Transportation Design Manual and Complete Streets Guide

Volume 2

Complete Streets Guide

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CITY OF BELLEVUE
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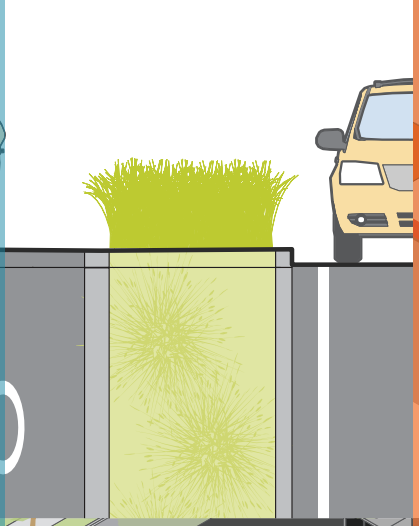
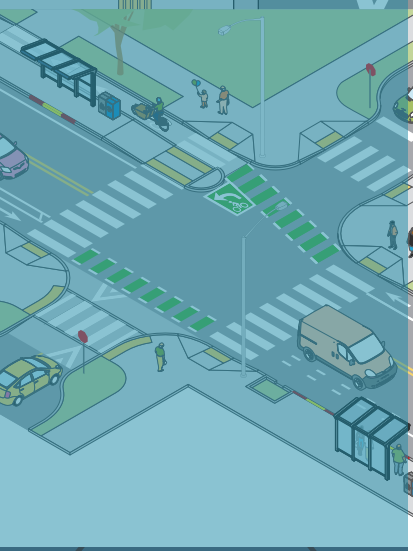
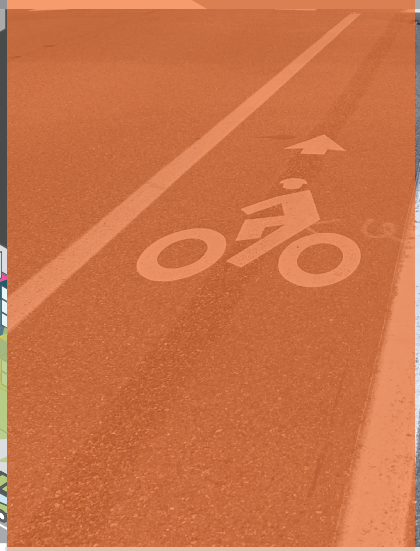
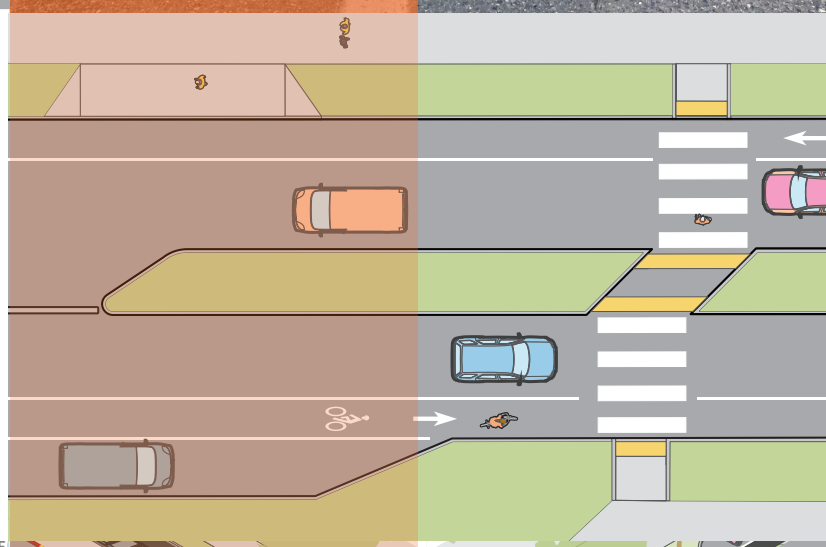
Bellevue Complete Streets

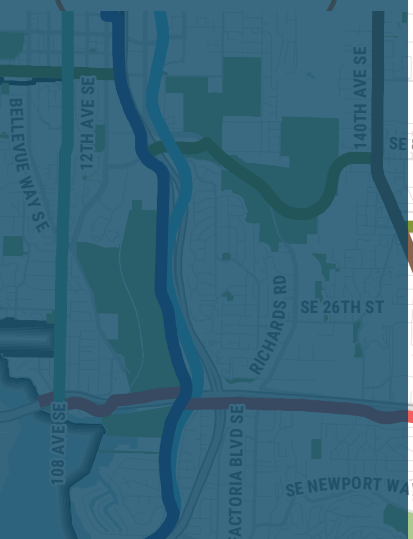
AUGUST 2020







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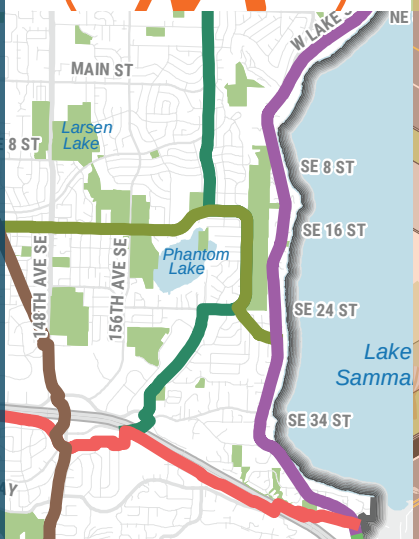
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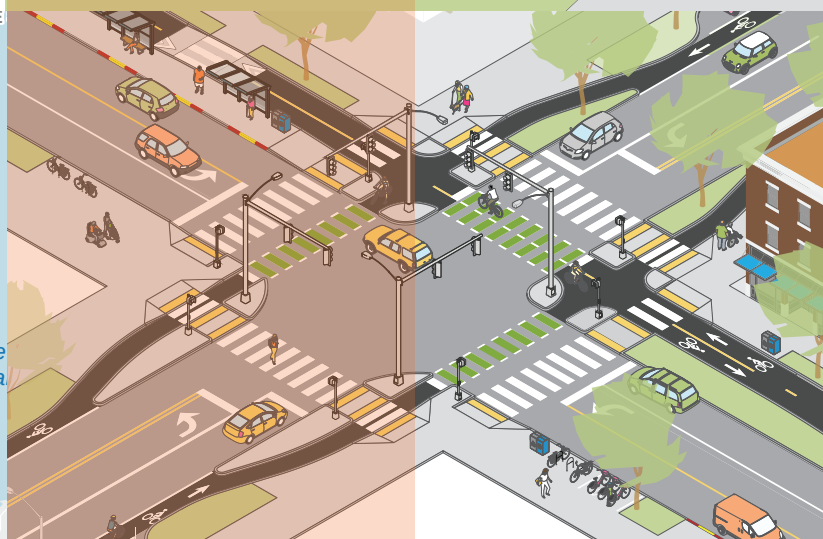

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Introduction and User's Guide

Introduction

The Bellevue Complete Streets Transportation Design Manual establishes requirements for the design and development of transportation facilities in Bellevue based on a Complete Streets approach to ensure safe, reliable, equitable mobility for people using all modes of travel.

The Complete Streets approach is mandated by the Bellevue city code (BCC) as follows:

"The City of Bellevue will, to the maximum extent feasible, implement complete streets. 'Complete streets' means that streets provide appropriate facilities to meet the mobility needs of people of all ages and abilities who are walking, bicycling, riding transit, driving, and transporting goods. Complete streets will be implemented through the scoping, planning, design, building, operating, and maintaining an integrated and connected transportation system." BCC 14.60.191, enacted by Ordinance 6308 on 9/16/2016.

This Design Manual provides context for Complete Streets and the other City of Bellevue transportation-related goals and objectives. It also provides an overview of design guidance, city requirements and standards in order to meet this mandate. It is based upon and implements city, state, and national laws, codes, regulations, ordinances, plans, and policies, as well as and best practices from organizations like the National Association of City Transportation Officials (NACTO), and the Institute of Transportation Engineers (ITE).

Safety, achieved through appropriate project design, is a key city goal. The design requirements contained within this Design Manual, per BCC 14.60.191, are intended to supplement, but not be a substitute for, competent work by design professionals. In a complex urban environment, the designer of transportation facilities will need to make decisions regarding competing project elements. As this Design Manual cannot anticipate all such situations, the design professional must therefore apply engineering analysis and sound professional judgment in the design process.

The City encourages creativity and context-appropriate innovations that result in a superior design. When innovative or creative designs are proposed that fall outside the design parameters of this Design Manual, additional documentation will be required to record the decision-making process. Proposed departures from these standards will be evaluated on the basis that the proposal will meet requirements for safety, financially feasible maintenance, and pleasant appearance, and that it produces acceptable results for the user, the environment, and the public.

What is a Complete Street?

A Complete Street provides appropriate accommodation for people who use multiple modes of travel, including driving, walking, rolling, and riding transit. A Complete Street accommodates persons of all abilities, while promoting safe operation for all users.

User's Guide

The Design Manual shall be used for new development projects, ones that modify existing developments or city right of way, and city-constructed projects. This Design Manual is to be used as a resource by city staff, residents, developers, contractors, and design professionals.

The Design Manual is comprised of three parts each corresponding to a specific phase of project development. The following descriptions provide guidance on the content and intended audience for each part of the Design Manual.

Part 1: Transportation Policy

Part 1 provides the policy framework for the development of transportation-related facilities in Bellevue.

Project Phase(s): Scoping, planning, and design

Target audience: City staff, developers, and consultants. The public will also find value in this section.

Contents:

A. General Considerations: high-level information about permitting, deviation from standards, design criteria, engineering plans
B. Comprehensive Plan – Transportation Element: goals and policies relevant to the design, development, and implementation of streets
C. Complete Streets: description and importance of the city's approach to creating safe and reliable mobility options, as well as relevant Comprehensive Plan policies
D. Vision Zero: description of the city's initiative to eliminate fatalities and serious injuries on Bellevue streets, and relevant Comprehensive Plan policies
E. Multimodal Level of Service: description and overview of standards and guidelines the city uses to integrate the needs of all modes of travel, to ensure multimodal connectivity through the city.

Part 2: Complete Streets Components

Part 2 provides illustrated decision-making guidance for the public right-of-way and direction on use of general design features.

Project Phase(s): Scoping, planning and design

Target audience: City staff, consultants, design professionals, developers

Contents:

A. How a Complete Street comes together
B. Pedestrian Facilities
C. Bicycle Facilities
D. Transit Facilities
E. Roadway and Curb Space Facilities
F. Intersections
G. Other Key Considerations

The following tables and figures have been updated from and supersede those in adopted plans and reports:

Table 3: Sidewalk and Landscape Buffer Width Standards Source: MMLOS Metrics, Standards & Guidelines, 2017
Table 4: Mid-Block Pedestrian Crossings Source: MMLOS Metrics, Standards & Guidelines, 2017
Table 5: Bicycle Level of Service / Level of Traffic Stress. Source: MMLOS Metrics, Standards & Guidelines, 2017
Table 6: Bicycle Facility Components at an Intersection. Source: MMLOS Metrics, Standards & Guidelines, 2017
Table 7: Transit Stop / Station Level of Service Source: MMLOS Metrics, Standards & Guidelines, 2017

Figure 4: Bicycle Network Map. Source: 2009 Pedestrian & Bicycle Transportation Plan
Figure 5: Existing and Planned Mid-Block Crossings Source: Downtown Transportation Plan, October 2013
Figure 6: Planned Sidewalk Width and Landscape Type Source: Downtown Transportation Plan, October 2013
Figure 8: Recommended Intersection Types Source: Downtown Transportation Plan, October 2013

Part 1: Transportation Policy

Introduction

This part of the Design Manual provides the policy framework and context for the design guidance and requirements provided in Parts 2 and 3. This policy framework starts with the Bellevue Comprehensive Plan, the foundation for the transportation policies and Complete Streets philosophy. Other policies and plans that shape the guidance and requirements included in this Design Manual include Multimodal Level of Service, Vision Zero, the Transit Master Plan, and Pedestrian and Bicycle Transportation Plan. Each of the policy documents are discussed below.

A. Comprehensive Plan

Transportation Element

Policies in the Comprehensive Plan Transportation Element are key to understanding the link between land use and the multimodal transportation system. Integrating the two ensures that transportation facilities and services support the city's growth strategy. The Transportation Element supports a complete, connected, and resilient multimodal transportation system, and it provides both broad and detailed policy direction to guide programs, design, and investments that address local and regional mobility. Policies describe the city's approach to ensuring that multimodal mobility supports the land use vision and urban livability expectations of Bellevue residents, employees, and visitors.

While the Comprehensive Plan recognizes that private automobiles carry the majority of daily trips in Bellevue, the city and its regional partners are investing in transit, bicycle, and pedestrian infrastructure that will allow for people to choose from a number of mobility options. As such, the Comprehensive Plan includes policies aimed at creating mixed-use, transit-rich, walkable neighborhoods, and for building out the pedestrian and bicycle networks.

Goal and Policies

Goal: To maintain and enhance a comprehensive multimodal transportation system to serve all members of the community.

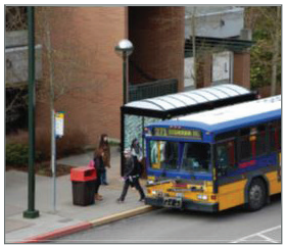
Policies: Each section of the Transportation Element contains policies that express the City Council's intent for mobility. The following topics represent the general policy direction for Bellevue's transportation system and its management. Refer to the Comprehensive Plan Transportation Element for policies and accompanying narrative for more detail.

Transportation and Land Use

Policies address how the Bellevue transportation system is supportive of and integrated with land use and urban design plans, including considerations of urban livability.

Mobility Management

Policies address how the city will provide a variety of safe, comfortable, and connected mobility options for residents, employees and visitors.



Transportation Demand Management

Policies address transportation demand management strategies and promote alternatives to driving alone.

Roadways

Policies address scoping, planning, designing, implementing, operating, and maintaining Bellevue's street system to meet community mobility needs.

Transit

Policies address transit service and access to transit in Bellevue.

Environmental Considerations Policies

Policies address how transportation infrastructure will minimize impacts to the natural environment in coordination with the Environmental Element.

Pedestrian and Bicycle Transportation

Policies address increasing the opportunities to provide people with safe, comfortable, and connected pedestrian and bicycle facilities.

Neighborhood Protection Policies

Policies address how the city will protect neighborhoods from impacts associated with the transportation system, such as noise, congestion, and cut-through traffic in coordination with the policies of the Neighborhoods Element.

Freight Mobility

Policies address the efficient movement of goods within and through Bellevue and provide direction to design and manage curbside space to accommodate small-scale parcel delivery and loading through development review.

Complete Streets Policies

The Transportation Element contains policies that relate to a Complete Streets approach to mobility. Specific policy direction relating to how Bellevue plans, designs, and implements Complete Streets includes the following:

TR-20. Scope, plan, design, implement, operate, and maintain a complete and multimodal transportation system in a corridor approach within and across Mobility Management Areas.

Transit Master Plan

The Bellevue Transit Master Plan is adopted by reference in the Transportation Element. This plan describes a city-wide transit system that serves residents, employees, and businesses and connects the city to the region, with a partnership between the city and the transit providers. The Transit Master Plan calls for a transit system that provides abundant access, establishes a frequent transit network, implements speed and reliability enhancements, and improves pedestrian and bicycle access to transit stops and stations. Specifically, this Design Manual addresses facilities that provide for transit passenger access, comfort, and information, as described in policy that is applicable throughout the city.

Policy TR-67. Coordinate with private developers and transit providers to integrate transit passenger information and facilities, pedestrian connections and weather protection, and bicycle access and parking into new development and redevelopment.

Pedestrian and Bicycle Transportation Plan

The Pedestrian and Bicycle Transportation Plan lays out the network of pedestrian facilities, bicycle routes, and facilities intended to connect the city internally and with the regional bicycle system.

Included in the Pedestrian and Bicycle Transportation Plan are recommended bicycle facility types intended to provide connections along arterials. A rapid evolution of

bicycle facility types has taken place since the Plan was written (2009), and new facility types are now considered best practice for creating environments that feel safe for a wide range of bicycle riders. These new types of facilities are documented in the Bicycle Level of Service section of this Design Manual. Note that bicycle facility types determined by current best practices may supplement or supersede the Pedestrian and Bicycle Transportation Plan. A Complete Streets approach that includes engagement with the community and professional judgment will determine the design of the bicycle facility on any given corridor.

Bellevue Downtown Subarea Plan

The Downtown Subarea Plan supports walking as the easiest way to get around in Downtown Bellevue. Investments to enhance the environment for people walking are essential for a thriving downtown. It recommends intersections and crosswalks designed to accommodate increasingly large numbers of pedestrians, mid-block crossings to facilitate pedestrian crossings of arterials between signalized intersections, sidewalks and curbside landscaping to provide barrier-free access that is separated from traffic, and through-block connections to create walkable corridors through Downtown superblocks. The Downtown Subarea Plan also provides maps and additional design guidance, relevant material is included in this Design Manual.

A goal for mobility in Downtown Bellevue is to create a multimodal transportation system to support a dense, mixed-use urban center. Walking and bicycling converge with transit at bus stops and stations. Essential components of Downtown transit access are described as follows:

- Transit Passenger Access, Comfort and Information: Transit passengers are pedestrians or bicyclists before and after their ride on the bus or train. Context-appropriate components for transit stops are implemented by the city, the transit agencies, or incorporated into new projects through development review. Comfortable pedestrian and bicycle access to and from transit stops and light rail stations will enhance ridership.

This Design Manual focuses primarily on facilities that provide and enhance transit passenger access to and from stops and stations, passenger comfort while waiting for the bus, and information in the form of wayfinding and transit routes.

B. Complete Streets

The Bellevue Comprehensive Plan incorporates the concept of Complete Streets and establishes the goal to maintain and enhance a comprehensive multimodal transportation system to serve all members of the community with safe and reliable mobility options.

There is no universal template for a Complete Street. Each street in Bellevue is unique, and each street must serve a range of users with a design that is compatible with the function and context of the corridor and surrounding community. A Complete Street uses a flexible approach to design that is informed by best practices, manuals and guides, to serve all users and support livable and sustainable communities. In situations where it is not possible, practical, or desirable to incorporate facilities for all modes on a single street, a Complete Network provides access for all modes along convenient alternate routes.

Complete Streets are essential to achieving a comprehensive, integrated, connected, and resilient multimodal transportation system. This Design Manual reflects best practices to implement a Complete Streets approach, applying design guidance from such professional organizations as the American Association of State Highway Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Association of City Transportation Officials (NACTO) to the Bellevue context.

Moving into, around, and through Bellevue is reliable and predictable.

A Bellevue is connected to the region, enabling local and regional access for businesses and neighborhoods. Safe and reliable mobility options, including walking, biking, transit and driving, take people where they need to go. The city's transportation system integrates leading safety and efficiency technology.

Why Complete Streets?

By advancing a Complete Streets approach, Bellevue residents, employees, and visitors will be able to move safely and comfortably along street corridors with a full suite of mobility options. The street network will provide capacity to serve travel demand for private auto, rideshare, and freight. Connected and continuous pedestrian and bicycle facilities will provide convenient access to schools, work, activity centers, transit, and parks. Frequent, reliable and accessible transit service will provide Bellevue workers and residents with connections within the city and region. The transportation system will complement and enhance neighborhood character, the environment, and quality of life.

Safety

Complete Streets help to maintain and enhance safety for all users of the roadway network by ensuring that appropriate accommodations exist for people using all modes. For example, to ensure that getting around Bellevue on foot is easy and safe, and that bicycling facilities accommodate riders of all ages and abilities, Bellevue incorporates pedestrian and bicycle facility improvements into roadway projects to implement the Pedestrian and Bicycle Transportation Plan and prioritizes projects that address safety issues. With an emphasis on safety, Complete Streets support the Vision Zero safe systems approach.

Mobility Options

A roadway network that operates efficiently for vehicle travel is one element of the balanced and accessible transportation system. As more people choose to live closer to where they work, they seek out and use a variety of options to get around. Bellevue has transportation strategies that emphasize walking, bicycling, and transit, coupled with growth that is focused in mixed-use, transit-rich, walkable and bikeable neighborhoods.

Equity

Mobility options consider and accommodate the needs of underserved populations, including persons with disabilities, older adults, the young, and low-income households. By constructing and maintaining pedestrian and bicycle facilities, integrating these with transit, and designing, implementing, and maintaining the transportation system in accordance with the Americans with Disabilities Act (ADA), the Bellevue Complete Streets approach helps ensure that people of all ages and abilities can get where they need to go.

Economic Vitality

Population, employment, and tourism fuel the demand for mobility. Continued economic prosperity and a diversifying population in Bellevue will require multimodal transportation options that maintain and enhance mobility for people and goods. Both local and regional resources are needed to ensure the entire transportation system supports the economy. A Complete Streets approach helps to ensure that the transportation system is designed to meet the future travel demand and to reflect or enhance the character of the community.

Livability

A multimodal transportation system contributes to a high-quality of life that Bellevue residents and employees expect and that attracts employers and businesses.

Bellevue will continue to emphasize walking, bicycling, and transit use as essential components of mobility in a livable city while providing roadways that operate efficiently for all modes in the urban context. A Complete Streets approach involves stakeholders in planning and design decisions regarding community goals for land use, livability, and addressing cut-through traffic.

Health

Complete Streets help promote a healthy community by encouraging people to walk, ride a bicycle, and to use public transportation. Engaging in active transportation provides significant benefits to personal health and to the environment. In a multimodal environment, air pollution and noise may be less than in an auto-dominated locale.

Sustainability

Whether considering runoff from streets, tailpipe emissions, or noise from tires and engines, the transportation system affects the quality of the environment. Automobile travel and energy consumption contribute to air pollution and carbon emissions. Complete Streets help to protect the environment and reduce the growth of congestion by providing safe and accessible alternatives to single-occupancy driving.

As part of Complete Streets, transportation demand management (TDM) strategies help people reduce the number of drive-alone trips and the per capita vehicle miles traveled. These two factors help to manage congestion, reduce spending on roadway capacity and parking, lessen environmental and neighborhood impacts, and meet mode share targets.

Applicability and Exceptions

The Complete Streets ordinance in Bellevue city code 14.60.191 states:

The City of Bellevue will, to the maximum extent practical, implement Complete Streets.

This applies on the public rights-of-way and easements for all project phases including scoping, planning, designing, implementing, operating, and maintaining the transportation system.

Additionally the Complete Streets ordinance states:

In cases where accommodations for a particular mode with a documented need cannot be incorporated along a particular street, accommodation of this mode may be provided along a convenient alternate route.

Facilities to accommodate a particular travel mode are not required to be provided, subject to the determination of the transportation director, when one or more of the following is present:

1. *There is a known absence of current demand and an absence of probable future demand for a particular mode;*
2. *Modal plans (pedestrian and bicycle transportation plan, transit master plan) and the comprehensive plan do not recommend facilities to support a particular mode;*
3. *Motorized or nonmotorized users are prohibited by law from using the right-of-way;*
4. *Environmental constraints significantly and adversely affect the feasibility to provide facilities for a particular mode;*
5. *The cost of facilities for a particular mode would be disproportionate to the current demand and probable future demand;*
6. *Routine maintenance of the transportation system is performed that does not change the roadway geometry or operations, such as mowing, sweeping, spot repair, pothole repair, and joint or crack sealing;*
7. *A documented exception is granted by the transportation director.*

C. Multimodal Level of Service

The City of Bellevue recognizes that it is essential that the transportation system accommodate everyone's mobility needs, regardless of trip mode or purpose. The safest and most comfortable option will vary depending on the person and their trip, and is why the city plans for and manages a multimodal transportation system.

Since the city's founding, most of the transportation planning and resources in Bellevue have been devoted to motorized vehicle mobility. Policy has largely centered on ensuring that traveling in vehicles is not too inconvenient, time consuming, or unsafe. Recognizing this historic investment in auto capacity, the City is currently increasing the resources devoted to facilities that support people walking, rolling, riding a bicycle, or taking transit.

Through the Transportation Element, Council directed that metrics, standards, and guidelines be established and implemented for all modes of travel. In 2017, the Transportation Commission explored national best practices and adapted what they learned into multimodal level of service (LOS) metrics, standards, and guidelines.

Multimodal LOS ensures that all modes are accommodated on the City's transportation facilities when viewed at the network level. Multimodal LOS is a key analytical framework for the planning and design of new or modified transportation facilities and is also integral to the City's design standards and guidelines that are considered for both public and private investments into Bellevue's transportation system.

What is multimodal mobility?

Multimodal mobility is a planning and design strategy that aims to make all modes of transportation effective and viable for people moving in and around Bellevue. The city's multimodal mobility strategy incorporates planning policies and projects for all mobility options, including walking, bicycling, riding transit, and driving.

Multimodal planning considers the modes of transportation and the context as inputs to design and investment decisions.

Overview: Multimodal LOS

Policies in the Transportation Element address level of service and provide direction to achieve a multimodal approach to mobility. Multimodal LOS metrics, standards, and guidelines depart from the decades-old approach of measuring only the volume-to-capacity ratio of vehicles traveling through an intersection at the PM peak period. Consequently, the design approaches to achieving multimodal mobility are evolving.

Table 1 provides an overview of the metrics that inform the design of public investments and private-sector projects. For each mode of travel, mobility level of service is expressed in a way that corresponds to the needs for access and safety for the users of that mode. Each mode-specific section in this Design Manual provides design details for projects that progress toward a multimodal approach to mobility.

Pedestrian Level of Service

Pedestrian LOS relates to the quality of the walking experience; it emphasizes a person's fundamental expectations for safety, comfort, and connectivity. Sidewalk design and dimensions are informed by the neighborhood and land use context. City-wide standards for arterial streets apply, except where the Land Use Code provides neighborhood-specific standards and where, according to Table 2, adjacent land use intensity and related activity dictate that wider sidewalks, a wider landscape buffer, or both are intended. Enhanced design treatments are embedded to create safe and accessible crossings at intersections and mid-block pedestrian crossings. Public and private investments in the pedestrian system provide access and add value to individual development projects and to the community.

Pedestrian Facilities at Intersections

Vision Zero documents that intersections are among the most dangerous places for people walking. The design of pedestrian facilities at an intersection may include various combinations of components to enable a pedestrian to more safely cross a street. Pedestrian LOS guidelines are intended to enhance the access, comfort, and above all, safety for people crossing the street at an intersection by using design components in the right combination to suit the location. Factors that influence an intersection design relate to the land use and urban design context and to the vehicle use of the roadway.

For instance, in Downtown Bellevue where a safe and comfortable walk should be a top priority, design considerations to enhance the pedestrian environment are applied in the crosswalk areas between the curbs,

Table 1: Multimodal Metrics Summary

Mode	LOS Metric
Vehicle See details in Curbspace Management Section F	Intersection: Volume/Capacity Ratio
	Intersection: Average Delay
	Arterial corridor: Typical Urban Travel Time/Travel Speed
Pedestrian See details in Pedestrian Facilities Section B	Sidewalk and Landscape Buffer Width
	Intersection Design
	Mid-Block Crossing Locations
Bicycle See details in Bicycle Facilities Section C	Level of Traffic Stress (LTS) on Corridors
	Level of Traffic Stress (LTS) at Intersections
Transit See details in Transit Facilities Section D	Passenger Comfort, Access and Safety
	Transit Travel Speed on Corridors

Table 2: MMLOS Prioritization

The land use context helps define the intended level of service for each mode and to identify priorities between modes.

Mode	Typical Locations with Higher LOS standards	Typical Locations with Medium LOS standards	Typical Locations with Lower LOS standards
Pedestrian Facilities	Downtown BelRed	Activity Centers, Pedestrian Destinations	Bridle Trails SE Bellevue
Bicycle Facilities	Priority Bicycle Corridors	Designated Bicycle Network	Not on Designated Bicycle Network
Transit Access	Rapid Ride Stop, Light Rail Station	Frequent Transit Network Stop	Primary Transit Stop, Local Transit Stop
Vehicle Intersections	Bridle Trails, SE Bellevue	Crossroads, East Bellevue	Downtown, BelRed

in the design of the corners and ramps, and in back-of-curb space and amenities. Specific intersection treatment details that are applied to the various categories of land use are summarized in this Manual in Table 9: Standard Intersection Treatment.

Mid-Block Pedestrian Crossings

Nearby land use, through-block pedestrian connections, and roadway characteristics determine the demand and opportunities for mid-block crossings and the type of treatment used for crossings. Location guidelines for mid-block pedestrian crossings recommend that spacing from intersections provide reasonable pedestrian access, as shown in Table 4: Mid-Block Pedestrian Crossings in Part 2 - Pedestrian Facilities of this Design Manual. Given the wide range of conditions at potential crossing locations, engineering judgment will determine specific design treatments. Typical components of a mid-block crossing include crosswalk striping, a median island that may be landscaped, and some type of electronic traffic advisory such as a full signal or a flashing beacon.

Bicycle Level of Service

Bicycle facility metrics and guidelines for arterial corridors are intended to improve the safety and quality of the experience of the bicycle rider. This is an emerging best practice for cities that intend to enrich the environment for people who want to ride a bicycle for commuting, errands, and/ or recreation. It is based on the premise that high-quality bicycle facilities promote safer bicycling and safer streets for everyone , including people waking and driving. The quality of the bicycling experience is largely determined by the speed and daily volume of vehicle traffic on the street, coupled with the type of bicycle facility. An off-street path, such as the I-90 Trail, SR 520 Trail, and the Eastrail, are intended to meet the highest expectations for bicycle LOS, including at intersections with surface streets. A physically separated bikeway such as the multipurpose path on NE 12th Street east of 108th Ave NE and extending across I-405 to the Spring District is in that same category.

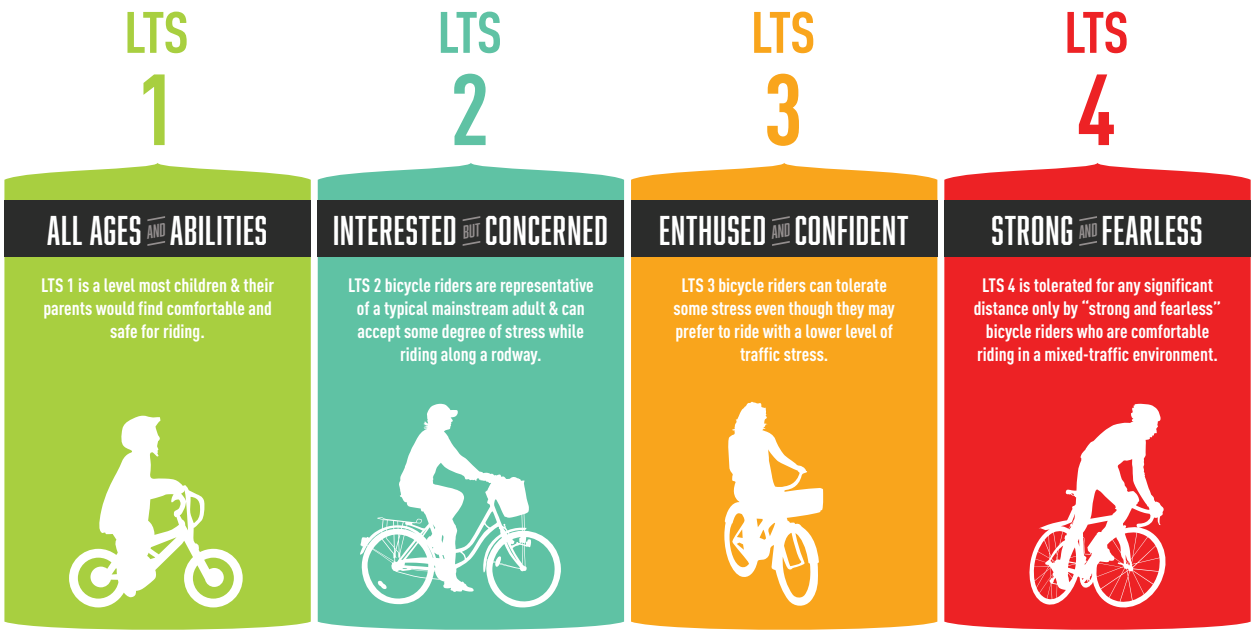
Bicycle Level of Traffic Stress/Level of Bicycle Comfort

For a bicycling network to attract diverse ridership, low-stress/high-comfort connections are needed; these connections are achieved along a route that does not require a bicycle rider to exceed their tolerance for traffic stress. This concept is used to identify the components of a bicycle facility that will provide an acceptable level of separation and protection from traffic for people who can tolerate various levels of stress/expect various levels of comfort while riding (note that the individuals who are not inclined to ride a bicycle under any circumstances are not factored in this methodology). To help inform the design of bicycle facilities, a classification system for Bellevue identifies “levels of traffic stress” (LTS) for street segments as shown in Table 5: Bicycle Level of Service / Level of Traffic Stress in Part 2 - Bicycle Facilities of this Design Manual.

