- Amenities themselves, as well as placement of amenities, must meet ADA requirements.
- Number of shelters and amount of seating should be based on both the number of people who will use the bus stop during peak service as well as the length of time people are likely to be waiting.

## ADDITIONAL CONSIDERATIONS

- On a case-by-case basis, additional circumstances may be considered for amenity placement:
  - At transfer locations, as it is likely passengers will be waiting for their connecting route;
  - At stops serving vulnerable populations (including transit-dependent communities, older adults, and persons with disabilities), regardless of level of boardings; and
  - At stops proximate to essential services such as, but not limited to, grocery stores, health clinics, and employment centers.
- Amenities may not be needed at stops used primarily for alighting passengers.
- Amenities can be provided in varying combinations depending on need and available space. For example, if some form of shelter is already available nearby, such as from shade trees or building awnings, a transit shelter may not be necessary; however, other amenities such as seating, recycling/trash receptacles, and wayfinding may be considered.
- Regular maintenance should be planned and budgeted for all amenities.
- Deviations from standard amenity designs should be considered based upon need.
- Vendors, sponsors, advertisers, and partners who may design, install, and/or maintain transit amenities should meet all ADA requirements and guidelines.

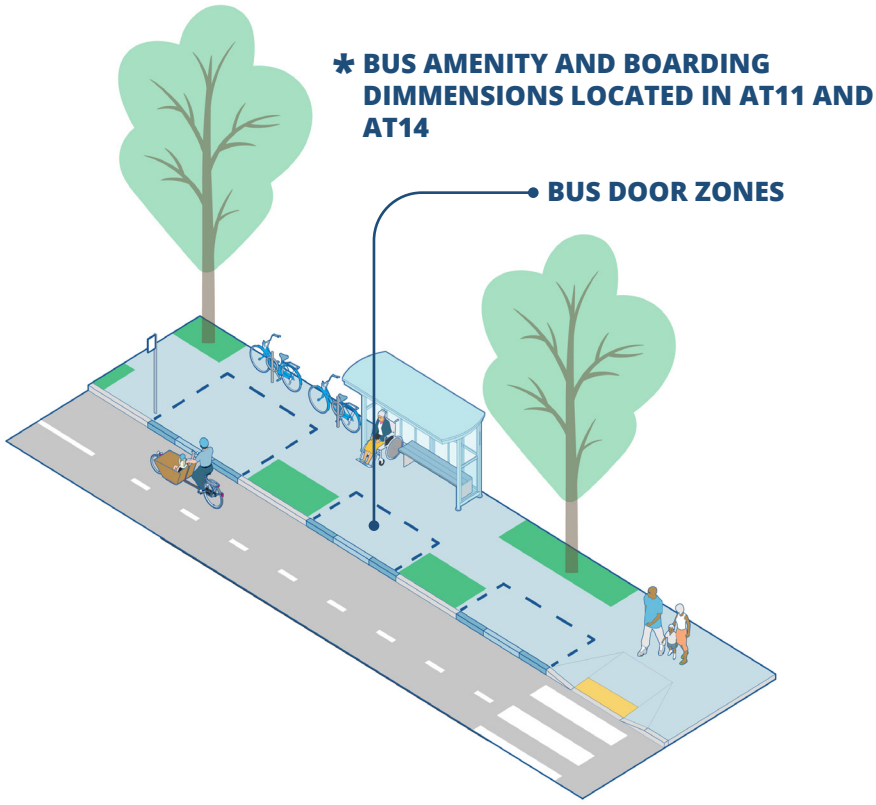
## REFERENCES


- Rock Region METRO 2021-2024 Title VI Program Update, April 2021
- Transit Cooperative Research Program (TCRP) Report 19: Guidelines for the Location and Design of Bus Stops
- ADA Accessibility Guidelines
- PROWAG

# AT4: BUS STOPS

Well-designed transit stops are crucial to the success of a transit system. They directly affect each customer's access to the system, perception of overall ease-of-use, and safety. The design of every stop must consider the relationship among the bus, the human, and the street. Stops must be visible to riders, visible to bus operators, accessible to people of all abilities, and provide capacity for waiting, boarding, and alighting without disrupting through-activity on surrounding streets and sidewalks.

More broadly, bus stops are an important component of civic infrastructure. Bus stop design and configuration can promote transit operations, activate underutilized space, double as public art, and support other multimodal activity.




Bus Stops should:

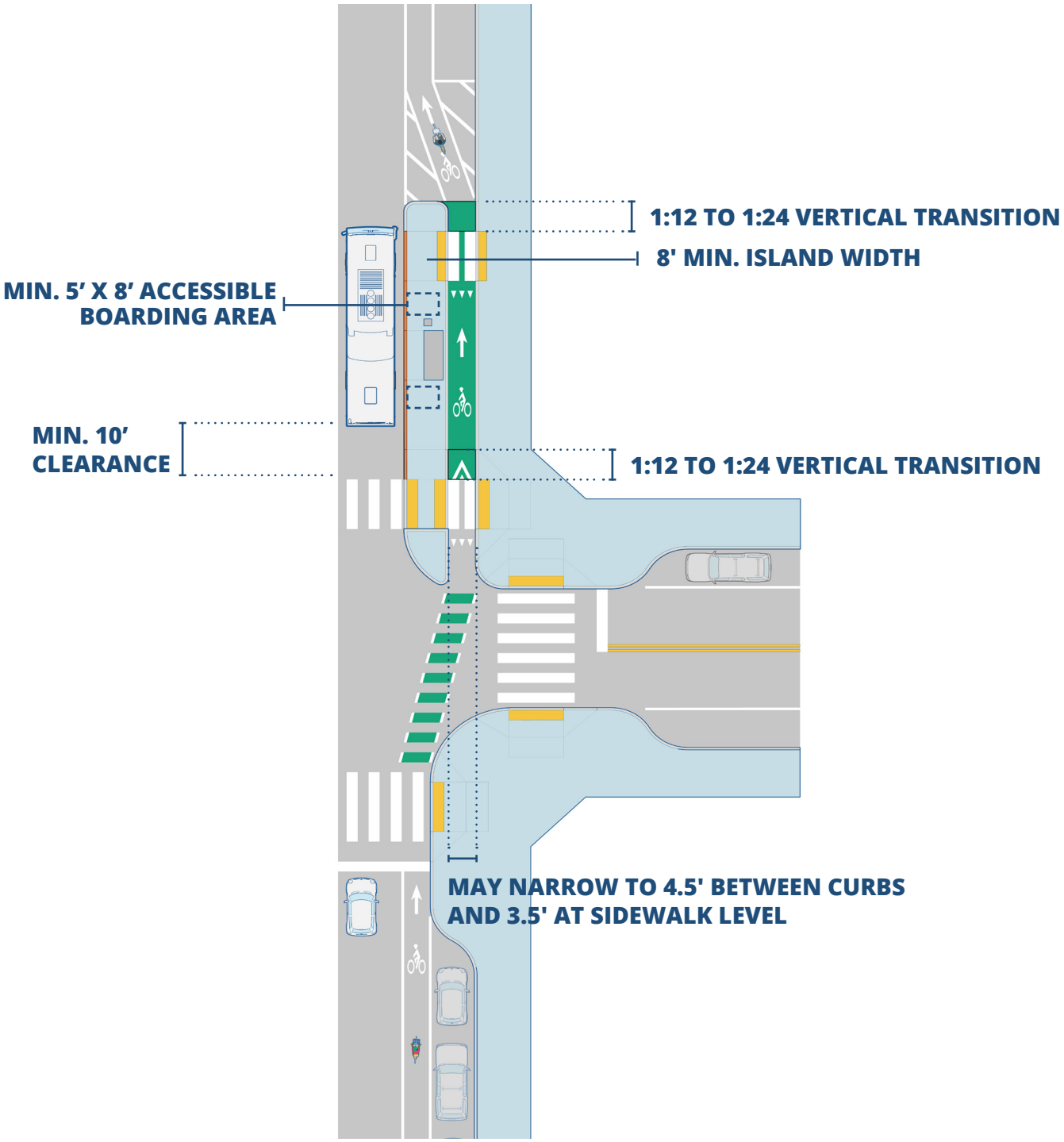
- **Maximize Pedestrian Safety**, whether it is a person who is waiting for a bus, boarding a bus, alighting a bus, walking or bicycling near a bus, or crossing a street.
- **Be Accessible for All Ages and Abilities.**
- **Be compatible with existing and anticipated transit vehicles** to achieve accessible and fast boarding.
- **Be Designed to Elevate Transit Service and Transit Riders** by prioritizing configurations that allow for far-side, in-lane stops and use bus bulbs or floating designs to create shorter, safer pedestrian crossings, reduce conflicts with bicyclists, and provide more active space on sidewalks.

## DETAIL REFERENCES IN THIS GUIDE

- AT11: Bus Stop Boarding and Alighting Areas
- AT13: Bus Stop Shelters and Benches

# AT5: FLOATING BUS STOP (IN LANE)

Floating bus stops are an elegant solution to the conflicts among transit vehicles, cyclists, and through-traffic on roadways with high volumes of multimodal users. Sometimes called “island bus stops” these stops are paved areas separated from the sidewalk by a bicycle channel. They allow for the transit vehicle to serve a stop in-lane (thus avoiding the delay often caused by pull-out stops) while cyclists travel through in their own lane. While some yielding is necessary, bothersome and often dangerous leapfrogging of cyclists and transit vehicles is eliminated. While floating bus stops should be designed for accessibility and meet applicable standards, consultation among roadway engineers and METRO operations staff prior to construction will result in the most functional outcome considerate of fleet specifications and other operational conditions.



## USE

- Streets with high volumes of multimodal activity, including transit frequency, pedestrian volumes, and cyclists.
- Streets with dedicated or planned bicycle facilities .

## GUIDANCE

- Dimensions of the platform must meet accessibility standards.
- An accessible boarding area must also be provided.  Typically, these are 5’ long parallel to the curb, by 8’ wide perpendicular to the curb.
- A minimum 10’ of clear sidewalk space must separate nearby crosswalks and the transit vehicle.
- Shelters and other amenities, if available, must be clear of accessible paths and boarding areas.
- Pedestrian crossings must be marked through the bicycle lane and detectible warning strips must be placed on both sides of every crossing.  Where bicyclists must yield to pedestrians crossing between the sidewalk and floating bus stop, “BIKES YIELD TO PEDESTRIANS” signs must be used.
- Level boarding is desired for ease of boarding and operational efficiency; however, the platform height should be compatible with the fleet.
- Cross slopes should not exceed 2% at landing areas in front of vehicle doors and in the accessible path.

## ADDITIONAL CONSIDERATIONS

- PROWAG and ADAAG should be consulted and applied with considerations to locational and operational context.
- Bike signals with far-side floating bus stops can be used to provide a dedicated bicycle and pedestrian through-phase, clarifying intersection movements and priority.

## RESOURCES

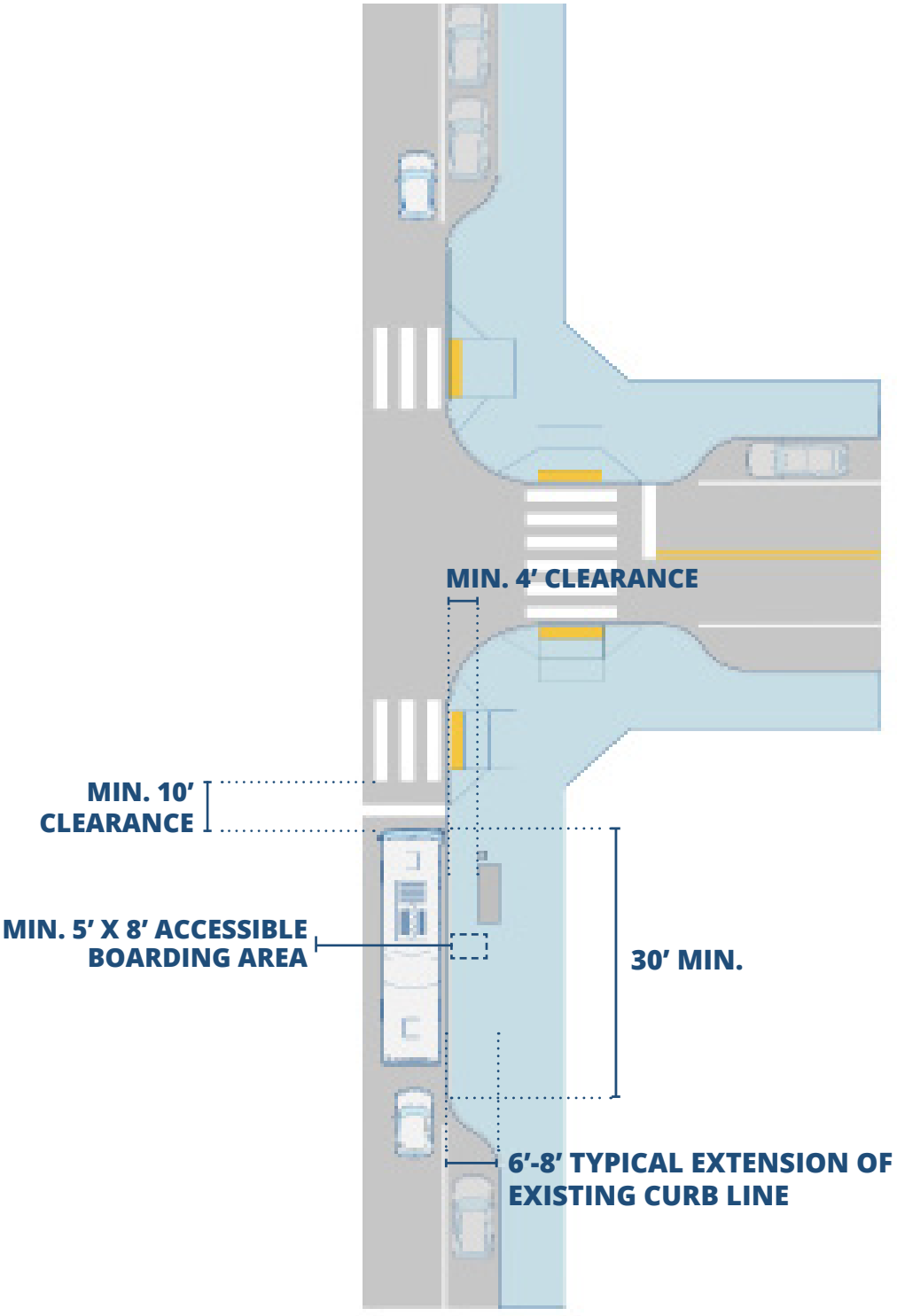
- NACTO Transit Street Design Guide
- ADA Accessibility Guidelines
- PROWAG
- FHWA Achieving Multimodal Networks

## DETAIL REFERENCES IN THIS GUIDE

- AT11: Bus Stop Boarding and Alighting
- AT13: Bus Stop Shelters and Benches
- AT15: Bicycle Parking Integration
- IC7: Curb Ramps
- IC9: Marked Crosswalks

# AT6: BUS BULB (IN LANE)

Bus bulbs (or “boarding bulbs”) provide a variety of benefits for both the transit rider and the quality of the transit service overall. Bus bulbs create additional sidewalk space for waiting passengers and can include shelters and other amenities. They also reduce pedestrian crossing distances, prevent high-speed turns, and facilitate improved visibility between the bus operator and those waiting at the bus stop. Generally, it is important that design, roadway engineering, and transit operations staff confer on dimensions and placement of bus bulbs to ensure they function properly with the existing fleet.



## USE

- Curbside-running transit in both dedicated bus lanes and mixed traffic where there is not a dedicated bicycle facility between the bus and the curb.
- Near-side, far-side, and midblock stops.
- Proximate to signalized and unsignalized intersections.

## GUIDANCE

- Dimensions of the bulb must meet accessibility standards.
- A minimum 10’ of clear sidewalk space must separate nearby crosswalks and the transit vehicle.
- Shelters and other amenities, if available, must be clear of accessible paths and boarding areas.
- The bus bulb should be long enough to serve all doors of at least one transit vehicle but ideally all buses that might be dwelling at the stop at the same time.
- Bulbs typically extend 6’ to 8’ from the existing curbline.
- Cross slopes should not exceed 2% at landing areas in front of vehicle doors and in the accessible path.

## ADDITIONAL CONSIDERATIONS

- Platform height should be compatible with the vehicle to be used.  Level or near-level boarding is desired if slope conditions allow.

## RESOURCES

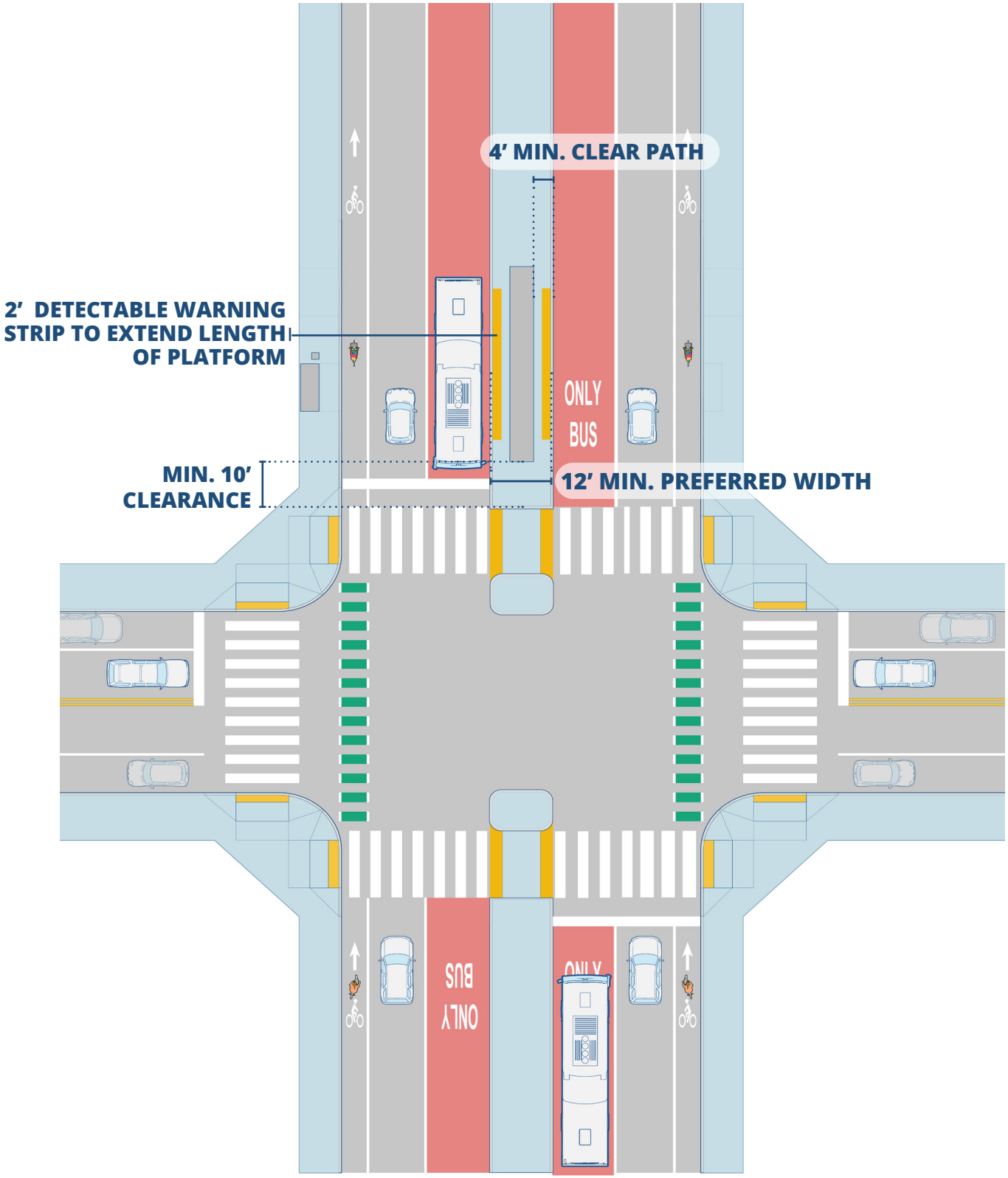
- NACTO Transit Street Design Guide
- ADA Accessibility Guidelines
- PROWAG
- FHWA Achieving Multimodal Networks

## DETAIL REFERENCES IN THIS GUIDE

- AT11: Bus Stop Boarding and Alighting
- AT13: Bus Stop Shelters and Benches
- AT15: Bicycle Parking Integration
- IC8: Curb Ramps
- IC9: Marked Crosswalks

# AT7: MEDIAN STOP

Median bus stops are used where transit runs along the center of a street, often, but not always, along a historic streetcar line.  Center medians often provide ample space for passengers waiting, boarding, and alighting a transit vehicle, and gives the service a high level of visibility and branding identity.



## USE

- Corridors with one or more high-ridership routes.
- Corridors with multiple travel lanes in both directions.
- Corridors with many driveways on one or both sides of the street.
- Corridors with premium service where visibility and branding are important.

## GUIDANCE

- The bus stop should be large enough to accommodate anticipated passengers comfortably.
- The bus stop platform should be long enough to accommodate the maximum number of vehicles expected to stop at the same time during the busiest time of day.
- Clear landing areas should be provided at all doors.
- A minimum 4’ clear path should be provided along the length of the platform with detectible warning strips at the curb.

## ADDITIONAL CONSIDERATIONS

- Platform height should be compatible with the vehicle to be used.  Level or near-level boarding is desired.
- Signal phase separation or other restrictions on left turns should be employed to reduce conflict between the transit vehicle and mixed traffic, as well as for the safety of passengers and other pedestrians crossing the street at or near the bus stop.

