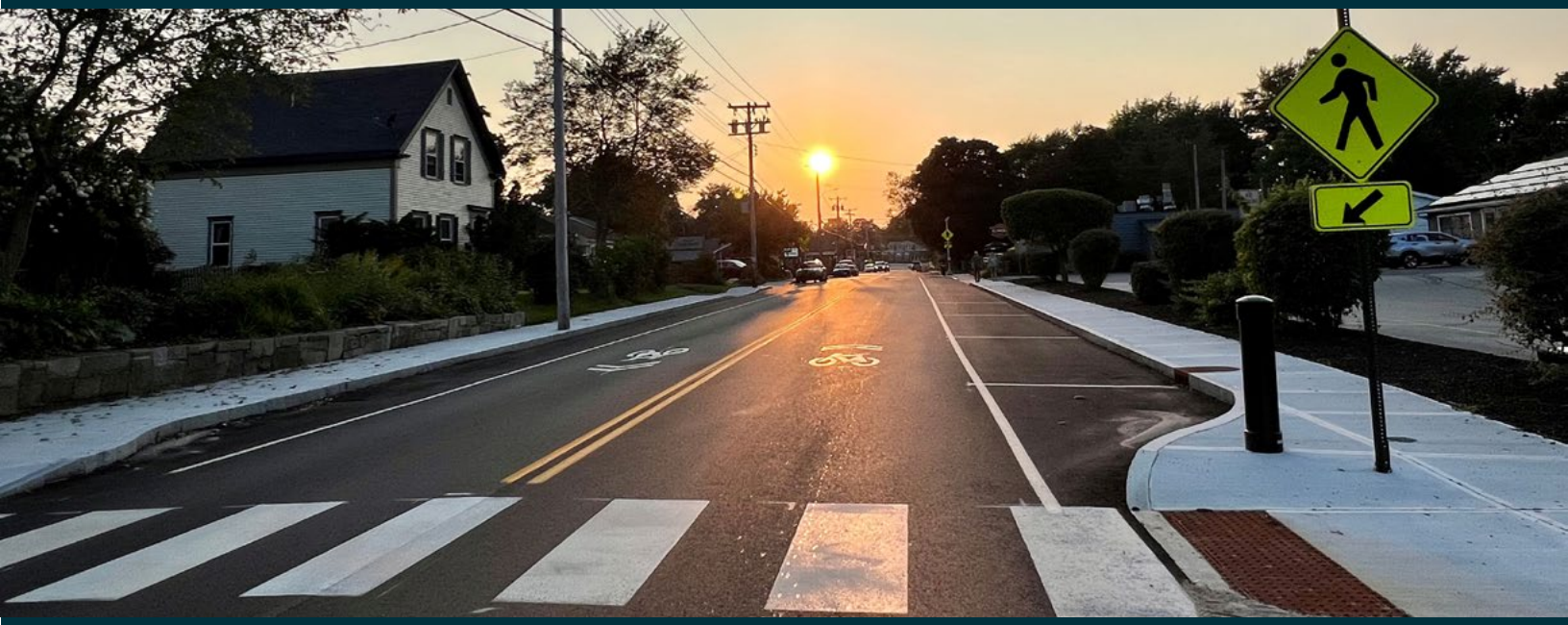
STREET DESIGN MANUAL

2024



CITY OF SOUTH PORTLAND

The South Portland Street Design Manual was produced 2023 - 2024, led by the Sustainability Department, Planning & Development Department, and Department of Public Works. This manual reflects collaboration across multiple City departments, with MaineDOT, and with the Greater Portland Council of Governments / Portland Area Comprehensive Transportation System.
Toole Design served as the consultant.

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Introduction

South Portland's streets make up a significant amount of publicly owned land and are critical to the function of the City. Movement of people and goods is the primary function, but streets also support socialization, shopping, exercise, and community character. Streets play a key role in people's mobility, safety, and health, so the City of South Portland is prioritizing a complete streets approach to street design, as reflected in the Complete Streets policy adopted by the City in October 2017.

