PVD GREAT STREETS

Appendix E: Implementation Guide

At the same time as the development of the Great Streets Plan, the City worked with Toole Design Group to develop a guide that would be used for the implementation of the plan, specifying how roadway elements should be standardized, and how those standards should be applied on different typologies of streets (e.g. residential vs. downtown vs. neighborhood commercial corridor).

MAYOR JORGE O. ELORZA
CITY OF PROVIDENCE

https://www.providenceri.gov/planning/great-streets/

PROVIDENCE GREAT STREETS IMPLEMENTATION GUIDE

ACKNOWLEDGEMENTS

JORGE O. ELORZA, MAYOR

Thank you to many City of Providence staff members who contributed their time, input, and expertise to the creation of the Providence Great Streets Implementation Guide:

- Nicole Pollock, Chief of Staff
- Sabrina Solares-Hand, Director of Operations
- Bonnie Nickerson, AICP, Director of Planning and Development
- Martina Haggerty, Director of Special Projects
- Alex Ellis, Principal Planner
- Antonio Morabito, Director of Public Works
- Nate Urso, Traffic Engineer
- Craig Hochman, Deputy Chief Engineer
- Leo Perrotta, Parking Administrator
- Doug Still, City Forester
- Ellen Cynar, Director of Healthy Communities
- Leah Bamberger, Director of Sustainability
- Gina Rodriguez-Drix, Cultural Affairs Manager

Prepared by: Toole Design Group

CONTENTS

PROVIDENCE GREAT STREETS IMPLEMENTATION GUIDE

01 INTRODUCTION

As our largest public asset, covering over 13% of Providence's total land area (over 1,500 acres), our streets play a central role in shaping our neighborhoods. Our streets impact the way we live, work, play, and move around our city. They embody our character and culture. They connect us to each other, to our schools and jobs, and to our social lives. Our streets are also vital to creating inclusive and thriving neighborhoods where all residents and visitors of Providence are welcome and supported.

The Providence Great Streets Initiative is based on one guiding principle: Every street in Providence should be safe, clean, healthy, inclusive, and vibrant. Put simply, every street in Providence should be great. This Implementation Guide (the "Guide") is a tool for creating, enhancing, and maintaining great streets throughout all of Providence.

As one of the oldest cities in the country, Providence's streets reflect the compact, irregular building patterns that characterize the City's organic growth. This history and urban form are part of what gives our neighborhoods their unique character and sense of place. People, however, are the key ingredient to great streets. With those who live in, work in, and visit Providence in mind, the Providence Great Streets Initiative sets out to achieve four goals:

Our streets will be safe. We will design streets that are safe for people of all ages, physical abilities, and modes of transportation.

Our streets will be clean, green, healthy, and sustainable. We will build a resilient city that champions proper maintenance, environmental stewardship, water management, energy conservation, and green infrastructure.

Our streets will be inclusive and welcoming. We will integrate social, racial, and income equity into the design and function of our streets as envisioned by community members. By design, our streets will prioritize people, celebrate the diversity and culture of our neighborhoods, and ensure access for people with disabilities.

Our streets will be vibrant. We will incorporate thriving public places and amenities into our streets that strengthen land use, foster healthy economic growth, support small businesses, and activate our streets. Our streets will be dynamic, enjoyable places for all people in all neighborhoods.

The Guide was developed by incorporating City standards, research, industry best practices, and community input. Building an urban environment that is safe, clean, healthy, inclusive, and vibrant requires careful consideration of the needs of a wide range of users and contexts. It requires thinking critically about what exists today, and what we want to exist in the future. The goal of this Guide is to help practitioners and residents plan and design great streets that reach every neighborhood, support all types of mobility, and reinforce a wide range of land uses.

ACHIEVING THE PROVIDENCE GREAT STREETS VISION

Our City's planners, engineers, architects, developers, businesses, property owners, and residents all have a role to play in realizing this vision. Whether a street is scheduled for routine maintenance or is part of a major reconstruction project, Great Streets design principles must be woven into the process. This Guide is the starting point for leveraging each and every one of those opportunities.

In addition to investments in streets throughout the City, a signature feature of the Providence Great Streets Initiative is a commitment to building a connected network of Urban Trails. The **Urban Trail Network** will connect every Providence neighborhood with high-quality paths for people walking, riding bicycles, and using other micromobility modes like scooters and skateboards. There are several defining design features of the Urban Trail Network, which are also explored in detail in this Guide.

URBAN TRAIL NETWORK DESIGN PRINCIPLES

- Urban Trails connect people to every neighborhood and key destinations.
- Urban Trails prioritize high-comfort paths for people using micromobility modes.
- Urban Trails provide continuous, legible routes and minimize detours.
- Urban Trails are easily recognizable with a strong visual identity.

THIS CITYWIDE ENDEAVOR WILL PREPARE US FOR A FUTURE THAT IS SAFER, GREENER, HEALTHIER, INCLUSIVE, AND MORE VIBRANT. THE INITIATIVE SUPPORTS CITY GOALS:

- **Eliminating serious injuries and deaths of vulnerable road users.**
- **Reducing household transportation costs to make Providence more affordable.**
- **Helping all Providence residents to live healthy lives.**
- **Improving access to diverse cultural and civic assets.**
- **Helping Providence become carbon neutral by 2050.**
- **Increasing the reach of people served by our investments.**

PURPOSE OF THE GUIDE

The purpose of the Guide is to describe and illustrate design guidelines for future investments in our streets. As part of the Great Streets Initiative, a master plan was developed. The Great Streets Master Plan establishes a citywide vision for great streets and Urban Trails, initial concepts, and priorities for implementation. This Guide is a practitioner's tool that will help bring the master plan to life, in addition to providing design guidance and standards for future projects yet to be identified.

The Implementation Guide provides specific information, guidelines, and direction related to design and construction of the City's streets, in addition to specific guidance for Providence's signature Urban Trail Network. Locations for additional references are also provided, where appropriate.

This Guide should be implemented with engineering judgement. The Guide integrates design flexibility to achieve outcomes that improve the public realm to support all modes of transportation while meeting requirements mandated by local, state, and federal authorities. The Guide presents minimum, maximum, and recommended design criteria that vary by context. This Guide does not include construction-ready design standards and details.

This Guide provides design standards and references to best practices to ensure consistency and quality as the network develops over time. The information provided is compatible with the inherent flexibility provided in Federal Highway Administration (FHWA), American Association of State Highway Transportation Officials (AASHTO), Manual on Uniform Traffic Control Devices (MUTCD), Rhode Island Department of Transportation (RIDOT), and Rhode Island Public Transit Authority (RIPTA) design guidance.

USING THE GUIDE

The Implementation Guide is comprised of three integrated chapters, described in the sections below.

CHAPTER 2: CONTEXT TYPES

This chapter provides a concise manual for designing great streets and Urban Trails in seven typical contexts throughout Providence. Taken together, the chapter provides a comprehensive review of designing safe, green, healthy, inclusive, and vibrant streets throughout all of Providence. For each context type, this chapter provides a practitioner's companion for carrying out the principles of the Great Streets Initiative on specific projects based on surrounding land uses, transportation patterns, and other characteristics.

For each of the seven context types, Chapter 2 provides illustrated decision-making guidancefor the public right-of-way, and direction on use of general design features as well as design features for streets designated as part of the Urban Trail Network.

Chapter 2 provides guidance for the following seven typical context types in Providence:

Neighborhood Street: Low-speed, low-volume residential streets that make up the majority of Providence's streets.

Neighborhood Connector Street: Residential streets with intermittent commercial uses that connect Providence's dense residential areas to commercial areas.

Neighborhood Main Street: Streets that are the civic, commercial, and cultural activity centers of a neighborhood.

Major Downtown Street: Larger, high-activity streets in the Downtown core of Providence.

Minor Downtown Street: Small, often one-way streets in the Downtown core of Providence.

Industrial Street: Streets that primarily serve industrial land uses.

Off-Street Connection: Spaces along or within parks or other passive areas that serve both as travelways and recreational spaces.

CHAPTER 3: DETAIL DICTIONARY

The Detail Dictionary is a companion section to the context types found in Chapter 2. The Detail Dictionary provides details and specifications on design elements that are found throughout Providence, regardless of context. Each element in the Design Dictionary corresponds to a color-coded and categorized identification icon that is referenced throughout the Chapter 2. As practitioners use the context type guidance found in Chapter 2, reference should be made to the details called out and provided in the Detail Dictionary to ensure consistent use of methods and materials across Providence. The elements of the Detail Dictionary are coded and organized into the following categories:

SA: Safety and Accessibility

GI: Green Infrastructure

CA: Curbside Amenities

S: Signage

CHAPTER 4: MAINTENANCE

Chapter 4 provides general guidance on maintenance for various elements discussed throughout the Guide. Maintenance considerations are an important part of the final design of each project. Chapter 4 explores methods and maintenance standards for seasonal maintenance, as well as construction access and temporary paths of travel.

GREAT STREETS BEGIN WITH INCLUSIVE PUBLIC ENGAGEMENT

The guidance within this document cannot be applied without understanding the needs of individuals and their communities. People with daily, first-hand experience interacting with the streets in their communities should be consulted for their expert understanding of what primary challenges they face on their streets and what design solutions will most effectively meet their needs.

The Great Streets PVD Initiative began with community workshops across the City, and this small-scale engagement should continue as discrete projects take shape. As practitioners use this toolkit to create great streets and Urban Trails, community members should be engaged as design partners. All designs should build on their knowledge of their community and respond to their lived experiences.

DEFINITIONS

» Street

Travelways for people walking, running, biking, scootering, skateboarding, rollerblading, driving, or using other micromobility options. The street includes public realm spaces adjacent to roadways such as sidewalks, paths, plazas, green spaces, other gathering spaces.

» Urban Trail

An on or off-street path (or paths) of travel that is safe, comfortable, and easily accessible for people walking, running, biking, scootering, skateboarding, rollerblading, or using other micromobility options.

» Micromobility Modes

Small and adaptable transportation options or technologies that enable efficient transportation. Micromobility options currently include people walking, running, riding bicycles and e-bikes, skateboarding, rollerblading, and riding scooters and e-scooters; however, new micromobility technologies are evolving every day.

THE ROLE OF DESIGN STANDARDS IN PROVIDENCE

The design standards within this Guide are intended to contribute to a unified user experience citywide. Consistent designs, construction practices, and materials contribute to a legible and readily navigable public realm that will appeal to Providence residents and visitors alike. The Guide will also help ensure that new investments comply with current applicable standards and agreed-upon best practices for the City of Providence. Adherence to regulatory standards will ensure that investments qualify for State and Federal funding sources. Finally, standard methods and materials help create efficient and simple maintenance procedures for the many departments and agencies that work within the public realm in Providence.

Several other sources for standards and guidance are referenced throughout the Guide. These standards should be used in decision making where appropriate during the design phase.

NOTE ON THE USE OF THE WORD SHOULD

“Should” statements in this Guide denote the official policy or approach of the City of Providence. Exceptions to “Should” statements will be documented and reviewed on a case-by-case basis.

FEDERAL, STATE, AND LOCAL STANDARDS AND GUIDELINES

- MUTCD: The Federal Highway Administration’s Manual on Uniform Traffic Control Devices (MUTCD)
- AASHTO: American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities, and AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities
- NACTO: The National Association of City Transportation Officials’ (NACTO) Urban Bikeway Design Guide
- NACTO Urban Street Design Guide ADA: Americans with Disabilities Act (ADA) The United States Access Board’s proposed Public Rights-of-Way Accessibility Guidelines (PROWAG) and the 2010 ADA Standards for Accessible Design
- RIDOT: The Rhode Island Department of Transportation (RIDOT) Complete Streets Action Plan, Standard Specifications, Linear Stormwater Manual.
- RIPTA: Bus Stop Design Guidelines
- State of RI General Law Chapter 31-19 Operation of Bicycles
- City Standards: City of Providence Zoning Ordinance, Complete Streets Resolution, Traffic Calming Design Guidelines

02 CONTEXT TYPES

This section provides guidance for implementing Great Streets in seven typical contexts found throughout Providence. Though the City of Providence's vision is that all streets will be **safe**, **clean**, **healthy**, **inclusive**, and **vibrant**, the design strategies used to achieve those goals will differ from place to place based on land use, available right-of-way, and community needs.

Seven context types are outlined in this chapter: Neighborhood Streets, Neighborhood Connector Streets, Neighborhood Main Streets, Major Downtown Streets, Minor Downtown Streets, Industrial Streets, and Off-Street Connections. For each context type, this chapter highlights design treatments that will help the City meet each of the core principles of the Providence Great Streets Initiative (safe, clean, healthy, inclusive, and vibrant).

As practitioners use the design strategies provided for each context type, engineering judgement will be critical to design for those unique and challenging scenarios that fall outside of the seven context types identified in this chapter.

Additionally, Providence's signature **Urban Trail Network** will require careful consideration of the surrounding context to ensure the trail has a consistent design, is well connected, and is appealing to people of all ages, abilities, and backgrounds. For each context type, guidance is provided to help implement the Urban Trail network with solutions that address specific challenges or needs.

Practitioners should refer to Chapter 3 (Detail Dictionary) for detail and specification on the appropriate uses, requirements, and additional considerations of the various elements referenced throughout this chapter.

- **Neighborhood Streets**

  Low-speed, low-volume residential streets.

- **Neighborhood Connector Streets**

  Streets that connect Providence's residential and commercial areas.

- **Neighborhood Main Streets**

  Streets that are the civic, commercial, and cultural activity centers of a neighborhood.

- **Major Downtown Streets**

  Larger, high-activity streets in the Downtown core of Providence.

- **Minor Downtown Streets**

  Small, often one-way streets in the Downtown core of Providence.

- **Industrial Streets**

  Streets that primarily serve industrial land uses.

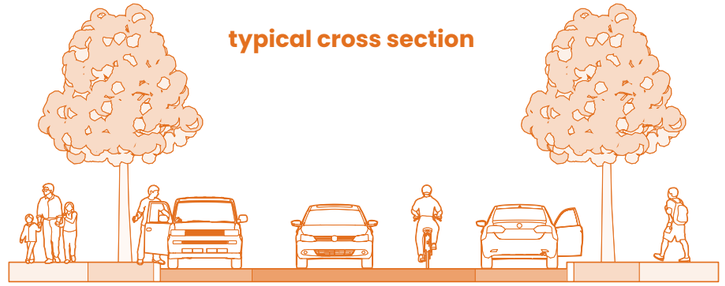
- **Off-Street Connections**

  Off-street spces that serve both as travelways and recreational spaces.

NEIGHBORHOOD STREET

Neighborhood Streets make up the dense residential fabric of Providence's neighborhoods. They are narrow, slow, and typically tree-lined. Neighborhood Streets are places where children play, neighbors relax, and daily activities of life happen. These streets vary in width, but typically range from 17' to 34' wide from curb to curb.

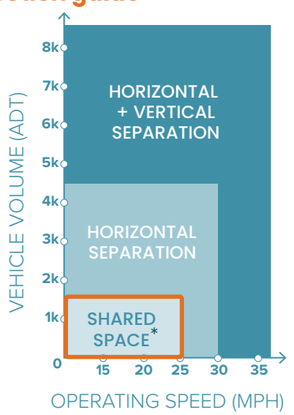
typical cross section



	sidewalk[1]	buffer	parallel parking	1 travel lane	2 travel lanes[2]	parking	buffer	sidewalk[1]
rec	6'	5'	7'	9'	16'	7'	5'	6'
min	4'	0'	7'	9'	16'	7'	0'	4'
max	-	-	8'	10'	18'	8'	-	-

[1] When using minimum widths, a 4' clear path should be preserved that is free of utility poles or other obstructions.
[2] Where two-way access and on-street parking is provided, the combined space for both travel lanes may be as narrow as 12' if parking utilization is low and/or if curbside space is designated for vehicles to yield to oncoming vehicle traffic.

facility selection guide

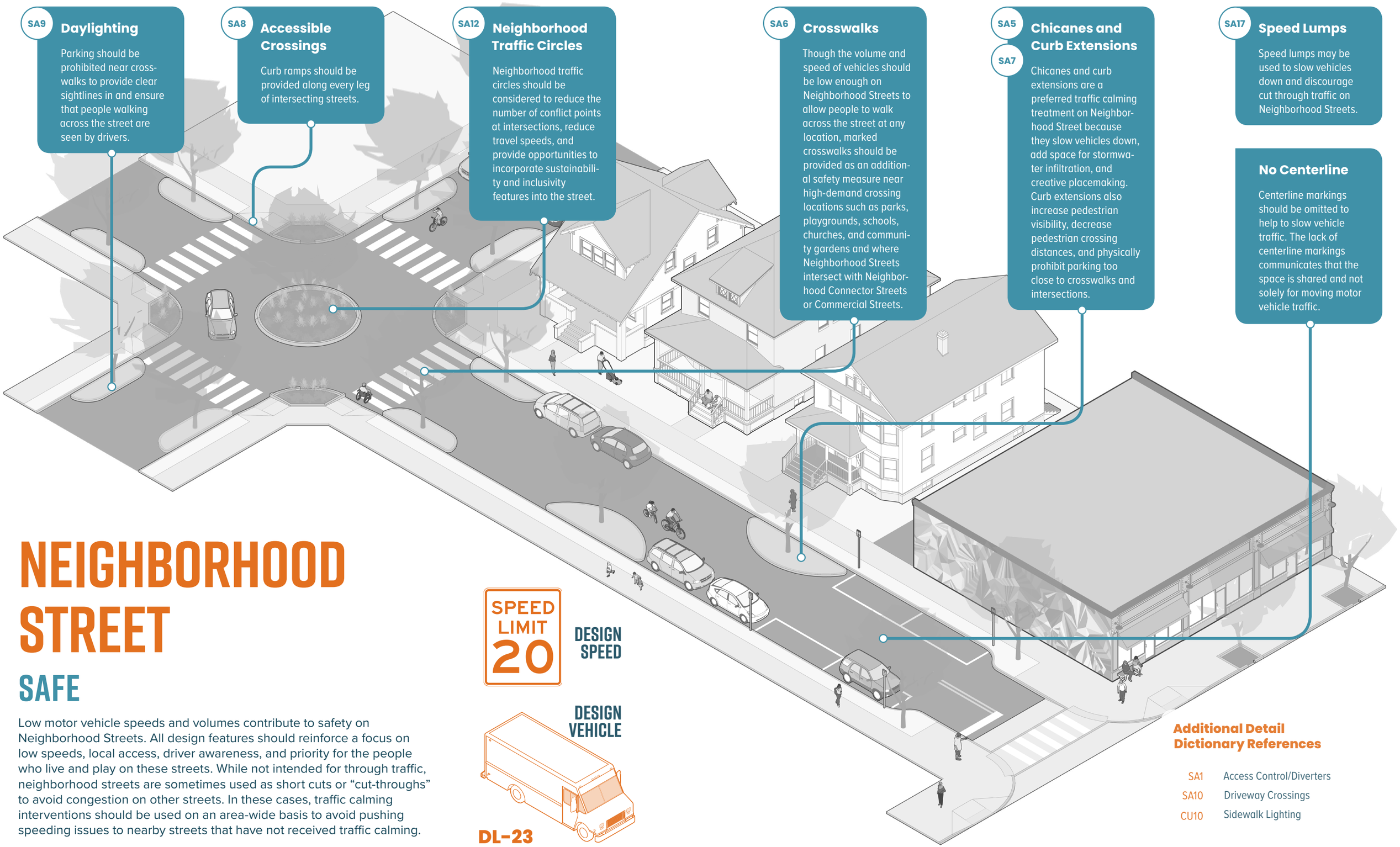


NEIGHBORHOOD STREET

*vehicle volumes up to 3,000 may be acceptable in limited circumstances

example streets

- Lowell Avenue
- Sinclair Avenue
- Sharon Street
- Indiana Avenue
- Arnold Street



SA9 Daylighting

Parking should be prohibited near crosswalks to provide clear sightlines in and ensure that people walking across the street are seen by drivers.

SA8 Accessible Crossings

Curb ramps should be provided along every leg of intersecting streets.

SA12 Neighborhood Traffic Circles

Neighborhood traffic circles should be considered to reduce the number of conflict points at intersections, reduce travel speeds, and provide opportunities to incorporate sustainability and inclusivity features into the street.

SA6 Crosswalks

Though the volume and speed of vehicles should be low enough on Neighborhood Streets to allow people to walk across the street at any location, marked crosswalks should be provided as an additional safety measure near high-demand crossing locations such as parks, playgrounds, schools, churches, and community gardens and where Neighborhood Streets intersect with Neighborhood Connector Streets or Commercial Streets.

SA5 SA7 Chicanes and Curb Extensions

Chicanes and curb extensions are a preferred traffic calming treatment on Neighborhood Street because they slow vehicles down, add space for stormwater infiltration, and creative placemaking. Curb extensions also increase pedestrian visibility, decrease pedestrian crossing distances, and physically prohibit parking too close to crosswalks and intersections.

SA17 Speed Lumps

Speed lumps may be used to slow vehicles down and discourage cut through traffic on Neighborhood Streets.

No Centerline

Centerline markings should be omitted to help to slow vehicle traffic. The lack of centerline markings communicates that the space is shared and not solely for moving motor vehicle traffic.

NEIGHBORHOOD STREET

SAFE

Low motor vehicle speeds and volumes contribute to safety on Neighborhood Streets. All design features should reinforce a focus on low speeds, local access, driver awareness, and priority for the people who live and play on these streets. While not intended for through traffic, neighborhood streets are sometimes used as short cuts or “cut-throughs” to avoid congestion on other streets. In these cases, traffic calming interventions should be used on an area-wide basis to avoid pushing speeding issues to nearby streets that have not received traffic calming.

DESIGN SPEED

DESIGN VEHICLE

DL-23

Additional Detail Dictionary References

SA1	Access Control/Diverters
SA10	Driveway Crossings
CU10	Sidewalk Lighting

NEIGHBORHOOD STREET

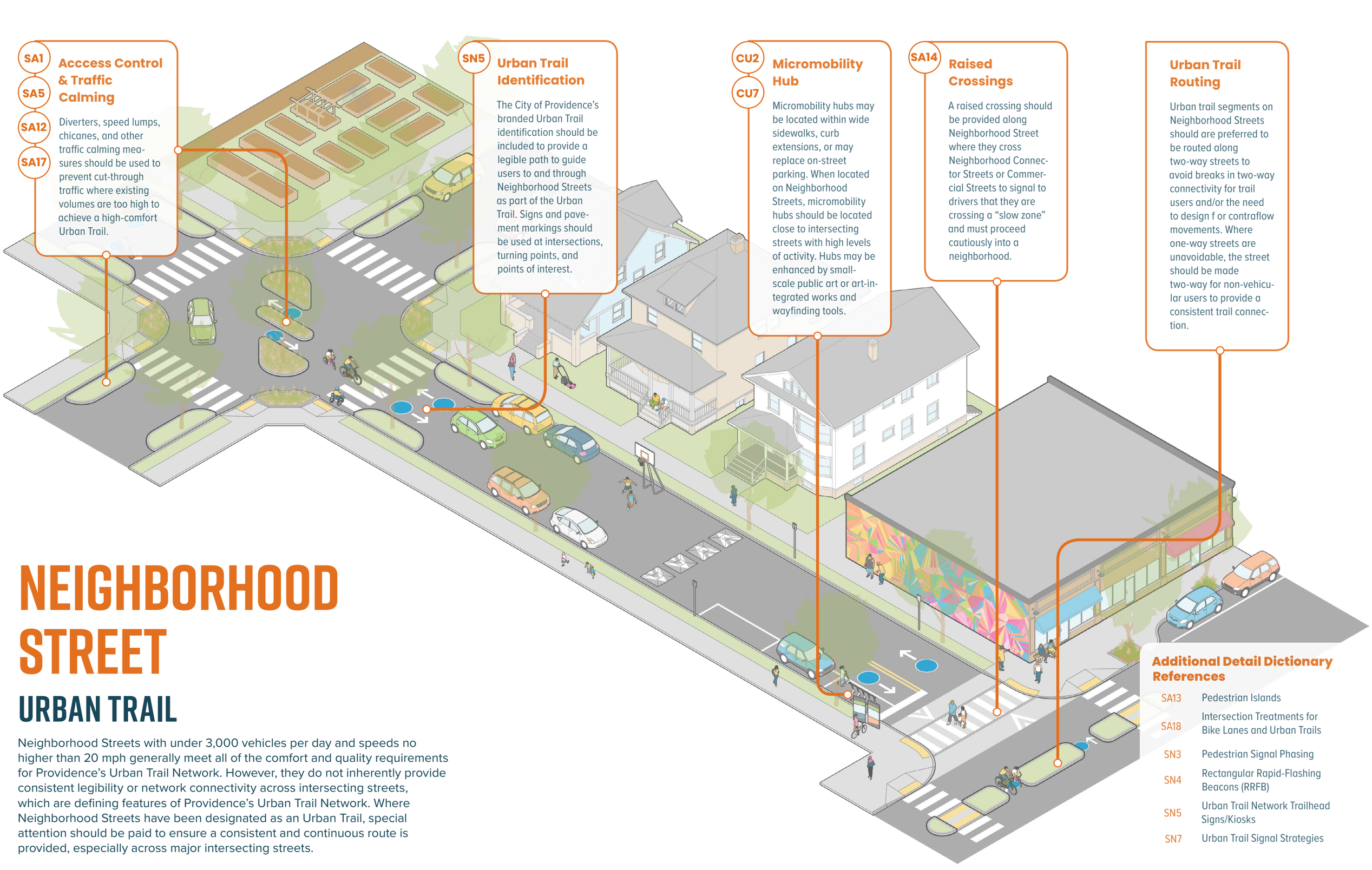
CLEAN & HEALTHY

With few competing priorities for curbside use on Neighborhood Streets, green infrastructure elements should be maximized wherever possible. Based on the residential nature of Neighborhood Streets, green elements should focus on controlling stormwater, mitigating urban heat island effects, providing shade and canopy to reduce building energy needs for cooling, providing wildlife habitat, and instilling public pride throughout the neighborhood.

NEIGHBORHOOD STREET

INCLUSIVE & VIBRANT

Neighborhood Streets encourage people to sit outside on their porches and stoops to converse with neighbors and observe the street. The design should encourage children to play and provide comfortable places to travel with family, friends, and pets on the way to parks, shops, and other local destinations.



NEIGHBORHOOD STREET

URBAN TRAIL

Neighborhood Streets with under 3,000 vehicles per day and speeds no higher than 20 mph generally meet all of the comfort and quality requirements for Providence's Urban Trail Network. However, they do not inherently provide consistent legibility or network connectivity across intersecting streets, which are defining features of Providence's Urban Trail Network. Where Neighborhood Streets have been designated as an Urban Trail, special attention should be paid to ensure a consistent and continuous route is provided, especially across major intersecting streets.

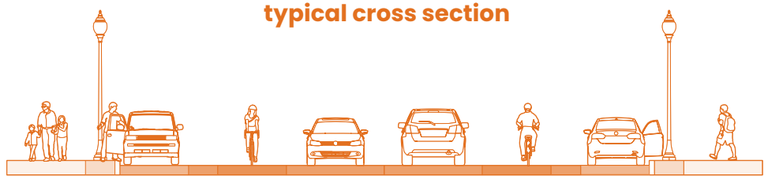
Additional Detail Dictionary References

SA13	Pedestrian Islands
SA18	Intersection Treatments for Bike Lanes and Urban Trails
SN3	Pedestrian Signal Phasing
SN4	Rectangular Rapid-Flashing Beacons (RRFB)
SN5	Urban Trail Network Trailhead Signs/Kiosks
SN7	Urban Trail Signal Strategies

NEIGHBORHOOD CONNECTOR STREET

Neighborhood Connector Streets typically connect residential areas to neighborhood activity centers or commercial hubs. Though largely residential, Neighborhood Connector Streets are occasionally punctuated with intermittent corner stores, laundromats, schools, and other small-scale commercial or civic uses. Neighborhood Connector Streets range in width, but are typically 34’ to 46’ wide from curb to curb.

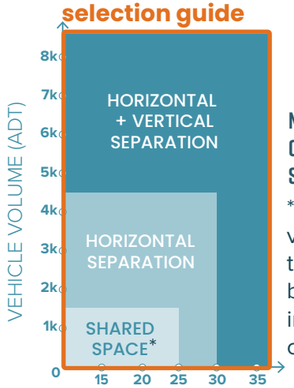
typical cross section



	sidewalk[1]	landscape buffer[2]	parallel parking[5]	bike lane & painted buffer[3]	travel lane[4]	travel lane**** travel lane[4]	bike lane & painted buffer[3]	parallel parking[5]	landscape buffer[2]	sidewalk[1]
rec	8'	3'	8'	10'	10'	10’	10'	8'	3'	8'
min	4'	0'	7'	5'	10’	10’	5'	7'	0'	4'
max	-	-	8’	-	11’	11’	-	8’	-	-

[1] When using minimum widths, a 4’ clear path should be preserved that is free of utility poles or other obstructions.
[2] When the project is located within a stormwater priority area, space for stormwater infiltration should be maximized, where appropriate.
[3] Where available space for the bike lane exceeds 8’, vertical separation should be used. Where available space for the bike lane exceeds 6’, provide a painted buffer between parked cars and the bike lane where there is parallel parking, or between travel lanes and the bike lane where no parallel parking is located. In some cases where total bike lane space is 10-14’ for both directions, both directions of bike traffic should be consolidated on one side of the street in a bidirectional facility.
[4] 11’ travel lanes are preferable on bus routes.
[5] Parking lanes may not be feasible or needed on both sides of the street

facility selection guide

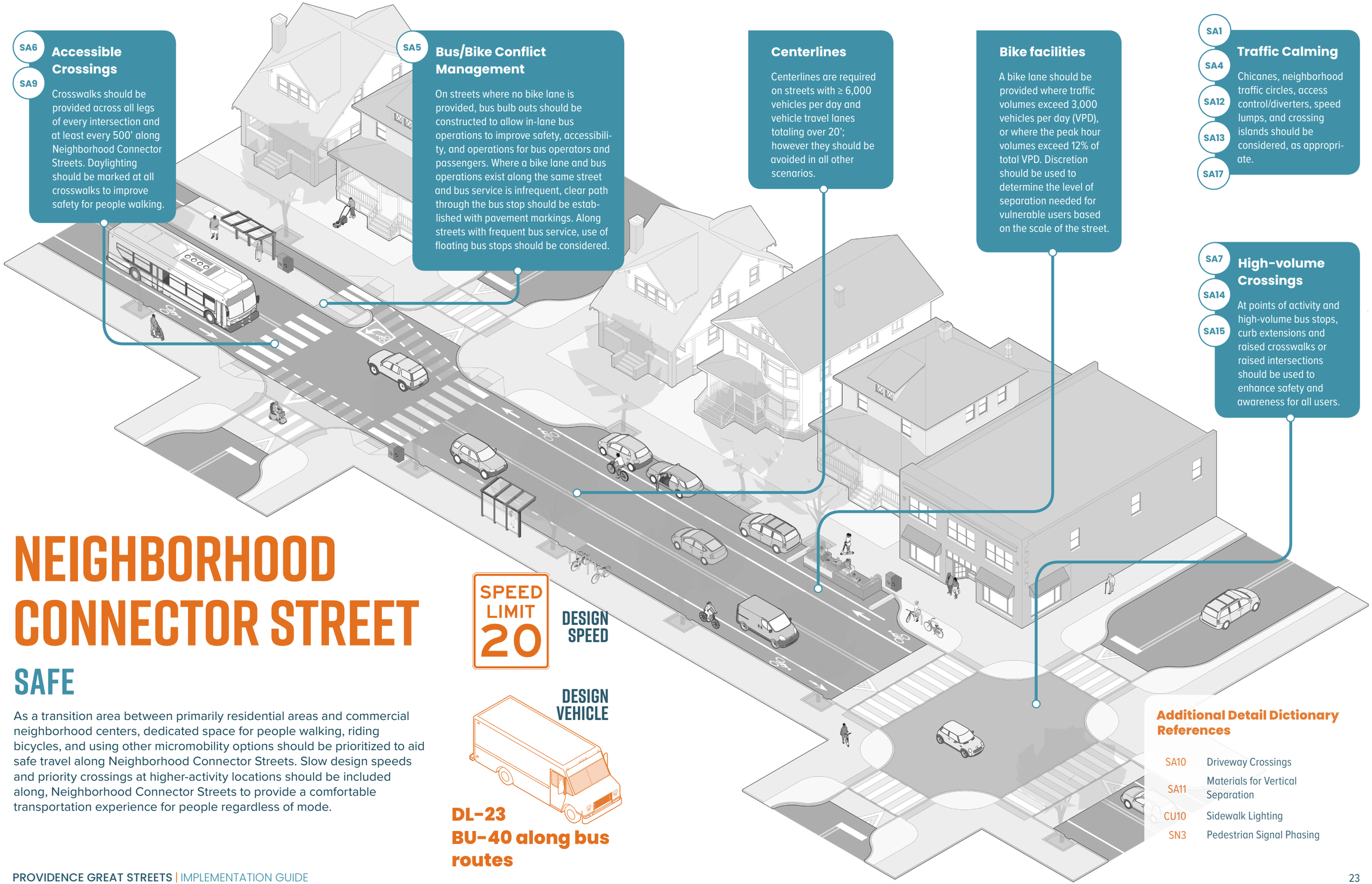


NEIGHBORHOOD CONNECTOR STREET

*vehicle volumes up to 3,000 may be acceptable in limited circumstances

example streets

- Candace Street
- Knight Street
- Webster Avenue
- Public Street
- Olney Street



SA6 **SA9**

Accessible Crossings

Crosswalks should be provided across all legs of every intersection and at least every 500' along Neighborhood Connector Streets. Daylighting should be marked at all crosswalks to improve safety for people walking.

SA5

Bus/Bike Conflict Management

On streets where no bike lane is provided, bus bulb outs should be constructed to allow in-lane bus operations to improve safety, accessibility, and operations for bus operators and passengers. Where a bike lane and bus operations exist along the same street and bus service is infrequent, clear path through the bus stop should be established with pavement markings. Along streets with frequent bus service, use of floating bus stops should be considered.

Centerlines

Centerlines are required on streets with ≥ 6,000 vehicles per day and vehicle travel lanes totaling over 20'; however they should be avoided in all other scenarios.

Bike facilities

A bike lane should be provided where traffic volumes exceed 3,000 vehicles per day (VPD), or where the peak hour volumes exceed 12% of total VPD. Discretion should be used to determine the level of separation needed for vulnerable users based on the scale of the street.

SA1 **SA4** **SA12** **SA13** **SA17**

Traffic Calming

Chicanes, neighborhood traffic circles, access control/diverters, speed lumps, and crossing islands should be considered, as appropriate.

SA7 **SA14** **SA15**

High-volume Crossings

At points of activity and high-volume bus stops, curb extensions and raised crosswalks or raised intersections should be used to enhance safety and awareness for all users.

NEIGHBORHOOD CONNECTOR STREET

SAFE

As a transition area between primarily residential areas and commercial neighborhood centers, dedicated space for people walking, riding bicycles, and using other micromobility options should be prioritized to aid safe travel along Neighborhood Connector Streets. Slow design speeds and priority crossings at higher-activity locations should be included along, Neighborhood Connector Streets to provide a comfortable transportation experience for people regardless of mode.

SPEED LIMIT 20

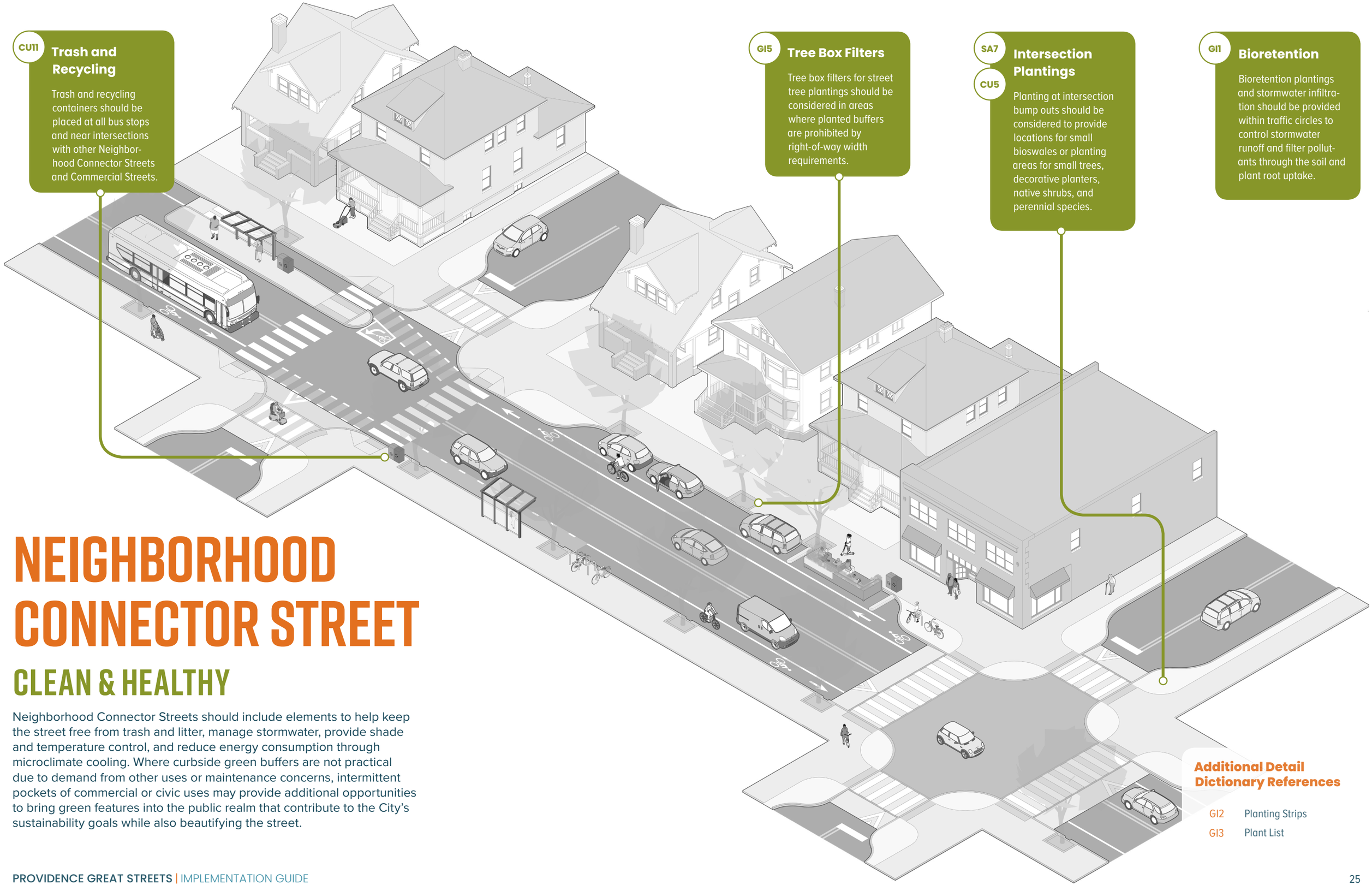
DESIGN SPEED

DESIGN VEHICLE

DL-23
BU-40 along bus routes

Additional Detail Dictionary References

SA10	Driveway Crossings
SA11	Materials for Vertical Separation
CU10	Sidewalk Lighting
SN3	Pedestrian Signal Phasing



NEIGHBORHOOD CONNECTOR STREET

CLEAN & HEALTHY

Neighborhood Connector Streets should include elements to help keep the street free from trash and litter, manage stormwater, provide shade and temperature control, and reduce energy consumption through microclimate cooling. Where curbside green buffers are not practical due to demand from other uses or maintenance concerns, intermittent pockets of commercial or civic uses may provide additional opportunities to bring green features into the public realm that contribute to the City's sustainability goals while also beautifying the street.

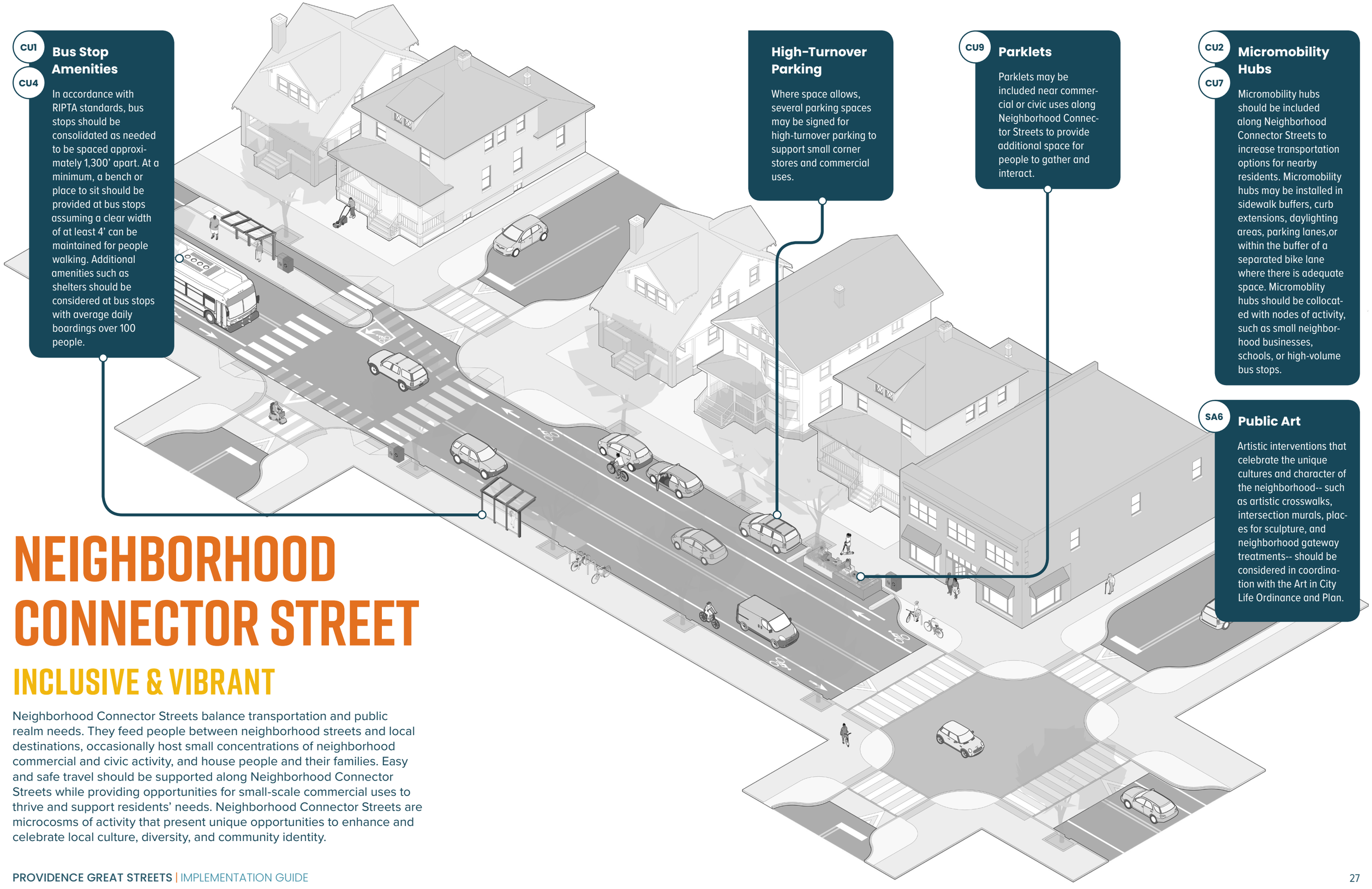
Additional Detail Dictionary References

GI2 Planting Strips
GI3 Plant List

NEIGHBORHOOD CONNECTOR STREET

INCLUSIVE & VIBRANT

Neighborhood Connector Streets balance transportation and public realm needs. They feed people between neighborhood streets and local destinations, occasionally host small concentrations of neighborhood commercial and civic activity, and house people and their families. Easy and safe travel should be supported along Neighborhood Connector Streets while providing opportunities for small-scale commercial uses to thrive and support residents' needs. Neighborhood Connector Streets are microcosms of activity that present unique opportunities to enhance and celebrate local culture, diversity, and community identity.



CU1 **CU4** **Bus Stop Amenities**

In accordance with RIPTA standards, bus stops should be consolidated as needed to be spaced approximately 1,300' apart. At a minimum, a bench or place to sit should be provided at bus stops assuming a clear width of at least 4' can be maintained for people walking. Additional amenities such as shelters should be considered at bus stops with average daily boardings over 100 people.

High-Turnover Parking

Where space allows, several parking spaces may be signed for high-turnover parking to support small corner stores and commercial uses.

CU9 **Parklets**

Parklets may be included near commercial or civic uses along Neighborhood Connector Streets to provide additional space for people to gather and interact.

CU2 **CU7** **Micromobility Hubs**

Micromobility hubs should be included along Neighborhood Connector Streets to increase transportation options for nearby residents. Micromobility hubs may be installed in sidewalk buffers, curb extensions, daylighting areas, parking lanes,or within the buffer of a separated bike lane where there is adequate space. Micromoblity hubs should be collocated with nodes of activity, such as small neighborhood businesses, schools, or high-volume bus stops.

SA6 **Public Art**

Artistic interventions that celebrate the unique cultures and character of the neighborhood-- such as artistic crosswalks, intersection murals, places for sculpture, and neighborhood gateway treatments-- should be considered in coordination with the Art in City Life Ordinance and Plan.

NEIGHBORHOOD CONNECTOR STREET

URBAN TRAIL

Traffic volumes, speeds, and conditions vary widely across the City's Neighborhood Connector Streets. Depending on speed and volume conditions, Urban Trails on these streets may take the form of neighborhood greenways or, if traffic volumes exceed 3,000 vehicles per day, may require fully separated facilities. When full separation is used, a two-way facility on one side of the street is preferred. Designers should consider a variety of factors when determining where to locate the Urban Trail on including land use and destinations, the number of driveways and curb cuts, ease of access, overall network connectivity, and public input. In instances where the Urban Trail takes the form of a neighborhood greenway, strong traffic calming elements and visual cues should be provided to maintain legibility, connectivity, and comfort along the trail route. Neighborhood greenways on Neighborhood Connector Streets should follow the same guidelines for Urban Trails on Neighborhood Streets.

Trail Width

In general, a trail width of at least 11' is recommended on Neighborhood Connector Streets. When located adjacent to the Downtown core, universities, or high-activity commercial centers, practitioners should consider wider trail widths. Except in extremely constrained scenarios, the Urban Trail should not replace the existing sidewalk, but should provide additional space for people walking, riding bicycles, running, or using other micromobility modes.

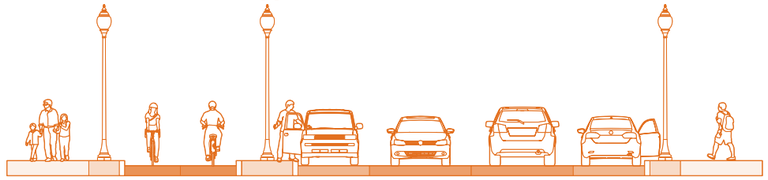
SA4 Bus/Bike Conflict Management

On Neighborhood Connector Streets where an Urban Trail and bus service are provided, floating bus stops should be constructed to mitigate bus activity and contra-flow trail movements. In these cases, on-street parking should be located on the same side of the street as the Urban Trail to provide space for the floating bus stop. If no parking is provided on the same side of the street, a temporary mixing of the sidewalk and Urban Trail may be considered to mitigate conflicts at the bus stop. If the Urban Trail bends in to mix with the adjacent sidewalk, designers should use paint and signage to slow trail users and communicate priority for people walking at the conflict point.