## RESOURCES

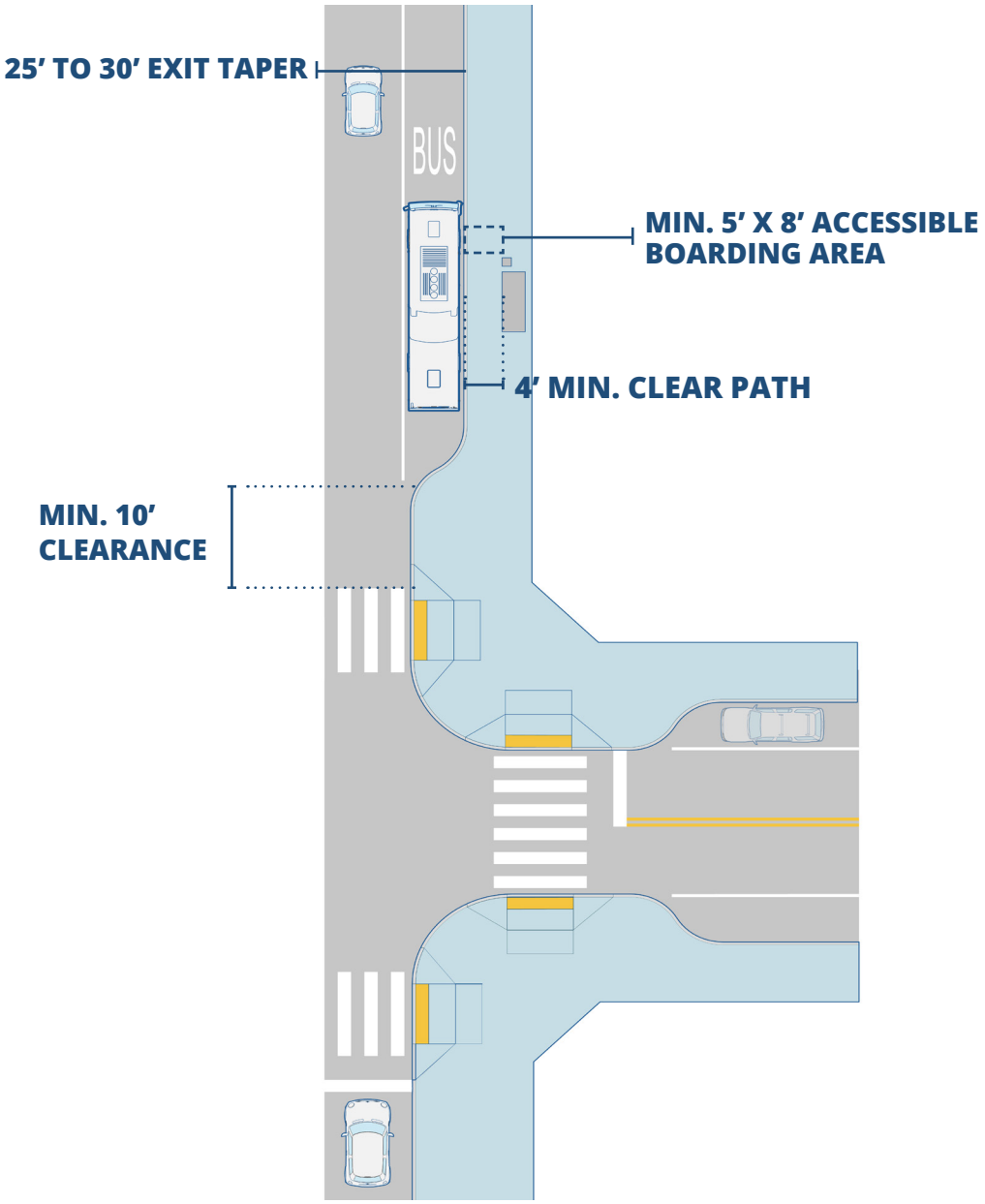
- NACTO Transit Street Design Guide
- ADA Accessibility Guidelines
- PROWAG
- FHWA Achieving Multimodal Networks

## DETAIL REFERENCES IN THIS GUIDE

- AT11: Bus Stop Boarding and Alighting
- AT13: Bus Stop Shelters and Benches
- AT15: Bicycle Parking Integration
- IC4: Pedestrian Islands
- IC7: Curb Ramps
- IC9: Marked Crosswalks

# AT8: PULL-OUT STOP (OFF LANE)

Pull-out transit stops can provide some advantages for transit operations or pedestrian safety on a case-by-case basis, however pull-out stops primarily benefit vehicular through traffic. Required platform length is longer than for in-lane stops in order to provide necessary transition space. Enforcement to keep the pull-out clear of stopped or parked vehicles other than buses is also typically necessary to prevent blockages.




## DETAIL REFERENCES IN THIS GUIDE

- AT11: Bus Stop Boarding and Alighting
- AT13: Bus Stop Shelters and Benches
- AT15: Bicycle Parking Integration
- IC9: Marked Crosswalks

## USE

- Curbside-running transit in both dedicated bus lanes and mixed traffic.
- Can be used when there is a dedicated bicycle facility to the right of the transit vehicle's travel lane.
- Near-side, far-side, and midblock stops.
- Proximate to signalized and unsignalized intersections.

## GUIDANCE

- "NO PARKING: BUS STOP" signs (MUTCD R7-107) and pavement markings must clearly delineate the edge of the bus stop zone.
- There should be at least 10' of clear sidewalk distance between the nearest crosswalk and the rear of the vehicle for a far-side stop or the transit stop sign pole at a near-side stop.
- Platforms should meet accessibility standards with a minimum of 5' of curb length at each vehicle door. Ideally the platform is continuous between all doors.
- The bus stop platform should be long enough to accommodate the maximum number of vehicles expected to stop at the same time during the busiest time of day with at least 5' allowed between each vehicle.
- Clear landing areas should be provided at all doors.
- A minimum 4' clear path should be provided along the length of the platform with detectible warning strips at the curb.

**Desired Minimum Bus Zone Length by Vehicle Type (feet)**

| Stop Position | 40' Bus | 60' Bus | 2 x 40' Bus | 2 x 60' Bus |
|---|---|---|---|---|
| Near-Side | 100 | 120 | 145 | 185 |
| Far-Side | 90 | 100 | 125 | 165 |
| Far-Side, after right turn | 140 | 160 | 140 | 230 |
| Mid-Block | 120 | 145 | 185 | 210 |

*Transit Street Design Guide, National Association of City Transportation Engineers (NACTO), 2016*

## ADDITIONAL CONSIDERATIONS

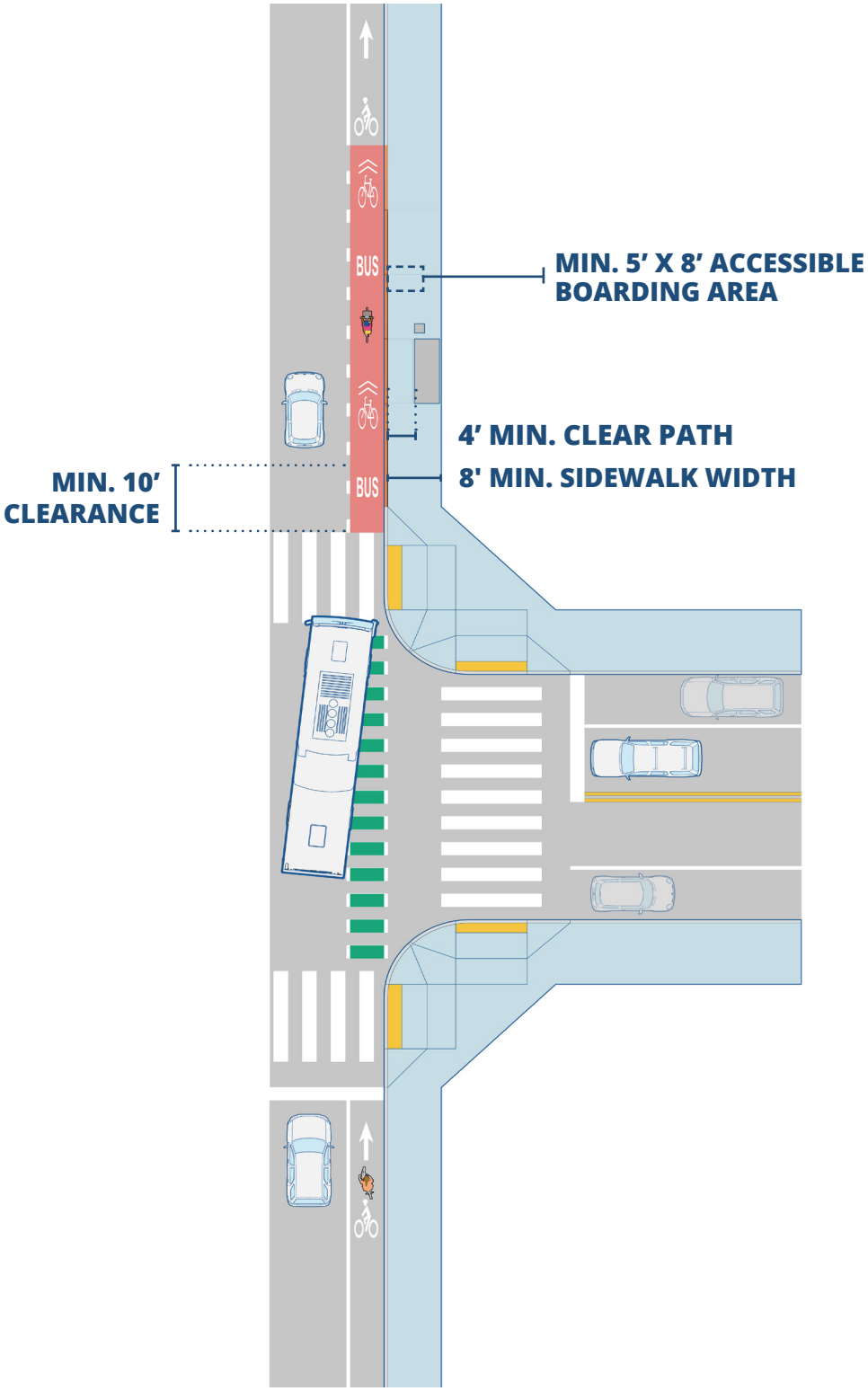
- Pulling out of traffic and then merging back into traffic can cause more delay as compared to in-lane stops. Routes therefore require additional time in the schedule.
- Bus bulbs or floating bus stops can minimize interruption of the sidewalk and can shorten crossing distances.
- Placement of shelters and other amenities must meet accessibility guidelines.

## RESOURCES

- NACTO Transit Street Design Guide
- ADA Accessibility Guidelines
- PROWAG
- MUTCD
- FHWA Achieving Multimodal Networks

# AT9: SIDEWALK STOP (IN LANE)

In-lane transit stops require no additional right of way and typically have little adverse impact on traffic flow. Required curb length is limited, thus preserving space for other uses including street trees and landscaping, amenities, and parking. In-lane stops also eliminate the need for the bus operator to merge into traffic, thus avoiding delays and crash potential.



## USE

- Curbside-running transit in both dedicated bus lanes and mixed traffic.
- Near-side, far-side, and midblock stops.
- Proximate to signalized and unsignalized intersections.

## GUIDANCE

- There should be at least 10’ of clear sidewalk distance between the nearest crosswalk and the vehicle.
- Platforms should meet accessibility standards with a minimum of 5’ of curb length at each vehicle door. Ideally the platform is continuous between all doors.
- The bus stop platform should be long enough to accommodate the maximum number of vehicles expected to stop at the same time during the busiest time of day with at least 5’ allowed between each vehicle.
- Clear landing areas should be provided at all doors.
- A minimum 4’ clear path should be provided along the length of the platform with detectible warning strips at the curb.

### Desired Minimum Platform Length by Vehicle Type (feet)

| Stop Position | 40’ Bus | 60’ Bus | 2 x 40’ Bus | 2 x 60’ Bus |
|---|---|---|---|---|
| Near-Side | 35 | 55 | 80 | 115 |
| Far-Side | 45 | 65 | 90 | 130 |
| Midblock | 35 | 55 | 80 | 115 |

*Transit Street Design Guide, National Association of City Transportation Engineers (NACTO), 2016*

## ADDITIONAL CONSIDERATIONS

- Because sidewalk stops are typically sidewalk curb-height, the transit vehicle will likely need to deploy ramps or use a kneeling feature for boarding and alighting.
- Bus bulbs or floating bus stops can minimize interruption of the sidewalk and can shorten crossing distances.
- Placement of shelters and other amenities must meet accessibility guidelines.

## RESOURCES

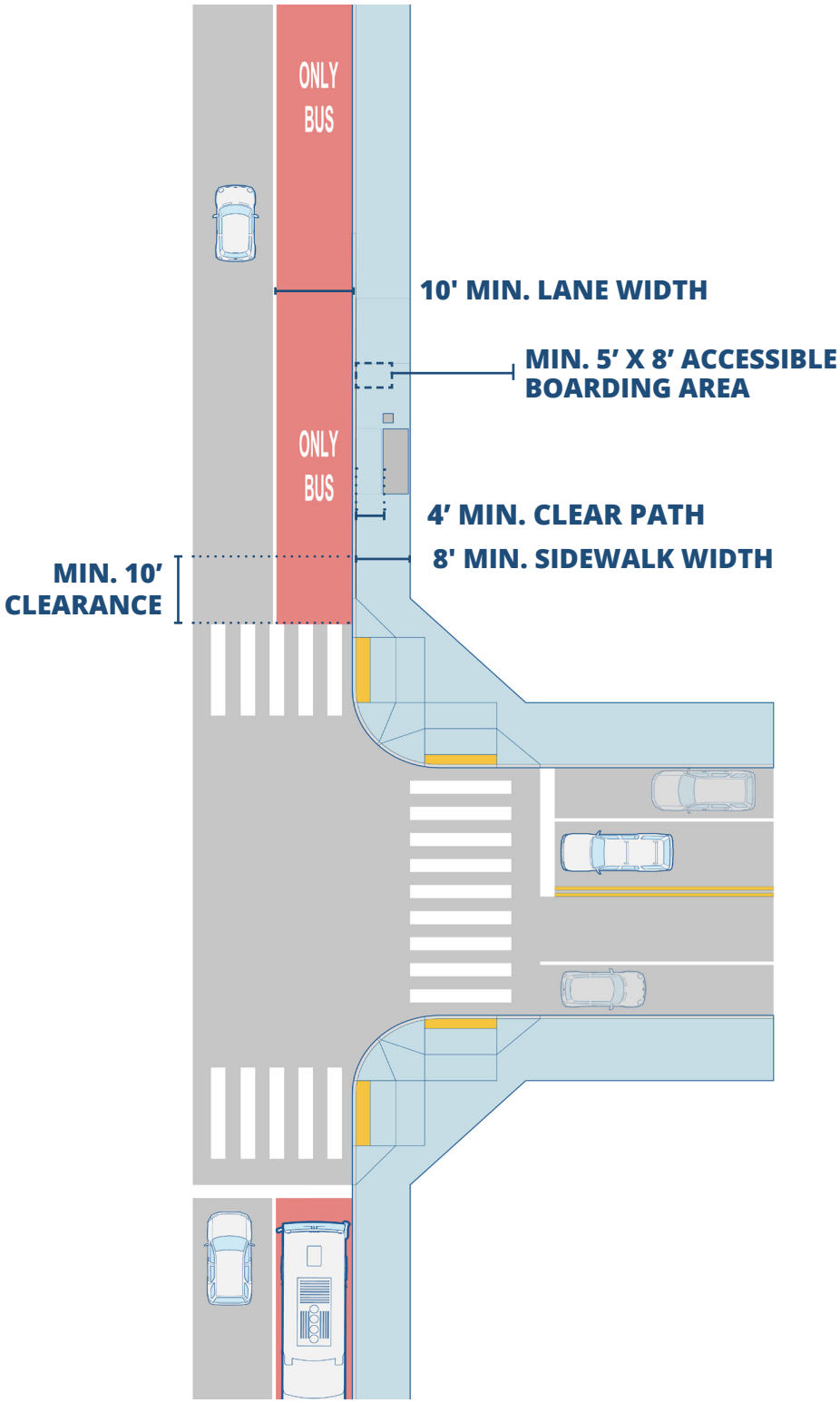
- NACTO Transit Street Design Guide
- ADA Accessibility Guidelines
- PROWAG
- FHWA Achieving Multimodal Networks

## DETAIL REFERENCES IN THIS GUIDE

- AT11: Bus Stop Boarding and Alighting
- AT13: Bus Stop Shelters and Benches
- AT15: Bicycle Parking Integration
- IC9: Marked Crosswalks

# AT10: DEDICATED BUS LANES

Dedicated bus lanes improve reliability and operational efficiency of transit by separating transit from mixed traffic. Often, dedicated bus lanes are paired with queue jumps and/or transit signal priority to maximize efficiency and on-time performance.



## USE

- Travel lanes can be dedicated to transit vehicles in any corridor but provide the greatest benefit in high-ridership corridors and in corridors where buses experience significant delays.
- Downtown Mixed-Use and Suburban Commercial Corridor Types may include dedicated bus lanes to move more people with greater efficiency through congested corridors.
- Determining corridors in which to dedicate lanes to transit service should involve consideration of a variety of factors, including transit ridership volume and future demand, travel time through the corridor, needs of bicyclists, and safety.

## GUIDANCE

- Curbside transit lanes are typically the easiest and most cost-effective dedicated bus lanes to implement on streets with in-lane sidewalk stops or where floating bus stops or bus bulbs are present.
- These lanes should be 11' to 12' wide (10' minimum) and should be designated using a single or double solid white line, "BUS ONLY" markings in lane, and signage designating the lane as restricted (see MUTCD 3D.01 and 2B.20 for additional guidance).
- Turns across transit lanes must be managed to reduce delays and for the safety of all users.

## ADDITIONAL CONSIDERATIONS

- Designated bus lanes can also function as shared bus-bike lanes.
- In addition to appropriate pavement markings and signage, enforcement may be required to maintain integrity.
- Red colored pavement (using paint, thermoplastic, methyl methacrylate (MMA) or embedded color) can be used to visually enforce the restricted use of the lane and highlight the transit system. This should be considered consistent with local regulations, but it is now being applied widely throughout the U.S. As red colored pavement has received Interim Approval by FHWA for bus lanes, a written request must be made to FHWA to gain permission to install it.
- Shared transit/right-turn lanes can be applied where right-turn volumes are light or moderate and pedestrian volumes are low. The left side of the transit lane should be dashed for 50 to 100' before the intersection and "RIGHT LANE MUST TURN RIGHT" AND "EXCEPT BUSES" should be marked on the pavement and with signage (see MUTCD R3-7R and R3-1B for more detail).

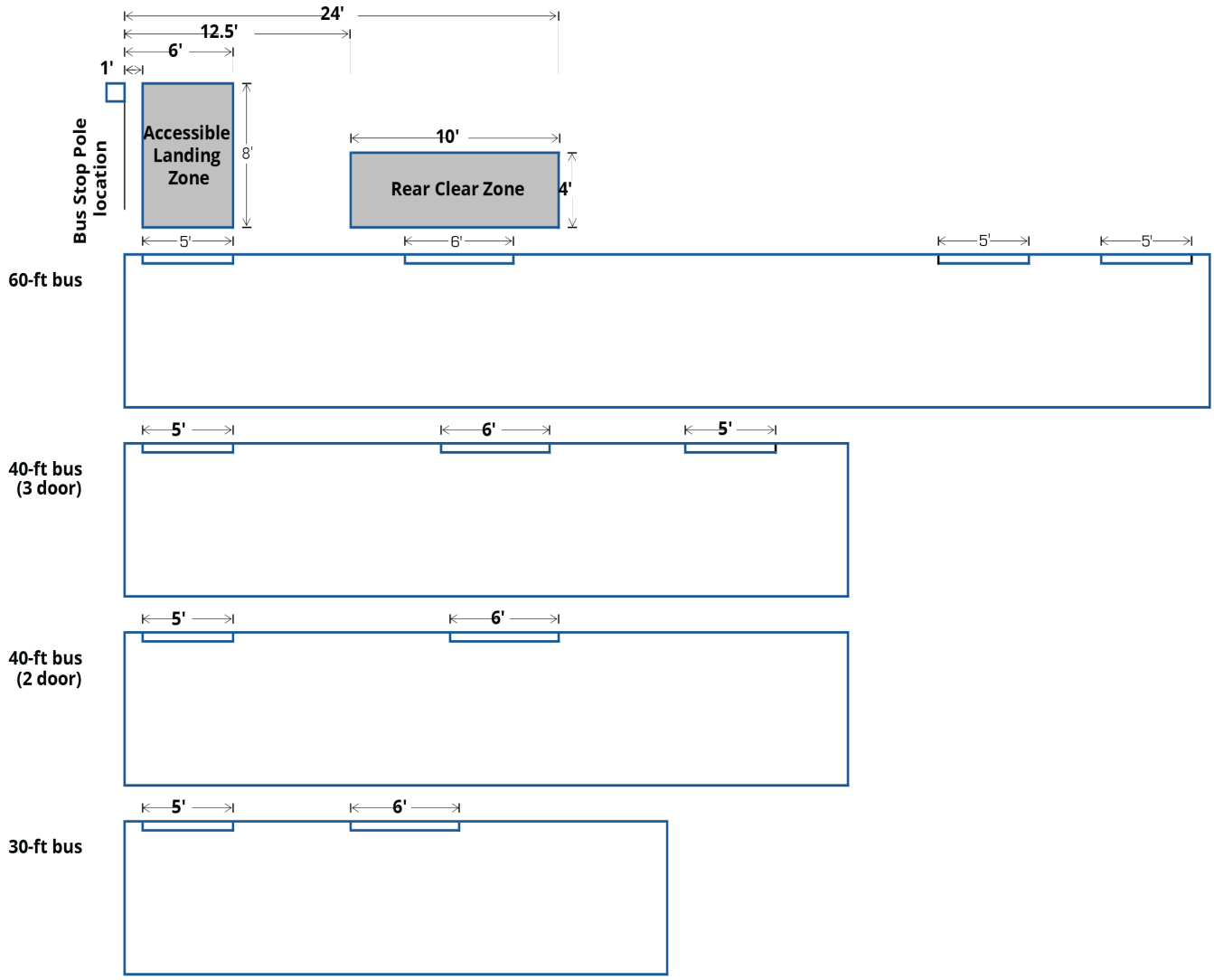
## RESOURCES

- NACTO Transit Street Design Guide
- ADA Accessibility Guidelines
- PROWAG
- FHWA Achieving Multimodal Networks
- MUTCD

## DETAIL REFERENCES IN THIS GUIDE

- AT11: Bus Stop Boarding and Alighting
- AT13: Bus Stop Shelters and Benches
- IC9: Marked Crosswalks

# AT11: BUS STOP BOARDING AND ALIGHITNG AREAS

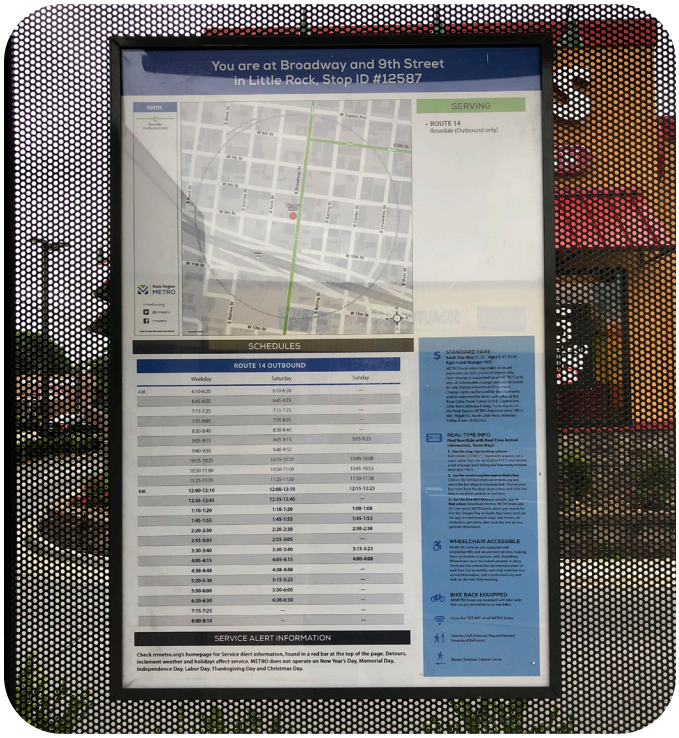



Bus stop boarding and alighting areas should be designed for safety, ease of use, and functional interaction with other street functions. Smooth pavement at bus stops is critical to maintain accessibility. Bus stops should have an unobstructed boarding area 8' to 12' long, parallel to the curb so that boarding and alighting at front and rear doors in a typical bus can be accommodated. In a constrained location, the minimum unobstructed boarding area is 5'.