Bicycle Facilities on Arterials

The level of traffic stress for people riding bicycles along arterials is based on the speed and volume of vehicle traffic, together with the type of bicycle facility. For example, a low level of traffic stress/high level of bicycle comfort (LTS 1) can be achieved along a street with very low traffic speed and volume with minor improvements to bicycle facilities, such as shared lane markings (sharrows) or striped bike lanes. With higher traffic speed and traffic volume, providing a low-stress/high-comfort environment requires progressively more protective measures, such as buffered or protected bike lanes.

The Bicycle LTS (or LOS) metrics provide guidance regarding the type of bicycle facility that will provide a comfortable riding environment for various types of bicycle riders.



Bellevue Bicycle Level of Traffic Stress (LTS) Categories Source: MMLOS Metrics, Standards & Guidelines, 2017

Each bicycle facility type is assigned a Level of Traffic Stress rating based on the speed limit and traffic volume of the street. In Table 5 in Part 2 - Bicycle Facilities of this Design Manual, the number/color of each cell represents the approximate Bicycle LTS that may be achieved given the combination of roadway characteristics and bicycle facility components. The LTS precision indicated in the table may not be exactly what people experience while riding—the hard edges of each cell should be blurred somewhat to indicate a gradient of LTS outcomes. Various combinations may be applied to achieve the intended LTS. This table does not account for many other factors and characteristics, such as slope, pavement condition, percent of heavy vehicles, that may affect the LTS for a bicycle rider and inform the facility design. These other characteristics can be addressed in the design of the bicycle facility—for example, a protected bicycle lane for an uphill climb with a corresponding downhill shared lane marking (sharrow). It is understood that roadway characteristics, particularly traffic speed and volume are highly variable along a corridor and at various times of day. Likewise, the LTS experienced by a person riding a bicycle may also vary according to the time of day.

Transit Passenger Access, Comfort and Information

Components of transit passenger access, comfort, and information are documented in both the Transit Master Plan and the Downtown Transportation Plan. Components vary generally by type, design, quantity, and quality based on the level of transit service that is provided at the following locations:

- Local Transit Stop: served by a single transit route with generally 30 or fewer boardings per weekday.
- Primary Transit Stop: served by one or more transit routes with service provided at a combined headway of 30 minutes or better.
- Frequent Transit Network/RapidRide Station: served primarily by RapidRide B and frequent transit network routes. Examples include Sound Transit route #550 and King County Metro routes #271 and #245.
- Transit Center/Multimodal Center: served by multiple transit routes and transit modes, including light rail, with a constant flow of transit vehicles and passengers throughout the day.

Guidelines for transit passenger comfort, access, and information specific to each type of transit stop or station are shown in Table 8: Transit Stop / Station Level of Service in Part 2 - Transit Stop Facilities of this Design Manual.

D. Vision Zero

Vision Zero is an approach to safety that focuses on eliminating traffic deaths and serious injuries.

At the core of Vision Zero is the belief that death and injury on streets are unacceptable and preventable—that collisions are neither "accidents" nor an inevitable part of mobility in cities. Incidents that result in injury or death are largely the result of driver behavior and roadway design. A solution to this problem must therefore come from multiple angles, including street design that emphasizes safety, predictability, and the potential for human error; targeted education; and rigorous, data-driven enforcement efforts.

The City of Bellevue Vision Zero initiative reflects a commitment to eliminate traffic deaths and serious injury collisions on city streets by 2030. In December 2015, the

City Council passed Resolution 9035 endorsing Vision Zero, which states that the life, safety, and health of residents, employees, and visitors to Bellevue is the highest priority for the City Council. Following a review of existing policies and programs by the Transportation Commission and Planning Commission, the City Council approved Ordinance 6334 in December 2016, adopting Vision Zero amendments to the Comprehensive Plan that included the following new and revised policies:

TR-55. Maintain a collision reduction program to identify high collision locations, evaluate and prioritize potential safety improvements and implement recommended changes.

TR-146. Consider neighborhood traffic and livability conditions and address potential adverse impacts of public and private projects during the scoping, planning, designing, permitting, and construction phases.

TR-147. Evaluate neighborhood impacts and Complete Streets implementation opportunities as part of corridor and subarea transportation studies.

TR-61.1. Strive to achieve zero traffic deaths and serious injuries on Bellevue streets by 2030.

TR-61.2. Develop a programmatic approach to Vision Zero that integrates components of Education, Encouragement, Enforcement, Engineering, Equity, and Evaluation.

TR-63.3. Design and manage streets to foster safe and context-appropriate behavior of all roadway users.

TR-116.1. Strive to provide separation between motorized vehicles, pedestrians, and bicyclists, as feasible, reasonable, and appropriate to the context, while maintaining adopted level of service standards for all modes.

Safe Systems

A Vision Zero Safe Systems Approach, recommended by the Transportation Commission, was approved by the City Council on June 15, 2020 in Resolution 9769.

The City Council resolution says that the responsibility for the Safe Systems approach is shared: leaders make challenging decisions when traffic safety is at stake; staff leverage new technologies and closely monitor data to assess results, and create partnerships with the public and private sectors; and all parties develop a safety culture that acknowledges zero as the only acceptable number of deaths and serious injuries on our streets.

In adopting the Safe Systems approach, the City Council considered the following:

- In their research on 53 countries, the WRI Ross Center for Sustainable Cities and the Global Road Safety Facility of the World Bank "found that those that have taken a Safe System based approach have achieved both the lowest rates of fatalities per 100,000 inhabitants and the greatest reduction in fatality levels over the past 20 years."
- The Institute of Transportation Engineers – in partnership with the national Road to Zero Coalition – is encouraging Vision Zero communities in the United States to adopt the Safe Systems approach because it is demonstrated to result in improved safety outcomes.
- The Washington Traffic Safety Commission incorporated a Safe Systems approach in the 2019 Target Zero Plan. The document states: "It is time for Washington to adopt the Safe Systems principles statewide in its policies, programs, projects, activities, and investments. When we do so, we will save lives provide better stewardship of public resources and improve the function of the transportation system for everyone using it."

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Part 2: Complete Streets Components

A. How a Complete Street comes together

Streets and street networks serve many functions. First, they enable the movement of people and goods in a city, and the linear nature of streets makes them an ideal space for the utility networks that support city life like electricity, water, and wastewater. Complete Streets serve those transportation and utility functions, ensuring that convenient and comfortable travel is possible for all modes, and all people, including the city's most vulnerable—children, older adults, and people using mobility devices. Complete Streets are also public spaces that support activities that contribute to public life and livability in Bellevue.

Bellevue Land Use Context

The design of a Complete Street is strongly influenced by the adjacent land use. A "one size fits all" approach does not work when the design of a street is intended support all modes and to contribute to public life and livability.

There are many land use contexts in Bellevue that serve as the framework around what type of transportation designs should be made. The Complete Streets Design Manual identifies separate land use types that inform the street design, including:

Activity centers

For the purposes of describing the land use context, an Activity Center includes the commercial areas of Crossroads, Factoria, Wilburton, and Eastgate plus smaller areas throughout the City as shown on Figure 1. A Neighborhood Shopping Center like those found in Northtowne, Lake Hills, Newport Hills, and other similar commercial centers throughout the city that occupy land that is typically zoned Neighborhood Business.

Pedestrian destinations

A Pedestrian Destination is a facility or location such as a school, park, community center, senior center, library, frequent transit network stop, or a trail crossing.

Bel Red and Downtown

BelRed and Downtown are separate categories due to the intensity of development; the Land Use Code requirements are applied in those neighborhoods.

Elsewhere in the City

This category covers areas that do not fit into one of the preceding land use types, and the city-wide standards in the Land Use Code and the Design Manual apply there (see Figure 1: Land Use Context).

Frequent Transit Network

Frequent Express, Frequent Rapid, and Frequent Local routes collectively comprise the Frequent Transit Network (FTN), which is the highest priority for service enhancements and capital projects to improve transit speed and reliability.

Priority Bicycle Corridor Network

The Priority Bicycle Corridor Network (PBCN) was identified in the 2009 Pedestrian and Bicycle Transportation Plan and proposed Bicycle Network, and includes eleven cross-city Bicycle Priority Corridors that promote connections to surrounding jurisdictions and create links among communities within Bellevue.

How a Complete Street comes together: Table of Graphics

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Land Use Context

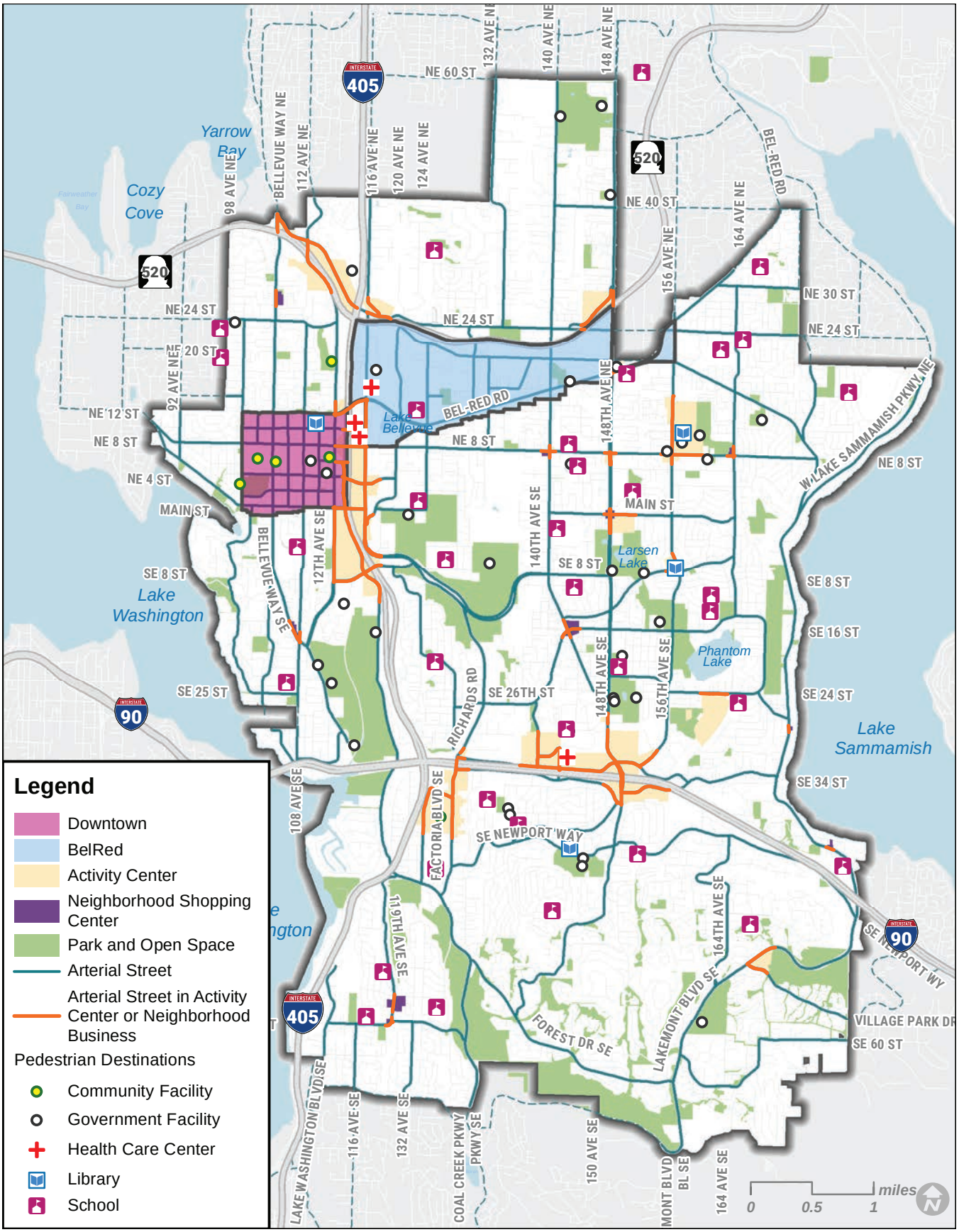

Figure 1: Land Use Context

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Frequent Transit Network

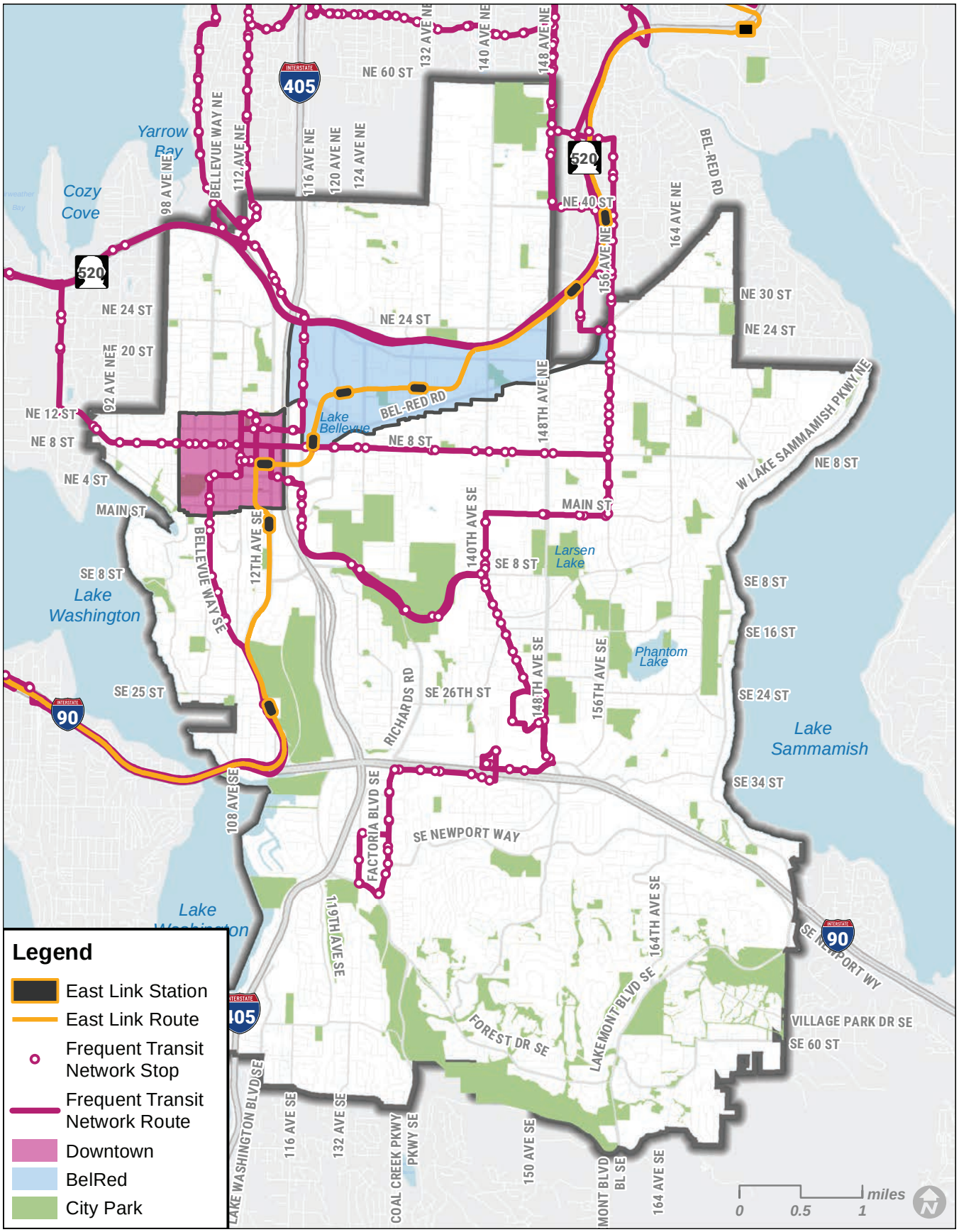

Figure 2: Frequent Transit Network

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Priority Bicycle Corridor Network

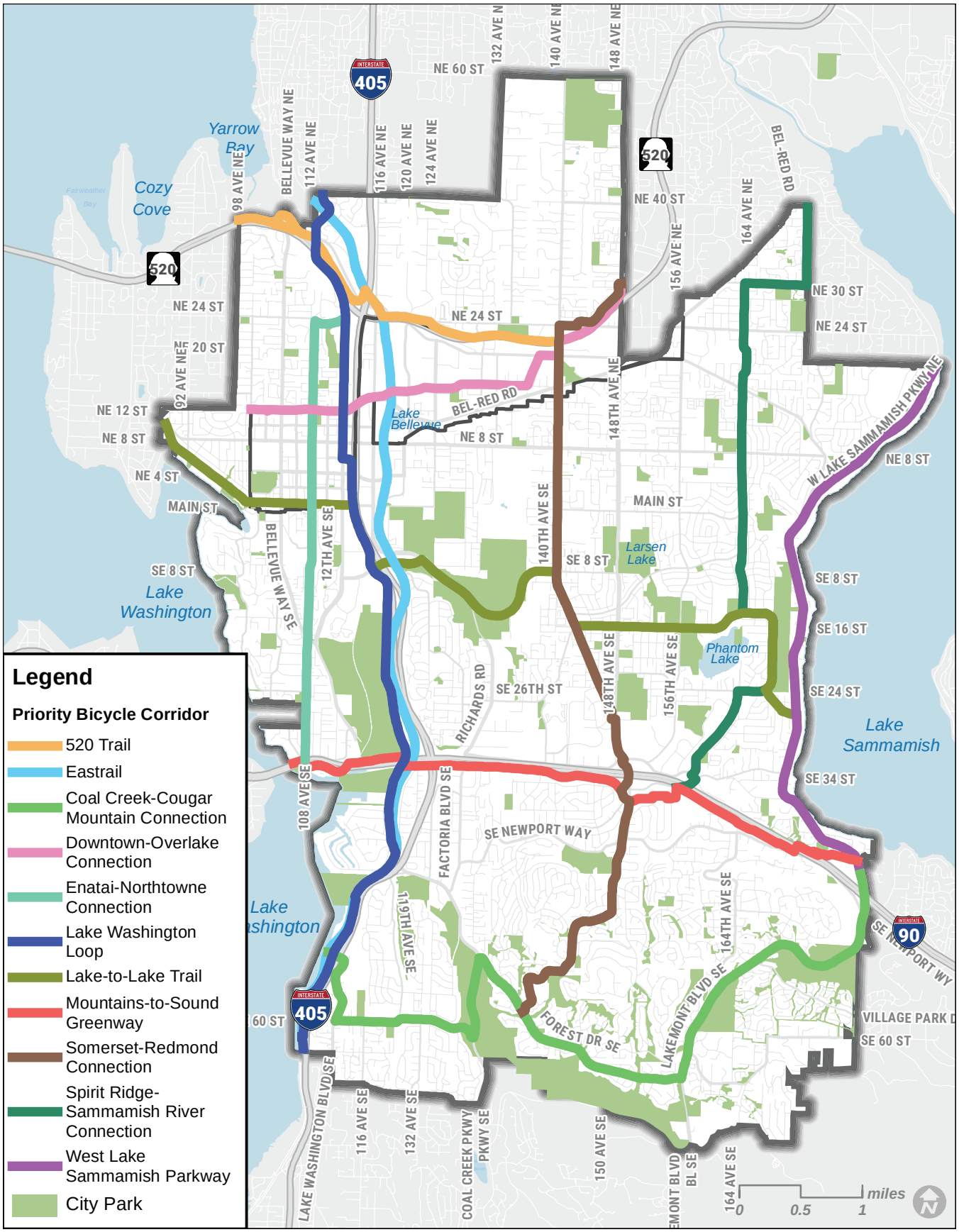

Figure 3: Priority Bicycle Corridors

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Bicycle Network

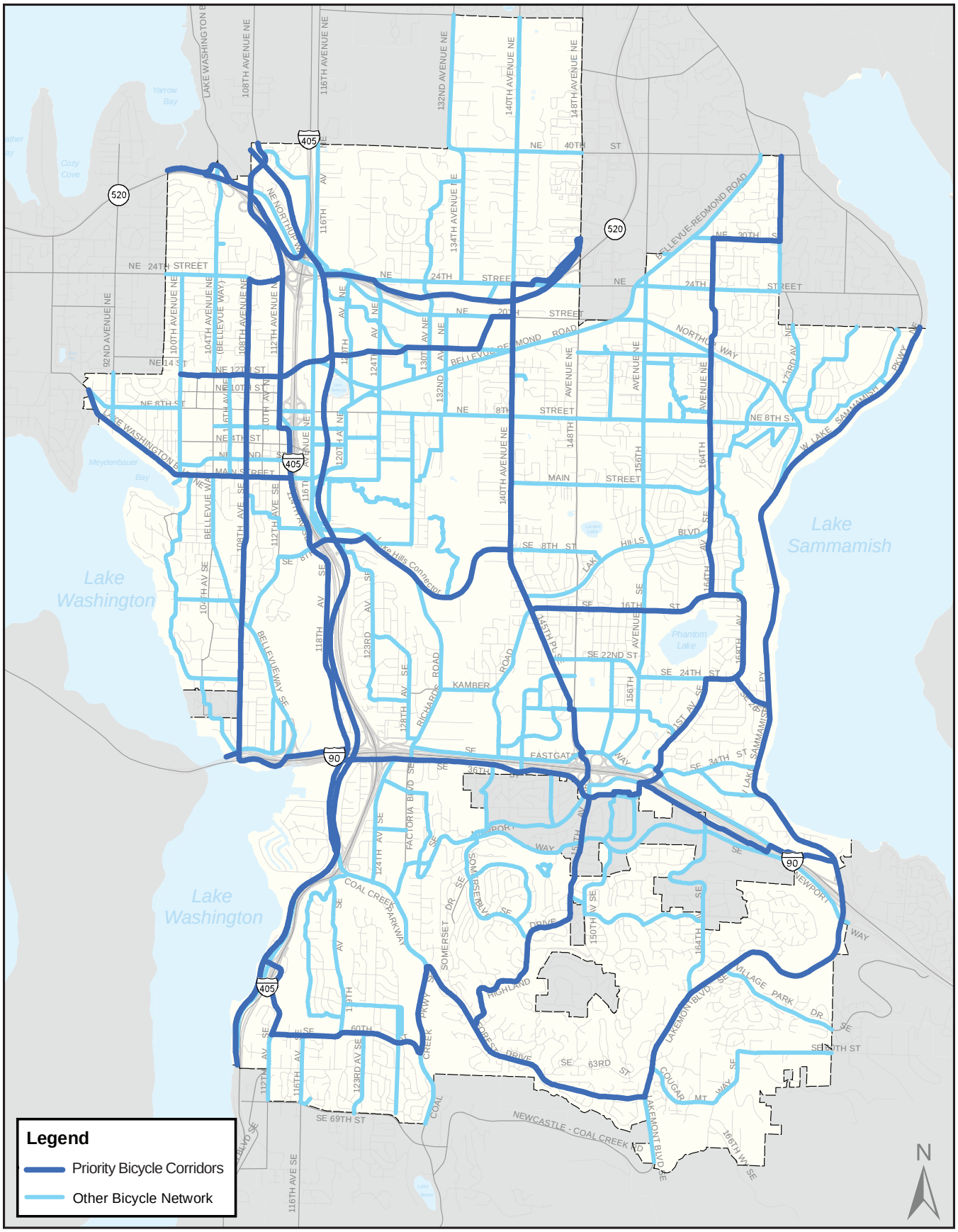

Figure 4: Bicycle Network Map
(amended from 2009 Pedestrian & Bicycle Transportation Plan)

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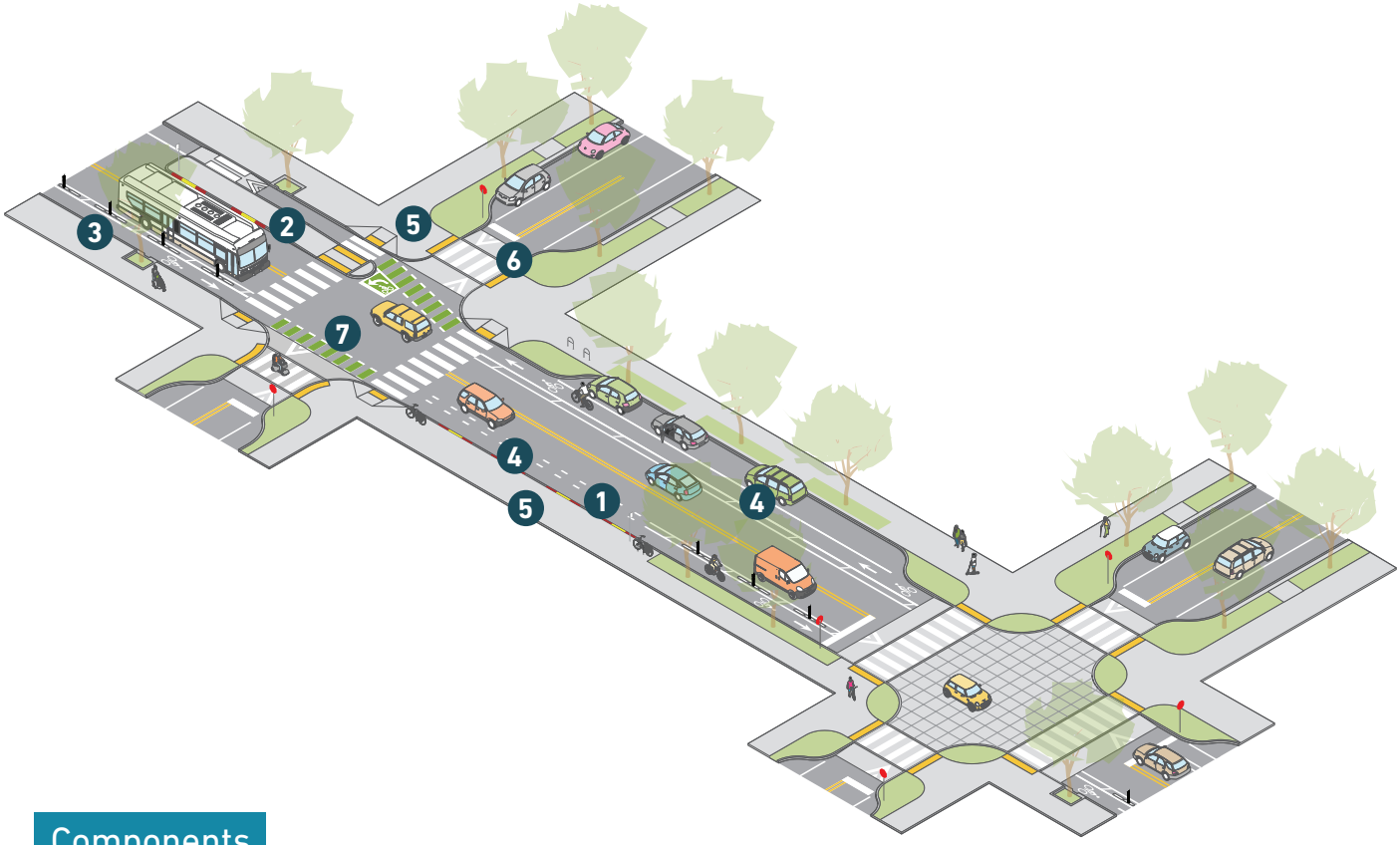
Complete Street



Components

For movement along the street

1. Lane width and lane configuration are designed to match the function of the street. Lanes may be wider where mobility of freight and transit is important. Where multimodal travel and land use access is important, lane width appropriate for the intended speed (narrower to reduce vehicle speed) and to facilitate safer walking and biking.

2. Enhanced transit stops make traveling by transit more convenient, accessible, and enjoyable. Stops like floating transit islands facilitate quicker boarding and alighting of passengers and make the reentry of buses into traffic more expedient, reducing delays.

3. Dedicated bicycle facilities like protected bike lanes create organized, predictable streets that make it safer and more comfortable for bicyclists. They also make it easier for drivers to see and anticipate the movement of bicyclists.

4. Bicycle facilities may be one-way with the flow of traffic (as shown) or two-way .

5. Sidewalks accommodate pedestrian activity and functional elements like signs, landscaping, and bike racks, as well as amenities that enhance the streetscape for all users.

For movement across the street

5. Crossings are designed for the safety and convenience of pedestrians who are the most vulnerable users of the streets. The radius of a corner should be designed to slow turning vehicles and to allow for the placement of perpendicular curb ramps.

6. Crossing enhancements make it easy and safe for people to cross. High visibility crosswalks increase awareness for all users, curb extensions position pedestrians to be visible to drivers and reduce crossing distances and thus exposure to vehicles. Raised crossings enhance pedestrian visibility and slow vehicles at pedestrian crossings.

7. Intersection treatments for bicyclists like bike lane extension markings, turn boxes, and bicycle signals create dedicated space for bicyclists to move through intersections safely and predictably.

- Traffic control and signals create the opportunity to cross where and when it is safe and convenient to do so and reduce the potential for conflicts between modes. Signals are phased and timed to make it easy to cross through protected turning phases, giving adequate crossing time or a head start before turning cars conflict with pedestrian crossing movements.

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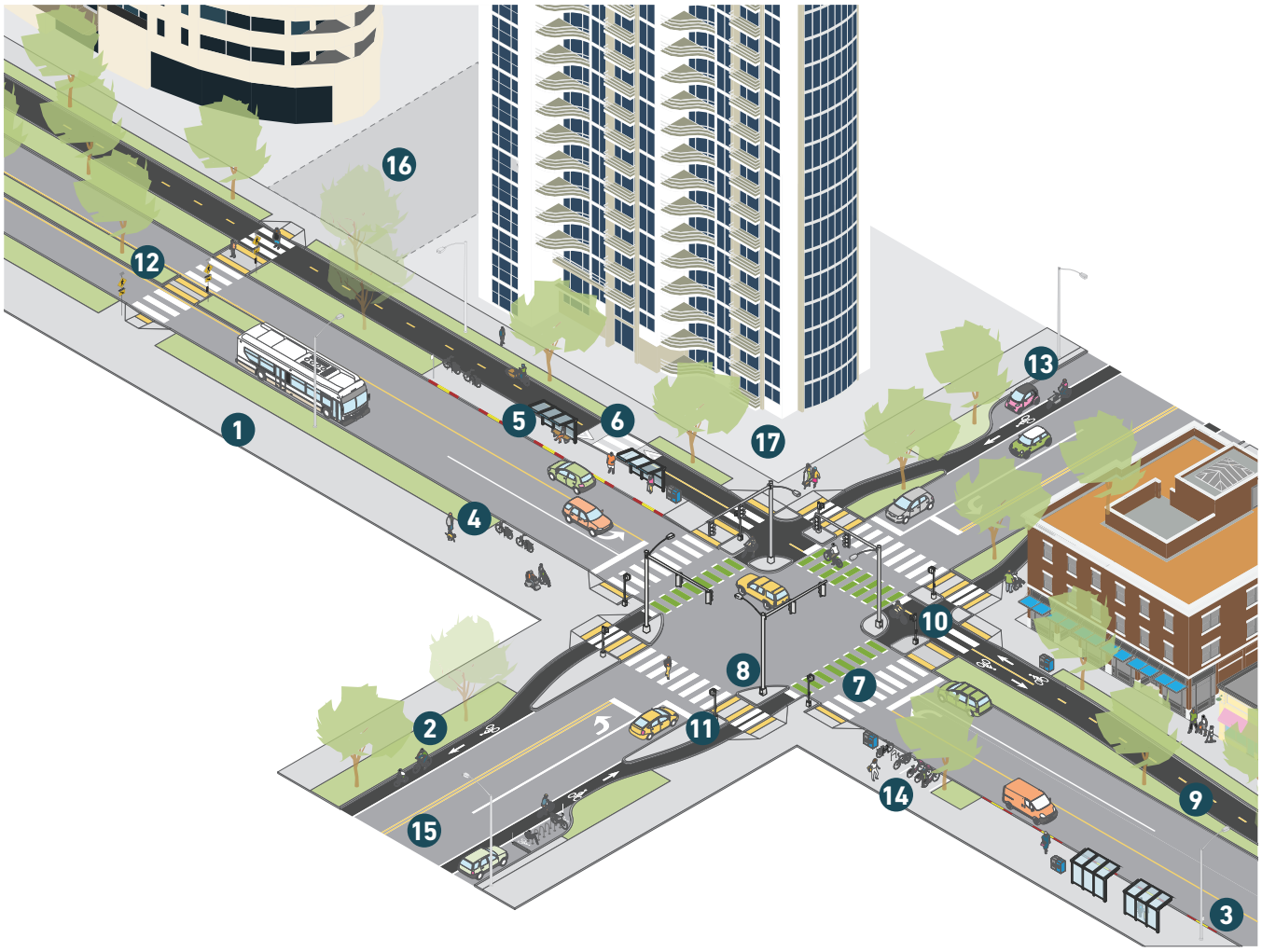
Downtown Complete Street



Components

1. Sidewalk
2. Sidewalk landscape buffer and street trees
3. Street and pedestrian-scale lighting
4. Amenity zone and street furniture, including bike parking
5. Weather protection (at bus stop)
6. Transit zone with bus/bike conflict management
7. Enhanced or exceptional intersection crosswalk and curb ramp
8. Smaller curb radius
9. Protected bike lane (one-way or two-way, as shown)
10. Protected bike intersection
11. Pedestrian and bicycle signal
12. Mid-block crossing with Rectangular Rapid Flash Beacon (RRFB)
12. Median and pedestrian refuge Island
13. On-street parking
14. Micromobility hub / bike parking
15. Vehicle lanes
16. Through-Block Pedestrian Connection. Refer to the Downtown Land Use Code (20.25A.160.D) for locations and specifications
17. Building setbacks. Refer to Land Use Code Dimensions chart (LUC 20.20.010).