Goals for Street Design

By adopting a Complete Streets approach, the City is committed to design streets to prioritize safety, inclusivity, convenience, and comfort for pedestrians, cyclists, micromobility users, transit users, and drivers of all ages and abilities. The design of South Portland's streets will account for the needs of all users in a more coordinated way, reflect the variation in neighborhood types, and allow for appropriate street designs to complement those neighborhoods. To that end, street design in South Portland will:

- **Reduce and manage speeds** of motor vehicles to decrease crash risks and potential for injuries and fatalities, particularly for vulnerable pedestrians and cyclists
- **Increase visibility and awareness** of pedestrians and people on bikes
- **Minimize exposure** of pedestrians and cyclists to motor vehicles

The City seeks street design that supports equity, prosperity, and socialization. Street design should reflect adjacent land use and travel mode priorities according to that use. Thus, the City has developed this manual for street design.

Purpose and Use of this Manual

This manual communicates street types, user priorities, street zone widths, and specific street design elements to use in South Portland's public streets. Alongside this manual, project conditions, goals, design judgment, and interdepartmental/agency collaboration, including with MaineDOT on state and state aid roads, should guide which street design elements and dimensions are appropriate for use.

While it can serve as a resource for residents and advocates, this manual is primarily intended for use by City planning and engineering staff, decision-makers, and developers to guide street design projects. The manual should also serve as a reference for MaineDOT staff, transit providers, and GPCOG/PACTS when designing streets in the City of South Portland.

Design According to Project Type

Complete streets design can be incorporated into all project types with varying costs. More extensive modifications can be made with street reconstruction or redevelopment projects, which require longer timelines and strategic capital planning. Pavement markings, signage, and perhaps some limited curb work can help improve safety through pavement restoration projects.

This manual does not guide full design approaches according to each project type. Rather, the manual attempts to lend design flexibility across all project types and express both budget-friendly and longer-term redevelopment options.

Design Fundamentals

The following are big picture considerations for design with a complete streets approach.

Balancing Streets for All Users

To balance streets for all users, travel mode priorities must be determined in terms of street width, safety components, and amenities. Consider the following broad design principles:

- **Optimize use of right-of-way (ROW) space** to serve all modes. This may involve narrowing or reducing the number of travel lanes to reallocate space to bikes and pedestrians for curbside uses.
- **Design from edges of the ROW inward** to ensure safe and comfortable space for people walking, biking, and transiting in addition to motor vehicles.

Intersections

While generally not part of the scope of this manual, intersection design is fundamental to the safety and experience of all street users. Guidance for intersections – on design and control vehicles, corner and effective turning radius, encroachment, and signals – can be found in many of the resources listed on the next page. Designers are particularly encouraged to choose the smallest practical radius that allows for all desired intersection safety improvements. Some brief guidance for intersections is provided in the Design Elements pages of this guide.

Emergency Response

Complete streets can and should provide adequate space for emergency response vehicles. As permitted by law, emergency response vehicles may use the full width of the roadway and intersections, with other vehicles required to give emergency responders the right of way. Designers should consider the following:

- Avoid introductions of continuous medians that prevent emergency vehicles from passing other motor vehicles. Limited length medians, mountable medians, or pedestrian islands can be used at intersections where vehicles are able to turn and clear space for emergency responders.
- Bike lanes can be designed as part of usable width for emergency response. See the *Design Elements* sections on different bike lane types for more information.
- Traffic calming elements can be sized for easy passage by fire vehicles. See the *Traffic Calming* section for more information.

Snow Maintenance

Consider snow maintenance needs in all street design projects. Broadly, provide space for snow to be stored, particularly if the snow cannot be moved off-street. Pointers on designing for snow maintenance are included in some Street Types and Design Elements sections of this guide.

Related Initiatives & Guidance

The City of South Portland works in cooperation with adjacent munipalities, Maine Department of Transportation (MaineDOT), the Greater Portland Council of Governments (GPCOG), and Portland Area Comprehensive Transportation System (PACTS), which is part of GPCOG. The following are a few related initiatives:

- MaineDOT Family of Plans, which includes a plan for active transportation
- MaineDOT Guidelines on Crosswalks
- GPCOG Transit Tomorrow plan and Transit Together report
- PACTS Connect 2045 Long-Range Transportation Plan for Greater Portland
- PACTS Regional Bicycle and Pedestrian Facility Design Guidance
- PACTS Vision Zero Greater Portland action plan
- PACTS Complete Streets Policy
- Cities of Portland & South Portland One Climate Future - Climate Action and Adaptation Plan
- Maine Climate Council Maine Won't Wait - Four-Year Plan for Climate Action