## DETAIL REFERENCES IN THIS GUIDE

- AT4: Bus Stops
- AT13: Bus Stop Shelters and Benches
- AT15: Bicycle Parking Integration

# AT12: BUS STOP SIGNAGE AND GENERAL WAYFINDING

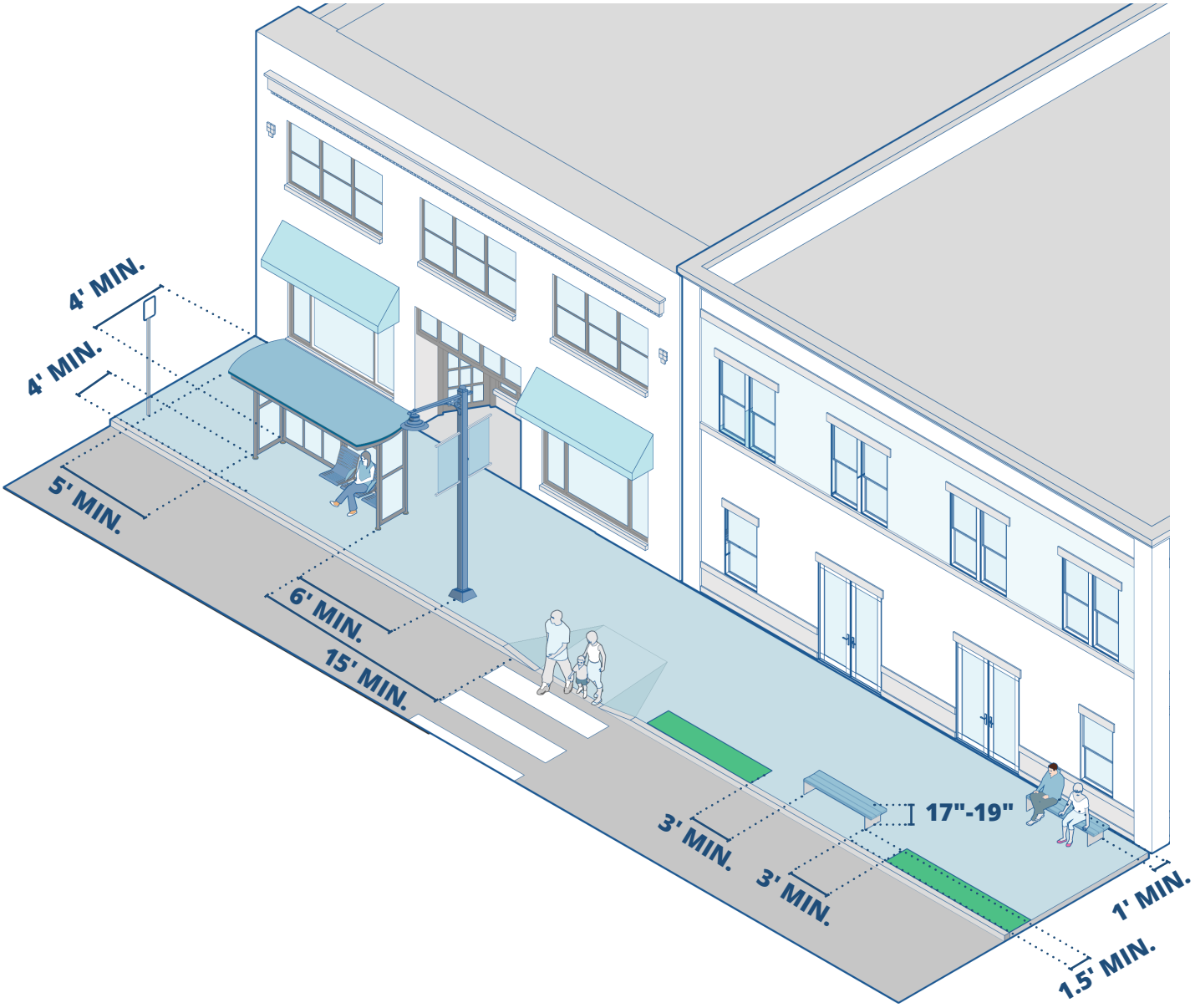


Transit Stops should include clear, relevant information to riders, including both those who may be boarding a bus, or alighting at the stop. This information makes it easier to identify bus stops and understand travel options. Relevant transit system information includes route or system maps, schedule and travel time information, real-time variable digital messages, current fares, and phone number or website to access additional information. For young riders or those with low vision or visual disabilities, audible announcements should be provided.

Signs identifying stop name or location should be prominent so that passengers in a transit vehicle can identify and request the stop. Bus stop signs should be on their own pole, and not affixed to a pole used for another purpose.

Wayfinding and destination information can also enhance the transit stop's functionality as important civic infrastructure supporting mobility and access to important places and services. Wayfinding signage should be overhead or at eye-level. Font type and size should be appropriate for pedestrians.

# AT13: BUS STOP SHELTER AND BENCHES

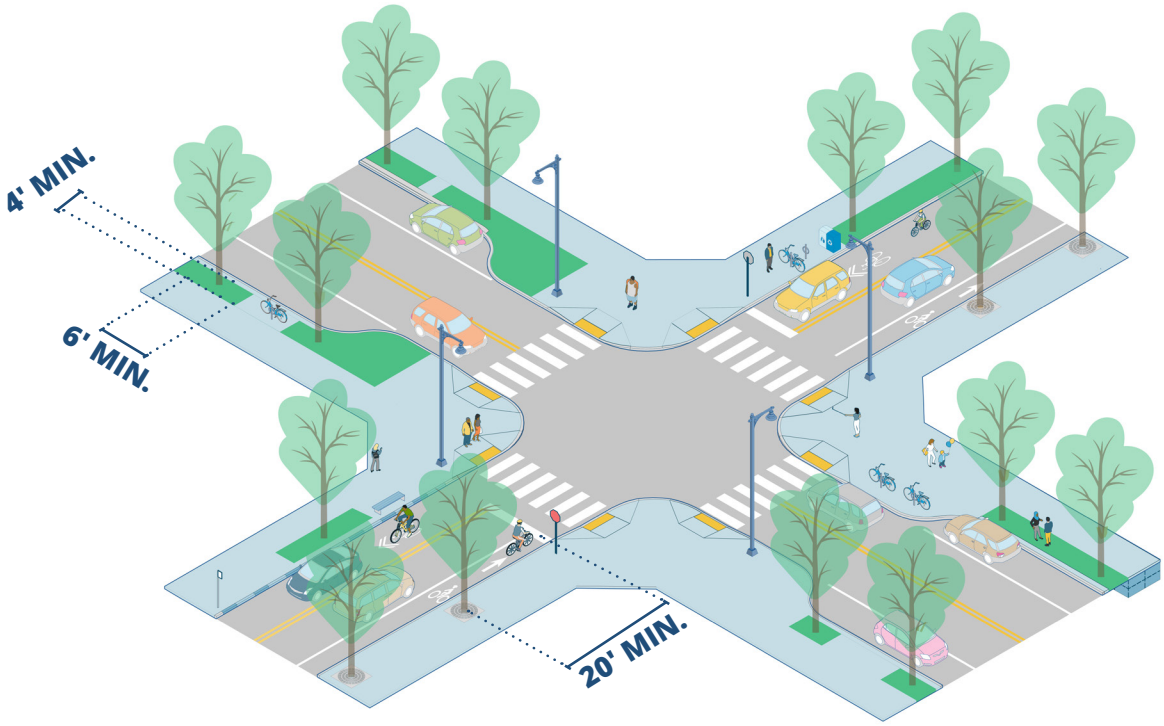



Bus stop shelters can dramatically improve the comfort of waiting passengers by shielding them from sun, rain, or wind; providing a place to sit and travel information; and greater visibility. It is most typical for shelters to be oriented open to the curb, but they can also be oriented toward or integrated into a building. Shelters are typically 4' deep but can be narrower in constrained conditions. If seating is provided, a minimum 2'6"x4' clear space for a wheelchair user must be provided entirely within the shelter space. The shelter, including its posts and supporting walls, as well as associated elements such as seating, trash receptacles, and signage must not conflict with pedestrian travel paths, boarding areas, and vehicle door zones. Minimum ADA guidelines should be met at all stops.

Seating at or near transit stops improves rider comfort and overall experience. Benches should comply with ADAAG and be a minimum of 43 inches long, 20-24 inches wide, and the seat should be 17-19 inches off the ground. Seating should not block pedestrian pathways; 4' (minimum of 3') of clear distance on all sides where pedestrians are traveling should be provided.

# AT14: LANDSCAPING

Landscaping can improve the appearance of the transit stop and the street overall and provide functional benefits such as shade, stormwater management, and better air quality.




## USE

- In the amenity zone of sidewalks.
- In daylighting areas, bus bulbs, and floating bus stops so long as accessibility guidelines are met for the stop and amenities, and landscaping does not encroach into the transit vehicle boarding and alighting zone or in the clear pathway.
- Park entrances and points of interest along off-street multi-use paths.
- High-volume stops and transit hubs.
- To guide transit passengers and pedestrians through appropriate pathways or to desired crossings.

## GUIDANCE

- Ensure drainage and infiltration rates are appropriately designed to avoid pooling of water.
- Select appropriate plantings for the climate and environment, as well as those that require minimal maintenance.

## ADDITIONAL CONSIDERATIONS

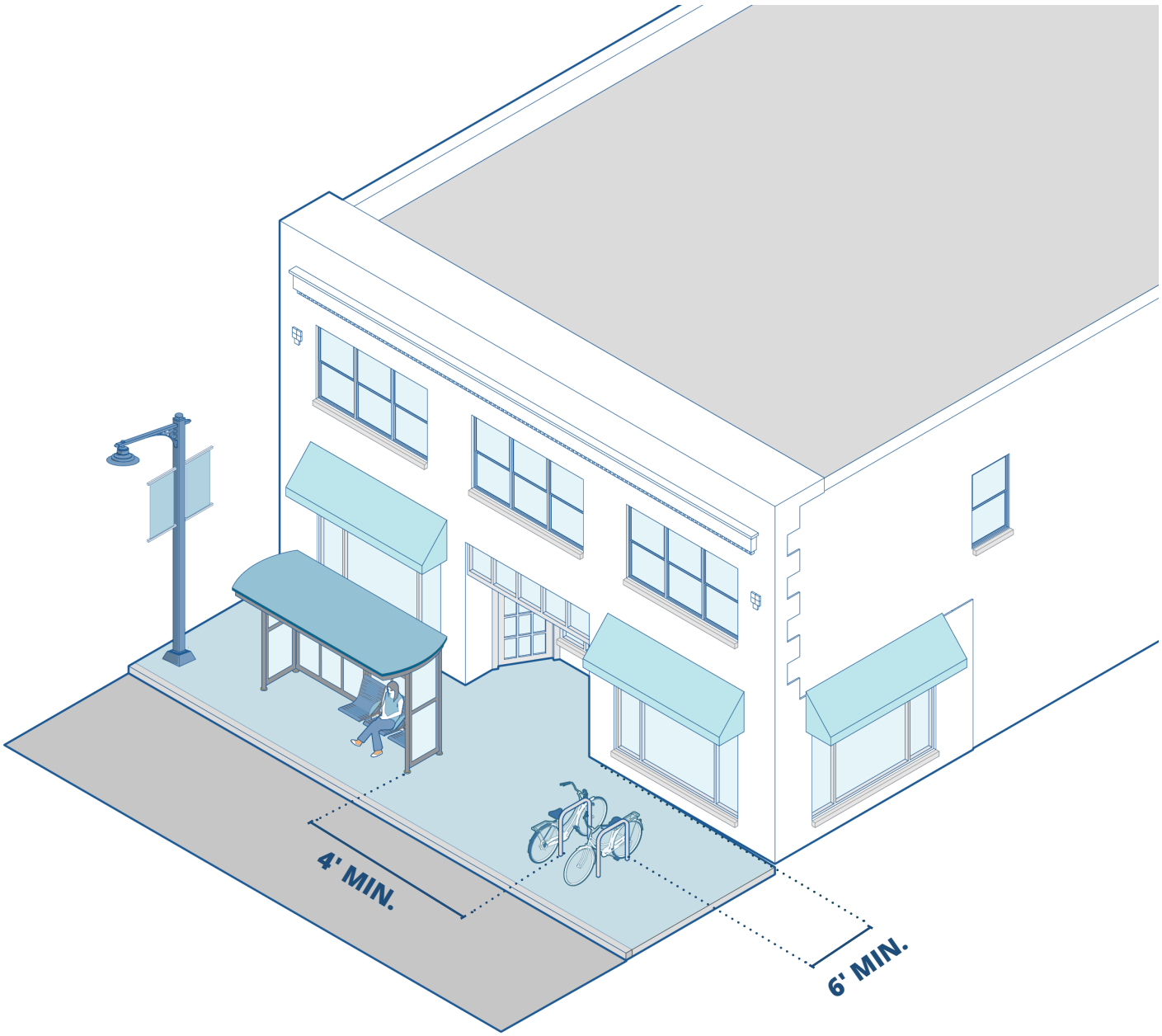
- Consider maintenance requirements, costs, and responsible parties prior to design and implementation.

## RESOURCES

- FHWA Achieving Multimodal Networks
- NACTO Transit Street Design Guide

# AT15: BICYCLE PARKING INTEGRATION

In bus stop locations proximate to activity centers or key destinations, parking for bicycles can be co-located with the bus stop.  Bike racks should be located in the amenity zone of the sidewalk, maintaining an unobstructed path of travel for people walking and wheeling. As an alternative or in addition to bike racks on the sidewalk, bike parking corrals can be located in on-street parking lanes, curb bump outs, or daylighting areas. Pavement markings, curb stops, flexposts, or other elements can be used to clearly delineate corral parking areas.



## USE

- In the amenity zone of sidewalks.
- Daylighting areas, curb bulb outs, bus bulbs, and converted on-street parking space(s).
- Park entrances and points of interest along off-street multi-use paths.
- High-volume bus stops and transit hubs.

## GUIDANCE

- Only inverted U (hoop) or post and ring (hitch) rack styles should be installed in the public realm. These rack styles are versatile and intuitive, allowing bicycles of all shapes and sizes to be properly locked through the frame and at least one wheel.
- Bicycle parking should be provided at or near bus stops that serve trails, outdoor recreation areas where bicyclists may be present, and corridors frequently used for bicycle commuting.
- Bicycle racks should not encroach upon transit vehicle boarding and alighting zones, clear zones reserved for through-movement of pedestrians, nor block access to shelters or seating.

## ADDITIONAL CONSIDERATIONS

- Ensure bike racks are installed on a flat surface where the rack may be securely fastened to the ground.
- Consider use of bike corrals in high-demand areas to provide up to 12 bike spaces in what would otherwise accommodate a single vehicle parking space; this can be in an on-street or off-street parking space.

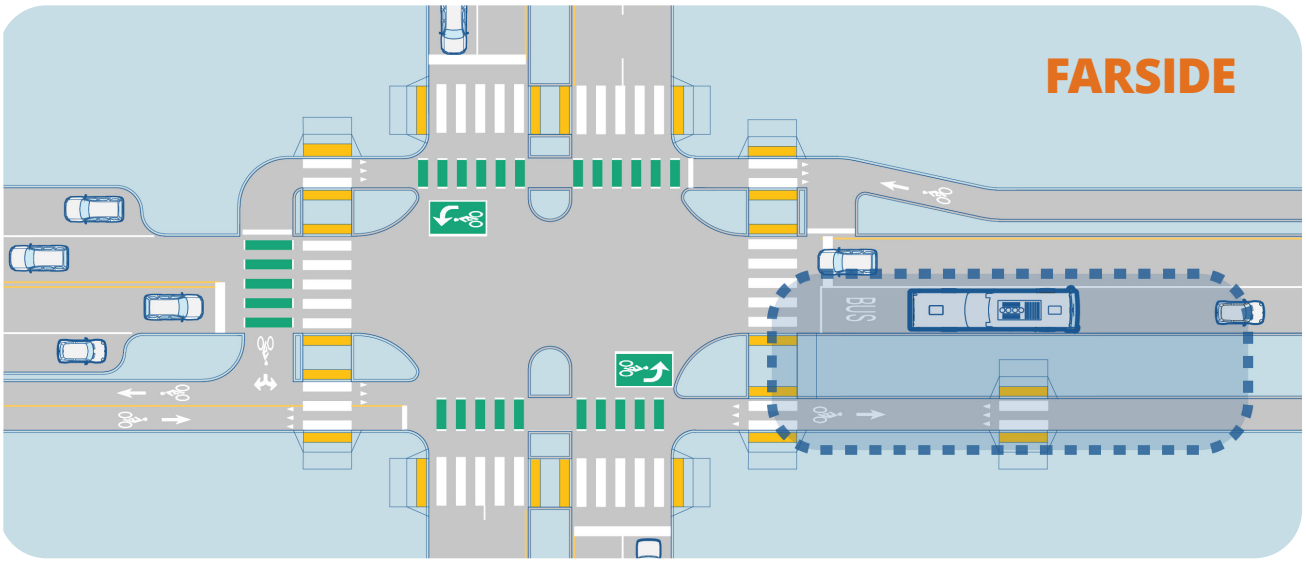
## RESOURCES

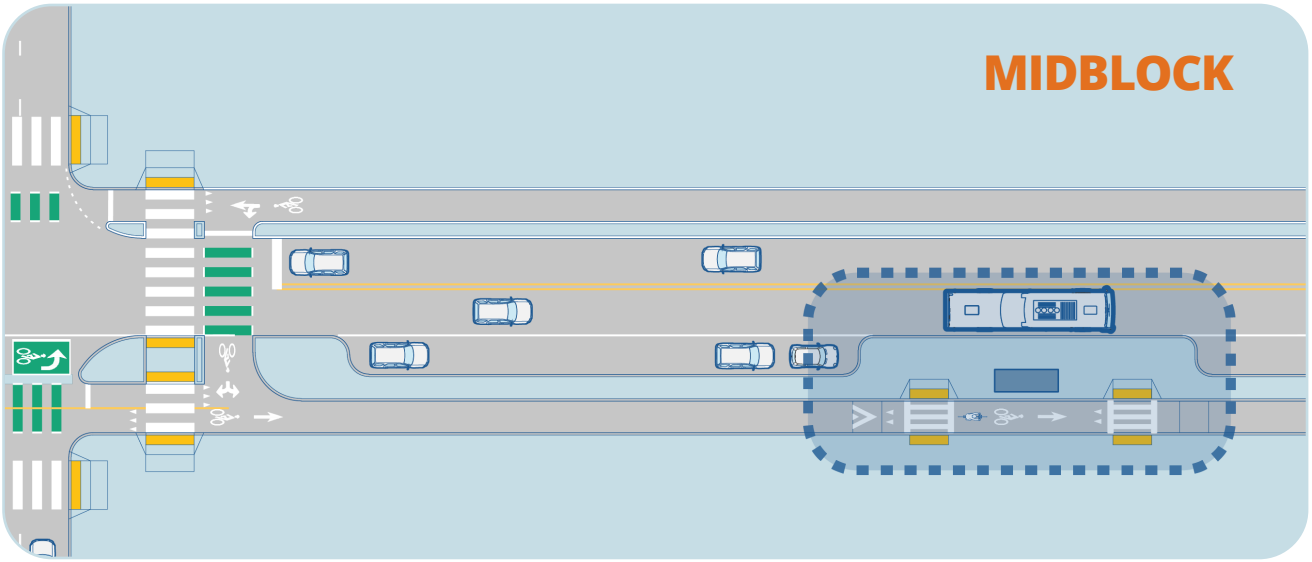
- APBP Essentials of Bike Parking
- PROWAG

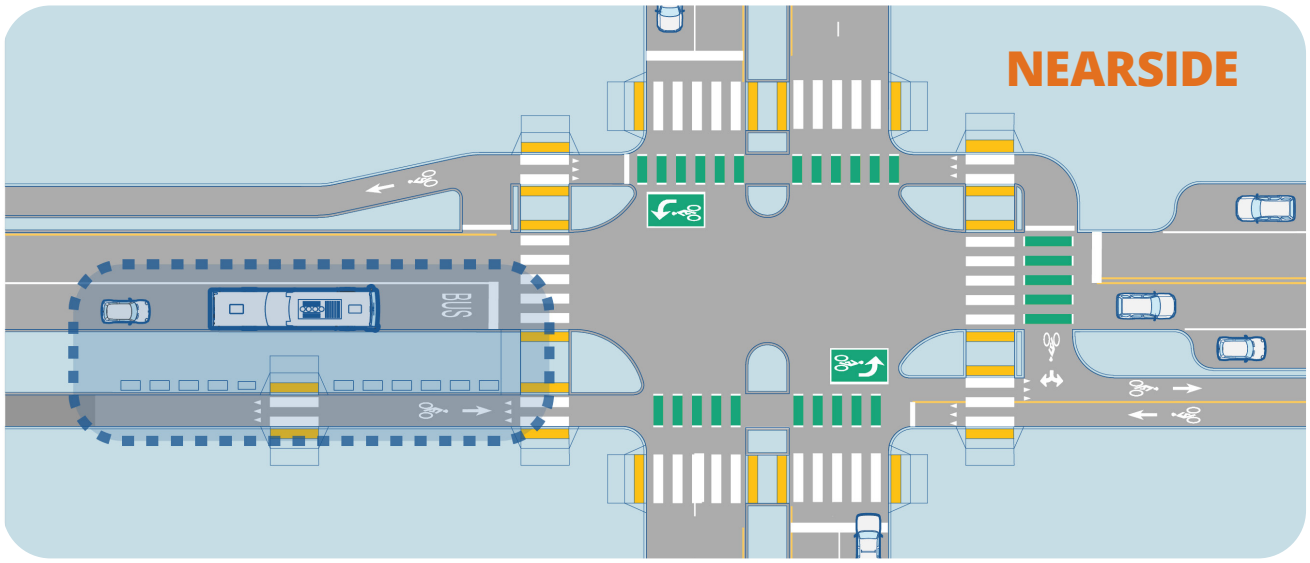
## DETAIL REFERENCES IN THIS GUIDE

- AT4: Bus Stops
- AT11: Bus Stop Boarding and Alighting
- AT13: Bus Stop Shelters and Benches
- BF2: Bicycle Parking

# AT16: BUS STOP PLACEMENT



Bus stops are where passengers and transit vehicles intercept. A variety of design considerations must be made to ensure the experience is safe, comfortable, and predictable for the transit rider, and to maintain the efficiency of the transit service.