SN2 SN5 Urban Trail Wayfinding

The City of Providence's branded Urban Trail markings and signage should be included at decision points and/or other points of interest to direct Urban Trail Users to important destinations such as parks, schools, libraries, and museums, highlight important cultural and historic information, and provide consistency along the entirety of the Urban Trail.

typical cross section



	sidewalk	landscape buffer	two-way Urban Trail	buffer[2]	parallel parking	travel lane[3]	travel lane[3]	parallel parking	landscape buffer	sidewalk[1]
rec	8'	3'	11'	5'	8'	10'	10'	8'	3'	8'
min	4'	0'	8'	2'	7'	10'	10'	7'	0'	4'
max	-	-	-	-	8'	11'	11'	8'	-	-

[1] When using minimum widths, a 4' clear path should be preserved that is free of utility poles or other obstructions.
[2] When located adjacent to parking, the buffer width should be at least 2' to protect people walking, running, or riding bicycles from open car doors.
[3] 11' recommended along bus routes

Urban Trail

On streets where full separation is appropriate, the Urban Trail may be located either at street level or sidewalk level, depending on drainage and construction costs. When at sidewalk level, a buffer between the sidewalk and Urban Trail is desirable to protect people walking from faster-moving modes generally used in the Urban Trail.

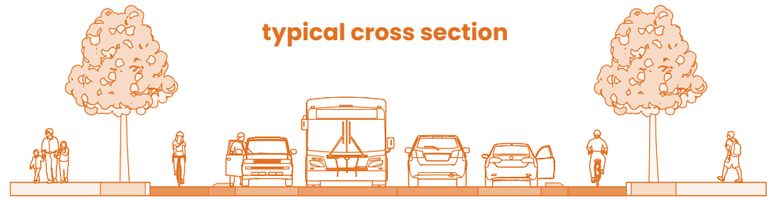
Additional Detail Dictionary References

SA10	Driveway Crossings
SA11	Materials for Vertical Separation
SA18	Intersection Treatments for Bike Lanes and Urban Trails
CU7	Micromobility Hubs
SN3	Pedestrian Signal Phasing
SN7	Urban Trail Signal Strategies

NEIGHBORHOOD MAIN STREET

Neighborhood Main Streets are the hub of community life and culture within Providence's diverse neighborhoods. Though Neighborhood Main Streets throughout Providence may have similar uses and functions – for example, shops, restaurants and cafes, pharmacies, and community centers – each maintains a distinct and unique sense of place. When traveling through or stopping along Neighborhood Main Streets, people feel connected to the people and history of the neighborhood.

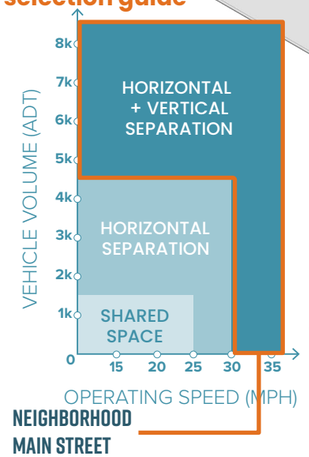
typical cross section



	sidewalk	landscape buffer[1]	bike lane & buffer[2]	parallel parking	travel lane[3]	travel lane[3]	parallel parking	bike lane & buffer[2]	landscape buffer[1]	sidewalk
rec	10'	5'	9.5'	8'	10'	10'	8'	9.5'	5'	10'
min	5'	0'	5'	7'	9'	9'	7'	5'	0'	5'
max	-	-	-	8'	11'	11'	8'	-	-	-

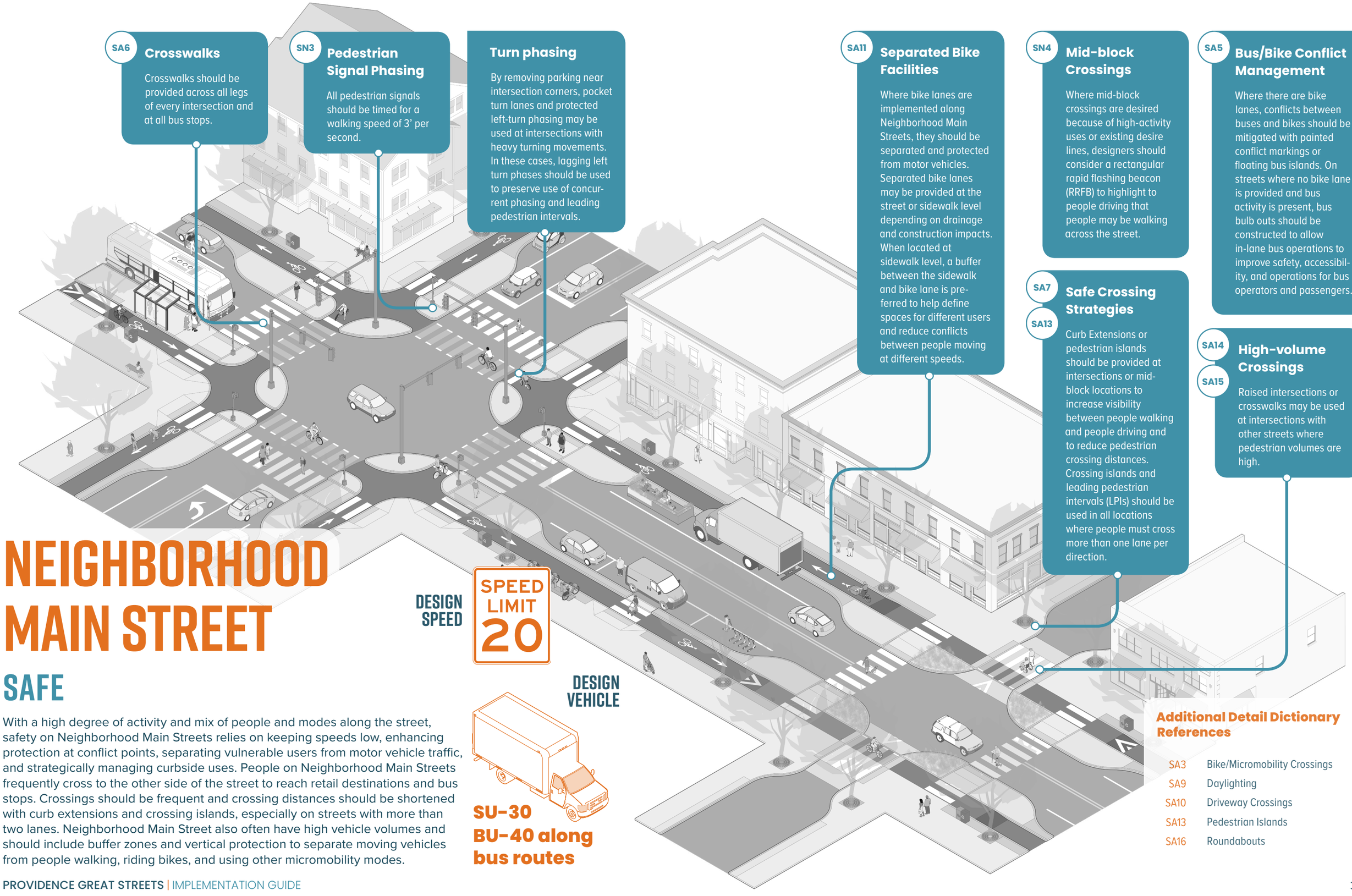
[1] When the project is located within a stormwater priority area, space for stormwater infiltration should be maximized, where appropriate.
[2] Where available space for the bike lane exceeds 8', vertical separation should be used. Where available space for the bike lane exceeds 6', provide a painted buffer between parked cars and the bike lane where there is parallel parking, or between travel lanes and the bike lane where no parallel parking is located. In some cases where total bike lane space is 10-14' for both directions, both directions of bike traffic should be consolidated on one side of the street in a bidirectional facility.
[3] 11' travel lanes are preferable on bus routes.

facility selection guide



example streets

- Broad Street
- Hope Street
- Smith Street
- Atwells Avenue



SA6 Crosswalks

Crosswalks should be provided across all legs of every intersection and at all bus stops.

SN3 Pedestrian Signal Phasing

All pedestrian signals should be timed for a walking speed of 3' per second.

Turn phasing

By removing parking near intersection corners, pocket turn lanes and protected left-turn phasing may be used at intersections with heavy turning movements. In these cases, lagging left turn phases should be used to preserve use of concurrent phasing and leading pedestrian intervals.

SA11 Separated Bike Facilities

Where bike lanes are implemented along Neighborhood Main Streets, they should be separated and protected from motor vehicles. Separated bike lanes may be provided at the street or sidewalk level depending on drainage and construction impacts. When located at sidewalk level, a buffer between the sidewalk and bike lane is preferred to help define spaces for different users and reduce conflicts between people moving at different speeds.

SN4 Mid-block Crossings

Where mid-block crossings are desired because of high-activity uses or existing desire lines, designers should consider a rectangular rapid flashing beacon (RRFB) to highlight to people driving that people may be walking across the street.

SA5 Bus/Bike Conflict Management

Where there are bike lanes, conflicts between buses and bikes should be mitigated with painted conflict markings or floating bus islands. On streets where no bike lane is provided and bus activity is present, bus bulb outs should be constructed to allow in-lane bus operations to improve safety, accessibility, and operations for bus operators and passengers.

SA7 SA13 Safe Crossing Strategies

Curb Extensions or pedestrian islands should be provided at intersections or mid-block locations to increase visibility between people walking and people driving and to reduce pedestrian crossing distances. Crossing islands and leading pedestrian intervals (LPIs) should be used in all locations where people must cross more than one lane per direction.

SA14 SA15 High-volume Crossings

Raised intersections or crosswalks may be used at intersections with other streets where pedestrian volumes are high.

NEIGHBORHOOD MAIN STREET

SAFE

With a high degree of activity and mix of people and modes along the street, safety on Neighborhood Main Streets relies on keeping speeds low, enhancing protection at conflict points, separating vulnerable users from motor vehicle traffic, and strategically managing curbside uses. People on Neighborhood Main Streets frequently cross to the other side of the street to reach retail destinations and bus stops. Crossings should be frequent and crossing distances should be shortened with curb extensions and crossing islands, especially on streets with more than two lanes. Neighborhood Main Street also often have high vehicle volumes and should include buffer zones and vertical protection to separate moving vehicles from people walking, riding bikes, and using other micromobility modes.

DESIGN SPEED

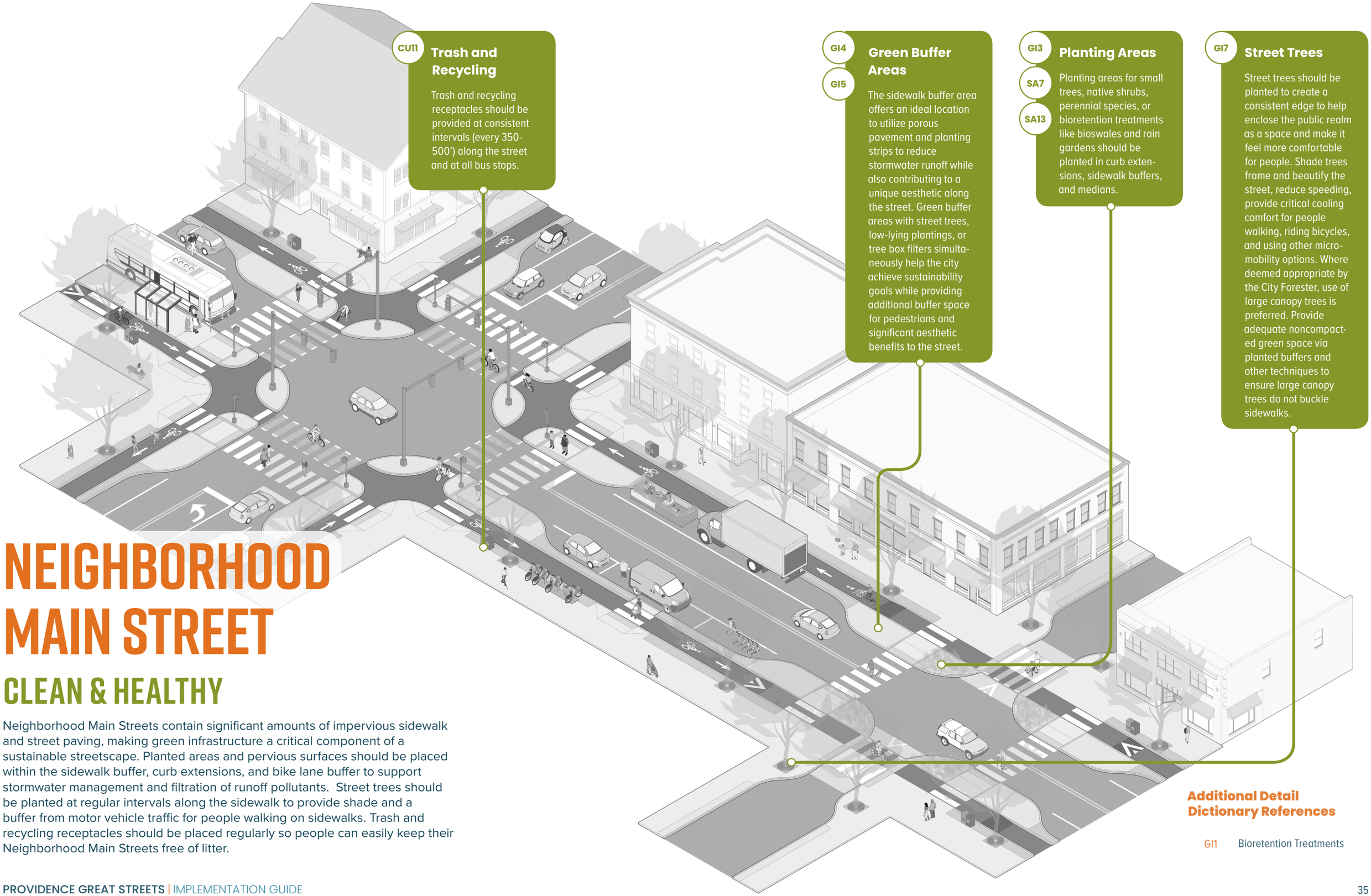
SPEED LIMIT 20

DESIGN VEHICLE

SU-30
BU-40 along bus routes

Additional Detail Dictionary References

SA3	Bike/Micromobility Crossings
SA9	Daylighting
SA10	Driveway Crossings
SA13	Pedestrian Islands
SA16	Roundabouts



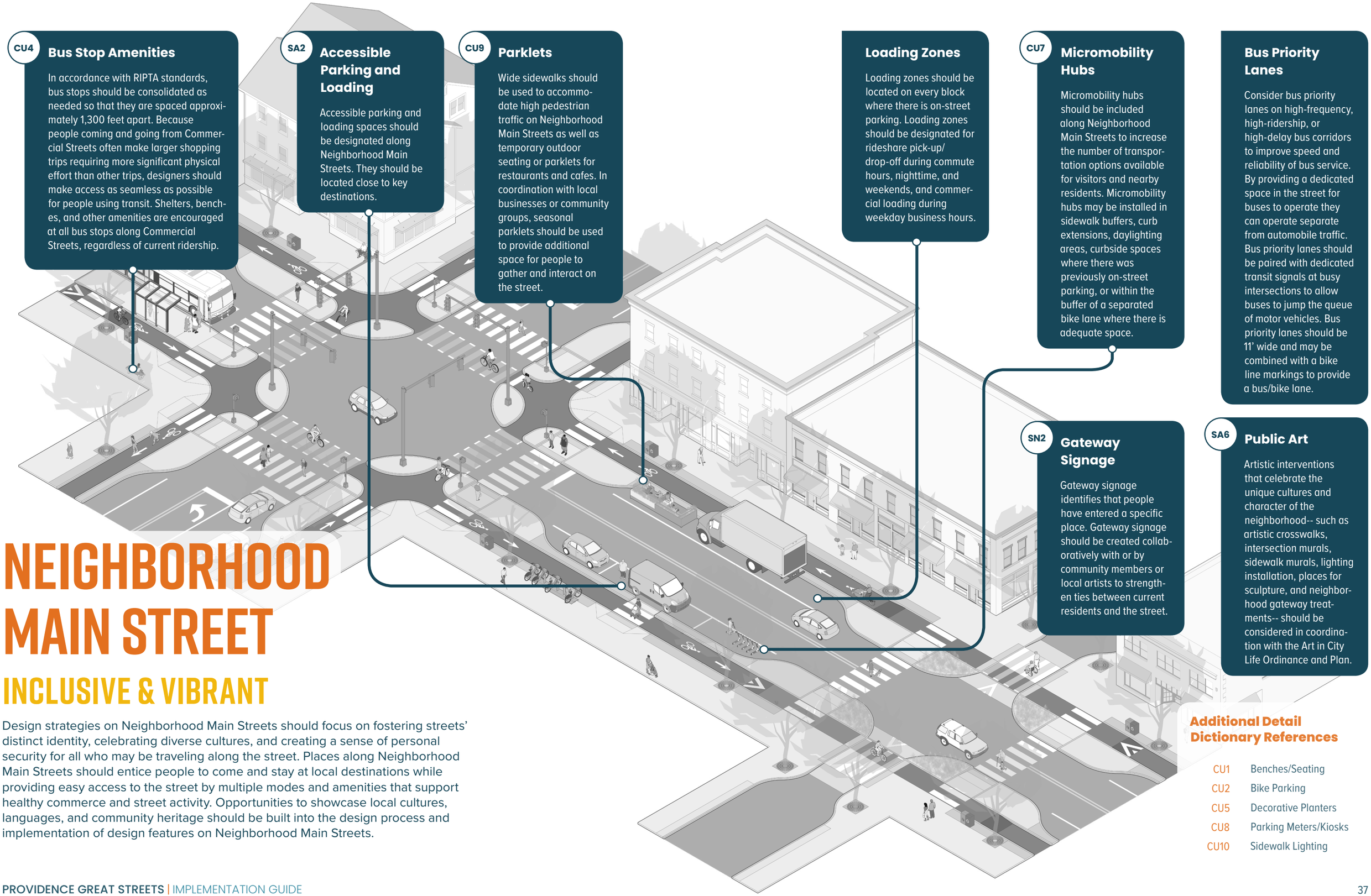
NEIGHBORHOOD MAIN STREET

CLEAN & HEALTHY

Neighborhood Main Streets contain significant amounts of impervious sidewalk and street paving, making green infrastructure a critical component of a sustainable streetscape. Planted areas and pervious surfaces should be placed within the sidewalk buffer, curb extensions, and bike lane buffer to support stormwater management and filtration of runoff pollutants. Street trees should be planted at regular intervals along the sidewalk to provide shade and a buffer from motor vehicle traffic for people walking on sidewalks. Trash and recycling receptacles should be placed regularly so people can easily keep their Neighborhood Main Streets free of litter.

Additional Detail Dictionary References

GI1 Bioretention Treatments



CU4 Bus Stop Amenities

In accordance with RIPTA standards, bus stops should be consolidated as needed so that they are spaced approximately 1,300 feet apart. Because people coming and going from Commercial Streets often make larger shopping trips requiring more significant physical effort than other trips, designers should make access as seamless as possible for people using transit. Shelters, benches, and other amenities are encouraged at all bus stops along Commercial Streets, regardless of current ridership.

SA2 Accessible Parking and Loading

Accessible parking and loading spaces should be designated along Neighborhood Main Streets. They should be located close to key destinations.

CU9 Parklets

Wide sidewalks should be used to accommodate high pedestrian traffic on Neighborhood Main Streets as well as temporary outdoor seating or parklets for restaurants and cafes. In coordination with local businesses or community groups, seasonal parklets should be used to provide additional space for people to gather and interact on the street.

Loading Zones

Loading zones should be located on every block where there is on-street parking. Loading zones should be designated for rideshare pick-up/drop-off during commute hours, nighttime, and weekends, and commercial loading during weekday business hours.

CU7 Micromobility Hubs

Micromobility hubs should be included along Neighborhood Main Streets to increase the number of transportation options available for visitors and nearby residents. Micromobility hubs may be installed in sidewalk buffers, curb extensions, daylighting areas, curbside spaces where there was previously on-street parking, or within the buffer of a separated bike lane where there is adequate space.

Bus Priority Lanes

Consider bus priority lanes on high-frequency, high-ridership, or high-delay bus corridors to improve speed and reliability of bus service. By providing a dedicated space in the street for buses to operate they can operate separate from automobile traffic. Bus priority lanes should be paired with dedicated transit signals at busy intersections to allow buses to jump the queue of motor vehicles. Bus priority lanes should be 11' wide and may be combined with a bike line markings to provide a bus/bike lane.

SN2 Gateway Signage

Gateway signage identifies that people have entered a specific place. Gateway signage should be created collaboratively with or by community members or local artists to strengthen ties between current residents and the street.

SA6 Public Art

Artistic interventions that celebrate the unique cultures and character of the neighborhood-- such as artistic crosswalks, intersection murals, sidewalk murals, lighting installation, places for sculpture, and neighborhood gateway treatments-- should be considered in coordination with the Art in City Life Ordinance and Plan.

NEIGHBORHOOD MAIN STREET

INCLUSIVE & VIBRANT

Design strategies on Neighborhood Main Streets should focus on fostering streets' distinct identity, celebrating diverse cultures, and creating a sense of personal security for all who may be traveling along the street. Places along Neighborhood Main Streets should entice people to come and stay at local destinations while providing easy access to the street by multiple modes and amenities that support healthy commerce and street activity. Opportunities to showcase local cultures, languages, and community heritage should be built into the design process and implementation of design features on Neighborhood Main Streets.

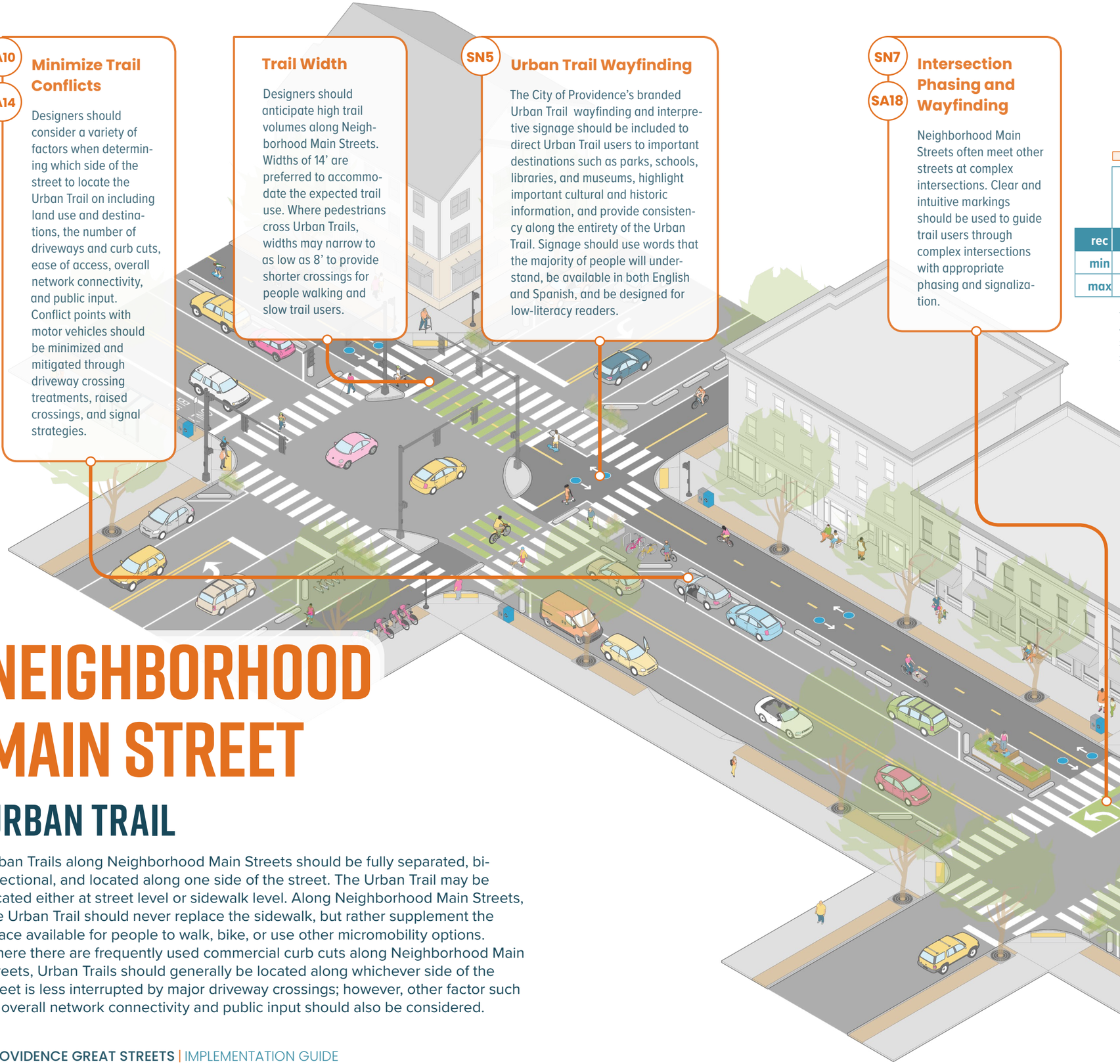
Additional Detail Dictionary References

CU1	Benches/Seating
CU2	Bike Parking
CU5	Decorative Planters
CU8	Parking Meters/Kiosks
CU10	Sidewalk Lighting

NEIGHBORHOOD MAIN STREET

URBAN TRAIL

Urban Trails along Neighborhood Main Streets should be fully separated, bi-directional, and located along one side of the street. The Urban Trail may be located either at street level or sidewalk level. Along Neighborhood Main Streets, the Urban Trail should never replace the sidewalk, but rather supplement the space available for people to walk, bike, or use other micromobility options. Where there are frequently used commercial curb cuts along Neighborhood Main Streets, Urban Trails should generally be located along whichever side of the street is less interrupted by major driveway crossings; however, other factor such as overall network connectivity and public input should also be considered.



SA10 SA14 Minimize Trail Conflicts

Designers should consider a variety of factors when determining which side of the street to locate the Urban Trail on including land use and destinations, the number of driveways and curb cuts, ease of access, overall network connectivity, and public input. Conflict points with motor vehicles should be minimized and mitigated through driveway crossing treatments, raised crossings, and signal strategies.

Trail Width

Designers should anticipate high trail volumes along Neighborhood Main Streets. Widths of 14' are preferred to accommodate the expected trail use. Where pedestrians cross Urban Trails, widths may narrow to as low as 8' to provide shorter crossings for people walking and slow trail users.

SN5 Urban Trail Wayfinding

The City of Providence's branded Urban Trail wayfinding and interpretive signage should be included to direct Urban Trail users to important destinations such as parks, schools, libraries, and museums, highlight important cultural and historic information, and provide consistency along the entirety of the Urban Trail. Signage should use words that the majority of people will understand, be available in both English and Spanish, and be designed for low-literacy readers.

SN7 SA18 Intersection Phasing and Wayfinding

Neighborhood Main Streets often meet other streets at complex intersections. Clear and intuitive markings should be used to guide trail users through complex intersections with appropriate phasing and signalization.

typical cross section

	sidewalk	landscape buffer[1]	two-way Urban Trail[2]	buffer	parallel parking	travel lane[3]	travel lane[3]	parallel parking	landscape buffer[1]	sidewalk
rec	10'	5'	14'	5'	8'	10'	10'	8'	5'	10'
min	5'	0'	11'	2'	7'	9'	9'	7'	0'	5'
max	-	-	16'	-	8'	11'	11'	8'	-	-

[1] When located adjacent to parking, the buffer width should be at least 3' to protect trail users from people opening car doors.
[2] Two-way Urban Trail may reduce to 8' for short segments.
[3] 11' recommended along bus routes.

SA11 Urban Trail/ Sidewalk Buffer

When at sidewalk level, a buffer should be provided between the sidewalk and the Urban Trail to protect people walking from faster-moving modes generally used in the Urban Trail. The buffer between the Urban Trail and sidewalk is an ideal place to reinforce sustainability goals with plantings, trash and recycling bins, or other elements like benches, lighting, signage, and art.

SA5 Bus/Bike Conflict Management

Where there are RIPTA bus routes along Neighborhood Main Streets with Urban Trails, floating bus stops should be constructed to mitigate potential conflicts between buses and contra-flow trail movements. If on-street parking is only provided on one side of the street, it should be located on the same side as the Urban Trail to provide space for the floating bus stop.

Additional Detail Dictionary References

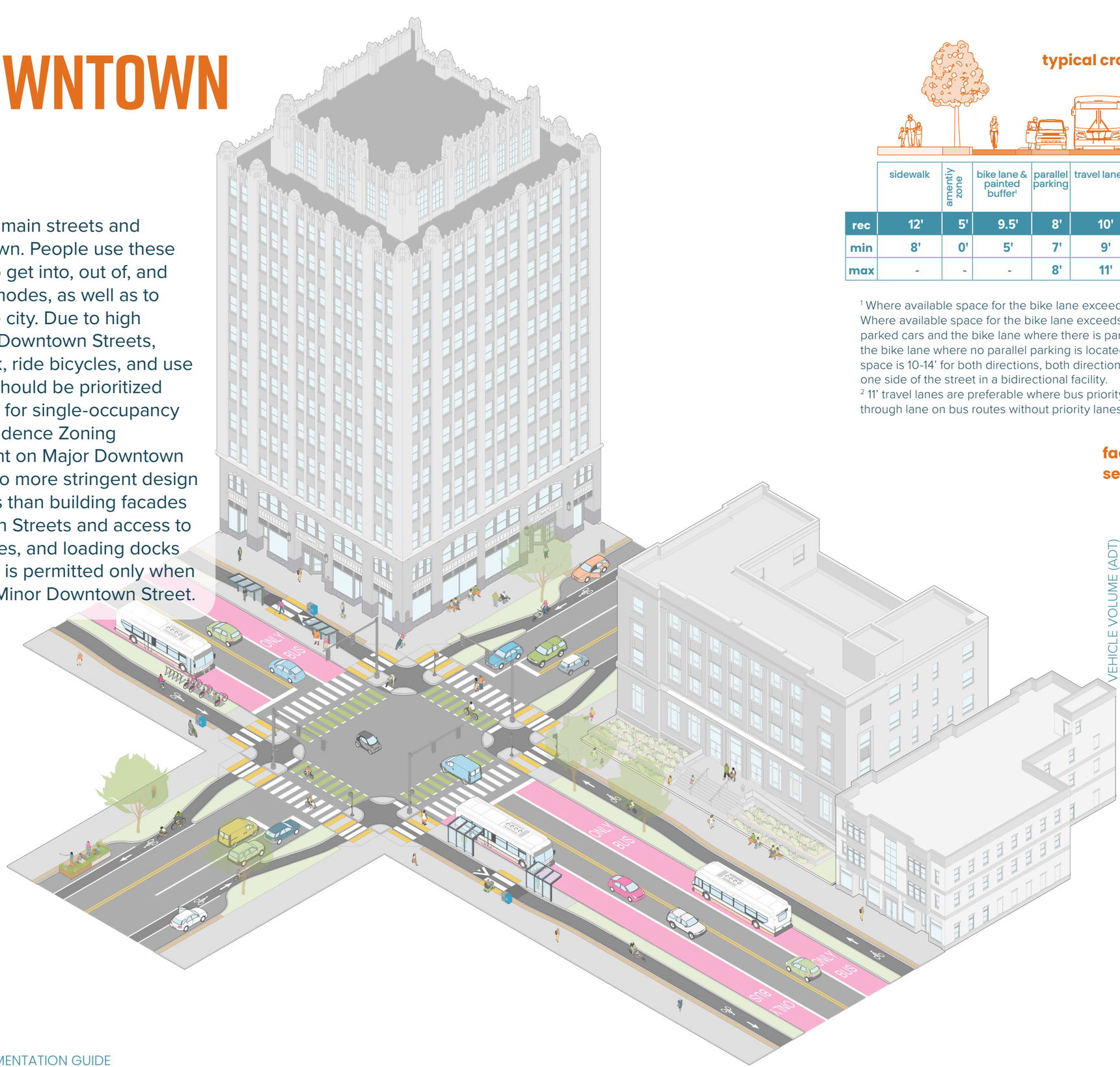
SN3	Pedestrian Signal Phasing
SN6	Urban Trail Network Trailhead Signs/Kiosks

MAJOR DOWNTOWN STREET

Major Downtown Streets are main streets and centers of activity in Downtown. People use these streets throughout the day to get into, out of, and around Downtown using all modes, as well as to sit, shop, relax, and enjoy the city. Due to high volumes of activity on Major Downtown Streets, people who take transit, walk, ride bicycles, and use other micromobility options should be prioritized over parking and travel lanes for single-occupancy vehicles. Per the City of Providence Zoning Ordinance, buildings that front on Major Downtown Streets are typically subject to more stringent design and development regulations than building facades that front on Minor Downtown Streets and access to parking lots, parking structures, and loading docks and areas from Major Streets is permitted only when the lot has no frontage on a Minor Downtown Street.

example streets

- Empire Street
- Fountain Street
- Clifford Street

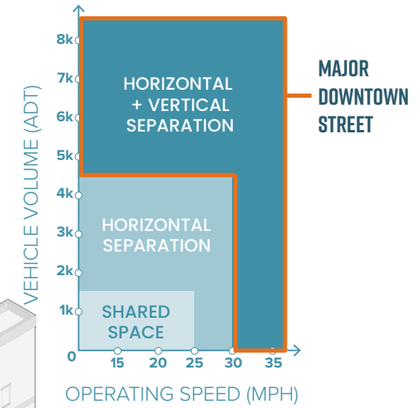


typical cross section

	sidewalk	amenity zone	bike lane & painted buffer[1]	parallel parking	travel lane[2]	travel lane[2]	parallel parking	bike lane & painted buffer[1]	amenity zone	sidewalk
rec	12'	5'	9.5'	8'	10'	10'	8'	9.5'	5'	12'
min	8'	0'	5'	7'	9'	9'	7'	5'	0'	8'
max	-	-	-	8'	11'	11'	8'	-	-	-

[1] Where available space for the bike lane exceeds 8', vertical separation should be used. Where available space for the bike lane exceeds 6', provide a painted buffer between parked cars and the bike lane where there is parallel parking, or between travel lanes and the bike lane where no parallel parking is located. In some cases where total bike lane space is 10-14' for both directions, both directions of bike traffic should be consolidated on one side of the street in a bidirectional facility.
[2] 11' travel lanes are preferable where bus priority lanes are provided or the rightmost through lane on bus routes without priority lanes.

facility selection guide

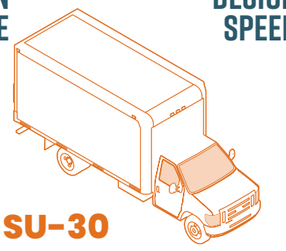


MAJOR DOWNTOWN STREET

SAFE

High volumes of vehicle, pedestrian, bicycle, and transit users on Major Downtown Streets make separation of modes a key factor for safety. Low motor vehicle travel speeds should be encouraged through design features including use of travel lanes no wider than 11', on-street parking, curb extensions, crossing islands, and tree canopies. At complex intersections, treatments on Major Downtown Streets should focus on providing clear priority and sight lines for vulnerable users of the street, including people walking, riding bicycles, and using other micromobility modes.

DESIGN VEHICLE



SU-30
BU-40 along bus routes

DESIGN SPEED

SA7 SA13 SA14 SA15 SN3 Crossing Visibility

Where more than one vehicular travel lane is provided in a single direction, care should be given to ensure people crossing the street are visible from all lanes of traffic as they cross. Leading pedestrian intervals as well as either curb extensions or crossing islands should be used in all locations where people must walk across more than one lane in either direction. Other appropriate traffic calming treatments include raised cross-walks and raised intersections.

SA18 Protected Intersections

Where space allows, protected intersections should be used to minimize conflicts and increase visibility of people walking and riding bicycles. Protected intersections should include curb extensions with space cut out for bike lanes to provide space for people riding bicycles to wait at red lights ahead of drivers traveling in the same direction and create shorter crossing distances. At these intersections, no turn on red restrictions should be combined with leading pedestrian and bike intervals allow people walking, riding bicycles, and using other micromobility modes to enter intersections before drivers. Pavement markings should be used to signal that drivers must yield to pedestrians and bike lane users.

SA7 Safe Crossing Strategies

Curb extensions at intersections should be considers to shorten long crossing distances, enforce parking restrictions near crosswalks, and provide additional public space. Curb extensions should extend approximately 6' from the curb, or 1' less than the parking lane, and have curb ramps that align with cross-walks.

SA11 Separated Bike Facilities

Separated bike lanes should be provided on Major Downtown Streets to create space for people to ride bicycles, scoot, and skate on the street separated from automobile traffic. Lanes should be no narrower than 5' wide. A buffer area at least 2' wide should be used and should include vertical elements to enhance separation and aesthet-ics.

Curb Radii

Smaller curb radii should be used to help keep vehicle turning speeds low, improving safety for all, and thus curb radii should be minimized as much as possible while accommodating the turning movements of the vehicle types that most frequently turn in the intersection. Where needed, mountable truck aprons should be used to allow larger vehicles to safely make turns, along with recessed stop bars on smaller intersecting streets to allow large vehicles to encroach on opposing lanes.

SN5 Bus/Bike Conflict Management

At bus stops where there is on-street parking, bus bulbs or floating bus islands should extend into the parking lane to allow bus passen-gers to board and alight without the bus pulling over to the curb, to speed up service, and to make buses more accessible for people with movement disabilities. Bike lanes should continue between the bus bulb or floating island and sidewalk to minimize conflicts between buses and people riding bicycles.

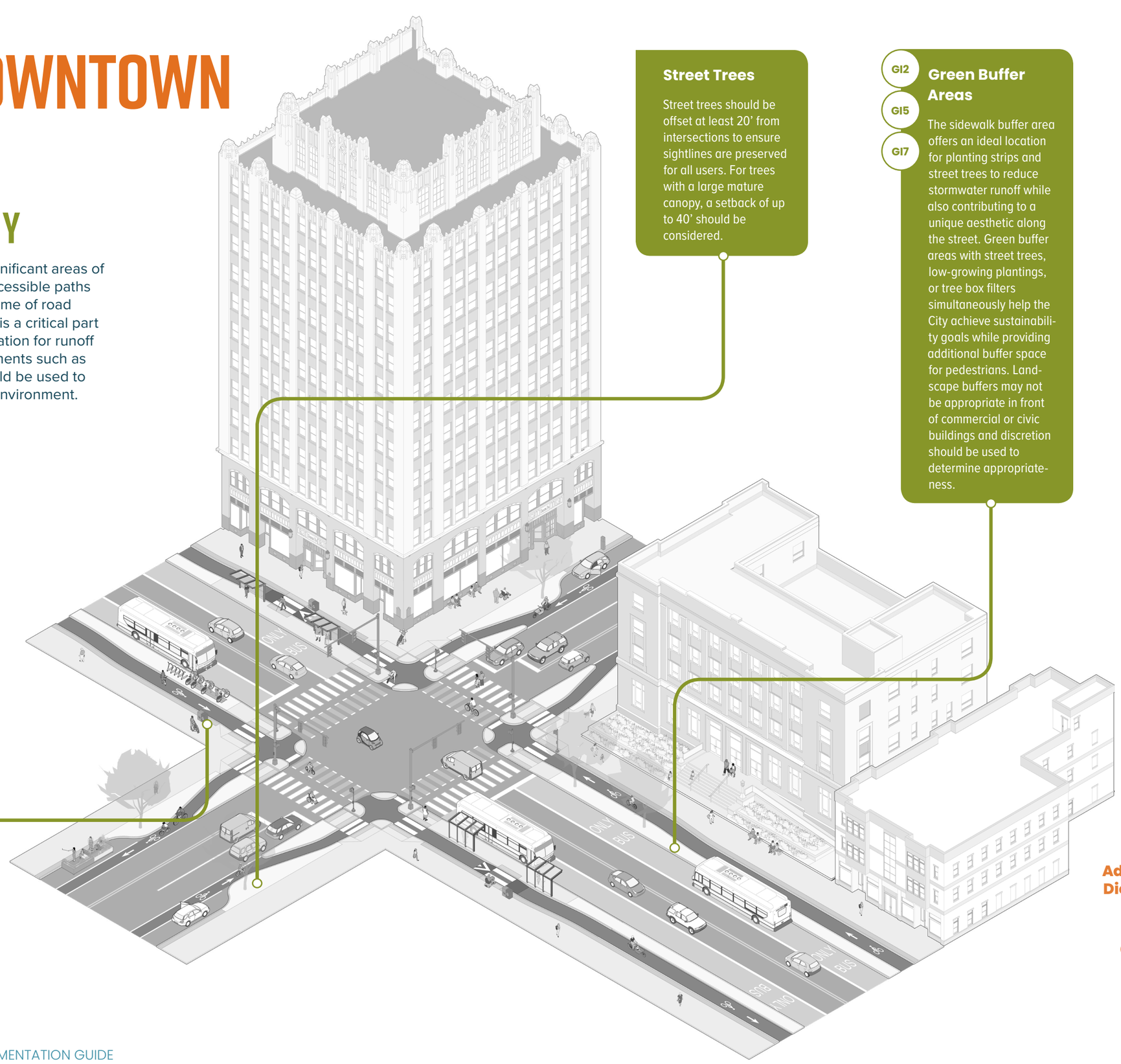
Additional Detail Dictionary References

SA3	Bike/Micromobility Crossings
SA6	Crosswalks
SA8	Curb Ramps
SA9	Daylighting
SA10	Driveway Crossings

MAJOR DOWNTOWN STREET

CLEAN & HEALTHY

Major Downtown Streets contain significant areas of impermeable surface to facilitate accessible paths for a wide range and significant volume of road users. As such, green infrastructure is a critical part of stormwater management and filtration for runoff pollutants. Green infrastructure elements such as street trees and planting areas should be used to create a comfortable and pleasant environment.



Street Trees

Street trees should be offset at least 20' from intersections to ensure sightlines are preserved for all users. For trees with a large mature canopy, a setback of up to 40' should be considered.

GI2 GI5 GI7

Green Buffer Areas

The sidewalk buffer area offers an ideal location for planting strips and street trees to reduce stormwater runoff while also contributing to a unique aesthetic along the street. Green buffer areas with street trees, low-growing plantings, or tree box filters simultaneously help the City achieve sustainability goals while providing additional buffer space for pedestrians. Landscape buffers may not be appropriate in front of commercial or civic buildings and discretion should be used to determine appropriateness.

CU11

Trash and Recycling

Trash and recycling receptacles should be provided at consistent intervals (every 350-500') along the street and at all bus stops. Curb extensions are an ideal place for trash and recycling containers as they do not interfere with the clear accessible path.

Additional Detail Dictionary References

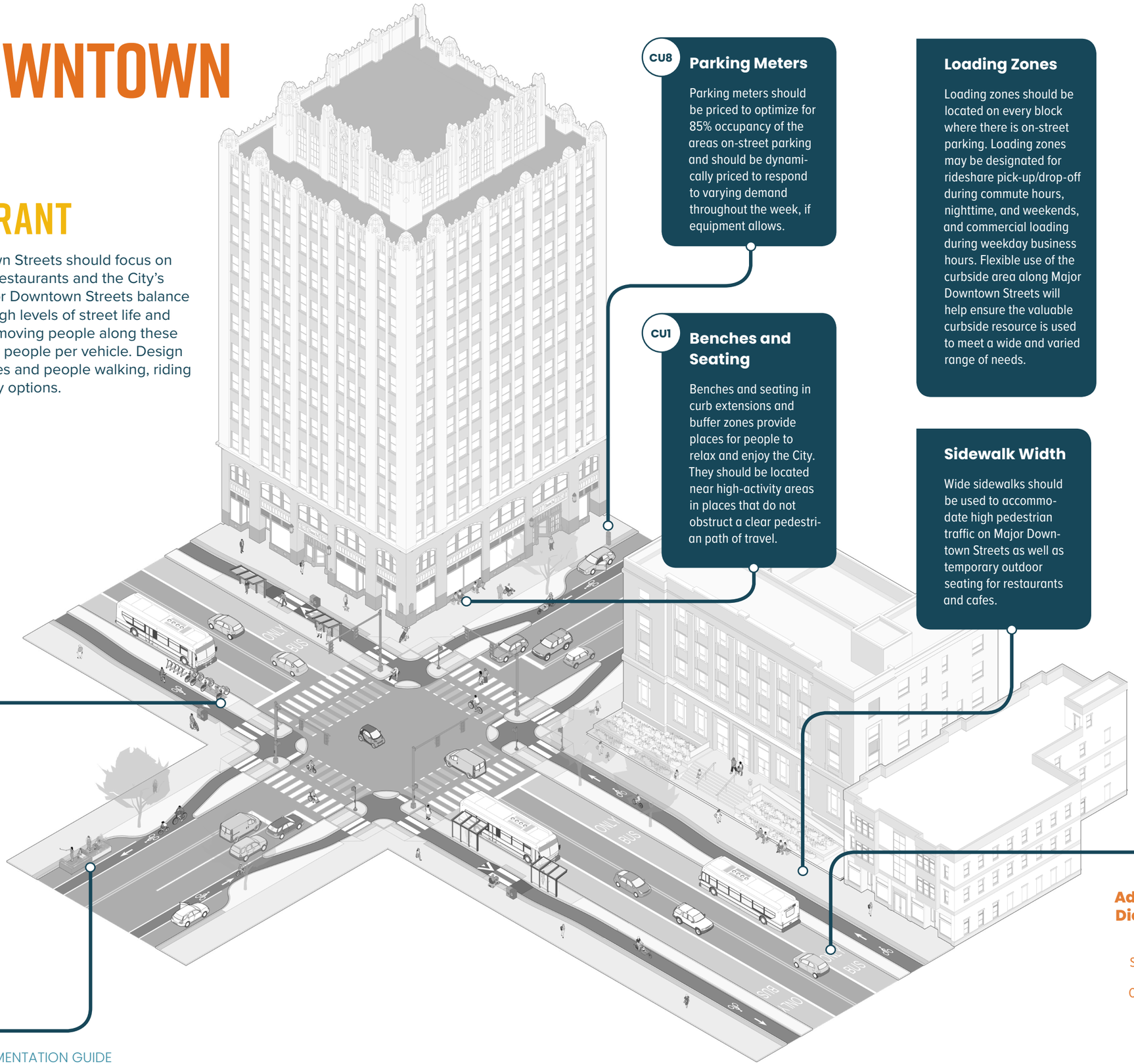
GI1 Bioretention Treatments

GI3 Plant List

MAJOR DOWNTOWN STREET

INCLUSIVE & VIBRANT

Design strategies on Major Downtown Streets should focus on celebrating Downtown's shops and restaurants and the City's thriving arts and cultural scene. Major Downtown Streets balance a high volume of person-trips with high levels of street life and activity. Buses are a key element of moving people along these busy streets, carrying as many as 60 people per vehicle. Design elements should give priority to buses and people walking, riding bicycles, or using other micromobility options.