These components are representative of a complete street and may not be applicable in all situations.

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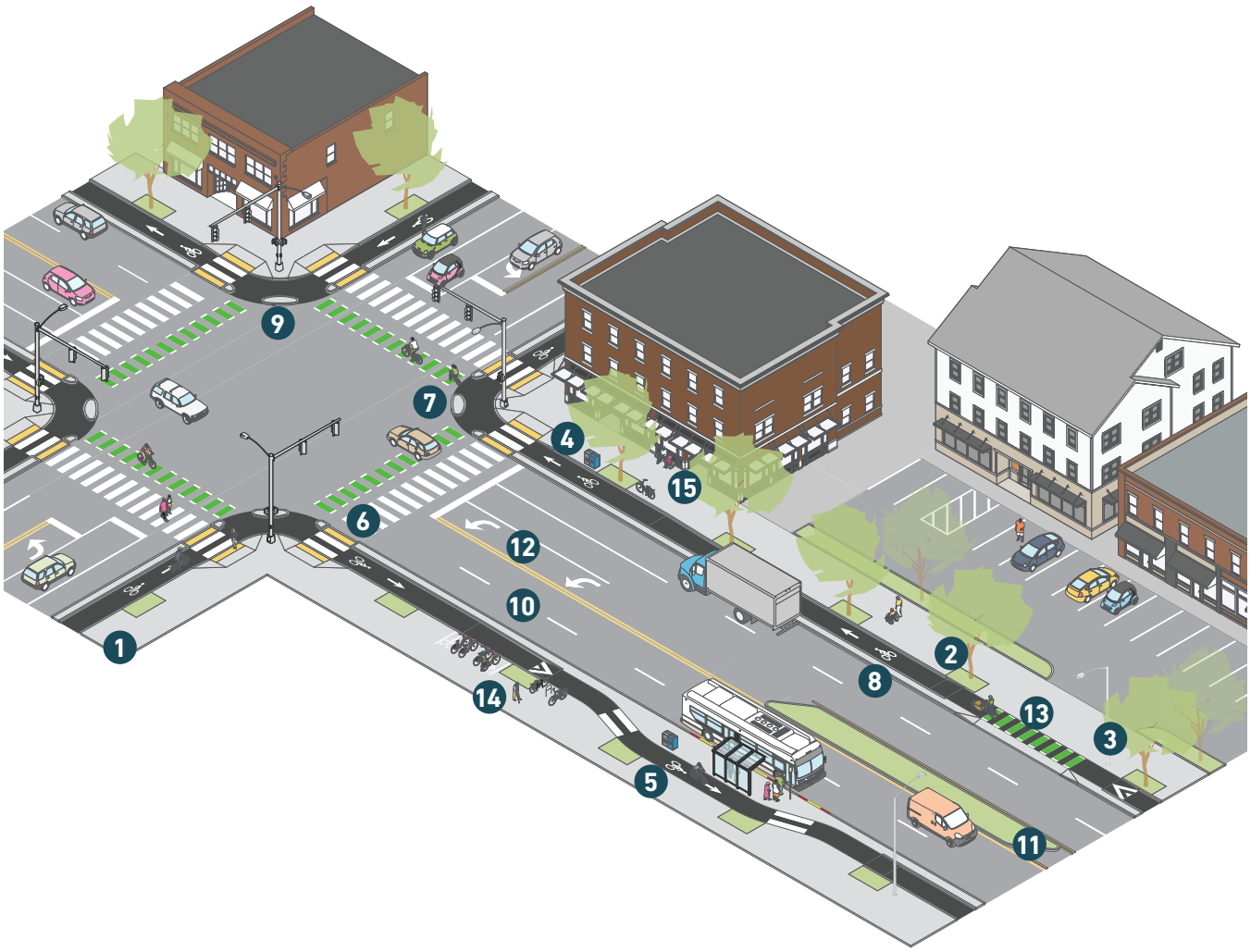
Activity Center Complete Street



Components

1. Sidewalk
2. Sidewalk landscape buffer and street tree
3. Street and pedestrian-scale lighting
4. Amenity zone and street furniture including bike parking
5. Transit zone with bus/bike conflict management
6. Crosswalk and curb ramp
7. Smaller curb radius
8. Protected bike lane
9. Protected intersection
10. Vehicle lane
11. Two-way left turn lane
12. Separate left turn signal phase
13. Driveway at sidewalk level
14. Micromobility hub / bike parking
15. Building setbacks. Refer to Land Use Code Dimensions chart (LUC 20.20.010).

These components are representative of a complete street and may not be applicable in all situations.

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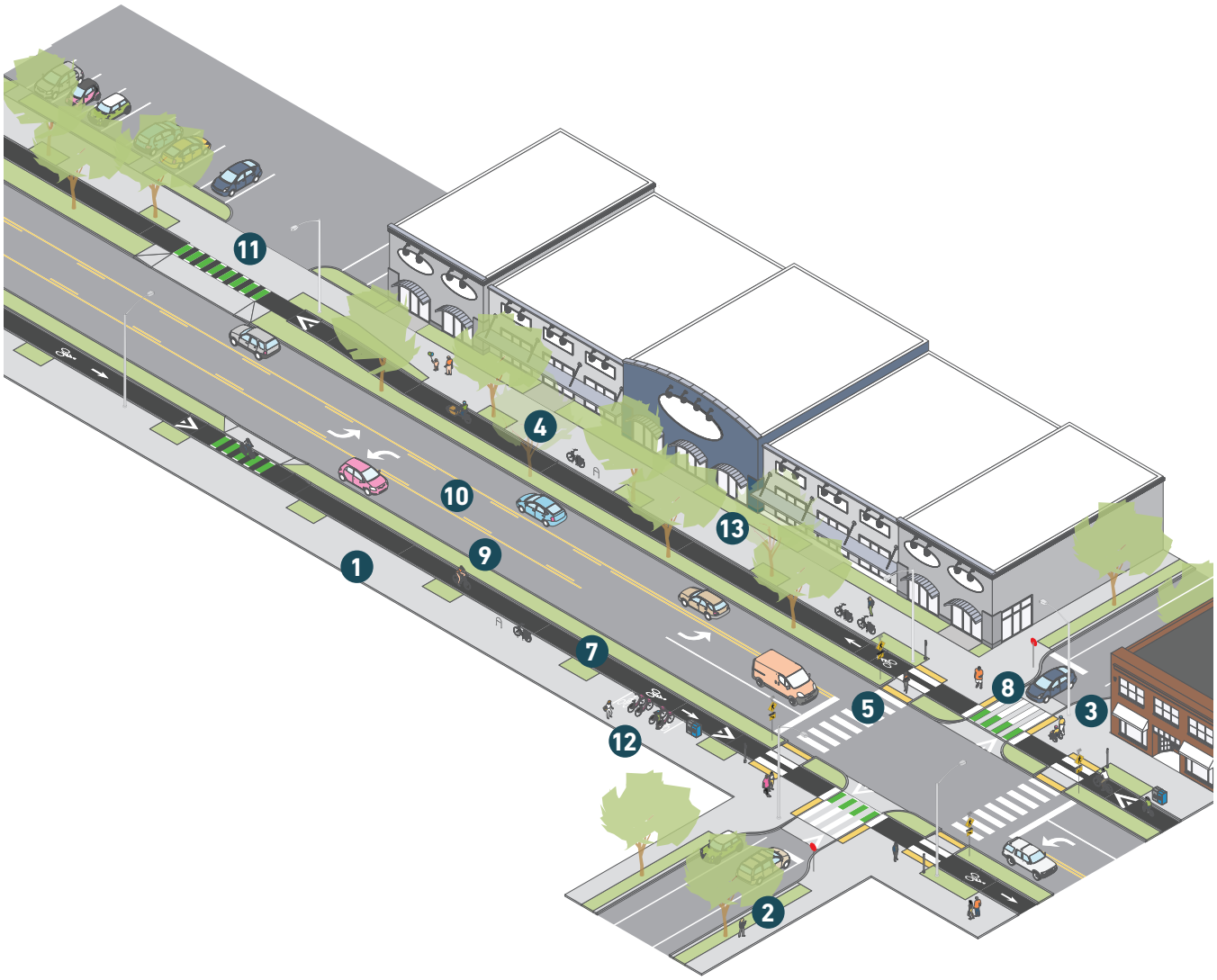
Neighborhood Shopping Center Complete Street



Components

1. Sidewalk
2. Sidewalk landscape buffer and street trees
3. Street and pedestrian-scale lighting
4. Amenity zone and street furniture including bike parking
5. Crosswalk and curb ramp
6. Raised crosswalk and green skip stripe
7. Protected bike lane
8. Raised crossing across local street
9. Vehicle lane
10. Two-way left turn lane
11. Driveway at sidewalk level
12. Micromobility hub / bike parking
13. Building setbacks. Refer to Land Use Code Dimensions chart (LUC 20.20.010).

These components are representative of a complete street and may not be applicable in all situations.

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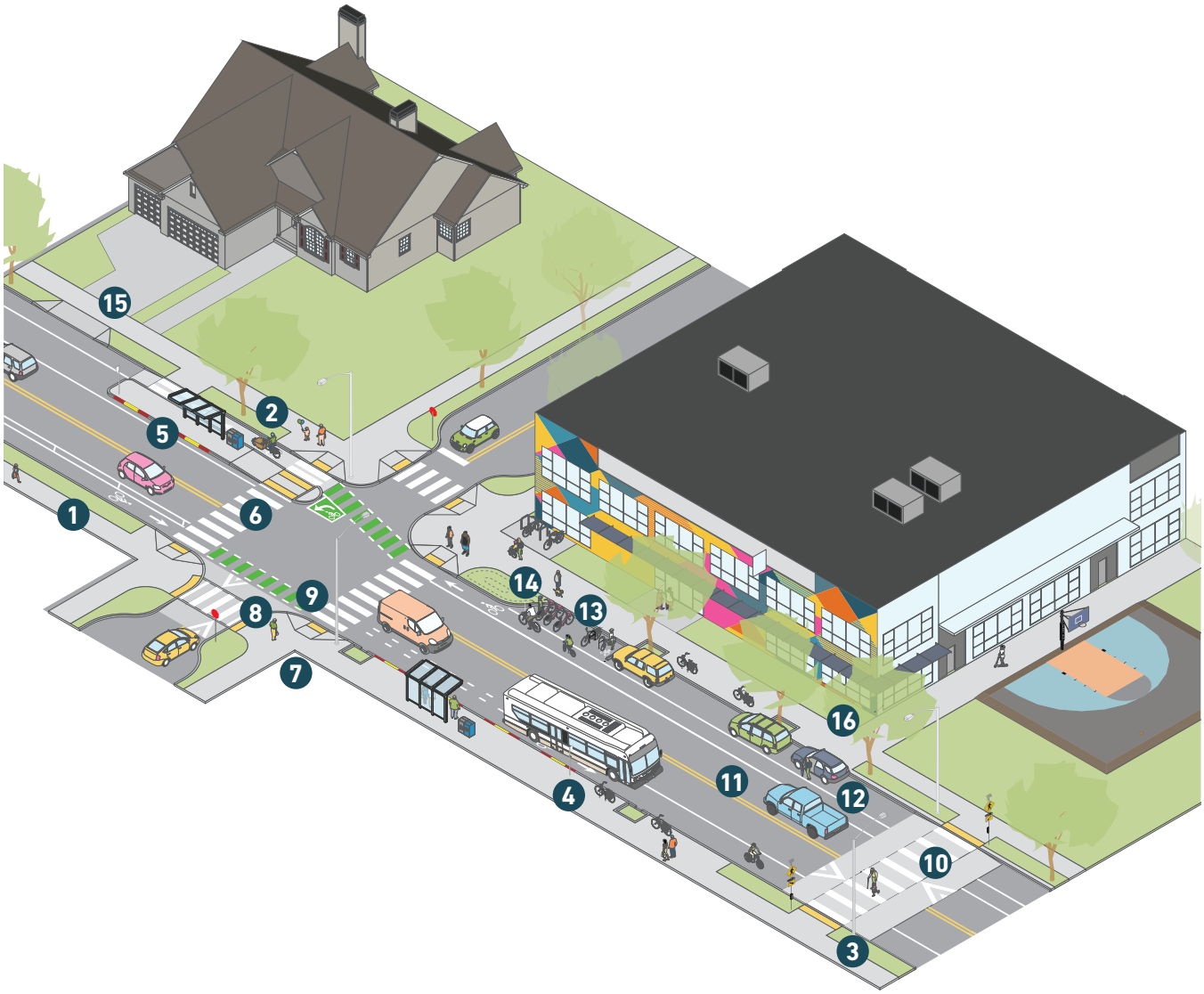
Pedestrian Destination and Elsewhere in the City Complete Street



Components

1. Sidewalk
2. Sidewalk landscape buffer and street trees
3. Street and pedestrian-scale lighting
4. Amenity zone and street furniture
5. Transit zone with bus/bike conflict management
6. Crosswalk and curb ramp
7. Curb return radius
8. Raised crosswalk
9. Green skip stripe bike crossing
10. Raised mid-block crossing
11. Vehicle lane
12. On-street parking
13. Micromobility hub / bike parking
14. Low impact development/ bioretention planter
15. Driveway at sidewalk level
16. Building setbacks. Refer to Land Use Code Dimensions chart (LUC 20.20.010).

These components are representative of a complete street and may not be applicable in all situations.

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B. Pedestrian Facilities

An integrated, connected, and safe pedestrian system provides convenient access to schools, work, transit, and parks and makes walking an attractive option. The functionality and character of the pedestrian realm is also a critical part of the walking experience.

Streets designed for pedestrian and bicycle travel offer a multitude of health, environmental, safety, and livability benefits. They encourage multimodal options and promote active transportation, slow vehicle speeds, and inspire conviviality and public life.

The design of streets for pedestrian movement encompasses both the network and the walking environment or pedestrian realm. A high-quality pedestrian realm is important because trips by any mode typically start and end with walking. When the pedestrian network and pedestrian realm are well-designed and integrated with other modes, they make the entire street work better for everyone.

Pedestrian Realm

The pedestrian realm includes sidewalks, through-block connections, and public and private plazas that are connected to public streets. The function and design of the pedestrian realm is influenced by the land use context and the character of each street. This design manual is focused on the pedestrian realm that extends from the curb to building face or property line, and includes sidewalks, street trees and landscaping, street furniture, signs, green stormwater infrastructure (GSI), streetlights, bicycle racks, transit stops, and crossing of the street at intersections and mid-block locations. The pedestrian realm is a place of transition between private and public space, and of economic exchange as retailers attract people to their windows and shops and restaurants.

The pedestrian realm is not a singular space—rather it is composed of distinct zones that perform specific functions in the overall operation of the street. Although boundaries between zones may blur and blend, the overall function of each zone generally remains consistent. These zones are described in the following pages.

The width of the various zones is based on the intensity and type of uses expected along a particular street segment. It is also informed by street type, the available right-of-way, and the scale of the adjoining buildings. Contextual guidance is offered in the MMLOS section in Part 1: Transportation Policy in this Design Manual. A balanced approach for determining the width of zones considers the character of the surrounding area and the anticipated pedestrian activities. The preferred width of the pedestrian zone may not always be possible to attain, and design judgment must be used to achieve a safe, comfortable, and functional facility.

As summarized in Part 1, Section C, the multimodal level of service metrics, standards and guidelines informs the dimension of the sidewalk and the frequency/spacing of arterial crossings in accordance with the land use context. The following tables summarize the guidance.

Table 3: Sidewalk and Landscape Buffer Width Standards
(Amended from MMLOS Metrics, Standards & Guidelines, 2017)

Context / Component	Downtown / BelRed	Activity Center	Neighborhood Shopping Center	Pedestrian Destination	Elsewhere in the City
Sidewalk Width and Landscape Buffer Width	Downtown Land Use Code BelRed Land Use Code	16 ft. total	13 ft. total on frontage adjacent to shopping center	13 ft. total on frontage of pedestrian destination and within 100 ft. of a FTN stop	Bellevue Land Use Code Transportation Design Manual

Notes:
- Landscape buffer is 5-feet minimum
- The final design and the ultimate achieved LTS is subject to engineering design and site-specific situations.
- The Downtown Land Use Code provides the dimensional standards for arterials in the Downtown Subarea (see Figure 1).
- The BelRed Land Use Code and the BelRed Corridor Plan (2012 or thereafter amended) provide the dimensional standards and material guidance for local streets and arterials in the BelRed Subarea (see Figure 1).
- FTN = Frequent Transit Network, refer to the Bellevue Transit Master Plan (see Figure 2)

Table 4: Mid-Block Pedestrian Crossings
(Amended from MMLOS Metrics, Standards & Guidelines, 2017)

Context / Component	Downtown	Activity Center	Neighborhood Shopping Center	Pedestrian Destination	Elsewhere in the City
Arterial Crossing Frequency	Downtown Transportation Plan (≤ 300 ft.)	≤800 ft.: Factoria ≤600 ft.: Elsewhere	One crossing every 600 ft. or less within shopping center area	Within 600 feet of primary entrance Within 300 ft. of bus stop pair on FTN	Applicable as needed

Notes:
- Intersection treatment and the location and design of mid-block crossings are to be determined and approved by the Transportation Department.
- FTN is the Frequent Transit Network (see Figure 2).

Pedestrian Facilities: Table of Graphics

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Sidewalk Zones

Description

Sidewalks provide the fundamental infrastructure for pedestrian mobility and incorporate streetscape features that enhance livability. Sidewalks provide access to destinations such as transit, schools, employment and shopping. They also serve as a place for social walking, physical activity, lingering, and people-watching.

Three zones make up the area between the curb and the edge of the right-of-way as described below. The width and character of the zones will vary depending on the adjacent land use, available right-of-way, and intended function. Although the boundaries between the three zones can sometimes be blurred, each zone serves a distinct purpose.

Features

1. **Amenity zone**. Located adjacent to the curb, this multi-functional zone contains components that support pedestrian travel and use (e.g. street furnishings, pedestrian-scale lighting, signs) as well as vehicle and bicycle travel (e.g., signs, street lighting, bicycle racks, and transit stops). It may also contain underground utilities, street trees and plantings, and stormwater infrastructure such as a rain garden. The standard width of this zone is 5 ft minimum, as specified in Bellevue city code.

2. **Through Zone.** The through zone is the space where pedestrians can travel in a continuous, direct path, safe from conflicts with other travel modes and unencumbered by street furnishings, frontage improvements, or other obstacles. Per the Americans with Disabilities Act (ADA) standards, the through zone shall contain a pedestrian access route (PAR) that is continuous and unobstructed, with a width of at least 5 ft.

3. **Frontage Zone.** The frontage zone is the space for building features and entries. It is where appurtenances are located, out of the path of travel of pedestrians. The width of the frontage zone will vary by land use and applies only areas with zero building setback.

4. **Extension/amenity pad.** This is a dedicated zone for streetscape elements like bike parking, newspaper boxes, and informational signs/ kiosks. It is located for the convenience of street users and to prevent encroachment in the through zone but typically applies to areas with zero building setback. An extension/ amenity pad must be a minimum of 4 ft in width and may be located 50 ft. plus or minus, on center, within the landscape buffer.

5. **Courtesy strip.** Where there is on-street parking and also a continuous landscape strip, a courtesy strip provides dedicated, hard surface access space for people to step out of vehicles, out of the way of landscape buffer elements like streets trees and plantings, signs, street lights, and bicycle parking.

See Street Trees and Landscape Buffers for dimensions.

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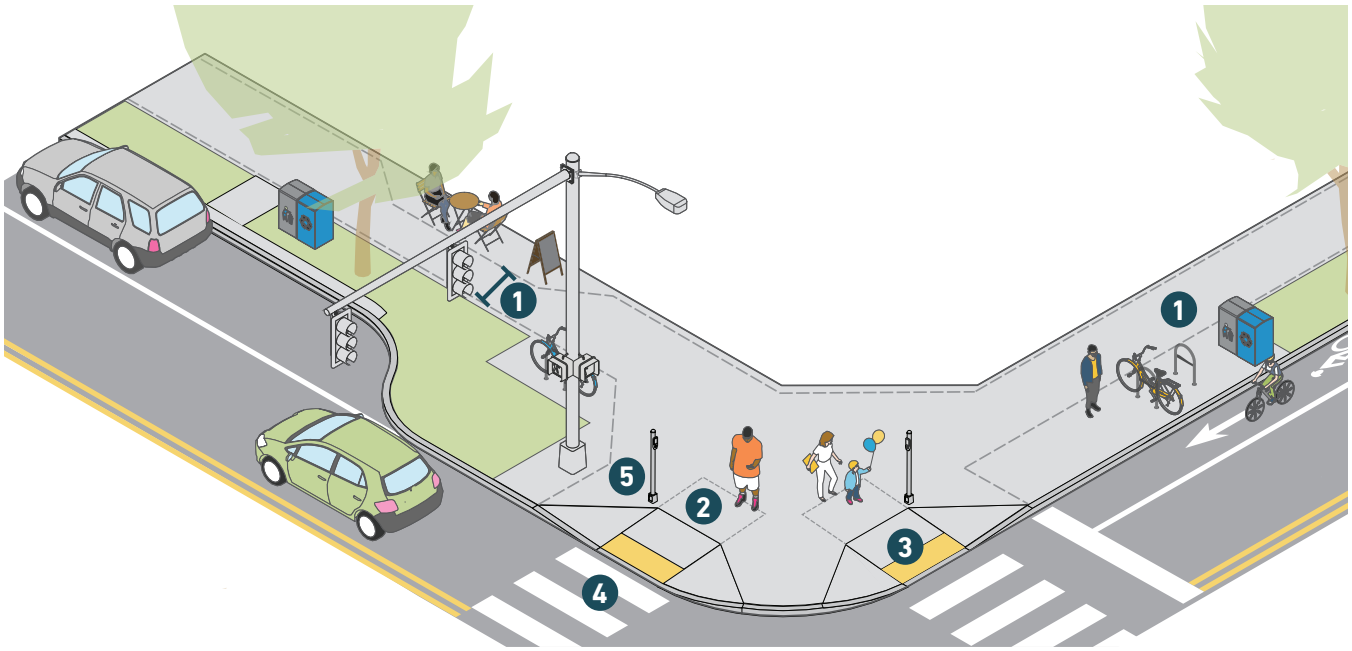
Sidewalk Accessibility



Description

Sidewalk accessibility is important for pedestrians of all ages and abilities. Accessible sidewalks are particularly important for younger and older pedestrians, especially those with disabilities. The design of an accessible sidewalk includes the following considerations: the alignment and width of the pedestrian access route (PAR), lack of obstructions and encroachments within the PAR, the walking surface running (longitudinal) and cross slope, the condition of the walking surface, the location and design of curb ramps, the width and the location of crosswalk striping, and the location and types of signalization. Americans with Disabilities Act (ADA) standards, Bellevue city code, and best practices state the following requirements:

Features

1. Pedestrian access route (PAR) shall be at least 5 ft wide (exclusive of the width of the curb), continuous, and unobstructed, and shall have a maximum cross slope of 2%. A minimum of 4 ft is allowable at pinch points.

2. Curb ramps should be aligned with the PAR to the extent possible, and parallel curb ramps (as opposed to a single corner curb ramp) are preferred. A minimum 4 ft x 4 ft level landing pad shall be located at the top the curb ramp to allow for positioning and turning of wheelchair.

3. Ramp design (perpendicular, parallel, or combination) is dictated by site conditions, but must meet the following ADA minimums: ramp must have a maximum running slope of 8.3% and a maximum cross slope of 2%, transitions (or flares) can have a maximum slope of 10%. The width of the ramp shall be a minimum of 4 ft. A contrasting-colored detectable warning surface, minimum 2 ft depth and as wide as the ramp, shall be placed at the bottom of the curb ramp.

4. The ramp portion of the curb ramp must be aligned with the crosswalk to position wheelchair users to easily transition between the crosswalk and the sidewalk.

5. Pedestrian push buttons should be located where a pedestrian who is blind or low-vision can easily locate and activate them. Accessible signals (APS) that provide audible and tactile crossing indications. When new pedestrian push buttons are installed they must be APS compliant though pushbuttons themselves are not required unless the pedestrian phase is not on recall. Otherwise, APS should be installed where there is potential demand, a request, or a complex intersection that would be difficult for blind/low-vision pedestrians to understand and use. APS pushbuttons should be located between 1.5 and 6 ft (but no further than 10 ft) from the edge of the curb or shoulder, and between the edge of the crosswalk line that is the farthest from the center of the intersection and the side of the curb ramp.

- Alterations and new construction may trigger that existing substandard facilities be upgraded to current ADA requirements. Where it is technically infeasible to meet requirements, for example due to a street's running slope, it is possible to gain approval for alternative designs through the Maximum Extent Feasible (MEF) documentation process.

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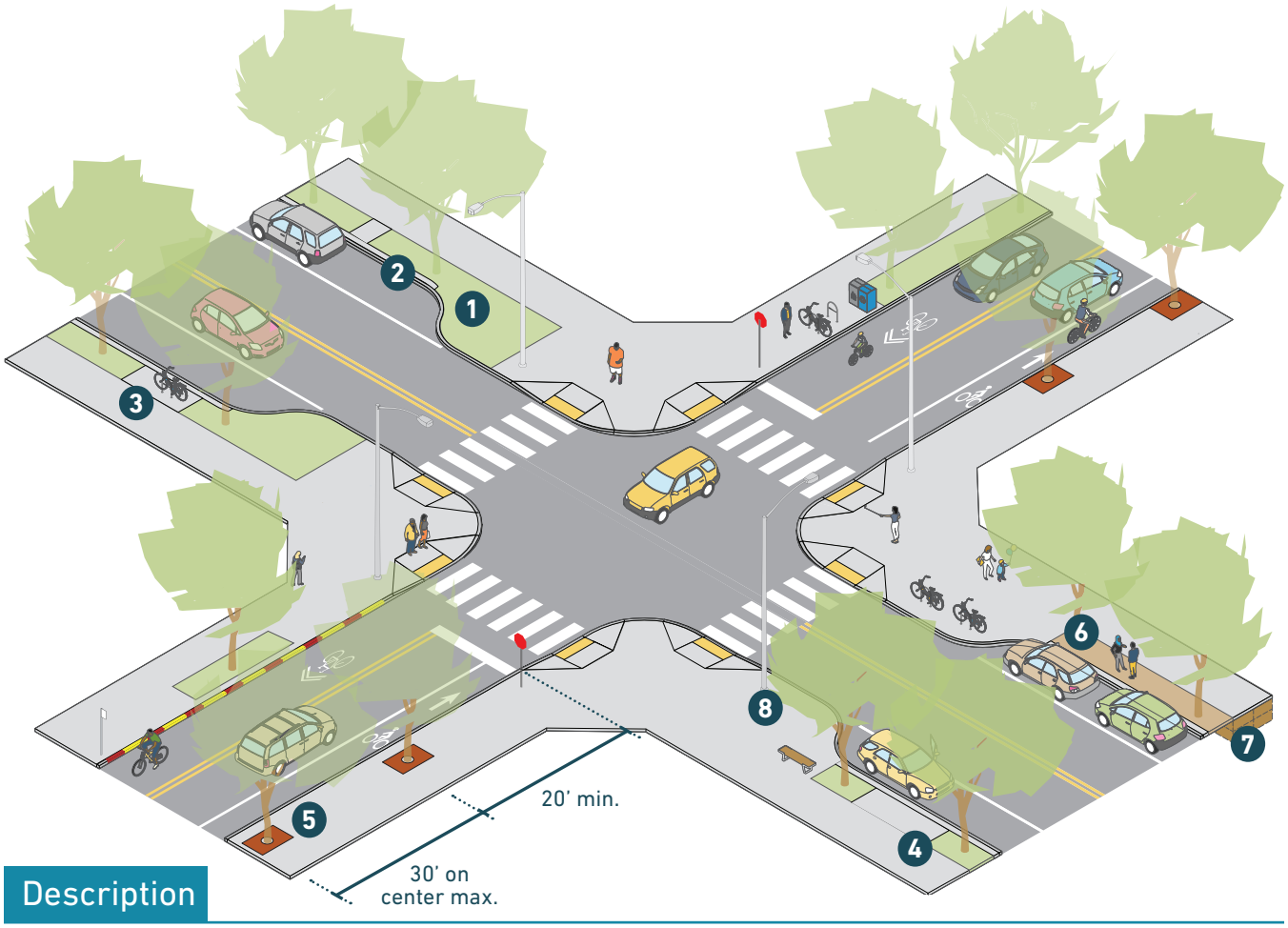
Street Trees and Landscape Buffer



Description

Street trees and landscape buffers provide shade for pedestrians, separate pedestrians from travel lanes, create a more pleasant walking environment, and enhance the aesthetics of a streetscape (the Downtown Land Use Code prescribes the width of sidewalks and the landscaping treatment adjacent to the street). Along some streets a landscape planter with street trees is required, while on other streets it is preferred to have street trees in tree wells. The landscape buffer area—options described below—accommodates paved areas for street furniture and accessories such as bicycle parking racks, benches and transit boarding platforms.

Features

1. A continuous planting strip supports a healthy urban forest by providing more soil volume for trees and should be used wherever possible, even if not for an entire block length. A 4 ft min. wide sidewalk extension, placed approximately 50 ft on center provides access between parking and sidewalk when continuous planter strips are adjacent to on-street parking or loading zones.

2. An 18 in. wide courtesy strip provides a hard surface for people to step out of vehicles where on-street parking is located.

3. Amenity pads, sited between courtesy strips, provide a place for site furnishings, bike parking, and transit loading/unloading.

4. Where continuous planting strips are not possible or desired, trees can be placed in single tree pits. The minimum size of a trees pit is 4 ft wide by 6 ft long, to allow adequate rooting space.

5. Tree grates can be used to protect trees roots and provide a level walking surface at tree pits, particularly in high-volume pedestrian areas. However, it is important that tree grates be maintained to ensure proper tree growth and prevent tree girdling.

6. Flexible porous surfacing is a lower cost alternative to tree grates for providing level walking surface in planting strips. These rubber-based materials allow air and water to reach the tree roots.

7. Soil cells are an engineered solution to create more soil volume for trees under adjacent pavements. Note some soil cell systems are DOE-approved bio-retention facility equivalents.

8. Street light coordination is a best practice for ensuring the placement of street trees does not conflict with minimum street lighting standards.

See Standard Drawings for Downtown Sidewalks with Tree Pits and Landscape Strips.