## USE

- Bus stops may be placed on the far-side or near-side of an intersection or midblock.
- Buses may pick up or drop off passengers by stopping in-lane at a designated location or at a pull-out stop.
- Bus stops may be located along all Corridor Types.

## GUIDANCE

- Bus stop placement should consider sight lines; stops should be visible from the transit vehicle, as well as from multiple directions or locations proximate to the stop.
- Bus stops should be in locations with adequate space for a loading platform that meets ridership demand and accessibility requirements. Platform lengths vary by busy stop type.
- The rear of the bus should be at least 10 feet from the crosswalk or curb return. Far-side in-lane stops are most needed on streets with one travel lane in each direction. However, to minimize queuing of vehicles behind the bus, it is suggested to create a longer far-side stop, or activate an early red phase after the bus clears the intersection.
- Generally, far-side in-lane bus stops are preferred, particularly on streets with a single travel lane in the direction of the bus's travel, because they are proven to be safer for transit riders and pedestrians, have less impact on transit operations, and are relatively less costly to implement.
- The rear of the bus when stopped should be no less than 10' from the crosswalk or curb return. Provide adequate curb space for the vehicle to maneuver in and out (if applicable).

## ADDITIONAL CONSIDERATIONS

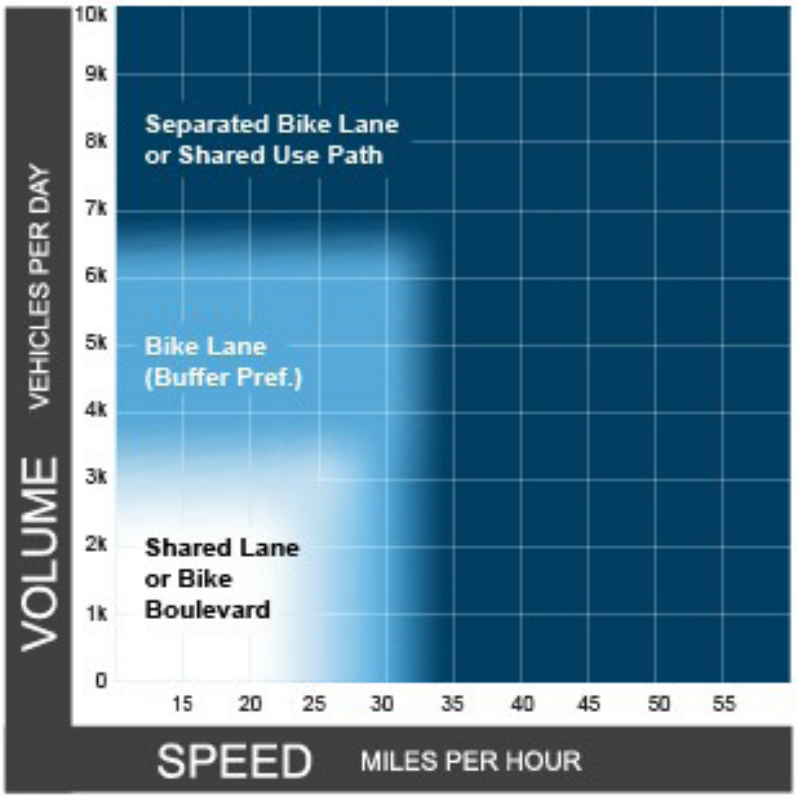
- Care should be taken to ensure the design of far-side in-lane bus stops do not create queues back through the intersection. To minimize queuing of vehicles behind a stopped bus, it is suggested to create a longer far-side stop or have an early red signal phase after the bus clears the intersection. Consider potential conflicts with on-street parking, bicycle infrastructure, and turning vehicles.

## RESOURCES

- FHWA Achieving Multimodal Networks
- NACTO Transit Street Design Guide

# BICYCLE FACILITIES

# BF1: HOW TO SELECT AND PRIORITIZE BICYCLE FACILITIES




**Notes**

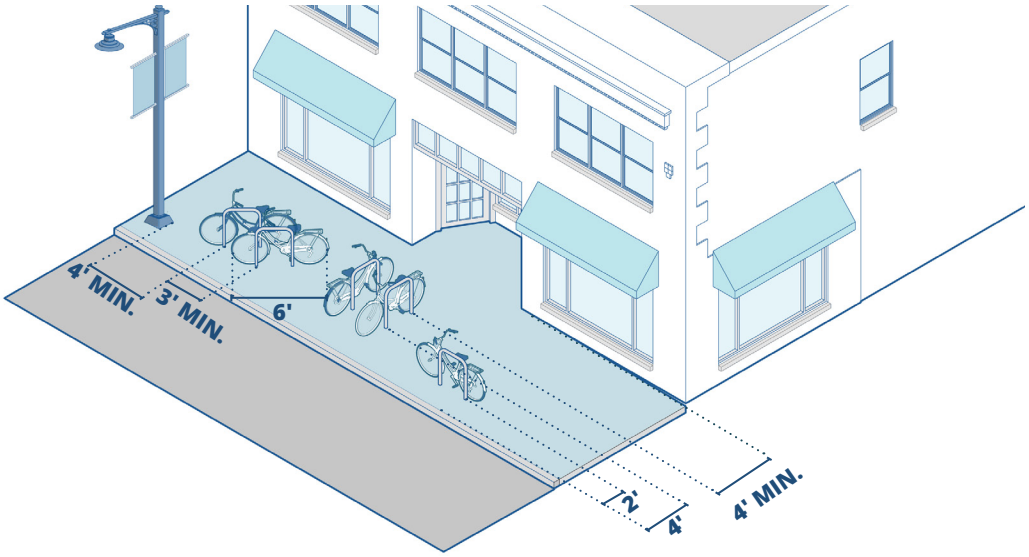
1. *Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.*
2. *Advisory bike lanes may be an option where traffic volume is <3K ADT.*
3. *See Section 4.4 for a discussion of alternatives if the preferred bikeway type is not feasible.*

*Source: FHWA Bikeway Selection Guide*

Selecting the most appropriate bicycle facility type for any given street is one of the most important steps in realizing a truly functioning multimodal transportation network. A community can have hundreds of miles of bicycle facilities, but if they are the wrong facilities or along the wrong streets, they may experience very little use and be deemed unsuccessful. Matching the right facility type to the right street is paramount to achieve a network that attracts everyone – a network that provides a high level of user comfort, safety, and mobility. Selecting bicycle facilities requires a balance of community priorities for local land use context, analysis, engineering judgment, available funding, and physical constraints of the existing street. Keep in mind, facility selection is iterative; as more data about the street and surrounding context is gathered, use of existing facilities is documented, and land use changes occur over time, the type of facility that planners and designers deem most appropriate may change and evolve. The FHWA Bikeway Selection Guide is a valuable resource for bikeway selection. It uses vehicle speed and traffic volumes to assist practitioners with planning and designing bikeways for all ages and abilities. While vehicle speed and traffic volumes are key indicators, these factors, as mentioned previously, should be complemented by actual physical constraints, community desires, and budgetary limitations.

# BF2: BICYCLE PARKING

To truly encourage people to choose to ride a bicycle for transportation and recreation, it is essential to provide safe, convenient, and ample bicycle parking along their route and at destinations. Bike racks and parking corrals should provide places where people can securely lock their bicycles. Bike racks should be located in the amenity zone of the sidewalk, maintaining an unobstructed path of travel for people walking and wheeling. As an alternative or in addition to bike racks on the sidewalk, bike parking corrals can be located in on-street parking lanes, curb bump outs, or daylighting areas. Pavement markings, curb stops, flexposts, or other elements can be used to clearly delineate corral parking areas.




## USE

- In the amenity zone of sidewalks.
- Daylighting areas, curb bulb outs, and converted on-street parking space(s).
- Park entrances and points of interest along off-street multi-use paths.
- High-volume bus stops and transit hubs.

## GUIDANCE

- Only inverted U (hoop) or post and ring (hitch) rack styles should be installed in the public realm. These rack styles are versatile and intuitive, allowing bicycles of all shapes and sizes to be properly locked through the frame and at least one wheel.

## ADDITIONAL CONSIDERATIONS

- Consider separating bicyclists from pedestrians where higher volumes are expected through the construction of parallel paths for each mode.
- Do not consider multi-use paths a substitute to accommodating more confident bicyclists in the roadway.

## RESOURCES

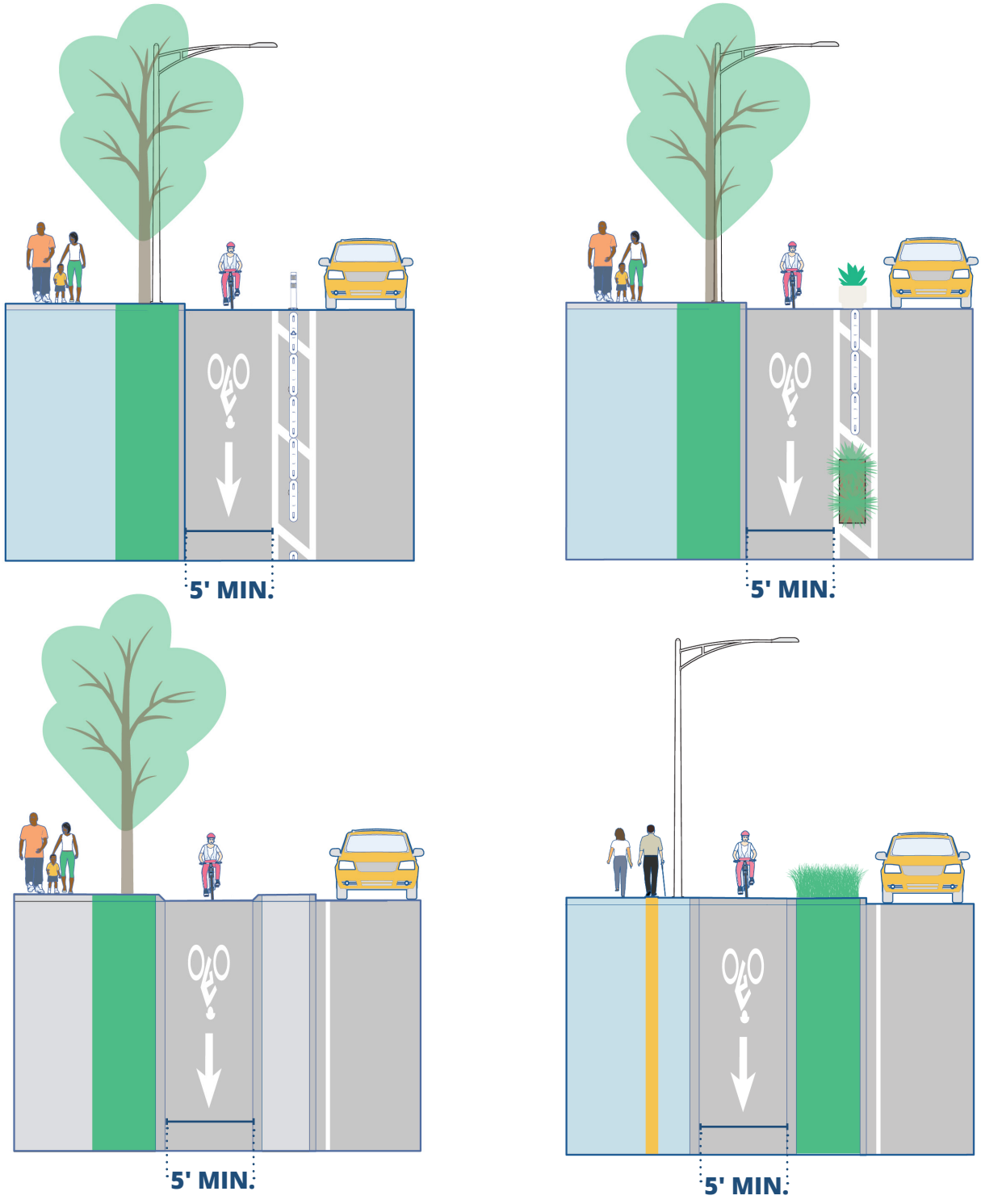
- AASHTO Guide for the Development of Bicycle Facilities
- FHWA Bikeway Selection Guide
- NACTO Urban Bikeway Design Guide

## DETAIL REFERENCES IN THIS GUIDE

- AT13: Bus Stop Shelters and Benches
- AT15: Bicycle Parking Integration

# BF3: SEPARATED BIKE LANES

Separated bike lanes (SBLs) (also called protected bike lanes or cycle tracks) provide a greater physical distance from motorized travel making them more attractive to a wider range of bicyclists than traditional striped bike lanes, particularly on higher volume and higher speed roads. SBLs are intended for exclusive use by bicyclists and other micromobility users; they are not intended for pedestrians. Where on-street parking is present, they eliminate the risk of a user being hit by an opening car door. The vertical physical separation of SBLs also prevents people driving cars from driving, stopping, or waiting in the bikeway. Additionally, they provide greater comfort to pedestrians by moving the sidewalk further away from motorized traffic and separating them from bicyclists operating at higher speeds.



## USE

- Bikeways on or adjacent to streets with actual operating speeds over 30 mph or where average daily traffic exceeds 6,000 vehicles per day.
- Bikeways where on-street parking is present and significant turnover of that parking is experienced.
- Urban trails on Downtown Mixed-Use, Town Main Street, Suburban Commercial, and Industrial corridors.
- Pedestrian lane on Rural roads.

## GUIDANCE

- Determine bike lane width by the anticipated peak hour bicycle and micromobility volume.
- Require a street buffer that is separated from the street by vertical elements (see additional guidance on Vertical Separation).
- Narrow travel and parking lanes to minimum widths in constrained corridors before narrowing bikeway width. Prioritize reduction of the space allocated to the street before narrowing other spaces. This can include decreasing the number of travel lanes, narrowing existing lanes, and/or adjusting on-street parking.
- Avoid narrowing sidewalks beyond the minimum necessary to accommodate pedestrian demand.
- Prevent the narrowing or elimination of the street buffer, as it is critical to the safety of SBLs.
- Maintain a minimum bike lane width of 5’ for one-way SBLs and 8’ feet for two-way bikeways, to ensure bicyclists can safely pass other bicyclists and micromobility users.

## ADDITIONAL CONSIDERATIONS

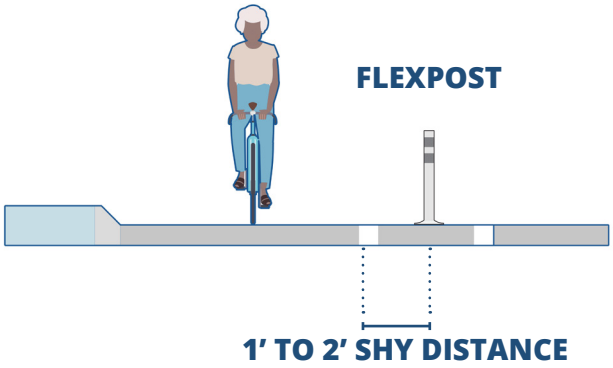
- Use of flexposts or low-profile curbs offer the least separation from traffic and should be used as an interim solution.
- Protecting bikeways with landscaping and/or on-street parking offer a high degree of separation, comfort, and safety to bicyclists and other micromobility users.
- Use of grade separation can provide an additional physical and visual cue to reinforce the distinction of the bikeway from adjacent motor vehicle travel lanes and pedestrian spaces, but these will often require roadway reconstruction.
- Employing one-way SBLs in the direction of motorized travel provides intuitive and simplified transitions to existing bike lanes and shared travel lanes.
- Implementation of two-way SBLs require special attention to properly transition contra-flow bicyclists and other micromobility users into existing bike lanes and shared travel lanes.
- Consider the need for specialized equipment to maintain separated bicycle lanes, as traditional street sweepers are too large to access them. Smaller street sweepers are available, and local governments should explore the opportunity to share the investment and use of such with one another.

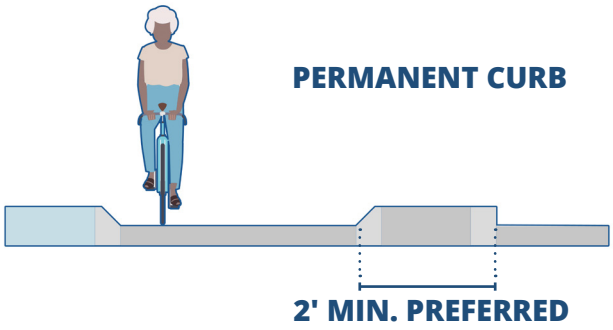
## RESOURCES

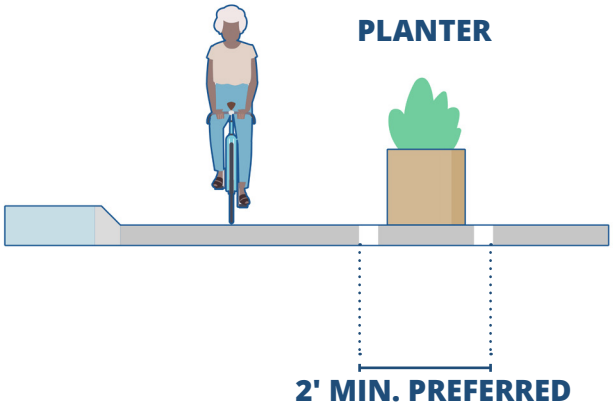
- FHWA Bikeway Selection Guide
- FHWA Achieving Multimodal Networks
- NACTO Urban Bikeway Design Guide

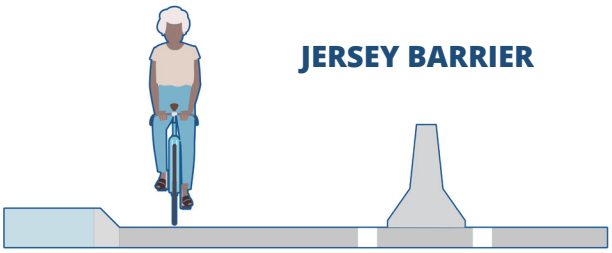
# BF4: VERTICAL SEPARATION

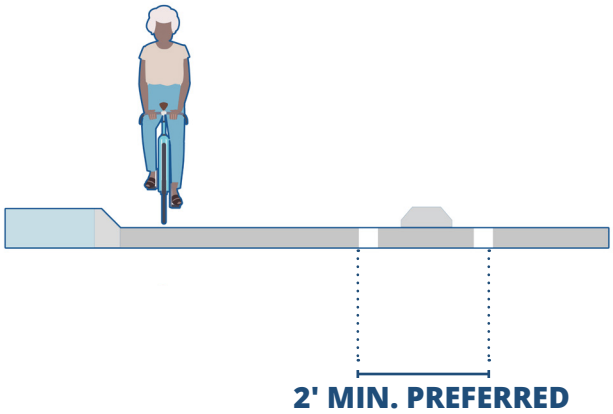
SBLs require both horizonal separation and vertical separation to be effective, safe, and comfortable for users of all ages and abilities. Vertical barriers provide both a perceived and real protection from motorized vehicles and can consist of a variety of elements, including flexposts, low-profile composite curbs, planters, concrete barriers, and temporary or permanent curbs/medians. Vertical separation can also be used to protect multi-use paths.

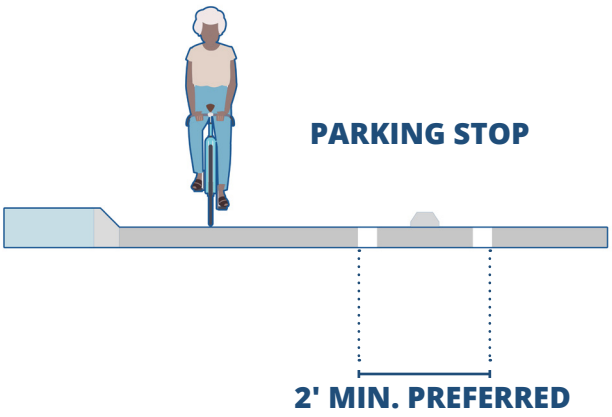


## USE

- Bikeways on or adjacent to streets with actual operating speeds over 30 mph or where average daily traffic exceeds 6,000 vehicles per day.
- Bikeways where on-street parking is present and significant turnover of that parking is experienced.
- Urban trails on Downtown Mixed-Use, Town Main Street, Suburban Commercial, and Industrial corridors.
- Pedestrian lane on Rural roads.

## GUIDANCE

- Consider actual operating speeds of motorized vehicles, posted speed limits, and land use context when selecting the most appropriate material for vertical separation.
- Flexposts, which are commonly used in retrofit, quick-build, or interim design projects, are appropriate in both low and high-speed conditions. While less expensive than some other vertical treatments, they do require continuous maintenance and can be perceived as less attractive than other options.
- Planters provide a more attractive and sustainable atmosphere to the bikeway and are often used along Downtown Mixed-Use and Town Main Street corridors. They may be used on streets with operating speeds up to 40 mph. When speeds are above 30 mph, a highly durable planter material should be used.
- Precast and permanent curb are appropriate on streets with speeds up to 45 mph.
- Parking stops can be used on streets with speeds up to 40 mph.
- Locate vertical elements within the buffer or on the outside edge line of SBLs and multi-use paths. When installing vertical elements, a minimum buffer width of 2’ is recommended.
- Install painted edge lines and vertical elements to guide drivers to park at least 3’ from the bikeway when parking is adjacent to the bikeway.