South Portland's streets must meet federal and state laws and should follow national best practices for design and traffic operations, including:

- American Association of State Highway and Transportation Officials (AASHTO) Green Book
- AASHTO Guide for the Planning, Designing and Operating Pedestrian Facilities
- AASHTO Guide for the Development of Bicycle Facilities
- Americans with Disabilities Act (ADA) Accessibility Guidelines & U.S. Access Board Public Rights-of-Way Accessibility Guidelines (PROWAG)
- Federal Highway Administration (FHWA) Bikeway Selection Guide
- Institution of Transportation Engineers (ITE) Designing Walkable Urban Thoroughfares: A Context Sensitive Approach
- ITE Neighborhood Street Design Guidelines
- National Association of City Transportation Officials (NACTO) Urban Street Design Guide
- NACTO Urban Bikeway Design Guide
- NACTO Don't Give Up at the Intersection (expands on Urban Bikeway guide)
- U.S. Department of Transportation (USDOT) Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD)

Typical roadway construction details such as pavement, sidewalk curb, and manhole details and trench backfill requirements – are included in Appendix A.

MaineDOT standards apply on state and state aid roads (see Appendix B map). Any deviation from MaineDOT standards may require a design exception from the Engineering Council. All projects that may require a design exception should involve MaineDOT early in the planning and design process.