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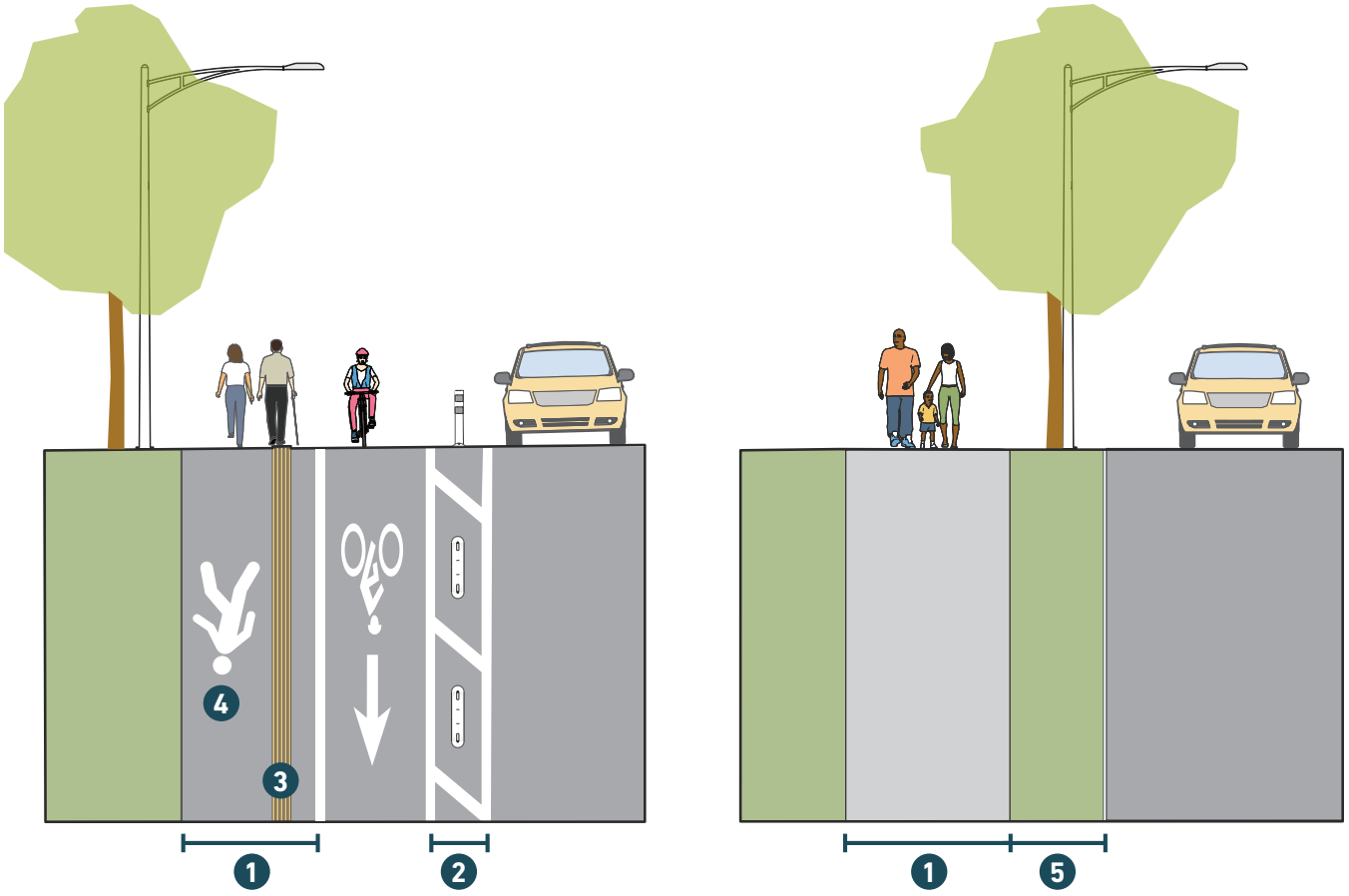
Alternative, Quick Build Walkway



Description

Where construction costs, safety concerns and other factors make installing a full curb/gutter and sidewalk infeasible, an alternative, quick build walkway can be employed to create a separated, dedicated space for people walking at a cost substantially lower and implemented much more quickly than traditional concrete sidewalks. Bellevue employs a variety of techniques to designate these walkways, including paint, plastic curbs, plastic posts, wheel stops, planter strips, and/or asphalt walkways (either raised or separated). The technique is informed by the roadway characteristics and site conditions, among other factors. Regardless of the treatment, alternative, quick build walkways must adhere to Americans with Disabilities Act (ADA) standards. Additionally, special consideration must be given to the design of driveway and roadway crossings.

Features

1. An alternative, quick build walkway shall have a maximum cross-slope of 2% and shall maintain a continuous and unobstructed clear pedestrian access route width of minimum of 4 ft, with 5 ft preferred.

2. Horizontal buffers shall be designated with pavement markings (longitudinal lines and cross hatching), with potential to add raised elements. The desired painted buffer width is 3 ft, with 2 ft being the minimum.

3. Where an alternative, quick build walkway is located adjacent to and at the same level as a bicycle facility, tactile walking surface indicators (TWSIs), also called directional indicators) shall be installed to distinguish between the walking surface and the biking surface. Like a detectable warning surface, TWSIs must be at least 2 ft wide, of contrasting color, and detectable by cane. TWSIs should be inset at least 1.5 ft from the edge of the walkway to allow users space to walk on top of them.

   Detectable warning surfaces must be placed at all roadway crossings to indicate to pedestrians that they are transitioning from a protected pedestrian travelway into a roadway. Driveway crossings, depending on vehicle volume, also merit treatments to bring awareness to both drivers and pedestrians of the potential for conflict. This may be accomplished with crosswalk striping, signs, raised crossings, or other treatments that slow drivers.

4. Similar to a bike lane with a bicyclist icon, an alternative walkway may feature a pedestrian icon (where paved) to heighten awareness of pedestrians.

5. Where space is available, a landscape buffer can be used to separate the walkway from travel lanes.

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Quick Build Pedestrian Facilities

Description

Quick build is a term for the rapid implementation of low-cost infrastructure that supports safe, accessible, and equitable walking, as well as transit use and biking. These projects may be implemented to support MMLOS or Vision Zero objectives, to respond to public demand for infrastructure improvements, to provide interim facilities or to demonstrate a proof of concept for improvements.

The practice of quick build has evolved in response to a variety of project constraints that prevent or slow implementation of the changes desired including long project development times, limited funding, complicated infrastructure requirements (e.g. drainage needs), or skepticism from city staff or the public. Quick build projects are not intended to be permanent but are made of durable materials that can last 1-5 years. While appropriate design review and approvals are required, the less permanent nature of the installations can help speed up the implementation timeline. The list below includes a sampling of some, but not all kinds of projects that are possible.

Features

1. Pavement markings, plastic curbs and flex posts can be used to create a curb extensions/bulb-out or mid-block crossing to increase the visibility of pedestrians and reduce exposure by shortening crossing distance. The same treatment can be used to daylight a corner for better visibility.

2. A parklet converts curbside parking spots to a placemaking opportunity for elements like seating, gathering space, plantings, bike parking, and public art installations.

3. An intersection mural or painted crosswalk can be used to establish neighborhood identity, placemaking, and increase awareness of crossings.

4. A hardened centerline for left turn traffic calming and slow turn wedge for right turn traffic calming are low-cost, high-impact treatments to tighten turn radii, modify turning angles, increase visibility of pedestrians, increase stopping time, and making crossings safer and more comfortable for pedestrians.

5. A bus stop extension can be created with a prefabricated unit or other materials to allow buses to stop in-lane and extend the sidewalk out to meet where the buses stop. This treatment helps buses stay on schedule by increasing the ease of reentering the flow of traffic after picking up and dropping off passengers.

6. A pedestrian plaza can be created with pavement markings, paint, flex posts, or planters where excess pavement and right-of-way can be rededicated to other uses to create areas for seating, gathering, and other placemaking activities.

7. Quick build materials can also be employed to create a range of traffic-calming features, from mini-roundabouts/neighborhood traffic circles to chicanes and pinch points.

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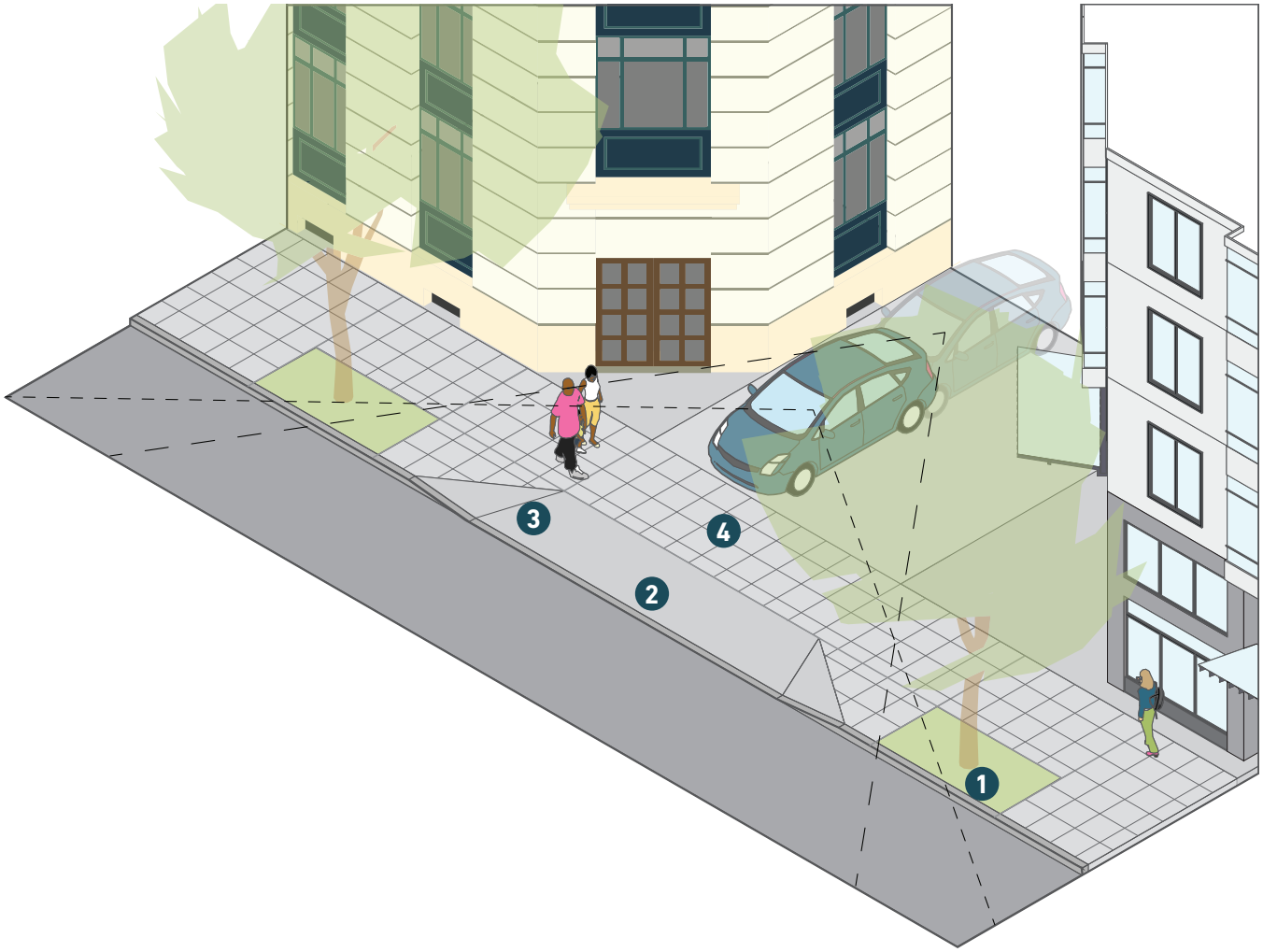
Driveway Crossing



Description

Sidewalks should be level and continuous across driveways to prioritize pedestrian movement. The design and detailing of driveways should emphasize to a driver of a vehicle that they are encroaching into a pedestrian area and should proceed with caution.

Features

1. Driveways should be placed to maximize sight distance for both drivers and pedestrians. Keep trees, site furnishings, and other fixed objects outside of the sight triangle to maintain sight lines between drivers and pedestrians.

2. Driveway width should be kept to the minimum needed to accommodate the planned type of vehicle.

3. Driveways should be designed such that the rise in elevation to the grade of the sidewalk should be contained within the landscape buffer. When this is not possible the sidewalk should slope down on each side to the driveway elevation at a maximum 8.3% grade or combination sidewalk/ driveway approach elevation change with less slope, maintaining a minimum 4 ft. pedestrian access route (PAR) with maximum 2% cross slope.

4. Sidewalk scoring pattern should extend across the driveway.

   See Standard Drawings for Downtown Driveway

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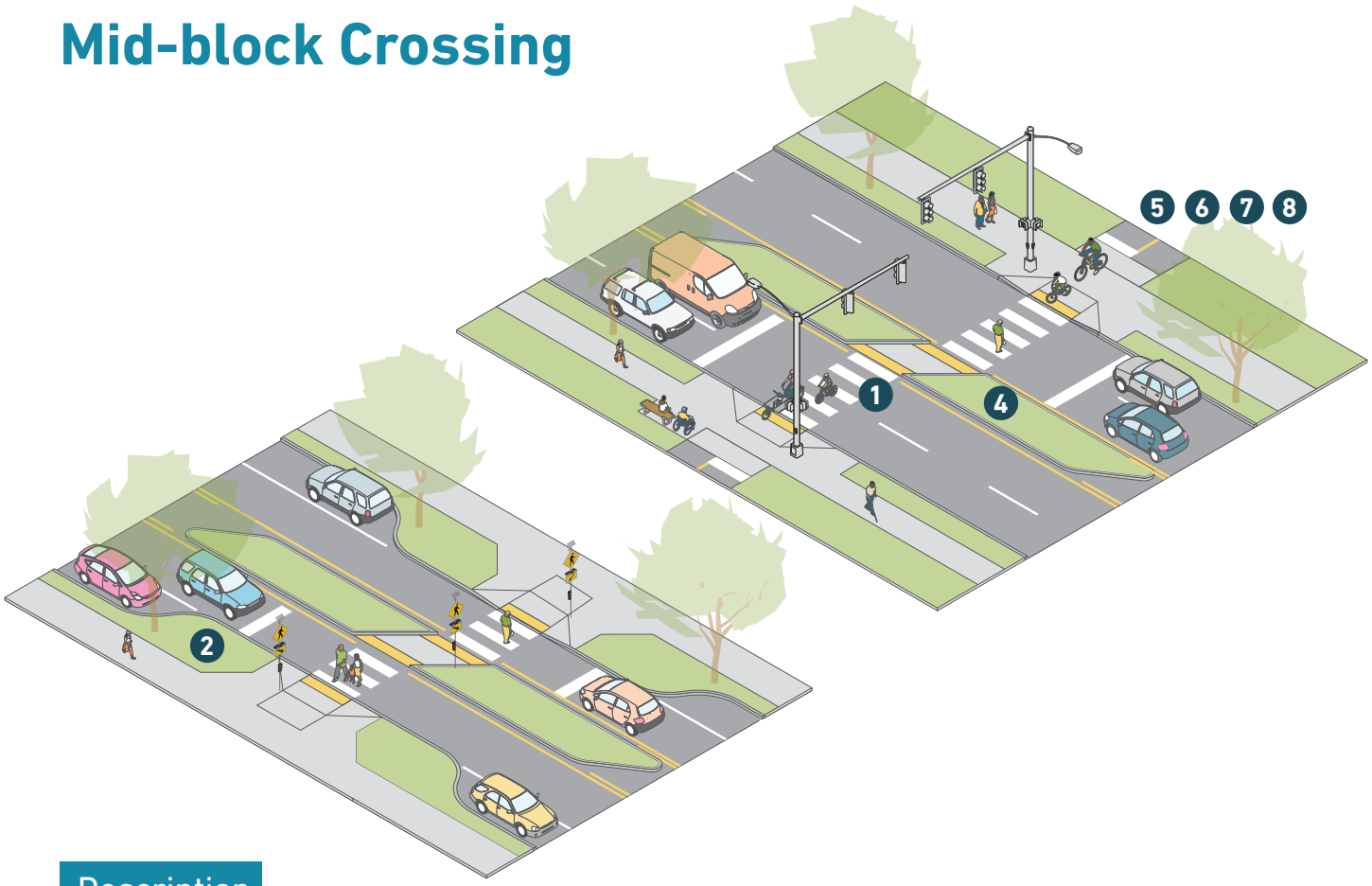
Mid-block Crossing



Description

Mid-block crossings are marked crosswalks located between intersections. Each mid-block location in a Downtown super-block is a potential candidate for a pedestrian crossing, and the Downtown Transportation Plan identifies higher priority locations for near-term implementation. The MMLOS (Table 1) provide guidance for locations outside of Downtown.

Mid-block crossing features may be used where a shared use path intersects a roadway, and at locations where the distance to the nearest intersection is too far in relation to major pedestrian attractors (e.g., transit stops, parks, school, retail). The following treatments help to inform motorists that pedestrians are likely to be crossing at this location.

Features

1. High-visibility crosswalks and warning or advanced warning signs increase visibility and awareness of the crossing.
2. Geometric alterations like curb extensions and raised crossings bring awareness and visibility and slow drivers.
3. Traffic control and signalization will vary according to the roadway characteristics. They can include advance stop/yield lines, pedestrian-activated warning signals like Rectangular Rapid Flash Beacons (RRFBs) and traffic signals.
4. Crossings of multi-lane streets should have median pedestrian refuge islands to allow for two-stage crossings, and advance stop/yield markings or full signalization.
5. For shared use paths and trails, crossing treatments need to communicate to bicyclists and pedestrians how to proceed safely across and to drivers to anticipate the path users and operate safely.
6. On trail crossings, right-of-way priority is assigned to the busiest direction of travel; in some cases, this may be the multipurpose path. Crossing treatments will depend on the speed and volume of crossing traffic and may include stop signs, rectangular rapid flashing beacons (RRFBs), high-intensity activated crosswalk beacons, or full signalization.
7. Mid-block trail and shared use path crossings should be aligned as close to perpendicular as possible to maximize sight distance, reduce crossing distance and exposure. Signage, crosswalk markings or high-visibility markings, and lighting should also be included.
8. Bollards can be used to prevent motor vehicles from entering the multipurpose path, but other design interventions, such as signs, trail alignment geometry, and landscaping should be explored first. Any treatment should allow maintenance vehicle access.

See Standard Drawings for Raised Crosswalks and RRFB Assembly.

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Downtown: Mid-Block Crossing

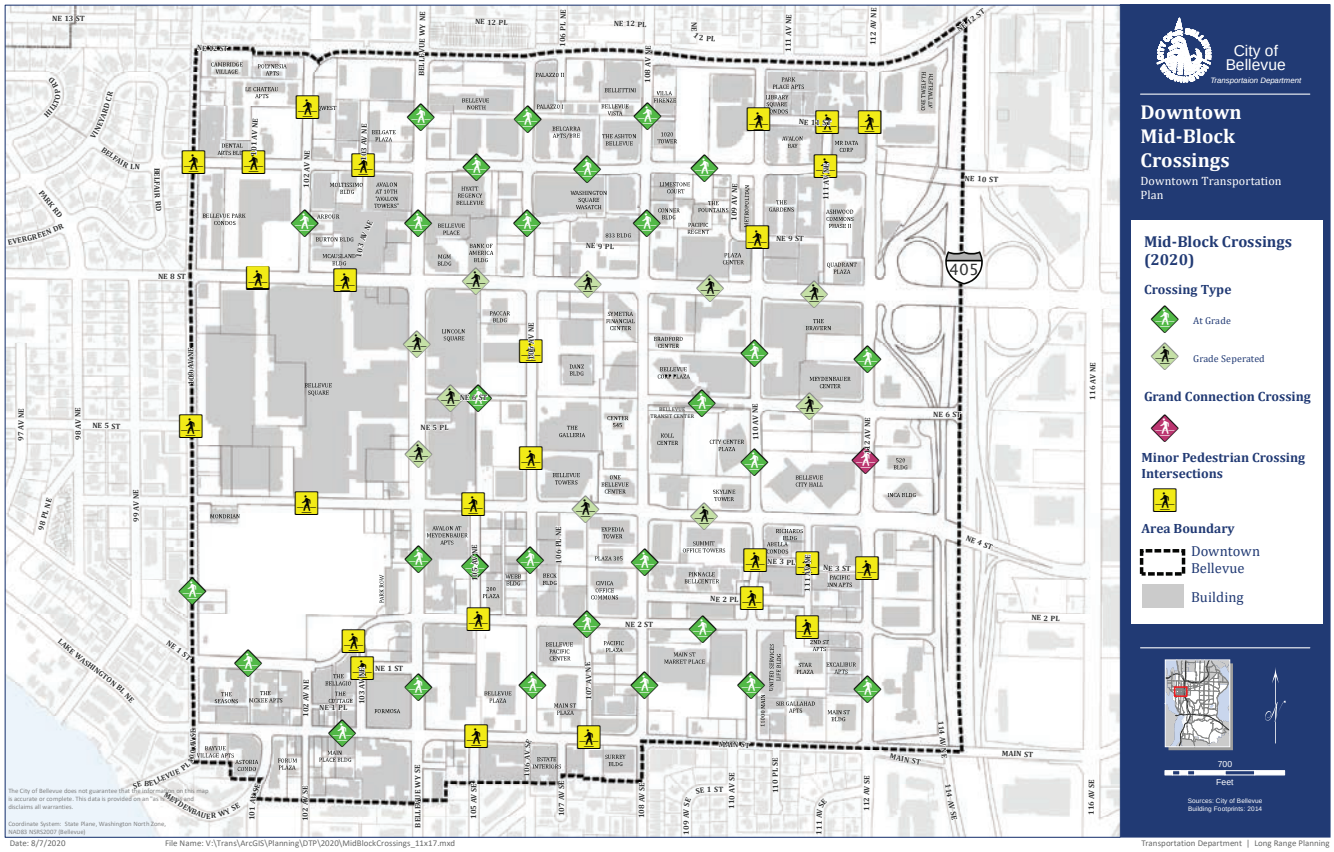

Figure 5: Existing and Planned Mid-Block Crossings *(Amended from the Downtown Transportation Plan, October 2013)*

The Downtown Transportation Plan emphasizes the importance of the pedestrian environment and provides specific treatment recommendation all downtown intersections.

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Downtown: Planned Sidewalk Width and Landscape Type

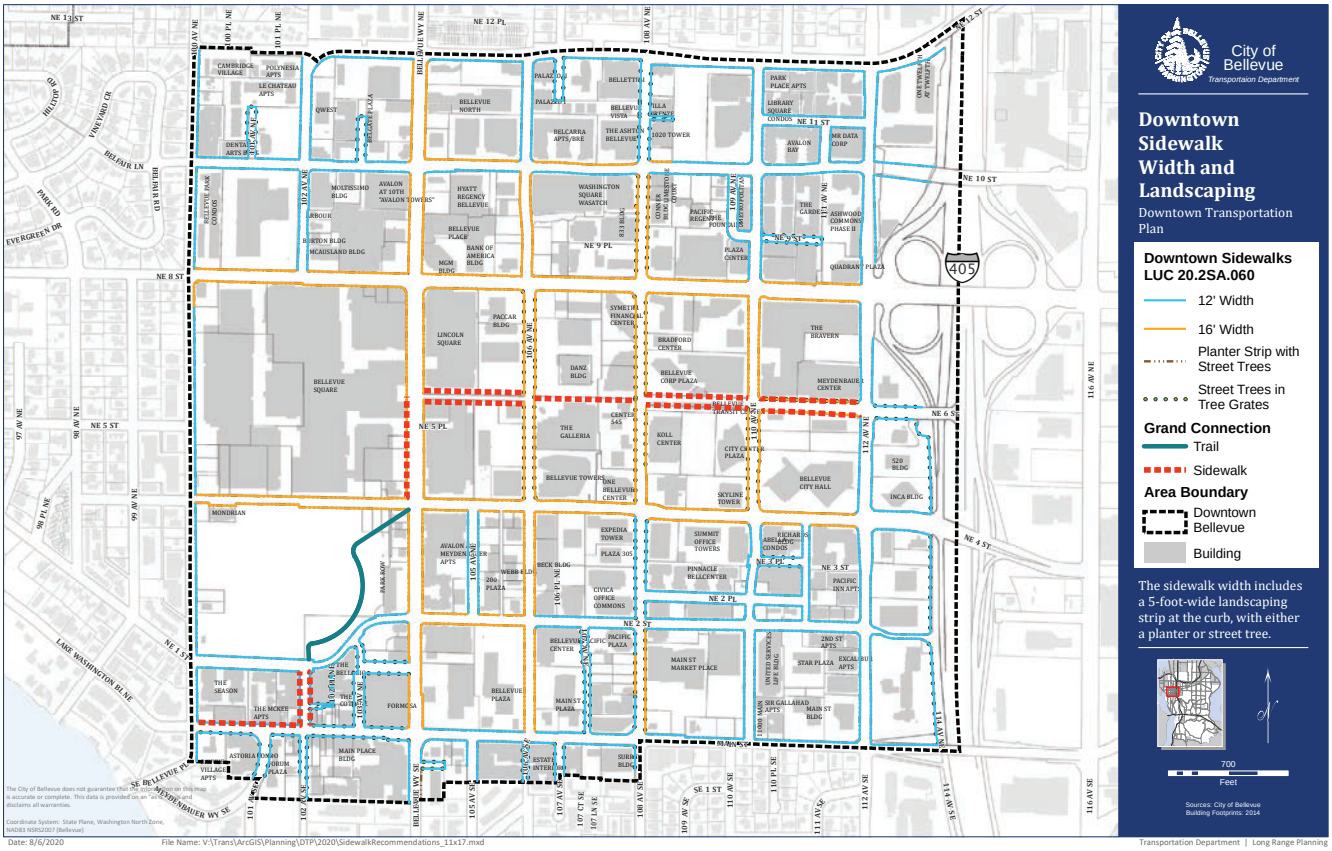

Figure 6: Planned Sidewalk Width and Landscape Type *(Amended from the Downtown Transportation Plan, October 2013)*

The widths in Figure 6 are adopted in the Downtown Land Use Code; refer to LUC 20.25 A. As part of its emphasis on the importance of the pedestrian environment, the Downtown Transportation Plan provides planned sidewalk widths and landscape types. Refer to the Grand Connection Design Guidelines and the Downtown Land Use Code for specific dimensions, design standards and guidelines.

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C. Bicycle Facilities

Bicycles are an efficient, environmentally friendly, and healthy mode of transportation. For people of all ages and abilities to be comfortable riding a bike in the city, there must be a safe and complete bicycle network.

Bicycle Level of Traffic Stress and Level of Service

Bicycle Corridor LTS (or LOS) Recommendations

The following guidelines help inform the type of bicycle facility needed to achieve the recommended level of service/level of traffic stress. Note that LOS is used in reference to Bellevue's MMLOS guidelines, but the term LTS is used broadly across the U.S. as a measure of the quality of a bicycle facility.

- **LTS 1. Priority Bicycle Corridors within Downtown, Activity Centers, and Multipurpose Paths**
  A high level of bicycle mobility for all ages and abilities is expected within areas where the city has the vision, intent and policy to promote a high-density, mixed-use urban environment.
- **LTS 2. Priority Bicycle Corridors outside of Activity Centers**
  A moderate level of bicycle mobility for Interested but Concerned adults would require comfortable bicycling connections between Activity Centers and on recognized regional routes, such as the Lake Washington Loop.
- **LTS 3. Other Bicycle Network Corridors**
  Other bicycle network corridors include those on arterial streets that are part of the Bicycle Network but not part of a Priority Bicycle Corridor. This network serves to connect neighborhoods with Activity Centers and Frequent Transit Network.

Bicycle Facility Components on Arterials

The level of traffic stress (LTS) that is experienced by people riding bicycles along arterials is based on the speed and volume of vehicle traffic as well as the type of bicycle facility.

Bicycle Network Corridors

Applying the intended bicycle LTS to the bicycle network arterial corridors and intersections in the Pedestrian and Bicycle Transportation Plan (2009) would yield a system that is comfortable, safe, and accessible to people who want to travel by bicycle.

Table 5 describes the type of bicycle facility that would be needed, given the speed and volume of traffic to achieve the intended bicycle LTS.

Intersections

When a bicycle facility along an arterial intersects another arterial, the bicycle corridor level of service should be carried across the intersecting arterial. Otherwise, the that intersection may become a barrier to bicycle travel to those who feel the level of traffic stress is too great for them.

Table 6 is a representation of the types of facilities that may be employed to extend a bicycle corridor LTS across an intersection; these are not prescriptive solutions but rather guidelines to be implemented as appropriate to the context.

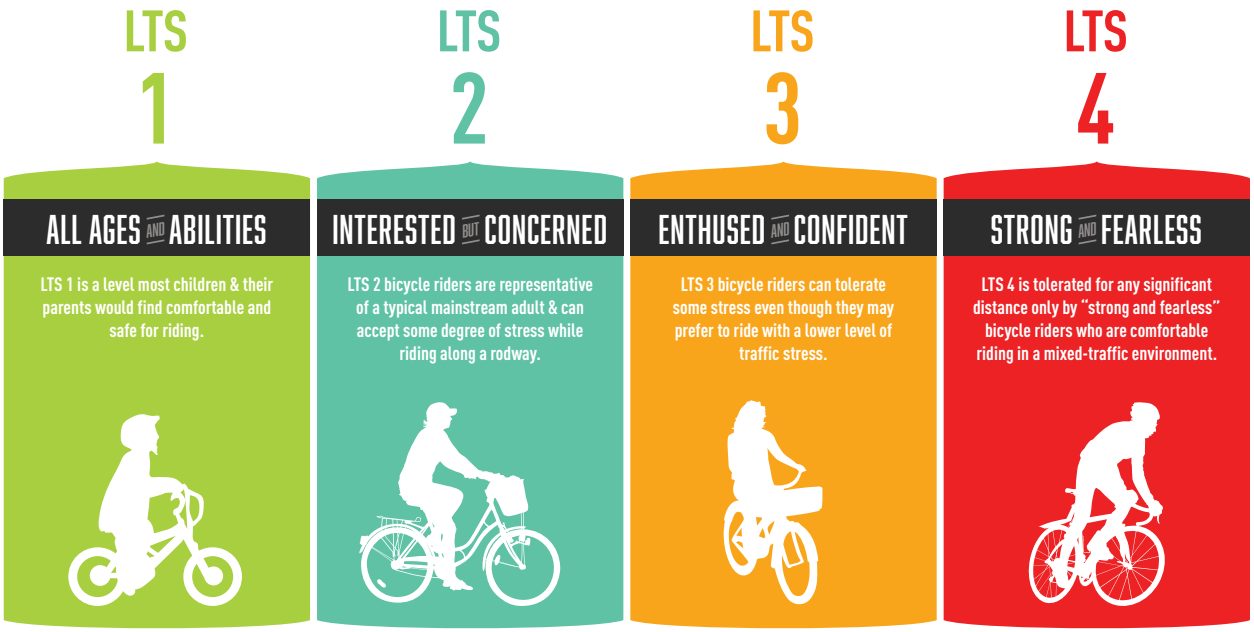

Figure 7: Bellevue Bicycle Level of Traffic Stress (LTS) Categories Source: MMLOS Metrics, Standards & Guidelines, 2017

Table 5: Bicycle Level of Service / Level of Traffic Stress *(Amended from the MMLOS Metrics, Standards & Guidelines, 2017)*

Roadway Characteristics		**Bicycle Facility Components: Guideline to Achieve Intended Level of Service/Level of Traffic Stress**					
Speed Limit	**Arterial Traffic Volume**	**No Marking**	**Sharrow Lane Marking**	**Striped Bike Lane**	**Buffered Bike Lane (Horizontal)**	**Protected Bike Lane (Vertical)**	**Physically Separated Bikeway**
</=25	<3k	1	1	1	1	1	1
	3-7k	3	3	2	1	1	1
	>/=7k	3	3	2	2	1	1
30	<10k	3	3	2	2	1	1
	10-25k	4	4	3	3	2	1
	>/=25k	4	4	3	3	3	1
35	<25k	4	4	3	3	3	1
	>/=25k	4	4	4	3	3	1
>35	Any	4	4	4	4	3	1

Notes: This table is amended from Transportation Commission recommendations in their MMLOS report per evolving best practices. The final design and the ultimate achieved LTS is subject to engineering design and site-specific situations.

The icon to the right is included with each bicycle facility, to show the LTS rating that maybe achieved with the type of facility shown in Table 5 (although LTS depends on the speed limit and traffic volume).