CU7 Micromobility Hubs

Micromobility hubs should be included along Major Downtown Streets to increase transportation options. Micromobility hubs may be located on wide sidewalks, within curb extensions, in curbside spaces where there was previously on-street parking, or within the buffer of a separated bike lane where there is adequate space.

CU9 Parklets

In coordination with local businesses or community groups, seasonal parklets should be used to provide additional space for people to gather and interact on the street. In addition to providing a place for community expression, parklets may also help support local businesses along Major Downtown Streets.

CU8 Parking Meters

Parking meters should be priced to optimize for 85% occupancy of the areas on-street parking and should be dynamically priced to respond to varying demand throughout the week, if equipment allows.

CU1 Benches and Seating

Benches and seating in curb extensions and buffer zones provide places for people to relax and enjoy the City. They should be located near high-activity areas in places that do not obstruct a clear pedestrian path of travel.

Loading Zones

Loading zones should be located on every block where there is on-street parking. Loading zones may be designated for rideshare pick-up/drop-off during commute hours, nighttime, and weekends, and commercial loading during weekday business hours. Flexible use of the curbside area along Major Downtown Streets will help ensure the valuable curbside resource is used to meet a wide and varied range of needs.

Sidewalk Width

Wide sidewalks should be used to accommodate high pedestrian traffic on Major Downtown Streets as well as temporary outdoor seating for restaurants and cafes.

Public Art

Artistic interventions that celebrate the unique cultures and character of Providence-- such as lighting installations and places for sculpture-- should be considered in coordination with the Art in City Life Ordinance and Plan.

Bus Priority Lanes

Consider bus priority lanes on high-frequency, high-ridership, or high-delay bus corridors to improve speed and reliability of bus service. By providing a dedicated space in the street for buses to operate they can operate separate from automobile traffic. Bus priority lanes should be paired with dedicated transit signals at busy intersections to allow buses to jump the queue of motor vehicles. Bus priority lanes should be at least 11' wide and may be combined with a bike line to provide a bus/bike lane.

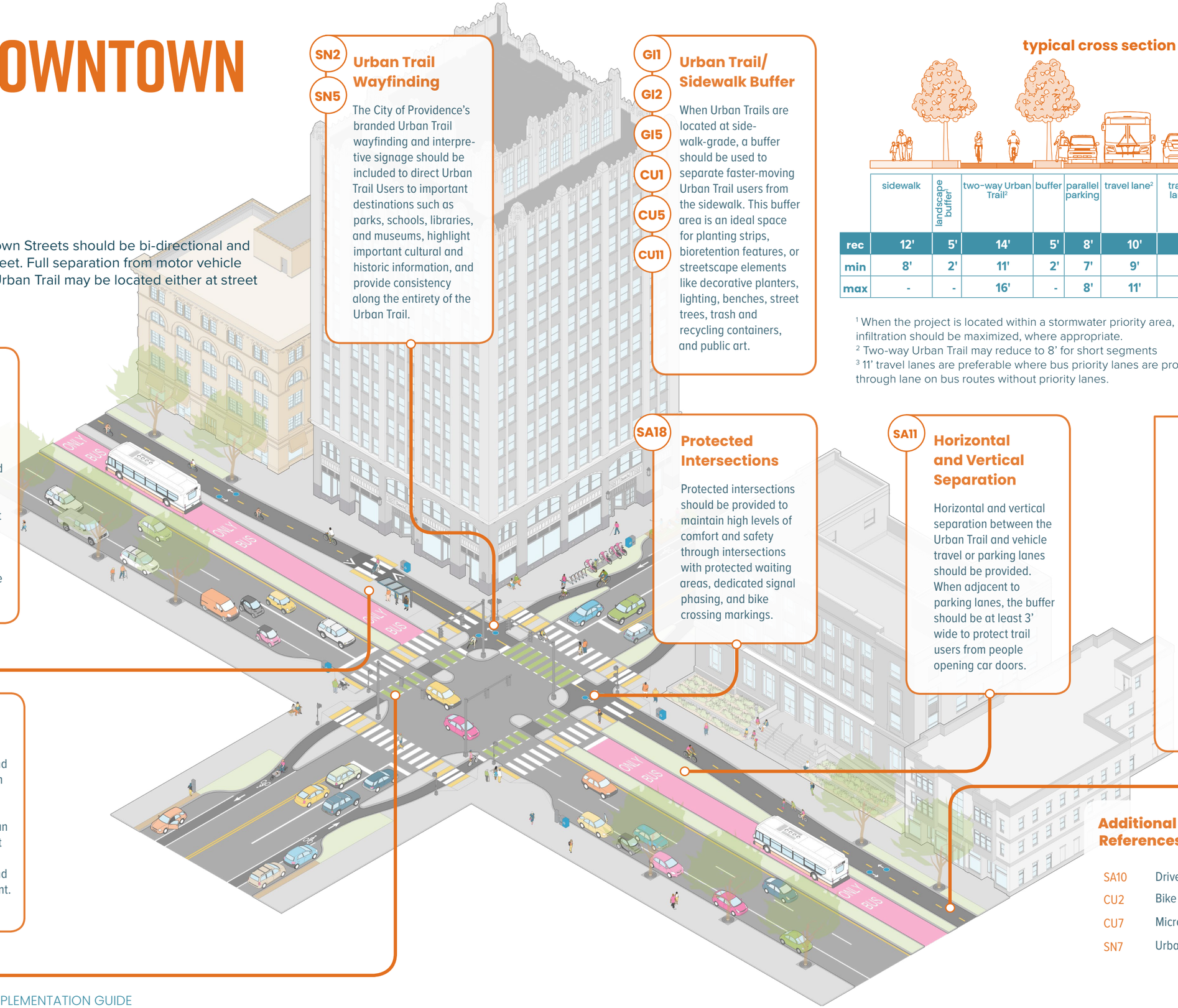
Additional Detail Dictionary References

SA2	Accessible Parking & Pick-up/Drop-off Zones
CU2	Bike Parking

MAJOR DOWNTOWN STREET

URBAN TRAIL

Urban Trails along Major Downtown Streets should be bi-directional and located along one side of the street. Full separation from motor vehicle traffic should be provided. The Urban Trail may be located either at street level or sidewalk level.



SN2 SN5 Urban Trail Wayfinding

The City of Providence's branded Urban Trail wayfinding and interpretive signage should be included to direct Urban Trail Users to important destinations such as parks, schools, libraries, and museums, highlight important cultural and historic information, and provide consistency along the entirety of the Urban Trail.

GI1 GI2 GI5 CU1 CU5 CU11 Urban Trail/ Sidewalk Buffer

When Urban Trails are located at side-walk-grade, a buffer should be used to separate faster-moving Urban Trail users from the sidewalk. This buffer area is an ideal space for planting strips, bioretention features, or streetscape elements like decorative planters, lighting, benches, street trees, trash and recycling containers, and public art.

SA5 Bus/Bike Conflict Management

Where there RIPTA bus routes and Urban Trails are both present on Major Downtown Streets, floating bus stops should be constructed to mitigate contraflow trail movements through the bus stop. If on-street parking is only provided on one side of the street, the parking should be located on the same side as the Urban Trail to provide space for the floating bus stop.

SA18 Protected Intersections

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

SA11 Horizontal and Vertical Separation

Horizontal and vertical separation between the Urban Trail and vehicle travel or parking lanes should be provided. When adjacent to parking lanes, the buffer should be at least 3' wide to protect trail users from people opening car doors.

SA3 Intersection Design

Conflict points with motor vehicles should be minimized and mitigated through careful design and signal treatments at intersections and driveway crossings. Clear priority for Urban Trail users should be provided at all major crossings by maintaining the grade of the sidewalk and through use of high visibility paint.

typical cross section

	sidewalk	landscape buffer[1]	two-way Urban Trail[2]	buffer	parallel parking	travel lane[2]	travel lane[2]	parallel parking	landscape buffer[1]	sidewalk
rec	12'	5'	14'	5'	8'	10'	10'	8'	5'	12'
min	8'	2'	11'	2'	7'	9'	9'	7'	0'	8'
max	-	-	16'	-	8'	11'	11'	8'	-	-

[1] When the project is located within a stormwater priority area, space for stormwater infiltration should be maximized, where appropriate.
[2] Two-way Urban Trail may reduce to 8' for short segments
[3] 11' travel lanes are preferable where bus priority lanes are provided or the rightmost through lane on bus routes without priority lanes.

Trail Width

Designers should anticipate high trail volumes along Major Downtown Streets. Widths of 14' are preferred to accommodate the expected trail use. Where pedestrians cross Urban Trails, widths may narrow to as low as 8' to provide shorter crossings for people walking and slow trail users. When located adjacent to exceptionally high-activity pedestrian areas, practitioners should consider wider trail widths.

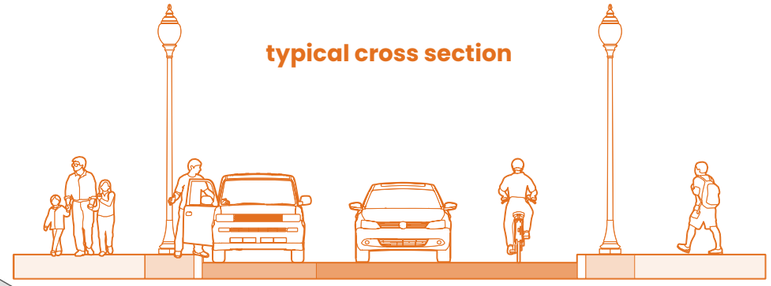
Additional Detail Dictionary References

SA10	Driveway Crossings
CU2	Bike Parking
CU7	Micromobility Hubs
SN7	Urban Trail Signal Strategies

MINOR DOWNTOWN STREET

Minor Downtown Streets are correlated with Downtown B streets in the Zoning Ordinance excepting the following streets, which should be treated on a case-by-case basis: Broad from Empire to 95; Sabin/Broadway; Washington through Kennedy Plaza; Memorial from Washington to Westminster; East Franklin; West Exchange; Friendship; Pine; Dorrance from Washington to Exchange; Canal; Smith; Charles; Orms.

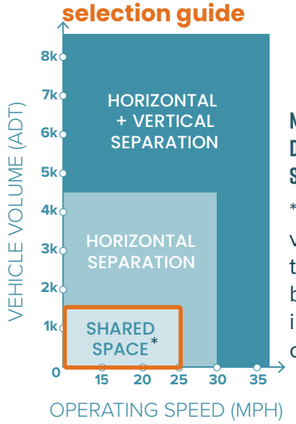
typical cross section



	sidewalk	landscape buffer	parallel parking	1 travel lane	2 travel lanes[2]	landscape buffer	sidewalk
rec	8'	3'	7'	9'	16'	3'	8'
min	5'	0'	7'	9'	12'	0'	5'
max	-	-	8'	10'	18'	-	-

[1] Curbless Minor Downtown Streets should have buffer spaces of at least 2' and should contain a vertical element or another detectable edge to aid visually-impaired people in navigation.
[2] The travelway on two-way Minor Downtown Streets with on-street parking may be as narrow as 12' if parking utilization is low or if curbside space is designated for vehicles to yield to oncoming vehicle traffic.

facility selection guide

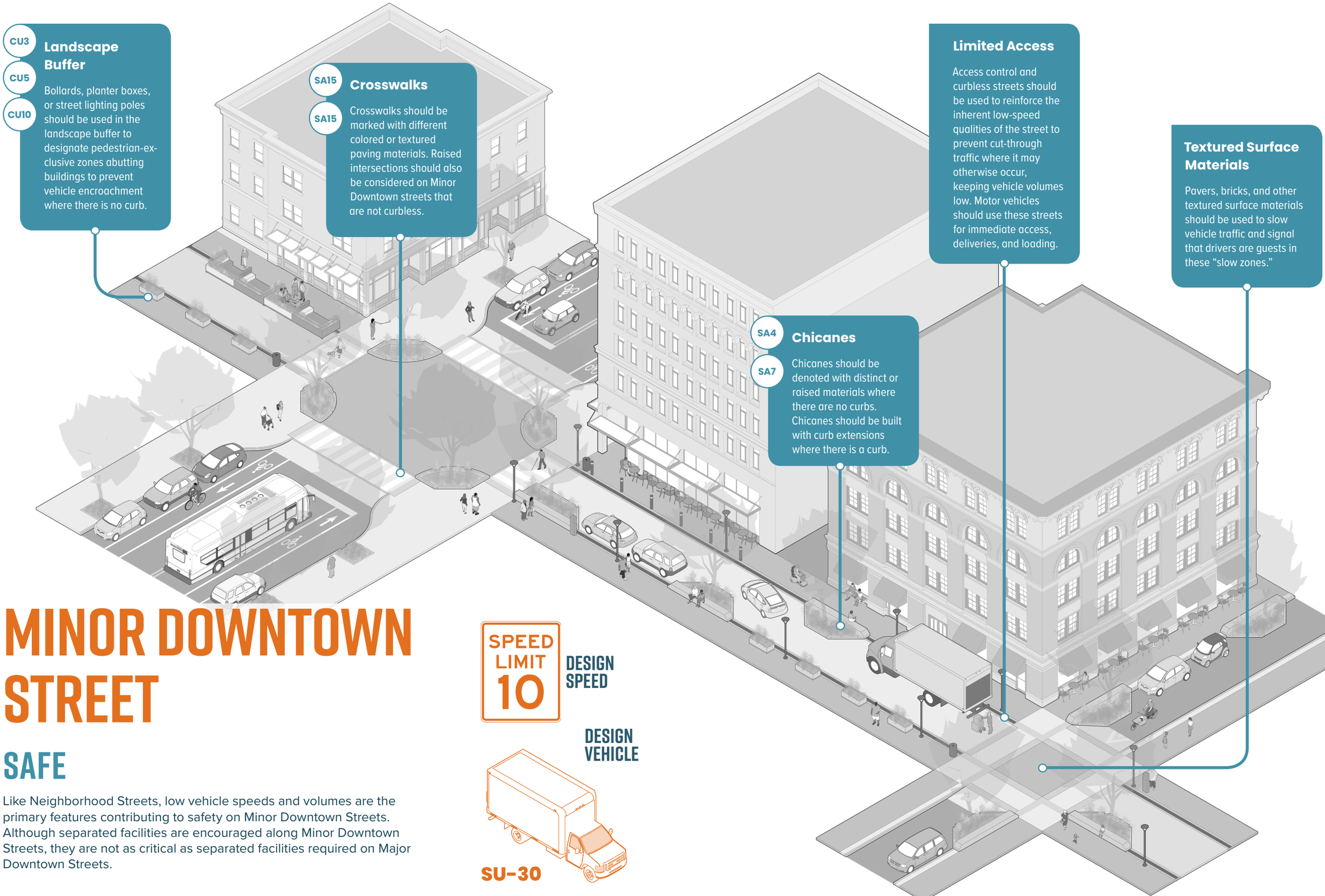


MINOR DOWNTOWN STREET

*vehicle volumes up to 3,000 may be acceptable in limited circumstances

example streets

- Snow Street
- Orange Street
- Elm Street



MINOR DOWNTOWN STREET

SAFE

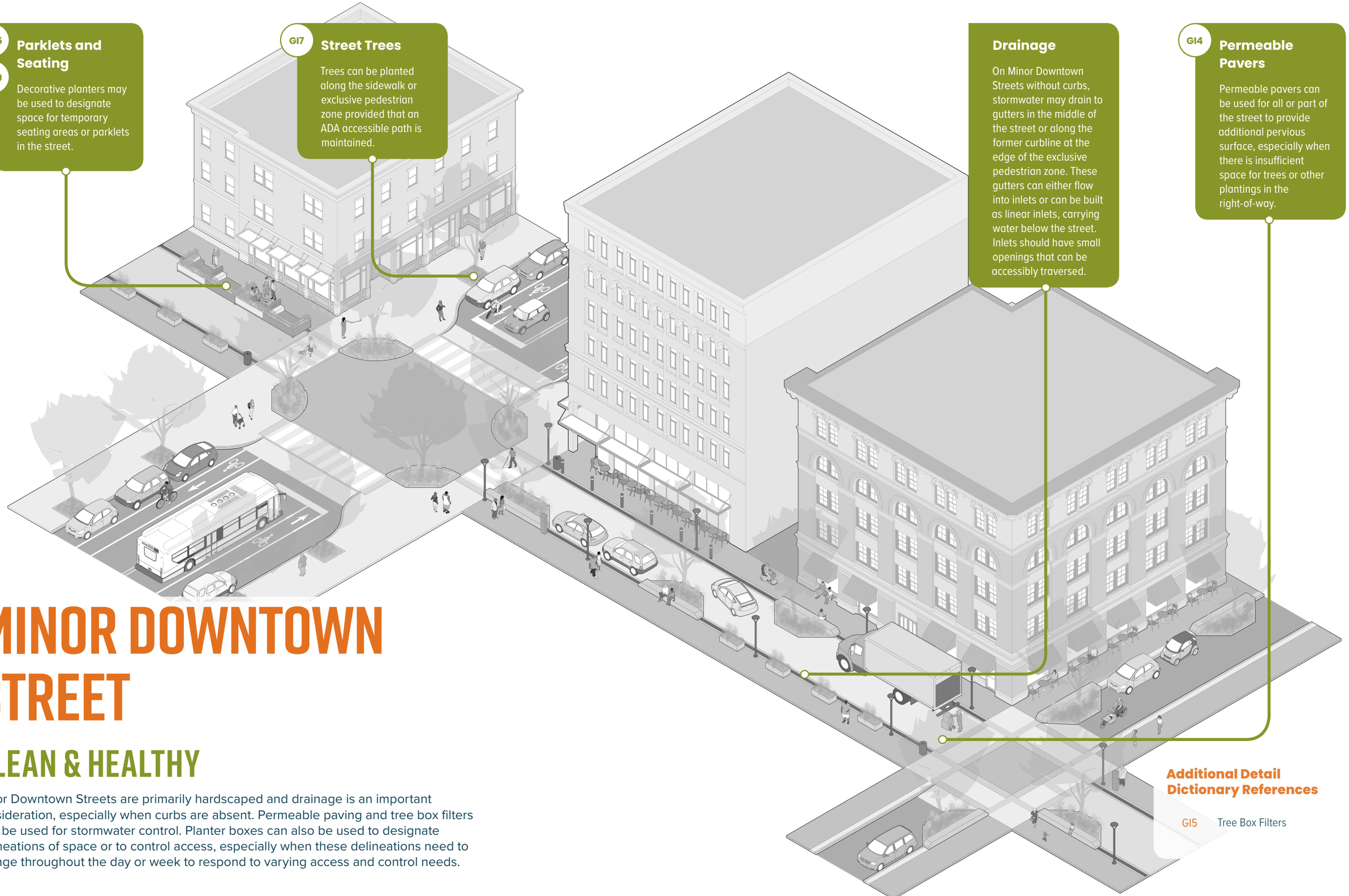
Like Neighborhood Streets, low vehicle speeds and volumes are the primary features contributing to safety on Minor Downtown Streets. Although separated facilities are encouraged along Minor Downtown Streets, they are not as critical as separated facilities required on Major Downtown Streets.

SPEED LIMIT 10

DESIGN SPEED

DESIGN VEHICLE

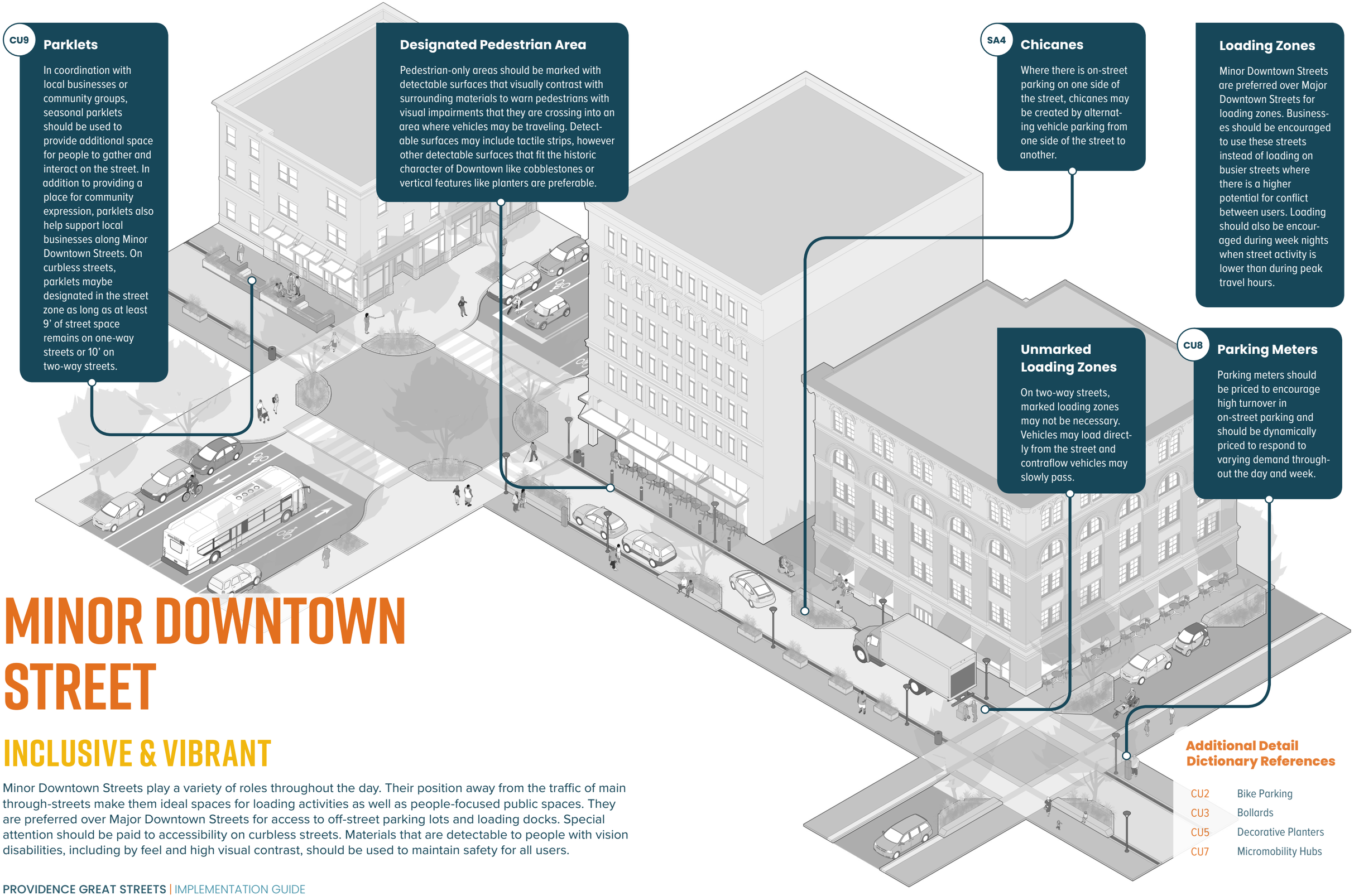
SU-30



MINOR DOWNTOWN STREET

CLEAN & HEALTHY

Minor Downtown Streets are primarily hardscaped and drainage is an important consideration, especially when curbs are absent. Permeable paving and tree box filters may be used for stormwater control. Planter boxes can also be used to designate delineations of space or to control access, especially when these delineations need to change throughout the day or week to respond to varying access and control needs.



CU9 **Parklets**

In coordination with local businesses or community groups, seasonal parklets should be used to provide additional space for people to gather and interact on the street. In addition to providing a place for community expression, parklets also help support local businesses along Minor Downtown Streets. On curbless streets, parklets maybe designated in the street zone as long as at least 9' of street space remains on one-way streets or 10' on two-way streets.

Designated Pedestrian Area

Pedestrian-only areas should be marked with detectable surfaces that visually contrast with surrounding materials to warn pedestrians with visual impairments that they are crossing into an area where vehicles may be traveling. Detectable surfaces may include tactile strips, however other detectable surfaces that fit the historic character of Downtown like cobblestones or vertical features like planters are preferable.

SA4 **Chicanes**

Where there is on-street parking on one side of the street, chicanes may be created by alternating vehicle parking from one side of the street to another.

Loading Zones

Minor Downtown Streets are preferred over Major Downtown Streets for loading zones. Businesses should be encouraged to use these streets instead of loading on busier streets where there is a higher potential for conflict between users. Loading should also be encouraged during week nights when street activity is lower than during peak travel hours.

Unmarked Loading Zones

On two-way streets, marked loading zones may not be necessary. Vehicles may load directly from the street and contraflow vehicles may slowly pass.

CU8 **Parking Meters**

Parking meters should be priced to encourage high turnover in on-street parking and should be dynamically priced to respond to varying demand throughout the day and week.

MINOR DOWNTOWN STREET

INCLUSIVE & VIBRANT

Minor Downtown Streets play a variety of roles throughout the day. Their position away from the traffic of main through-streets make them ideal spaces for loading activities as well as people-focused public spaces. They are preferred over Major Downtown Streets for access to off-street parking lots and loading docks. Special attention should be paid to accessibility on curbless streets. Materials that are detectable to people with vision disabilities, including by feel and high visual contrast, should be used to maintain safety for all users.

Additional Detail Dictionary References

CU2	Bike Parking
CU3	Bollards
CU5	Decorative Planters
CU7	Micromobility Hubs

SA15

Raised Intersections

Intersections should be designed to prioritize people walking, riding bicycles, and using micromobility devices. Raised intersections should be used to signal pedestrian priority at crossings and also provide space to use pavers or other character-appropriate materials along the street.

SN2
SN5
SN6

Urban Trail Wayfinding

The City of Providence's branded Urban Trail pavement markings, wayfinding, and interpretive signage should be included to direct Urban Trail users to important destinations such as parks, schools, libraries, and museums, highlight important cultural and historic information, and provide consistency along the entirety of the Urban Trail.

SA3
SA13
SA13

Intersection Design

Where raised intersections are not feasible crossing busy streets, consider using dedicated signal phasing, refuge medians, and/or additional signage. Where raised intersections are not feasible at offset intersections where Minor Downtown Streets meet a larger or busier street, short trail segments should be built to connect two links using the appropriate context type. These short links should be highly noticeable and legible at each end.

Shared Streets

Where Urban Trails are designated along Minor Downtown Streets, streets should be shared streets that prioritize slow, non-vehicular travel and provide high levels of comfort. If curbless, shared streets are not feasible, the Urban Trail should be bi-directional and located along one side of the street with full separation from motor vehicle traffic provided.

MINOR DOWNTOWN STREET

URBAN TRAIL

Connectivity is the defining feature of Providence's Urban Trail network. Minor Downtown Streets -especially curbless ones - inherently meet many requirements for Providence's Urban Trail Network, excepting connectivity. For Minor Downtown Streets to rise to the level of an Urban Trail, special attention should be paid to ensure a consistent and continuous route is provided across major intersecting streets.

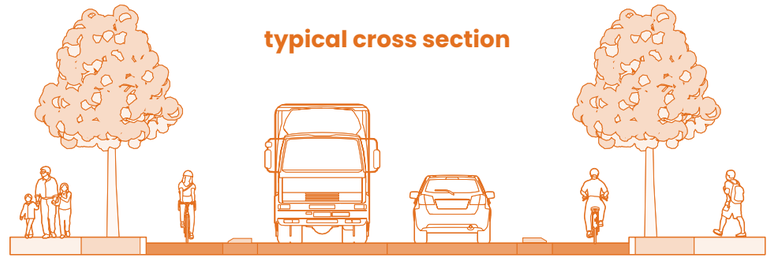
Additional Detail Dictionary References

SA18	Intersection Treatments for Bike Lanes and Urban Trails
SN4	Rectangular Rapid-Flashing Beacons (RRFB)
SN7	Urban Trail Signal Strategies

INDUSTRIAL STREET

Industrial Streets play an important role supporting the local and regional economy. Large trucks regularly use these streets to process and distribute goods from industrial sites within Providence. While Industrial Streets may lack pedestrian-scaled storefronts or other active uses, they should be designed to create an engaging, comfortable, and safe public realm for people who work in or travel through industrial areas.

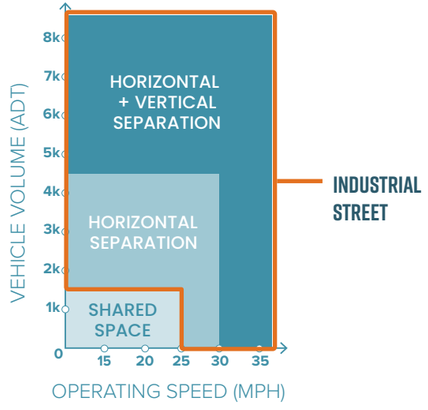
typical cross section



	sidewalk	landscape buffer[1]	bike lane[2]	travel lane	travel lane	bike lane[2]	landscape buffer[1]	sidewalk
rec	6'	5'	9.5'	11''	11''	9.5'	5'	6'
min	5'	0'	5'	10'	10'	5'	0'	5'
max	-	-	-	11'	11'	-	-	-

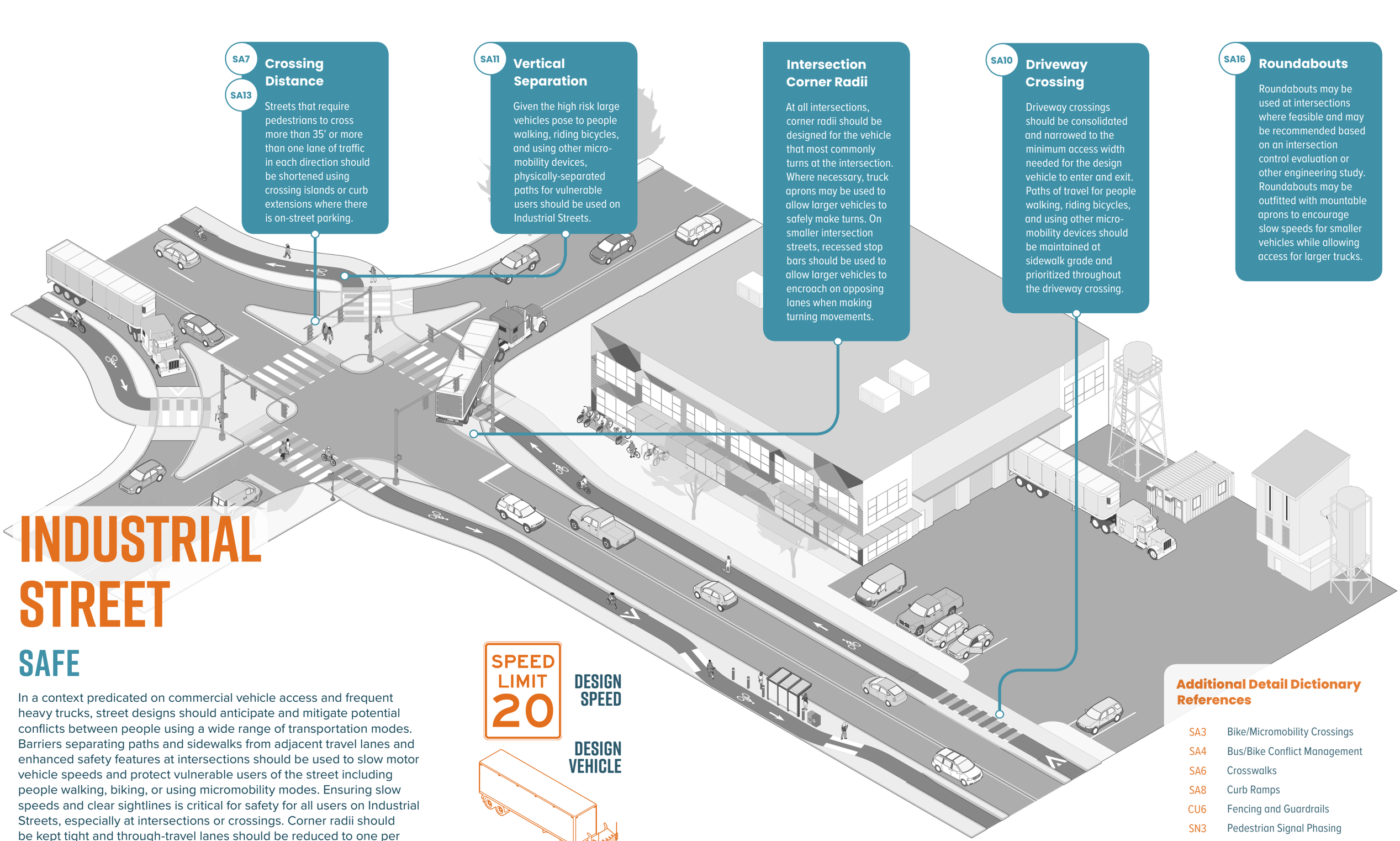
[1] When the project is located within a stormwater priority area, space for stormwater infiltration should be maximized, where appropriate.
[2] Where available space for the bike lane exceeds 8', vertical separation should be used. Where available space for the bike lane exceeds 6', provide a painted buffer between parked cars and the bike lane where there is parallel parking, or between travel lanes and the bike lane where no parallel parking is located. In some cases where total bike lane space is 10-14' for both directions, both directions of bike traffic should be consolidated on one side of the street in a bidirectional facility.

facility selection guide



example streets

- Allens Avenue
- Niantic Avenue
- Dupond Drive
- Magnan Drive



INDUSTRIAL STREET

SAFE

In a context predicated on commercial vehicle access and frequent heavy trucks, street designs should anticipate and mitigate potential conflicts between people using a wide range of transportation modes. Barriers separating paths and sidewalks from adjacent travel lanes and enhanced safety features at intersections should be used to slow motor vehicle speeds and protect vulnerable users of the street including people walking, biking, or using micromobility modes. Ensuring slow speeds and clear sightlines is critical for safety for all users on Industrial Streets, especially at intersections or crossings. Corner radii should be kept tight and through-travel lanes should be reduced to one per direction to create predictable and slow traffic patterns that improve safety for all users.

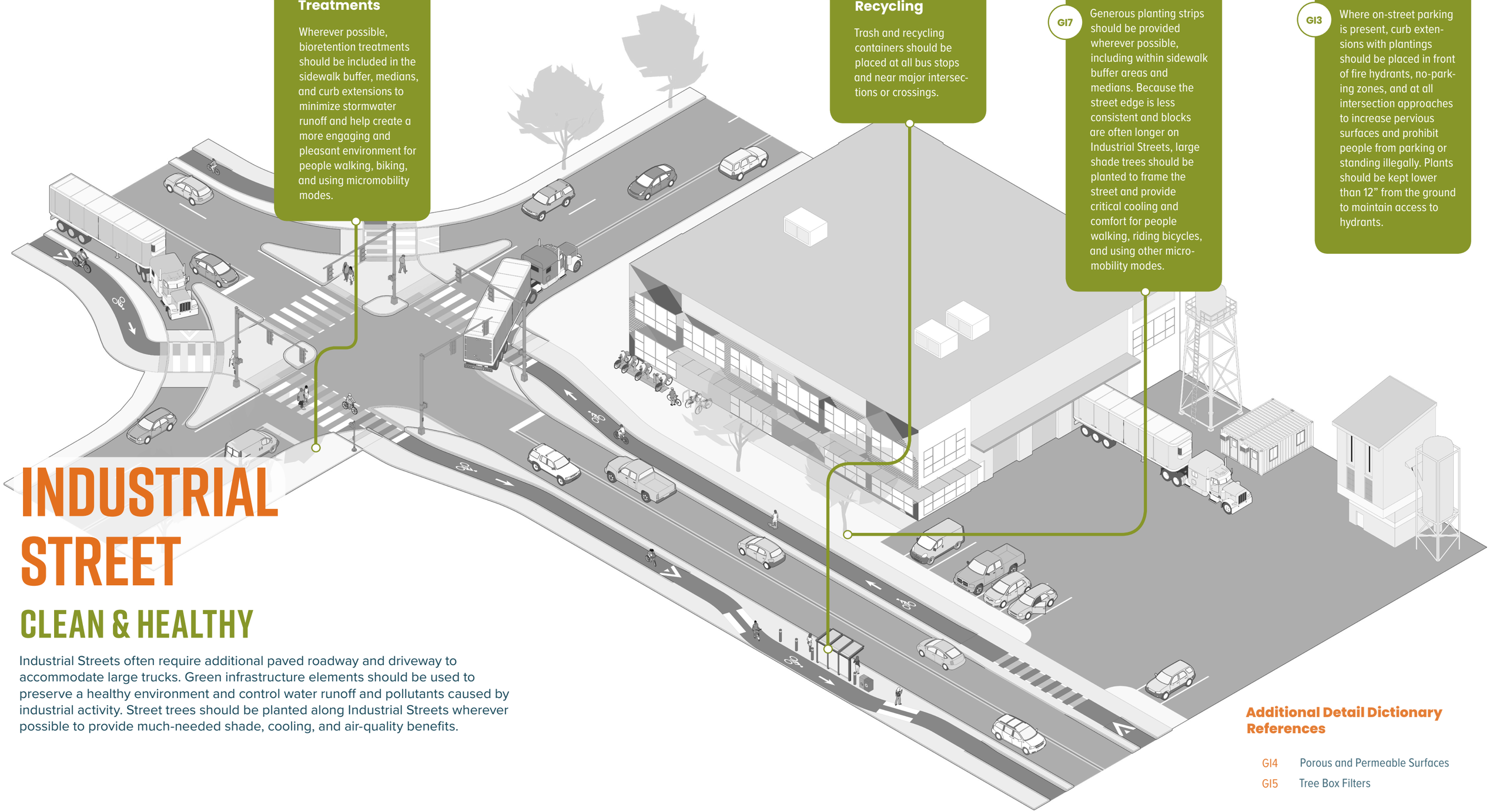
DESIGN SPEED

DESIGN VEHICLE

WB-50

Additional Detail Dictionary References

SA3	Bike/Micromobility Crossings
SA4	Bus/Bike Conflict Management
SA6	Crosswalks
SA8	Curb Ramps
CU6	Fencing and Guardrails
SN3	Pedestrian Signal Phasing



GI1 Bioretention Treatments

Wherever possible, bioretention treatments should be included in the sidewalk buffer, medians, and curb extensions to minimize stormwater runoff and help create a more engaging and pleasant environment for people walking, biking, and using micromobility modes.

CU11 Trash and Recycling

Trash and recycling containers should be placed at all bus stops and near major intersections or crossings.

GI3 Planting Strips

GI7

Generous planting strips should be provided wherever possible, including within sidewalk buffer areas and medians. Because the street edge is less consistent and blocks are often longer on Industrial Streets, large shade trees should be planted to frame the street and provide critical cooling and comfort for people walking, riding bicycles, and using other micromobility modes.

SA7 Curb Extensions

GI3

Where on-street parking is present, curb extensions with plantings should be placed in front of fire hydrants, no-parking zones, and at all intersection approaches to increase pervious surfaces and prohibit people from parking or standing illegally. Plants should be kept lower than 12” from the ground to maintain access to hydrants.

INDUSTRIAL STREET

CLEAN & HEALTHY

Industrial Streets often require additional paved roadway and driveway to accommodate large trucks. Green infrastructure elements should be used to preserve a healthy environment and control water runoff and pollutants caused by industrial activity. Street trees should be planted along Industrial Streets wherever possible to provide much-needed shade, cooling, and air-quality benefits.

Additional Detail Dictionary References

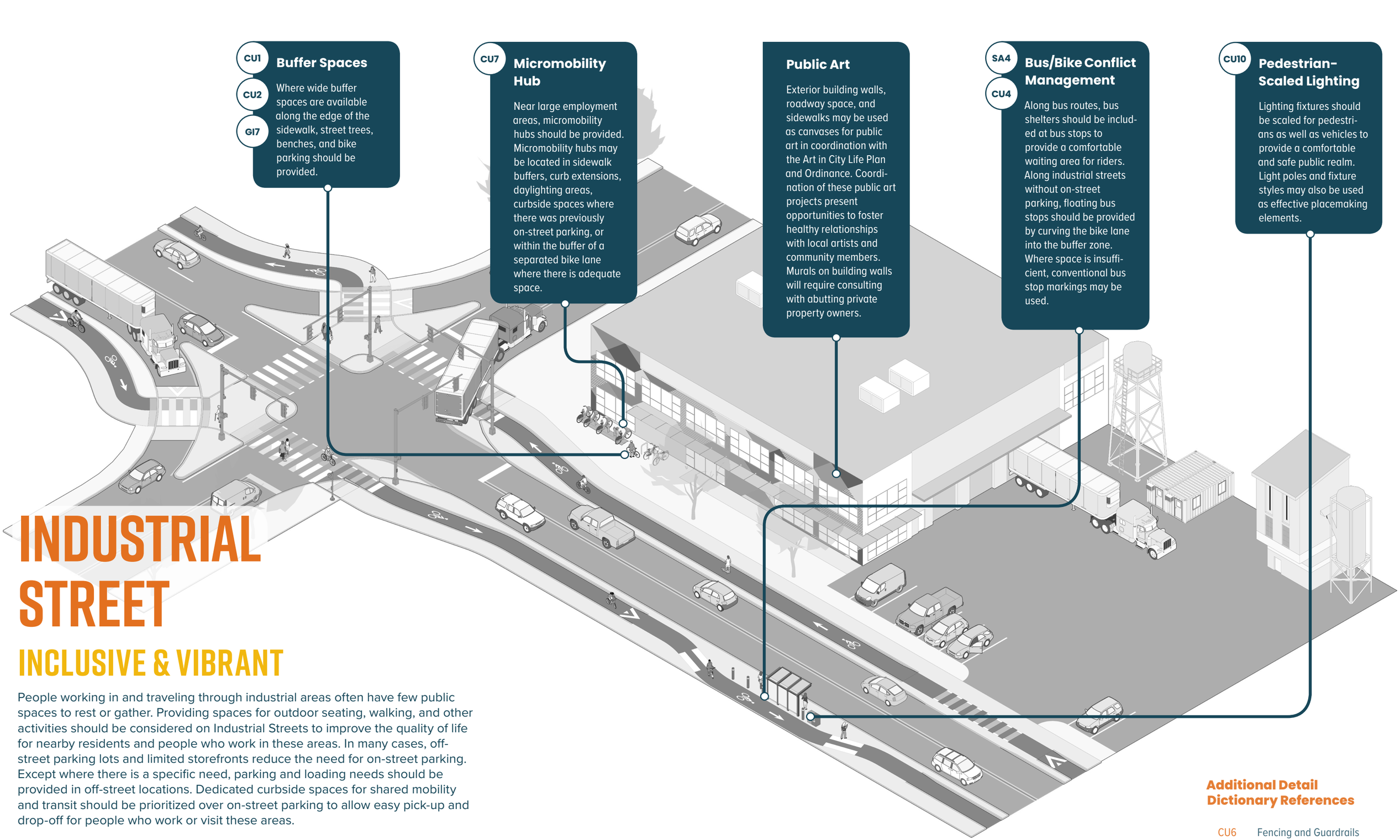
GI4 Porous and Permeable Surfaces

GI5 Tree Box Filters

INDUSTRIAL STREET

INCLUSIVE & VIBRANT

People working in and traveling through industrial areas often have few public spaces to rest or gather. Providing spaces for outdoor seating, walking, and other activities should be considered on Industrial Streets to improve the quality of life for nearby residents and people who work in these areas. In many cases, off-street parking lots and limited storefronts reduce the need for on-street parking. Except where there is a specific need, parking and loading needs should be provided in off-street locations. Dedicated curbside spaces for shared mobility and transit should be prioritized over on-street parking to allow easy pick-up and drop-off for people who work or visit these areas.



Additional Detail Dictionary References

CU6 Fencing and Guardrails

SA3
SA10
SN7

Vehicle Conflict Management

Conflict points with motor vehicles should be minimized and mitigated through careful design and signal treatments at intersections and driveway crossings. Due to the presence of high-volume driveways, clear priority for Urban Trail users should be provided at all major driveway crossings by maintaining the grade of the sidewalk, using high visibility paint, and appropriate signage.

CU1
CU10
CU11
GI7

Sidewalk/Trail Buffer

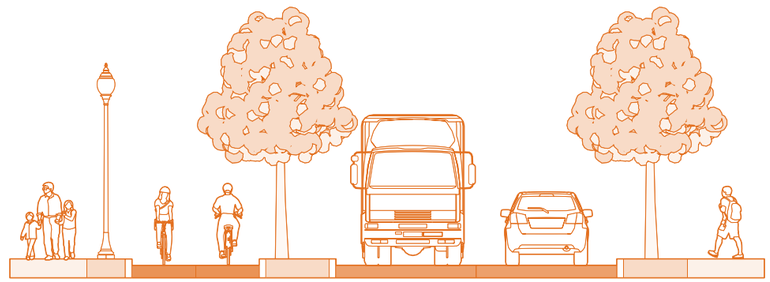
When at sidewalk level, a buffer between the sidewalk and Urban Trail is desirable to protect people walking from faster-moving modes generally used in the Urban Trail. The buffer between the Urban Trail and sidewalk is an ideal place to reinforce clean and healthy streets with plantings, and trash and recycling bins, or to enhance other elements of the street with benches, lighting, and art.

SA11
GI2

Planted Buffer

Where enough right-of-way exists, a wide planting strip should be provided between the Urban Trail and vehicle travel lanes to form a buffer. In constrained sections, the buffer should be at least 2' wide and feature a planting strip or other context-appropriate materials for vertical separation.

typical cross section



	sidewalk	landscape buffer	Urban Trail	buffer	travel lane	travel lane	landscape buffer	sidewalk
rec	6'	3'	10'	5'	11'	11'	5'	6'
min	5'	2'	8'	2'	10'	10'	2'	5'
max	-	-	16'	-	11'	11'	-	-

SA4

Bus/Bike Conflict Management

If bus service is provided, floating bus stops should be used to mitigate bus activity and contra-flow trail movements. If on-street parking is only provided on one side of the street, it should be located on the same side as the Urban Trail to provide requisite space for the floating bus stop. If there is no on-street parking, the Urban Trail may curve towards the sidewalk and may need to share sidewalk space for a short period. In these cases, the Urban Trail should be delineated with different pavement markings and should narrow to 8' to leave the maximum amount of exclusive-pedestrian space possible.