## ADDITIONAL CONSIDERATIONS

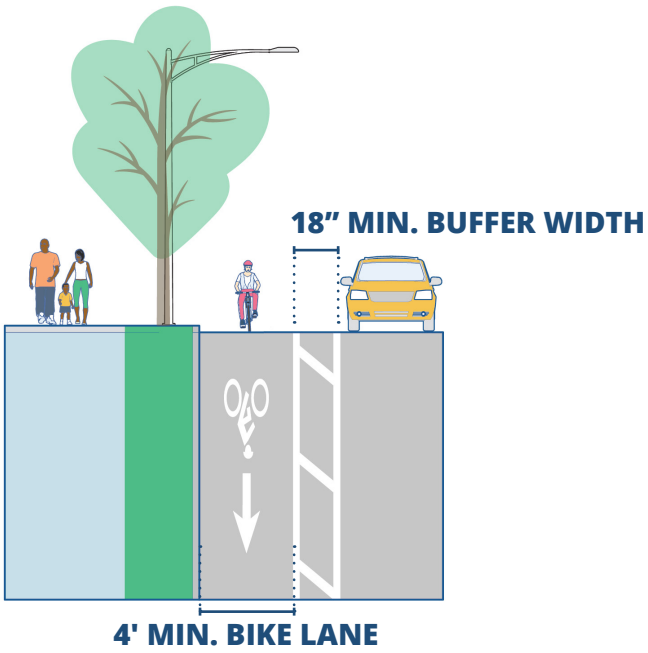
- Use of any vertical barrier introduces additional but varying maintenance considerations.
- Consider the visual environment where the vertical separation will be employed before selecting a material type.
- Assume a 1’ to 2’ shy distance from vertical elements when determining where to site vertical elements relative to the bikeway.
- Where right of way and funding are available, use of landscaped islands between bikeways and motor vehicle travel lanes provides protection for bicyclists and other micromobility users, beautification, and sustainable stormwater infrastructure
- Consider using flexposts, low-profile composite curbs, planters, and precast concrete curbs as temporary, lower-cost solutions for rapid implementation, pilot projects, and interim designs.
- Use concrete or weighted plastic barriers during construction activity to guide people walking, bicycling, or using other micromobility devices around construction zones.

## RESOURCES

- FHWA Achieving Multimodal Networks
- NACTO Urban Bikeway Design Guide

# BF5: BUFFERED BIKE LANE

Buffered bike lanes provide horizontal separation in the form of pavement striping, but they do not provide any vertical separation like an SBL. Buffered bike lanes are typically used as a low-cost way to quickly reallocate space on lower volume streets without the need for capital construction. They also allow bicyclists to ride side-by-side or to pass bicyclists and other micromobility users of varying speeds.




## USE

- Bikeways on streets with actual operating speeds over 25 mph or where average daily traffic is between 3,000 and 6,000 vehicles per day.
- Bikeways where on-street parking is present and significant turnover of that parking is experienced.

## GUIDANCE

- Use a minimum width of 4' for a buffered bike lane; the preferred width is 6'.
- Use a minimum buffer width of 18". There is no maximum buffer width. Diagonal cross striping should be used for buffers that are less than 3' in width, while chevron cross hatching should be used for buffers greater than 3'.
- Break buffers where curbside parking is outside the bike lane to allow drivers to cross the bike lane.
- Utilize high visibility paint for buffers.

## ADDITIONAL CONSIDERATIONS

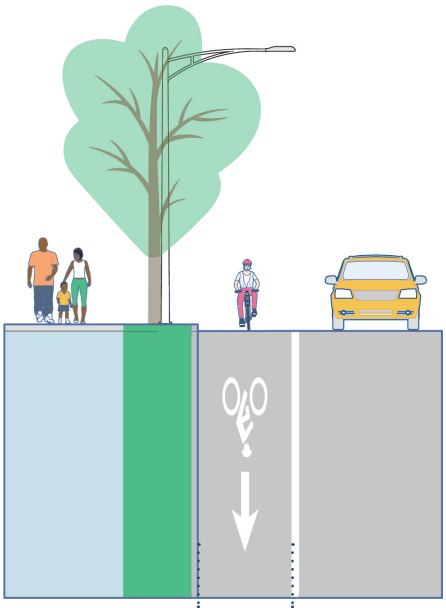
- Retrofit existing street space to provide buffers through the reduction of the number of travel lanes, narrowing of existing travel lanes, or reorganization of on-street parking.
- Consider placing buffer next to on-street parking lanes. If the bikeway is between the parking lane and the curb, the buffer should be located in the door zone of parked cars.
- While not as effective as SBLs, research has documented that buffered bike lanes increase the perception of safety.
- Install buffered bike lanes where 7' of roadway width is available (on each side), rather than a striped bike lane.

## RESOURCES

- FHWA Bikeway Selection Guide
- NACTO Urban Bikeway Design Guide

# BF6: STRIPED BIKE LANE

Striped bike lanes are located directly adjacent to motor vehicle travel lanes, providing no horizontal or vertical separation. They are delineated by a single pavement stripe and bike lane markings.



5' MIN. BIKE LANE

## USE

- Bikeways on streets with actual operating speeds less than 35 mph or where average daily traffic less than 6,000 vehicles per day.

## GUIDANCE

- Use a minimum width of 5’ for a striped bike lane; the preferred width is 6’. The width of the lane must be exclusive from the gutter.
- Provide additional width to add a door zone marked with Parking T’s or hatch marks where high on-street parking turnover is expected.
- Install contra-flow bicycle lanes on one-way streets to allow two-way bicycle travel to improve bicycle network connectivity.

## ADDITIONAL CONSIDERATION

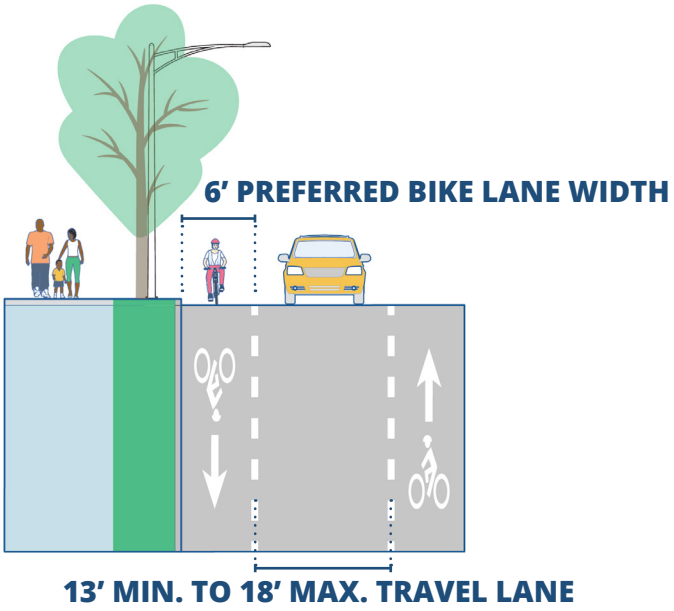
- Understand that stopping, standing, and parking in striped bike lanes may be problematic in areas of high parking demand and deliveries, especially in commercial and residential areas.
- Consider wider bike lanes or buffered bike lanes in locations with high on-street parking turnover.

## RESOURCES

- FHWA Bikeway Selection Guide
- NACTO Urban Bikeway Design Guide

# BF7: ADVISORY SHOULDER

Advisory shoulders are paved spaces for people walking, bicycling, and using micromobility devices on roadways where there is not enough space for typical bike lanes. This facility creates a yield situation in which motorists a able to use the entire roadway when bicyclists, pedestrians, and micromobility users are not present, but motorists must yield to those vulnerable users when they are present.




## USE

- Streets too narrow for bike lanes and normal-width travel lanes.

## GUIDANCE

- Use a minimum width of 13’ for the center travel lane; maximum width is 18’. Center lanes wider than 18’ may encourage excessive vehicle speeds.
- Use a preferred width of 6’ for advisory shoulders; 4’ is acceptable in constrained right of way. If motor vehicle speeds exceed 50 mph, moderate to heavy volumes of traffic exist, and/or above-average bicycle usage is present, then advisory shoulders may be need to be wider than 6’.
- Avoid the use of rumble strips, as they will greatly discourage bicycling and potentially cause damage to bicycles and injury to bicyclists.

## ADDITIONAL CONSIDERATIONS

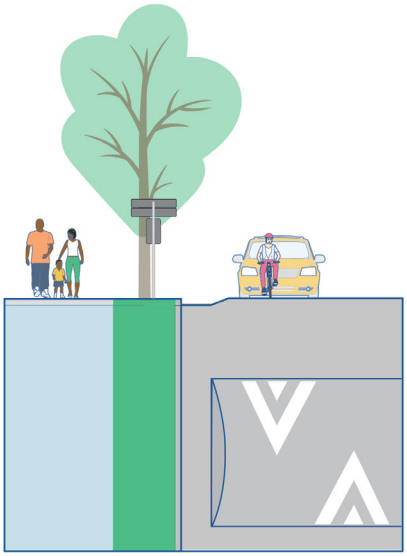
- Understand that advisory shoulder treatments require FHWA permission to experiment.

## RESOURCES

- FHWA Bikeway Selection Guide
- NACTO Urban Bikeway Design Guide

# BF8: NEIGHBORHOOD BIKEWAY

Neighborhood bikeways are suitable for quiet streets that connect through residential neighborhoods. They should be attractive to all ages and abilities. These treatments are designed to prioritize bicycle, pedestrian, and micromobility device through-travel, while discouraging high-volume motor vehicle traffic and maintaining relatively low motor vehicle speeds. Treatments vary depending on context, but often include elements of traffic calming, including traffic diverters, speed humps, chicanes, pavement markings, and/or signage.



## USE

- Bikeways on streets with actual operating speeds up to 25 mph or where average daily traffic is below 3,000 vehicles per day.

## GUIDANCE

- Place stop signs or traffic signals along the neighborhood bikeway in a way that prioritizes the bicycle movement, minimizing stops for bicyclists whenever possible.
- Include traffic calming measures such as street trees, traffic circles, chicanes, and speed humps.

## ADDITIONAL CONSIDERATIONS

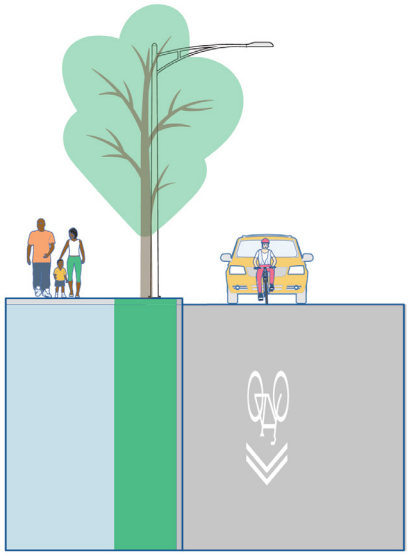
- Consider using traffic diverters or semi-diverters to redirect cut-through vehicle traffic and reduce traffic volumes while still enabling local access to the street.
- Understand that additional treatments for major street crossings may be needed, such as median refuge islands, rapid flashing beacons, bicycle signals, and HAWK or half signals.

## RESOURCES

- FHWA Bikeway Selection Guide
- NACTO Urban Bikeway Design Guide

# BF9: SHARED LANE

Shared lanes require bicyclists to ride in mixed traffic with motorized vehicles. They provide no dedicated space for bicyclists. Typically, only the most experienced bicyclists are comfortable in shared lane environments.



## USE

- Streets where other bicycle facility types are not possible and with operating speeds of 35 mph or less.
- Streets interior to areas where drivers intuitively drive slower like parks, school campuses, and recreation areas.

## GUIDANCE

- Include shared lane markings and signs to inform drivers that bicyclists may travel in the lane and clearly mark where bicyclists should be expected.
- Use of shared lane markings is only allowed on streets with operating speeds of 35 mph or less.

## ADDITIONAL CONSIDERATIONS

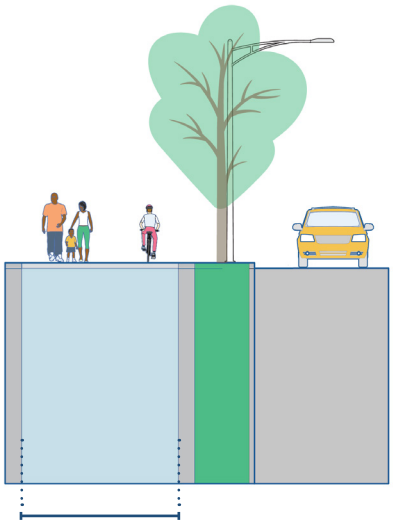
- Realize that the comfort and safety of shared lanes is variable based on motorized traffic conditions, including vehicle operating speeds, average daily volumes of vehicles, and street maintenance.
- Understand that the majority of bike/car crashes occur in shared lanes that are inappropriate for their contexts.

## RESOURCES

- AASHTO Guide for the Development of Bicycle Facilities
- FHWA Bikeway Selection Guide
- NACTO Urban Bikeway Design Guide

# BF10: MULTI-USE PATH

Multi-use paths or shared use paved trails are two-way facilities that are grade-separated from motor vehicle traffic and used by people walking, wheeling, bicycling, and using other micromobility devices. They are often called trails or greenways when located in an independent alignment (such as a greenbelt or abandoned railroad). When they follow roadways, they are often called sidepaths. Many people express a strong preference for separating walking and bicycling from motor vehicle traffic when compared to on-street bikeways.



10' TO 12' PREFERRED WIDTH

## USE

- Multi-use facilities adjacent to streets with actual operating speeds in excess of 35 mph or where average daily traffic is over 7,000 vehicles per day.
- Multi-use facilities in dedicated right of way like utility easements, along streams and rivers, and in former railroad corridors.

## GUIDANCE

- Use a width of 10' to 12' with 8' being the minimum for short distances in constrained areas. Heavy volumes or a high proportion of pedestrians may require wider widths than 12'.
- Design multi-use paths according to state and national standards, including establishing a design speed (i.e., typically 18 mph) and appropriate geometry.
- Give priority to path users at intersections with roadways, including separation physically and timing and through the inclusion of high-visibility crossing treatments.
- Minimize the number of driveway and street crossings along the path.

## ADDITIONAL CONSIDERATIONS

- Consider separating bicyclists from pedestrians where higher volumes are expected through the construction of parallel paths for each mode.
- Do not consider multi-use paths a substitute to accommodating more confident bicyclists in the roadway.

## RESOURCES

- AASHTO Guide for the Development of Bicycle Facilitie
- FHWA Bikeway Selection Guide
- AASHTO Guide for the Development of Bicycle Facilities

# INTERSECTIONS AND CROSSINGS

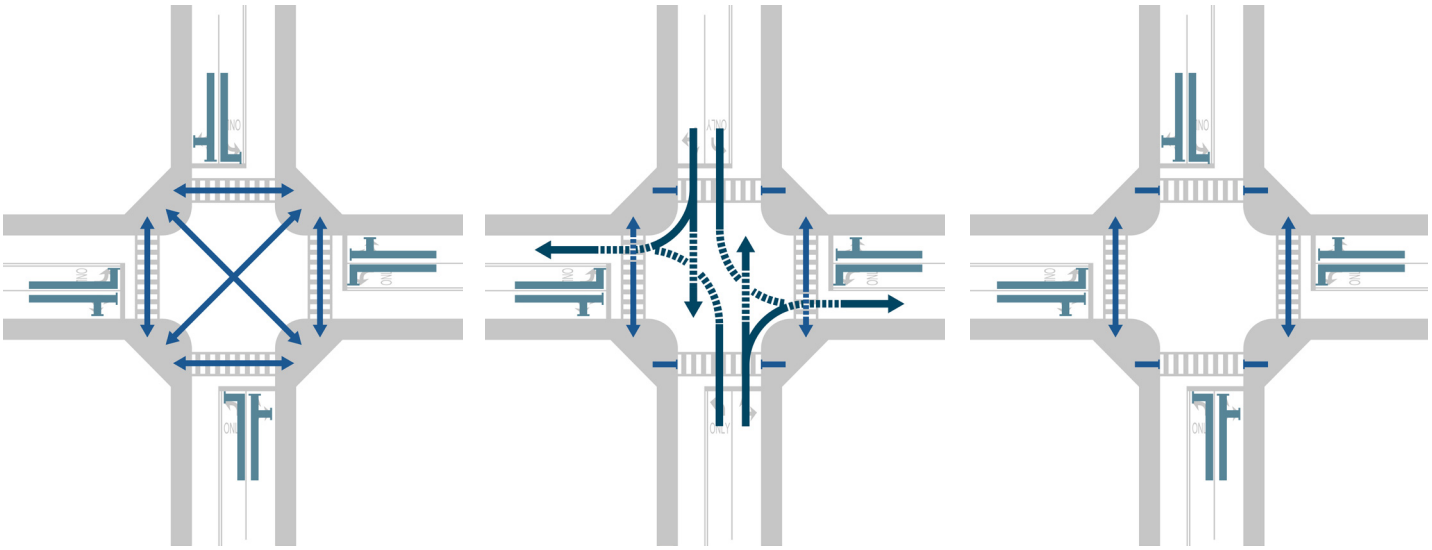
# IC1: TRAFFIC SIGNAL OPERATIONS FOR PEDESTRIAN MOBILITY

To moderate which legs of an intersection have the right of way, intersections are either stop sign controlled or signal controlled. Pedestrian signals are part of the traffic signal system at signalized intersections that are specifically designed to control intersection operations for people walking and wheeling. Pedestrian signal phasing should be designed to minimize exposure of people walking to motor vehicles, minimize delay for people waiting to cross the street, reduce non-compliant and unsafe crossing behavior, and provide accessibility benefits to disabled people. Pedestrian phasing can be described by three categories:

» **Concurrent phasing** allows people to walk or wheel across the street at the same time as motor vehicle traffic that is moving in the same direction, minimizing delay for all users.

» **Exclusive phasing** gives a separate, dedicated phase for people walking and wheeling in all directions while prohibiting motor vehicle movements. Exclusive phasing can provide safety benefits by eliminating modal conflicts; however, it does create longer delays for all modes, which can lead to non-compliant crossing behavior if delay is excessive.

» **Hybrid phasing** uses concurrent phasing to minimize delay for people walking and wheeling on legs of an intersection where conflicts are minimal, while also providing an exclusive phase for legs that are more challenging. Hybrid phasing is typically used at complex intersections.



EXCLUSIVE PHASING | CONCURRENT PHASING | LEADING PEDESTRIAN INTERVAL

## USE

- Signalized intersections.

## GUIDANCE

- A walking speed of 3’ per second should be used to time pedestrian phases to ensure adequate time is provided for people to cross the street.
- Use concurrent phasing unless high turning movement volumes (250 or more per hour) create a strong safety concern.
- Employ leading pedestrian intervals (LPIs) where concurrent phasing is used to give people crossing the street a head start before other street users are allowed to proceed. LPIs encourage drivers to yield to people walking and wheeling while they are turning and improve visibility between all users. No Turn on Red restrictions should be considered at all locations where LPIs are used.
- When protected left-turn phases are provided, lagging left turns (left turn signal at the end of the green phase) should be used to preserve the ability to use LPIs with concurrent phasing.
- When using concurrent phasing on streets with high pedestrian traffic or in proximity to high-demand bus strops, signals should be placed on automatic pedestrian recall.
- Consider use of exclusive phasing at intersections with high pedestrian traffic or where at least 250 motor vehicles turn right per hour along any approach.
- Implement No Turn on Red restrictions at all locations were exclusive phasing is used.

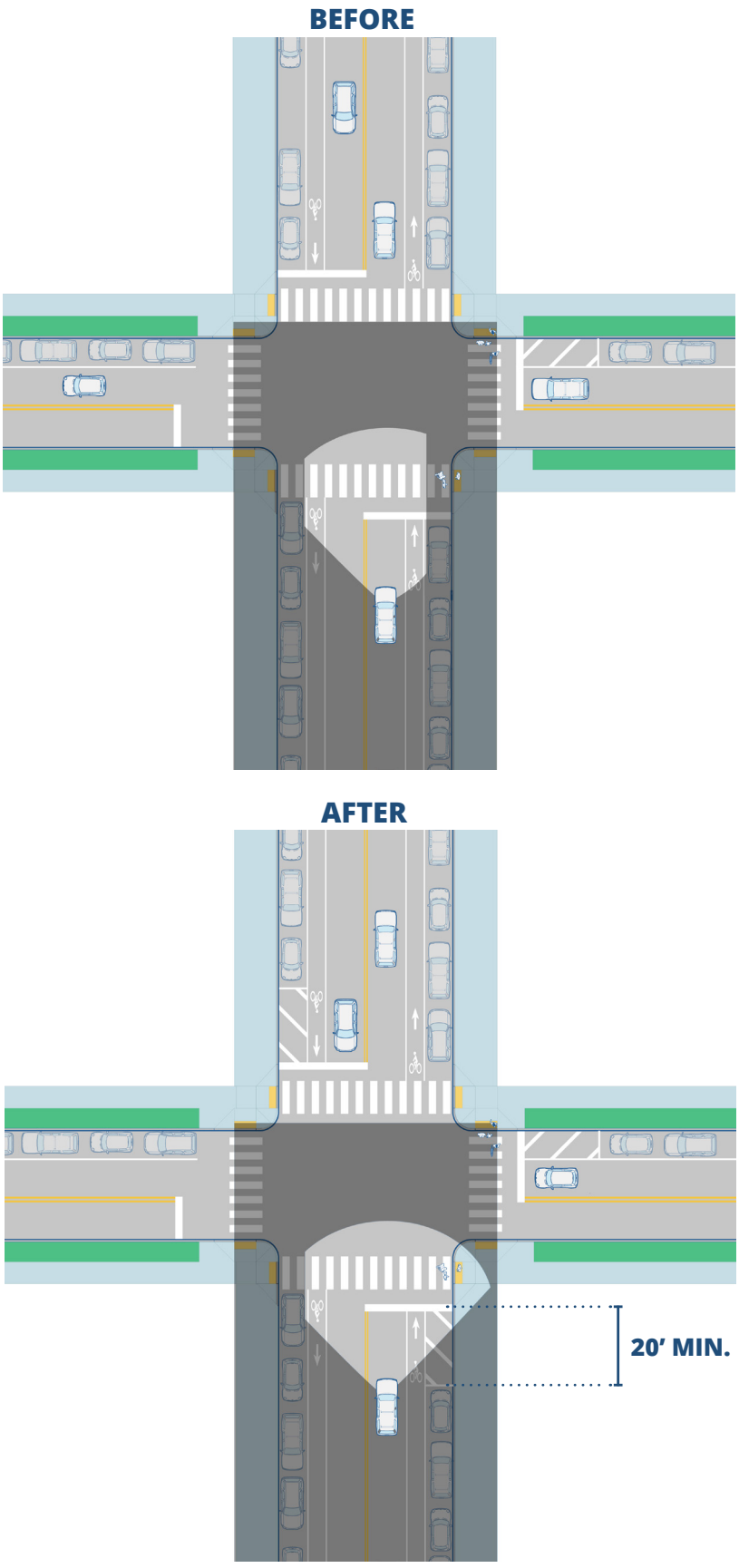
## ADDITIONAL CONSIDERATIONS

- Ensure all pedestrian signal heads are correctly oriented to be visible to all users who are directed to follow the signal indications, including people riding bicycles or using other micromobility devices.
- Time signal phases so that people walking or wheeling have adequate time to cross the entirety of the street during a single walk phase.
- Provide accessible pedestrian signals (APS) to assist people with disabilities.
- Install pedestrian countdown signals to further assist people in crossing the street.