Table 6: Bicycle Facility Components at an Intersection
(Amended from the MMLOS Metrics, Standards & Guidelines, 2017)

Bicycle LOS/LTS	Signal	Street Crossing	Approach to Intersection	Approach to Intersection with Right Turn Lane	Bike Amenities
LOS 1	Dedicated bike signal	Green	• Protected intersection • Parking protected bike lane	• Dedicated bike facility approaching intersection • Include bend-out design and protected intersection approach • Add mountable corner island to slow vehicle speeds • Refer to NACTO "Don't Give Up the Intersection"	• Bike lean rail for all bike lane approaches • Bike wayfinding signage • Include bike wayfinding pavement markers
LOS 2	Dedicated bike signal	Green skip stripe	• Bike lane against curb • Parking protected bike lane or buffered door zone bike lane	• LOS 2 facility may warrant upgrading to LOS 1 intersection treatment based on context (crossing busy arterial, freeway interchange, high vehicle volume, etc.) • Bike box: add two-stage and approach bike boxes as needed • Consider bike ramp to sidewalk if necessary	• Bike wayfinding signage • Lean rails where appropriate (LOS 1 upgrade)
LOS 3	No dedicated bike signal; bikes use pedestrian signal	Standard white skip stripe	• Bike lane between vehicle lanes and curbs • Sharrows in turn lanes • Standard door zone bike lanes (between travel and parking lanes)	• Mixing zone (bike lane between right turn and through lanes) • Bike box: add two-stage bike box as needed	• Bike wayfinding
LOS 4	No specific design guidance for LOS 4. Streets that rate LOS/LTS 4 either lack any kind of accommodation for bicycles, or may have higher vehicle speed and volume, making bicycling feel very uncomfortable for most bicyclists.				
Trail or Mid-Block Crossing	Full signal, HAWK* or RRFB**, push button or loop detector actuation	Green solid or skip-stripe	N/A	N/A	

*HAWK stands for High Intensity Activated Crosswalk Beacon. A HAWK is a push-button activated signal that stops traffic to provide a protected pedestrian crossing at an otherwise unsignalized location.
**RRFB stands for Rectangular Rapid Flashing Beacon. This beacon is actuated with a push button and the flashing lights advise drivers that a person walking or riding a bicycle to cross the street at the mid-block location.
Notes: This table is amended from Transportation Commission recommendations in their MMLOS report per evolving best practices. The final design and the ultimate achieved LTS is subject to engineering design and site-specific situations.




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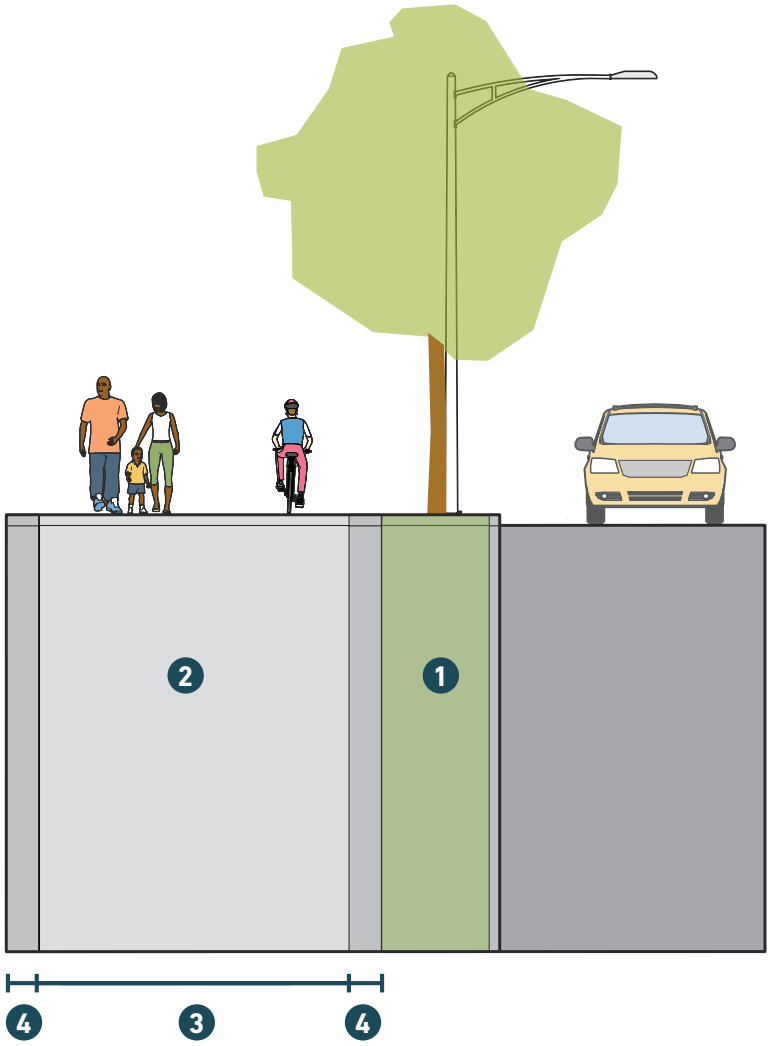
Multipurpose Path

LTS



Description

Multipurpose paths and trails are located in separate, off-street rights-of-way, such as former rail corridors (e.g., the Eastrail) and may also be sited within a road or highway right-of-way (i.e., the I-90 Trail and the 520 Trail) or adjacent to urban arterials such as NE 12th Street in Downtown and Spring Boulevard in BelRed. By definition, a multipurpose path will achieve a LTS 1. Attention to intersection design is needed to ensure a continuous LTS 1 corridor.

Features

1. Off-street paths may be infrequently intersected by streets and driveways, but their separation from vehicle traffic makes them the most comfortable facility for all ages and abilities.

2. Acceptable surface materials are asphalt and concrete. Special paving may be applied in limited circumstances, especially in locations of congestion or at approaches to intersections.

3. The desirable paved width is 14 ft., excluding the shoulders; the minimum paved width is 12 ft. A yellow center line stripe may be used in select locations to keep traffic directional through the curves, on steep grades with significant speed differential between up- and down-hill bicycles, in areas of heavy trail usage, or as a de facto wayfinding tool.

4. Shoulders outside the operating space of the path provide shy distance from vertical objects, such as fences and walls along the edge of the path that a handlebar or wheel could strike.

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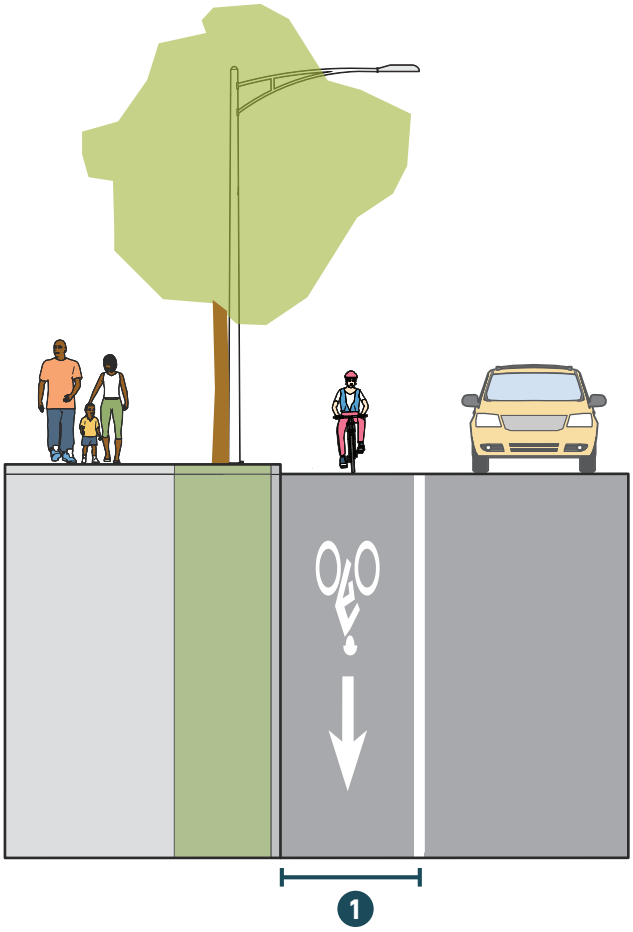
Striped Bike Lane

LTS



Description

Bike lanes provide dedicated space within a roadway for use by bicyclists and micromobility. They are designated with striping, pavement markings, and signage but do not include horizontal or vertical separation elements adjacent to the vehicle lane. A striped bike lane may achieve the intended bicycle Level-of traffic Stress (LTS) depending on the speed limit and the average daily traffic as shown in Table 5.

Features

1. The desirable width is 6 ft.; the minimum width is 5 ft.

- Bike lanes are for one-way travel (matching the direction of traffic) and are normally provided in both directions on two-way streets and/or on one side of a one-way street.
- Bike lanes are typically located on the right side of the street, between the adjacent travel lane and curb, shoulder, edge of pavement, or parking lane, and they typically match the direction of motor vehicle travel.
- Other configurations, like left-side lane or contra-flow lanes, can be used in response to localized conditions.
- To indicate the continuation of the bike lane through intersections, bike lane extension/crossing markings are used through intersections.

See Standard Drawings for Striped Bicycle Lane Channelization and Bike Facility Markings.

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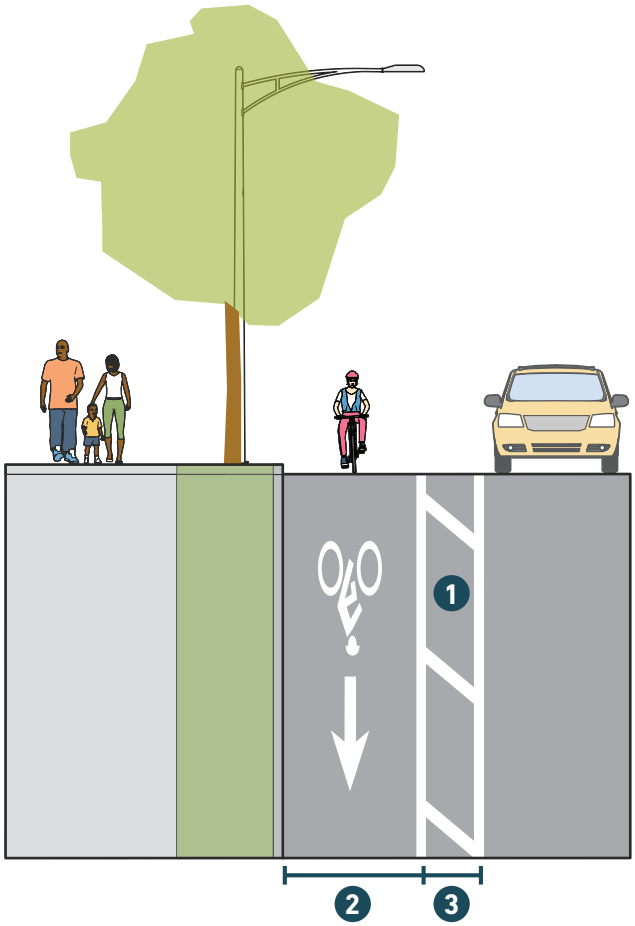
Buffered Bike Lane (Horizontal Separation)

LTS



Description

Buffered bike lanes provide a horizontal buffer between the bike lane and the adjacent motor vehicle lane and/or on-street parking. A buffered bike lane is simply a conventional striped bike lane that is separated—or buffered—from the adjacent vehicle travel lane using cross-hatched striping. Bicycle lanes with buffers should be installed where horizontal separation is needed to achieve the intended level of traffic stress (see LTS/LOS section).

Features

1. Buffered bike lanes feature a buffer space, designated with pavement markings (longitudinal lines and diagonal cross hatching). Solid longitudinal lines with diagonal cross hatching are used where vehicle crossing the buffer is discouraged. Dashed longitudinal lines are used where vehicles crossing the buffer is allowed at locations like driveways or transit stops.

2. The desirable buffered bike lane width is 6 ft.; the minimum width is 4 ft. when located next to a 2 ft. min. buffer. When there is high bicycle volume or speed differential, 7 ft. is recommended to allow passing.

3. The desired buffer width is 3 ft. with 1.5 ft. being the minimum, and 3 ft. minimum when adjacent to on-street parking.

See Standard Drawings for Buffered Bike Lane Channelization and for Bike Facility Markings.

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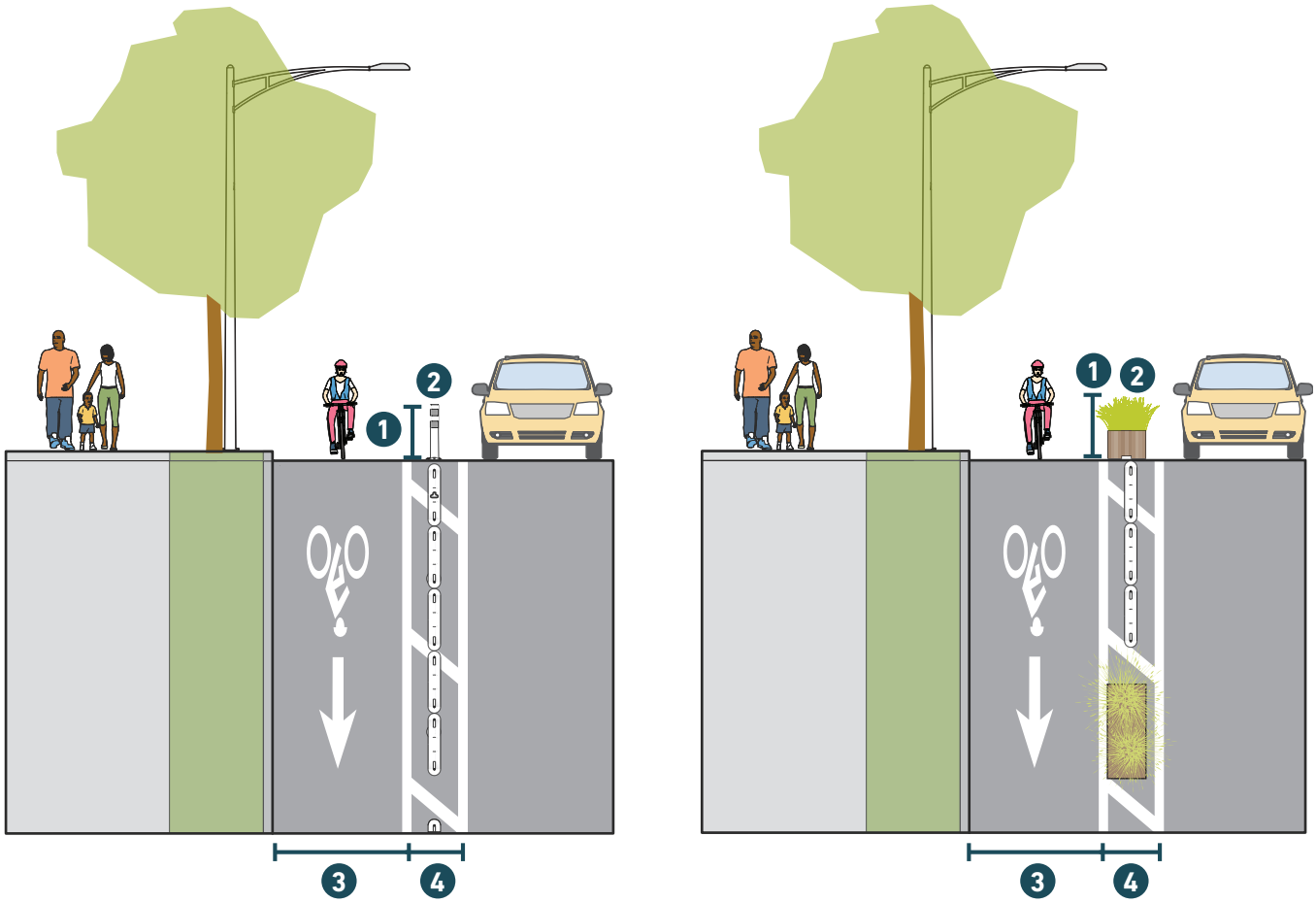
Protected Bike Lane (Vertical Separation)

LTS



Description

Protected bike lanes (also called separated bike lanes or cycle tracks) are bike lanes that are physically separated from moving vehicles and/or parking lanes through the use of vertical elements within a horizontal separation. The vertical separation components included here are easier and less expensive to install than more robust or permanent separation methods used in physically separated bike lanes and are thus typically used in retrofit projects.

Features

1. Vertical elements like cast-in-place or precast curbs, flex-posts, planters, engineered rubber curbs provide separation between the protected bike lane and the adjacent travel lane. Keep vertical elements, including plantings, below 30 in. to maintain sight lines.
2. The separation method or grade level of protected bike lanes will depend on available right-of-way, traffic volume and speed, drainage infrastructure, pedestrian volume, and the context.
3. The desirable protected bike lane width is 5 ft.; the minimum width is 4 ft. when located next to a 2 ft. min. buffer. When there is a high bicycle volume or speed differential, 7 ft. is recommended to allow passing.
4. The desired buffer width is 3 ft. with 2 ft. being the minimum . A minimum 3 ft. buffer is required when the bike lane is adjacent to parking.

See Standard Drawings for Buffered Bike Lane Channelization and for Bike Facility Markings.

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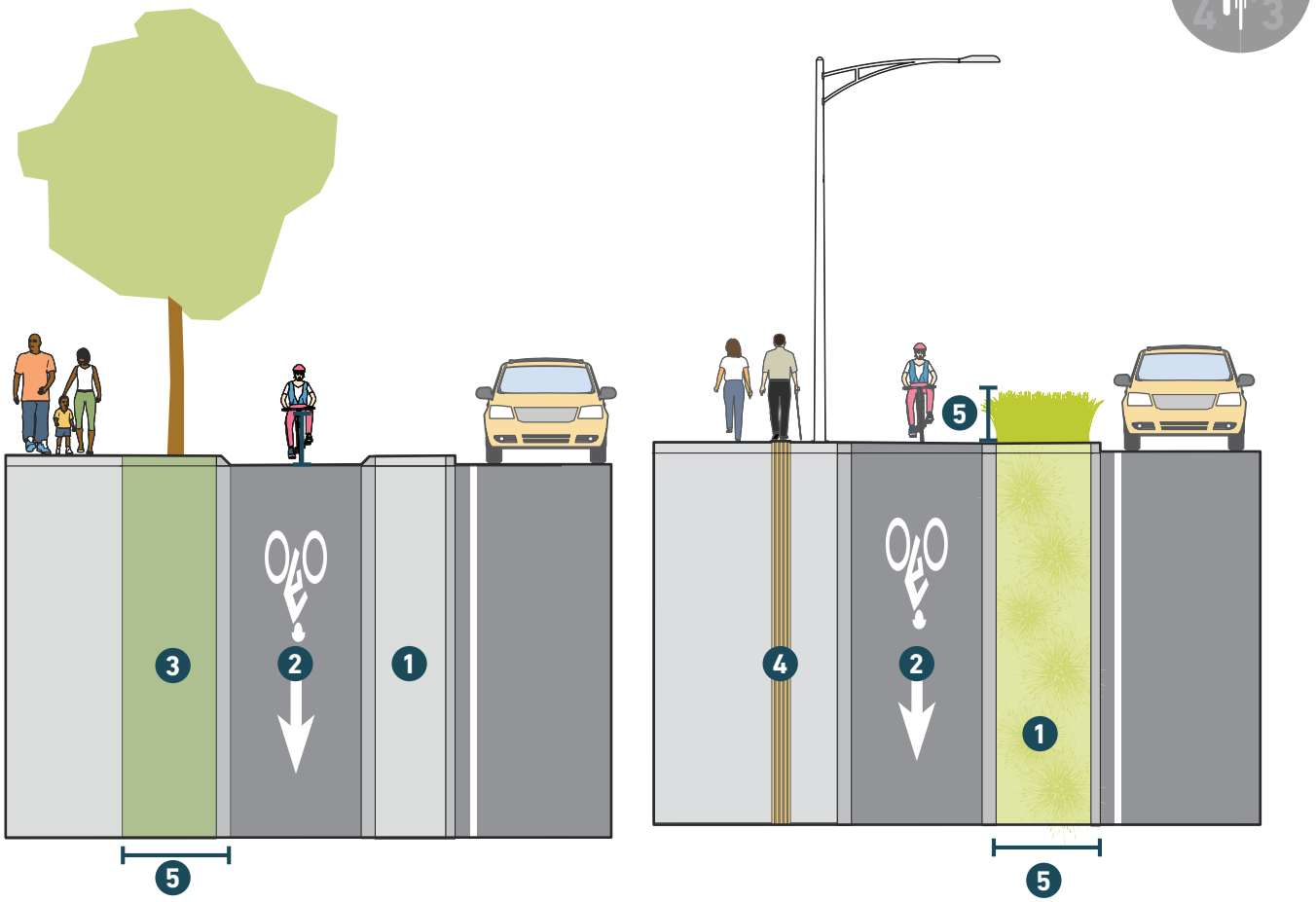
Physically Separated Bikeway

LTS



Description

Physically separated bikeway facilities are intended for exclusive use by bicycles and other micromobility users. They are separated from the roadway (as in behind the curb), and while they may be at the same level as the sidewalk, they are not intended for pedestrian use and there is typically an embedded or applied demarcation between the sidewalk and the bicycle facility. A physically separated bikeway is marked with a bicycle symbol and an arrow to indicate direction of travel, usually in the same direction as the adjacent vehicle lane, but may be two-directional. Similar to a multipurpose path, a physically separated bikeway achieves LTS 1, and special attention must be given to driveway crossings and intersections.

Features

1. Vertical elements like cast-in-place, precast curbs, or plantings provide separation in the street buffer between the bikeway and the adjacent vehicle travel lane.

2. Physically separated bike lanes may be located at the grade of the sidewalk, at the grade of the travel lane, or mid-way between. They may be one-way or two-way, depending on the overall available right-of-way width of other contextual factors

3. A buffer between the sidewalk and bikeway helps to discourage bicyclists from riding on the sidewalk and pedestrians from walking in the bikeway. The buffer can be a planting strip, striped space, special pavement, or some other feature that will denote separation.

4. When located immediately adjacent to and at the same grade as the sidewalk, tactile walking surface indicators (TWSIs) must be used to indicate for pedestrians with vision disabilities where pedestrians are intended to travel. Like a detectable warning surface, TWSIs must be at least 2 ft wide, of contrasting color, and detectable by cane. TWSIs should be inset at least 1.5 ft from the edge of the walkway to allow users space to walk on top of them.

5. The minimum width for at-grade planters in the sidewalk or street buffer is 5 ft in. to provide space for low plants and street trees . Keep vertical elements, including plantings, below 30 in. to maintain sightlines.

See Street Trees and Landscape Buffer for tree space requirements. See Standard Drawings for Bike Facility Markings.

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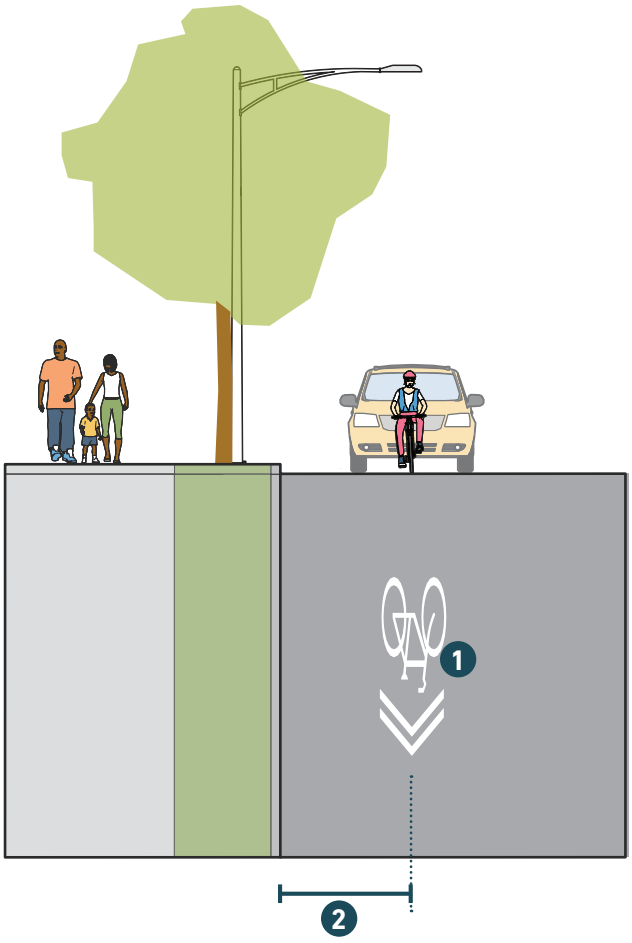
Shared Lane Marking (Sharrow)

LTS



Description

A shared lane marking (sharrow), is a symbol applied to a vehicle travel lane. Unlike a striped bicycle lane, a sharrow does not designate part of the roadway for the exclusive use of bicycles. Shared lane markings are used on low-speed, low-volume streets or to bridge short gaps in the bike network where a dedicated facility is not possible due to space, right-of-way, or other constraints. An example would be a one-block gap between a trail and a protected bike lane. Sharrows may indicate positioning and wayfinding for bicyclists, and alert motorists to expect people biking on the roadway.

Features

1. Bicycle symbols with chevrons are placed in the roadway where bicyclists should position themselves.
2. Preferred shared lane marking placement is center of lane on lower speed streets. Minimum placement is 4 ft. from curb where there is no on-street parking and 11 ft. from curb when adjacent to on-street parking.

- The symbols are typically spaced according to their intended use and the character of the roadway. When used to bridge a gap in the bike network, shared lane markings should be placed every 50-100 ft., whereas on lower volume, lower speed roadways they can be placed less frequently (up to every 250 ft.).

See Standard Drawings for Bike Facility Markings.

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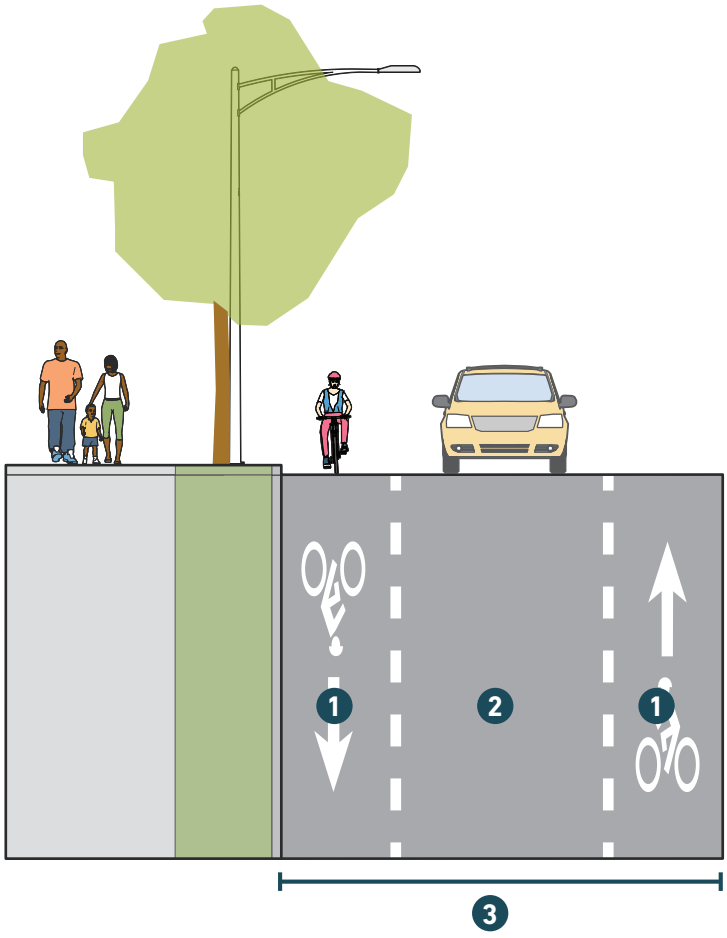
Advisory Bike Lane



Description

Advisory bike lanes may be used on streets with a low traffic volume (less than 5,000 vehicles per day) and a low-speed limit (25 mph maximum). Advisory bike lanes create a flexible street that accommodates and prioritizes bicycle travel where there may not be enough room to accommodate designated bike lanes. One center lane is provided for two-way vehicle traffic. Adjacent to the center lane are edge lanes intended for people biking. Two vehicles may pass one another by merging into the edge lane. The edge lanes are dashed to indicate that people driving may travel there—after yielding to present users—to facilitate a safe passing of another vehicle.

Features

1. Designated space for bicycle travel is vindicated with bicycle lane stencils and/or striping.
2. A single travel lane, intended for two-way operations, is situated in between the bike lanes. Vehicles queue or use the bicycle space if it is available.
3. Street width to be 20 ft. minimum and 30 ft. maximum.

   See Standard Drawings for Bike Facility Marking.

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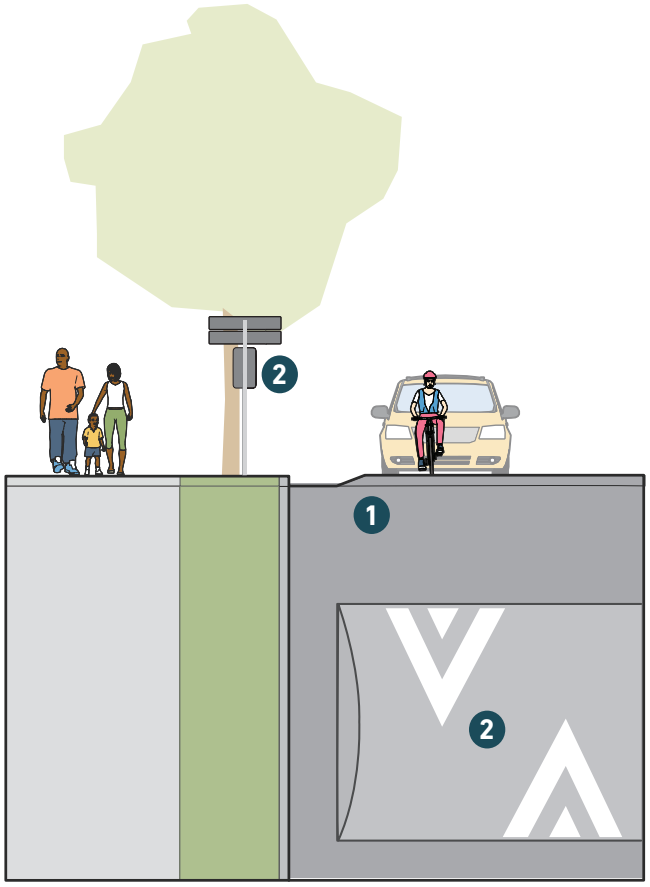
Neighborhood Bikeway



Definition

Neighborhood bikeways are corridors that are designed to prioritize bicycle and pedestrian travel. They have a low volume of motor vehicle traffic, making them more comfortable for a wide range of bicyclists. Drivers present in these corridors are typically making local access trips and traveling at slow speed. A number of traffic calming components such as the speed hump shown here, may be incorporated to attenuate traffic speed and volume, and thus create a LTS 1 or LTS 2 environment for bicyclists.

Features

1. Bicyclists travel with motorists in a shared lane on neighborhood bikeways.

2. Signs, pavement markings, traffic calming, and other tools are used to instill awareness of bicyclists by drivers, limit drivers' speeds, and reduce traffic volume by making the roadway less useful as an access route to destinations beyond the immediate area.

- When neighborhood bikeways cross arterials or heavier-traveled roadways, more robust crossing treatments are needed to prevent these crossings from being barriers. Treatments include elements like RRFBs, bike boxes, medians with cut-throughs, and other traffic calming features

See Standard Drawings for Speed Humps and for Bike Facility Marking.

See the City of Bellevue Residential Traffic Guidebook for the Traffic Safety Toolkit.

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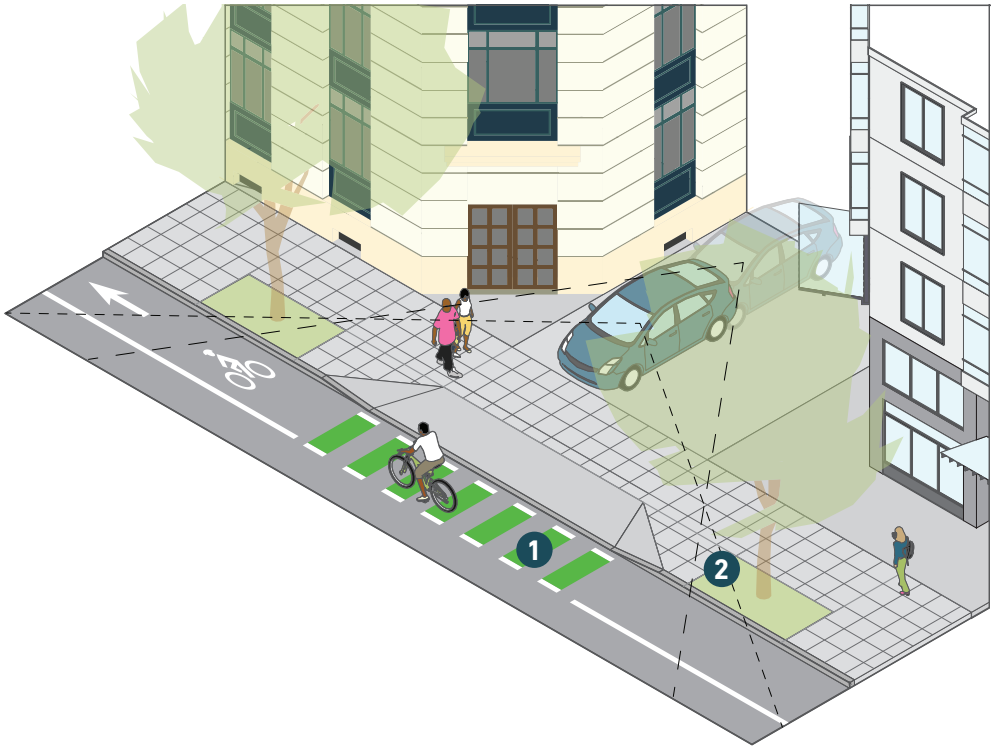
Driveway Crossing of Bike Facility



Description

Driveways present locations for potential conflict between bicyclists traveling in bicycle lanes and drivers as they ingress/egress private property and thereby cross paths with bicyclists. Drivers may not anticipate bicycle traffic or understand the need to yield to bicyclists. This is particularly true on protected bike lanes, especially two-way protected bike lanes. Driveway crossings should be designed to make right-of-way priority for bicyclists and pedestrians clear, provide adequate sight distance to increase reaction time, and increase awareness to all users about the need for caution.