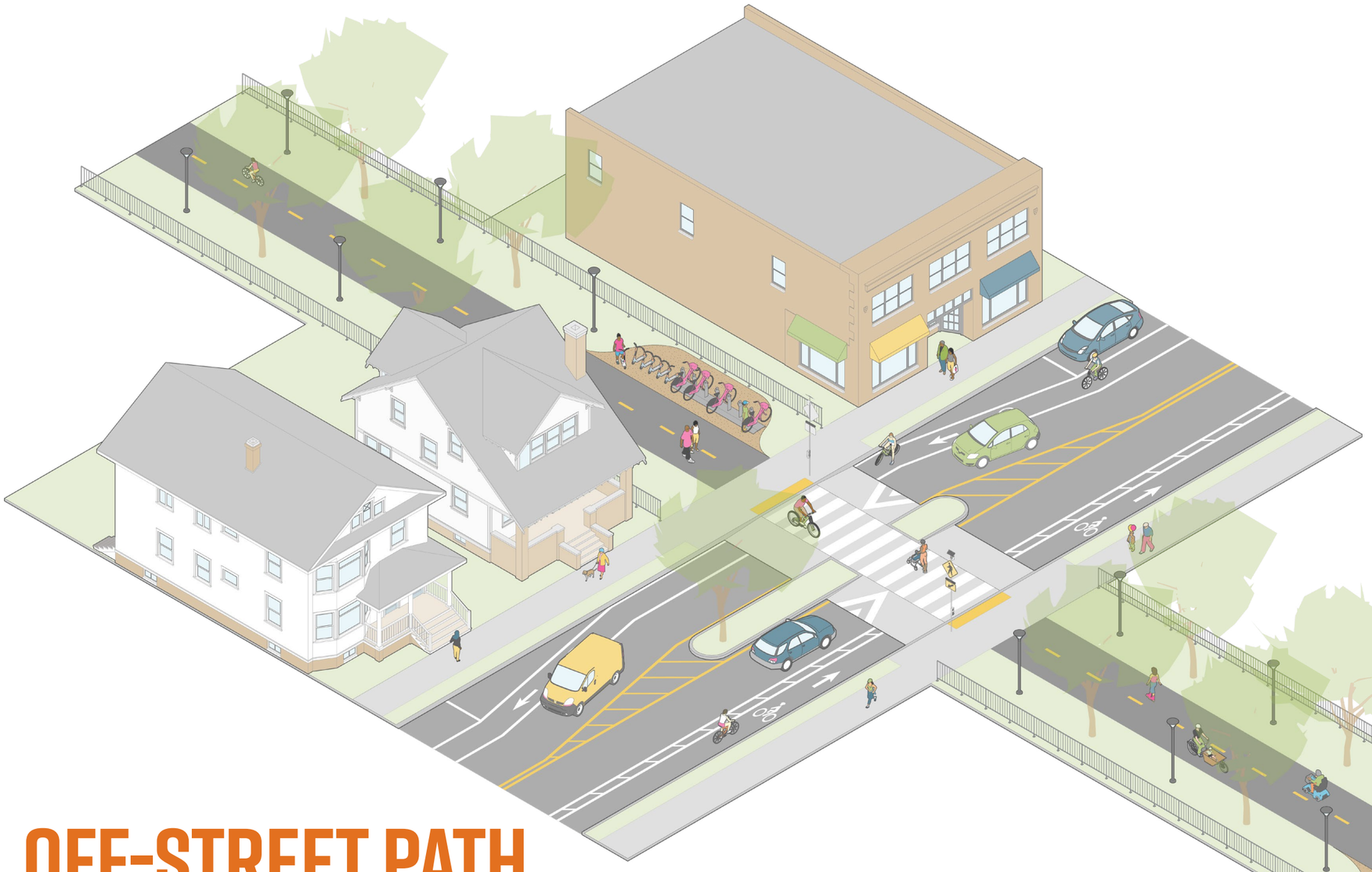
INDUSTRIAL STREET

URBAN TRAIL

Urban trails through industrial areas provide key connections between neighborhoods and to industrial jobs along the street. Urban trails should consist of two-way paths fully separated and protected from vehicle traffic through industrial areas. With a significant number of large vehicles making turns in and out of industrial driveways along the street edge, designers should seek to minimize conflicts with curbside and driveway activity when determining which side of the street is most appropriate for the Urban Trail. The volume of trail users on Industrial Streets will likely be low to moderate, but may be higher along streets that serve as a primary connection between dense residential areas and high-activity destinations such as Downtown or local universities. In constrained areas, it may be appropraite to consolidate the Urbal Trail and sidewalk on one side of the street.

Additional Detail Dictionary References

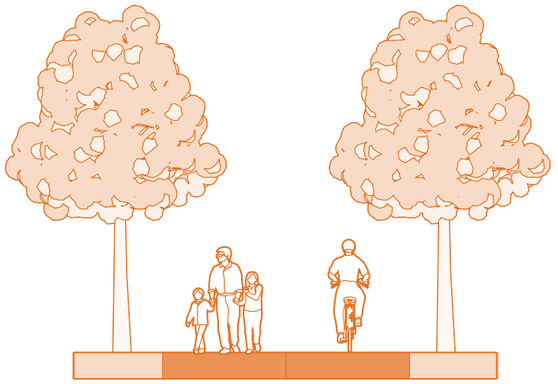
SA18	Intersection Treatments for Bike Lanes and Urban Trails
SN5	Urban Trail Identification



OFF-STREET PATH

Off-street paths – usually in parks and along greenways – provide people with an important oasis from busy urban life without needing to travel far to access greenery and nature. Though some off-street paths create obvious links within the Urban Trail Network, others may be intended for more passive uses and have different design needs based on their desired use as either active travelways or passive recreation spaces.

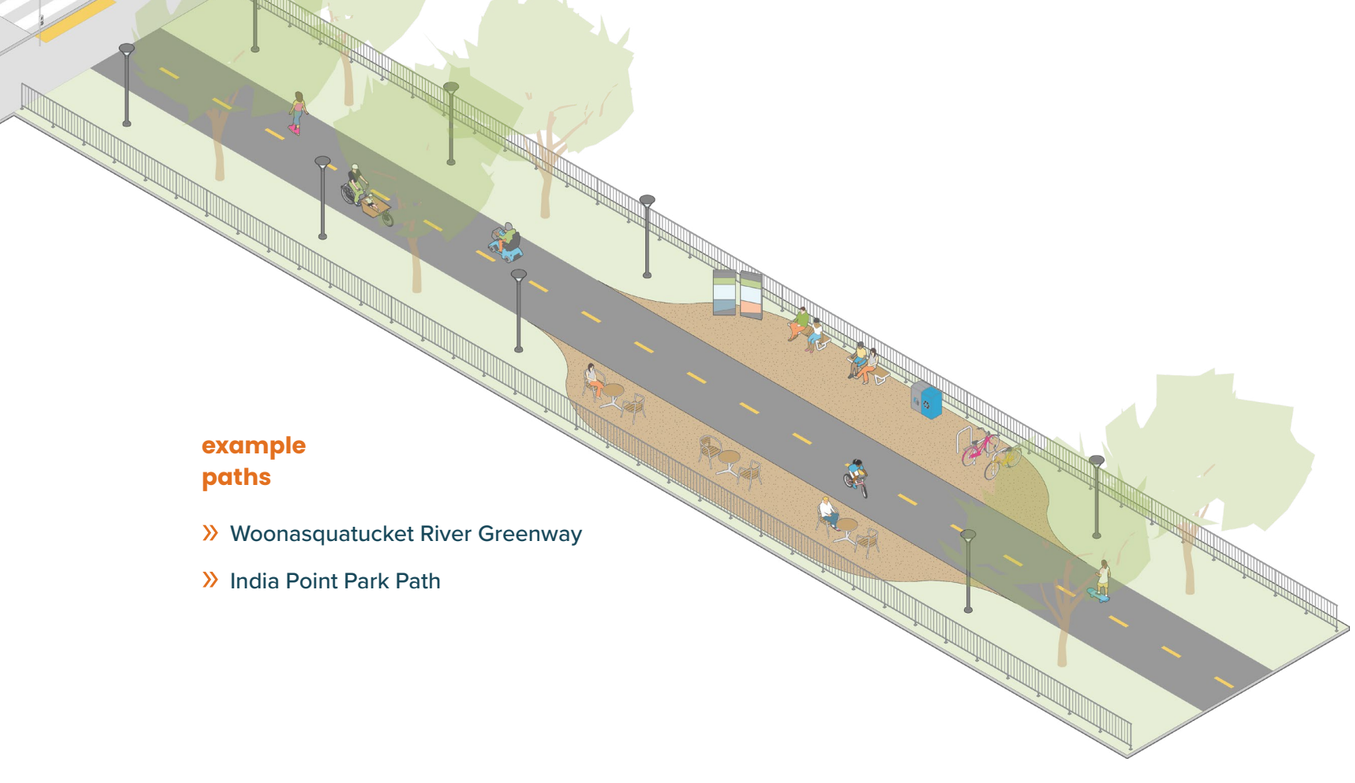
typical cross section

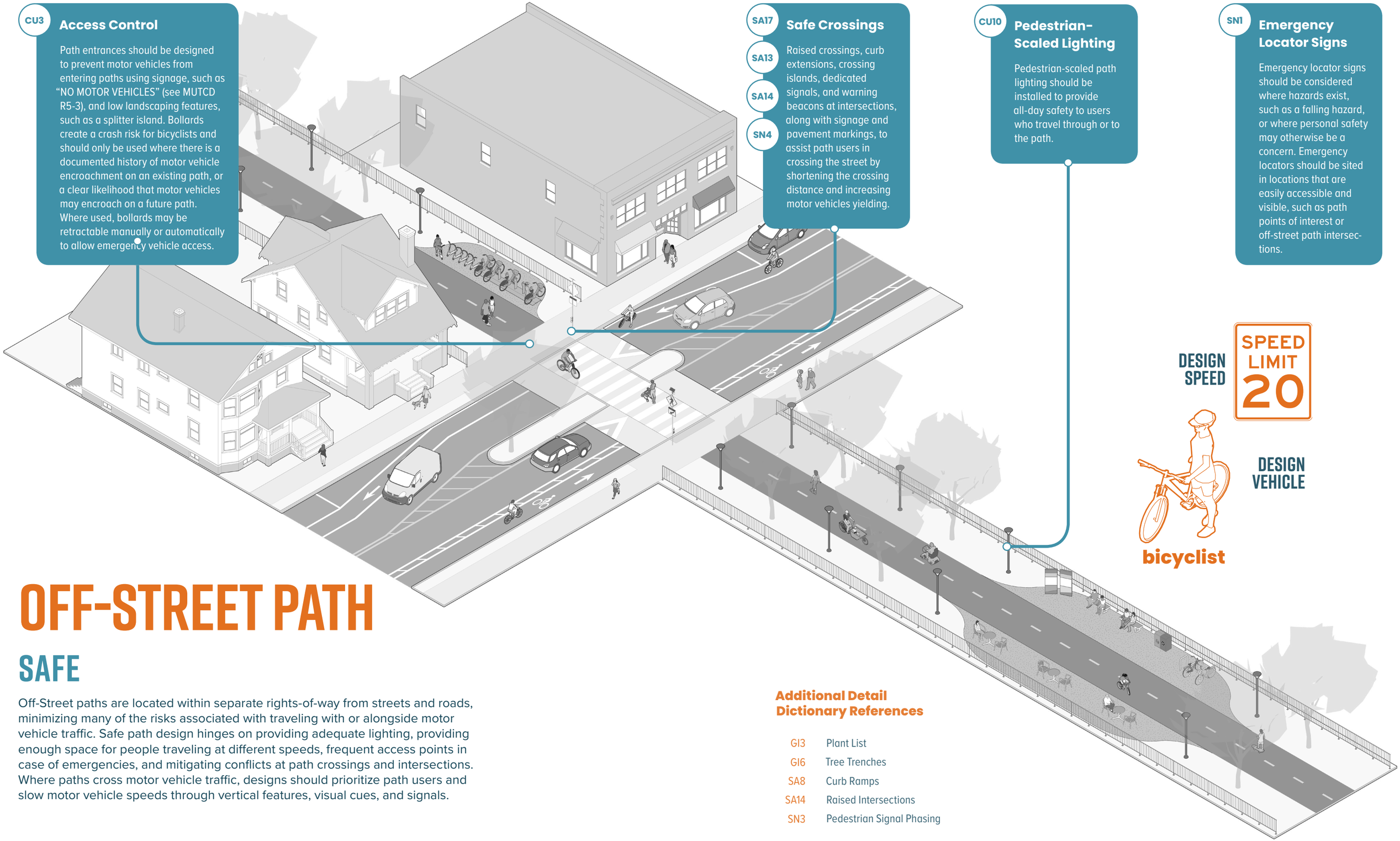


	buffer	trail	buffer
rec	**5'**	**14'**	**5'**
min	**2'**	**10'**	**2'**
max	-	-	-

example paths

- Woonasquatucket River Greenway
- India Point Park Path





CU3 Access Control

Path entrances should be designed to prevent motor vehicles from entering paths using signage, such as "NO MOTOR VEHICLES" (see MUTCD R5-3), and low landscaping features, such as a splitter island. Bollards create a crash risk for bicyclists and should only be used where there is a documented history of motor vehicle encroachment on an existing path, or a clear likelihood that motor vehicles may encroach on a future path. Where used, bollards may be retractable manually or automatically to allow emergency vehicle access.

SA17 SA13 SA14 SN4 Safe Crossings

Raised crossings, curb extensions, crossing islands, dedicated signals, and warning beacons at intersections, along with signage and pavement markings, to assist path users in crossing the street by shortening the crossing distance and increasing motor vehicles yielding.

CU10 Pedestrian-Scaled Lighting

Pedestrian-scaled path lighting should be installed to provide all-day safety to users who travel through or to the path.

SN1 Emergency Locator Signs

Emergency locator signs should be considered where hazards exist, such as a falling hazard, or where personal safety may otherwise be a concern. Emergency locators should be sited in locations that are easily accessible and visible, such as path points of interest or off-street path intersections.

DESIGN SPEED

SPEED LIMIT 20

DESIGN VEHICLE

bicyclist

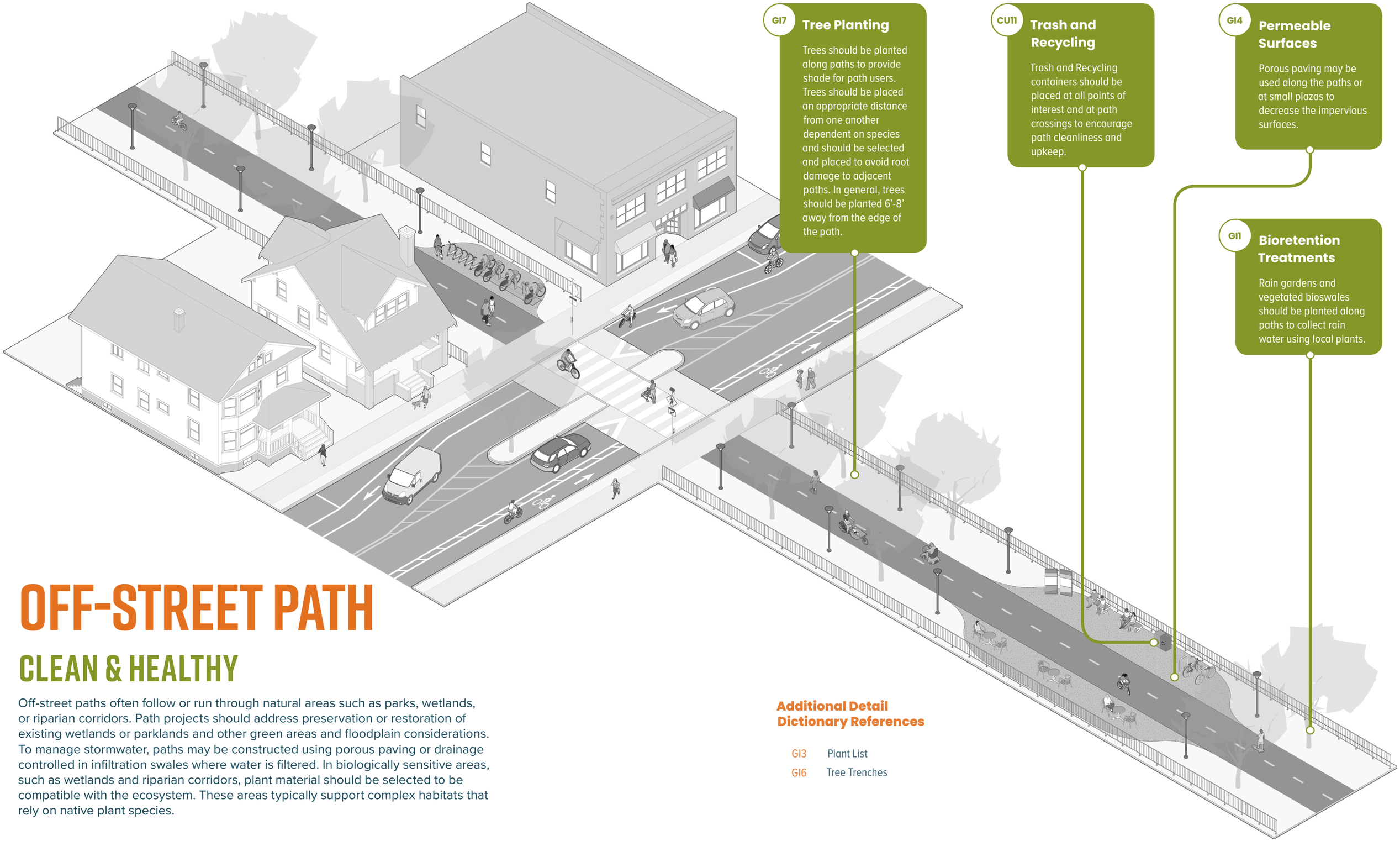
OFF-STREET PATH

SAFE

Off-Street paths are located within separate rights-of-way from streets and roads, minimizing many of the risks associated with traveling with or alongside motor vehicle traffic. Safe path design hinges on providing adequate lighting, providing enough space for people traveling at different speeds, frequent access points in case of emergencies, and mitigating conflicts at path crossings and intersections. Where paths cross motor vehicle traffic, designs should prioritize path users and slow motor vehicle speeds through vertical features, visual cues, and signals.

Additional Detail Dictionary References

GI3	Plant List
GI6	Tree Trenches
SA8	Curb Ramps
SA14	Raised Intersections
SN3	Pedestrian Signal Phasing



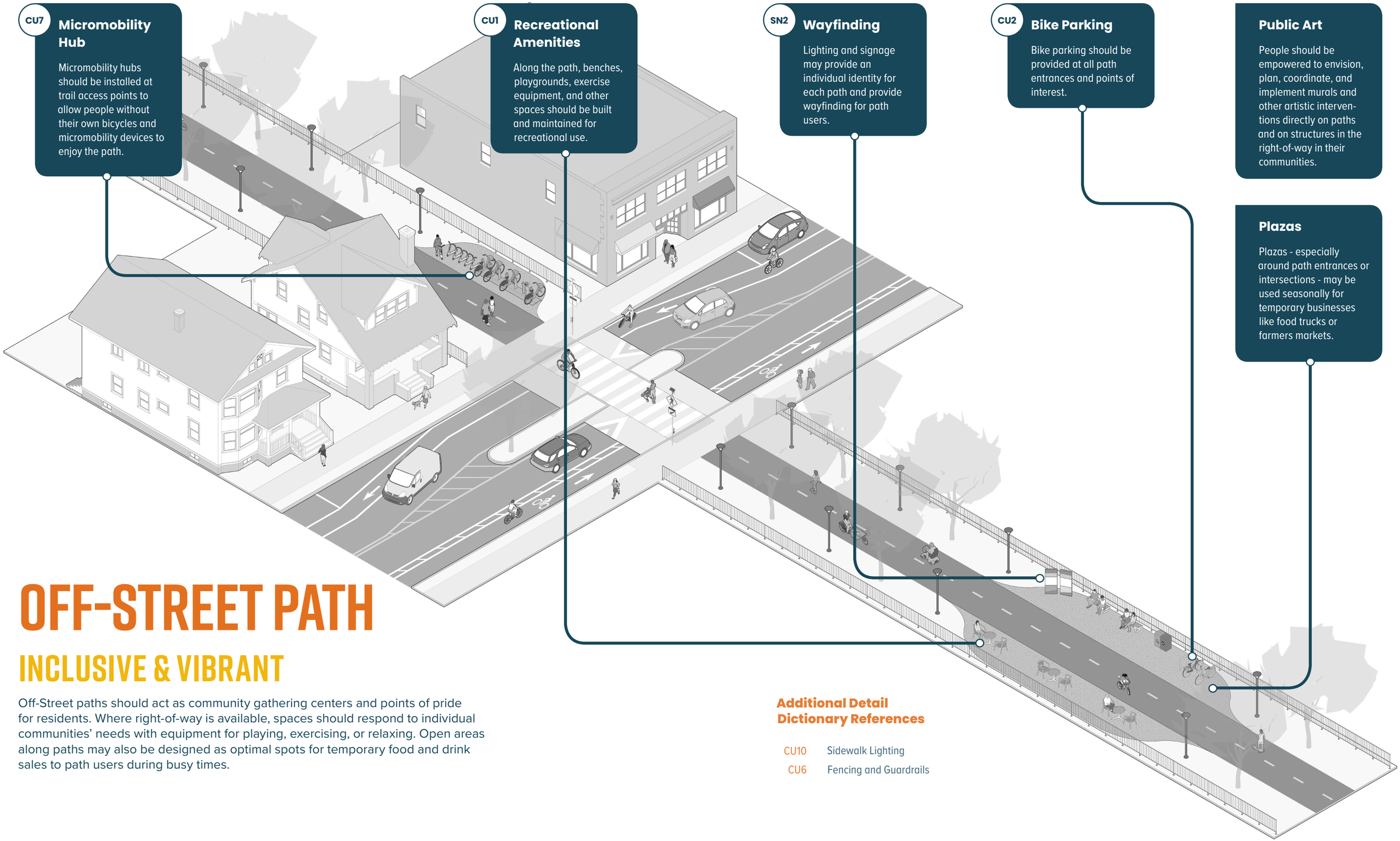
OFF-STREET PATH

CLEAN & HEALTHY

Off-street paths often follow or run through natural areas such as parks, wetlands, or riparian corridors. Path projects should address preservation or restoration of existing wetlands or parklands and other green areas and floodplain considerations. To manage stormwater, paths may be constructed using porous paving or drainage controlled in infiltration swales where water is filtered. In biologically sensitive areas, such as wetlands and riparian corridors, plant material should be selected to be compatible with the ecosystem. These areas typically support complex habitats that rely on native plant species.

Additional Detail Dictionary References

GI3 Plant List
GI6 Tree Trenches



OFF-STREET PATH

INCLUSIVE & VIBRANT

Off-Street paths should act as community gathering centers and points of pride for residents. Where right-of-way is available, spaces should respond to individual communities' needs with equipment for playing, exercising, or relaxing. Open areas along paths may also be designed as optimal spots for temporary food and drink sales to path users during busy times.

Additional Detail Dictionary References

CU10	Sidewalk Lighting
CU6	Fencing and Guardrails

OFF-STREET PATH

URBAN TRAIL

Paths within parks and other natural spaces take on a unique identity based on their surrounding environmental, cultural, and land use features. This section is intended to provide guidance on how to successfully incorporate a range of off-street paths into the Urban Tail network in Providence. Off-street Urban Trails should include wide paths and may include separate pedestrian paths to safely and comfortably accommodate a higher volume and mix of users. Off-street trails should also seamlessly connect to on-street ones with wayfinding and smooth transitions.

SA14

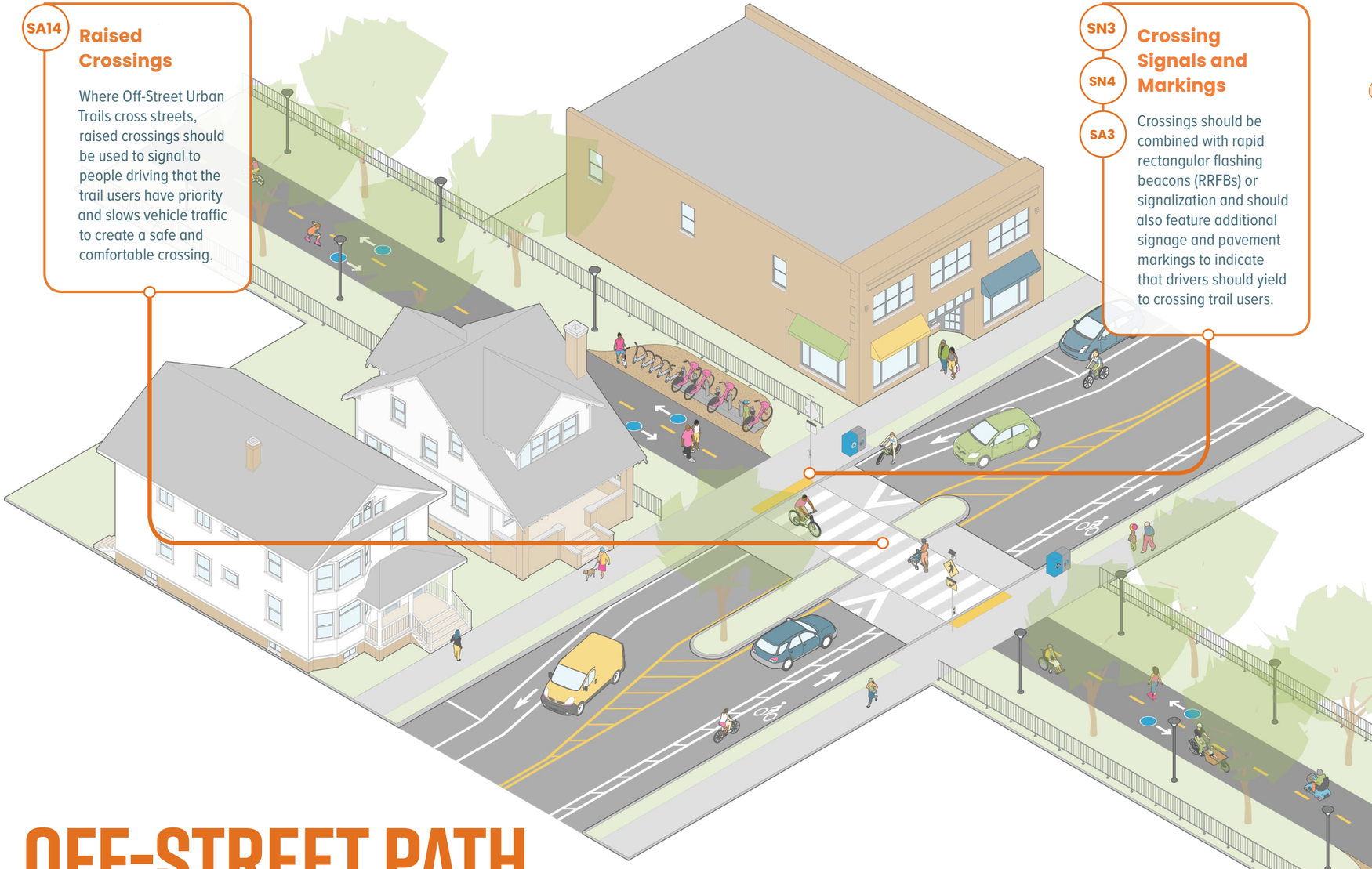
Raised Crossings

Where Off-Street Urban Trails cross streets, raised crossings should be used to signal to people driving that the trail users have priority and slows vehicle traffic to create a safe and comfortable crossing.

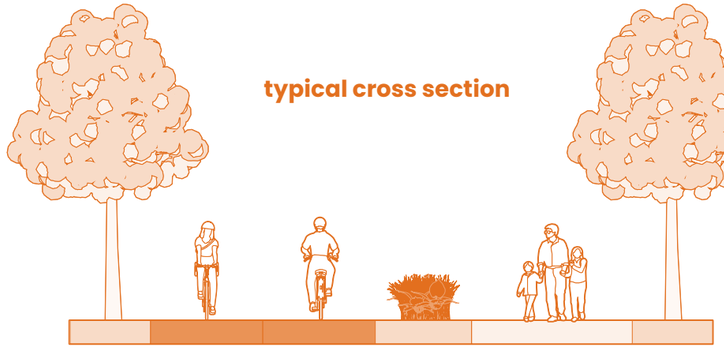
SN3
SN4
SA3

Crossing Signals and Markings

Crossings should be combined with rapid rectangular flashing beacons (RRFBs) or signalization and should also feature additional signage and pavement markings to indicate that drivers should yield to crossing trail users.



typical cross section



	buffer	Urban Trail	buffer	walking path[1]	buffer
rec	-	14’	6’	10’	-
min	5’	11’	2’	6’	5’
max	-	16’	-	10’	-

[1] Separation of walking and biking/micromobility paths should be considered when pedestrian are expected to constitute 30% or more of the total trail traffic. Designers may consult the FHWA Shared Use Path Level of Service Calculator for additional tools to evaluate path width.

SN2
SN5
SN6

Urban Trail Wayfinding

The City of Providence’s branded Urban Trail signage and pavement markings should be used to direct people along the Urban Trail, making navigation easy without the aid of smartphones or other devices.

Trail Width

Trail widths of at least 14’should be used. Wider paths should be considered where high levels of activity are expected.

Additional Detail Dictionary References

SA18 Intersection Treatments for Bike Lanes and Urban Trails

03 DETAIL DICTIONARY

This Detail Dictionary provides additional detail and specificity about the many elements referenced in Chapter 2, Context Types. The details provided in this chapter should be applied with professional engineering judgment. Details are provided for guidance purposes and are not to be used as construction-ready standards or specifications. The Detail Dictionary does not include every detail or feature required for the design of streets and Urban Trails, therefore throughout the chapter, references to other guides and industry standards are provided for supplemental information and detail.

HOW TO USE THE DETAIL DICTIONARY:

Each element in the Detail Dictionary corresponds with the letter/number codes referenced in the Context Types throughout Chapter 2. The individual elements within the Detail Dictionary are grouped under one of the following subject categories:

- **SA - Safety and Accessibility:** Details for elements that provide traffic calming by slowing motor vehicles, provide physical separation for people walking, riding bicycles and using other micromobility options, increase visibility of people walking and riding bicycles, and enhance accessibility for users of all ages and abilities.
- **GI - Green Infrastructure:** Details for elements that beautify streets and mitigate adverse environmental impacts from pollution, stormwater runoff, and heat island effect. Consult the 2019 RIDOT Linear Stormwater Manual for comprehensive information regarding a wide range of stormwater Best Management Practices.
- **CA - Curbside Amenities:** Details for elements that provide seating, shelter at transit stops, waste disposal, storage for bikes and scooters, and other means for enjoying the street environment.
- **SN – Signage and Signals:** Details for traffic signals and signage for streets and Urban Trails. Standard roadway signage is not included in this dictionary. Consult the MUTCD for additional detail about requirements for regulatory signage.

Each detail provides a description and illustration depicting critical guidance including design components and dimensions. In addition, use, requirement, and preference information is provided for each element in the Detail Dictionary.

- **Use:** Defines what the element achieves and where the element is appropriate.
- **Requirements:** Identifies dimensional, placement, and other requirements for design features and elements
- **Additional Considerations:** Describes opportunities for enhancements or alternative design features that practitioners should consider related to use, maintenance needs, and culture.

NOTE ON THE USE OF THE WORD SHOULD

“Should” statements in this Guide denote the official policy or approach of the City of Providence. Exceptions to “Should” statements will be documented and reviewed on a case-by-case basis.

SAFETY & ACCESSIBILITY

Details for elements that provide traffic calming by slowing motor vehicles, provide physical separation for people walking, riding bicycles and using other micromobility options, increase visibility of people walking and riding bicycles, and enhance accessibility for users of all ages and abilities.

- **SA01** Access Control/Diverters
- **SA02** Accessible Parking & Pick-up/Drop-off Zones
- **SA03** Bike/Micromobility Crossings
- **SA04** Chicanes
- **SA05** Bus/Bike Conflict Management
- **SA06** Crosswalks
- **SA07** Curb Extensions
- **SA08** Curb Ramps
- **SA09** Daylighting
- **SA10** Driveway Crossings
- **SA11** Materials for Vertical Separation
- **SA12** Neighborhood Traffic Circles
- **SA13** Pedestrian Islands
- **SA14** Raised Crossings
- **SA15** Raised Intersections
- **SA16** Roundabouts
- **SA17** Speed Lumps
- **SA18** Intersection Treatments for Bike Lanes and Urban Trails

GREEN INFRASTRUCTURE

Details for elements that beautify our streets and mitigate adverse environmental impacts from pollution, stormwater runoff, and heat island effect. Consult the 2019 RIDOT Linear Stormwater Manual for comprehensive information regarding a wide range of stormwater Best Management Practices.

- **GI01** Bioretention Treatments
- **GI02** Planting Strips
- **GI03** Plant List
- **GI04** Porous & Permeable Surfaces
- **GI05** Tree Box Filters
- **GI06** Tree Trenches
- **GI07** Tree Planting

CURBSIDE AMENITIES

Details for elements that provide seating, shelter at transit stops, waste disposal, storage for bikes and scooters, and other means for enjoying the street environment.

- **CU01** Benches/Seating
- **CU02** Bike Parking
- **CU03** Bollards
- **CU04** Bus Shelters & Stop Amenities
- **CU05** Decorative Planters
- **CU06** Fencing and Guardrails
- **CU07** Micromobility Hubs
- **CU08** Parking Meters/Kiosks
- **CU09** Parklets
- **CU10** Sidewalk Lighting
- **CU11** Trash & Recycling Containers

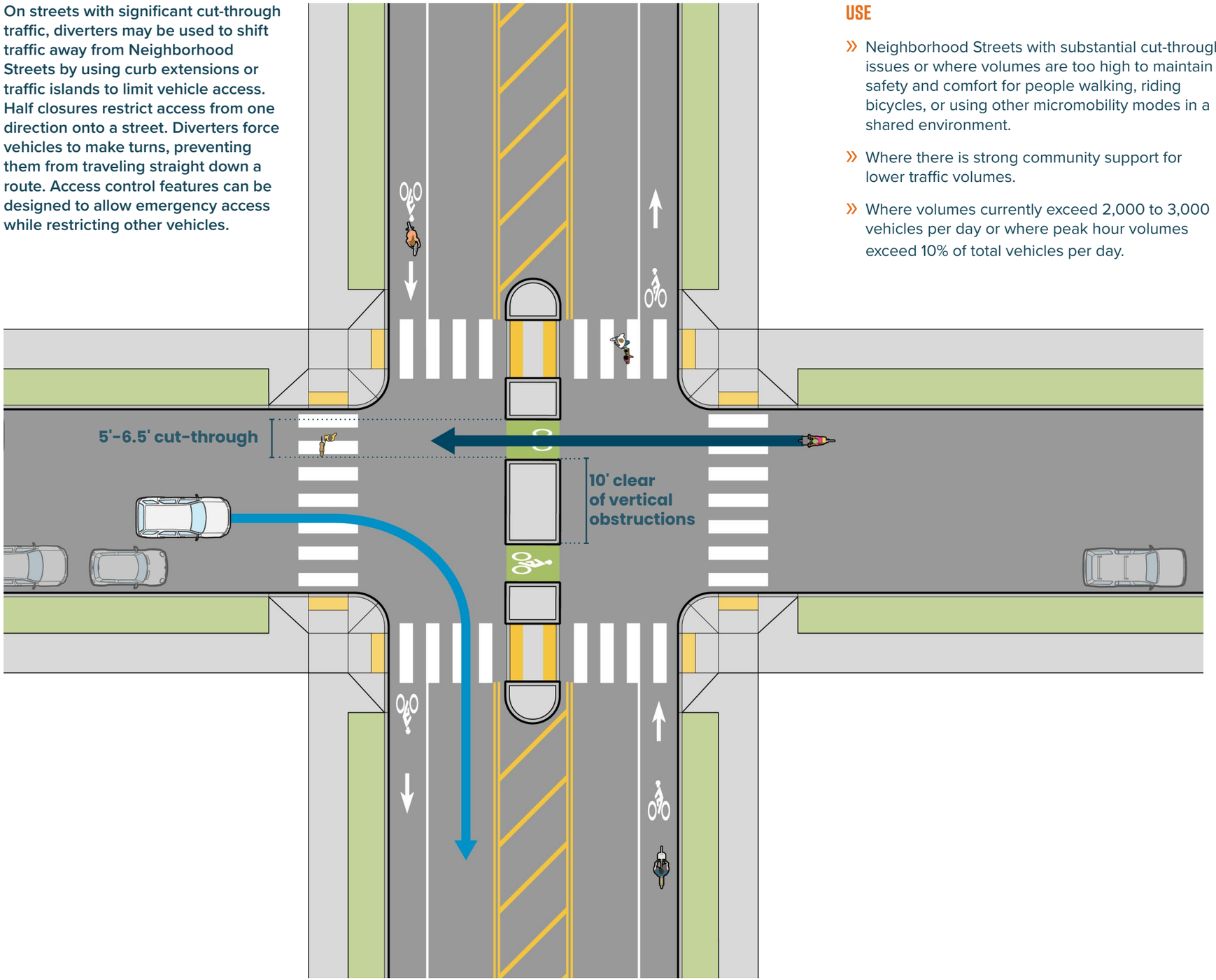
SIGNAGE AND SIGNALS

Details for signals and signage for our streets and Urban Trails. Standard roadway signage is not included in this dictionary. Consult the MUTCD for additional detail about requirements for regulatory signage.

- **SN01** Emergency Locators
- **SN02** Interpretive
- **SN03** Pedestrian Signal Phasing
- **SN04** Rectangular Rapid-Flashing Beacons (RRFB)
- **SN05** Urban Trail Identification
- **SN06** Urban Trail Network Trailhead Signs/Kiosks
- **SN07** Urban Trail Signal Strategies

SA01 ACCESS CONTROL/DIVERTERS

On streets with significant cut-through traffic, diverters may be used to shift traffic away from Neighborhood Streets by using curb extensions or traffic islands to limit vehicle access. Half closures restrict access from one direction onto a street. Diverters force vehicles to make turns, preventing them from traveling straight down a route. Access control features can be designed to allow emergency access while restricting other vehicles.



USE

- Neighborhood Streets with substantial cut-through issues or where volumes are too high to maintain safety and comfort for people walking, riding bicycles, or using other micromobility modes in a shared environment.
- Where there is strong community support for lower traffic volumes.
- Where volumes currently exceed 2,000 to 3,000 vehicles per day or where peak hour volumes exceed 10% of total vehicles per day.

REQUIREMENTS

- Provide accessible routes for people walking through access control features using flush surfaces and curb ramps at crossings.
- Where required, ensure emergency vehicle access is provided by considering the wheelbase of fire and other emergency vehicles when designing diverter islands. Consider using mountable 6” curbs and providing a width of 10’ that is clear of landscaping and rigid vertical elements within the diverter to aid emergency vehicle passage.
- Use cut-throughs of 5' to 6.5' to provide access for people riding bicycles and using other micromobility options while preventing vehicle through-traffic.

ADDITIONAL CONSIDERATIONS

- Consider potential traffic impacts to adjacent Neighborhood Streets before implementing diverters and ensure nearby Neighborhood Streets are adequately traffic calmed. Ensure diverters do not push cut through traffic from one Neighborhood Street to an adjacent Neighborhood Street, but rather deflect traffic to larger collectors and arterials.
- Use mountable curbs to keep vehicle routes narrow while allowing larger vehicles like delivery and garbage trucks to encroach on the barriers in turns.
- Provide W11-15 crossing signs where bicyclists and pedestrian crossings may be unexpected.

ADDITIONAL RESOURCES

- City of Providence Traffic Calming Design Guidelines
- FHWA Traffic Calming ePrimer 3.21 to 3.24

SA02 ACCESSIBLE PARKING & PICK-UP/DROP-OFF ZONES

Accessible parking and loading spaces provide additional space adjacent to parking stalls for vans with ramps to allow passenger alighting and ensure an accessible route from the landing area to the sidewalk. While on-street parking located adjacent to the sidewalk is generally considered accessible, parking that is located away from the sidewalk does not provide a clear accessible path to the sidewalk.

By State law, people with disability placards are permitted to park in any legal parking space without time restrictions and at no cost. However, standard parking stalls are not dimensioned to provide convenient or accessible routes for people using vehicle lifts and ramps.

USE

- For every 25 parking spaces up to 100 per block perimeter, one accessible parking space should be provided.
- For each additional 50 parking spaces up to 200 per block perimeter, one additional space should be accessible. Where more than 200 parking spaces are provided per block perimeter, 4% should be accessible.
- Where dedicated pick-up/drop-off passenger zones are provided, at least one passenger loading zone for each 100' should be accessible.

REQUIREMENTS

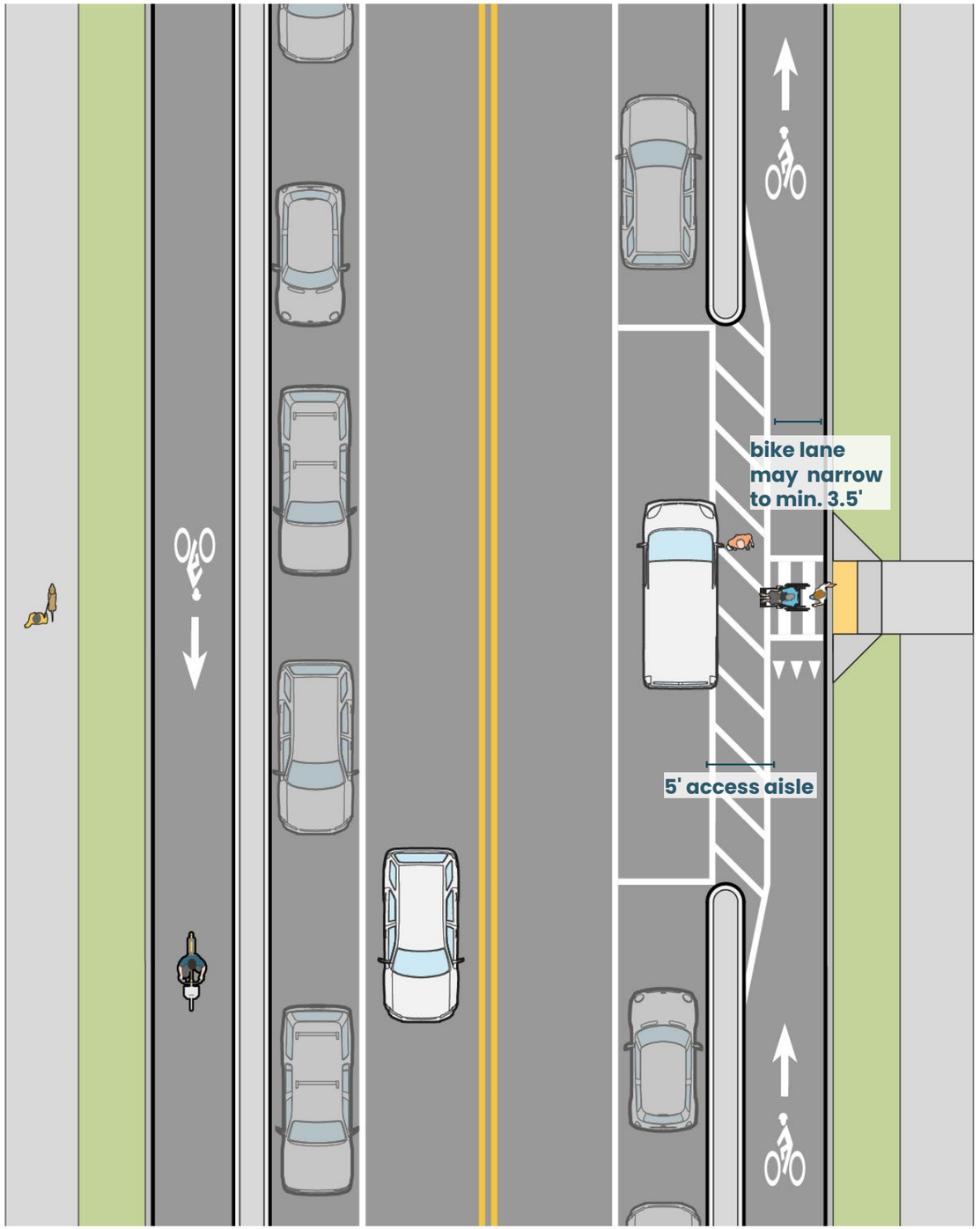
- Provide a 5' street-level access aisle adjacent to accessible spaces.
- In constrained rights-of-way, minimize the width of buffers before any other element. Separated bike lanes should be narrowed before sidewalks and may be reduced beyond their minimum dimensions for short distances. One-way separated bike lanes may narrow to 4.5' between curbs or 3.5' at sidewalk level or adjacent to a street level access aisle for short segments. Two-way separated bike lanes or Urban Trails may narrow to 8' between curbs or 7.5' at sidewalk level or access aisle for short segments.

ADDITIONAL CONSIDERATIONS

- Accessible spaces at the far side or near side of intersections can use existing curb ramps to maintain an accessible route.
- Mid-block spaces should be reserved for locations where intersection locations are not feasible or to facilitate access to a specific destination. A curb ramp to access the sidewalk from the accessible parking space will be required.

ADDITIONAL RESOURCES

- PROWAG



SA03 BIKE/MICROMOBILITY CROSSINGS

Bike Crossings are pavement markings that indicate a path or crossing at intersections or across driveways. They direct people riding bicycles or using other micromobility options to the safest direct path through an intersection and provide a warning to people driving to look for through movements before making a turn.

USE

- Where off-street Urban Trails meet roadways.
- Where bicycle/motor vehicle conflicts are frequent.
- Where the path of travel through the intersection is complex.
- Across wide, high-volume, and/or commercial driveways.

REQUIREMENTS

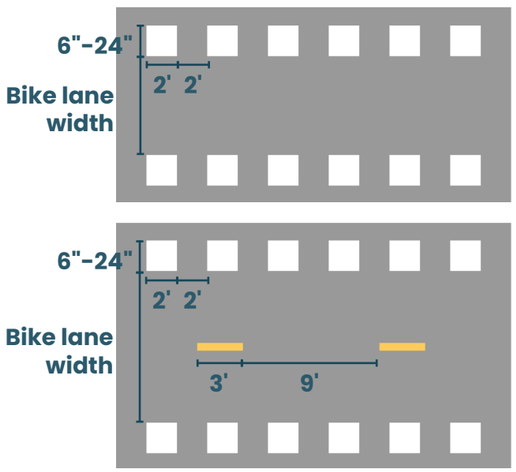
- Use white edge lines (which may be 6" to 24" in width) spaced 2' apart where not adjacent to a crosswalk.
- Maintain the width of the bike/micromobility crossing by aligning the outside lines of the crossing with the feeding and receiving legs of the bike lane or Urban Trail.
- Include a dashed yellow centerline in two-way bike/micromobility crossings.
- Use crossings in conjunction with advance-stop queue boxes, two-stage left turn boxes, and protected intersections (**see SA18**).

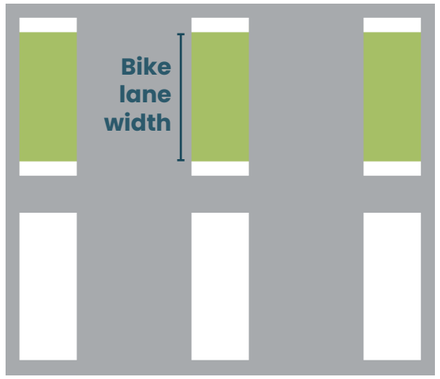
ADDITIONAL CONSIDERATIONS

- Apply green pavement markings along with dashed white edge lines to improve visibility and delineation of the crossing, especially when adjacent to a crosswalk.
- Align the inside of the white crossing markings with the width of the bike/micromobility facility to maintain the full width of the bike/micromobility lanes through the intersection.
- Align bike crossing markings with crosswalk markings where directly adjacent to minimize visual clutter.