## RESOURCES

- MUTCD
- FHWA Achieving Multimodal Networks
- PROWAG

# IC2: DAYLIGHTING



Daylighting ensures that appropriate sightlines and visibility are maintained by restricting stopping, parking, or loading and unloading in proximity to crossings, intersections, and driveways. Daylighting can be provided through the use of signs, pavement markings, flexposts, and/or curb extensions.

## USE

- Locations where there is on-street parking, loading/unloading, or excess pavement width approaching crosswalks, intersections, or driveways.

## GUIDANCE

- Sign and/or mark no less than 20’ of space from a crosswalk or 30’ of space from the stop bar at a controlled intersection as “No Parking” or “No Stopping.”
- Sign or mark no less than 5’ of space from a lower volume driveway as “No Parking” or “No Stopping.”

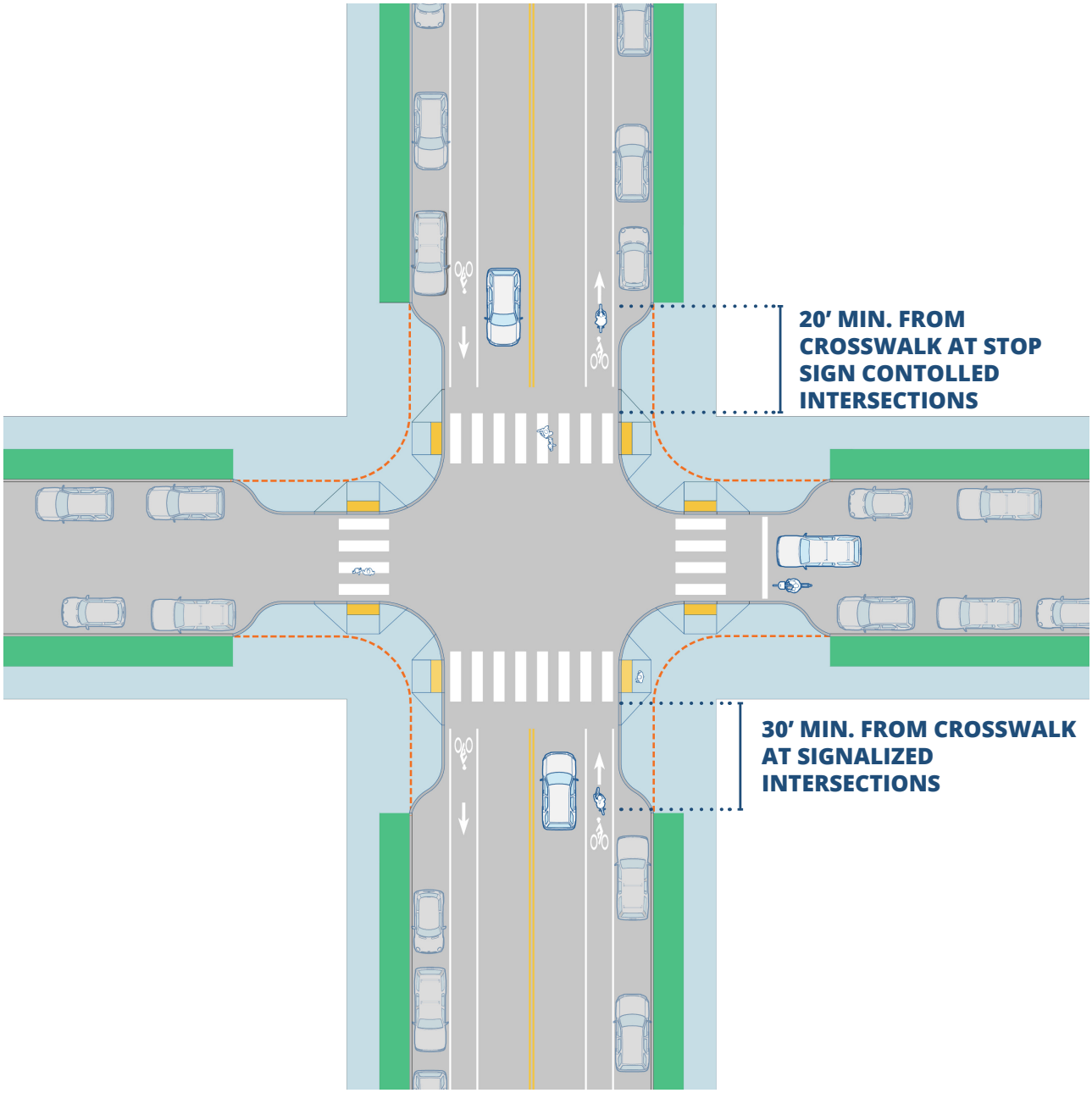
## ADDITIONAL CONSIDERATIONS

- Use engineering judgment to determine if longer daylighting areas should be implemented based on prevailing vehicle speeds or other intersection features.
- Use physical barriers or delineators such as flexposts or curb extensions to prevent vehicles from stopping or parking in daylighted areas.
- Consider the use of street murals, low level landscaping or planters, bike parking, or multimodal hubs in daylighted areas.

## RESOURCES

- MUTCD
- NACTO Urban Street Design Guide

# IC3: CURB EXTENSIONS



Extending the curb beyond the sidewalk increases visibility of people walking and wheeling and shortens their crossing distance, particularly when on-street parking is present. Curb extensions can also be effective at narrowing streets or tightening intersections to reduce motor vehicle turning speeds. Curb extensions may also be used to create a bus bulb.

## USE

- Corners of intersections with on-street parking.
- Entries to Urban Residential and Suburban Residential Connector corridors.
- Bus stops as bus bulbs.
- Midblock locations where traffic calming or improved sightlines are desired, including Urban Trails, multi-use paths, bus stops, or major destinations.

## GUIDANCE

- Extend curb extensions no less than 20’ from the crosswalk at stop sign controlled intersections and 30’ from signalized intersections.
- Keep corner radii as small as possible while still accommodating the design vehicle at a crawl speed.
- Ensure curb extensions do not impeded stormwater management. In retrofit conditions, it may be necessary to preserve the original curb and gutter flow path by leaving 1’ to 2’ between the existing curb and the curb extension.

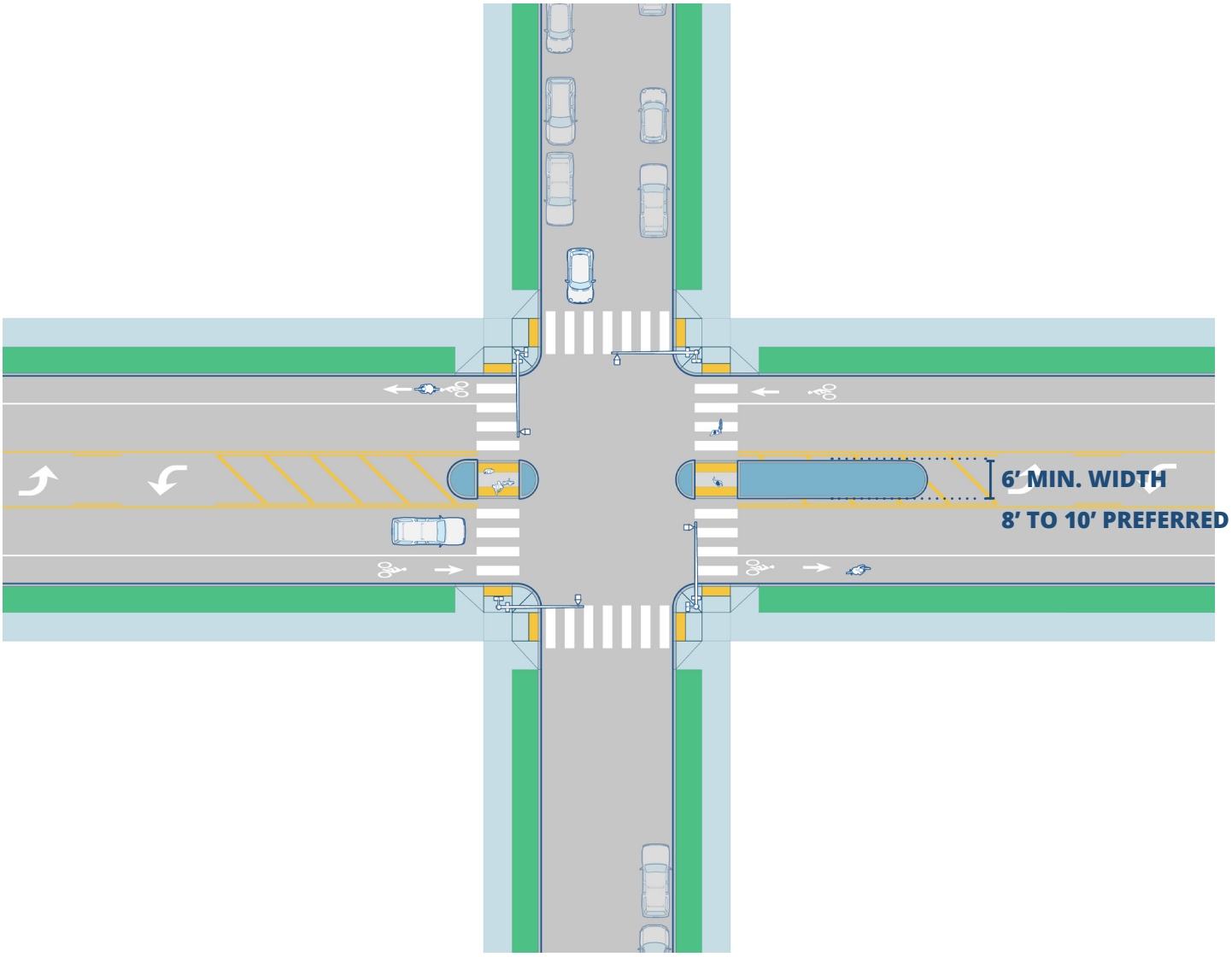
## ADDITIONAL CONSIDERATIONS

- Consider incorporating green infrastructure into curb extensions to collect stormwater and provide planting areas.
- Integrate street furniture or other public space elements such as art, bike parking, wayfinding, micromobility hubs, and lighting.
- Design corner radii for the vehicle that turns most frequently at that intersection.
- Accommodate larger design vehicles with mountable curbs or truck aprons while keeping corner radii tight to maintain slow turning speeds.

## RESOURCES

- NACTO Urban Street Design Guide

# IC4: PEDESTRIAN ISLANDS



Pedestrian islands provide a protected refuge in the center of two-way streets for people walking and wheeling, allowing them to cross the street in two phases. Crossing islands provide particular benefit where crossing distance is long or where multiple lanes in a single direction must be crossed. Islands can also calm traffic by visually and physically narrowing the roadway.

## USE

- Crossings where roadway width or prevailing vehicle speeds make people crossing the street feel unsafe or where traffic speeds and volumes prohibit people from crossing.
- Crossings that require a person to cross more than one lane of traffic in each direction on a two-way street.

## GUIDANCE

- Provide a minimum island width that matches the width of the crosswalk or that is at least 6’ wide.
- Maintain a flush accessible path through the crossing island.
- Provide detectable warning strips at the entrance and exit of the crossing island or any time a person crossing will enter the vehicle travelway.
- At signalized intersections, orient and time pedestrian signals to serve people in the crossing island. If pedestrian signalization is not on automatic recall, locate a push button in the island.
- Follow MUTCD guidance for signage, signalization, pavement markings, and painted curb on the island approach.

## ADDITIONAL CONSIDERATIONS

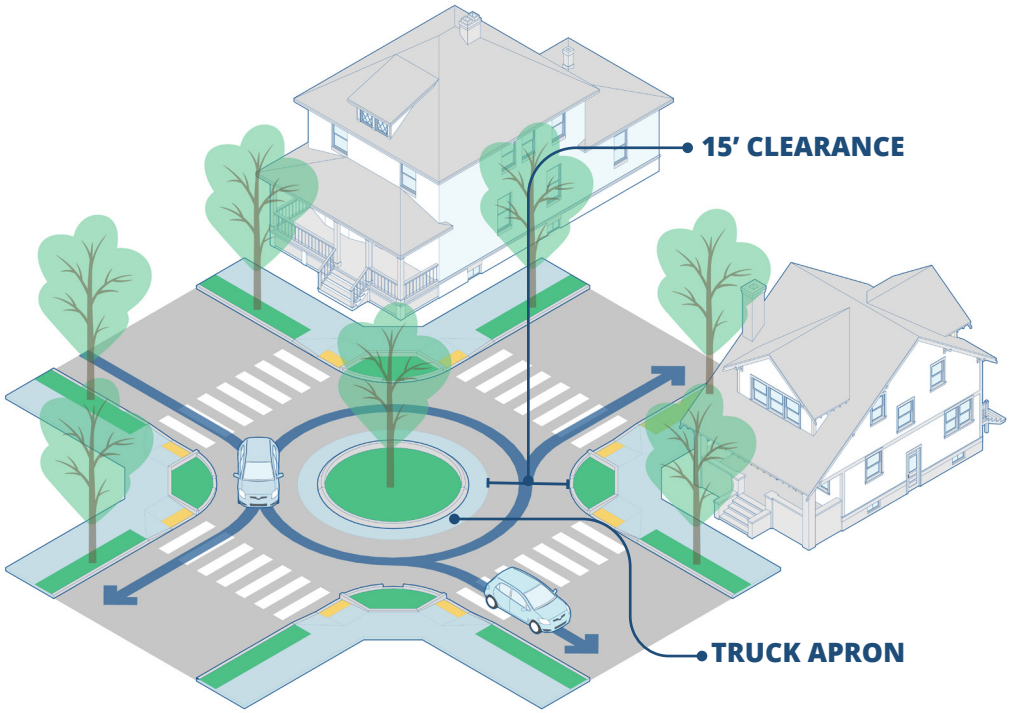
- Maximize the width of the crossing island to narrow vehicle travel lanes and provide additional refuge area for pedestrians. An island width of 8’ to 10’ is preferred over the 6’ minimum. At locations where people bicycling may also be crossing, a width of 10’ is needed.
- Consider utilizing the interior of the island for bioretention, street trees, or other stormwater management. Ensure plantings do not impact visibility between pedestrians and motor vehicles.

## RESOURCES

- MUTCD
- FHWA Achieving Multimodal Networks
- NACTO Urban Street Design Guide
- PROWAG

# IC5: NEIGHBORHOOD TRAFFIC CIRCLES

Neighborhood traffic circles, sometimes called mini roundabouts, can effectively calm traffic on low-volume neighborhood streets. Neighborhood traffic circles can be implemented with vertical or mountable curbing, depending on specific turning radius requirements. This countermeasure also allows for opportunities for landscape, special identifying neighborhood signage, or public art.




## USE

- Intersections in residential areas where vehicle volumes for all approaching legs are less than 15,000 VPD.
- Do not use on primary emergency vehicle access routes.

## GUIDANCE

- Provide 15’ clearance from intersection corners to edge of traffic circle, which may include a mountable truck apron.

## ADDITIONAL CONSIDERATIONS

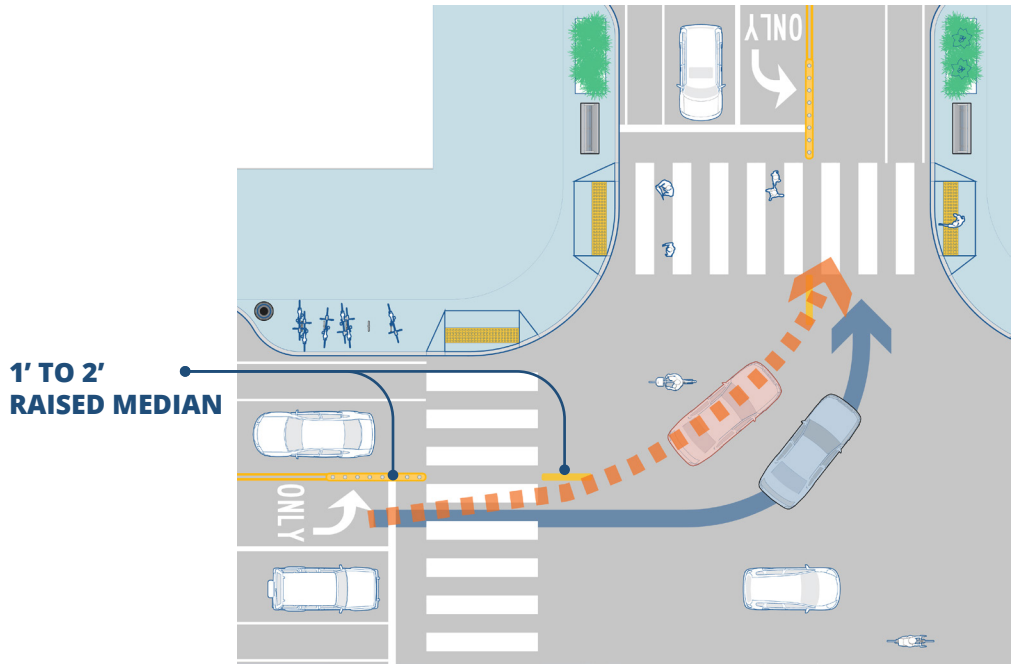
- Use the largest traffic circle radius possible to encourage slower speeds.
- Mark crosswalks ahead of each approach/entrance to the traffic circle.

## RESOURCES

- NACTO Urban Street Design Guide
- FHWA Traffic Calming ePrimer 3.7

# IC6: HARDENED CENTERLINES

Hardened centerlines prevent “cutting the corner” by blocking the diagonal path through a crosswalk, forcing drivers to slow their left turning movements at intersections. To “harden” the centerline, narrow concrete or modular medians, flexposts, or other vertical elements are added along the roadway centerline to discourage high-speed turning movements by effectively reducing a vehicle’s turning radius. Slower speeds give drivers more time to react to people walking, wheeling, bicycling, or using other micromobility devices.




## USE

- Intersections where the speed of left turn movements need to be slowed.

## GUIDANCE

- Install a narrow (1’ to 2’ in width) raised median along the path of the centerline; precast concrete or modular medians work well.
- Add flexposts or other vertical delineators for additional deterrence.

## ADDITIONAL CONSIDERATIONS

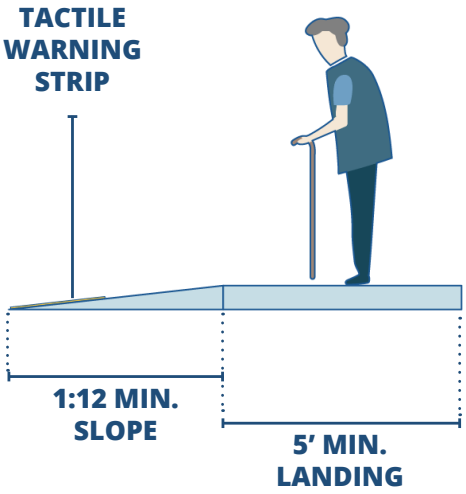
- Consider the turning movements of larger vehicles, like trucks and buses, when determining how much of the centerline to harden.
- While hardened centerlines provide a significant enough obstacle to keep motor vehicles from “cutting the corner,” they are also low-profile enough to allow for emergency vehicle turning flexibility.

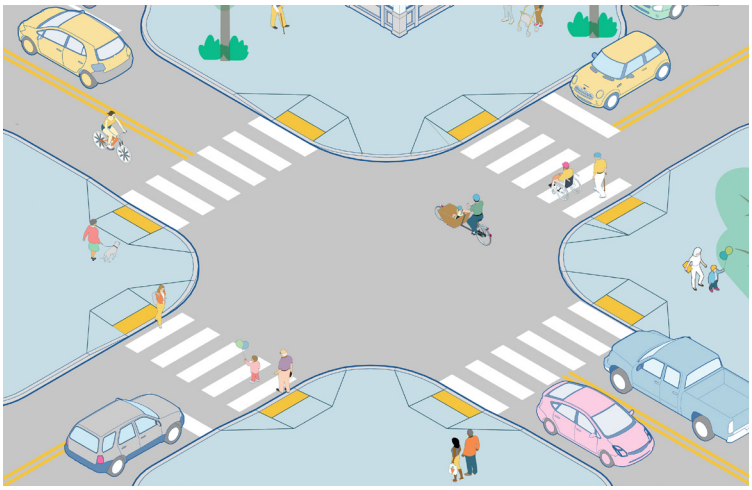
## RESOURCES

- NACTO Don’t Give Up at the Intersection

# IC7: CURB RAMPS

Curb ramps, or ADA ramps, are required at all intersection, midblock, and other crossings where vertical elevation changes occur. Curb ramps support independent mobility for all people, including people with physical disabilities, people pushing strollers, or people pulling suitcases or other wheeled objects.



DIRECTIONAL CURB RAMPS AT INTERSECTION

## USE

- All pedestrian crossing locations where vertical grade changes are present.

## GUIDANCE

- Provide a clear level landing zone of no less than 4' by 4' at the sidewalk at the back of the ramp.
- Provide a ramp that is no less than 3' in width; 5' wide is preferable. When possible, match the width of the ramp to the width of the crosswalk.
- Ensure ramp slope is not greater than 1:12.
- Install detectable warning surfaces at the bottom of the ramp immediately behind the curb.
- Provide ramp flares with a maximum slope of 1:10 when pedestrians may travel across the ramp. When a level landing is not possible, the maximum slope of ramp flares should be 1:12.