Features

1. Right-of-way priority and awareness for all users about the need for caution can be conveyed with bike lane extension/crossing markings, green paint, signs indicating that drivers should yield to bicyclists, or by raising the level of the bike facility.

- Raising the bikeway to sidewalk level at a driveway, if conditions allow, forces drivers to slow at the driveway ramp before crossing the bikeway and sidewalk.

2. Maintain minimum required sight distances to allow drivers of motor vehicles to clearly see pedestrian and bicyclist at all driveways, buildings, and garage entrances. "Daylighting," or restricting parking on either side of the driveway crossings, creates clear sight lines and increases reaction time for all users.

See Standard Drawings for Pedestrian Sight Lines, Channelization Lines, Raised Crosswalk, Chevron Detail and Downtown Driveway.

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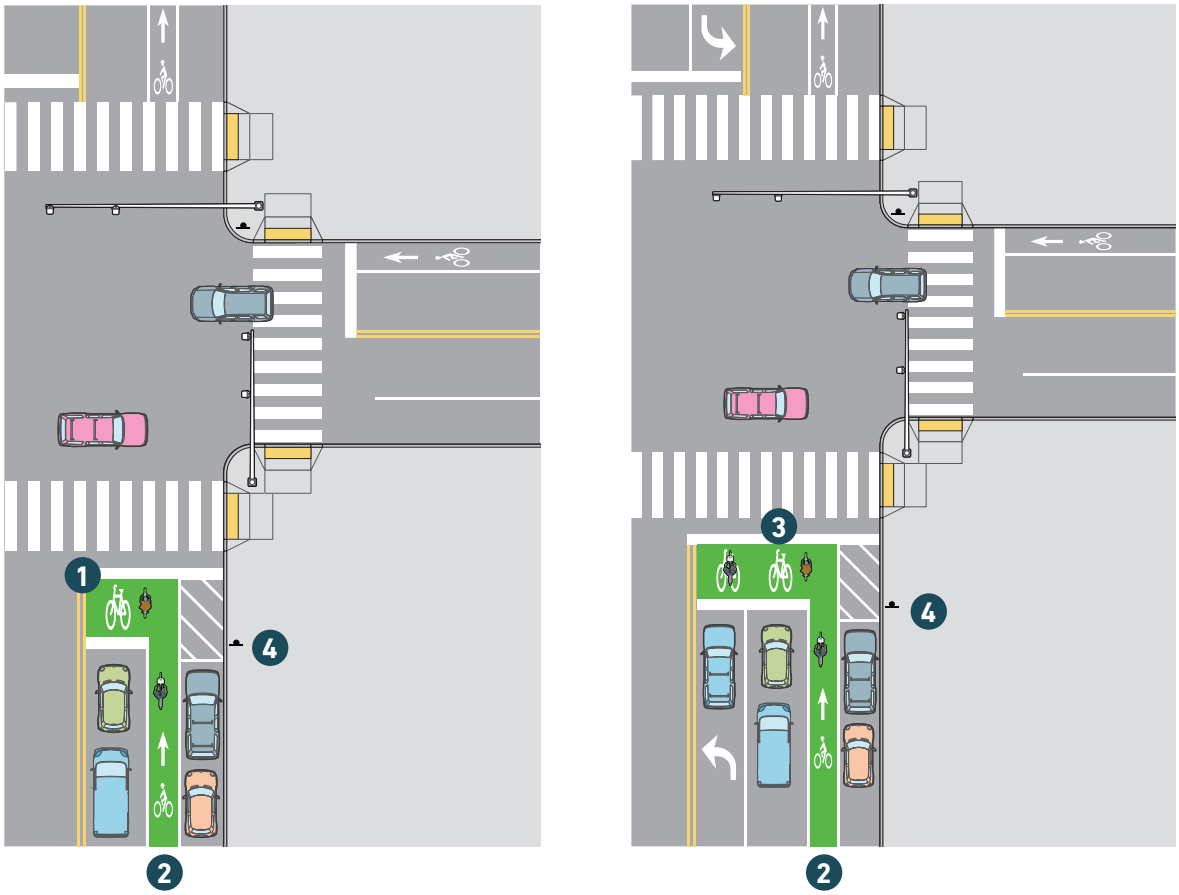
Bicycle Intersection Treatments

Bike Box



Description

Bike boxes designate an area in front of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase. Bike boxes can provide the following benefits to bicyclists:

- When applied across a left-turn lane, they can facilitate left turns for bicyclists by providing a highly visible waiting space and allowing bicyclists to proceed into the turn ahead of vehicles.
- They allow bikes to cluster together and proceed through the intersection at the start of a green phase, reducing the potential for turning conflicts.
- They can prevent right-hook turning conflicts by positioning bicyclists out of the way of right-turning vehicles.

Features

1. Bike boxes contain a bicycle legend and are typically highlighted with green pavement markings, a bike loop detection to actuate the signal in the absence of a car. They are typically 10-16 ft deep.
2. Bike boxes often include an approach lane adjacent to the curb that allows bicyclists to pass waiting vehicles to reach the queuing area.
3. The queuing area itself may extend across all approach lanes (including left-turn lane) or just the outside lane, depending on the intended function. The bike box should not extend across more than one through lane, as shown in the example on the right.
4. Bike boxes should be accompanied by a right turn on red restriction only when it is placed in front of a general purpose lane.

See Standard Drawings for Sight Distance, Channelization Lines, Bicycle Lanes at Intersections, Crosswalk Markings, and Bike Facility Markings.

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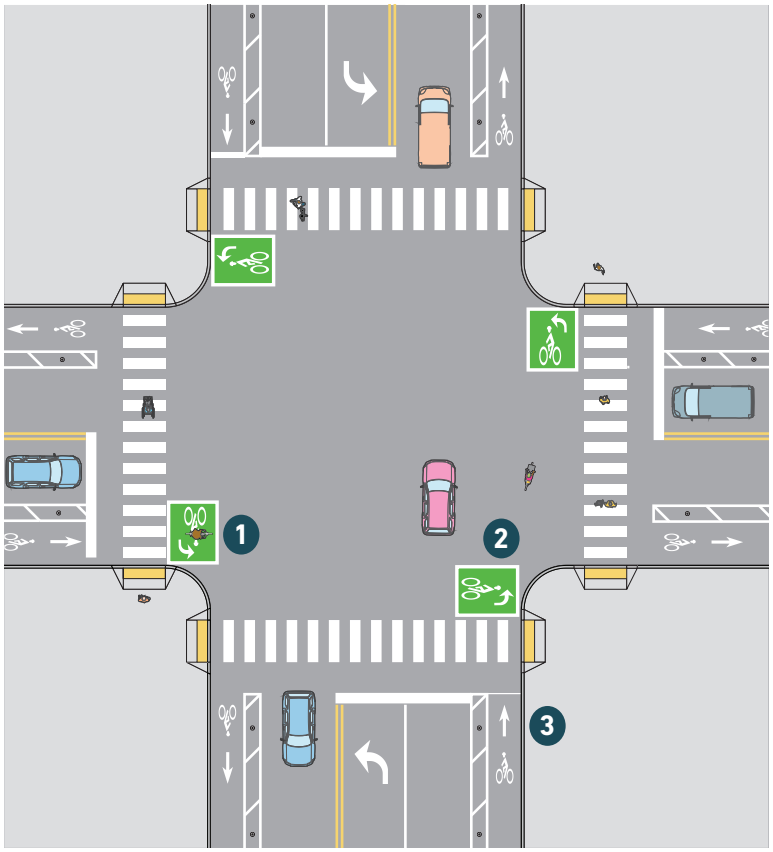
Two-Stage Turn Box



Description

A two-stage turn box can be used to facilitate bicycle left turns on a signalized multi-lane roadways, to make a left turn from a right-side bike lane or right turn from a left-side bike lane. The two-stage turn box is placed in front of the travel lane and marked crosswalk to heighten visibility and is positioned at the leg of the intersection to the right of the previous direction of travel.

Features

1. Two-stage turn boxes are typically placed ahead of the bike lane and the pedestrian crossing, and can also be placed in front of a parking lane.
2. They feature painted or thermoplastic green box, 10 ft. x 6 ft, with a bicycle stencil and an arrow that indicates to bicyclists how they should position themselves to make the turn.
3. This treatment should be accompanied by a right turn on red restriction for vehicles.

See Standard Drawings for Sight Distance, Channelization Lines, Bicycle Lanes at Intersections, Crosswalk Markings, and Bike Facility Markings.

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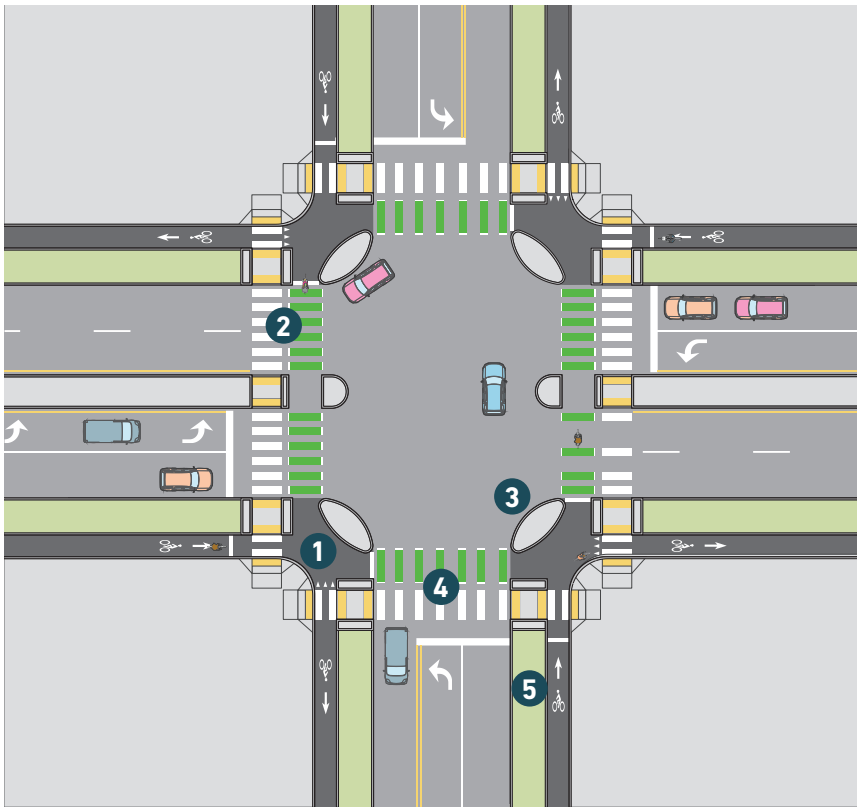
Protected Intersection



Description

A protected intersection uses geometric design and separation to improve sight lines and reduce vehicle turning speeds, make bicyclists more visible, create safe queuing space, and facilitate safer and more comfortable intersection crossing maneuvers for bicyclists and pedestrians. Protected intersections are a key component of a complete and safe bicycle network that is inviting for bicyclists of all ages and abilities.

Features

1. The bikeway is offset from travel lanes at the corners and protected from turning vehicles with corner islands. The bikeway taper angle is 1:5 preferred and 1:4 max.
2. The offset creates a waiting zone for turning cars and more direct sight lines between drivers and bicyclists, reducing conflicts.
3. Corner islands slow vehicle turns and create protected queuing space for bicyclists.
4. Typically, protected intersections use a combination of green skip stripe/ crosswalk striping, bike stencils, green paint, and raised concrete islands to create an intuitive design that all users understand.
5. Zones that do not allow stopping or standing before the crosswalks and cross-bikes, 20 ft. min., help maintain clear sight lines that may otherwise be blocked by parked motor vehicles.

See Standard Drawings for Crosswalk Markings, Bike Facility Markings

See NACTO's guide Don't Give Up at the Intersection

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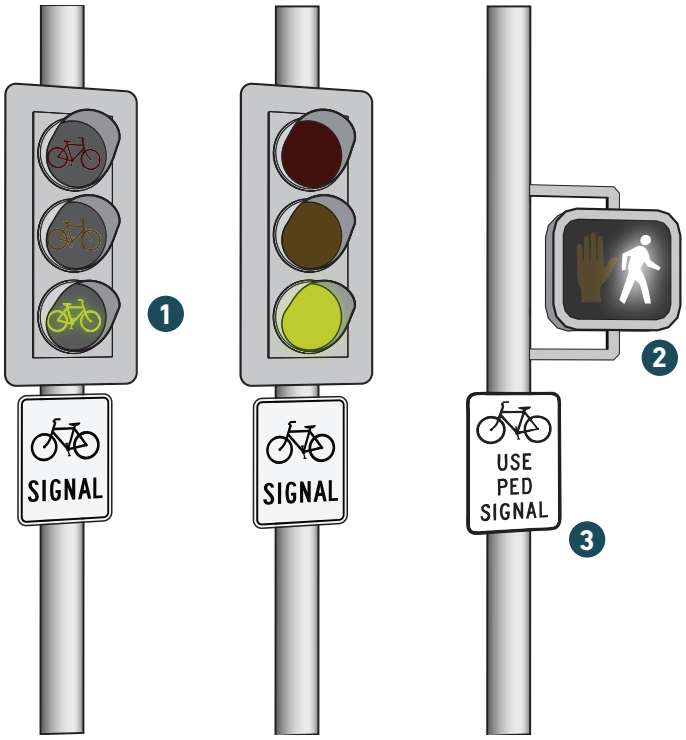
Bike Signal



Description

A bike signal provides a dedicated signal phase for bicycle movement through an intersection. It can be used in combination with signals for vehicles to resolve or prevent conflicts that cannot be addressed through vehicle signalization alone. Bike signals are commonly used on protected bike lanes but can also be used on other types of bicycle facilities to achieve the intended level of service. They are needed along priority bicycle corridors to maintain a LTS 1 level of service through a signalized intersection.

Features

1. A bike signal with a bike symbol signal face can only be used where all conflicting movements can be eliminated.
2. Bike signals should be mounted at a height thats better corresponds to the eye level of a bicyclist. Ideally, a near-side signal should be provided.
3. Bike signals should be actuated by loop detector or other automatic means. Push buttons may be used when there are constraints on installing loop detectors or when there is a desire to provide immediate feedback about detection.

- Bicycle signals may be used for the following bicycle facilities:
  1. Contra-flow bike lanes.
  2. Bike lanes that are against the curb with a right turn pocket to the left of the cyclist.
  3. Where bicyclists need to make an exclusive movement through an intersection to avoid other conflicting movements.

See Standard Drawings for Loop Detector Layout and Bicycle Markings.

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Other Intersection Features for Bicyclists

1 Physically separated bikeway and sidewalks meet at the intersection corner.

2 Separate RRFB activation button for bicyclists at the street curb

3 Lean rail and planter buffer along protected bike lane

4 Bollards with boulders prevent entrance to the multipurpose path by unauthorized motor vehicles

Features

1 Align the multipurpose path to channelize trail users to the corners so they can cross using crosswalks. The radius of the curves should accommodate bicyclists.

2 The width of the curb ramp and the crosswalk should match and should be wide enough to the anticipated volume of users. The tactile warning surfacing on the curb ramps should extend across the full width of the ramp.

3 At signalized crossings, corners should be wide enough to accommodate both bicyclists and pedestrians as they wait for the signal. Automatic sensors are preferred and may be embedded in the pavement, infrared, or camera sensor. Push buttons should be conveniently located for access by bicyclists and pedestrians, and yet not pose a hazard for trail users as they move through the crossing. Lean rails can be added to organize bicycles along the edges of the queuing area and allow other trail users to cluster together.

4 Bollards should be removable to allow for maintenance vehicle access. Ensure bollard is equipped with reflectors for low-light visibility. However, bollards can pose a striking risk for bicyclists so should be used as a last resort.

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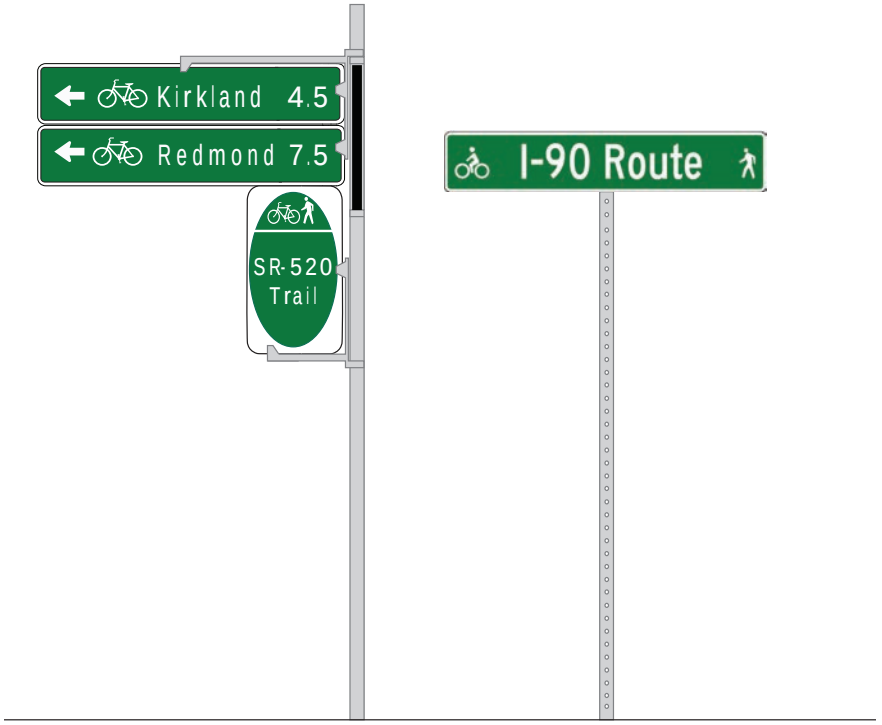
Supportive Bike Infrastructure and Programs

Bicycle Wayfinding



Description

Wayfinding is an important tool for improving bicycling conditions. Wayfinding signs help bicyclists identify designated routes, select destinations, provide links where there are gaps in the bicycle network, and remind motorists to anticipate the presence of bicyclists. The Bellevue Bicycle Wayfinding Guide, based on the Manual on Uniform Traffic Control Devices (MUTCD), provides guidance on sign installation. Signs are always installed by the city, not as a condition of development. They are typically used on Priority Bicycle Corridor routes, coordinated with adjacent jurisdictions.

Wayfinding signs are intended to guide cyclists who have a general sense of the area but who do not know the best route to get to their intended destination. Signs are typically placed at turning decision points along designated bicycle routes, as well as to confirm that a correct turn has been made Wayfinding signs do not always indicate that a route is a dedicated bicycle facility, nor do they imply that the signed route is safer than another route.

Features

1. A wayfinding system typically combines signage and pavement markings to guide bicyclists along designated routes to select destinations.
2. Signs should be compliant with the MUTCD and the Bellevue Bike Wayfinding Guide. They can include both distance to destination and travel time, though travel time is not typical for Bellevue.
3. Typical sign types include:
   - Identification/confirmation signs, which display destinations like designated routes and destination (i.e., To Downtown) and may include distance and time. These signs do not include arrows because they are for information, not decision-making.
   - Turn signs provide "spot" guidance and include arrows and destinations only. They typically list a few destinations.
   - Decision signs are used to provide guidance and may include up to three destinations with arrows. They may also provide distance and travel time information.

See NACTO's Urban Bikeway Design Guide for their Bike Route Wayfinding Signage and Markings System and East King County Bicycle Wayfinding Practice Guide

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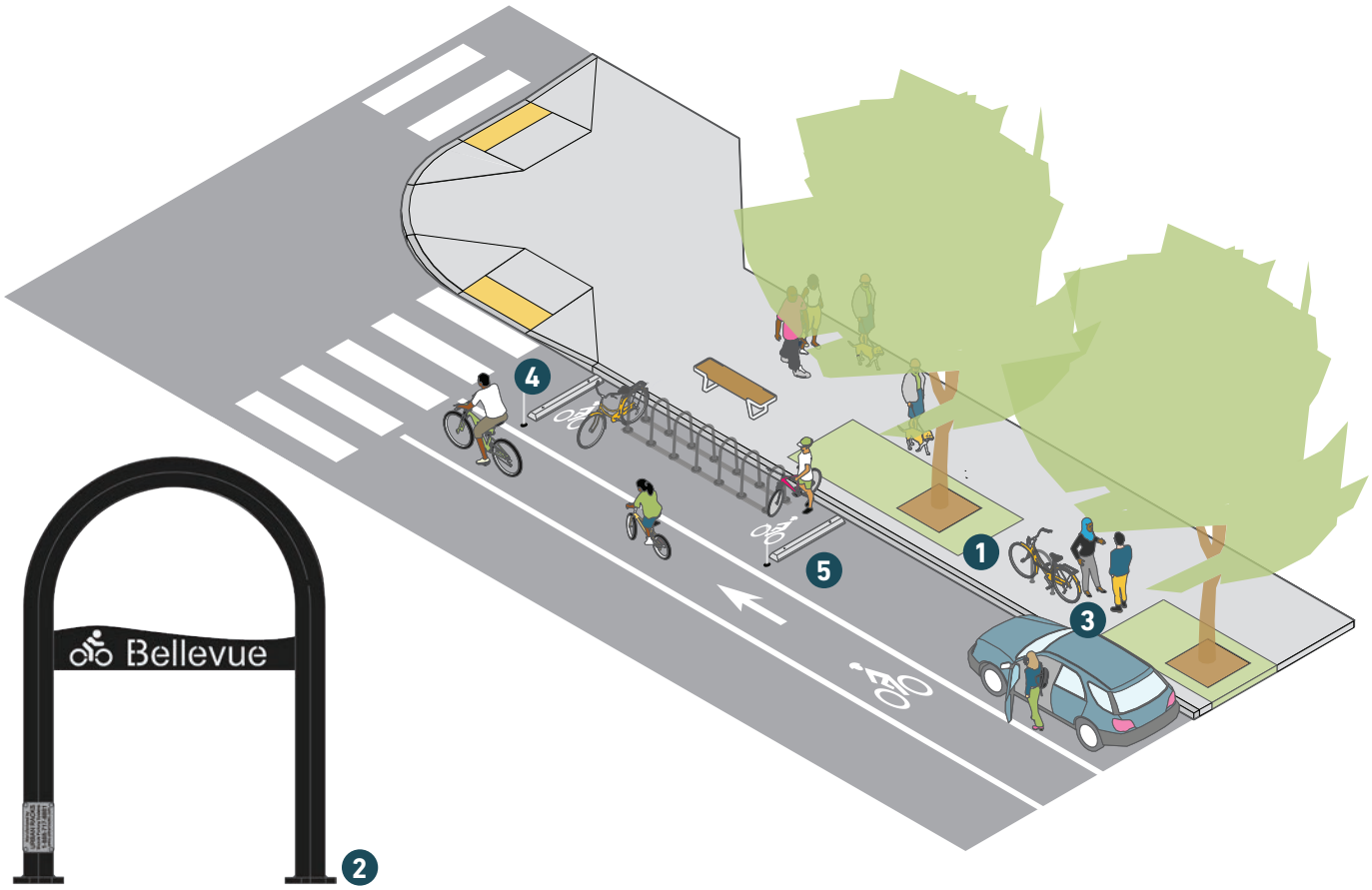
Short-Term Bicycle Parking



Description

Bicyclists need a secure, convenient place to park their bikes at their destination. Short-term bike parking supports a wide range of utilitarian and recreational bicycle trips. Shopping, errands, dining, commuting, and social trips are all facilitated with sturdy, secure, well-placed bike parking. Short-term bike parking at bus stops and light rail station areas helps to facilitate the use of bicycles to access public transit. In areas with high demand for bicycle parking or a need to declutter the landscape strip or sidewalk, bike corrals can be used.

Features

There are two keys to successful short-term bicycle parking: location and rack type.

1. Parking should be located in convenient, visible spots that allow bicyclists to feel comfortable leaving their bikes. This include frequented destinations and building entries or areas with lots of street activity to deter theft and vandalism. At the same time, bike racks should be located so that they do not impede pedestrian or curbside movement. The Bellevue Bike Parking Guide specifies locations.

2. Racks should be sturdy, well-secured units that allow the frame of a bicycle to be secured to the rack in more than one point of contact. The Bellevue standard u-shaped racks are simple and effective. For locations along the Grand Connection, see specific guidelines for the color of bike racks.

3. Racks at sidewalk grade should be placed 3 ft min from face of curb. As the popularity of e-bikes and cargo bikes grows, racks that accommodate bikes with longer wheelbases will become more important, as will rack locations that have adequate space to accommodate these larger bikes.

4. Bike corrals are typically sited adjacent to intersections, in the space where cars are not allowed to park due to sight distance restrictions.

5. Bike corrals consist of multiple bicycle racks. The corral is demarcated and protected with curbing on the ends, bicycle icons, and reflective markings or flex posts.

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D. Transit Stop Facilities

The goal for transit in Bellevue is to provide efficient, useful, and attractive service for most people, to most destinations, most of the time, serving maximum ridership, per the city's Transit Master Plan.

This section provides guidance for the installation of transit stop facilities to support transit passengers. Per the MMLOS Metrics, Standards & Guidelines, components of a transit stop vary generally by type, design, quantity, or quality based on the level of transit service that is provided at the following locations:

- **Local Transit Stop:** served by a single transit route with generally 30 or fewer boardings per weekday
- **Primary Transit Stop:** served by one or more transit routes with service provided at a combined headway of 30 minutes or better
- **Frequent Transit Network/RapidRide Station:** served primarily by RapidRide and also local or regional frequent transit network routes

Components at light rail stations are the responsibility of the transit agency.

Key Transit Components

Weather Protection/Canopy

In Downtown Bellevue providing building-mounted weather protection is the preferred way to support transit riders while promoting pedestrian circulation on the sidewalk without the clutter of a freestanding shelter. Elsewhere in the city, where the buildings are set back from the back of the sidewalk, installation and maintenance of freestanding bus shelters are the responsibility of the transit service providers.

Seating

In Downtown, seating under the building-mounted weather protection canopy is preferred. Elsewhere, seating should be provided under the freestanding shelter. In both situations, be sure to provide space for a wheelchair to fit fully under the weather protection canopy.

Paved Bus Door Passenger Zone

A paved surface is required between the back of the curb and the sidewalk to facilitate accessible and mud-free passenger boarding and alighting. The precise location and dimension of this paved surface will be determined in context, during plan review, with the intent to facilitate the movement of passengers between the sidewalk and the bus. A street frontage with a continuous landscape strip will require paved areas in the prescribed locations and dimensions. See also the Complete Street section in Part 1: Transportation Policy in this Design Manual.

Wayfinding and Transit Route Information

Wayfinding information will vary by context and will generally include local pedestrian destinations, walkways, and bicycle facilities. Transit route and timetable information at bus stops is the responsibility of the transit service provider. See the Downtown Wayfinding Manual for more information.

Table 7: Transit Stop / Station Level of Service *(Amended from the MMLOS Metrics, Standards & Guidelines, 2017)*

Context / Component	Local Transit Stop	Primary Transit Stop	Frequent Transit Network Stop/ RapidRide Stop
Weather Protection	Yes, Priority locations have 25+ daily boardings	Yes	Yes
Seating	Yes, Priority near Pedestrian Destinations	Yes	Yes
Paved Bus Door Passenger Zone	Yes, Zone length 25-30 ft.	Yes, Zone length 40 ft.	Yes, Zone length 60 ft.
Wayfinding	Optional	Yes	Yes

Notes:

- Transit stop typology defined by the Transit Master Plan, the Downtown Transportation Plan, and Multimodal Level-of-Service metrics, standards, and guidelines.
- Transit Center/Light Rail Stations are not included in this table because these facilities are designed and owned by the regional transit agencies. As part of the design review process, Bellevue will ensure consistency with Transit LOS guidelines.
- As shown in the graphic on the following page, the paved bus door zone can be split to correspond to the door locations on buses, with landscaping in between. When street trees are in tree grates, the bus door zone is continuous.

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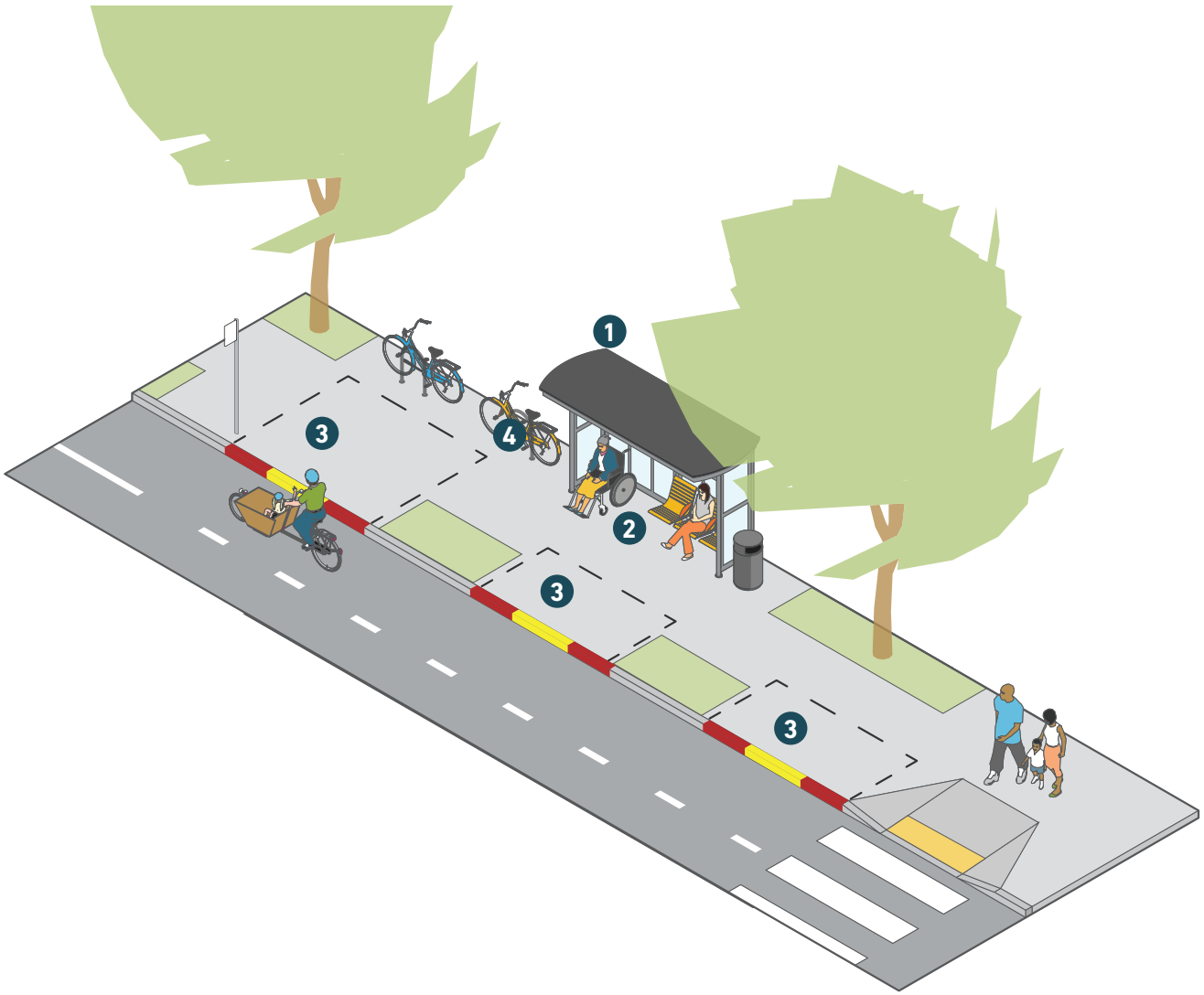
Local and Primary Transit Stops



Description

Features at local and primary transit stops will vary based on the number of daily boardings and proximity to pedestrian destinations. See the Table 8 for the Transit Stop / Station Level of Service Guidelines.