ADDITIONAL RESOURCES

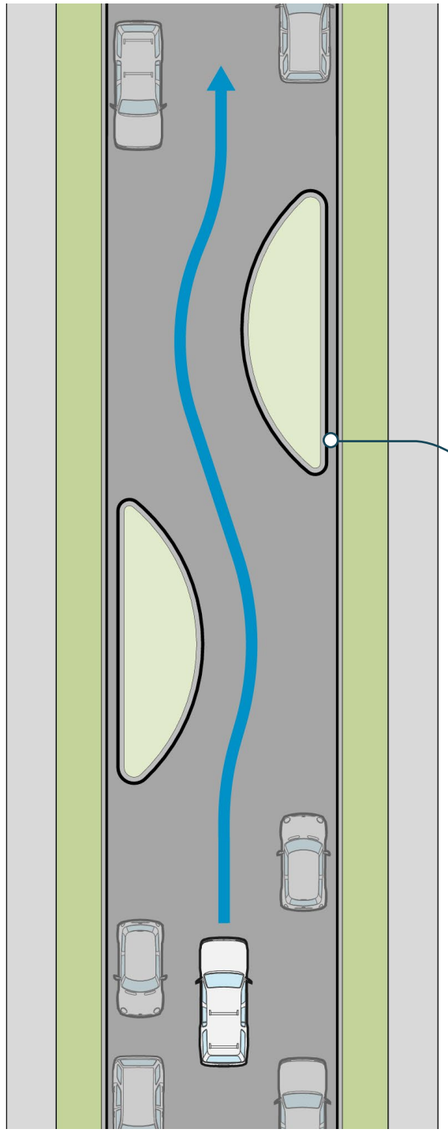
- AASHTO Guide for the Development of Bicycle Facilities
- FHWA Achieving Multimodal Networks
- NACTO Urban Bikeway Design Guide





SA04 CHICANES

Chicanes slow traffic by creating a serpentine travel path by alternating street features from one side of the street to the other. Curb extensions or on-street parallel parking may be used to produce a chicane. Chicanes increase the amount of public space available on a corridor and can be used for stormwater drainage catchment, street tree planting, benches, bicycle parking, and other amenities.



USE

- On low-volume streets including Neighborhood Streets, Neighborhood Connector Streets, and Minor Downtown streets.
- Avoid use on streets with significant volumes of bus, freight, or emergency response activity.

REQUIREMENTS

- Taper chicanes with a maximum ratio of 8:1 at either end.
- Use vertical elements like plantings or a W1-4 sign to warn drivers and snow plow operators of traffic pattern.

ADDITIONAL CONSIDERATIONS

- Use mountable curbs to accommodate larger vehicles while maintaining tight turn radii to slow people driving.
- Construct with 1' to 2' drainage channel between the chicane island and curb to maintain existing drainage patterns.
- Use for stormwater infiltration with bioretention areas or tree filter boxes (**see GI01 and GI05**).
- Consult with community members to identify what amenities within chicanes created with curb extensions are desired, such as public art, street furniture, bicycle parking, or planting area.

ADDITIONAL RESOURCES

- City of Providence Traffic Calming Design Guidelines
- FHWA Traffic Calming ePrimer 3.5
- NACTO Urban Street Design Guide

SA05 BUS/BIKE CONFLICT MANAGEMENT

The design treatments used for bus/bike conflict mitigation will depend on context, and may include either conventional bus stops, floating bus stops, or bus bulbs. Conflicts between curbside transit operations and people riding bicycles or using other micromobility options should be mitigated through design treatments that clearly define space and alert users to any locations where bus and bike/micromobility uses will be mixed within the street.

USE

- Where bus stops intersect two-way Urban Trails, floating bus stops are required to facilitate the contraflow bike/micromobility movement.
- Where bus stops intersect any type of separated bike/micromobility facility, floating bus stops are the preferred design treatment. Floating bus stops are specifically preferred along busy bus or bike/micromobility routes. Floating bus stops may also be used on streets with conventional striped bike lanes to better manage bus/bike conflicts and speed up transit operations.
- Where bike lanes and bus stops operate in a shared condition, conventional bus stop conflict markings should be used to identify conflict points and heighten awareness for both bus operators and people biking or using micromobility modes. Conventional bus stop markings may also be appropriate where one-way separated bike lanes are provided in highly constrained rights-of-way or on corridors with infrequent bus service.
- Where parallel on-street parking is provided and no bike lanes/Urban Trails are provided, bus bulbs may be used to improve transit operations and provide additional amenity space for passengers waiting at bus stops.

ADDITIONAL RESOURCES

- RIPTA Bus Stop Design Guide
- NACTO Transit Street Design Guide
- AASHTO Guide for the Development of Bicycle Facilities

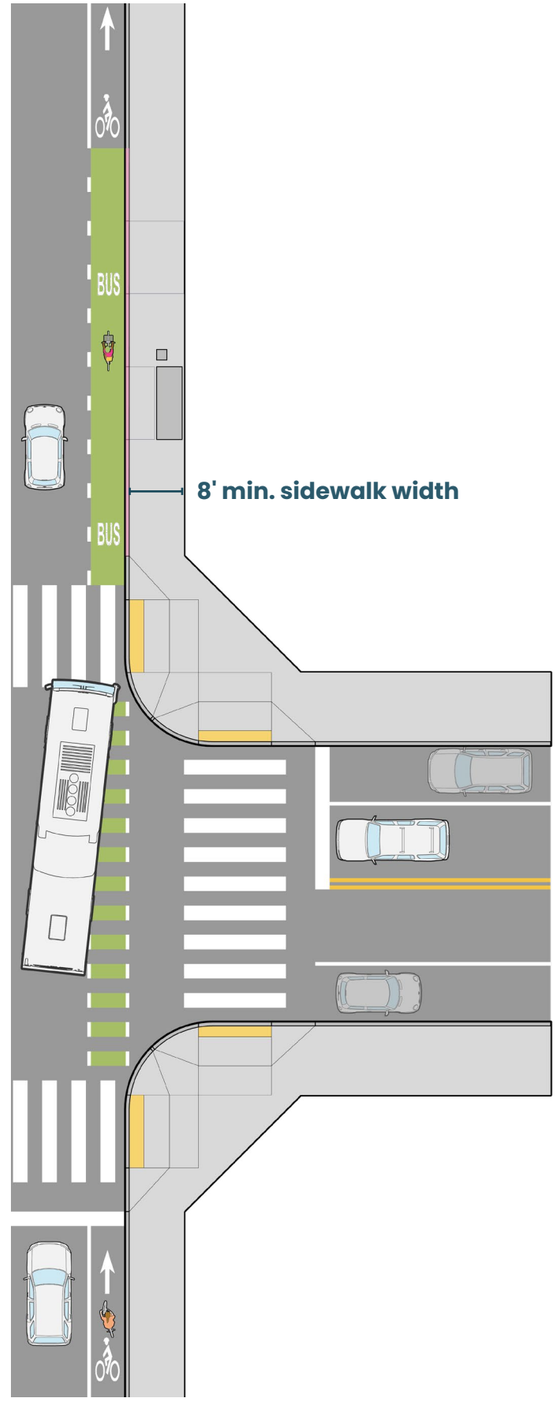
CONVENTIONAL BUS STOPS

CONSIDERATIONS

- The minimum sidewalk width at all bus stops should be 8' in order to accommodate deployment of an accessible ramp and boarding by passengers using wheeled mobility aids.
- Use bicycle lane symbols in conventional bus stops to indicate the best path of travel for people using bike lanes through the bus stop. Conventional bus stop markings should delineate a straight path of travel through the bus stop and to the entrance to the receiving bike lane after the bus stop. The bike lane symbols may be located between the “BUS” and “STOP” pavement markings.
- Provide adequate space for curbside bus stops to ensure buses can pull in fully parallel to the curb. Refer to Table 2.5 of the RIPTA Bus Stop Design Guide for specific requirements.

ADDITIONAL CONSIDERATIONS

- Include a bus shelter, seat, and trash and recycling receptacles at all stops.
- Provide smooth vertical transitions with a minimum slope of 1:12 and a maximum slope of 1:24 where bike/multimodal lanes rise to meet the sidewalk at grade at a bus platform.



SA05 BUS/BIKE CONFLICT MANAGEMENT (CONT.)

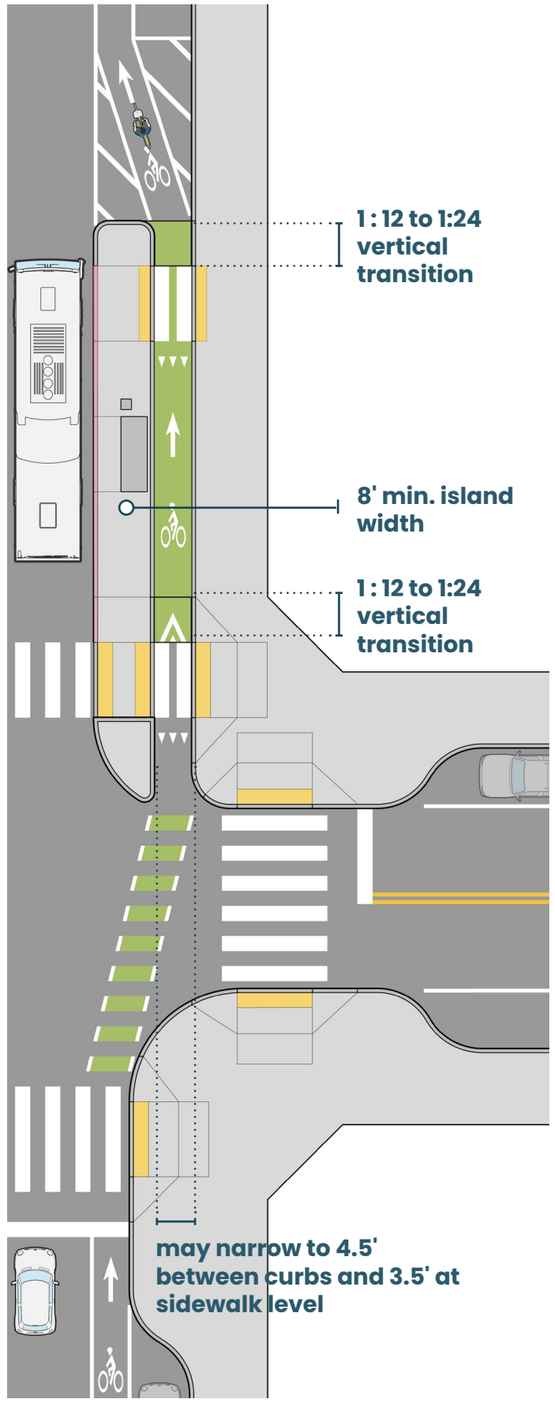
FLOATING BUS STOPS

REQUIREMENTS

- The minimum sidewalk width at all bus stops should be 8' in order to accommodate deployment of an accessible ramp and boarding by passengers using wheeled mobility aids.
- In constrained environments where a floating bus stop is required or desired, reduce the width of separated bike lanes before reducing space for the sidewalk or other features. One-way separated bike lanes may lanes narrow to 4.5' between curbs or 3.5' at sidewalk level. Two-way separated bike lanes or Urban Trails may narrow to 8' between curbs or 7.5' at sidewalk level.
- Provide a marked, level crossing with curb ramps or raise the bike lane or Urban Trail to sidewalk level where pedestrians must cross to the bus stop. Tactile strips should be used to communicate to blind or low-vision people where the bus stop crossing location is located.
- Use a gradual taper to route the bike/micomobility lane behind a floating bus stops, where needed. The maximum allowable taper ratio is 1:5, with a preferred ratio of 1:10.
- Ensure shy distances of 1' to 2' are kept between vertical elements (e.g. bus shelter or railings) and adjacent bike lanes.
- Provide smooth vertical transitions with a minimum slope of 1:12 and a maximum slope of 1:24 where bike/multimodal lanes rise to meet the sidewalk at grade at a bus platform.

ADDITIONAL CONSIDERATIONS

- Include a bus shelter, seat, and trash and recycling receptacles at all stops.
- Consider art installations and other community amenities on bus bulb outs and floating bus stops, provided that a fully accessible route and sightlines are preserved.



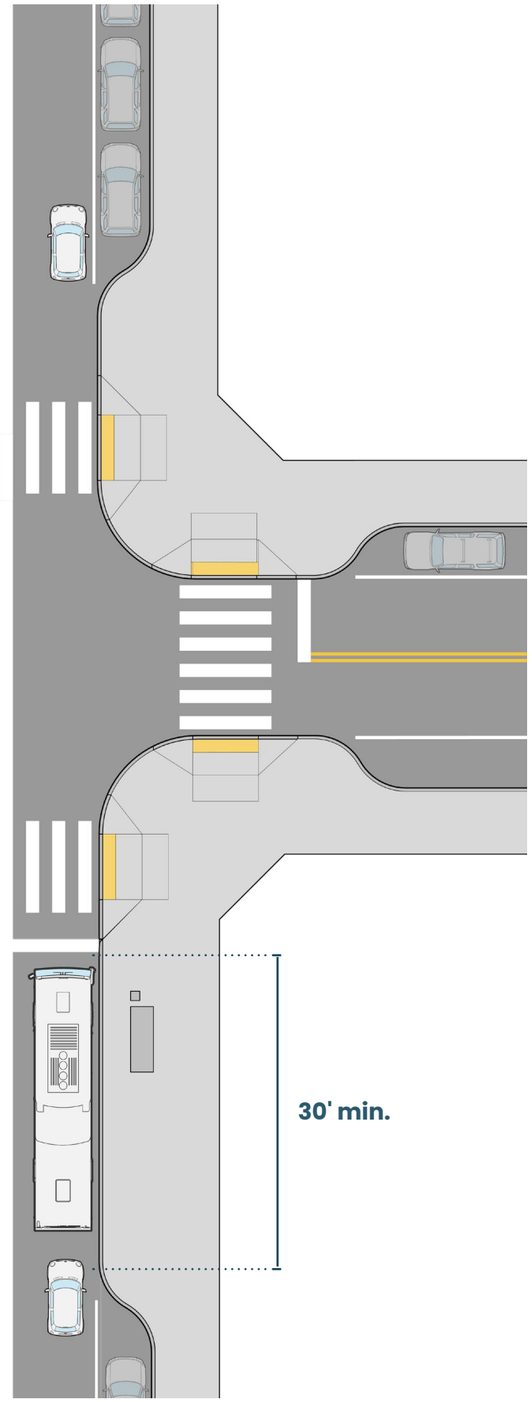
BUS BULBS

REQUIREMENTS

- Avoid use when bike lanes are present.
- The minimum sidewalk width at all bus stops should be 8' in order to accommodate deployment of an accessible ramp and boarding by passengers using wheeled mobility aids.
- Ensure bus bulbs are at least as long as one bus as measured from the front of the bus to the back of the rear door (approximately 30'). For higher-volume stops, a longer bus bulb equivalent to the length of two full buses (approximately 80') is desirable.
- Extend the outside curb of bus bulbs to 1' shy of the edge of the parking lane.

ADDITIONAL CONSIDERATIONS

- Include a bus shelter, seat, and trash and recycling receptacles at all stops.
- Consider art installations and other community amenities on bus bulb outs and floating bus stops, provided that a fully accessible route and sightlines are preserved.

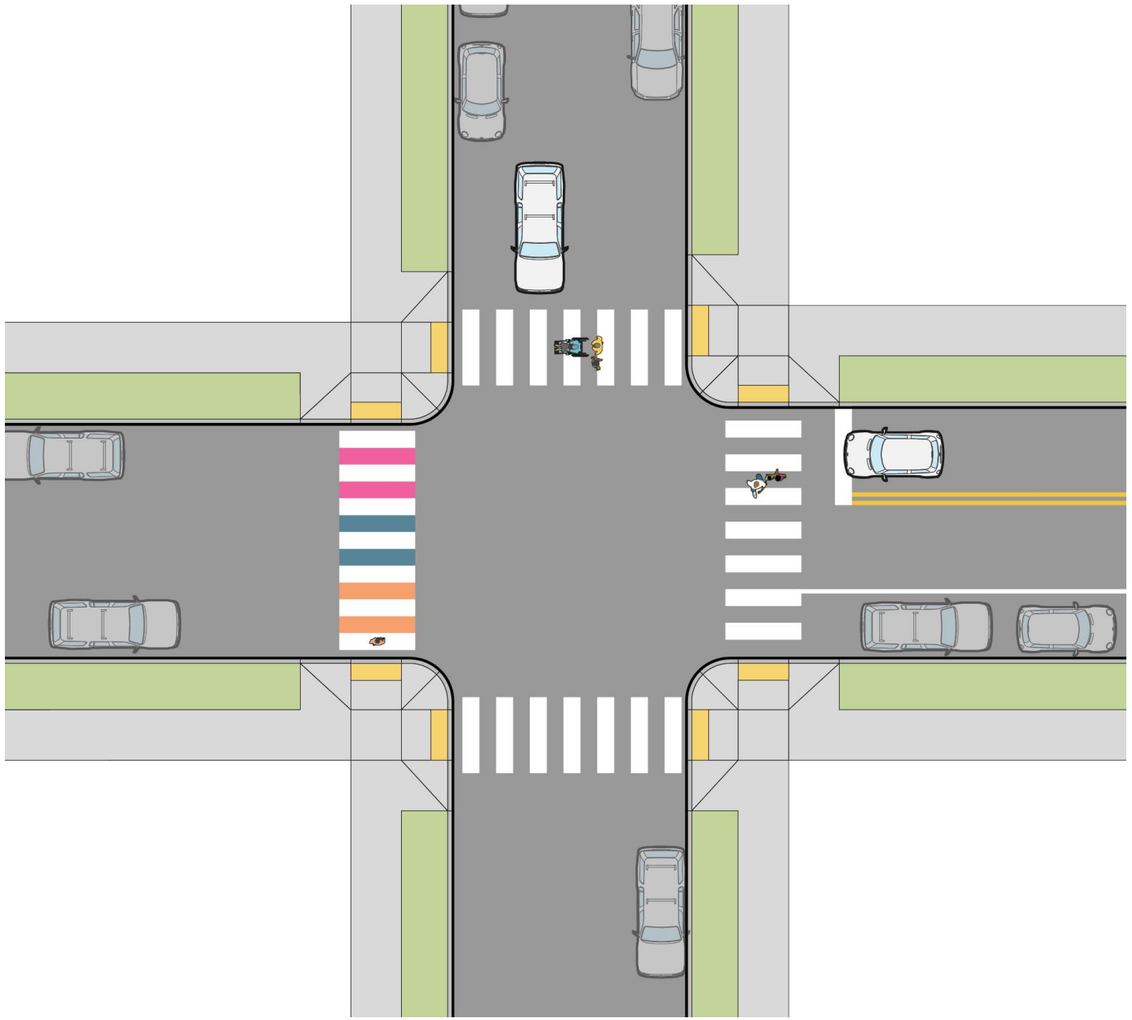


SA06 CROSSWALKS

Crosswalks indicate a designated path for people walking through intersections and high-volume driveways. Marked crosswalks should be located at intersections, high-demand midblock points, and across wide driveways in the path of travel for people walking. At select locations, creative crosswalks that incorporate art into a standard crosswalk marking may be appropriate to reinforce and celebrate community character and culture.

USE

- At all signalized intersections.
- At all intersections regardless of signalization along Neighborhood Connector Streets, Commercial Streets, and Major Downtown and B streets 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
  - At high-volume stop-controlled or signalized intersections.
  - At signalized mid-block locations.

REQUIREMENTS

- 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 apex ramps (**see SA08**).
- 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 regulatory sign R1-5 in advance of uncontrolled midblock crossings.
- Restrict on-street motor vehicle parking at least 20' in advance of the crossing to provide adequate sight distance (**see SA09**). Depending on context, signage, paint, or curb extensions, or other strategies to daylight crosswalks may be appropriate.
- 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 used, artistic elements must not interfere with the white, regulatory paint used for the crossing. Artistic paint may only be applied between the crosswalk markings.

ADDITIONAL CONSIDERATIONS

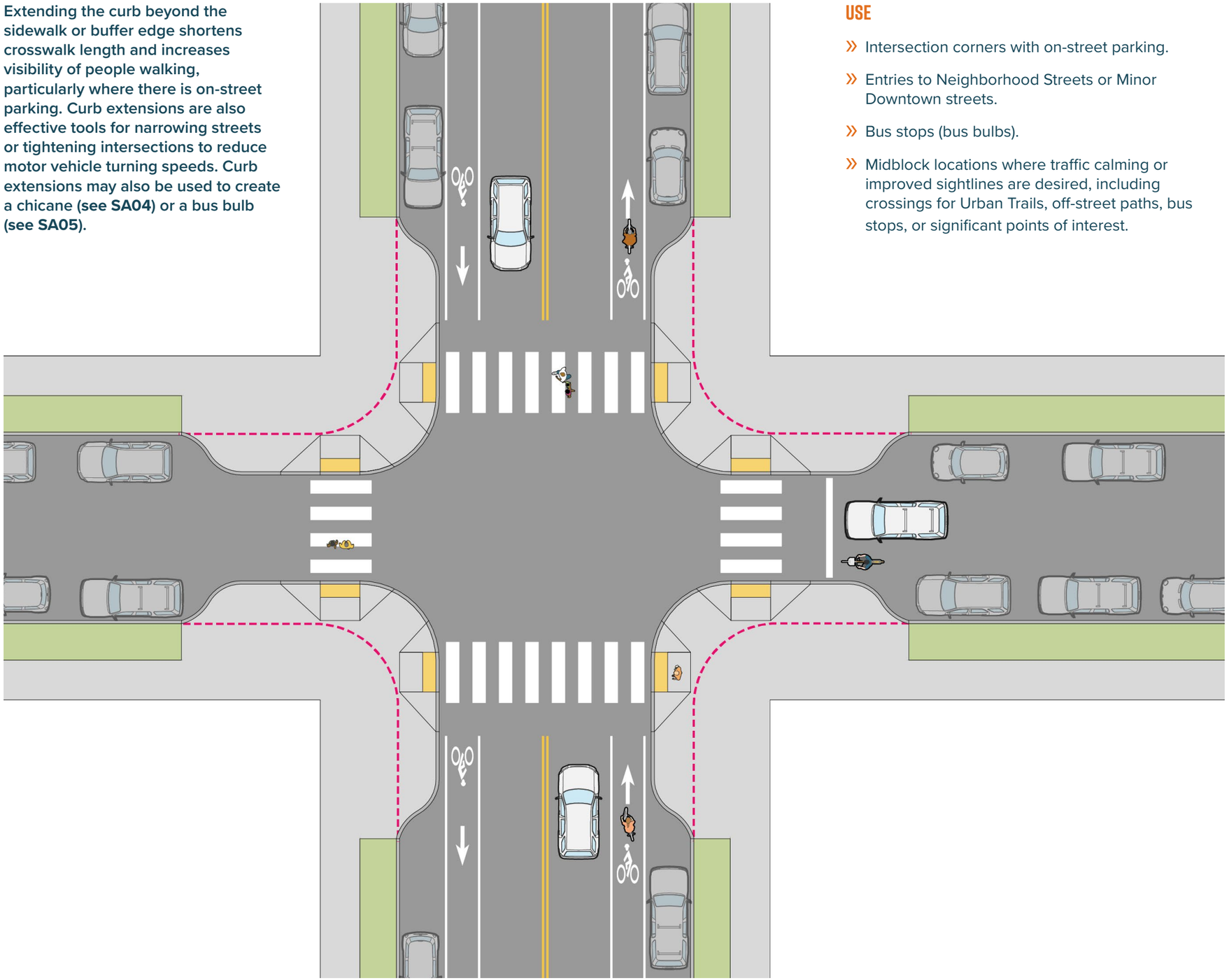
- Streetlights should be located to front-light crosswalks, with the light source situated in advance of the crosswalk in the direction of motor vehicle travel. For wider intersections, it may be necessary to place light poles on all four corners of each intersection to adequately light a crosswalk.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

ADDITIONAL RESOURCES

- RI Gen L § 31-18
- PROWAG
- FHWA STEP Guide
- MUTCD
- FHWA Achieving Multimodal Networks
- NACTO Urban Street Design Guide

SA07 CURB EXTENSIONS

Extending the curb beyond the sidewalk or buffer edge shortens crosswalk length and increases visibility of people walking, particularly where there is on-street parking. Curb extensions are also effective tools for narrowing streets or tightening intersections to reduce motor vehicle turning speeds. Curb extensions may also be used to create a chicane (**see SA04**) or a bus bulb (**see SA05**).



USE

- Intersection corners with on-street parking.
- Entries to Neighborhood Streets or Minor Downtown streets.
- Bus stops (bus bulbs).
- Midblock locations where traffic calming or improved sightlines are desired, including crossings for Urban Trails, off-street paths, bus stops, or significant points of interest.

REQUIREMENTS

- Extend curb extensions to at least 20’ from the crosswalk at uncontrolled intersectiond or 30' from controlled intersections.
- Keep corner radii small as possible while still accommodating the design vehicle at a crawl speed.
- Provide curb ramps (**see SA08**) at each crosswalk, except in the case of raised crosswalks or intersections.
- Ensure curb extensions do not impede stormwater management. If needed, preserve 1’ to 2’ between the sidewalk and curb extension to provide space for drainage structures or install additional drainage inlets to prevent ponding water.

ADDITIONAL CONSIDERATIONS

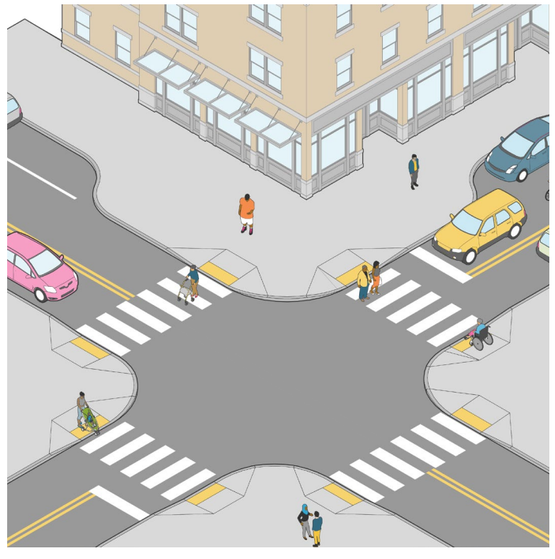
- Incorporate green infrastructure into curb extensions to collect stormwater and provide planting area.
- Incorporate street furniture or other public space elements such as public art, wayfinding, bike parking, trash and recycling receptacles, micromobility hubs, and street lighting.
- Accommodate large design vehicles with mountable curbs or aprons while keeping corner radii tight to maintain slow turning speeds.

ADDITIONAL RESOURCES

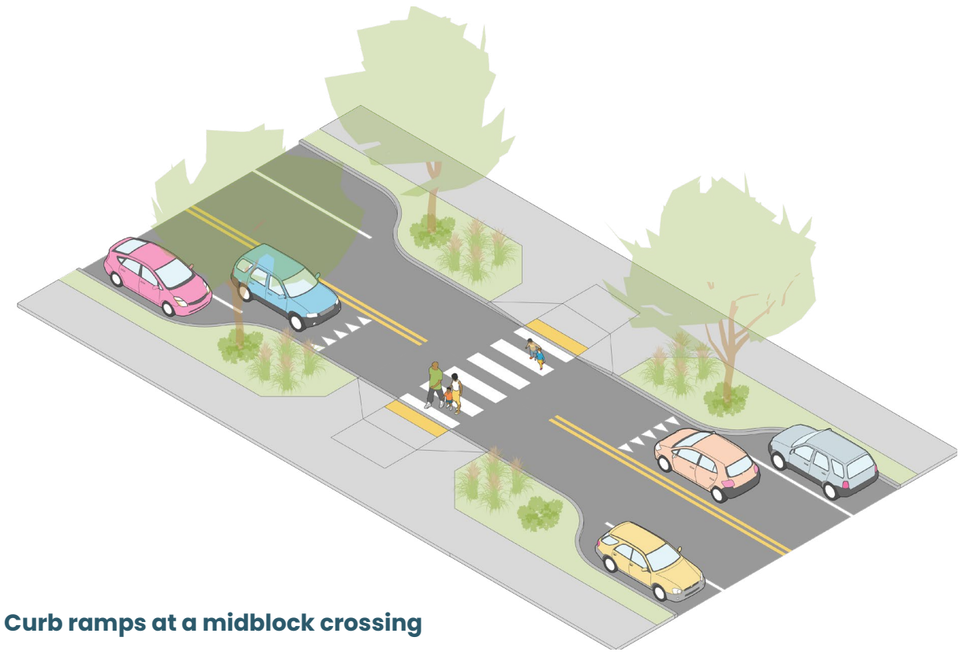
- City of Providence Traffic Calming Design Guidelines
- NACTO Urban Street Design Guide

SA08 CURB RAMPS

Curb ramps are required at all intersection, midblock, and other crossings where curbs and vertical elevation changes are present. Curb ramps support independent travel for all people, including people with physical disabilities, people pushing strollers, or people towing suitcases or other wheeled objects.



Directional curb ramps at an intersection



Curb ramps at a midblock crossing

USE

- Pedestrian crossing locations where vertical grade changes occur, including at wide driveway or parking lot entrances and alleyways.

REQUIREMENTS

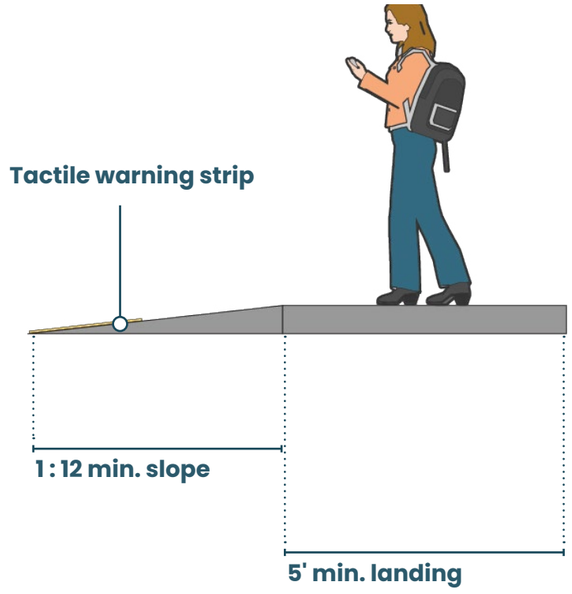
- Provide a clear level landing zone of at least 4’ by 4’ at the sidewalk level at the back of the ramp.
- Provide a ramp that is at least 3’ wide. A ramp that matches the width of the crosswalk or that is at least 5’ wide ramp is preferable.
- Provide a ramp slope not greater than 1:12
- Install detectable 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 cannot be provided, the maximum slope for ramp flares is 1:12.

ADDITIONAL CONSIDERATIONS

- Use parallel curb ramps instead of apex curb ramps to channelize pedestrian traffic and improve navigability for low-vision and blind people.
- Lengthen ramp and reduce slope beyond the 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.

ADDITIONAL RESOURCES

- City of Providence Standard Details
- PROWAG
- Rhode Island Department of Transportation Standard Detail 43.3
- FHWA Achieving Multimodal Networks



SA09 DAYLIGHTING

Daylighting provides appropriate sightlines and visibility by restricting parking or stopping near crossings, intersections, and driveways. Daylighting can be provided by using signs, pavement markings, flexposts, and/or curb extensions.

USE

- Locations where there is on-street parking approaching crosswalks, intersections, or driveways.

REQUIREMENTS

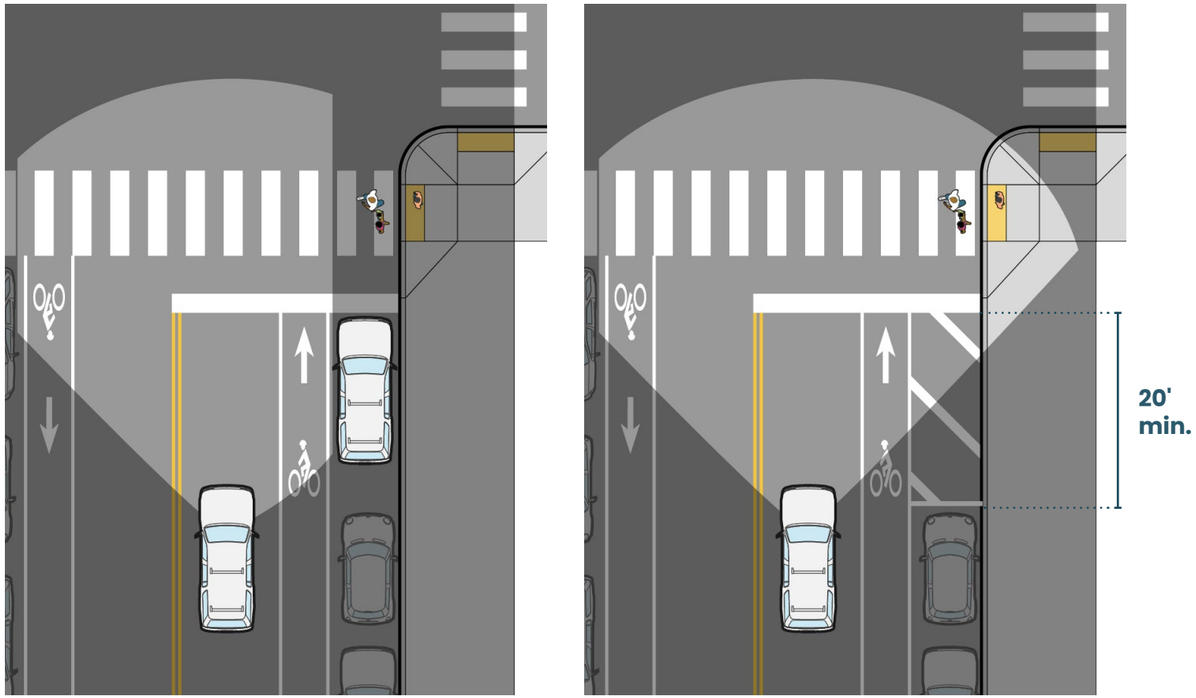
- Sign or mark at least 20' of space from a marked crosswalk or 30' of space from the stop bar at a controlled intersection as "No Parking."
- Sign or mark at least 5’ of space from a lower-volume driveway as ‘No Parking.’
- Sign or mark at least 20’ of space from a marked crosswalk, crossing, controlled intersection, or high-frequency driveway as ‘No Stopping.’

ADDITIONAL CONSIDERATIONS

- Use engineering judgement to determine if longer daylighting areas should be used based on prevailing vehicle speeds or other intersection features.
- Use physical delineators like flexposts or curb extensions to prevent vehicles from stopping in daylighted areas (**see SA07**).
- Consider ground murals, decorative planters, bike parking or multimodal hubs in daylighting areas (**see CU02, CU05, and CU07**).

ADDITIONAL RESOURCES

- NACTO Urban Street Design Guide
- RI General Laws § 31-21-4 (2012)



SA10 DRIVEWAY CROSSINGS

Driveways for residential or commercial uses 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 communicating priority for people walking along the sidewalk.

USE

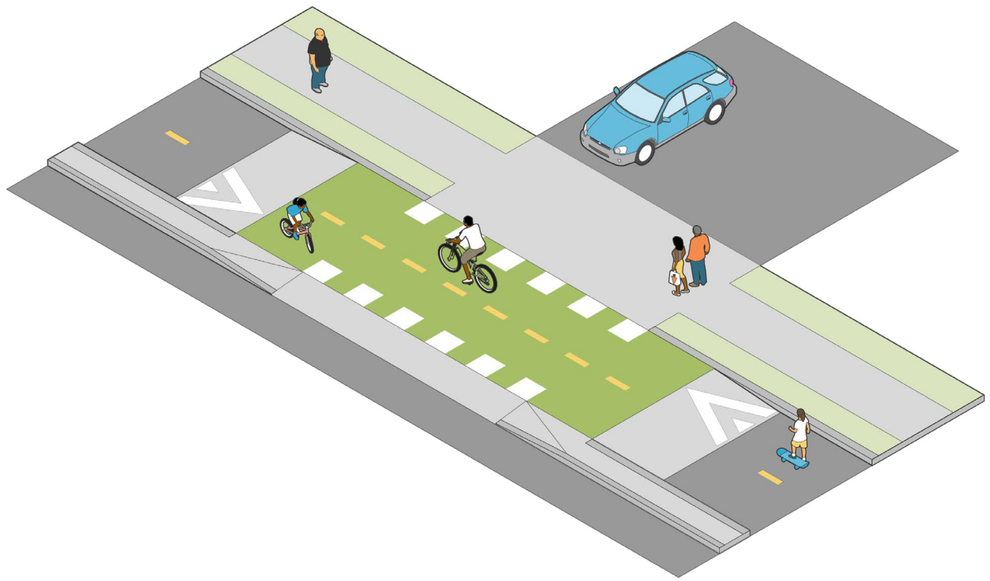
- All residential and commercial driveways.

REQUIREMENTS

- Maintain a continuous sidewalk grade crossing width of at least 4’ across all driveway crossings.
- Maintain a cross slope of 2% or less.
- Design for adequate sight distance for people driving using daylighting where necessary (**see SA09**).
- 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 options.
- 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 rapid 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 crossings when a bike lane or Urban Trail is present (**see SA03**).
- 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.



SA11 MATERIALS FOR VERTICAL SEPARATION

Vertical barriers like planter boxes, bike parking, flexposts, concrete barriers, permanent curbs, precast concrete curbs, and grade separation can be used to separate bike lanes and Urban Trails from motor vehicle travel lanes and adjacent pedestrian spaces.

USE

- Vertical separation should be used for all bicycle facility on roads with observed average speeds over 30 mph or motor vehicle volumes over 6,000 VPD.
- Any Urban Trail, other than those on Neighborhood Streets and Minor Downtown Streets.

REQUIREMENTS

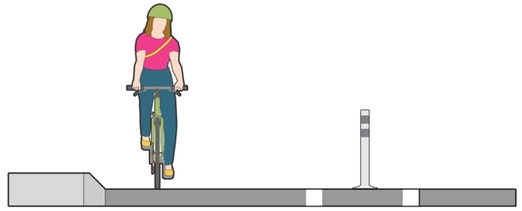
- Consider operational and posted speeds when selecting a material for vertical separation.
  - Flexposts, which are most commonly used in retrofit or quick-build projects, are appropriate in both low and high-speed conditions.
  - Planters may be used on streets with speeds up to 40 mph. When speeds 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 are appropriate on streets with speeds up to 40 mph.
- Locate vertical elements within the buffer area or on the outside edge line of separated bike lanes or Urban Trails. When installing vertical elements, a buffer width at least 2’ wide is preferred.
- Use painted edge lines and vertical elements to guide motorists to park at least 3’ away from the bike lane or Urban Trail when a parking-protected bike lane or Urban Trail is used.

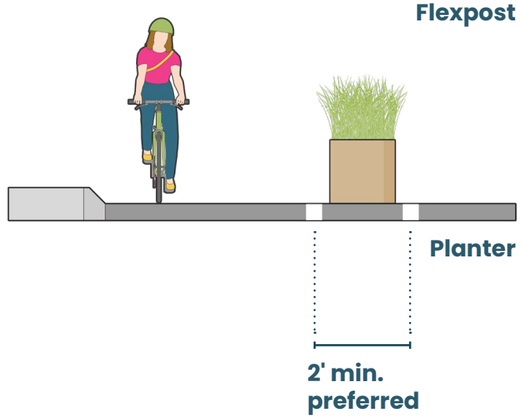
ADDITIONAL CONSIDERATIONS

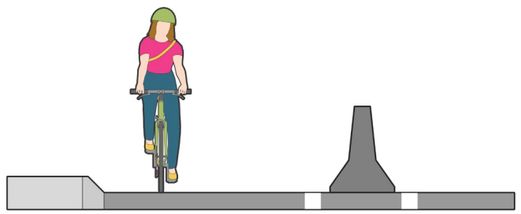
- Use concrete or weighted plastic barriers during construction activity to guide people walking or biking around constructions zones.
- Consider using flexposts, planter boxes, and precast concrete curbs as temporary and lower-cost materials to consider for rapid implementation, pilot projects, and when construction budgets are constrained.
- Use of permanent vertical elements, i.e. curbs, is preferred on all Urban Trails. Planter boxes may be used in addition to curb separation for aesthetics and additional separation. Use of planters will introduce additional maintenance considerations.
- Assume a 1' to 2 shy distance from vertical elements when determing where to site vertical elements relative to the bike lane.
- Use of materials such as planter boxes and precast curb are preferred over flexposts.

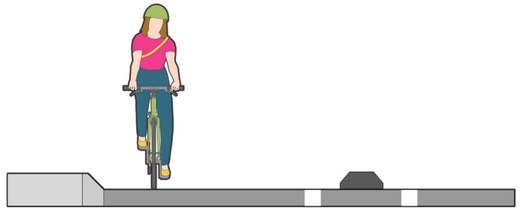
ADDITIONAL RESOURCES

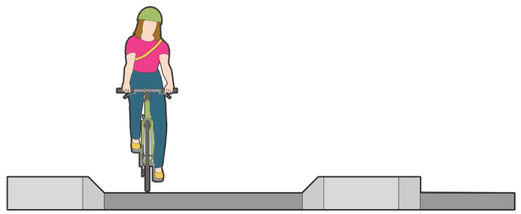
- FHWA Achieving Multimodal Networks
- NACTO Urban Bikeway Design Guide

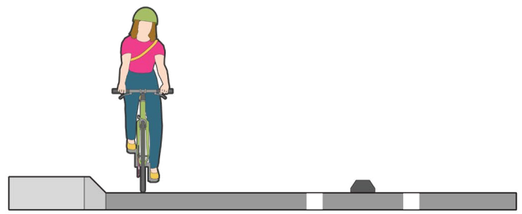






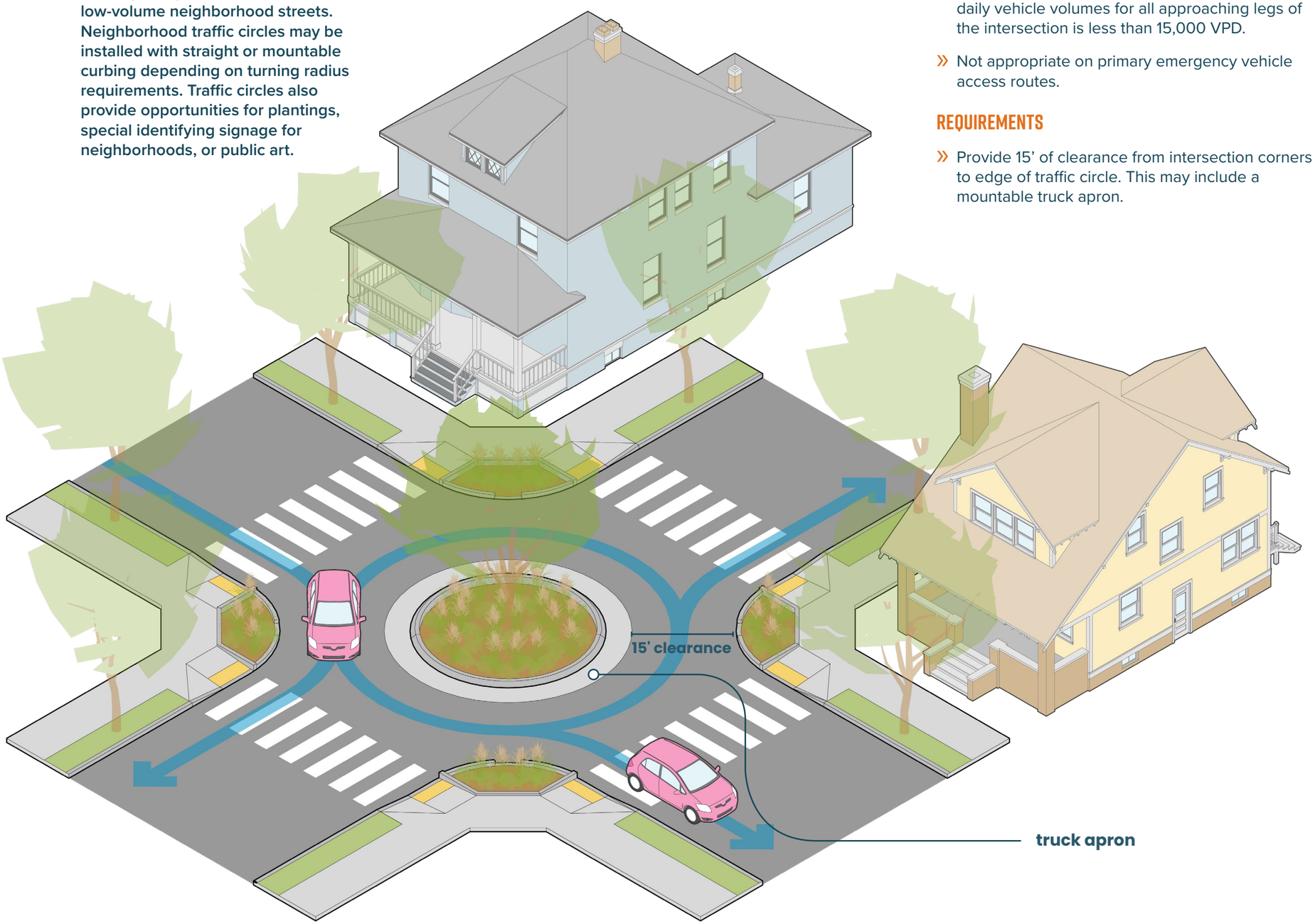






SA12 NEIGHBORHOOD TRAFFIC CIRCLES

Neighborhood traffic circles or mini roundabouts are effective traffic calming design alternatives for low-volume neighborhood streets. Neighborhood traffic circles may be installed with straight or mountable curbing depending on turning radius requirements. Traffic circles also provide opportunities for plantings, special identifying signage for neighborhoods, or public art.



USE

- Intersections in primarily residential areas where daily vehicle volumes for all approaching legs of the intersection is less than 15,000 VPD.
- Not appropriate on primary emergency vehicle access routes.