## ADDITIONAL CONSIDERATIONS

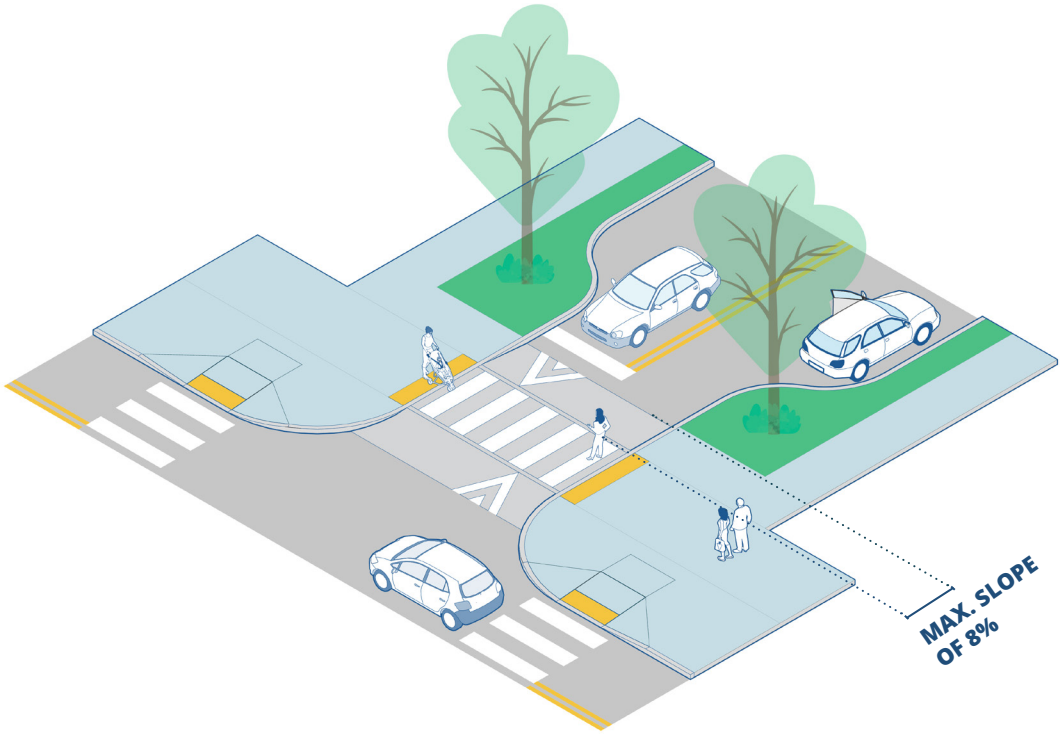
- Use two parallel curb ramps at corners rather than a single diagonal curb ramp to improve navigability for low-vision and blind people.
- Lengthen ramp and reduce slope beyond maximum allowable standards where possible.
- Widen ramp to sidewalk's clear width when the connecting sidewalk is wider than 8'.
- Widen ramp to accommodate multiple user types when connecting to an Urban Trail.

## RESOURCES

- NACTO Urban Street Design Guide
- FHWA Traffic Calming ePrimer 3.7

# IC8: RAISED CROSSWALKS

Raised crosswalks provide better visibility of pedestrians by motorists, calm traffic, and improve motorist yielding to people walking, wheeling, biking, and using other micromobility devices at intersections and midblock crossings. Elevating the crosswalk reduces or eliminates transitions from the sidewalk to the street crossing. Transition aprons on each approach to the raised crossing are marked with pavement markings to alert drivers of the grade change.




## USE

- Intersections where the speed of left turn movements need to be slowed.

## GUIDANCE

- Install a narrow (1' to 2' in width) raised median along the path of the centerline; precast concrete or modular medians work well.
- Add flexposts or other vertical delineators for additional deterrence.

## ADDITIONAL CONSIDERATIONS

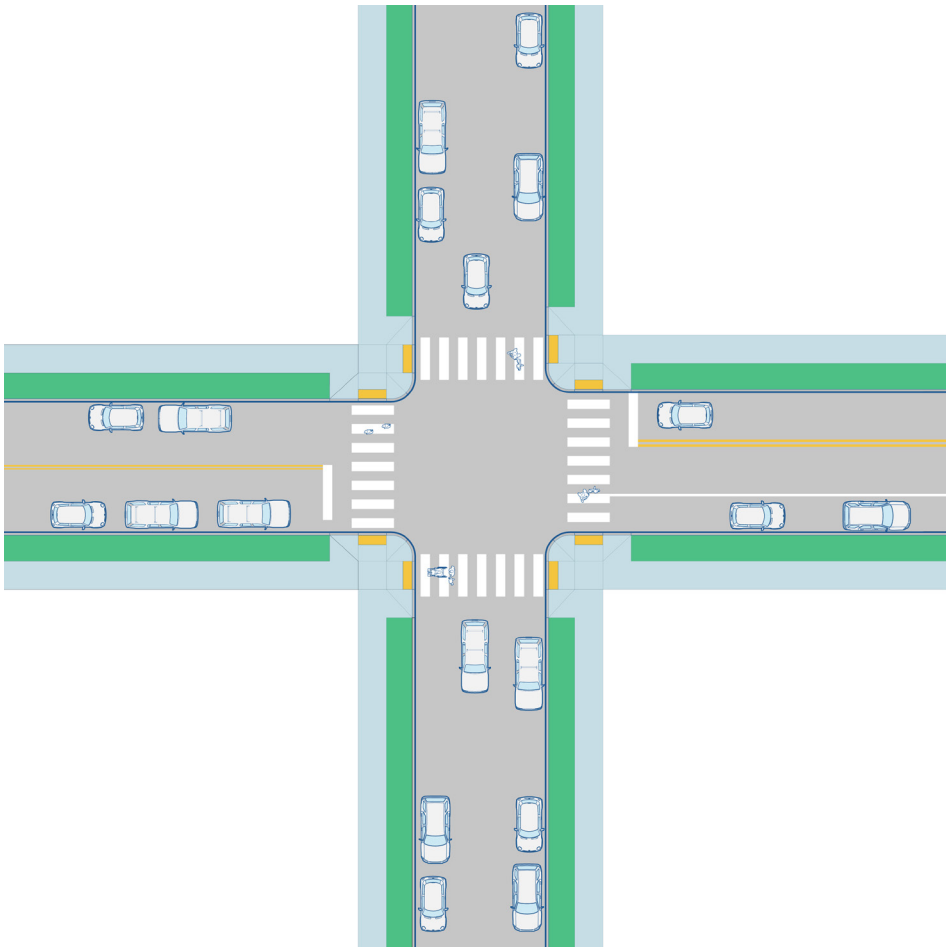
- Consider the turning movements of larger vehicles, like trucks and buses, when determining how much of the centerline to harden.
- While hardened centerlines provide a significant enough obstacle to keep motor vehicles from "cutting the corner," they are also low-profile enough to allow for emergency vehicle turning flexibility.

## RESOURCES

- NACTO Don't Give Up at the Intersection

# IC9: MARKED CROSSWALKS

Crosswalks clearly designate a path for people walking or wheeling through an intersection, at high-demand midblock points, and across wide driveways. Create crosswalks that incorporate art into the crosswalk marking may be appropriate a select locations to reinforce and celebrate community character and culture.



## USE

- At all signalized intersections.
- At all intersections regardless of signalization along Downtown Mixed-Use, Town Main Street, and Suburban Commercial corridors or at least every 500'.
- At intersections and midblock locations with bus stops.
- At midblock locations with significant walking trip generators such as schools, libraries, recreation centers, community centers, senior centers, parks, playgrounds, and places of worship.
- Across wide, at-grade commercial driveways.
- Creative crosswalks are appropriate at high-volume, stop sign controlled or signalized intersections and signalized midblock locations.

## GUIDANCE

- Consult the FHWA Safe Transportation for Every Pedestrian (STEP) Guide to select appropriate pedestrian crash countermeasures when designing new or improved crosswalks.
- Install ADA-compliant curb ramps (or blended transitions for raised crosswalks) to connect to accessible routes when constructing new crosswalks. Parallel curb ramps are preferred to diagonal.
- At controlled intersections, provide a stop bar in advance of the crossing and consider signal timing guidance at signalized intersections. Consider location of vehicle stop bars based on design vehicle turning envelope.
- Provide yield lines and YIELD HERE TO PEDESTRIAN sign (R1-5) in advance of uncontrolled midblock crossings.
- Restrict on-street parking no less than 20' in advance of the crossing to provide adequate sight distance. Additional daylighting strategies may be appropriate depending on context.
- Where mid-block crossings are desired because of high-activity uses or existing desire lines, consider a rectangular rapid flashing beacon (RRFB) or high-intensity activated crosswalk beacon (HAWK signal) to highlight to people driving that people may be walking across the street.
- Crosswalks should be as wide or wider than the connecting sidewalk.
- Where an Urban Trail or separated bike lane crosses a crosswalk, yield markings on the bike lane or Urban Trail approach can emphasize that people biking or using micromobility modes must yield to pedestrians within the crosswalk.
- Where creative crosswalks are implemented, artistic elements must not interfere with the white, regulatory markings used for the crossing and may only be applied between the markings.

## ADDITIONAL CONSIDERATIONS

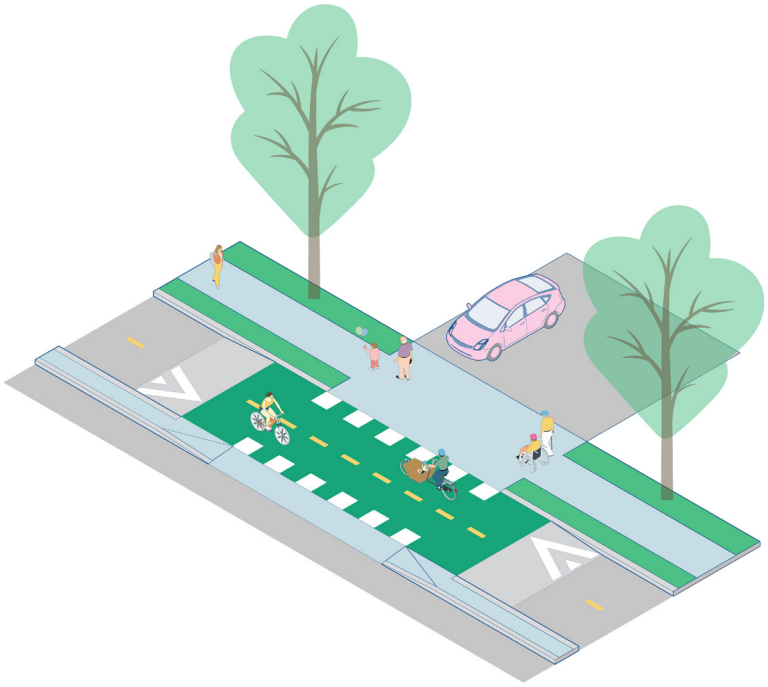
- Streetlights should be located to front-light crosswalks with the light source situated in advance of the crosswalk in the direction of motor vehicle travel. For wider intersections, it may be necessary to place light poles on all four corners of each intersection to adequately light each crosswalk.
- Use decorative paving or pavers to match local context in historic or special districts. Include white striping on both sides of the decorative materials.

## RESOURCES

- PROWAG
- FHWA STEP Guide
- MUTCD
- FHWA Achieving Multimodal Networks
- NACTO Urban Street Design Guide

# IC10: DRIVEWAY CROSSINGS

Residential and commercial driveways should be constructed to be level with the sidewalk or pedestrian path of travel and provide a minimum clear width of 4’ across the driveway. A level, continuous sidewalk eliminates the need for curb ramps while also indicating priority for people walking or wheeling along the sidewalk.



## USE

- All residential and commercial driveways.

## GUIDANCE

- Maintain a continuous sidewalk grade crossing width of no less than 4’ across all driveway crossings.
- Maintain a cross slope of no more than 2%.
- Design for adequate sight distance for people driving using daylighting where necessary.
- Align the edge of the transition apron with the face of the curb.

## ADDITIONAL CONSIDERATIONS

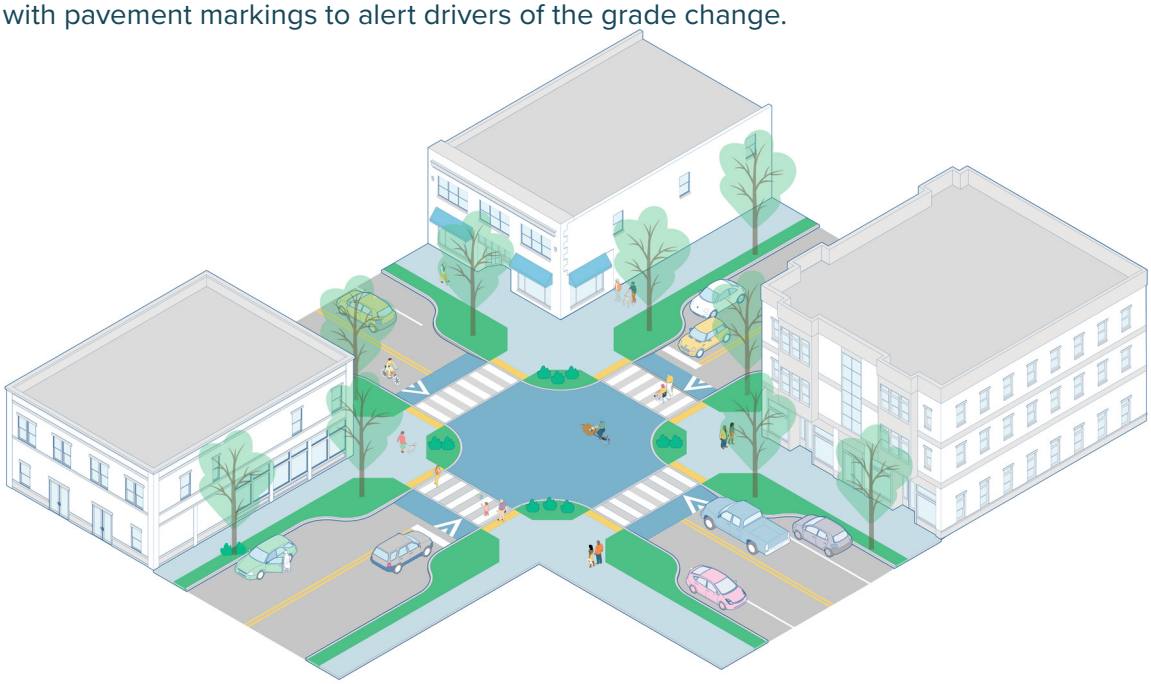
- Contain driveway apron to the sidewalk buffer, where provided, to maintain sidewalk grade for entire length of the driveway crossing.
- Maintain sidewalk and path materials (usually concrete) across driveway crossings to communicate priority for people walking, riding bicycles, and using other micromobility devices.
- Raise street-level separated bike lanes and Urban Trails to sidewalk grade for major driveway crossings. Where the density of major driveway crossings would result in a repaid succession of transition ramps, practitioners should consider raising the entire bike lane or Urban Trail to sidewalk level.
- Use bike/micromobility crossing pavement markings at high-volume or wide driveway crossing when a bike lane or Urban Trail is present.
- Include audible warning for people walking across major driveways in commercial areas and where parking garage exits cross sidewalks.
- Where low-clearance vehicles are expected to use driveways, the elevation should be reduced to 4 inches or less.

## RESOURCES

- PROWAG

# IC11. RAISED INTERSECTION

Raised intersections effectively calm traffic at intersections on streets with high volumes of people walking. Raising the entire intersection area creates a level transition from sidewalk to street crossing and elevates pedestrians for greater visibility by motorists. Transition aprons on all sides of the raised intersection should be marked with pavement markings to alert drivers of the grade change.



## USE

- Minor intersections with high volumes of people walking along Downtown Mixed-Use and Town Main Street corridors.
- Intersections along Urban Residential and Suburban Residential Connector corridors near major walking trip generators, such as schools or parks.
- Appropriate at both signalized and unsignalized locations.

## GUIDANCE

- Locate vehicle stop bars 20’ back from transition apron.
- Include warning pavement markings for drivers on transition aprons.
- Examine the impact to drainage patterns to ensure that the flow of water is properly accommodated.

## ADDITIONAL CONSIDERATIONS

- Use bollards or raised planter barriers along intersection corners to prevent people from driving vehicles onto the sidewalk.
- Consider the use of special paving material, color, and/or pattern to delineate and accentuate raised intersections.

## RESOURCES

- NACTO Urban Street Design Guide

# IC12: TRANSIT PRIORITIZATION AT INTERSECTIONS

Signal prioritization can help transit vehicles stay on schedule and can reduce the number of buses and drivers required for a route.  Signal operations can increase convenience, reliability, and predictability of transit.

## USE

- Where corridors are congested and signals are a major source of delay for transit buses.
- Corridors with long signal cycles or longer distances between signals.
- Where transit routes turn and additional signal phase time is needed for the maneuver of the bus.
- On Bus Rapid Transit or other signature routes.

## GUIDANCE

- In most locations, conditional transit signal priority (TSP), where advantage is only given if the bus is running behind schedule, is easiest to implement and allows the signal cycle to gradually return to its standard timing.
- Far-side bus stops are preferred generally, but near-side stops can be used.
- Develop a TSP plan based on improving operational reliability, and minimizing person delay. Consider impacts to cross streets and nearby intersections. If possible, measure benefits.
- Coordinate with local stakeholders.

## ADDITIONAL CONSIDERATIONS

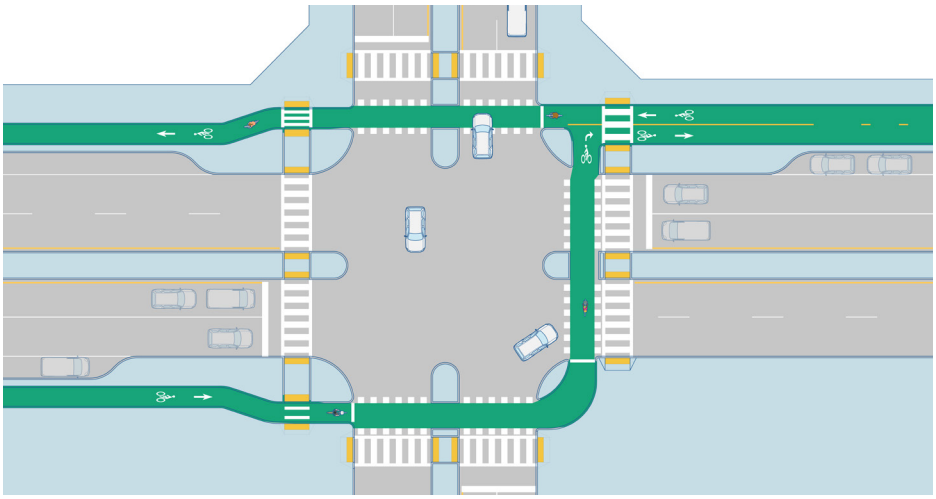
- TSP uses a combination of on-vehicle and wayside technology. Typically automatic vehicle location (AVL), GPS or other communication technology must be included as part of the system.
- Often, implementing TSP requires upgrading technology in the signal controller cabinet, on the vehicle, and at central traffic management systems (operations centers). Cost, flexibility, and long-term plans should be considered.

## RESOURCES

- NACTO Transit Street Design Guide

# IC13: PROTECTED INTERSECTIONS

Protected intersections provide dedicated space for people using the bike lane or Urban Trail to navigate intersections while slowing motor vehicle speeds at conflict points. Protected intersections improve safety for all modes by clearly delineated space for each mode



## USE

- Intersections where a separated Urban Trail meets a high-volume street.
- Intersections that carry a high volume of mixed vehicle traffic (i.e., high motor vehicle and high bicycle volumes).
- Intersections where a separated Urban Trail turns from one street onto another.

## GUIDANCE

- Use curbs, flexposts, bollards, or modular speed bumps to provide a physically separated area at the corners of an intersection. This space provides a queuing area beyond the crosswalk for people using the bike lanes or Urban Trail.
- Install daylighting at intersection approaches to improve visibility at the intersection and create space needed for queuing areas.
- Mark a stop bar for people using the bike lane or Urban Trail to wait at red lights at the edge of the queuing area.
- Implement bike/micromobility crossing markings across all legs of the intersection.
- Sign a No Turn on Red restriction for vehicle lanes parallel to a bike/micromobility crossing.
- Install a dedicated bicycle signal or use a Bikes Use Ped Signal sign (R9-5) to inform people using the bike lane or Urban Trail that they should cross with the pedestrian signal.
- Design vehicle right turns for use at slow speeds and use mountable features to accommodate design vehicles while keeping turning speeds low.

## ADDITIONAL CONSIDERATIONS

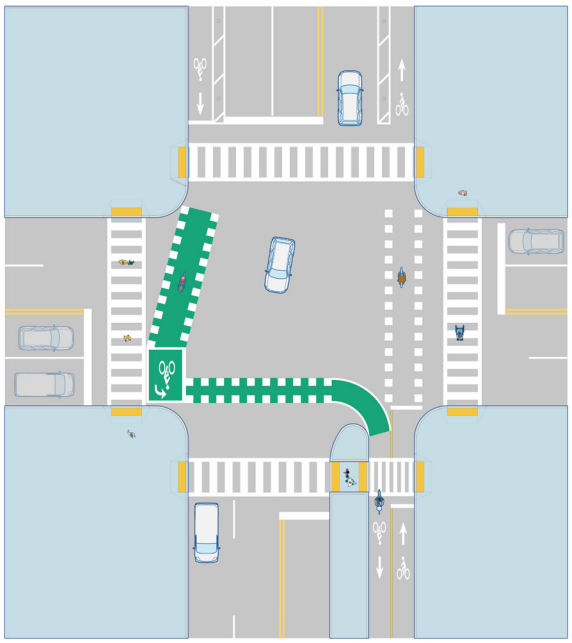
- Consider installing yield markings on the bike lane and Urban Trail in advance of the crosswalk to communicate pedestrian priority.
- Use curbs to delineate protected queuing are for people using bike lanes or Urban Trail.
- Consider pairing pavement markings and signage with dedicated bicycle signalization and phasing at complex intersections.

## RESOURCES

- NACTO Urban Bikeway Design Guide

# IC14: TWO-STAGE TURN BOX

Two-stage turn boxes allow people using the bike lane or Urban Trail to make left turns by crossing straight through an intersection in two phases, avoiding a merge across vehicle travel lanes.



## USE

- Signalized intersections where people riding using the bike lane or Urban Trail are likely to make left turns from the right side of the street.
- As two-stage turn boxes have received Interim Approval by FHWA, a written request must be made to FHWA to gain permission to employ them.

## GUIDANCE

- Locate outside of the vehicle path of travel, between the bike lane or Urban Trail crossing and crosswalk. If necessary, relocate the crosswalk, curb ramps, and vehicle stop bar behind the queue area to maintain an ADA-accessible path.
- Mark an area 4' to 8' wide and 8' to 10' long with green paint surrounded by a white box to designate the space where people using the bike lane or Urban Trail can wait before continuing to their left across the intersection.
- Include a bicycle symbol and left turn arrow inside the box.
- Provide a No Turn on Red restriction for vehicle lanes behind the queue box to prevent vehicles from encroaching in the turn box area.
- If on-street parking is provided, install daylighting at intersection approaches to improve visibility at the intersection.

## ADDITIONAL CONSIDERATIONS

- Expand queuing areas to 10' deep to accommodate people riding cargo bicycles or bicycles towing trailers.
- Consider pairing pavement markings and signage with dedicated bicycle signalization and phasing at complex intersections.