Features

1. The sheltered or enclosed passenger waiting areas can be either attached to the adjacent building or a freestanding shelter.
2. Seating and clear space in the sheltered area for wheelchairs and mobility devices.
3. Paved bus door zones for passenger boarding and alighting with bus zone curb painting may be continuous.
4. Short-term bicycle parking.
5. Curbside island (not shown) See examples as shown on the Complete Street graphics in Part2, Section A: How a Complete Street comes together in this Design Manual.

For additional information including RapidRide guidelines see King County Metro Transit Facilities Guidelines

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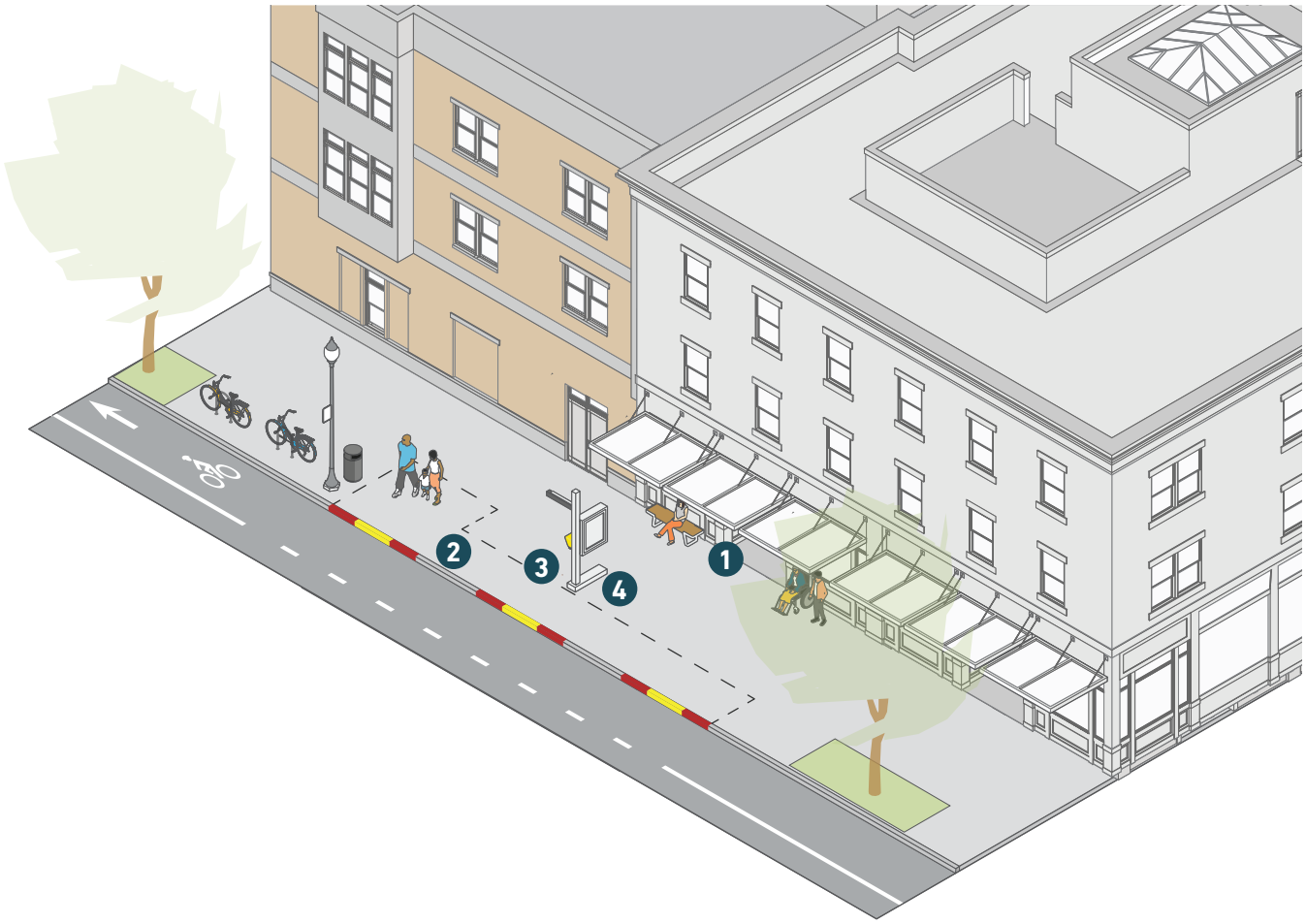
Frequent Transit Network Stop



Description

Frequent transit network stops are served by both RapidRide routes and local or regional frequent transit network routes. These stops have a high number of boardings and include features to improve boarding rates, such as off-board fare payment.

Features

1. The sheltered or enclosed passenger waiting area can be either attached to the adjacent building or a freestanding shelter. Provide clear space in the sheltered area for wheelchairs and mobility devices.
2. A continuous front and back door zone improve the ease of passenger boarding and alighting.
3. Off-board fare payment readers may be provided at stops with high ridership to speed up passenger boarding.
4. Customer information signs provide transit-related material to passengers such as maps, fare information, bus arrival information, and information about schedule or service disruptions.

For additional information including RapidRide guidelines see King County Metro Transit Facilities Guidelines

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E. Traffic Safety Countermeasures

To ensure that the transportation network is safe and comfortable for all users, the negative effects of certain driver behaviors is monitored and actively managed.

Traffic Safety Tools

The City of Bellevue uses a suite of approved traffic safety tools to manage traffic volume, reduce excessive vehicle speed, improve pedestrian and bicycle safety, enhance neighborhood identity, educate the community, manage neighborhood parking, and heighten school zone awareness. The tools are grouped into three categories: Education and Encouragement, Modifying Streetscape, and Parking.

Implementation of the treatments varies depending on the proposed tool and the treatment location. In general treatments are applied on residential or collector arterial streets where the speed limit is 25 mph or less. Implementing these tools is largely initiated by resident requests and then prioritized by city staff based on vehicle speed, traffic volume, impact to emergency response, collision history, presence of pedestrian path/walkway, and nearby generators of pedestrian activity. Once identified, city staff work to identify the most appropriate and beneficial traffic safety tool(s). It is common for traffic safety tools to be planned, designed and built with other improvements in the right of way, such as overlay or utility projects.

Effects on Residential Streets

Private development and transportation infrastructure changes can affect nearby transportation networks.

Changes that occur adjacent to or near residential neighborhoods can affect livability and safety on residential streets temporarily and in the long-term, particularly on nearby lower volume, lower speed residential streets. Spillover effects may include increased traffic volume, speeding, and on-street parking. Examples of projects that can have impacts on residential streets include:

- Projects that increase vehicle capacity of a roadway
- Large-scale infrastructure projects
- Project with long-term construction impacts
- Developments that generate increased vehicles and trips
- Projects outside of City of Bellevue limits but that influence the street network in the City of Bellevue

To address potential impacts, it is important to coordinate with Transportation staff early in the planning and design phases of potential development and infrastructure projects—both privately developed and publicly. In some cases, context-appropriate infrastructure improvements (i.e., radar speed limit signs, traffic calming, enhanced parking enforcement, and residential parking zones,) may be planned in consultation with the project developer to lessen minimize and mitigate impacts on residential streets. It is also best practice to include and involve the neighboring communities in all phases of the project's development.

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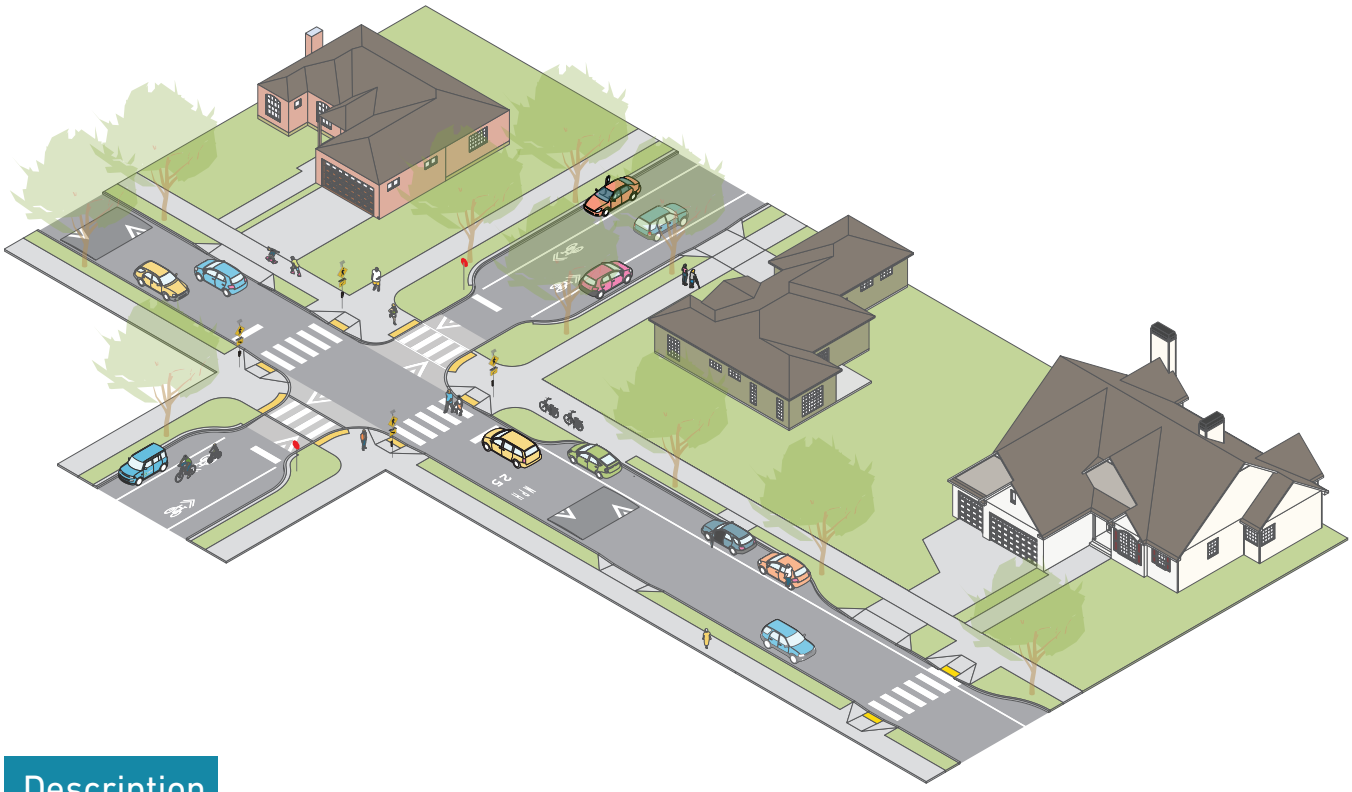
Traffic Safety Toolkit



Description

The Residential Traffic Guidebook provides tools to improve pedestrian and bicycle safety by managing traffic volume and reducing excessive vehicle speeds on residential streets and collector arterials; generally low-volume streets where the speed limit is 25 mph or less. Tools within in the Residential Traffic Guidebook are also used to help enhance neighborhood identity, educate the community, manage neighborhood parking, and heighten school zone awareness. Some of the tools in the traffic safety toolkit can be applied as quick build treatments to test efficacy of treatment, to measure community response and to phase-in treatments in a cost-effective way.

These tools can complement other facilities described in this Design Manual. When multiple facilities are combined streets can become low-volume, low-speed, low-stress streets supportive and safe for all users. For example, low-volume and low-speed streets with neighborhood bikeways use the tools in the toolkit to give travel priority to bicyclists. Neighborhood bikeways would at minimum use signs and pavement markings (e.g., shared lane markings) to clearly identify the bike route to all road users. Additionally, traffic calming measures to manage speed and volume would be considered as potential treatments to provide a safe and comfortable bicycling environment for people of all ages and abilities at all points along the route. For this type of bicycle facility, there is no one-size-fits-all approach.

As residential and collector arterials in Bellevue can have varying land use contexts and street characteristics, tools are designed and built in accordance with community input, overall project goals and stated best practices.

Features

1. Tools within in the Residential Traffic Guidebook include:

Education and Encouragement

- Bellevue School Pool
- Pedbee Education Program
- Portable Radar Dolly
- Traffic Analysis Reports (TAR)
- Traffic Safety Yard Signs

Modifying Streetscape

- Chicanes/Slow Point
- Curb Extensions
- Full Closure
- Lane Striping
- Median
- Mini Roundabout
- Neighborhood Entrance
- Partial Closure
- Raised Crosswalk
- "Residential Area" Sign
- School Zone Flashing Beacon
- Speed Cushion
- Speed Dot
- Speed Hump
- Speed Limit Pavement Marking
- Split Speed Hump
- Stationary Radar Sign
- Traffic Circle
- Turn Restriction

Parking

- Park Smart
- Residential Parking Zone (RPZ)

See the City of Bellevue Residential Traffic Guidebook for more information and the Traffic Safety Toolkit.

See Standard Drawings for Speed Humps and for Bike Facility Markings.

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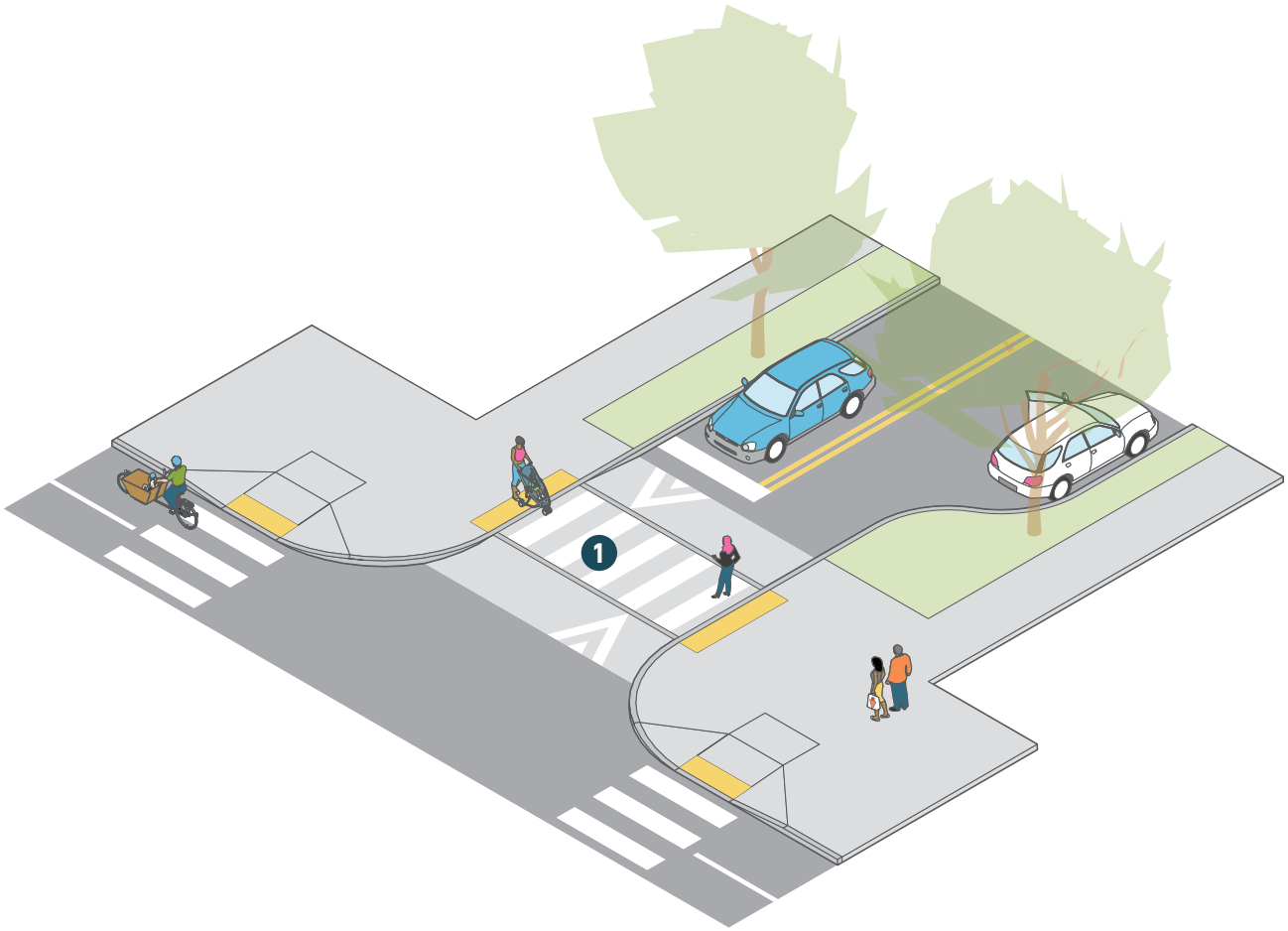
Raised Crossing



Description

A raised crossing is a method for calling attention to and slowing vehicle traffic across a pedestrian facility within an intersection. The raised crossing grade signifies to drivers that they are entering or crossing a pedestrian facility, improves visibility, and makes it more apparent that people walking receive the right-of-way priority.

Features

1. Raised crossings elevate the level of a pedestrian crosswalk from the street (e.g., 3 or 6 in.), with ramped approaches where vehicles cross.

- The raised crossing minimizes elevation change, making the crossing more convenient for pedestrians.
- A raised crossing can also be used where there is limited right-of-way and inadequate room to fit in curb ramps.

See Standard Drawings for Crosswalk Markings, Curb Ramps and Detectable Warning Surface.

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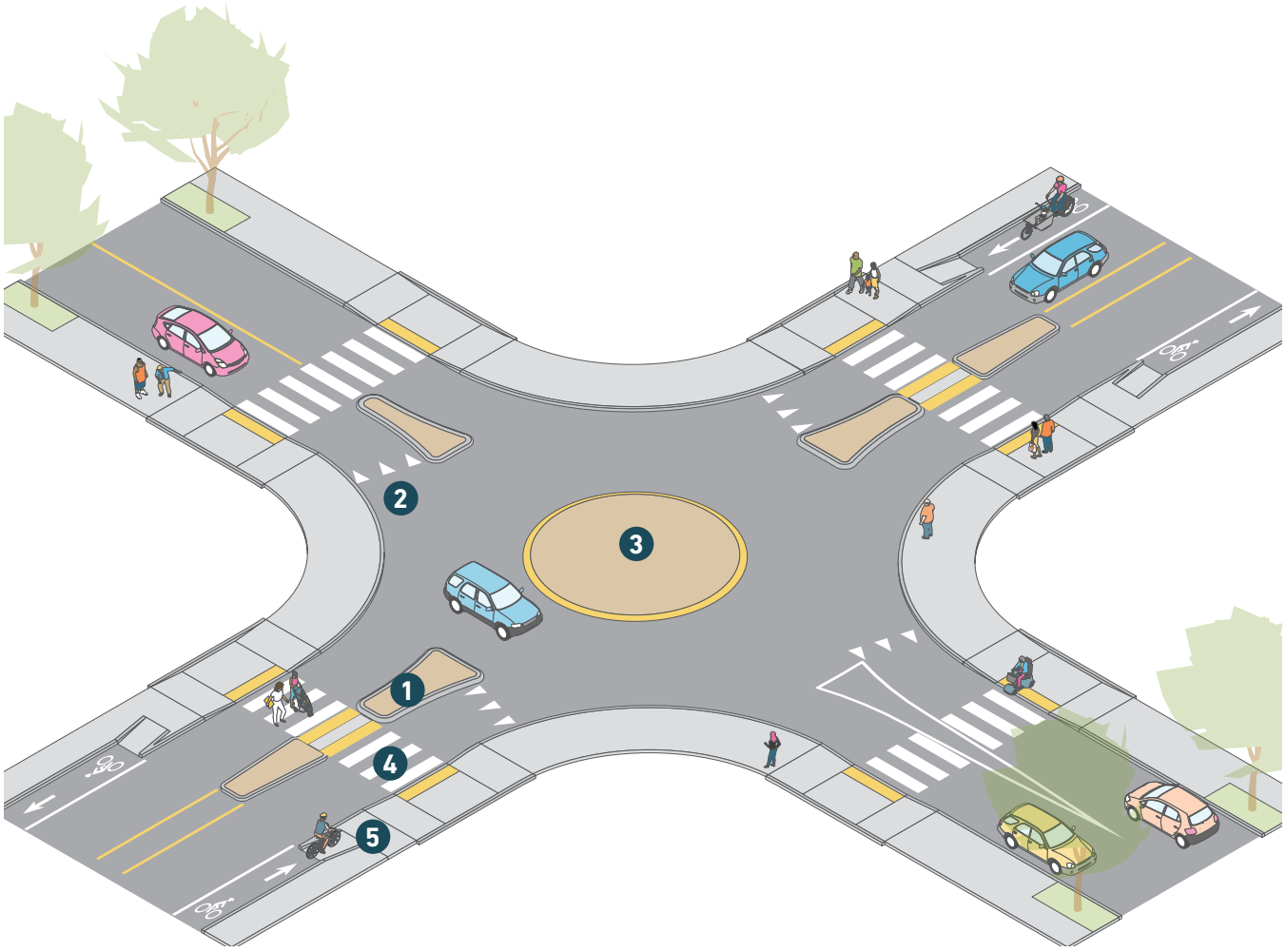
Mini-Roundabout



Description

Mini-roundabouts provide a traffic calming function by forcing drivers to deflect and thus slow their path of travel through an intersection. They typically fit within the curb lines of the street. They are typically used on single-lane, lower speed streets. Mini-roundabouts reduce intersection crash rates, reduce vehicle delays at minor street approaches, and have low maintenance costs relative to signalization.

Features

1. Splitter islands direct cars and can be either painted (with or without posts) or curbed/raised for added pedestrian protection.
2. Cars yield to traffic coming from the left as they enter the circle.
3. The central island can have a mountable truck apron or mountable curbs to accommodate buses and trucks.
4. Pedestrian crossings are set back from the intersection where drivers can focus on them better.
5. Bike lane cannot continue through a mini-roundabout but ramps can be provided to allow bikes access onto and off of the sidewalks. Bicycles can also travel through the roundabout like a vehicle would.

● RRFBs can be included to help facilitate crossings and increase pedestrian visibility.

See Standard Drawings for Crosswalk Markings, Curb Ramps, and Bike Facility Markings.

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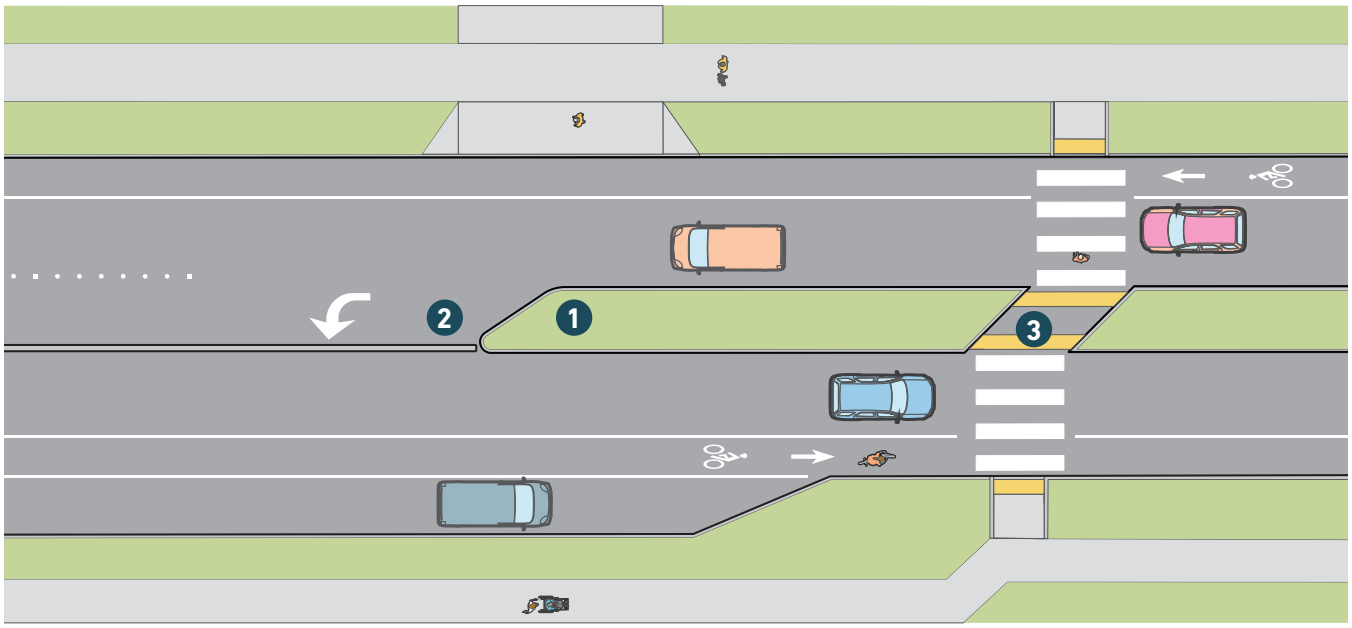
Medians



Description

Bellevue's streetscapes play a pivotal role in creating the vision of Bellevue as a "City in a Park." Medians, which are typically planted, add important greenspace within the city's most publicly used asset – the street network -- when used to create gateways into the city, districts or neighborhoods, along key city and scenic boulevards and other streets as design elements

In addition to boosting citywide character, medians can serve many different operational functions within streetscapes. Medians should be considered when there is a need to provide greater separation between opposing directions of travel, to restrict turn movements to improve safety or traffic flow, to facilitate safe midblock crossings through the creation of pedestrian refuges, and to reallocate underutilized roadway capacity to calm traffic. Medians should be raised islands with curbs - planted or with stamped decorative concrete consistent with area character. Where it is necessary or as an interim solution to solve a safety issue, medians can also be flush with the roadway and demarcated with c-curbs or roadway striping and flex posts. If the planned capacity of a street is above current demand, medians should be considered as a long term interim solution until that area is needed to support higher traffic volumes or new turning movements.

The design of medians should fit the places they are built and be attractive design elements. Adjacent land use, natural or urban context, neighborhood or district character, and other design considerations should drive their design. Median sizing should facilitate improvement of the functioning of streetscapes for all users – motorists, transit users, bicyclists and pedestrians.

Features

1. Medians are generally linear, although intersection roundabouts are considered medians. Linear medians can be continuous along a block, depending on purpose, and permitted or restricted turning movements. At intersections, including within roundabouts, medians must be designed so as not to limit turning radius or sight distance.

- Medians should be built to maximum width, particularly when used for plantings, to allow for more rooting space and limit impervious surfaces.

- When considering medians for a project, it is important to consult city and regional plans and policy, including but not limited to, the Comprehensive Plan, district and subarea plans, pedestrian and bicycle plans, regional transit plans, and others.

2. The taper and transition length of the median matches a street's design speed and maintenance needs. The nose of a typical median should be tapered at a radius of 1.5 to 2 ft. Raised pavement makers are installed at the island nose and 12 in. from the face of median curb.

3. Pedestrian refuge islands in medians should be 10 ft. wide and include detectable warning surfaces on both sides, with a minimum width between detectable warning surfaces of 2 ft.

See Standard Drawings for Typical Channelization at Median Islands, Parks details for soil preparation, irrigation and tree planting,

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Interim Curb Extensions, Slow Turn Wedges, and Hardened Centerlines

Description

Conflicts between crossing pedestrians and left-turning vehicles are one of the most common crash types. Slow turn wedges and hardened centerlines are two treatments developed to mitigate this risk. They are placed within intersections to slow and direct vehicle turning movements to prevent vehicles from cutting corners. They also angle vehicles for better sight distance of crossing pedestrians.

Features

1. A slow turn wedge is buffer created with pavement marking and flexposts or a rubber speed bump that is installed at the corner or an intersection to allow larger vehicles to negotiate the intersection corner, while encouraging sharper, slower turns by the driver of other motor vehicles. Interim curb extensions, shown here, can be similarly created with less permanent materials for the same effect, and to reduce pedestrian crossing exposure. Where there is insufficient roadway width and the curb lane is a "right turn only" lane, retrofit installations with mountable truck pillows would not be feasible.

2. Hardened centerlines can be created with modular speed bumps, flexposts, plastic curbing, or even pre-cast curbing. They are installed on the centerline of the roadway, in advance of and extending into the intersection beyond the crosswalk to where the turning movement is desired to start. Pedestrians island can serve this same function and are typically made of more durable materials.

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F. Curb Space Management

The space along the curb of a street supports a range of modes and activities, including on-street parking for cars and bikes, accessible on-street parking, transit stops and bus layover, commercial loading and deliveries, landscaping, parklets, and passenger loading/unloading.

Balancing access and mobility

Curb use on a given street is dictated by both the city's modal priorities and the characteristics of the street and surrounding land use. Curb space is thus managed to meet those goals and priorities, whether they be access oriented or mobility oriented.

In the past, on-street parking for vehicles and commercial loading/unloading have been the primary uses of curb space. Today, there is a greater emphasis on accommodating bicycles, transit, and ride-hailing along the curb, for greater multimodal access.

Landscaping, green stormwater infrastructure and site furnishings are also located along the curb, along with bike parking, signs, street lights and other elements that support both mobility and access to the adjacent land uses. Today there is also a greater interest in creating streets that provide gathering spaces and support activities like outdoor dining. Parklets can fill that role.

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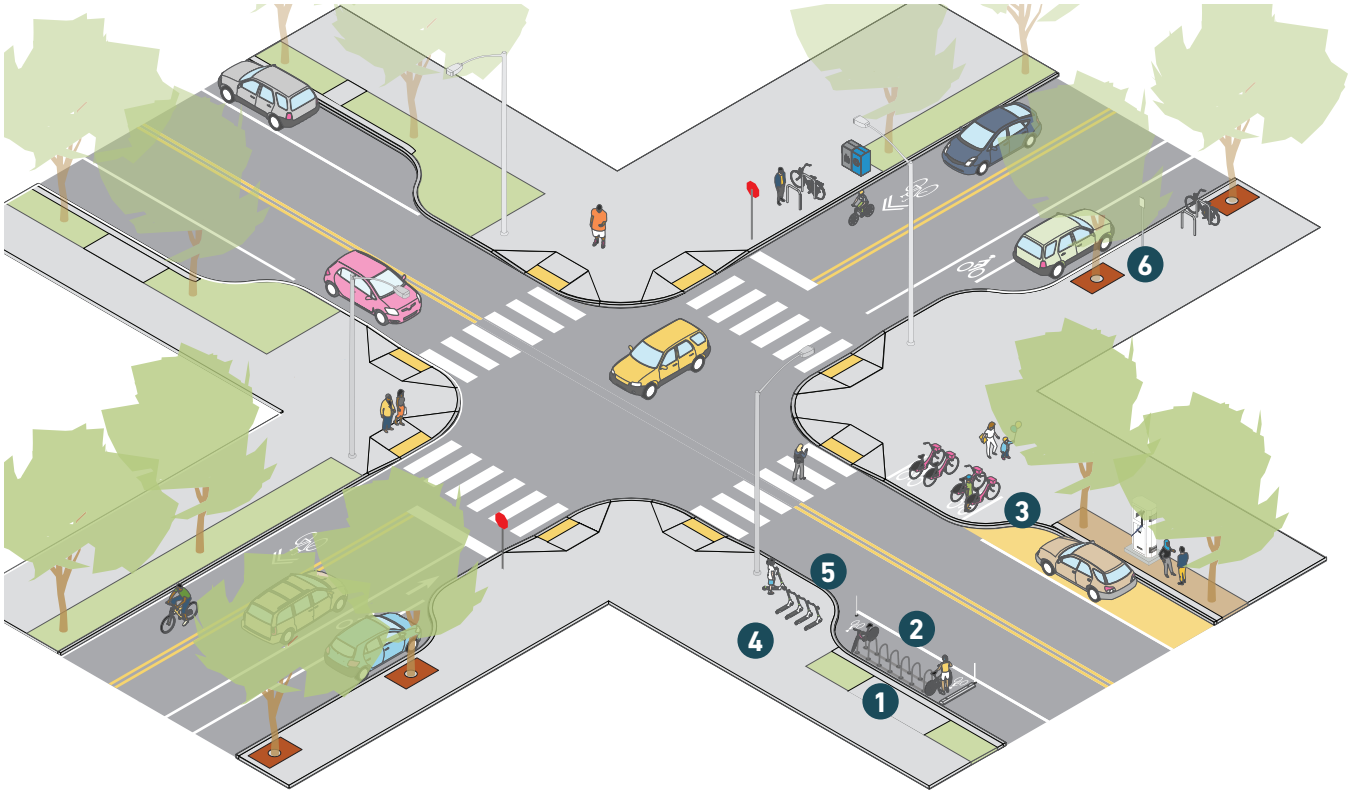
Curbside Management and Emerging Mobility



Description

Mobility is rapidly changing across the world. Accommodating the changing transportation landscape requires a coordinated effort that includes policy, planning, design, implementation, and follow-up. While shared mobility offers many advantages over private motor vehicles, it still has a physical footprint that must be accommodated, typically along curb space. Transportation network company (TNC) and shuttle loading zone and micromobility hubs can be created to provide designated pick-up and drop-off areas, Parking areas or corrals for bikeshare to reduce sidewalk clutter and make use of curbsides more efficient. Bikeshare docks typically feature semi-permanent structures that hold bicycles. Scooters may be parked in spaces designated by pavement markings and/or signage. Scooter stands may be installed to prevent scooters from tipping. Automatic curb monitoring equipment such as luminaire poles and in-ground sensors can be installed to help track demand and manage the curbside use.