REQUIREMENTS

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

ADDITIONAL CONSIDERATIONS

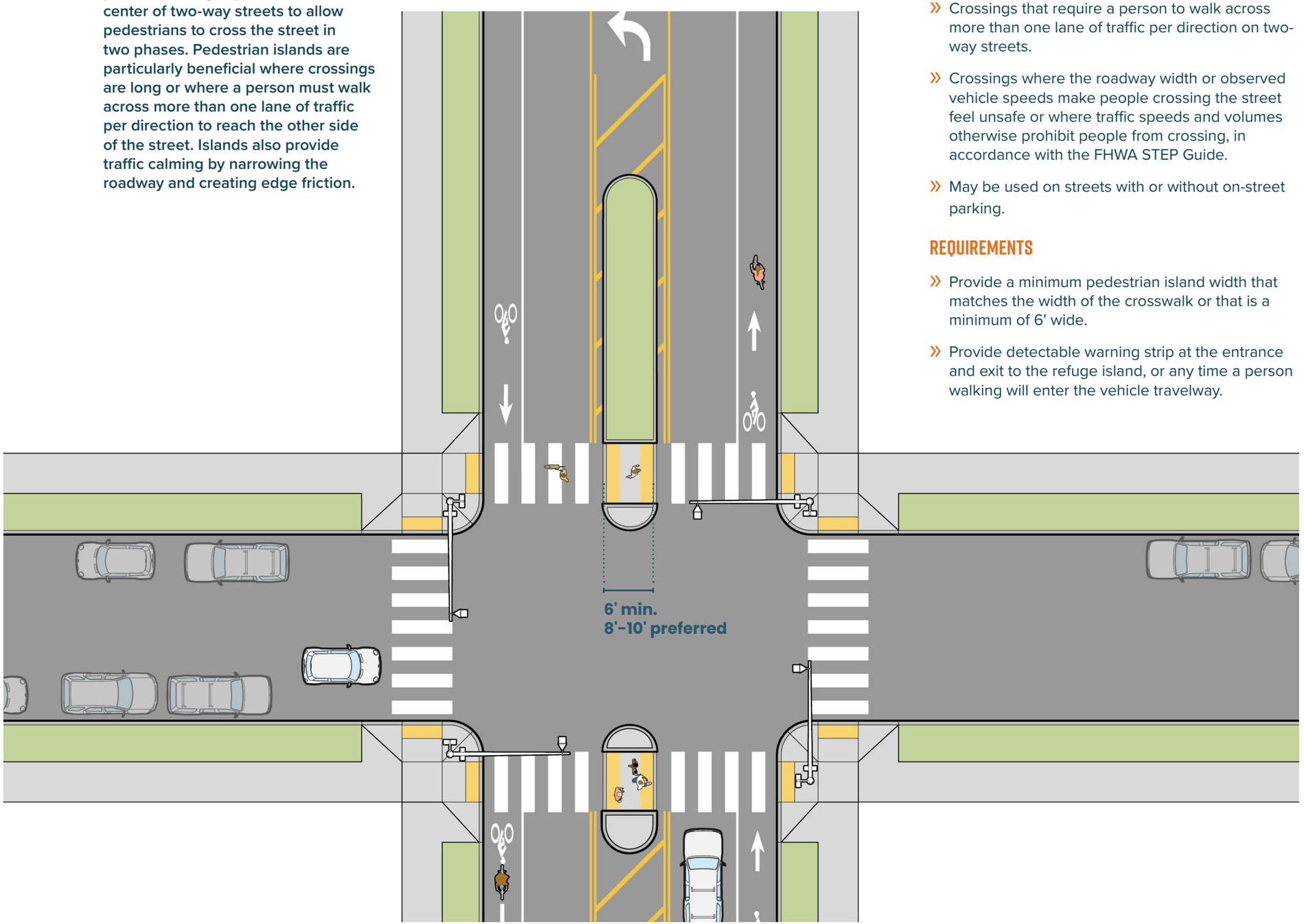
- Use the largest traffic circle radius possible to encourage slow speeds.
- Mark crosswalks ahead of each approach/ entrance to the traffic circle.
- Traffic controls may be used in addition to the traffic circle. If used, mount YIELD (R1-2) or STOP (R1-1) control signs at vehicle approaches to the circle.
- Mount a R6-4 directional sign in the circle when possible. Mount the R6-5P on the STOP or YIELD sign post if a sign can’t be mounted within the circle. Use corner curb extensions or splitter islands to channelize vehicles and further reduce speeds.
- Include mountable truck aprons around the outside of the circle to allow large vehicles to use the intersection without encouraging high speeds by smaller vehicles.
- Consider planting native and/or seasonal vegetation in the center of the circles to provide neighborhood beautification, traffic calming elements, and stormwater infiltration.
- Consider custom neighborhood identification signage or public art to the circle interior.

ADDITIONAL RESOURCES

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

SA13 PEDESTRIAN ISLANDS

Pedestrian islands provide a protected refuge space in the center of two-way streets to allow pedestrians to cross the street in two phases. Pedestrian islands are particularly beneficial where crossings are long or where a person must walk across more than one lane of traffic per direction to reach the other side of the street. Islands also provide traffic calming by narrowing the roadway and creating edge friction.



USE

- Crossings that require a person to walk across more than one lane of traffic per direction on two-way streets.
- Crossings where the roadway width or observed vehicle speeds make people crossing the street feel unsafe or where traffic speeds and volumes otherwise prohibit people from crossing, in accordance with the FHWA STEP Guide.
- May be used on streets with or without on-street parking.

REQUIREMENTS

- Provide a minimum pedestrian island width that matches the width of the crosswalk or that is a minimum of 6' wide.
- Provide detectable warning strip at the entrance and exit to the refuge island, or any time a person walking will enter the vehicle travelway.
- At signalized intersections, pedestrian signal heads must be oriented and timed to serve people in the refuge island. Where pedestrian signalization is not on automatic recall, a push button should be provided in the refuge island.
- Follow MUTCD guidance for warning 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 pedestrian comfort. An island width of 8-10' is preferred over the 6' minimum.
- Consider flush accessible paths through the pedestrian island to minimize the need for ramps. When a flush route through the island is used, detectable warning panels must be installed to indicate the transition from the pedestrian refuge island to the vehicle travelway.
- Consider bioretention planters, street trees, or other stormwater management techniques into the interior of the refuge island. Ensure plantings do not interfere with visibility.
- At locations where people biking may also be crossing, such as shared use path crossings, a width of 10' is preferred over the 6' minimum.

ADDITIONAL RESOURCES

- City of Providence Traffic Calming Design Guidelines
- MUTCD
- FHWA Achieving Multimodal Networks
- FHWA STEP Guide
- NACTO Urban Street Design Guide
- PROWAG

SA14 RAISED CROSSINGS

Raised crossings are used for traffic calming and to improve motorist yirlding to people walking and biking at intersections and midblock crossings. Crosswalks are elevated to reduce or eliminate the transition from the sidewalk to the street crossing. Transition aprons on each approach to the raised intersection are marked with pavement markings to alert drivers of the grade change.

USE

- Urban trail crossings.
- Intersections or midblock locations where increased visibility, priority, or accessibility for people walking, riding bicycles, or using other micromobility options is desired or needed.
- Across Channelized right-turn lanes.
- Along Neighborhood Main, Neighborhood Connector, and Major Downtown street where they intersect Neighborhood Streets.
- Locations where corner radii exceed 20'.
- Not appropriate on streets with steep roadway grades higher than 8%
- Not appropriate for installation directly adjacent to driveway aprons

REQUIREMENTS

- Ensure raised crosswalk is at least as wide as the connecting sidewalk or path of travel.
- Provide detectable warning strip at edge of sidewalk to indicate to pedestrians that they are exiting the sidewalk and entering the street.
- Restrict on-street parking and stopping at least 20' before the marked crosswalk to provide adequate sight distance and visibility between people crossing and people driving (**see SA09**).
- Include warning pavement markings for drivers on transition aprons and RAISED CROSSWALK signs at the crossing.

ADDITIONAL CONSIDERATIONS

- Provide transition apron slopes between 5% and 8%.
- Supplement parking restrictions with signage, pavement markings, and vertical elements such as flexible delineators, bollards, or planters (**see SA09**).
- Consider use of raised crosswalks with curb extensions to maximize visibility and further slow traffic.
- Where vehicles with low height wheelbases are likely (e.g. - lowboy trailers), the raised crosswalk height should be limited to 3 inches.

ADDITIONAL RESOURCES

- City of Providence Traffic Calming Design Guidelines
- PROWAG

raised crossing at an unsignalized intersection

midblock raised crossing

SA15 RAISED INTERSECTIONS

Raised intersections are effective traffic calming measures at intersections on streets with high volumes of people walking. The entire intersection area is elevated to create a level transition from sidewalk to street crossing. Transition aprons on all sides of the raised area are marked with pavement markings to alert drivers of grade change.

USE

- Minor intersections with high volumes of people walking in Downtown locations.
- Intersections in residential neighborhoods near major walking trip generators, such as schools or parks.
- Appropriate at both signalized and unsignalized locations.

REQUIREMENTS

- 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

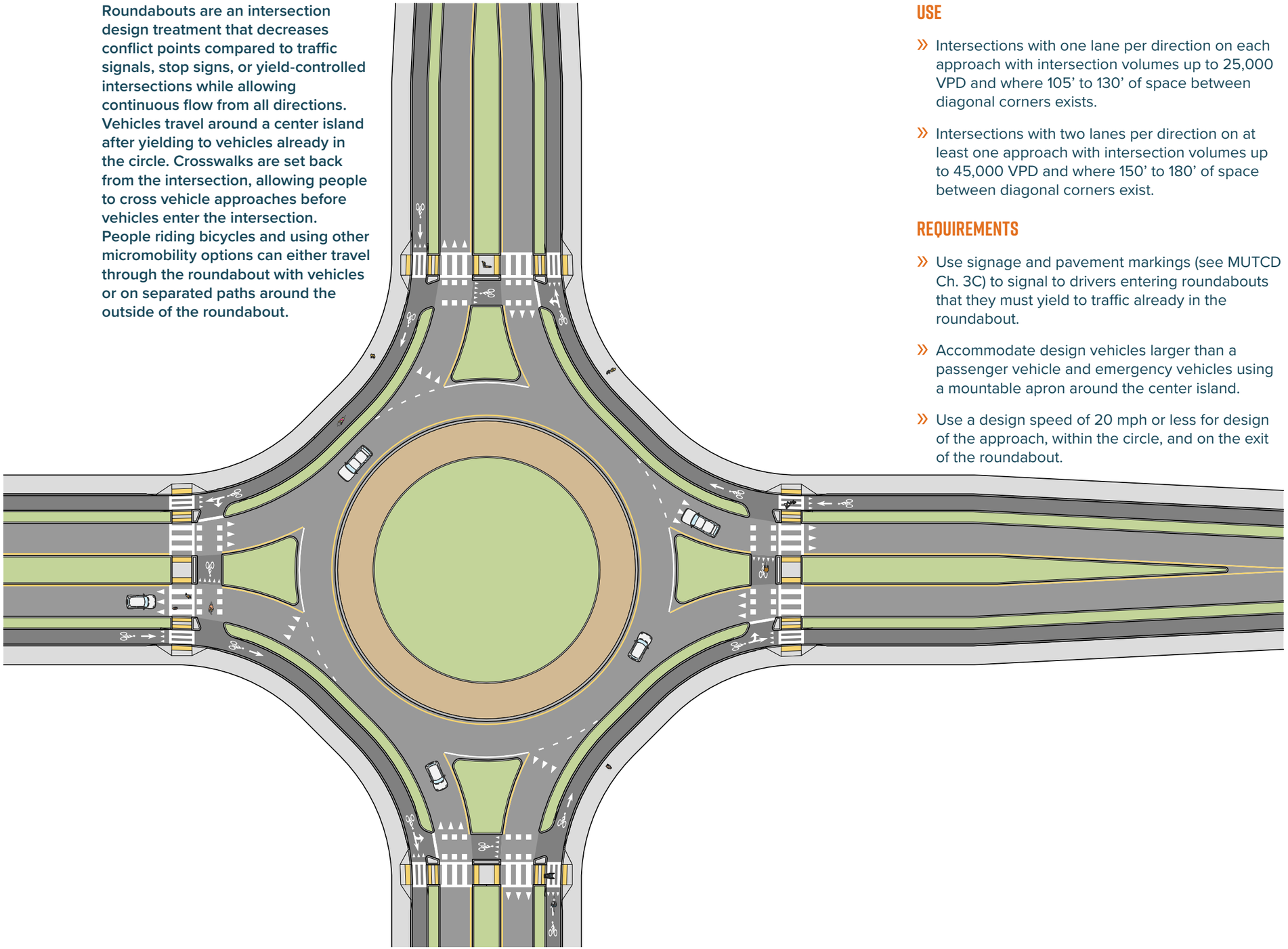
- Use bollards or raised planter barriers along intersection corners to prevent people from driving vehicles onto the sidewalk (**see CU03 and CU05**).
- Consider use of special paving material, color, and/or pattern to delineate and accentuate raised intersections.

ADDITIONAL RESOURCES

- City of Providence Traffic Calming Design Guidelines
- NACTO Urban Street Design Guide
- FHWA Traffic Calming ePrimer 3.15

SA16 ROUNDABOUTS

Roundabouts are an intersection design treatment that decreases conflict points compared to traffic signals, stop signs, or yield-controlled intersections while allowing continuous flow from all directions. Vehicles travel around a center island after yielding to vehicles already in the circle. Crosswalks are set back from the intersection, allowing people to cross vehicle approaches before vehicles enter the intersection. People riding bicycles and using other micromobility options can either travel through the roundabout with vehicles or on separated paths around the outside of the roundabout.



USE

- Intersections with one lane per direction on each approach with intersection volumes up to 25,000 VPD and where 105’ to 130’ of space between diagonal corners exists.
- Intersections with two lanes per direction on at least one approach with intersection volumes up to 45,000 VPD and where 150’ to 180’ of space between diagonal corners exist.

REQUIREMENTS

- Use signage and pavement markings (see MUTCD Ch. 3C) to signal to drivers entering roundabouts that they must yield to traffic already in the roundabout.
- Accommodate design vehicles larger than a passenger vehicle and emergency vehicles using a mountable apron around the center island.
- Use a design speed of 20 mph or less for design of the approach, within the circle, and on the exit of the roundabout.

ADDITIONAL CONSIDERATIONS

- Consider raising crosswalks on low-volume approaches to the roundabout (**see SA14**).
- Provide separated bicycle paths or Urban Trails around the outside of the circle when traffic volumes are greater than 6,000 VPD. The Urban Trail or separated bike lane crossing may be raised with the pedestrian crossing and should use pavement markings to indicate a bike/micromobility crossing (**see SA03**).
- Where traffic volumes are under 6,000 VPD, provide shared lane markings where Urban Trails or bike lanes merge with vehicle traffic to traverse the roundabout.
- Control speed through the roundabout by using the smallest inscribed circle diameter that still accommodates the design vehicle. Where wide variation in vehicle type through the roundabout is expected, use mountable aprons to maintain slower vehicle speeds while providing access for larger vehicles.
- Minimize footprint and conflict points by using one-lane roundabouts. Hybrid and two-lane roundabouts should be considered only where needed based on traffic volume and intersection operations.

ADDITIONAL RESOURCES

- City of Providence Traffic Calming Design Guidelines
- NCHRP Report 672 – Roundabouts: An Informational Guide, Second Edition
- MUTCD

SA17 SPEED LUMPS

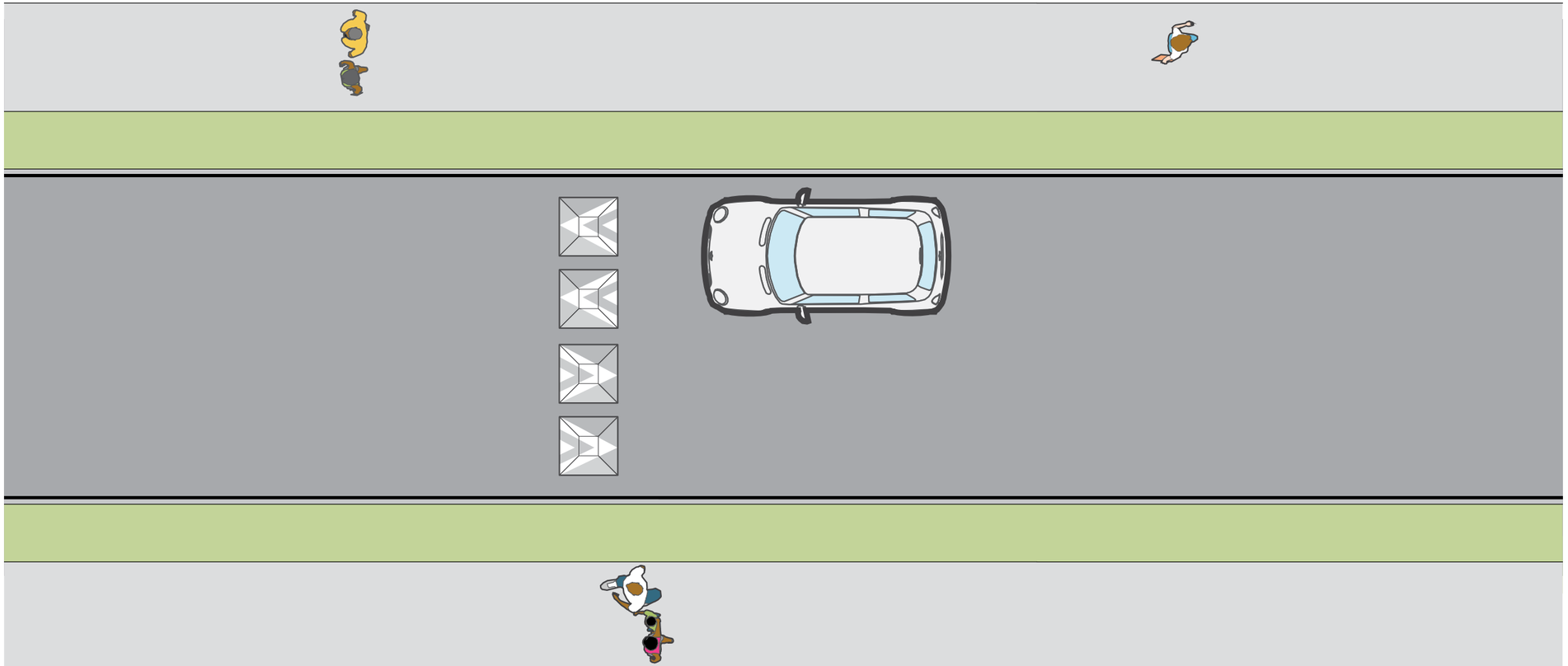
Speed lumps provide intermittent vertical elements to slow traffic and include gaps to allow vehicles with wide wheelbases such as buses, large trucks, and emergency vehicles to pass through unimpeded.

USE

- Midblock locations on Neighborhood Streets, Neighborhood Connector Streets, and Minor Downtown Streets.

REQUIREMENTS

- Design speed lumps to a half curb reveal height, typically 3”.
- Use transition apron slopes no greater than 1:10 and no less that 1:25.
- Taper sides of speed cushions with slopes or 1:3 or less.
- Space gaps in speed cushions for the appropriate fire truck wheelbase.
- Accompany speed lumps with warning signage (MUTCD W17-1).
- Provide adequate visibility and lighting at speed lumps.
- Do not place speed lumps within bike lanes.



ADDITIONAL CONSIDERATIONS

- Install as paved features or prefabricated rubber mats anchored to the roadway surface.
- Consider a trial period with temporary speed lump installation. Evaluate results for permanent installation.

ADDITIONAL RESOURCES

- City of Providence Traffic Calming Design Guidelines
- NACTO Urban Street Design Guide
- MUTCD

SA18 INTERSECTION TREATMENTS FOR BIKE LANES AND URBAN TRAILS

Intersection design can improve the safety of people riding bikes and using micromobility devices by separating them from vehicle traffic. Forward bike queue boxes separate people using the bike lane or Urban Trail by allowing them to stop at red lights ahead of the vehicle stop bar, allowing them to start riding before motor vehicles and move into left turn lanes while motor vehicles are stopped. 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. 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.

FORWARD BIKE QUEUE BOX

USE

- Intersections along routes with conventional or separated bike lanes.
- Intersections where people using the bike lane or Urban Trail are likely to make left turns.

REQUIREMENTS

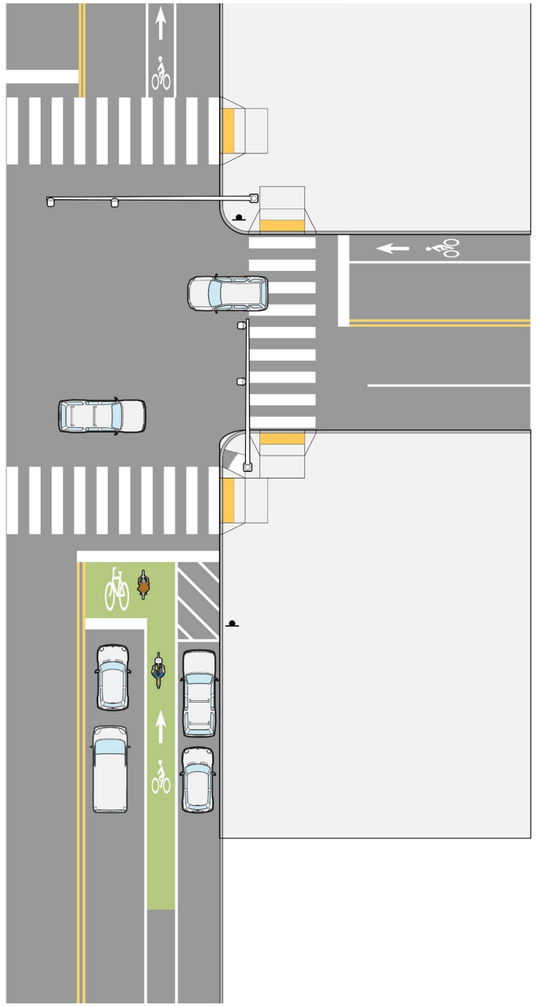
- Mark an area at least 8’ deep that extends the full width of the bicycle lane or Urban Trail and at least one adjacent travel lane with green paint. Mark bicycle symbols in the box. Mark vehicle stop bars behind the bike queue box.
- Where a dedicated left-turn lane is provided for motor vehicles, extend the queue box across the through lane and left-turn lane to allow people biking to make a left turn. If more than one through lane is provided, forward queue boxes should not be used to facilitate left turns. Two-stage queue boxes should be used instead.
- Provide a “No Turn on Red” restriction for vehicle lanes behind the queue box to prevent vehicles from encroaching in the queue area.

ADDITIONAL CONSIDERATIONS

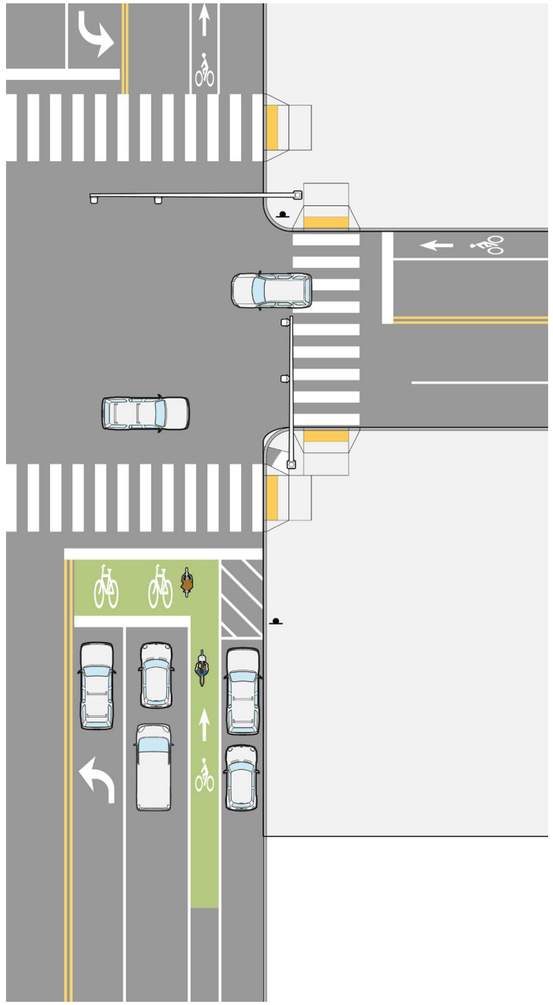
- Expand queuing areas to 10’ deep to accommodate people riding cargo bicycles or bicycles with trailers.
- Pair pavement markings and signage with dedicated signalization and phasing at complex intersections (see **SN7**).

ADDITIONAL RESOURCES

- NACTO Urban Bikeway Design Guide



forward queue box with no turn lane



forward queue box with turn lane

SA18 INTERSECTION TREATMENTS FOR BIKE LANES AND URBAN TRAILS (CONT.)

TWO-STAGE TURN BOX

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.

REQUIREMENTS

- 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 (see **SA9**).

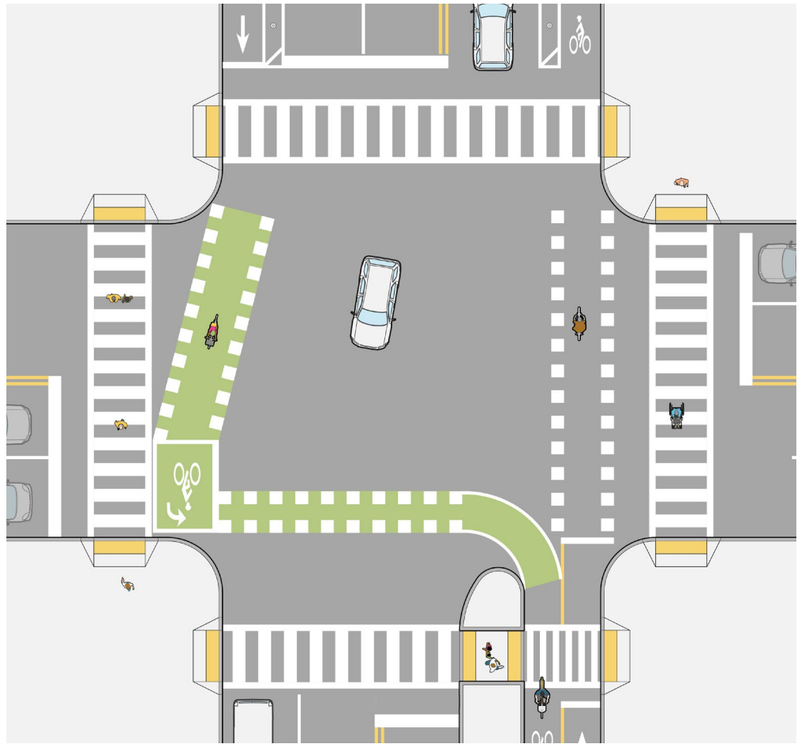
ADDITIONAL CONSIDERATIONS

- Expand queuing areas to 10’ deep to accommodate people riding cargo bicycles or bicycles with trailers.
- Pair pavement markings and signage with dedicated signalization and phasing at complex intersections (see **SN7**).

ADDITIONAL RESOURCES

- NACTO Urban Bikeway Design Guide

two-stage queue box



PROTECTED INTERSECTION

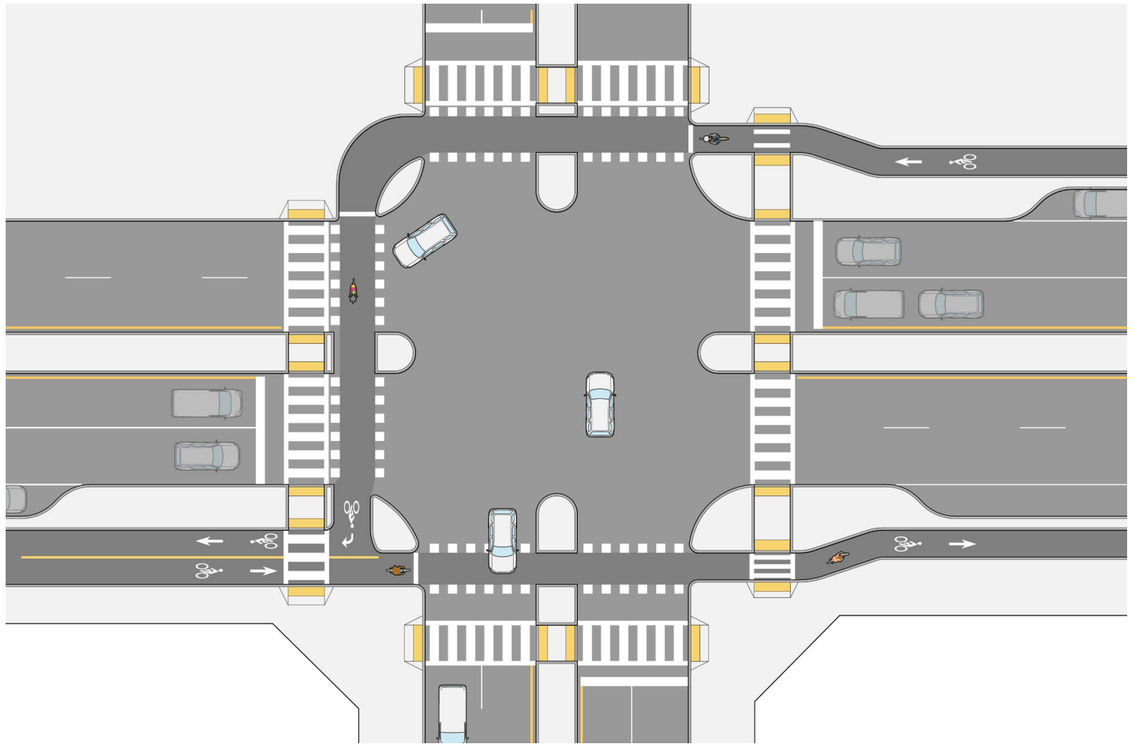
USE

- 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.

REQUIREMENTS

- 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 (see **SA9**).
- 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 (see **SA4**).
- Sign a “No Turn on Red” restriction for vehicle lanes parallel to a Bike/Micromobility Crossing.
- Install a dedicated bicycle signal (see **SN7**) or use MUTCD 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.

protected intersection



SA18 INTERSECTION TREATMENTS FOR BIKE LANES AND URBAN TRAILS (CONT.)

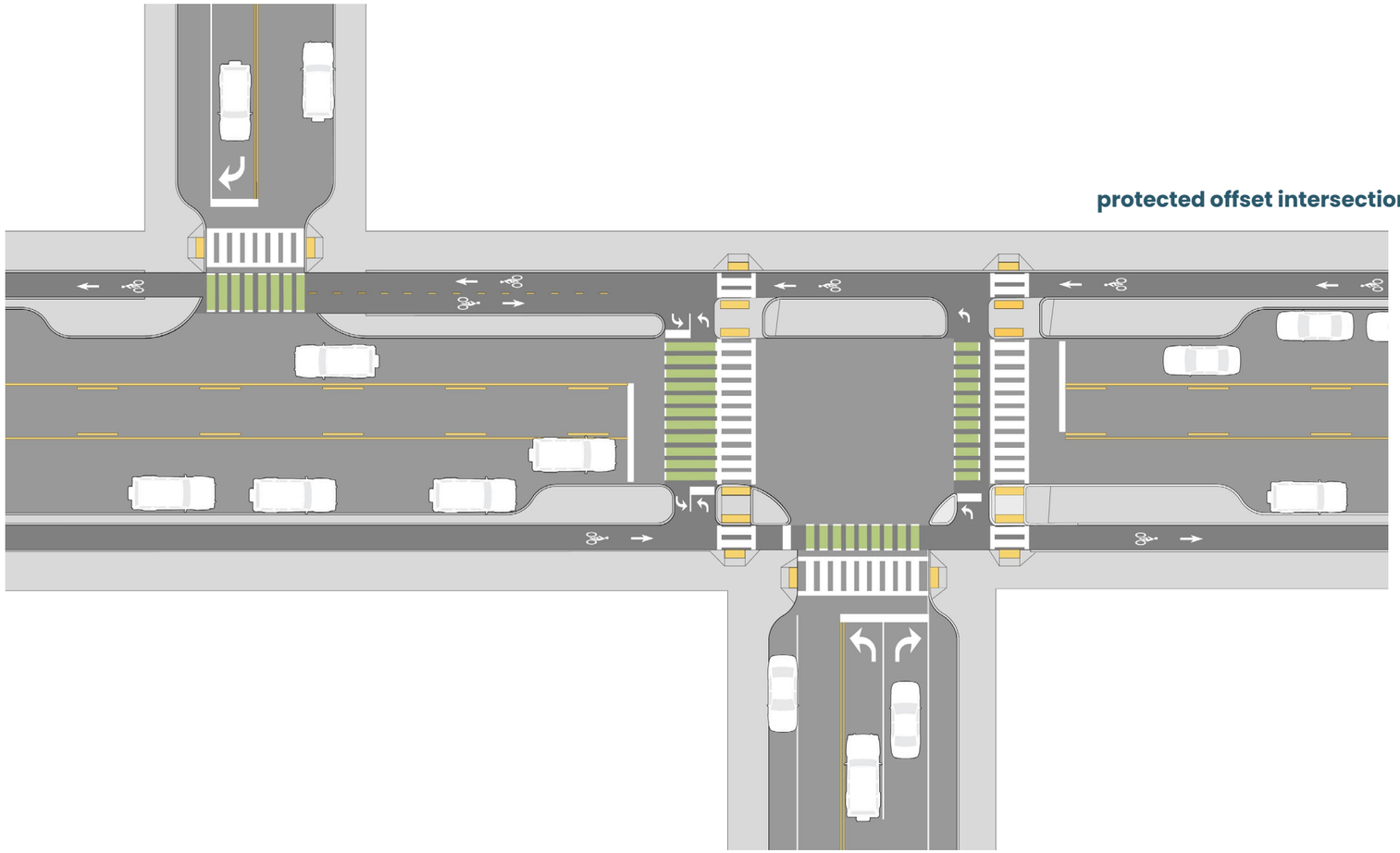
ADDITIONAL CONSIDERATIONS

- Consider marking yielding markings on the bike lane or Urban Trail in advance of the crosswalk to communicate pedestrian priority.
- Use curbs to delineate protected queuing area for people using bike lanes or Urban Trails.
- Pair pavement markings and signage with dedicated signalization and phasing at complex intersections (see **SN7**).

ADDITIONAL RESOURCES

- NACTO Urban Bikeway Design Guide

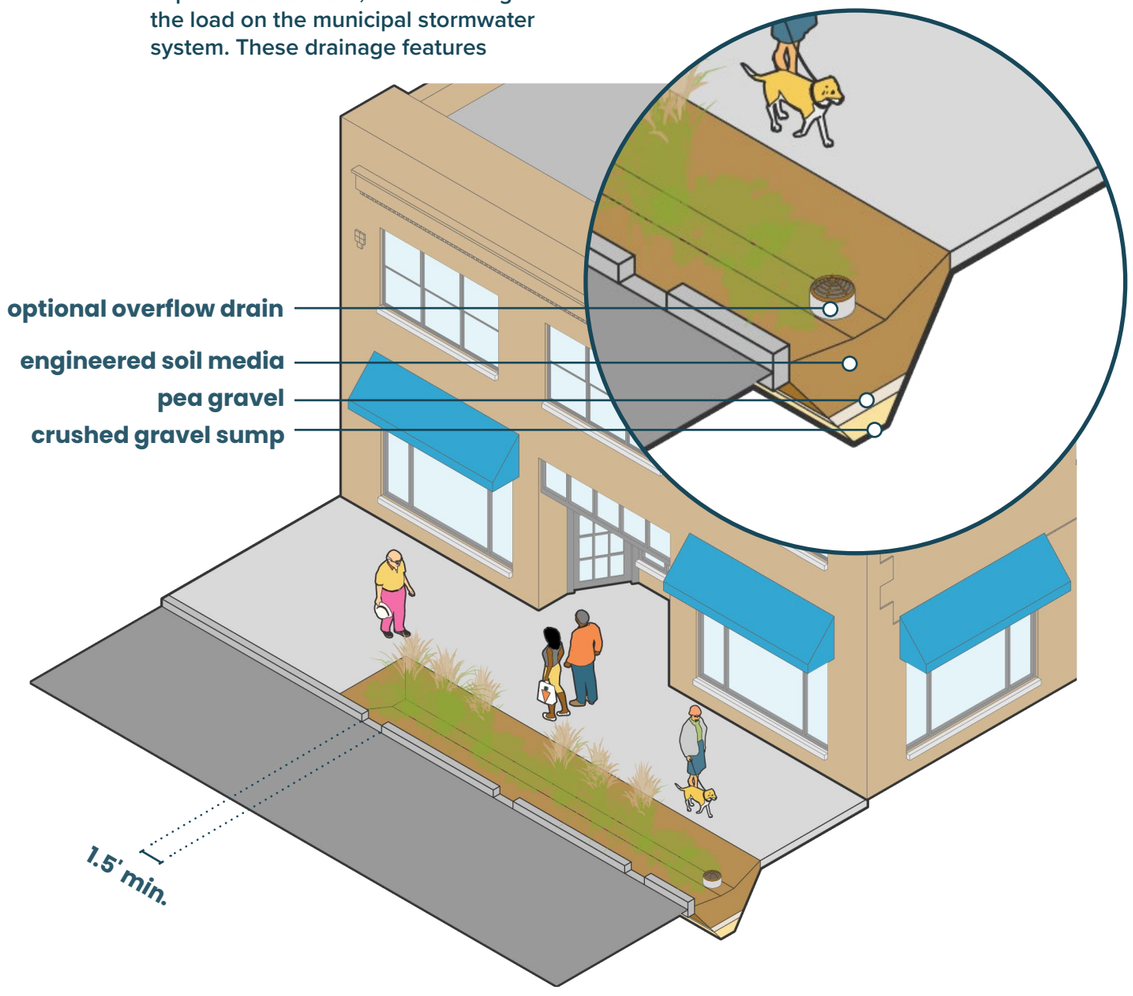
protected offset intersection



GI01 BIORETENTION TREATMENTS

Bioretention treatment areas are landscaped areas that temporarily store and infiltrate and filter stormwater runoff from impervious surfaces (surfaces like sidewalks and roadways that do not allow water to drain through the surface). Depending on their location, bioretention treatments may also provide traffic calming benefits to streets. Treatments may be incorporated into many areas of the streetscape to allow for temporary storage and infiltration of stormwater runoff from impervious surfaces, thus reducing the load on the municipal stormwater system. These drainage features also reduce the load on the municipal stormwater system, reduce runoff into our rivers, ponds, and streams, filter pollutants from runoff, and increase vegetation that helps clean our air and beautify our neighborhoods.

Treatments include: bioretention planters, which filter stormwater before it enters drainage systems; vegetated bioswales, which are shallow, linear depressed areas designed to manage a specific volume of runoff from adjacent impervious surfaces; and rain gardens, which are small systems with a slight depression that collect rain water and are planted with species that can withstand wet conditions (see GI03).



USE

- Within buffer areas, curb extensions, parking islands, medians, traffic circles and roundabouts, off-road trailside areas, and pedestrian refuge islands where at least 3’ of width is provided.

REQUIREMENTS

- Bioretention treatments should not interfere with the accessible pedestrian path on sidewalk.
- Native pollinator plants should be used when vegetation is included to support beneficial insects that are important to neighborhood plant health.
- Vegetation should be suited for the conditions of the site and maintenance requirements.
- Low-growing plants (under 3’ tall) should be used in locations where sight distance (e.g. for crosswalk locations) must be preserved or where personal safety is a concern.
- Green stormwater infiltration treatments located adjacent to building foundations should consider building drainage infrastructure, roof drainage and runoff, waterproofing of the foundation, and existing underground utilities. Typically, infiltration features should allow for a 5’ minimum setback from building basement foundations. Additional conveyance infrastructure may be necessary to prevent inundation of below-ground building structures.

ADDITIONAL CONSIDERATIONS

- Treatments should be calculated and designed for the expected volume of stormwater. Overflow piping mechanisms should be provided where necessary. Retention areas should drain surface water within 72 hours after storm events to prevent insect habitat and bacteria accumulation.
- Subsurface soil, geology, and groundwater table should be sampled and tested to ensure adequate drainage capacity. Consider using engineered soil to adequately temporarily store runoff in bioswales.
- Inlet curb cut openings should be designed to effectively channel stormwater into the adjacent stormwater feature by achieving at least a 2” drop in grade between the curb cut and the feature’s finished surface. An inlet width of at least 18” should be provided to reduce the likelihood of clogging. The curb cut surface area should be sloped downward into the feature.
- Check dams or serpentine swale alignments should be used to control stormwater flow within the swale on longitudinal slopes of 2-5% with bioswales.
- Consider rain gardens in neighborhood areas between sidewalks and curbs or along trails in off-street segments. These features do not typically require special engineered sub soil.

ADDITIONAL RESOURCES

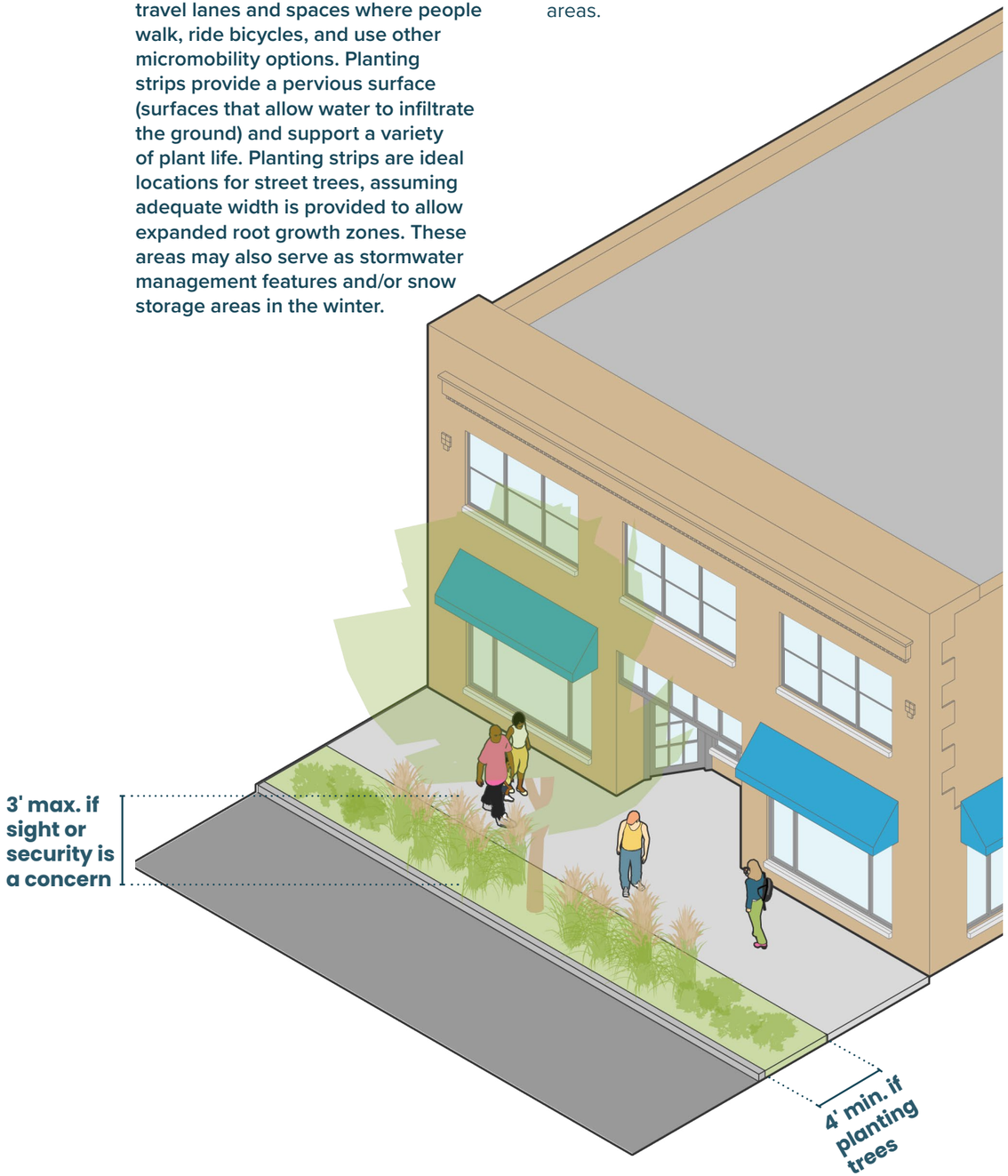
- RIDOT Linear Stormwater Manual

GI02 PLANTING STRIPS

Planting strips are located along sidewalks and paths and provide an effective buffer between vehicle travel lanes and spaces where people walk, ride bicycles, and use other micromobility options. Planting strips provide a pervious surface (surfaces that allow water to infiltrate the ground) and support a variety of plant life. Planting strips are ideal locations for street trees, assuming adequate width is provided to allow expanded root growth zones. These areas may also serve as stormwater management features and/or snow storage areas in the winter.

USE

- Within sidewalk, bike lane, and Urban Trail buffer areas.



REQUIREMENTS

- Planting strips may include grass only or may also include trees, shrubs, and other vegetation depending on width and goals for planting strip; however, street trees may not be appropriate where there is less than 4' available for the planting strip (**see GI06**).
- Adjacent walkways and travel lanes or visibility should not be obstructed with plantings. Plantings 3' or shorter should be used in areas where there are visibility or personal safety concerns.
- Plant material selection should consider ability to withstand winter snow storage.
- When other vegetation is included in planting strips, native, pollinator plants should be used to support beneficial insects that are important to all neighborhood plant health.

ADDITIONAL CONSIDERATIONS

- On Neighborhood Streets where a strong preference for greenery is indicated by residents or other stakeholders, consider use of a 4'-minimum width sidewalk to provide additional space for planting strips.

ADDITIONAL RESOURCES

- RIDOT Linear Stormwater Manual

GI03 PLANT LIST

The following plant lists are provided for reference. The Forestry Division of the Parks Department, which manages the City's trees along streets and other public property, should be consulted prior to final selection for urban tree planting.

USE

- All areas where planting may occur including sidewalk planting buffer strips, tree boxes, curb extensions, sidewalk amenity zones, bike lane and Urban Trail buffers, pedestrian refuge islands, medians, planter boxes, pocket parks, and parklets.

REQUIREMENTS

- Plants that need minimal water should be selected, as planting areas are unlikely to be mechanically irrigated.
- Low-growing shrubs and perennials should be used to maintain sightlines where necessary. Plants with a maximum mature height of 3' should be used in areas with visibility, public safety, or sightline concerns.
- Hardiness zones, plant species trends, and disease research should be consulted before selecting plant varieties.
- Native, pollinator plants should be used as much as possible.

ADDITIONAL CONSIDERATIONS

- Avoid invasive species.
- Plant for seasonal interest.
- Avoid trees and shrubs with fruit-drop in pedestrian areas.
- Seek opportunities for community participation and collaboration, such as the Providence Neighborhood Planting Program (PNPP) for new plantings.