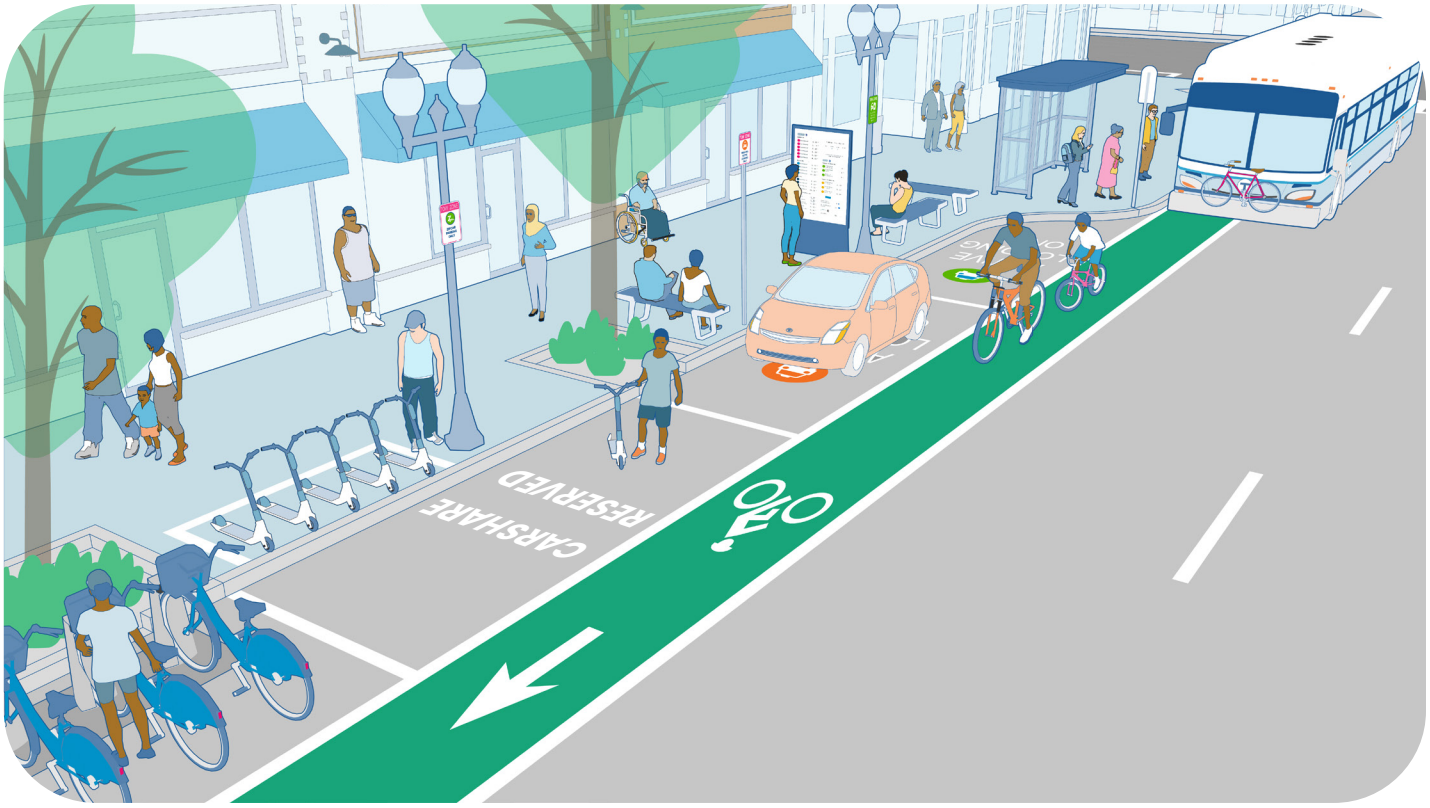
## RESOURCES

- NACTO Urban Bikeway Design Guide

# CURBSIDE MANAGEMENT

# CM1: MICROMOBILITY HUBS

Curbside activities, whether it be micromobility (bicycle or scooter) parking, freight loading/delivery, or ride share pick up and drop off, contribute to the vibrancy of local streets and support the local economy. Because the curbside is a limited resource, management is particularly important in corridors that experience high levels of multimodal activity.




## CURBSIDE MANAGEMENT PRINCIPLES

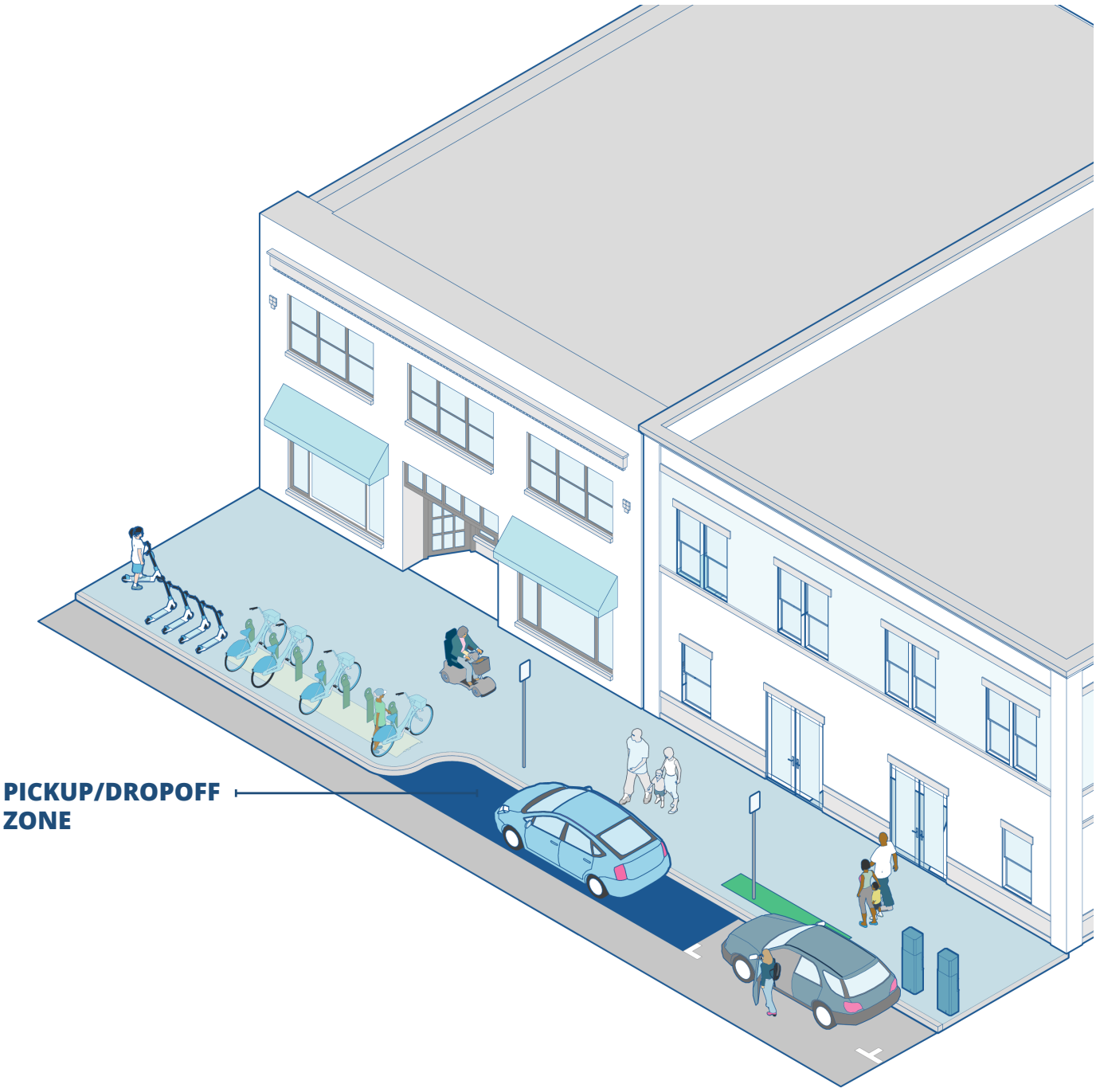
- CONNECTIONS MATTER.
- Safety of all users, whether walking, wheeling, driving, or taking transit, is paramount.
- Simple solutions, including off-street curbside use, should be considered.

## GUIDANCE

- Allowed uses, and limits to use of the curbside should be clearly communicated through signage and design.
- Curbside use should be limited along corridors with dedicated transit/bus only lanes.
- Provide unimpeded access to transit stops.
- Provide dedicated space for vehicles to pick up and drop off passengers.
- During the peak travel period, limit, prohibit, or provide alternative loading/delivery areas for freight.

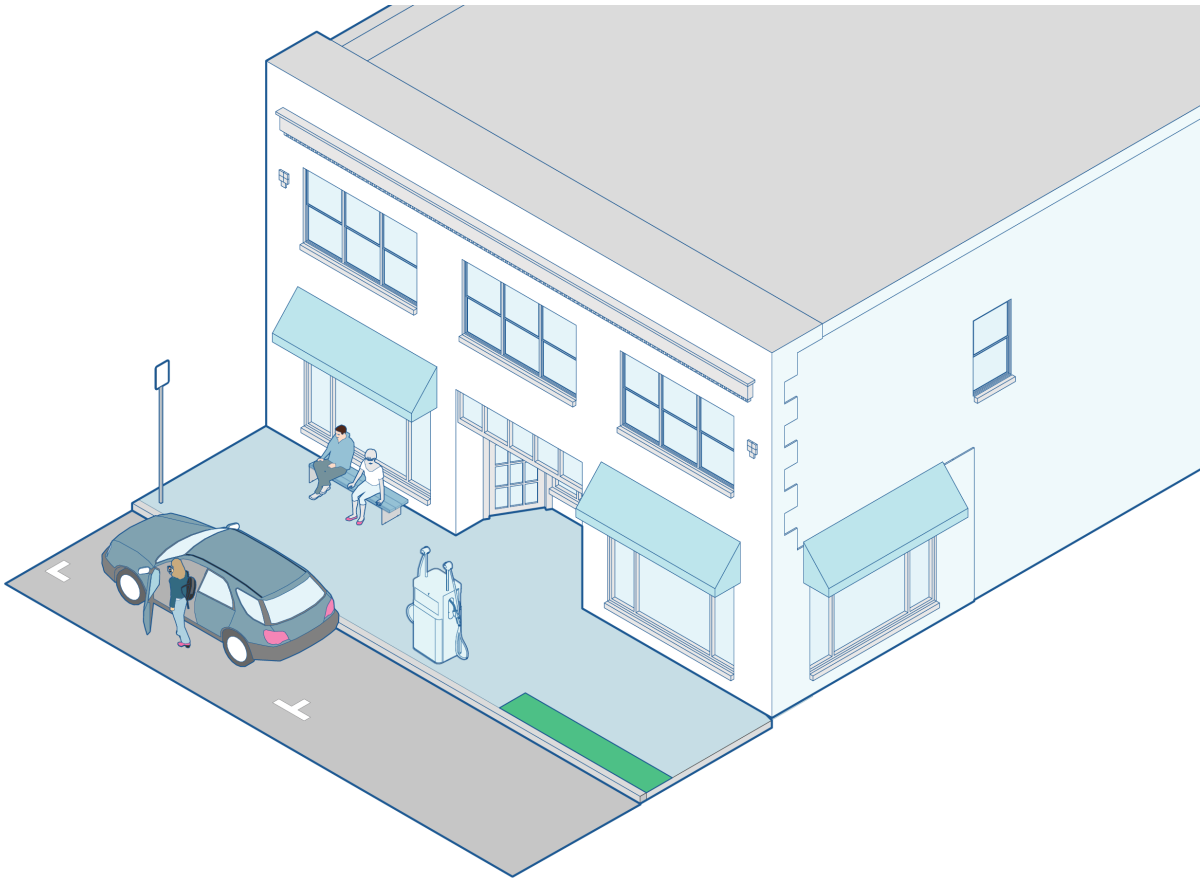
# CM2: SCOOTER AND BICYCLE SHARE PARKING

Bicycle and scooter share parking supports the transit system by providing an affordable and efficient way to make the first- and last-mile connection. Available dedicated parking also deters random and/or inappropriate parking such as leaving a scooter in the middle of a sidewalk or locking a bicycle to a light pole or tree. Placement and design should be consistent with BF2: Bicycle Parking and should be considered as part of an overall approach to curbside management.



# CM3: ELECTRIC VEHICLE CHARGING

With the growth of electric vehicles (EV) as a widespread transportation choice, the incorporation of charging stations is fast becoming a critical element of transportation infrastructure design. Unlike fueling stations for gas-powered vehicles, electric vehicles can be charged almost anywhere. Key elements of site design include accessibility, ease of use, visibility, and safety of users and the public.



## USE

- Curbside adjacent to on-street parking or in parking lots or public garages.

## GUIDANCE

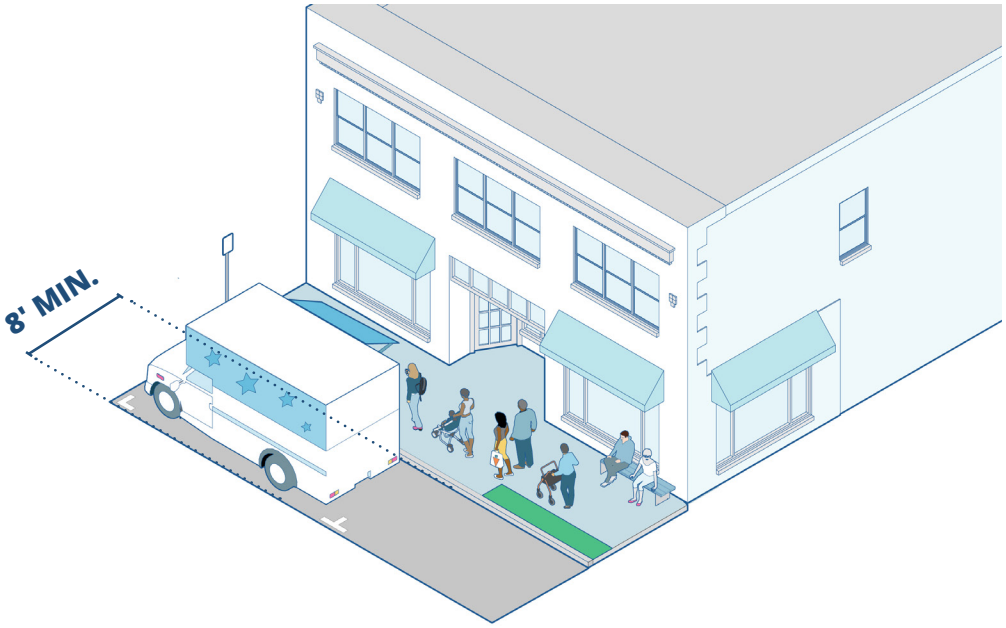
- Cord sets (in use or not in use) should not cross a pedestrian or bicycle pathway and should not encroach into transit vehicle loading zones.

## ADDITIONAL CONSIDERATIONS

- Infrastructure requirements for connecting to the electric grid and receiving payment should be considered.
- Maintenance and servicing requirements and the potential impact to surrounding uses should be considered.
- Desired vehicle orientation (parallel, pull in, angled).

# CM4: FOOD TRUCKS

Food trucks have gained popularity throughout Central Arkansas. Various jurisdictions have passed food truck ordinances and/or require permits or applications that regulate the operation of food trucks by time of day, location, and other factors. Food trucks help to activate street environments, enhance community character and pride, slow surrounding vehicle speeds, and increase walking and biking.




## USE

- In designated areas, on-street parking spaces, and public and private surface parking lots as regulated by local jurisdictional ordinances.

## GUIDANCE

- Locate no less than 15' from any fire hydrant and no less than 5' from any driveway, utility box or vault, curb ramp, or building entrance.
- Require adequate space for food truck operations. Food trucks are large vehicles (i.e., up to 26' long by 8' wide), often requiring more than one on-street parking space.
- Require vendors to have a plan for the queuing of waiting patrons that ensures an accessible route for passing pedestrians.
- Ensure vendors are responsible for collecting and removing food-related trash, leaving the site clean upon departure.

## ADDITIONAL CONSIDERATIONS

- Consider encouraging food trucks to operate in areas that will benefit from activation and increased foot traffic.
- Consider regulating the proximity a food truck may operate relative to brick and mortar restaurants and outdoor dining areas.
- Consider requiring larger daylighting for areas where food trucks may operate, as they are large and often have multiple telescoping appendages such as awnings and signage.

## ADDITIONAL CONSIDERATIONS

- Individual jurisdictional food truck ordinances.

# IMPLEMENTATION

# 04


The CARTS Multimodal Infrastructure Guidelines inform public right of way improvements throughout the region to promote the safe movement of people riding transit, walking, wheeling, bicycling, using other micromobility devices, and driving. Planning, design, and implementation of projects should be flexible to the unique circumstances of each site and the local requirements governing the roadway, whether a master street plan or state regulations.

## INTENDED TO SERVE:

These guidelines are intended to serve as

- **A Tool:** A tool for implementing agencies that wish to provide better multimodal infrastructure within their jurisdictions.
- **An Opportunity:** An opportunity for implementing agencies to apply consistent approaches while avoiding the hassle and expense of developing multimodal infrastructure design guidelines independently.
- **A Resource:** A resource for in-house agency staff, consultants, and private developers to reference when planning and designing a new project.

Incorporation of these guidelines into local master street plans is not required but is strongly encouraged to facilitate a common approach to and design of multimodal infrastructure and a consistent, safe, and predictable experience for transit riders, pedestrians, bicyclists , users of other micromobility options, and drivers throughout the region.

**“GUIDELINES ARE INTENDED TO SERVE AS A TOOL, AN OPPORTUNITY, AND A RESOURCE”**

# MAINTENANCE

05

Maintenance considerations are an important part of both the planning and final design of multimodal infrastructure. Responsibility for maintenance varies depending on the location of the roadway and whether it is owned by ArDOT or it is a local road.

For new construction projects, the following best practices should be employed by the responsible jurisdiction to ensure budgets are adequately funded and staff are prepared to carry out maintenance duties on schedule.

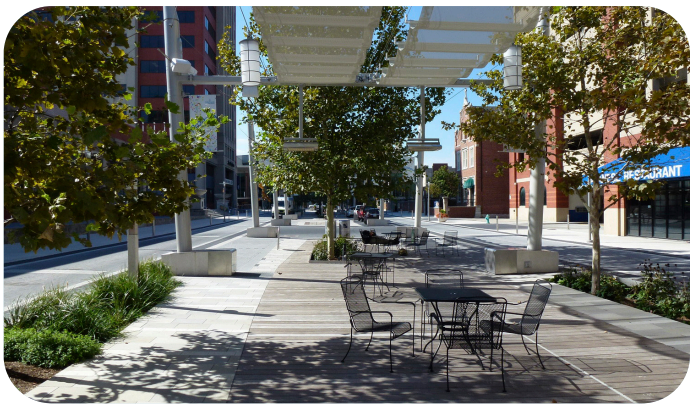
- Identify maintenance requirements during the planning and design phase of a project and coordinate with all entities or departments responsible for input on design and material selection.
- Consider using materials that can be sourced locally, are appropriate for all seasons, facilitate drainage, and are generally low maintenance, including native, drought-resistant landscaping where applicable.
- Clearly identify the "useful life" of a facility so that replacement costs can be included in local capital plans.

## BUS STOPS AND TRANSIT AMENITIES

Waiting for the bus should be a safe, comfortable, predictable experience. Bus stop conditions effect ridership, accessibility, and ease of use of the system. Regular maintenance is important to reduce risk and liability and maintain customer access and satisfaction. To manage costs and staff time, bus stops and associated amenities should be designed to minimize these factors.

- Regular, seasonal, and as-needed maintenance agreements should be established between Rock Region METRO and property owners or local jurisdictions to ensure that bus stops are functioning as designed, clear of clutter, accessible, and attractive.
- Rock Region METRO should regularly inspect bus stops and maintain an annual inventory of all assets, their condition, replacement schedule, and complaints.
- At floating bus stops, inspection and debris removal should also include the bikeway. These channelized bikeways can collect debris, posing a safety risk for both bicyclists and transit passengers crossing through the bikeway to access the stop or sidewalk.

## STREET FURNITURE & ART



Street furniture is a collective term for objects, amenities, and equipment serving various purposes in the right of way. These may include benches, kiosks, recycling and trash receptacles, fire hydrants, transit shelters, streetlights, and bollards, among other things. Material and durability are essential considerations to ensure low-maintenance requirements and reasonable maintenance costs.

**Streetscape Elements:**

- Coordination among Rock Region METRO and the street owner is necessary prior to installation of transit amenities, as well as during any maintenance activities.
- High quality, low-maintenance, weather-resident materials should be selected when possible.
- Context-appropriate materials and designs should be selected in historic areas or other locations where public infrastructure contributes to the overall branding or identity of a place. The difference in cost can be addressed in maintenance agreements.

- Warranties and the ability to fabricate items in-house should be considered when selecting materials or designs.
- Elements should be installed properly to prevent unnecessary maintenance and to maintain the terms of any applicable warranties.

**Maintenance of Public Art Installations:**

- Artists should be consulted for appropriate maintenance procedures.
- Consider allotting 10% of the project cost to maintenance.

**Propritization:**

- Prioritize placement of street furniture and art in places with high levels of pedestrian activity. See Chapter 3 for prioritization of transit amenities.

# SEASONAL MAINTENANCE

Central Arkansas experiences the best, and occasionally the worst, of all seasons. Maintenance plans and programs should consider timing, access, and equipment needs for all facilities. Considerations should include:

- Regular removal of sand, soil, and debris from bus stops, pathways, and bike facilities.
- Regular monitoring of infrastructure to ensure off-schedule maintenance needs can be handled in a timely manner.
- Use of buffers and landscape areas for snow storage , not bus lanes, sidewalks, or bike lanes.
- Establishing a list and map of priority transit routes and multimodal facilities where access is most crucial before and after severe weather events.
- Agreements among local governments to access and share equipment, especially specialized equipment for narrower travelways like separated bike lanes and multi-use paths.

# ACCESS DURING CONSTRUCTION

Whether it is to build a new facility or maintain anexisting one, construction can create safety and access issues for all street users. Transit riders, pedestrians, people with disabilities, and bicyclists are particularly vulnerable to injury or inconvenience due to changing conditions and the time it takes to complete a detour.

**Communication:**

- Users should be informed of the project well-ahead of the start of construction activities so that they have time to consider alternatives.
- Communication can take the form of signage in and around the impending construction project, fliers and signage on transit vehicles that serve the area, regular posts on social media, mailers to local residences, postings on community boards (such as in coffee shops, social service agencies, and at group mailboxes), and news bulletins to local TV and radio stations.
- Information should include a description of the project, the project's start date and duration, proposed detours, alternative bus stop locations, and where to find additional information or ask questions.

**Access:**

- ADA-compliant accessibility should be maintained throughout all construction zones.
- Drainage should be properly maintained by the contractor throughout the project.
- All ramps and slopes within the construction zone along public pedestrian pathways should meet ADA guidelines.
- Boarding and alighting areas at temporary bus stops should meet ADA guidelines.
- Temporary access signage should meet MUTCD requirements, see especially Chapter 6D. Pedestrian and Worker Safety.

METROPLAN

SMART PLANNING MAKES SMART PLACES.