Features

1. Bikeshare docks may be located in parking lanes where there is not enough room in designated no-parking zones. Placing docks in-street where traffic volume is high should be avoided. Vertical barriers, such as flex posts, precast curbs, or planters should be used to restrict motor vehicle encroachment of on-street docks and corrals.

2. Bikeshare pay and informational kiosks (if provided) should be accessed from the sidewalk. Adequate sun exposure should be ensured if docks are solar powered.

3. Hubs should be clearly delineated with striping, paint, and signage.

4. A 4 ft. minimum clear pedestrian path must be maintained behind any designated hub or designated micromobility parking area. In high-volume pedestrian areas, provide at least 2 ft. clearance between dock and clear pedestrian path on sidewalks.

5. A minimum distance of 3 ft. should be provided from the dock to the face of the curb. A depth of 6 ft. for bikeshare docks should be provided. Provide 4 ft. minimum clearance between the edge of a dock or designated parking area and any other vertical streetscape element.

6. TNC loading and shuttle passenger loading zones should be located and away from conflicting uses like transit stops and bike facilities. They can be paired with in-app geofencing to guide driver and passengers to designated stops. Shuttle loading zones should be 10 ft. wide.

See ITE Curbside Management Practitioners Guide

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Curbside Management & Emerging Mobility (cont.)

Siting

Where there is demand and use of emerging mobility services, facilities should be considered in the following areas:

- 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

Additional Siting 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.

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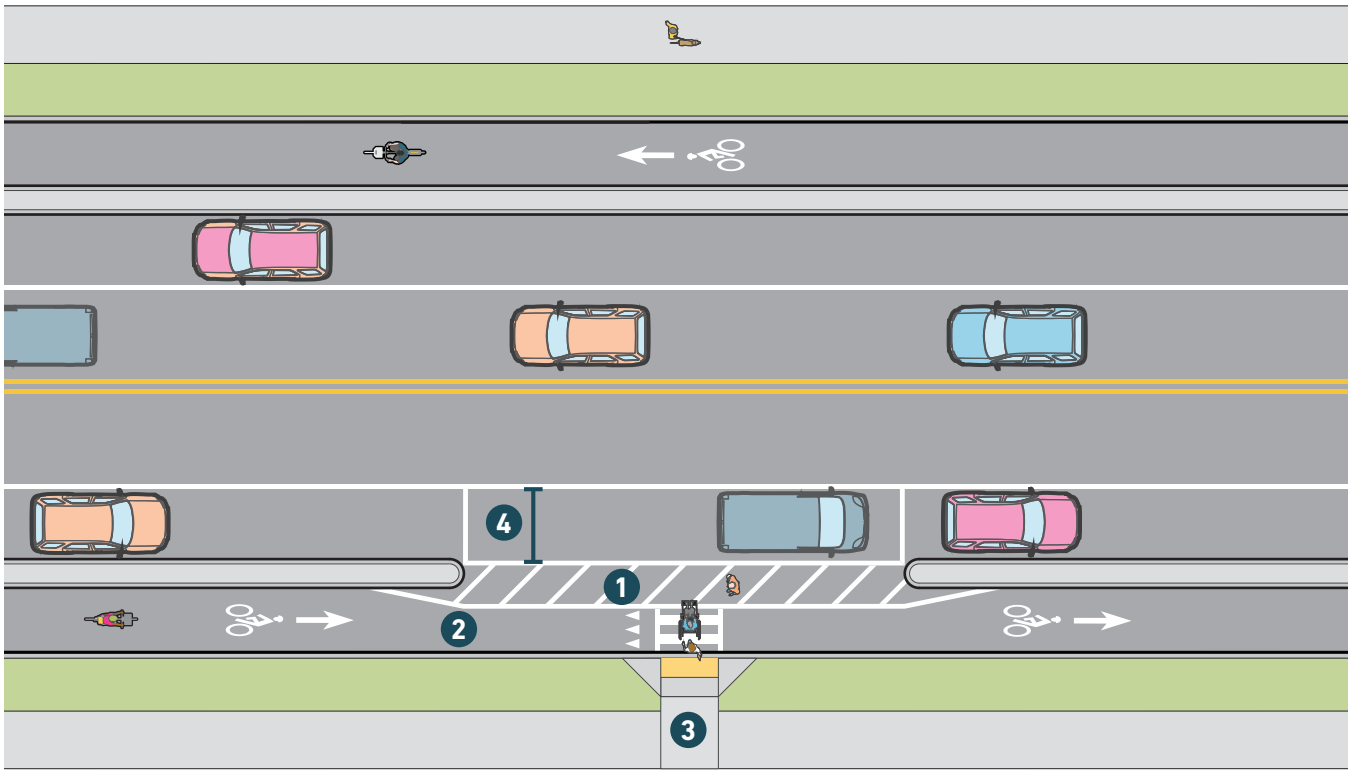
Accessible Parking and Loading Zones



Description

Accessible parking and loading spaces adjacent to parking stalls allow those riding in vans with ramps to alight; they also 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.

Washington state law permits people with disability placards 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.

Features

1. Provide a 5 ft. street-level access aisle adjacent to accessible spaces.

2. 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 ft. between curbs or 3.5 ft. 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 ft. at sidewalk level or access aisle for short segments.

- Accessible spaces at the far side or near side of intersections can use existing curb ramps to maintain an accessible route.

3. 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.

4. Loading zones for trucks and shuttle drop off areas should be 10 ft. wide.

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G. Intersections

Intersections are places of convergence: where street types, surrounding land uses, neighborhood identities, and most importantly, all users of the street meet and negotiate movement safely through the space.

Intersection design must meet the needs of all users of the street—pedestrians, bicyclists, and drivers. Safety is the number one priority when designing intersections. Intersections should be designed be predictable and intuitive for anyone to use.

Intersections must be accommodate the turning movement of the design vehicle appropriate for the highest street classification in the intersection. Intersections must also accommodate the vehicle types that can be expected on designated truck, transit, and school routes. At the same time, the accommodation of vulnerable users like pedestrians and bicyclists is critical, and awareness, reduced exposure, slower vehicle speed, and dedicated space and time can and should be used to eliminate conflicts and facilitate safe movement.

Intersection traffic control shall be designed as specified in the Manual for Uniform Traffic Control Devices (MUTCD).

Downtown Intersections

In the Downtown Transportation Plan, the City of Bellevue developed three levels of intersection treatments to facilitate pedestrian movement and address the needs of higher pedestrian volume through Downtown. These are **Standard**, **Enhanced**, and **Exceptional** Intersections.

Standard intersections include all the baseline elements of an intersection, from curb ramps to crosswalk striping.

Enhanced intersections accommodate a higher volume of pedestrians and improve the overall aesthetics of the streetscape. They have wider crosswalks than Standard intersections and feature additional treatments that contribute to the walking experience.

Intersections that merit **Exceptional** treatment are located along the Grand Connection—including at each end of the Bellevue Transit Center, and in Old Bellevue. Exceptional intersections feature the highest level of design considerations for pedestrian comfort, safety, and access.

Table 8: Standard Intersection per Bellevue Transportation Design Manual

Context / Component	Downtown / BelRed	Activity Center	Neighborhood Shopping Center	Pedestrian Destination	Elsewhere in the City
Signalized Intersection Treatment	Downtown Transportation Plan BelRed Corridor Plan	BelRed Corridor Plan or Downtown Transportation Plan "Enhanced" type	Bellevue Transportation Design Manual	Bellevue Transportation Design Manual	Bellevue Transportation Design Manual

Notes:

- Downtown Transportation Plan identifies three types of intersection – Standard, Enhanced, Exceptional-that are mapped and that warrant a suite of design components to accommodate the pedestrian needs for safety, comfort and access (see Figure 8). Refer also to the Streets section.
- BelRed Corridor Plan provides guidelines and standards applicable in the BelRed Subarea.
- Transportation Design Manual provides the default minimum components and design thereof for signalized intersections not addressed by other plans or codes. Context and engineering judgment will determine design.

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Downtown: Recommended Intersection Types

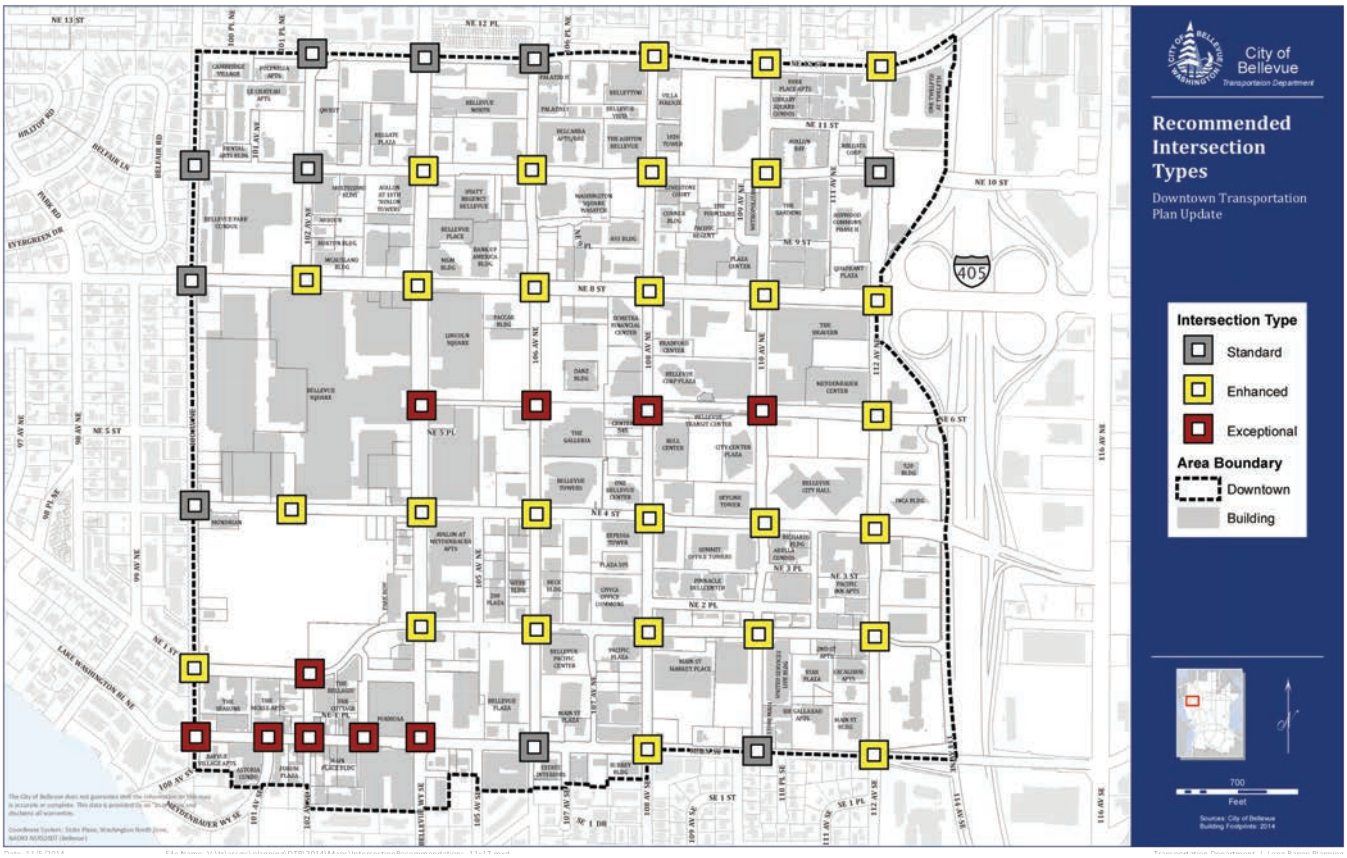

Figure 8: Recommended Intersection Types *(Amended from the Downtown Transportation Plan, October 2013)*

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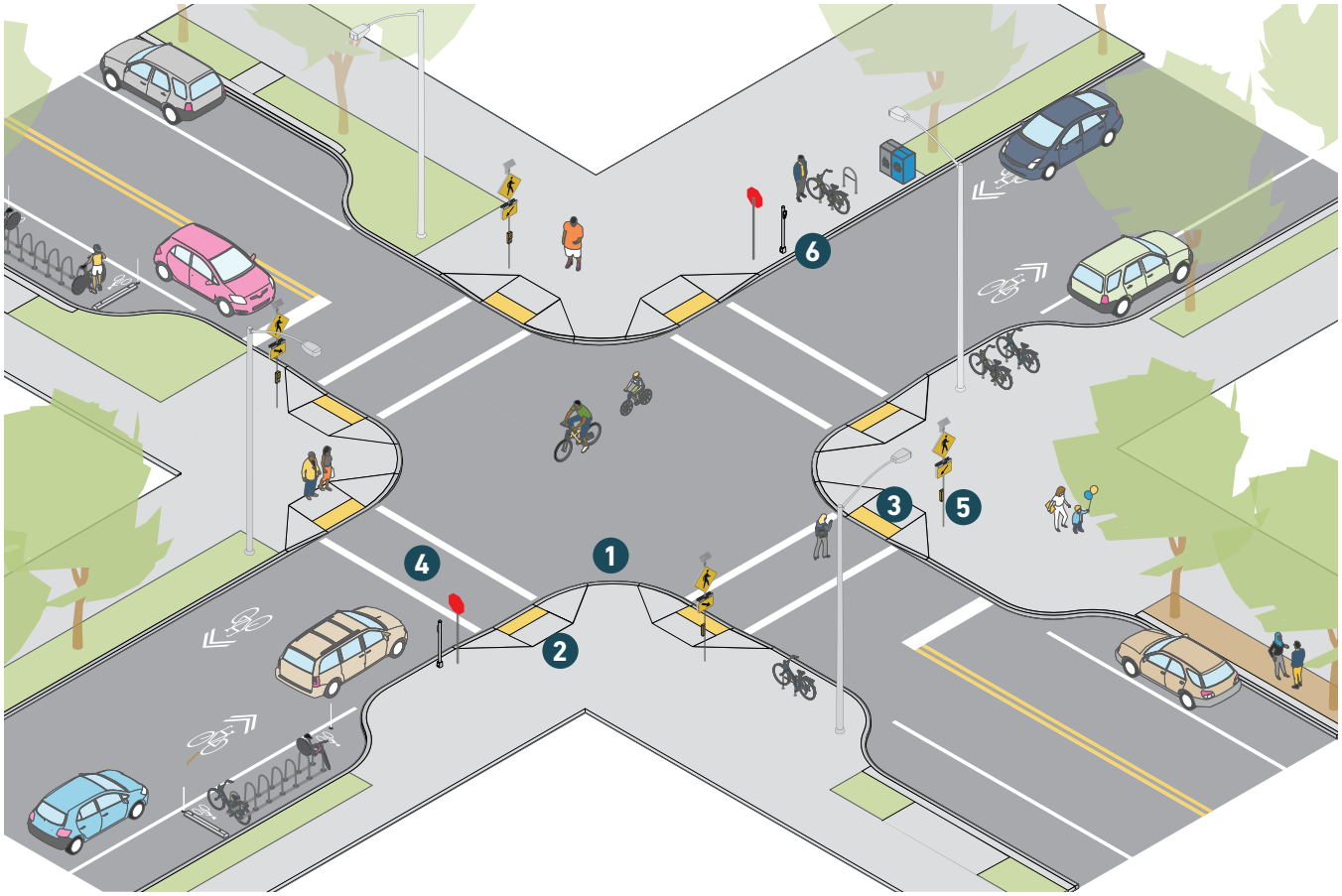
Standard Intersection



Description

Standard intersections feature elements that create an organized, intuitive, and safe space for interactions between pedestrians, drivers, and bicyclists. On some arterials, the volume and speed of traffic along the street can pose a barrier for nonmotorized users. To make bike priority continuous and travel comfortable for people of all ages and abilities along a low-volume street or bike facility, an arterial crossing should be designed with additional crossing treatments such as signage, RRFBs or signals.

Features

1. Corner curb radii are designed to slow vehicle turns. Radii are determined by the intersection type (i.e. arterial vs. non-arterial) and whether the street is transit or freight or truck route but should be the minimum necessary.
2. Curb ramps at each corner to allow pedestrian access to and from sidewalks and streets.
3. Detectable warning surfaces to indicate where the sidewalk meets the edge of the roadway for people with vision disabilities.
4. Crosswalks delineate the path between curb ramps. Crosswalks are typically standard style (two parallel bars placed perpendicular to the flow of traffic). Stop bars mark where motor vehicles must stop before proceeding through the crosswalk.
- At signalized intersections, countdown pedestrian signals and pedestrian-actuated push buttons for Accessible Pedestrian Signals (APS) provide audible and vibro-tactile indicators.
5. A bike facility crossing of an arterial includes bike lane extension markings, high visibility crosswalk and cross-bike markings and signage. It may also include traffic control signalization or warning beacons (e.g., RRFBs), and warning signs appropriate to the roadway.
6. Push buttons can be added for cyclists to activate the traffic control signalization or warning beacons before proceeding through the intersection.
- A crossing island or curb extensions may be included to reduce crossing distance and exposure.

See Standard Drawings for Crosswalk Markings, Curb Ramps and Detectable Warning Surface, Bike Facility Markings and RRFB Assembly.

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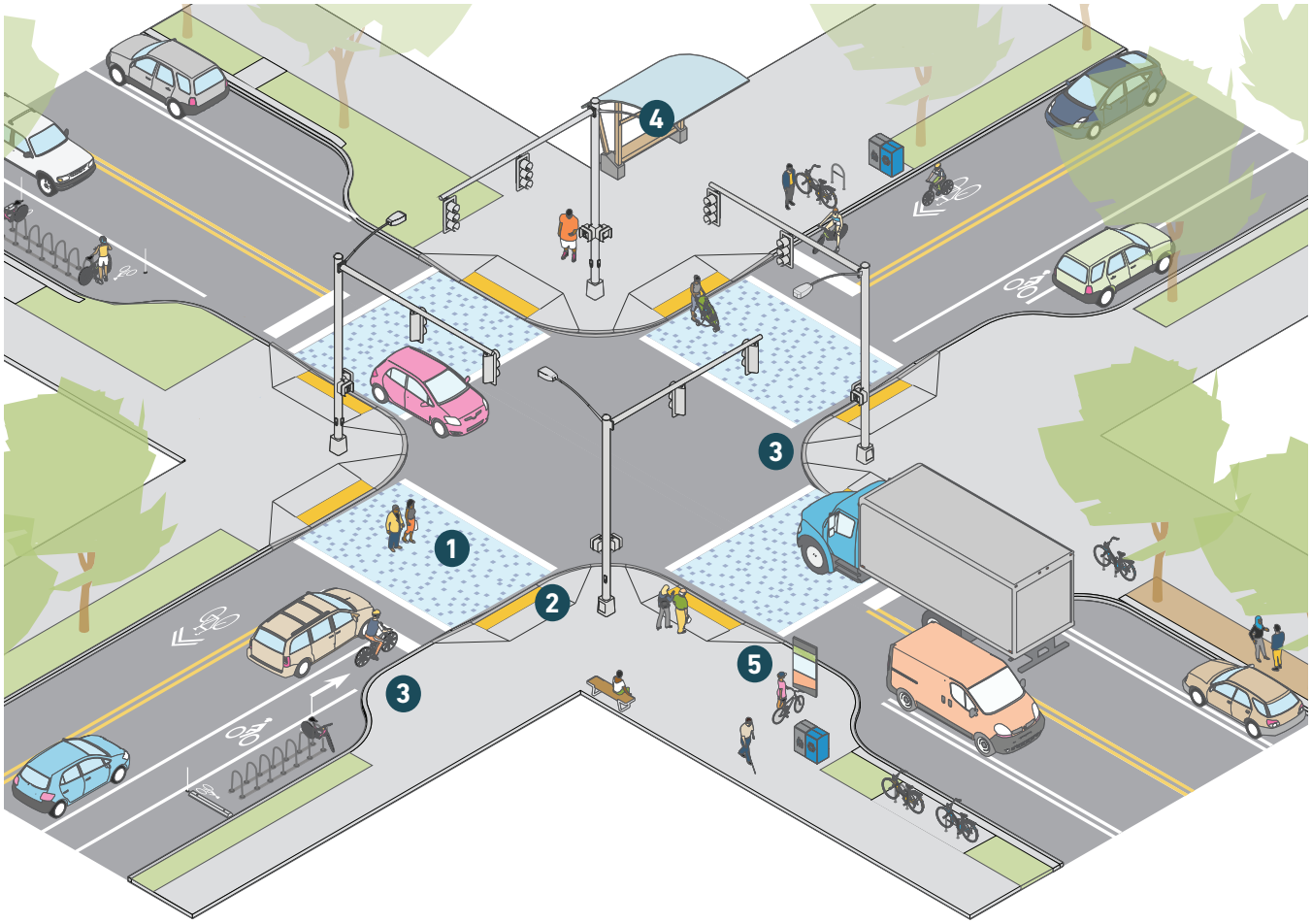
Enhanced and Exceptional Intersections



Description

At designated Downtown intersections where pedestrian and bicycle volume is high, and other locations identified in the Downtown Transportation Plan, additional treatments are appropriate to facilitate safe intersection crossings and to enhance the streetscape.

Features

1. To accommodate higher pedestrian volumes, wider (12-14 ft. wide) than standard crosswalks. Decorative treatment in crosswalk is encouraged and may include embedded pattern or integrated artwork
2. Wider curb ramps to accommodate higher multimodal volume.
3. Curb bulbs (extensions) with tighter corner radii to shorten crossing distances, calm traffic, and provide more queuing space for larger groups of people to wait for the signal.
4. At the corners, weather protection can be employed to shelter people waiting to cross the street. This can also include building awnings and canopies.
5. Wayfinding kiosks are also be included at Exceptional intersections.

Raised crossings may be included at Exceptional intersections. See Figure 8 for more guidance about application.

See Standard Drawings for Crosswalk Markings, Curb Ramps and Detectable Warning Surface.

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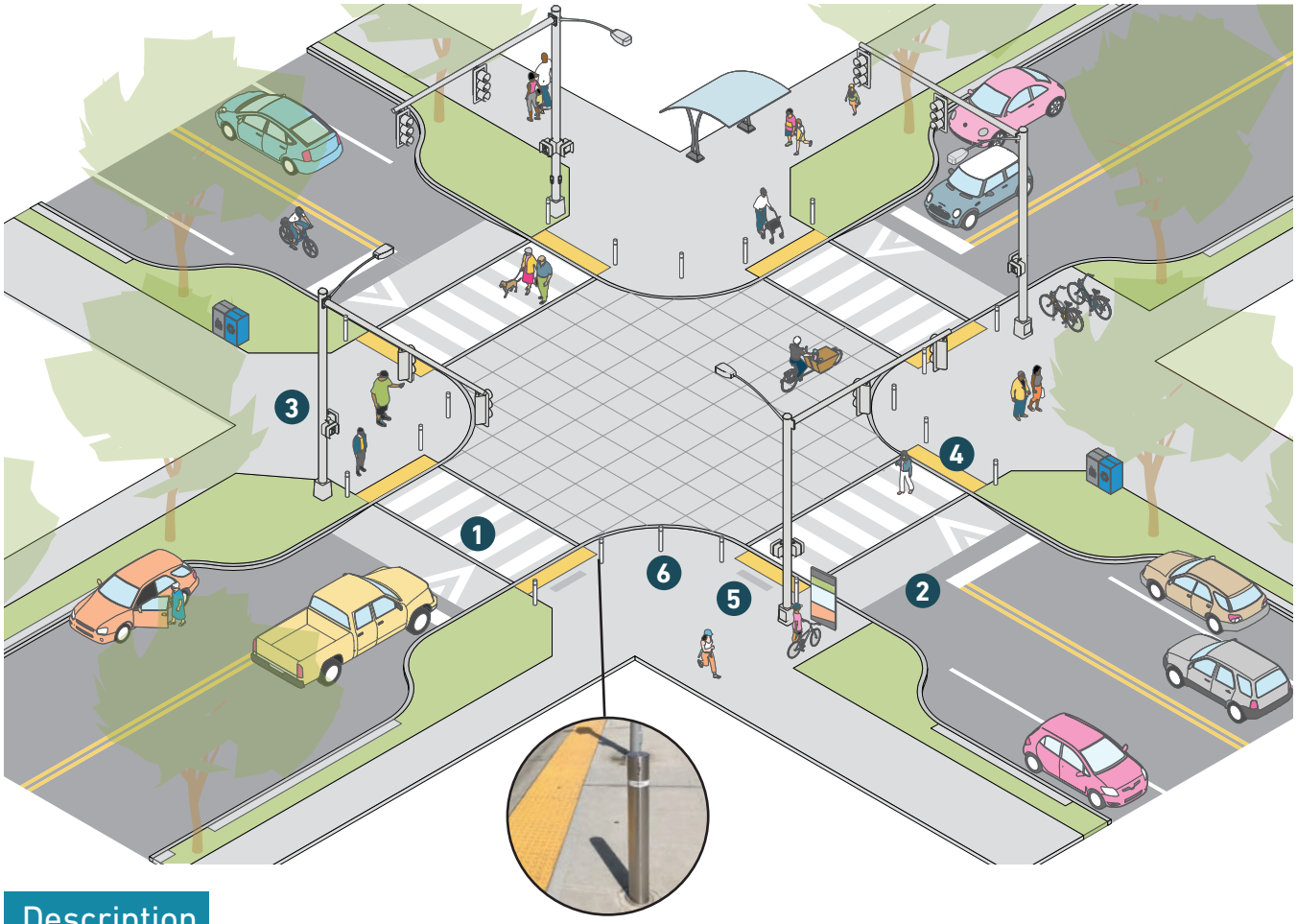
Raised Exceptional Intersection



Description

Raised intersections are essentially ramped speed tables that span the entire width of an intersections and facilitate pedestrian crossings by calming motor vehicle traffic and increasing yielding behavior. Raised intersections can also be used to convey the feel of a plaza or to create seamless connections to transit. Along the Grand Connection route through Downtown Bellevue, a raised intersection is the default design, except at NE 4th St at Bellevue Way.

Features

1. Intersection is raised to the level of the sidewalk, eliminating the need for ramps, making the crossing more accessible, safe, and convenient for pedestrians. Special paving is used to set it off visually from the intersecting streets. Detectable warning surfaces are used to provide guidance for people with vision disabilities.

2. Approach ramps with yield (chevron) pavement markings slow people driving as they enter the raised intersection.

3. All-way stop signs with advanced stop bars (placed further than the typical distance), slow drivers before they enter the intersection, allowing them to survey the intersection and other users. Signalization can also be used for traffic control.

4. Detectable warning surfaces are located before crosswalks to alert people with low or no vision that they are entering a space shared with motor vehicles and bicyclists. Continuous detectable warning surfaces would wrap the corner if the intersection is operated as an all way walk.

5. Street names can be added to corners as embedded stone or other materials, in locations such as along the Grand Connection.

6. Bollards can be used to prevent motor vehicles from entering the sidewalk, should be sturdy, and may be removable. The City standard for bollards is Reliance Foundry Bollard, Model R-8464 (stainless steel with reflector strip), or equivalent approved by the City Engineer. Bollard lighting is desired as a decorative element to illuminate the pedestrian space, highlight the edge of street, and to supplement intersection light fixtures, as approved by the City Engineer.

See Standard Drawings for Typical Raised All-Way Stop Intersection, Chevron, Stop Sign, and Curb Ramp Details.

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H. Other Key Considerations

The fields of active transportation and Complete Streets continues to evolve through technology, data, research, and practice. Staying abreast of trends and best practices demonstrates flexibility and a commitment to delivering quality transportation solutions. This section includes other considerations for maintaining and growing the street network that reflects best practices.

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Maintenance

Description

A strong, systemic commitment to maintenance is required to ensure the longevity, dependability, and quality of Complete Streets. While street and sidewalk maintenance fall under the city's Five-Year Pavement Preservation Program, other public and private projects can impact maintenance needs as can the city's urban forest. For example, sewer projects include proactive and reactive repairs and some of these can include associated restoration work of roads and sidewalks.

A maintenance plan needs to consider regular and seasonal maintenance of vegetation, street amenities and art, as well as 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 in the public right-of-way:

- Begin developing maintenance plans during the planning and design stages of projects and coordinate with all city departments and other stakeholders responsible for enforcing and carrying out maintenance practices. This is important as different parts of the right-of-way, like sidewalks and bike lanes, are maintained by different crews than other parts, like planted medians and street trees.
- Where necessary, prepare and execute maintenance agreements for elements of the public realm—such as 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 sweeping, vegetation care, snow removal, 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

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Low Impact Development
Bioretention Facility

Description

Bioretention facilities are one of a suite of low impact development tools that strive to manage stormwater runoff on-site through infiltration, filtration, storage, evaporation and transpiration. Bioretention facilities appropriate for use in the public right-of-way include bioretention cells, bioretention swales, bioretention planters (with and without underdrains), and rain gardens.

Features

- Bio-retention planters manage stormwater in a number of ways depending on the site conditions. They include conveyance, flow control and/or treatment.
- The State of Washington Department of Ecology considers Deep Root's Silva Cell tree soil cells / treatment system to be functionally equivalent to a rain garden. This approach provides a dual benefit of cleaning and storing stormwater under the pavement while also providing additional soil volume for trees.
- Provide a step out zone or courtesy strip along the street and a 4 ft. min. wide sidewalk extension when the bio-retention facility is adjacent to on-street parking or loading zones.
- Amenity pads, sited between bio-retention facilities, provide a place for site furnishings, bike parking, and transit loading/unloading.
- Inlets along the curb and notches at the sidewalk curb walls let stormwater into the facilities.
- An overflow connected to a slotted storm drain pipe maybe required.
- Planter fences around the perimeter of walled bio-retention planters provides a visual and physical barrier.

See Standard Drawings for Bioretention Facility Details.

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Permeable Pavement

Description

Permeable pavement, or pavement that allows rainwater to pass through, is an option for meeting on-site stormwater management, runoff treatment, or flow control requirements within the right-of-way. Permeable pavement is most commonly used for pedestrian facilities and should consist of permeable Portland cement concrete. Concrete pavers with permeable joints may be acceptable if friction and ADA surfacing requirements can be met; special design and materials submittal review are required in these cases. Porous asphalt is not permitted.

Features

- Permeable pavement can be used in areas where space is limited, allowing the sidewalk to be multi-functional in both providing a walking surface and stormwater benefits. Permeable pavement is typically designed as part of a system to retain and/or treat stormwater.
- A perforated underdrain can be used to connect water into the stormwater system if water is not able to partially or fully infiltrate into the native soils.
- A reservoir course (a layer of coarse rocks or gravel) provides a location for stormwater storage during storm events.
- The runoff treatment layer filters the stormwater before it enters the soil or stormwater system.
- Permeable pavement is also a useful tool in getting air and water to tree roots when used in the landscape buffer zone and for sidewalks adjacent to trees.

See Standard Drawings for Pervious Concrete details.

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Shared Streets and Curbless Streets

Description

Prioritizing streets for pedestrian travel, temporary uses, gatherings, and events is appropriate and fitting as a function of public space. Some options to prioritize streets for pedestrians are described below.

Shared streets lack distinct zones and separation, like curbs, between modes. Instead, pedestrians, bicycle, and very low-speed motor vehicle traffic share the travelway. Shared streets deprioritize vehicular traffic to allow pedestrians and bicycles more freedom of movement and to provide more flexibility for activities and amenities like site furnishings and plantings.

Festival streets are streets specifically designed to accommodate larger gatherings. They may be designed as shared streets, where modes mix, or as curb-less streets where each travel mode has a designated space but the street lacks curbs. Festival streets provide the flexibility to accommodate vehicular, pedestrian, and bicycle travel when not in use for gathering.

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