Design Provisions by Street Type

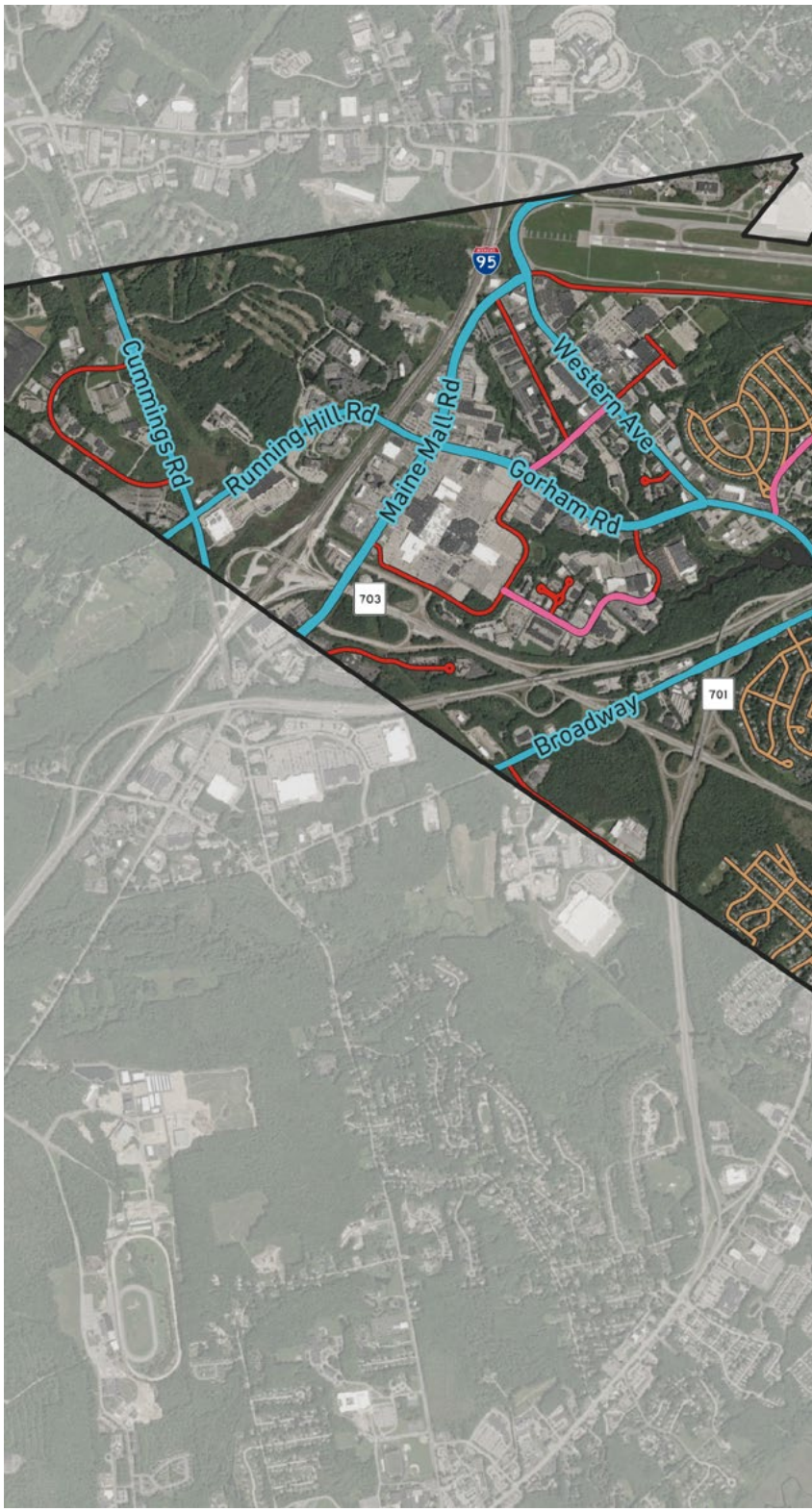
Street Types

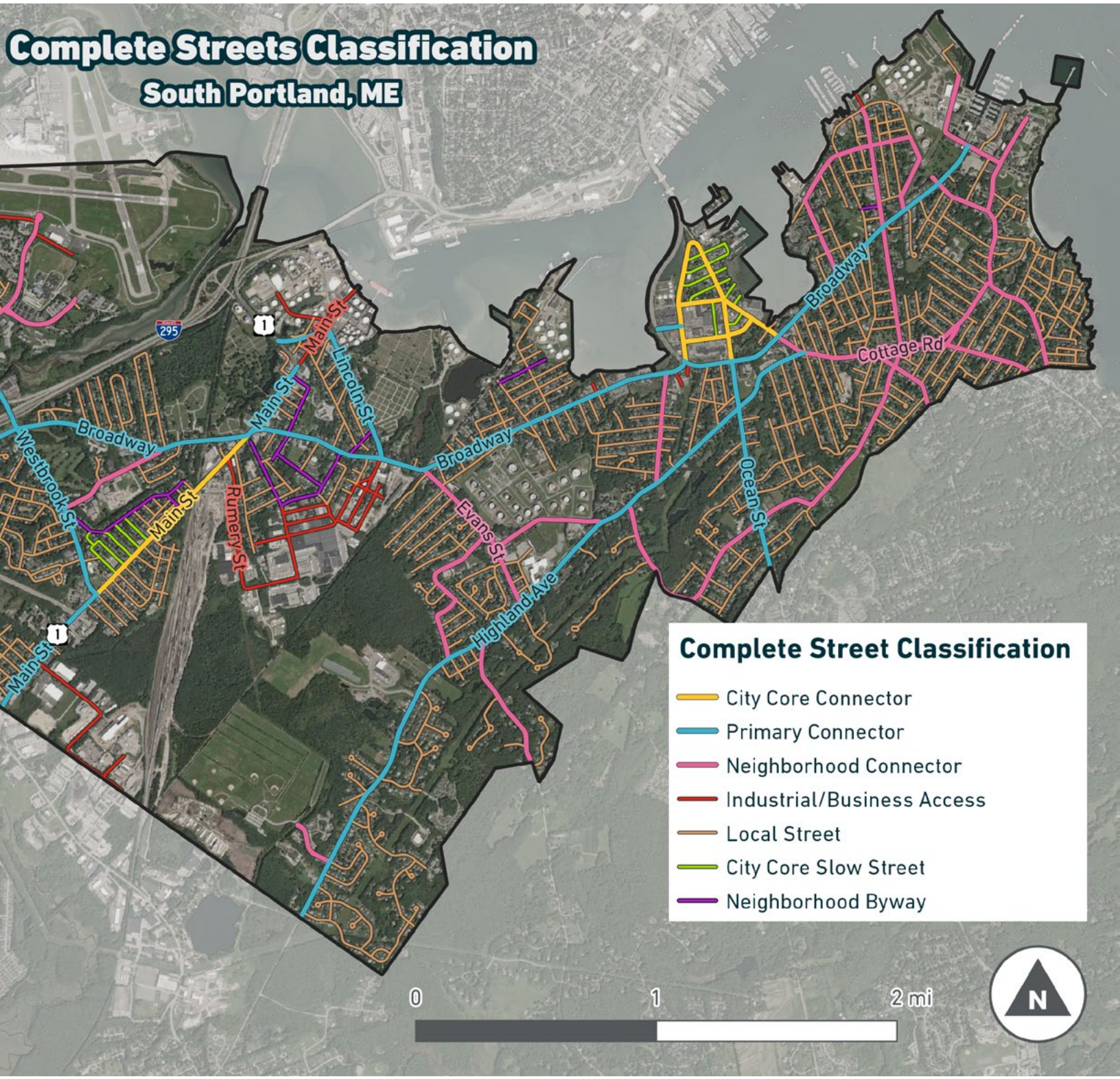
With this manual, streets have been reclassified to reflect adjacent land use and multimodal function within the broader City transportation network. The following are the redefined street type classifications in South Portland:

- **City Core Connector -** High volume, urban mixed-use
- **Primary Connector** High volume, cross-city
- **Neighborhood Connector -** Medium volume, mostly residential
- **Industrial / Business Access -** Commercial areas, heavy vehicle traffic
- **Local Street -** Low volume, residential
- **City Core Slow Street** Low volume, urban mixed-use, slow street
- **Neighborhood Byway -** Designated bicycle and pedestrian connection, residential, slow street

Federal Interstate highways are not included with this street classification as these are spaces only for motor vehicles and cannot be designed by the City. State-owned and state-aid routes (see Appendix B map) are included within this classification, and projects on these routes should be coordinated in close collaboration with MaineDOT and other local, state, and federal entities.

Street classifications are reflected in the summary map at right. Each street type and its design framework is detailed in the next several pages.




Complete Streets Classification
South Portland, ME
295
1
Main St
Lincoln St
Broadway
Cottage Rd
Westbrook St
Rumery St
Evans St
Highland Ave
Ocean St
Complete Street Classification
City Core Connector
Primary Connector
Neighborhood Connector
Industrial/Business Access
Local Street
City Core Slow Street
Neighborhood Byway
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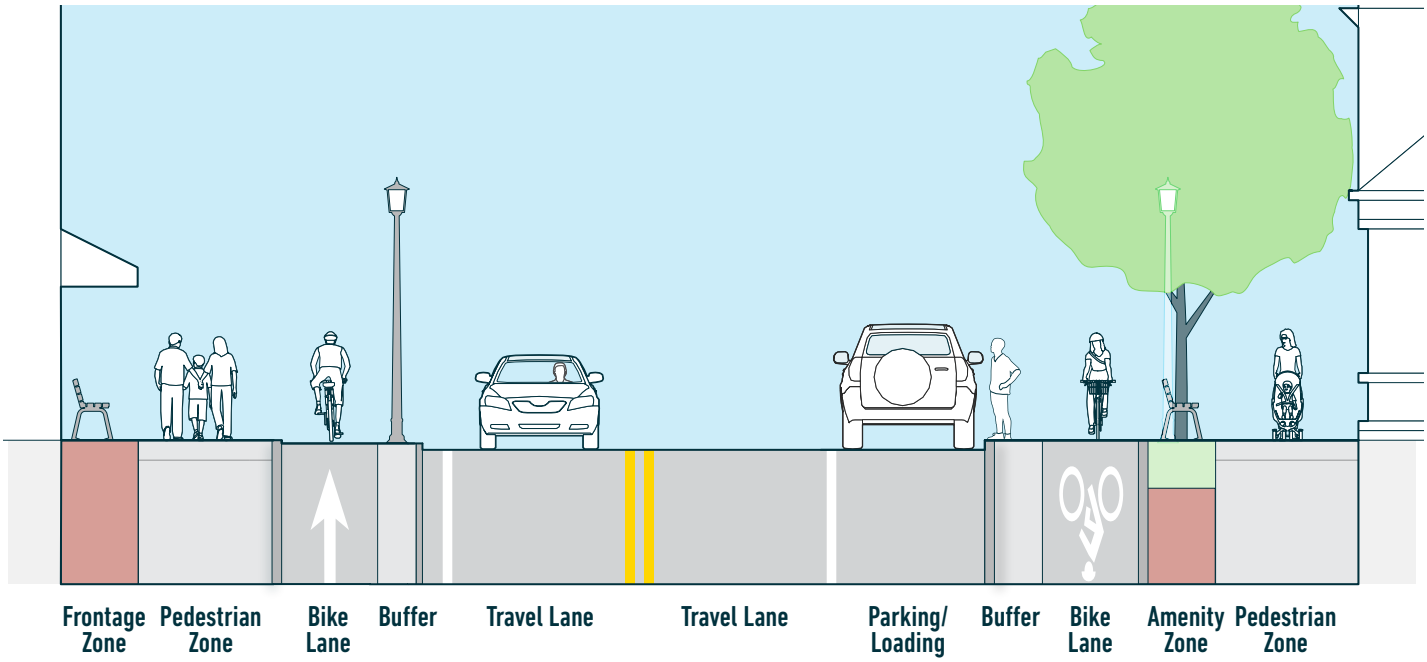
Street Zones & Widths