ADDITIONAL RESOURCES

- Department of Public Parks Providence Tree List
- Providence Neighborhood Planting Program

SMALL TREES

Hedge Maple
Amur Maple
Serviceberry
Shantung Maple
Thornless Cockspur Hawthorn
Amur Maackia
Flowering Plum
Sargent Cherry
Kwanzan Cherry
Schubert Cherry
Yoshino Cherry
Japanese Tree Lilac

MEDIUM TREES

Red Horsechestnut
European Hornbeam
Katsura Tree
Tellowwood
Turkish Filbert
Hardy Rubber Tree
Golden Raintree
Black Tupelo
Hophornbeam
Callery Pear
Sawtooth Oak

LARGE TREES

Red Maple
Sugar Maple
River Birch
Hackberry
Ginkgo
Honeylocust
Kentucky Coffeetree
Sweetgum
Tulip Tree
Dawn Redwood
London Planetree
Swamp White Oak
Shingle Oak
Pin Oak
Willow Oak
English Oak
Red Oak
Sophora
Baldcypress
Basswood
Littleleaf Linden
Silver Linden
Homestead Elm
American Elm
Chinese Elm
Japanese Zelkova

RARE NATIVE TREES

American Larch
Black Spruce
Striped Maple
Mountain Maple
Round-leaved Dogwood
Dawarf Chestnut Oak
Post Oak
Black Ash
Swamp Cottonwood
Bog Willow
Slippery Elm

UNAUTHORIZED TREES

Norway Maple
Sycamore Maple
Tree of Heaven
Mimosa
Mulberry
Amur Corktree
Bradford Pear

GI04 POROUS & PERMEABLE SURFACES

Porous or permeable paving (paving that allows water to pass through the surface into the ground) is an important component of green infrastructure, especially in urban areas where hardscape features are often needed to provide access. In areas that require hardscape or paved surfaces, porous paving can provide stormwater infiltration and prevent surface runoff. Because porous paving allows snow and ice melt to infiltrate directly into the paving surface, porous pavement can help eliminating puddling and freezing and may reduce winter salt and sand use by as much as 75%. There are several types of porous paving materials and associated cost ranges. Initial installation costs may be offset by eliminating the need for installation of drainage structures and piping.

USE

- Where slopes do not exceed 5% and within:
  - Gutter strips or parking lanes along the curb that are not used as traffic lanes or bus stops.
  - Tree trenches
  - Pedestrian walkways, bike lanes, and Urban Trails.
  - Public plazas and other public gathering spaces.

REQUIREMENTS

- Porous and permeable pavement surfaces should be stable, firm, and slip-resistant.
- Joints between pavers should not exceed a width of 0.5”.
- Maintenance requirements and plans for maintenance should be considered as part of material selection.
- Appropriate subsurface materials and depths to handle the runoff load of the design area should be used.
- Salt and sand should be limited on porous surfaces during winter months.

ADDITIONAL CONSIDERATIONS

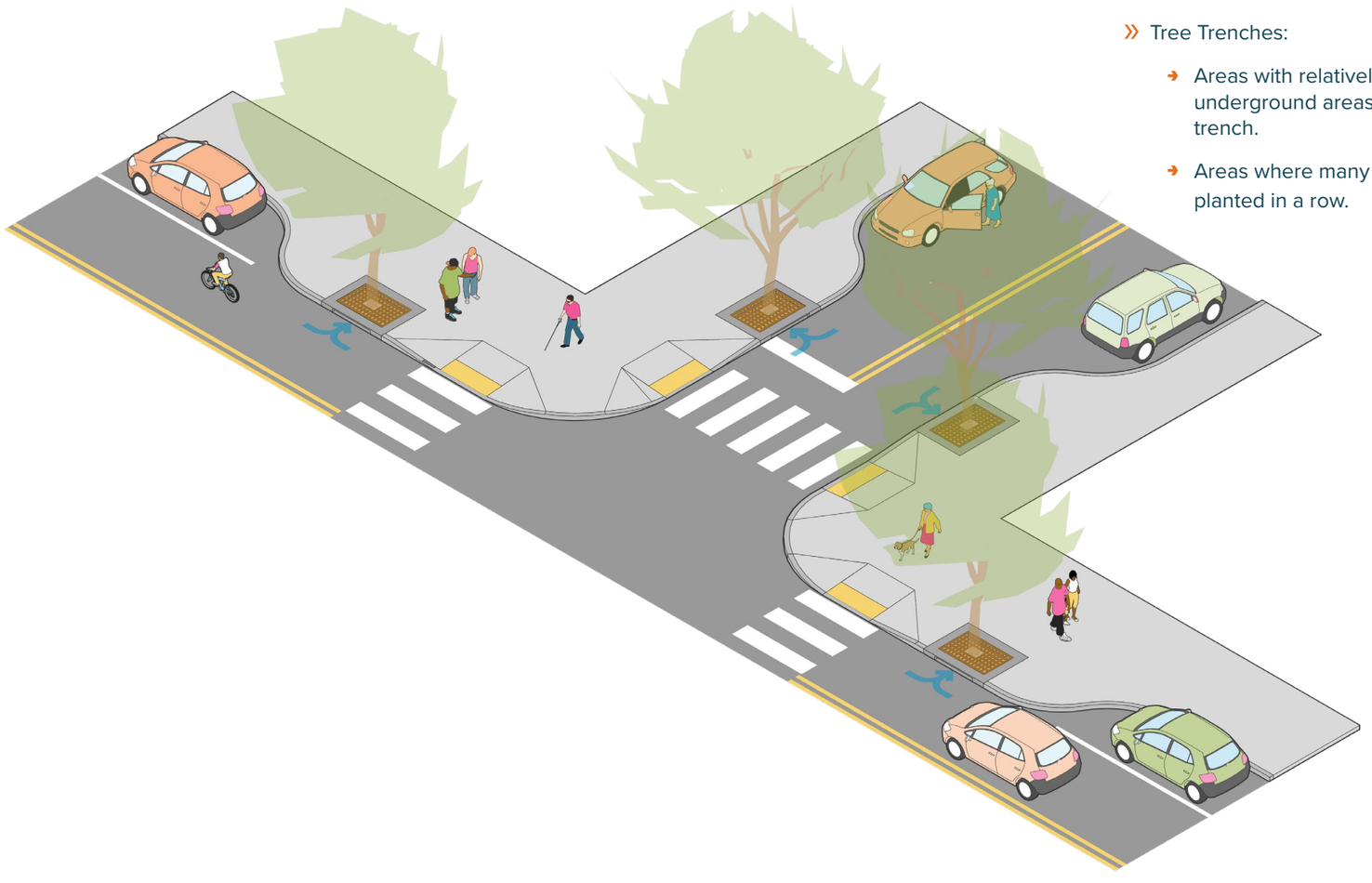
- Consider surrounding materials and context when selecting paving materials and colors.
- Soil testing and percolation rates should be used to inform subsurface material selection.
- Underdrains should be used when necessary.
- Porous surfaces should be vacuumed when standing water is observed, or at least every two years. Vacuuming activities will be most effective during the springtime, after a winter thaw.

ADDITIONAL RESOURCES

- PROWAG
- RIDOT Linear Stormwater Manual

GI05 TREE BOX FILTERS & TRENCHES

Tree box filters and trenches provide space to temporarily store and infiltrate stormwater runoff. Tree box filters are small, individual structures, while tree trenches are linear, continuous underground bioretention structures that provide a single structure to support multiple trees. These infrastructure features work by infiltrating stormwater below the surface into the boxes or trenches that contain special soil mixtures and subsurface aggregate materials that support tree growth while also allowing for water storage. The soil also irrigates trees and filters stormwater runoff, cleaning pollutants before allowing water to enter surrounding soil or conveying water to a drainage system. The surface material above the box or trench may be paved with accessible porous pavement and/or covered with tree grates that can be walked over. Structural soil or soil cells should be used to support paving while allowing for expanded root growth.



USE

- Areas where trees are planted among hardscaping elements such as sidewalks, plazas, and parking lots.
- Where paving or accessible surfaces are required for pedestrian access or street furniture between or surrounding street trees.
- Tree Box Filters:
  - Areas where utility or other underground structures constrain space and necessitate a well-contained tree structure.
  - Areas where trees punctuate the streetscape or are intermittent.
- Tree Trenches:
  - Areas with relatively unconstrained underground areas that can accept a large trench.
  - Areas where many trees line the street or are planted in a row.

REQUIREMENTS

- Underdrains should be tied into traditional drainage systems or filtration areas for control of extreme stormwater inundation.
- Stormwater should be directed to tree boxes through drain inlets in curbs or through sheet flow.
- The number and dimensions of filters should be adjusted according to stormwater management goals for streetscape. Trench areas should be designed according to calculated runoff volume requirements for the streetscape.
- ADA regulations concerning surface treatments and materials such as tree grates or pervious pavers within the pedestrian travel way should be followed. Grate openings and pavement joints should not exceed 0.5” and should be oriented so that longest openings are perpendicular to the path of travel for people walking.
- Tree species should be specified in accordance with the recommended street tree list and site conditions (**see GI03**).

ADDITIONAL CONSIDERATIONS

- Proper functioning soil media should be installed once other site work is completed to prevent premature compaction and clogging. Sand-based structural soils and cells should be used where feasible.
- Tree box filters and trenches should be maintained through routine trash removal, periodic soil inspections, and cleaning to prevent clogging once trees are established.
- Provide a continuous trench with shared soil between trees where possible to increase root growth zone.

ADDITIONAL RESOURCES

- PROWAG
- Department of Public Parks Providence Tree List

GI06 TREE PLANTING

Street trees contribute to neighborhood health, shade, urban wildlife and insect habitat, climate control, carbon sequestration, stormwater runoff mitigation, and, when strategically planted along street corridors, a visual traffic calming effect. Planting techniques for trees vary depending on available space and surface materials.

USE

- Within planting strips and buffers with a minimum width of 4’.
- Within curb extension planting areas, chicanes, traffic islands, and traffic circles.
- Within plazas or pocket parks.

REQUIREMENTS

- The Department of Parks’ Providence Tree List should be consulted for recommended species.
- Trees should be placed to ensure adequate sight lines are preserved at conflict points. Mature tree trunk width, height, and spread of the canopy should be calculated when determining setbacks from intersections or other areas where visibility is critically important.
- Trees should be located and spaced to not interfere with underground and overhead utilities.
- ADA regulations concerning surface treatments and materials such as tree grates or pervious pavers within the pedestrian travel way should be followed.
- Tree pit dimensions should be a minimum of 4’ wide by 6’ long. Larger areas may be required to accommodate large root balls or additional plant materials.
- Root growth zone for urban tree planting should be maximized wherever possible. Mature tree size and root growth requirements should be considered when locating trees and selecting tree species.

ADDITIONAL CONSIDERATIONS

- Plant trees with a maximum caliper size of 3” to 4” for best adaptability.
- Soil volumes for root growth should be expanded by placing specially formulated structural soils or soil cells beneath paving areas to the extent possible.
- Select a variety of species when planting large numbers of street trees to avoid massive die-off during biological blight events.
- Allow for maximum root growth zones with continuous planting strips or subsurface enlarged planting pits.

ADDITIONAL RESOURCES

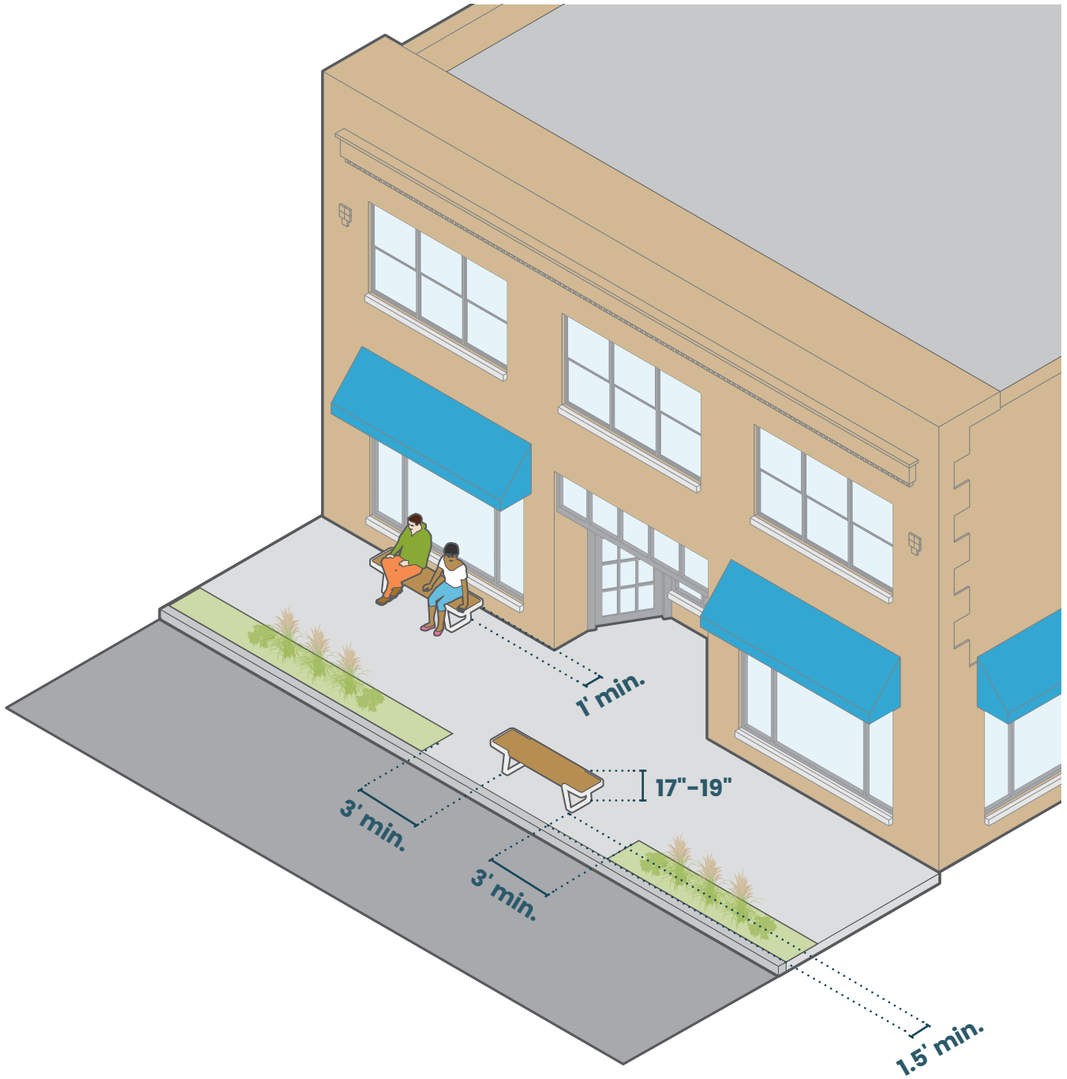
- PROWAG
- Department of Public Parks Providence Tree List

CU01 BENCHES/SEATING

Benches and other seating amenities provide opportunities for social interaction and rest. Seating should be provided where widths allow for required seating clearances and where a 4' unobstructed path of travel for people walking can be maintained. Seating styles and materials may vary depending on location and neighborhood context.

USE

- At bus stops.
- Within sidewalk buffer areas.
- Within plazas and pocket parks.
- At points of interest and intermittently along trails.



REQUIREMENTS

- A 3'-wide clear width should be maintained on either side of seating.
- Bench/seat back should be placed a minimum 12” from face of building when located at the back of sidewalk.
- When located at the front of sidewalk:
  - A minimum setback of 36" should be provided from face of curb to the seat/bench when the bench faces the street or when the bench is perpendicular to the curb.
  - A minimum setback of 18” should be provided from the face of curb to the seat/bench when the bench faces the sidewalk.
- Durable, low-maintenance seating materials and material finishes/coatings should be used.
- Siting benches arbitrarily may result in underuse or misuse. Consider adjacent land uses and sidewalk features, such as proximity to sidewalk cafes, bus stops and bus shelters (where the bench could provide additional or supplemental seating), and land uses that may occasionally result in people waiting to enter, such as a theater or restaurant when selecting the number and location of seating.

ADDITIONAL CONSIDERATIONS

- Consider what value a new bench will provide, and how it will be used, prior to siting.
- Use benches with backs and armrests for improved comfort and accessibility.
- Use benches with a seat height that is a minimum of 17” and a maximum of 19” from the ground.
- Where sidewalk widths allow, provide benches perpendicular to the street edge in groupings that face each other to encourage sociability and vibrancy.
- Consider historical or other cultural context when selecting seat style. Consult stakeholders, residents, the Historic District Commission, or other relevant groups when making a bench style selection.
- Locate benches under trees when possible to provide shade during summer months.
- Consider using wood or other soft materials for seating instead of granite or stone that may become too cold to comfortably use when temperatures drop.

ADDITIONAL RESOURCES

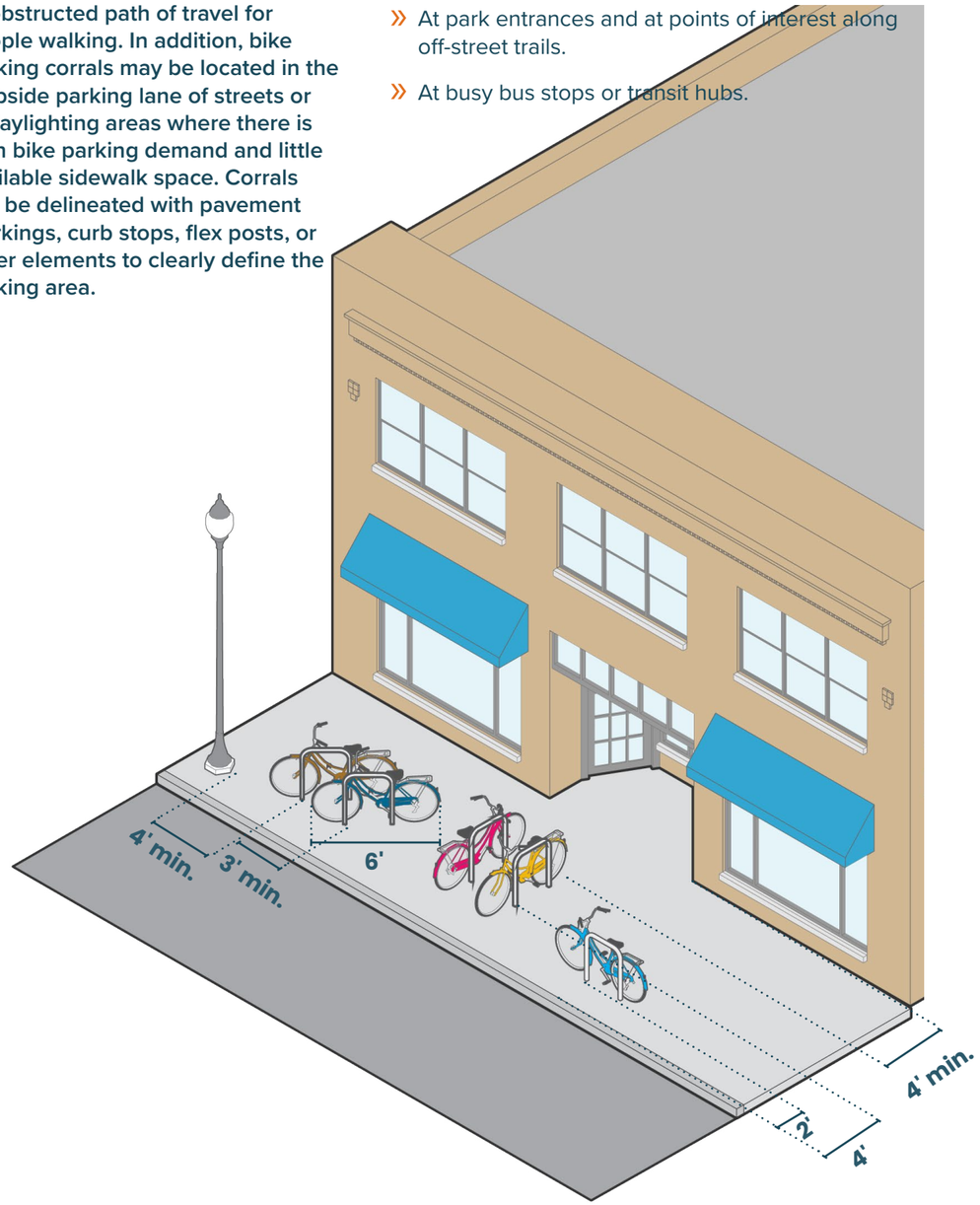
- PROWAG

CU02 BIKE PARKING

Bike racks and parking corrals provide structures for people to securely lock their bicycles. On sidewalks, bike racks may be located in the curbside buffer area, provided there is adequate width to maintain an unobstructed path of travel for people walking. In addition, bike parking corrals may be located in the curbside parking lane of streets or in daylighting areas where there is high bike parking demand and little available sidewalk space. Corrals can be delineated with pavement markings, curb stops, flex posts, or other elements to clearly define the parking area.

USE

- Within sidewalk buffers and wide Urban Trail or separated bike lane buffers.
- Within daylighting areas or vehicle parking lanes.
- At park entrances and at points of interest along off-street trails.
- At busy bus stops or transit hubs.



REQUIREMENTS

- Only inverted U (hoop) or post and ring (hitch) rack styles should be permitted to be installed within the public realm. These rack styles are versatile and intuitive, allowing bicycles of all shapes and sizes to be property locked through the frame and of least one wheel.
- Bike parking within sidewalk buffer areas should not encroach on the clear pedestrian zone when a bicycle is parked there. A minimum clear width of 4' should be preserved.
- Bike racks within the sidewalk buffer may be installed perpendicular, parallel, or at an angle to the curb.
  - Parallel bike parking should be set back 24" from the curb.
  - Perpendicular bike parking should be set back 48" from the curb.
  - Angled bike parking should be sufficiently set back from the curb to ensure a bicycle of at least 6' in length will fit on the curb and will not be damaged by car doors within an adjacent parking lane.
- When a group of bicycle racks are provided, 36" should be provided between bike racks. A minimum clear distance of 4' should be provided between a bicycle rack and any other streetscape element.
- Racks should be placed a minimum of 8' from all fire hydrants.
- Racks should not be places within 4' of the corner of any building
- In-street corrals should be clearly delineated with a vertical element such as a parking stop, concrete barrier, or flexpost to prevent vehicle encroachment.

ADDITIONAL CONSIDERATIONS

- Place racks in visible, well-lit locations and within 75' of commercial/residential building entrance doors.
- Ensure bike racks are installed on a flat surface where the rack may be bolted or securely fastened to the ground.
- Consider use of bike corrals in busy locations to provide up to 12 bike parking spaces in what would otherwise accommodate a single vehicle parking space.

ADDITIONAL RESOURCES

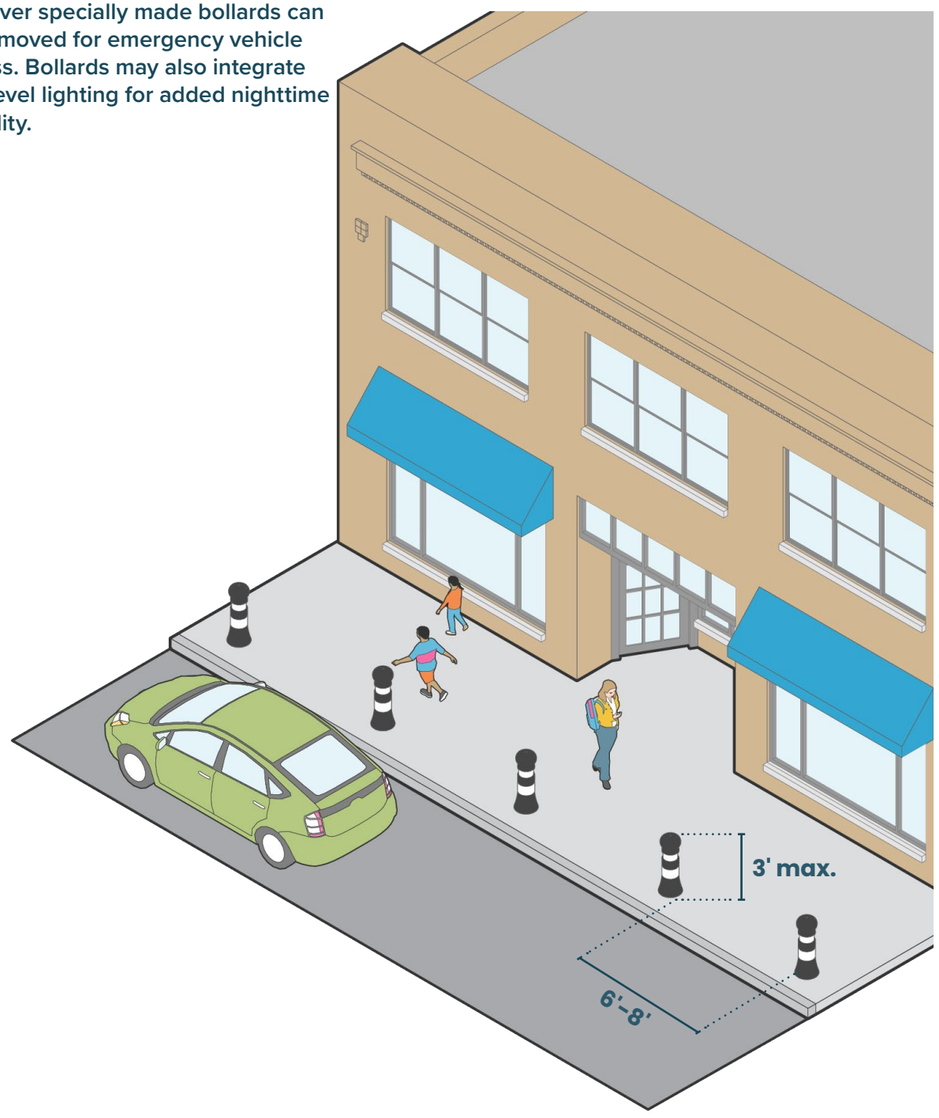
- APBP Essentials of Bike Parking
- PROWAG
- Providence Dimensional Requirements for JUMP bikes

CU03 BOLLARDS

Bollards are short, sturdy posts used to control vehicle access while allowing for people walking or riding bicycles to pass through. Posts are typically steel or cast iron, but may also be made out of precast concrete, granite, or other dense stone material. Most bollards are installed as permanent fixtures with concrete footings in the ground, however specially made bollards can be removed for emergency vehicle access. Bollards may also integrate low-level lighting for added nighttime visibility.

USE

- Within shared street environments to delineate pedestrian-only zones.
- At the corners of raised intersections to prevent vehicles from driving on to pedestrian walkways.
- In buffers between cars and bike lanes or Urban Trails.



REQUIREMENTS

- On shared streets and at raised intersections, bollards should be spaced close enough to discourage automobile encroachment while maintaining adequate width to preserve the street's aesthetics and not impede on pedestrian, bicyclist, or micromobility user travel. A 6' minimum and 8' maximum spacing is preferred.
- Bollards should not exceed 36" in height to avoid conflicts with handlebars and to maintain clear sightlines and visibility between users.

ADDITIONAL CONSIDERATIONS

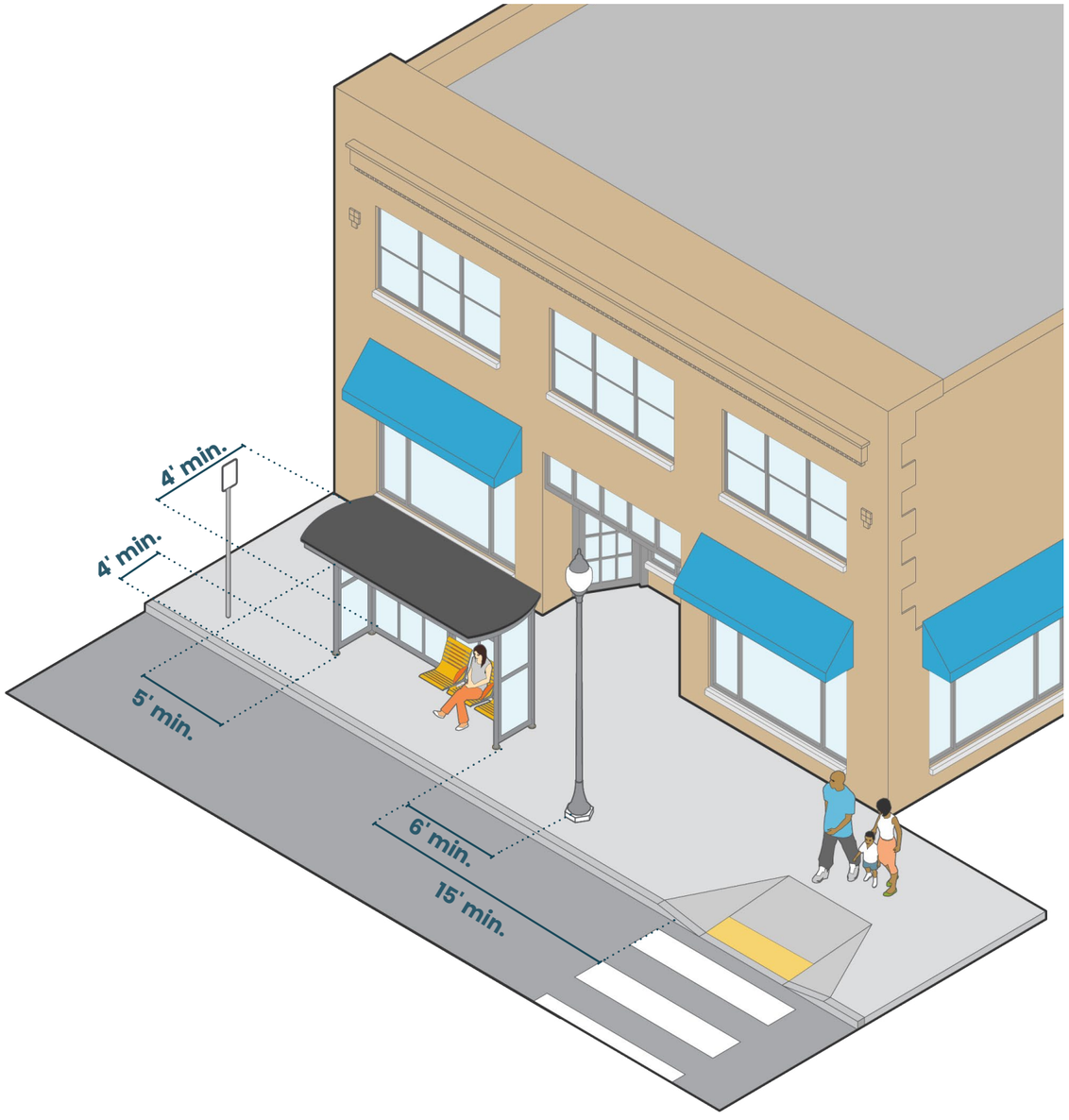
- Consider historical or other cultural context when selecting bollard style. Consult stakeholders, residents, the Historic District Commission, or other relevant groups when making a bollard style selection.
- Mount bollards in-ground as part of new construction and sidewalk concrete repairs.
- Incorporate lit bollards into lighting scheme along the side of off-street paths where needed.

ADDITIONAL RESOURCES

- FHWA Accessible Shared Streets

CU04 BUS SHELTERS & STOP AMENITIES

Bus shelters provide weather protection and a designated waiting area for bus passengers. Shelters are typically provided at frequently used bus stops and locations used by vulnerable passengers such as at schools and senior centers, but are appropriate and encouraged at all bus stops regardless of use. Benches, trash and recycling receptacles, and bike parking are other amenities that are often collocated with bus stops and provide additional comfort and functionality to the public transit system.



USE

- At any bus stop locations, but especially those with at least 50 passenger boardings per day.
- Near schools, community and senior centers, and hospitals.

REQUIREMENTS

- Boarding and alighting areas should be at least 8’ deep (perpendicular to the curb) and 5’ wide.
- Clear and level landings should be provided to both the front and rear doors of the bus. Bus doors are generally spaced 20’ apart.
- A clear pedestrian access aisle of at least 4’ wide should be preserved behind the bus shelter and the back of the sidewalk or nearest building façade.
- An appropriate shelter size should be selected based on site constraints and ridership demand. Typical shelters are 5’ deep and vary in length.
- At least 15’ should be provided between the edge of the shelter and crosswalks to maintain adequate visibility.
- Conflicts with trees and other streetscape amenities should be minimized by providing at least 6’ between the edge of the shelter and other vertical streetscape elements.
- Trash and recycling receptacle should be installed at all bus stops.

ADDITIONAL CONSIDERATIONS

- Where floating bus stops are used, shelters should be located on the floating island (**see SA04**).
- Include transparent wall panels in all shelters to promote feelings of personal safety and security.
- Consider incorporating art, advertising, or informational wayfinding signage within bus shelters.
- Install solar lighting where solar exposure is adequate.
- Provide bench seating while maintaining a minimum 30” wide by 40” long accessible space under shelter (**see CU01**).
- Provide real-time information displays to keep users informed about the arrival of their bus and other information, including delays on connecting lines, weather, and news.
- Provide heated solar-powered lamps for use in cold weather during transit operating hours.

ADDITIONAL RESOURCES

- Rhode Island Bus Stop Guide
- FHWA Achieving Multimodal Networks
- PROWAG

CU05 DECORATIVE PLANTERS

Raised planters may be used as effective edge barriers and space-defining elements. Planter boxes add to the aesthetic quality of the streetscape and come in many sizes and styles. Decorative planters are often preferred to other vertical buffer elements, but require maintenance agreements or other provisions to ensure adequate upkeep and plant health.

USE

- On curb extensions or on pedestrian refuge islands.
- Within buffers separating bike lanes or Urban Trails from motor vehicles within commercial or high-activity areas.
- Within buffers separating sidewalks from sidewalk-level separated bike lanes or Urban Trails.
- Around parklets and sidewalk seating areas to provide an enclosure.
- Adjacent to on-street bike or scooter parking corrals to prevent vehicle encroachment.

REQUIREMENTS

- When planters are used within buffers between bike lanes and cars to prevent vehicle parking or encroachment, they should be spaced 10’ to 15’ apart (edge to edge).
- Planters should not be located in areas that will obstruct vehicle visibility. Plant material should not exceed 36” when located within a buffer area adjacent to a bike lane or Urban Trail.
- A maintenance plan should be in place before installation of decorative planters.
- Low-maintenance plant materials that are resilient to heat or other elements should be used based on site conditions.

ADDITIONAL CONSIDERATIONS

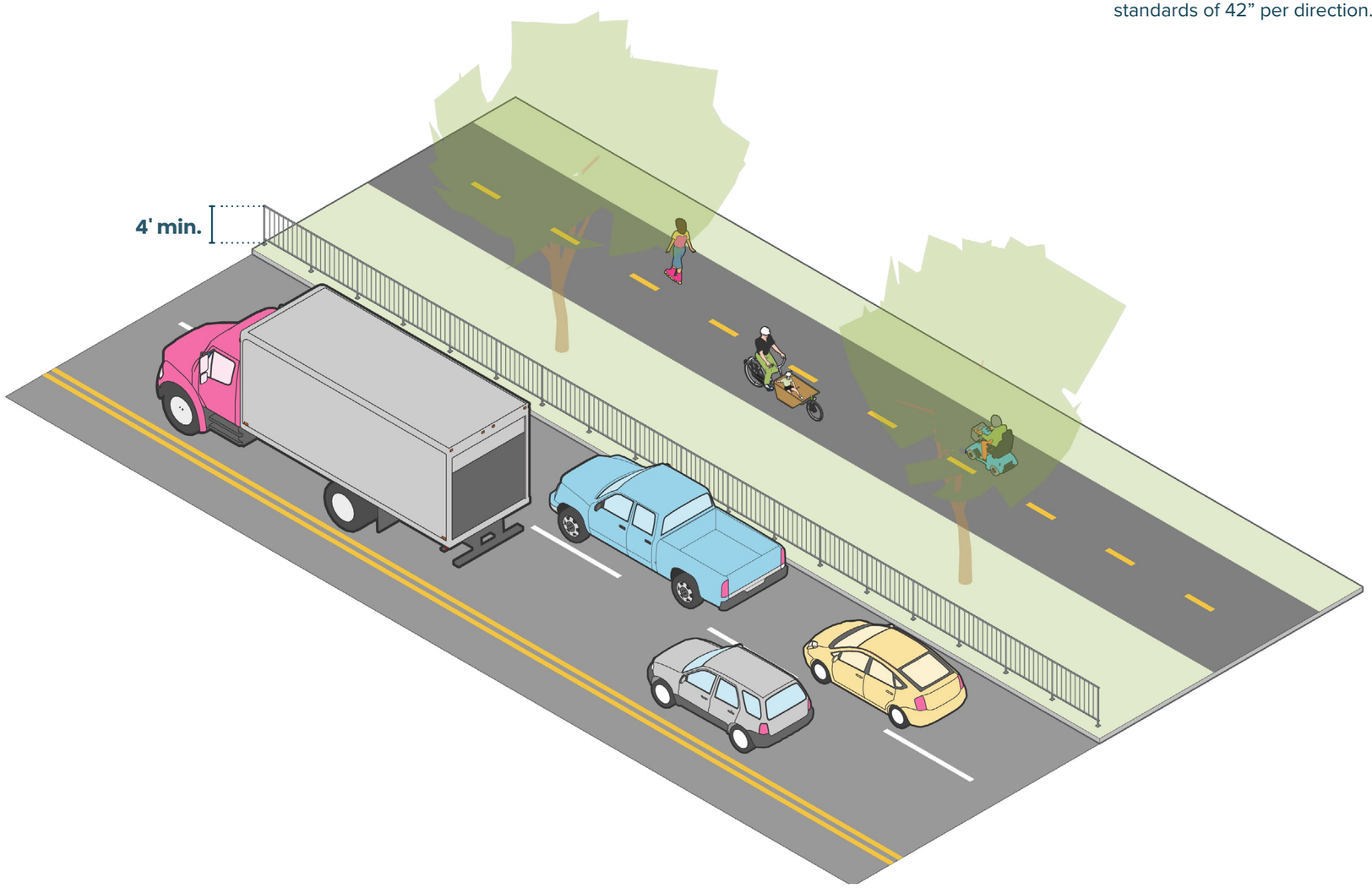
- Partner with nearby businesses, partner organizations, or community groups to adopt maintenance responsibilities, where feasible.
- Consider alternating planters and other vertical elements in buffers between vehicle and bike lanes or Urban Trails to reduce costs and allow easier maintenance and emergency vehicle access.
- Consider neighborhood and/or architectural context when selecting a planter style.

CU06 FENCING AND GUARDRAILS

Fencing and/or guardrails are used only in circumstances where other forms of barriers or buffers are not adequate to meet safety standards. These elements provide edge protection and separation of uses when necessary. The choice of material for fences may vary depending on site constraints, maintenance needs, and cost. Guardrail materials and installation should follow RIDOT standards.

USE

- Where fence enclosure or a guardrail barrier reduces safety hazards for people walking or riding bicycles.
- Where Urban Trails and off-street paths are parallel to adjacent to active rail lines.
- To separate Urban Trails and two-way bikeways from exceedingly high-volume or high-speed streets when available buffer space is narrow.



REQUIREMENTS

- Fences should be constructed to a minimum height of 4'.
- The impact of shy distance should be considered when determining widths of adjacent Urban Trails or separated bike lanes adjacent to fences or guardrails. Shy distances of 1' to 2' should be considered when located adjacent to a trail or bike lane. After accounting for shy distances, the minimum operating width of the adjacent trail or bike lane should not fall below minimum width standards of 42" per direction.

ADDITIONAL CONSIDERATIONS

- Use of chain link fences adjacent to trails or bike lanes are discouraged. Consider use a of a rub-rail where chain-link fences are used directly adjacent to an Urban Trail or off-street path to prevent handlebars from catching on the fence.
- Consider aesthetic goals for fence or rail in relation to design area.

ADDITIONAL RESOURCES

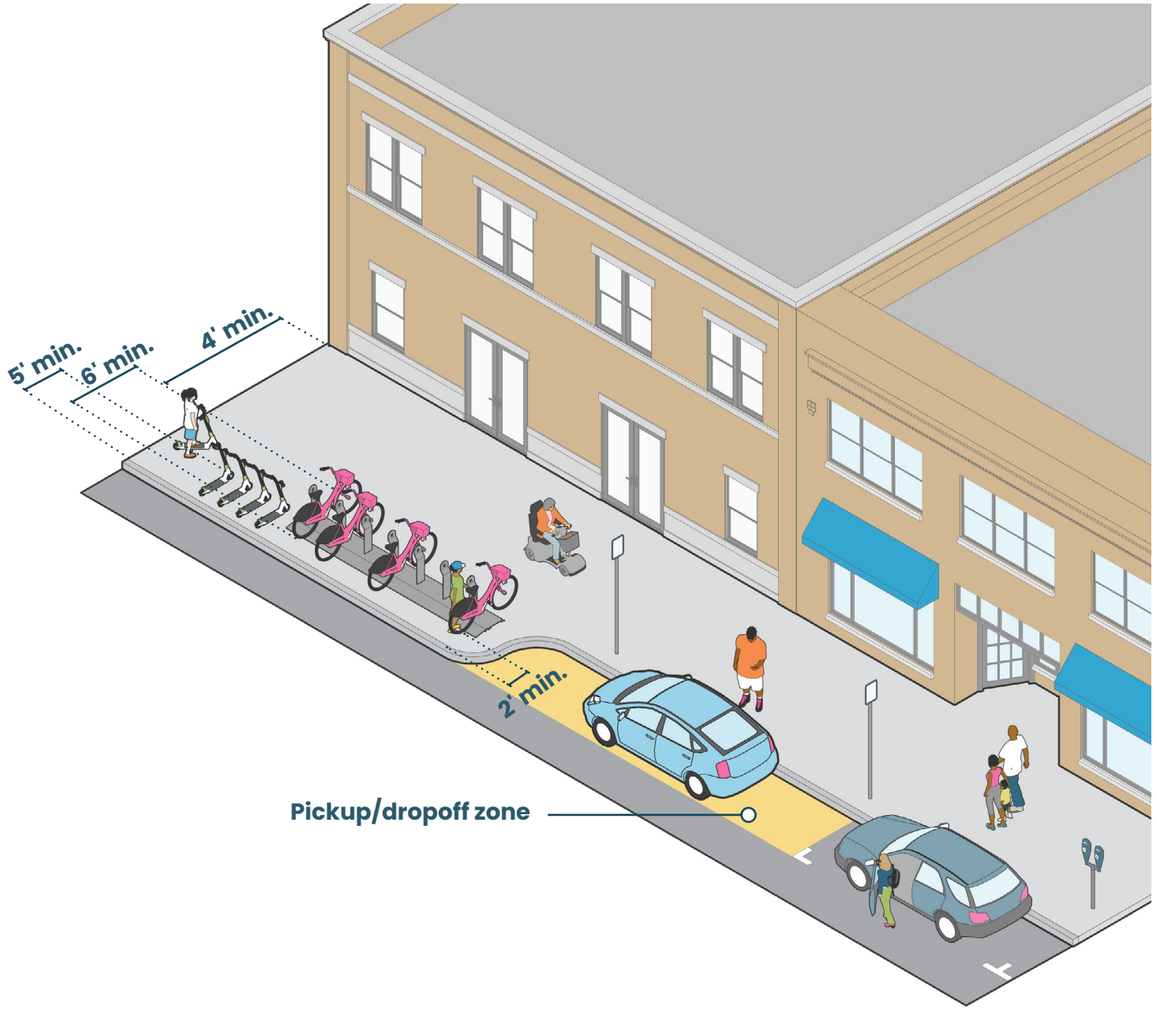
- RIDOT Standard Details

CU07 MICROMOBILITY HUBS

Micromobility hubs may provide designated parking areas or corrals for bikeshare, scooter-share to reduce sidewalk clutter and make use of curbsides more efficient. Bikeshare docks typically feature semi-permanent structures that hold bicycles, while scooters may be parked in spaces designated by pavement markings and/or signage. Scooter stands may be installed to prevent scooters from tipping over.

USE

- Near commercial or high-activity areas.
- On sidewalks with large buffer areas.
- Within curb extensions.
- Within pedestrian plazas.
- Near transit stops.
- Within on-street parking spaces or no parking zones where sidewalks are too narrow or pedestrian space is limited.



REQUIREMENTS

- A 4' minimum clear pedestrian path should be maintained behind any designated dock or designated micromobility parking area.
- A minimum distance of 2' should be provided from the hub to the face of the curb.
- A depth of 6' for bikeshare docks and 5' for scooter zones should be provided.
- In high-volume pedestrian areas, provide at least 2' clearance between hub and clear pedestrian path on sidewalks
- Provide 4' minimum clearance between the edge of a dock or designated parking area and any other vertical streetscape element.
- Docks should be oriented to allow people to pull a bicycle out onto the sidewalk instead of into the street.
- Bikeshare pay and informational kiosks (if provided) should be accessed from the sidewalk.
- Hubs may be located in parking lanes where there is not enough room in designated no-parking zones, such as daylighting areas (**see SA09**). Placing hubs in-street where traffic volumes are excessively high should be avoided. Vertical barriers, such as flexposts, precast curbs, or planters should be used to restrict motor vehicle encroachment on on-street docks and corrals.
- Hubs should be clearly delineated with striping, paint, and signage.
- Adequate sun exposure should be ensured if docks are solar powered.

ADDITIONAL CONSIDERATIONS

- Co-locate multiple micromobility options in the same location to maximize transportation choices for people and minimize sidewalk clutter and maximize curbside efficiency.
- Locate in well-lit areas with clear sight lines from sidewalks and pedestrian areas.
- Locate hubs in curb extensions and near bus stops to preserve maximum pedestrian access aisles.
- Consider use of on-street hubs as protective buffers between travel lanes and bike lanes or Urban Trails.
- Site hubs next to a curb extension to enhance and extend the intersection sight distance benefits provided by curb extensions (**see SA07 and SA09**).

ADDITIONAL RESOURCES

- Providence Dimensional Requirements for JUMP bikes
- ITE Curbside Management Practitioners Guide

CU08 PARKING METERS/KIOSKS

Parking meters and kiosks are devices people use to pay for on-street parking. They are installed in convenient curbside locations for user access while avoiding obstruction of the pedestrian path of travel. Modern parking meters and kiosks often take credit cards in addition to cash and/or coins and allow for prices to be dynamically changed based on demand, time of day, or day of the week. Parking meters typically allow payment of one to two directly adjacent parking spaces while parking kiosks typically allow payment for multiple parking spaces within a block.

USE

- Where on-street parking is provided proximate to commercial land uses fronting the street.
- Where on-street parking is provided proximate to occasional high-demand uses, such as sports or special event venues.

REQUIREMENTS

- If used, individual meters should be located within 3’ of the head or foot of the parking space to maintain potential lift operations where parallel on-street ADA parking exists.
- Meters should be mounted with centerline of controls at no more than 42” high per ADA standards.
- Meters should be placed as close as possible to the front of the curb or the back of the sidewalk to maintain ADA accessibility along sidewalks.
- Parking kiosks should be placed within the middle of the parking spaces they serve or, when possible, in curb extensions at one end of the spaces.
- When parking kiosks are used, signs should be placed approximately every 100’, using existing sign posts when possible, to direct people to parking kiosks.

ADDITIONAL CONSIDERATIONS

- Use parking kiosks where there are at least 8 parking spaces on a block face to reduce visual clutter of the street. Use parking meters on streets where there are fewer parking spaces.
- Convert current parking meters or meters that have been removed into bike parking with attachments that convert meter posts into post and ring racks. Do not use this conversion at ADA accessible parking meters.
- Select materials and styles for parking meters that match the local design context.

ADDITIONAL RESOURCES

- PROWAG

CU09 PARKLETS

Parklets are seating areas located in curbside on-street parking lanes that extend the pedestrian realm. These amenities provide a vibrant community space and places for social interaction. Parklets are often designed in partnership with local businesses and residents who manage and maintain the space. Parklets often become a focal point of the neighborhood and should be welcoming and accessible to all. The size and design of parklets is typically constrained by the on-street parking lane width and necessary clearances. Parklets typically occupy two standard on-street parking spaces. Parklets should be designed to be easily assembled and disassembled to provide flexibility of use.

USE

- On streets where vehicle speed limits are 25 mph or less.
- On streets with a running slope of 5% or less.
- On streets with moderate to high levels of current or projected people walking, land uses that encourage walking such as restaurants and cafes, and existing on-street parking.
- Where sidewalks are too narrow to accommodate sidewalk seating areas and on-street parking exists.

REQUIREMENTS

- Each end of the parklet should be buffered with parking stops, fencing, bollards, or other vertical elements. A minimum distance of 3’ should be provided from the edge of the parklet to the vertical element.
- The deck of the parklet should be flush with the adjacent curb to maintain accessibility from the sidewalk.
- The deck of the platform should be constructed to meet ADA surface standards.
- The parklet should not extend more than 7’ from the curb, regardless of the width of the parking lane.
- A consistent vertical edge should be provided along all sides of the parklet except the side open to the sidewalk. The height of the edge parallel to the street should be a minimum of 36” tall and a maximum of 42” tall. The height of the edges perpendicular to the street should be a minimum of 14” tall.
- Parklets should not block existing hydrants, manhole covers, or street drains.
- To maintain sightlines to crosswalks, parklets should not be located close to corners at intersections.
- Components of the parklet including the deck, vertical elements, seating, tables and planters should be low-maintenance and vandal-resistant.
- Prior to approval of installation, coordination with adjacent businesses and landowners should be completed to gauge support for parklets, develop maintenance partnerships, and ensure activation of the space.

ADDITIONAL CONSIDERATIONS

- Consider day and night surveillance when selecting sites.
- Provide bicycle parking or micromobility hubs at, near, or within the parklet (**see CU02 and CU07**).
- Disassemble and remove parklet during winter months if snow removal is prohibitive or materials will deteriorate.
- Consider temporary or pop-up installations to test the potential of the parklet and gauge community and other stakeholders.
- Use parklets as a temporary means to evaluate permanent curb extensions or sidewalk expansions.

ADDITIONAL RESOURCES

- PROWAG

CU10 SIDEWALK LIGHTING

Human-scale lighting is an important way to ensure public spaces feel safe and active at all times of day. Lighting also enhances the aesthetics of a streetscape and may help reinforce distinct neighborhood identities. Light poles may be used for decorative banners, advertising events, and seasonal decorations.

USE

- Commercial areas where streetlights do not light both roadway and sidewalk.
- Areas with high volumes of people walking or riding bicycles such as plazas, schools, parks, transit stations, Urban Trails, or in areas where personal safety is a concern.

REQUIREMENTS

- Fixtures should be spaced based on desired illumination levels, trees, and utility conflicts.
- A minimum clear accessible aisle of 3' should be maintained between all light poles and the back of sidewalk (4' minimum preferred).
- Lighting fixtures should be located at least 14' above the sidewalk level.
- Light poles should be placed a minimum of 18" back from the face of the curb. Wider setbacks (up to 3') may be appropriate where sidewalk widths are greater than 7'.
- In extremely constrained environments, engineering judgment should be used to locate needed lighting poles and fixtures.
- Where banners or hanging plants are affixed to light poles, adequate clearances should be provided below the hanging elements. A minimum of 9' should be provided below the bottom of a hanging plant or banner.

ADDITIONAL CONSIDERATIONS

- Consult International Dark Sky guidelines for luminaries.
- Consider neighborhood character and context when selecting light and pole style. Consult the Historic District Commission if working within a designated historic district.
- Select color temperature not to exceed 3,000 Kelvins that fits the feel and character of the street.

ADDITIONAL RESOURCES

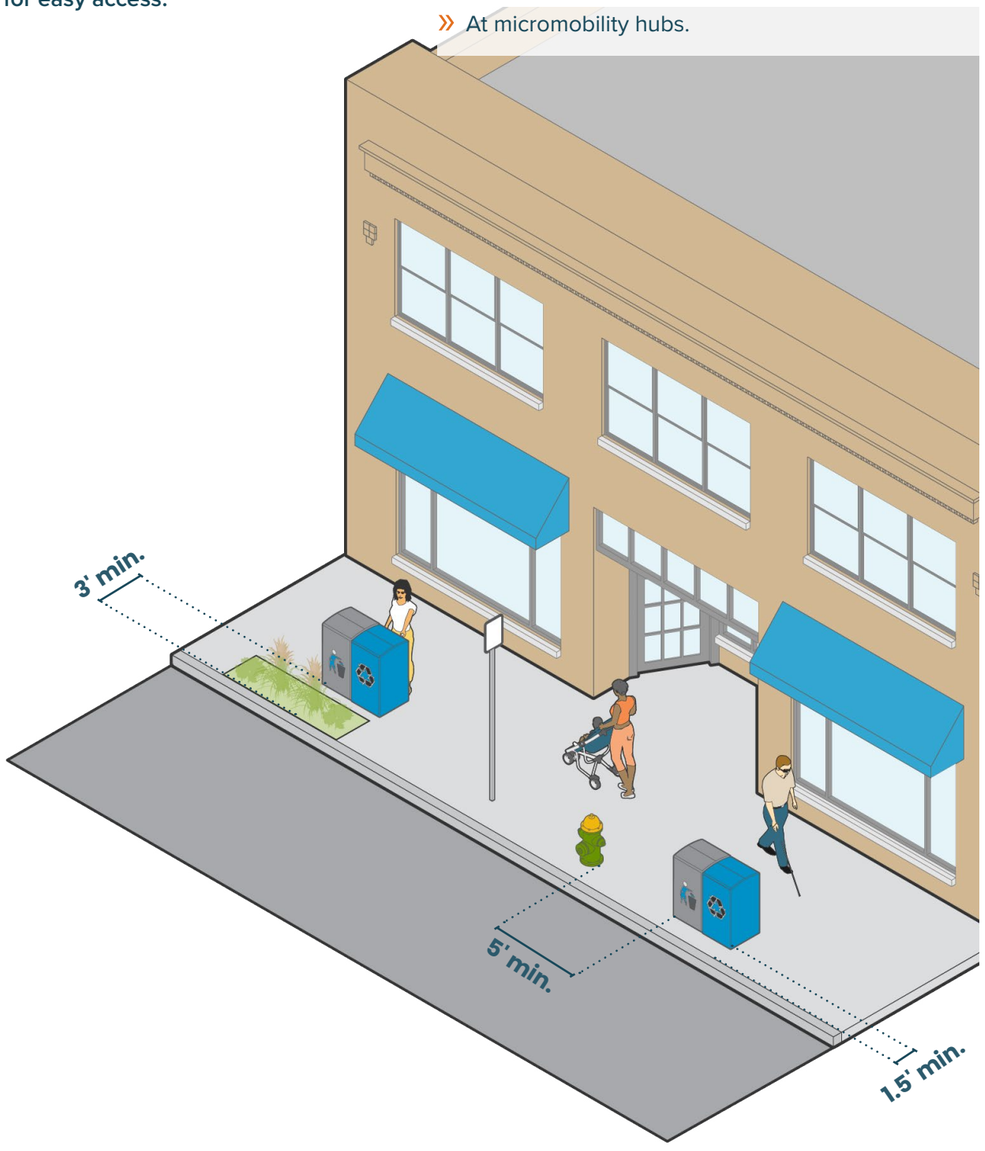
- International Dark Sky Association Outdoor Lighting Basics

CU11 TRASH & RECYCLING CONTAINERS

Trash and recycling receptacles are extremely important amenities in active streetscape areas. Properly sized and located receptacles reduce litter and help maintain a clean and attractive public realm. Receptacles require frequent maintenance and should be located alongside the curb for easy access.

USE

- On sidewalks and at intersections where there is a high volume of people walking.
- At all bus and transit stops.
- At intermittent trailside locations in conjunction with seating areas or points of interest.
- At micromobility hubs.



REQUIREMENTS

- Receptacles should be placed a minimum of 18" back from the face of the curb (3' minimum if next to parking).
- Receptacles should be oriented to face the sidewalk.
- A minimum of 3' should be provided from the edge of the receptacles to any other streetscape element.
- A minimum of 5' should be provided from the edge of the receptacles to any fire hydrant.
- Durable and vandal-resistant materials and designs should be used to withstand urban conditions and public use.
- Installation of new receptacles should be coordinated with Department of Public Works to ensure routine maintenance schedules can be guaranteed.
- Trash receptacles should be black and recycling receptacles should be blue.
- Receptacle capacity and design should conform to the standards most convenient for waste pick-up. Capacity should be 55 gallons and lids should be lift-off for both receptacle types, with a single-stream slot for recycling receptacles and hoods for trash receptacles.
- Materials should prevent ultraviolet damage, pest infiltration, and color fading.

ADDITIONAL CONSIDERATIONS

- Recycling receptacles should be co-located with trash receptacles anywhere they are installed.
- Provide information on recycling containers indicating what material types are appropriate to deposit into recycling receptacles.
- Consider streetscape character and context, and other streetscape elements when selecting style.
- Place trash and recycling containers every 200' along streets with commercial land uses.

SN01 EMERGENCY LOCATORS

Emergency locator signs (ELS) contain GPS-based information that help people communicate their location to emergency personnel while on off-street trails. ELS are important where trails run through parks or areas where people may be far enough off-road that they are uncertain of the nearest intersection or landmark reference.

USE

- Off-street trail network intersections.
- Locations along off-street trails where hazards exist, such as a falling hazard, or where personal safety may otherwise be a concern.

REQUIREMENTS

- Determine ELS locations based on use notes above and based on the character of an off-street trail network area.

ADDITIONAL CONSIDERATIONS

- Avoid using the United States National Grid (USNG) system for ELSs due to its complex numbering and sizing, which is more appropriate for rural areas.

ADDITIONAL RESOURCES

- PROWAG

SN02 INTERPRETIVE SIGNS

Interpretive signs should be used on streets and trails to provide information about the history, culture, environmental, and other characteristics of an area. Signage may be designed to address sites individually that do not fall within the Urban Trail Network. Sites that fall along the Urban Trail Network should be developed in coordination with the larger Urban Trail Network branding and signage requirements.

USE

- All sites where history, art, or special features of a site, such as stormwater treatment areas, may be explained and where adequate space exists.

REQUIREMENTS

- Sign location, height, and readability should be ADA-compliant.
- Sign placement should not interfere with a clear accessible aisle of at least 4’ on the sidewalk. Placement of signage is preferred within the buffer area when along a street.
- Durable and graffiti-resistant sign materials, such as high-pressure laminate, with an anti-graffiti coating, should be used.
- Refer to the PROWAG for specific guidance on character height, spacing, and proportions.
- Signs should use words and language that the majority of people will understand, be available in both English and Spanish, and be designed for low-literacy readers.

ADDITIONAL CONSIDERATIONS

- Use consistent signage styles across the City to connect the culture and history of Providence across locations, trail networks, or other unique cultural features. Color schemes and fonts should follow Urban Trail Network and City of Providence brand guidelines.
- Consider providing sign text in multiple language, adding braille descriptions, incorporating equipment to facilitate audio tours, including tactile textures, and using other features to accommodate different language proficiencies and abilities.
- Use high-contrast colors and low-glare finishes to ensure signs are legible to people with low vision disabilities.

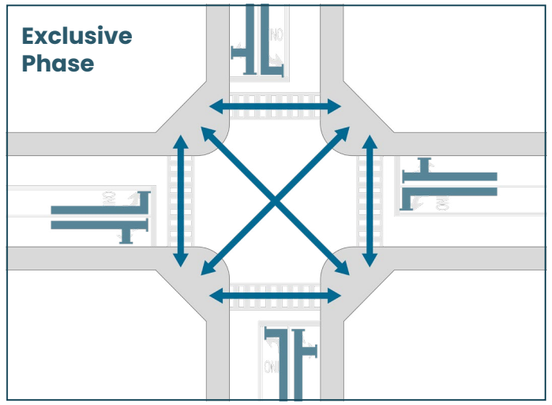
ADDITIONAL RESOURCES

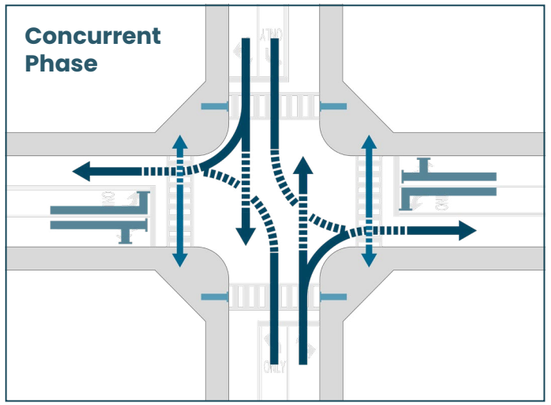
- PROWAG

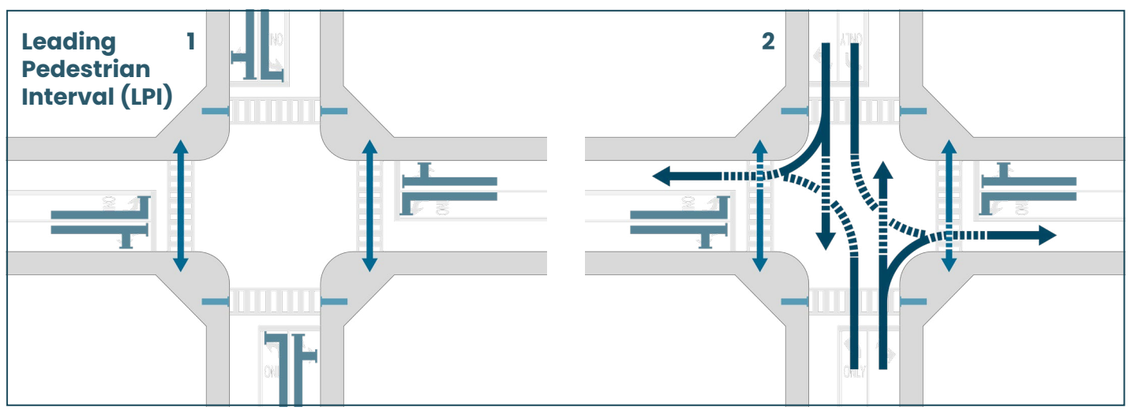
SN03 PEDESTRIAN SIGNAL PHASING

Pedestrian signals are part of a system of traffic signals that control intersection operations for people walking. Pedestrian signal phasing is intended 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 falls into three categories: concurrent, exclusive, or a hybrid of the two. As much as possible, consistent approaches to pedestrian phasing should be used across the City to help make the walking network predictable and consistent.

Concurrent phasing refers to phasing schemes that allow people to walk across the street at the same time and in the same direction as motor vehicle traffic. Concurrent phasing minimizes delay for all users. Exclusive phasing provides a separate phase for people walking that prohibits all motor vehicle movements while people walk across the street. Exclusive phasing can provide safety benefits by eliminating conflicts with motor vehicles, however exclusive phasing creates longer delays for all modes and may lead to non-compliant crossing behavior if delay is excessive. A hybrid phasing scheme may be beneficial at complex intersections including those with skewed intersections, multiple lanes of traffic, and leading protected left-turn phases. Hybrid pedestrian phasing uses concurrent phasing to minimize delay for people walking on those legs of the intersection where conflicts are minimal, while providing an exclusive phase for more challenging legs of the intersection.







USE

- All signalized intersections where people walking are likely to be present.

REQUIREMENTS

- A walking speed of 3' per second should be used to time all pedestrian phases and ensure adequate time is provided for people to cross the street.
- Concurrent Phasing
  - Use concurrent phasing at all signalized intersections, except where a strong safety concern is noted due to high turning movement volumes (250 or more turning movements per hour).
  - Leading pedestrian intervals (LPIs) should be used where concurrent phasing is applied to give people walking across the street a head start before other street users are allowed to proceed. LPIs encourage people driving to yield to pedestrians while they are turning and improve visibility between all users. No Turn on Red restrictions should be implemented at all locations where LPIs are used.
  - Where concurrent phasing is used, signals should be placed on automatic pedestrian recall. Automatic recall is especially important in high pedestrian traffic areas, such as within commercial areas and within a 10-minute walk shed of bus routes or transit stations.
  - Protected left-turn phases provide an exclusive phase for people driving to turn left and may be warranted if there is a pocket lane or center turn lane and high volumes of turning or opposing traffic on the street. In these cases, lagging left turns (left turn signal at the end of the 'green' phase) should be used instead of leading left turns (left turn signal at the beginning of the 'green' phase) to preserve the ability to use LPIs with concurrent phasing. The lagging left turn phase should be provided for both directions of traffic to avoid conflicts between through movements and permissive left turns, also known as a 'yellow trap.'
- Exclusive Phasing
  - Consider use of exclusive phasing where high concentrations of people walking are present or where at least 250 motor vehicles turn right per hour along any approach.
  - No Turn on Red restrictions should be implemented at all locations where exclusive phasing is used.
- Ensure all pedestrian signal heads are correctly oriented to be visible to all users who are directed to follow the signal indications. In locations where people riding bicycles or using other micromobility devices must use pedestrian signal heads to cross an intersection, signal heads must be visible from both the crosswalk and the approaching bike lane or Urban Trail. Where users of a bike lane or Urban Trail should use the pedestrian signal phase to cross an intersection, sign R9-5 should be provided.

ADDITIONAL CONSIDERATIONS

- Time signal phasing so that people walking have adequate time to cross both sides of a median-divided street during a single walk phase.
- Provide accessible pedestrian signals (APS) to assist people with disabilities.
- Provide a pedestrian countdown in pedestrian signal heads to assist people with street crossings.

ADDITIONAL RESOURCES

- MUTCD
- FHWA Achieving Multimodal Networks
- PROWAG

SN04 RECTANGULAR RAPID-FLASHING BEACONS (RRFB)

RRFBs combine signage and lights in a specific flashing pattern to help alert motorists to unexpected pedestrian and bicyclist crossings.

USE

- Unsignalized crossings at intersections or midblock locations where people walking, riding bicycles, or using other micromobility options are already observed crossing the street or where a new development is expected to create demand for a crossing.
- Uncontrolled crossings where vehicle yielding compliance is low and determined to be unsafe.
- Streets with posted speed of limits 35 mph or lower.

REQUIREMENTS

- Provide a high-visibility crosswalk, curb ramps, and tactile strips at all locations where an RRFB is used.
- Use accessible pedestrian actuation features and a R10-25 sign anywhere an RRFB is used.
- RRFBs should be mounted with W11-2 signs and W16-7P L (on the right side of the road, pointing to the left) or R (on the left side of the road, pointing to the right) plaques.

ADDITIONAL CONSIDERATIONS

- Pair RRFBs with raised crossings to slow motor vehicle traffic and further improve pedestrian safety at high-volume crossing locations (10,000ADT or above).
- Pair RRFBs with crossing islands to provide a pedestrian refuge on multi-lane streets.
- Consider use of side or overhead-mounted W11-2 (Pedestrian Crossing), S1-1 (School), and W11-15 (Bike and Ped Crossing) or W11-15P (Trail Crossing) signs depending on context. Where multiple lanes are provided in each direction or vehicle speeds exceed 35mph, overhead-mounted signs should be used instead of side-mounted signage.
- Maintain motorist sightlines in the immediate area around the RRFB by minimizing tall vegetation and other signage.

ADDITIONAL RESOURCES

- MUTCD
- FHWA Achieving Multimodal Networks
- NCHRP Research Report 841
- Interim Approval 1A-21

SN05 URBAN TRAIL IDENTIFICATION

A strong visual identity of the Urban Trail Network is a critical to provide legibility and consistency to trail users. Urban Trail identification is used to help trail users navigate through intersections and make transitions from two-way Urban Trail segments to neighborhood greenway Urban Trail segments. Urban trail identification may include a combination of signage, paint, or other materials such as thermoplastic and vinyl decals. Highly-intuitive identification treatments – such as paint – are strongly preferred rather than relying on signage to direct Urban Trail users.

USE

- All segments of the Urban Trail Network, including off-street trails, on-street trails, and neighborhood greenways.

REQUIREMENTS

- Surface-painted Urban Trail symbols should be painted every 200’ and at all intersections to guide users through crossings and onto the next segment of the Urban Trail.
- Consistent color and stenciling should be used across the city for all Urban Trail segments in accordance with the City’s standards for Urban Trail branding and signage.
- Where pole-mounted signs are determined to be necessary, signs should be spaced according to intersection density only as often as needed to reduce sign clutter. Signage should be provided at key decision points and/or where painted symbols are not feasible or adequate. Where intersections are within 300’ of each other, signs should be placed at intersections and midblock locations should be avoided.
- Signs should be mounted according to ADA and MUTCD standards.
- Regulatory and warning signage should be prioritized over identification signage when there is not space for both according to MUTCD standards.
- Bike/Micromobility crossing markings should be provided through all Urban Trail crossings. Urban trail pavement stencils should be visible from Urban Trail approaches to the receiving segment of the Urban Trail (see SA3).

ADDITIONAL RESOURCES

- MUTCD
- PROWAG

SN06 URBAN TRAIL NETWORK TRAILHEAD SIGNS/KIOSKS

Urban Trail Network trailhead sign/ kiosks may be located at important locations along Urban Trails where the provision of information to Urban Trail users is desired or necessary. Trailhead signs and kiosks may include destination information, maps, etiquette, and interpretive information.

USE

- At the beginning of trail segments, key destination connections or crossings, and at resting spots and/ or bike parking areas along trail segments.

REQUIREMENTS

- Kiosks should be installed according to ADA standards to preserve clear accessible aisles.
- The same kiosk type and style should be installed throughout the Urban Trail Network in adherence with established Urban Trail Network branding and signage.
- Signs should use words and language that the majority of people will understand, be available in both English and Spanish, and be designed for low-literacy readers.

ADDITIONAL RESOURCES

- PROWAG

SN07 URBAN TRAIL SIGNAL STRATEGIES

At signalized intersections, Urban Trails will require careful consideration to ensure conflicts between trail users and turning motorists are mitigated. Dedicated signals may be used to guide Urban Trail users through an intersection. Dedicated signals for Urban Trails should be strongly considered at complex intersections including skewed intersections, intersections where motorists must cross multiple lanes of vehicles traffic to make a turn, or where a two-way Urban Trail segment terminates and trail users must transition from two way-operations on one side of the street to one-way operations on both sides of the street. Though dedicated signals are preferred, pedestrian indicators may also be used to signal to trail users when it is appropriate to proceed through an intersection.

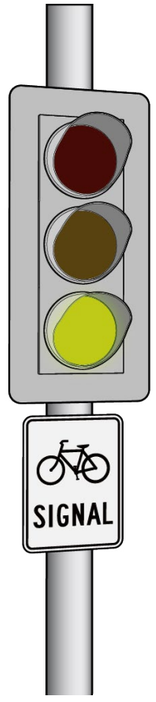
USE

- At all signalized intersections where an Urban Trail crossing is present.

REQUIREMENTS

- Signal heads or indicators intended to direct Urban Trail users should be visible from all approaches of the Urban Trail.
- Dedicated Urban Trail Signal
  - An 8” circular indicator with R10-10B sign should be used at intersections where contra-flow Urban Trail movements cannot be safely accommodated with pedestrian indications.
  - Where dedicated Urban Trail signals are used, the minimum green time should be calculated to allow for a typical user to make it at least half-way across the intersection before the yellow phase begins. Depending on grade and typical or expected trail users, a design speed between 3 mph and 8 mph should be used to determine minimum green cycles.
  - Where conflicts between turning motor vehicles and Urban Trail users are determined to be too significant to mitigate with any concurrent phasing scheme, an exclusive phase should be considered.
- Pedestrian Signal
  - At locations where Urban Trail users must use pedestrian signal heads to cross an intersection, signal heads should be visible from both the crosswalk and the approaching Urban Trail.
  - Provide a R9-5 sign at all locations where Urban Trail users must use pedestrian indicators to cross. Adjustments to the signal phase length should be made accordingly to provide adequate time for trail users to cross during the WALK signal. Automatic pedestrian recall should be used when Urban Trail users must follow pedestrian phases. A maximum crossing speed of 3.5’ per second should be used when timing Urban Trail crossing phases.
- Where motor vehicle turning movements across the Urban Trail exceed 100 right turn movements and/or 50 left turn movements per hour or where left turning vehicles cross more than one travel lane before the Urban Trail, an exclusive signal phase or protected turn signals should be used to prevent vehicles from conflicting with crossing Urban Trail users.
- Where motor vehicle turning movements across the Urban Trail are less than 100 right turn movements and 50 left turn movements per hour and where left turning vehicles cross one travel lane or less before the Urban Trail, concurrent phases with leading intervals may be used.
- No Turn on Red restrictions should be provided for all vehicle crossing movements that could conflict with Urban Trail crossings.
- Bike/Micromobility Crossing markings should be provided at all Urban Trail crossings of signalized intersections (**see SA3**)
- Detection– passive or push-button-based– should not be required for dedicated Urban Trail signals to activate; all Urban Trail signals should be automatic. Where detection is provided, it should allow trail users to request a quicker green light.

R9-5



R10-10B

When to Use Exclusive Phasing Based on Turning Volumes

		Motor Vehicles per Hour Turning across Separated Bike Lane/Urban Trail			
		Two-way Street			One-way Street
		Right Turn	Left Turn across One Lane	Left Turn across Two Lanes	Right or Left Turn
Separated Bike Lane/ Urban Trail Operation	One-way	150	100	50	150
	Two-way	100	50	0	100

SN07 URBAN TRAIL SIGNAL STRATEGIES (CONT.)

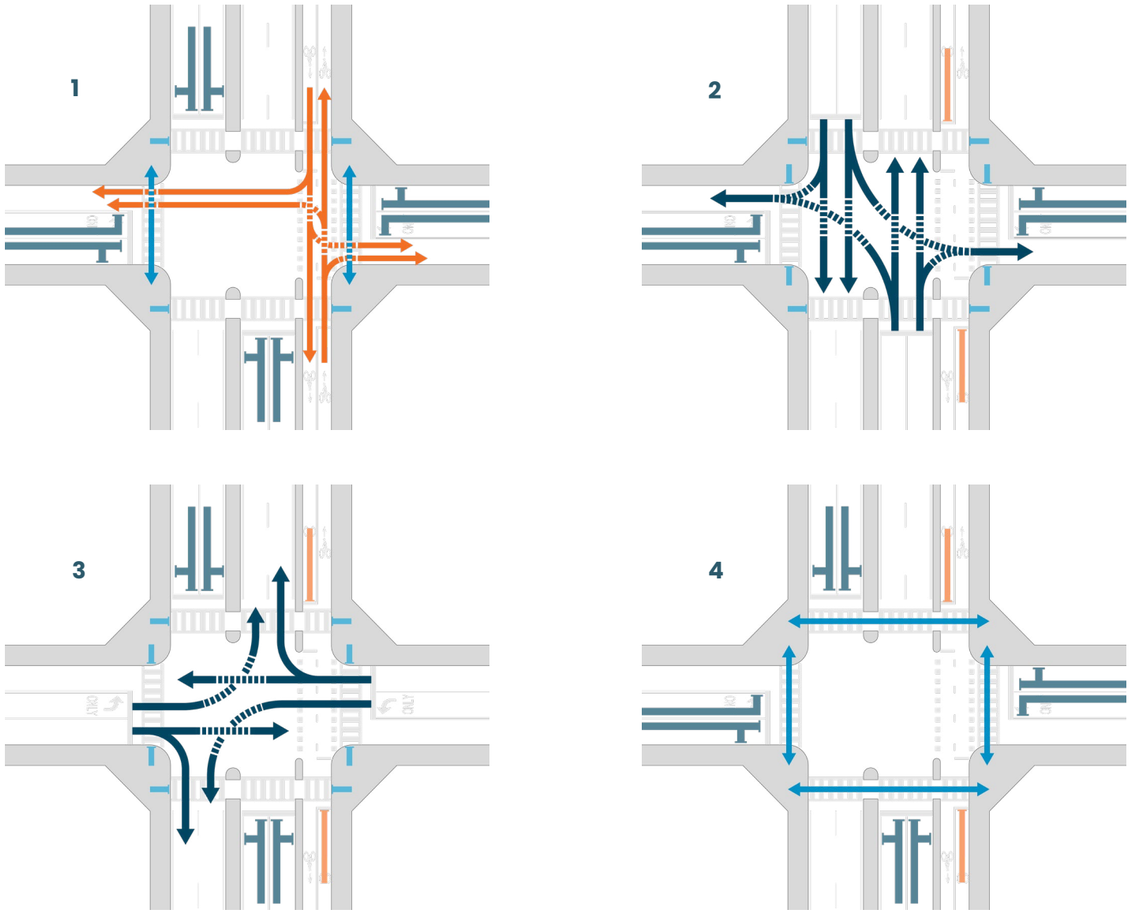
ADDITIONAL CONSIDERATIONS

- Consider use of R10-15 series signage to warn motorists and direct them to yield for movements that cross the Urban Trail.
- Locate far-side Urban Trail indication within 5’ of the edge of the Urban Trail to ensure indications are visible to trail users.
- Mount signals intended to direct Urban Trail users so that the bottom of the signal head is no less than 8’ and no more than 19’ above the ground or sidewalk.
- Provide accessible pedestrian signals (APS) to assist people with disabilities.
- Provide a pedestrian countdown to assist people with street crossings.
- Consider use of a flashing yellow arrow for motorists making turns (both left and right) across an Urban Trail where permissive turns are permitted and vehicle volumes exceed 50 vehicles per hour during peak periods.

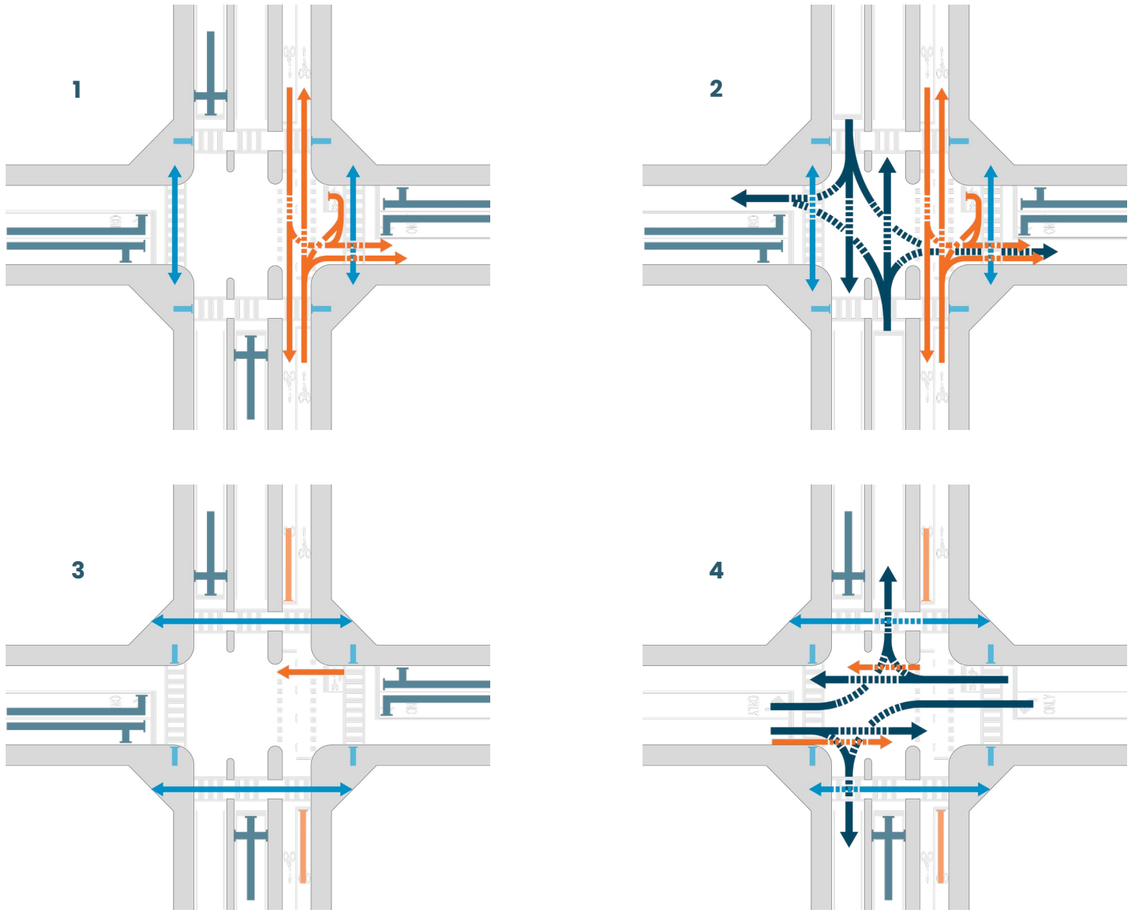
ADDITIONAL RESOURCES

- MUTCD
- NACTO Urban Bikeway Design Guide

Exclusive Phase



Concurrent Phase with Leading Interval



Motor Vehicles Pedestrians Bike and Micromobility Users

04 MAINTENANCE

A strong, systemic commitment to maintenance is required to ensure the longevity, dependability, and quality of great streets. This chapter outlines maintenance considerations for seasonal maintenance, vegetation maintenance, maintenance of street amenities and art, and provision of temporary access during construction activities.

For new construction projects or retrofits, the following general maintenance best practices should be followed to ensure City operational staff are adequately prepared to maintain new components of the public right-of-way:

- Begin developing maintenance plans during the planning and design stages of projects and coordinate with City departments and other stakeholders responsible for enforcing and carrying out maintenance practices.
- Where necessary, prepare and execute maintenance agreements for elements of the public realm – such as parklets, planters, bus shelters, traffic signals, and public art – to ensure longevity and consistent quality.
- Consider materials, maintenance vehicle availability, resources for upkeep, and equipment needs for snow removal, sweeping, vegetation care, and general clean-up as design decisions are made to ensure feasibility of proper maintenance.
- Carefully plan for seasonal maintenance requirements to ensure year-round accessibility and safety within the public realm.

WHO MAINTAINS OUR PUBLIC REALM?

PROVIDENCE DEPARTMENT OF PUBLIC WORKS

- Responsible for the routine and seasonal upkeep of City-owned travelways and elements of the public realm including sidewalks, pavement, sewers and drainage structures, traffic control devices, parking meters, etc.

PROVIDENCE DEPARTMENT OF PUBLIC PROPERTIES

- Responsible for the management, maintenance, upkeep and expansion of the City's street lights.

PROVIDENCE DEPARTMENT OF PARKS

- Responsible for the maintenance of all city-owned park land and pruning of City street trees.

PROVIDENCE DEPARTMENT OF ART, CULTURE, AND TOURISM

- Responsible for maintaining a catalogue of the City's public art collection and ensuring their upkeep.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

- Responsible for routine and seasonal upkeep of state-owned highways and right-of-way.

RHODE ISLAND PUBLIC TRANSIT AUTHORITY

- Responsible for routine maintenance and seasonal upkeep of bus shelters and stops, not including snow removal.

BUSINESS OWNERS

- Responsible for snow removal of sidewalks in front of their business.

RESIDENTS

- Responsible for snow removal of sidewalks in front of their homes.

SEASONAL MAINTENANCE

Successful seasonal maintenance programs require knowledgeable staff and crew, proper equipment, and consistent procedures and preventive strategies.

SEASONAL MAINTENANCE PLANNING

- Develop proactive strategies including regular facility inspection, repair, replacement, and clear record keeping to ensure seasonal maintenance practices are manageable and efficient.
- Develop strategic assessment, prioritization, and maintenance plans to care for all elements of the public realm, including sidewalks, roadways, catch basins, vegetation, signage, traffic signals, lighting, trash and recycling bins, street furniture, and pavement markings.
- Encourage the public to report issues and conditions via the City's 311 app.

SNOW CLEARANCE

Adequate snow clearance is critical to maintaining accessible trails and travelways throughout the year.

- Except in snow emergencies or unusually heavy snowfall, keep Urban Trails and bike lanes free of snow and ice.
- Develop a communication plan in alignment with City's Limited English Proficiency Plan to regularly remind property owners that they are responsible for clearing snow and ice from adjacent sidewalks.

Prioritization

A balanced snow clearance prioritization strategy ensures that essential services– such as emergency access– are provided while also tending to the needs of the most vulnerable users of our streets. People walking – especially those with physical disabilities – require a clear sidewalk in order to travel. People riding bicycles or using other micromobility options are more sensitive to snowfall than people driving due to smaller, thinner wheels and the need to keep balance on their vehicles.

- Establish a map of priority routes where emergency and multimodal access are most critical.

Clearances

- Maintain a minimum clear width of 4' per direction on separated bike lanes. On two-way Urban Trails, provide a minimum clear path of 8'.
- Maintain a clear width of 3' per direction on sidewalks and pedestrian paths.

Snow Storage

- Use buffers and landscape areas for snow storage. Ensure adjacent pedestrian paths remain clear and that snow does not impede sight lines.
- Consider the impacts of melting snow and resulting drainage as part of snow storage planning.

Equipment

- Use existing DPW plowing equipment (8' and 9' blades attached to pickups and landscapers) on travelways that are at least 8' wide.
- Procure special snow plowing equipment for one-way trails or bike lanes narrower than 8'.
- Procure snow throwers to push snow farther off paths than possible with snow plows, if needed.
- Consider procuring specialized equipment that can be outfitted with other attachments such as brooms, plow blades, snow throwers, and loaders.

Ice Control Treatments

- Treat Urban Trails, bike lanes, and shared use paths with salt, salt brine, or other ice control treatments to reduce icy and slippery conditions.
- Consider porosity of pavement materials, adjacent landscape areas, wetlands, or other environmentally sensitive sites when selecting ice control treatments. Salt and brine may damage tree and vegetation routes. Environmentally-friendly treatment options should be considered. Porous paving generally requires substantially reduced applications of ice control materials. Heavy use of sand may compromise the drainage capacity of these pavements.
- When the temperature remains above 15 degrees F, use potassium chloride to melt ice to prevent harm to humans or vegetation. Magnesium chloride releases 40% less chloride into the environment than rock salt or calcium chloride and continues to melt snow and ice until the temperature reaches -13 degrees F.
- Continue ice control treatment after snowfall events, as snow can melt and refreeze.
- If necessary, remove snow from buffer areas or improve capacity for drainage in areas where freezing is common.

STREET SWEEPING AND DEBRIS REMOVAL

Removal of sand and debris from trails and pathways is critical to maintaining high-quality travelways.

- Include on-street Urban Trails and bike lane facilities in regular sweeping schedules, including:
  - In the spring to remove accumulated winter sand, salt and other debris; and,
  - In the fall to prevent leaf buildup on paths.
- Monitor off-street infrastructure on a quarterly to ensure prompt removal of debris build-up.
- Clean and remove debris from buffers between streets and separated bike lanes or Urban Trails on a quarterly basis. In buffers where green infrastructure structures such as bioswales and infiltration systems are in place, debris clearance is especially important to ensure the system can perform stormwater management functions.

VEGETATION

Maintaining healthy street trees and other vegetation is critical to the beauty, sustainability, and resiliency of green infrastructure throughout the City. Detailed requirements for the maintenance and management of street trees can be found in Sec. 23 of the City Ordinance.

PLANT MATERIAL SELECTION AND SITING

- Select trees and plants for microclimate suitability based on their urban environment tolerance and low maintenance properties.
- Locate trees so that they don't block visibility of crosswalks or traffic control devices such as signs and traffic signals.
- Based on available space, work with the City Forester to select large tree species to maximize environmental benefits. Choose species based on sidewalk width, overhead utility wires, proximity to below-ground utilities, street lights, and other infrastructure.
- Mulch plant beds and tree pits to improve soil health. As a secondary approach, focus fertilizing on monitoring nutrient levels and feeding the soil. Soil health is the key to strong healthy plant material.
- Based on available space, maximize soil volume for tree roots including use of new soil technologies.

PLANT MATERIAL MAINTENANCE

- Ensure experienced arborists and/or urban foresters monitor and maintain streets trees, as needed. Established trees should be inspected once annually, with new trees or trees in poor health inspected more frequently. New street trees should be inspected and either accepted and rejected by the City arborist prior to planting.
- Include replacement of damaged or dead plant material in plans and budgets for routine maintenance.
- Trim trees and vegetation according to seasonal plant species requirements. Plants should be trimmed or pruned at the appropriate time of year for each specimen. Permits are required prior to trimming any City-owned trees. Coordinate with City Forester as needed.
- Maintain vegetation to ensure clear visibility for the safety of all users. With the exception of grass or other low-growing groundcover, do not allow vegetation to encroach within 12" of the edge of pathways or 100" vertically above the surface paving to allow for adequate user head-room and maintenance vehicles.

PROTECTION FOR VEGETATION

- Tree protection plans should be developed prior to construction activity near trees. Protection should include tree trunks and branches as well as the critical root zone and soil surrounding trees. Coordinate with City Forester as needed.
- Monitor sensitive and fragile ecosystems such as wetlands and riparian areas for invasive species. Successful removal of invasive species depends on prompt identification and appropriate removal procedures. Use current best practices and professional consultation in these cases.

STREET FURNITURE, ART, SIGNAGE, AND AMENITIES

Material and product durability are essential to low-maintenance design elements that will withstand the urban environment. As a premiere feature of the urban landscape in Providence, art is a core asset requiring maintenance like other elements of the streetscape. With artistic installations ranging from landmark to temporary, maintenance of the City's art collection requires cooperation by a number of agencies and private landowners.

SELECTION AND SITING OF STREETSCAPE ELEMENTS

- Select high-quality and low-maintenance benches, trash and recycling receptacles, bike racks, signage, and other amenities to save costs on repairs or replacements over their life cycle. Consider product maintenance requirements and warranties, and ability to fabricate in-house, when selecting elements.
- Ensure elements are installed property to prevent unnecessary maintenance.

MAINTENANCE OF ARTISTIC INSTALLATIONS

- Maintain permanent art works in accordance with the policies outlined in the Art in City Life Plan. Ensure 10% of each project cost is endowed for maintenance and conservation of these works.
- Establish maintenance and/or phasing out plans for new and temporary art installations introduced into the City's collection.

PRIORITIZATION

- Prioritize placement and maintenance of street furniture, art, signage, and other amenities in areas with significant foot-traffic. Poorly maintained amenities may contribute to feelings of personal insecurity, especially for people walking, riding bicycles, or using other micromobility options.

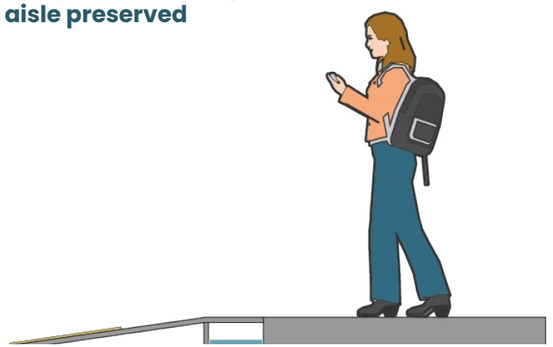
ACCESS DURING CONSTRUCTION

Construction activities can create difficult access and safety issues for all street users. Due to the time and effort required to make detours, people waking, riding bicycles, or using micromobility devices are particularly sensitive to detours.

ACCESS

- Maintain ADA-compliant accessibility throughout all construction zones. Use temporary ramps constructed of metal plates, wood, or asphalt as needed.
- Temporary ramps should not be located near drainage structures.
  - All slopes and ramps within pedestrian pathways should adhere to ADA accessibility guidelines.
  - Contractors should ensure drainage is able to enter the drainage system. If a ramp can only be placed such that it blocks drainage flow completely, a PVC pipe should be placed at the gutter to allow for flow. The pipe should be maintained by the contractor responsible for the project.

temporary curb ramps with drainage aisle preserved



- Ensure all project construction management plans are MUTCD-compliant.
- Establish a plan for clear protocols and lines of communication between City staff, inspectors, project managers, consultants (if used by the project), and contractors to quickly address work zone access issues that emerge during construction for people walking and riding bicycles.
- Minimize vertical and horizontal deflection in construction management plans for all that will affect the public right-of-way. Provide a detour that is as close as possible to the normal path of travel. To the extent possible, the layout of the street should remain consistent throughout construction. For example, where an Urban Trail and sidewalk are usually side-by-side when no construction is present, minimum widths for both should be continued through the construction zone. Whenever possible, maintain protected detours on the same side of the street as they normally exist around work zones. Detours that require people walking or riding bicycles to cross the street should be minimized, especially in locations where there are high volumes of people walking and riding bicycles.
- Where detours require channelization into a temporary path of travel within the street, detectable barriers should be used to ensure those with vision impairments can dependably use a cane to detect their path of travel.
- Regular maintenance – including snow removal and sweeping – should be conducted by the contractor in construction zones. Construction related debris should be cleared by the contractor.

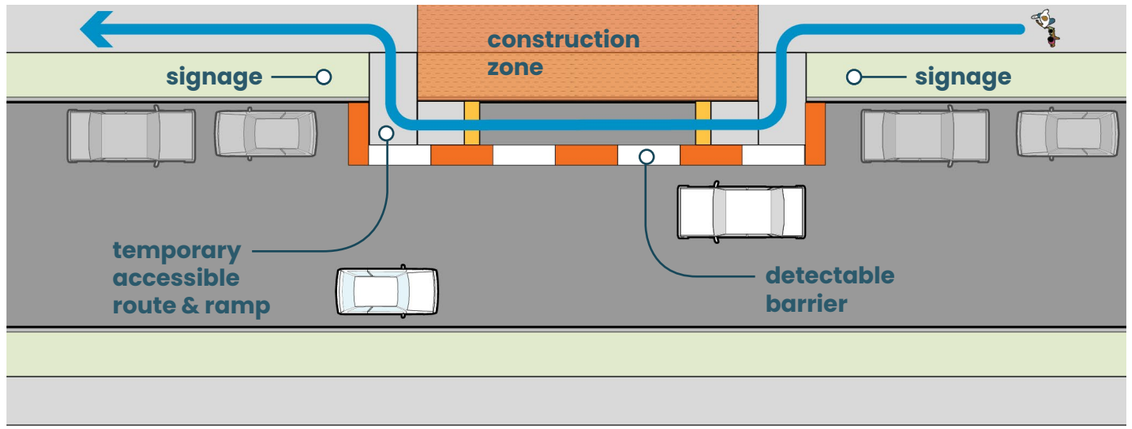
SIGNAGE

- Provide clear signage ahead of construction sites indicating detours or other special conditions. If detours or route changes are necessary, these should be clearly signed throughout the detour route. Signage should use words that the majority of people will understand and designed for low-literacy readers.
- Signs and equipment should not be placed within paths, trails, and bike lanes or in any way that impedes ADA access on sidewalks.
- Signage height should be appropriate for intended users. Signs and other devices mounted lower than 7 feet above the ground should not project more than 4 inches into the temporary path of travel.

ART

- Consider using art to offset feelings of disruption and annoyance for detoured travelers and adjacent residents and businesses. Project plans for temporary creative interventions on construction fencing or street paintings should be designed and approved in accordance with the Art in City Life Plan.

temporary pedestrian path of travel with detectable barriers



REFERENCES

- RIDOT Traffic Design Manual. Chapter 4: Work Zone Traffic Control
- MUTCD Part 6: Temporary Traffic Control
- PROWAG