Right-of-way (ROW) width is typically pre-established, and existing usable width may be less than ROW width. Based off the goals of the project and available ROW width, **use zones** can be designated within the street. The cross section below shows typical zones for use on South Portland streets under the classifications in this manual. It is important to note:

- Modal priorities determine which zones are included or excluded from each roadway design, and modes may share space within one zone.
- Zone widths and related design elements vary within each street type to respond to the level of pavement work or reconstruction, site conditions, functional needs, and constraints of individual streets, as determined through design and engineering judgment for each project.
- A few atypical zones may be applied to specific streets. These are expressed below the table on page 11.



The table on page 11 recommends possible street zones and zone widths for each street type according to minimums (MIN) and preferred ranges (PREF). Maximum (MAX) allowable widths are provided for travel lanes and parking and loading zones. Widths are not listed (na) where the component is unlikely to be included on a particular street type. See the *Modal Priorities & Design Provisions* sections below with each street type to determine whether a zone should be included on a particular street type.

	Pedestrian Travel Zone[a]		Frontage Zone		Amenity Zone / Esplanade[b]		Travel Lane[c]			Parking & Loading			Bike Lane (One-Way)[d]		Bike Buffer (One-Way)[d]	
	PREF	MIN	**PREF**	MIN	**PREF**	MIN	**PREF**	MIN	MAX	**PREF**	MIN	MAX	**PREF**	MIN	**PREF**	MIN
City Core Connector[1]	7’-10’	5’	3-5’	2’[e]	4’-8’	3’[f]	10’	10’	11’	8’	7’	8’	6’-7’	5’	3’	1’
Primary Connector	6’-8’	5’	3-5’	2’	5’+	3’	11’	10’	12’[g]	8’	8’	9’	6’-7’	5’	3’+	2’
Neighborhood Connector	6’-8’	5’	3-5’	2’	3’+	2’[f]	10’	10’	11’	8’	7’	8’	5’-6’	5’	3’	1’
Local	5’-6’	5’	na	na	na	2’	10’	9’	11’[h]	7-8’	7’	8’	5’-6’	4’[i]	na	na
Industrial/ Business Access	6’-8’	5’	na	na	6’-10’	3’	11’	10’	12’[g]	8’	8’	9’	6’-7’	5’	4’	3’
City Core Slow Street	6’-8’	5’	3-5’	2’	na	na	10’	9’	11’[h]	7’-8’	7’	8’	5’-6’	4’[i]	na	na
Neighborhood Byway[j]	5’-6’	5’	na	na	na	2’	10’	9’	11’[h]	7’-8’	7’	8’	5’-6’	4’[i]	na	na

a. In some cases, the Pedestrian Travel Zone will make up the entire sidewalk. Width is measured from the back of curb. The Pedestrian Zone should be kept clear of all obstacles, including signage and utility poles. The minimum pedestrian zone width for many streets is set at 5’ in the table above, which is a functional width and not required under ADA or PROWAG. Under uniquely constrained conditions, sidewalks may be narrowed in spot locations to 4’, the minimum width permitted by PROWAG. It may be necessary to increase overall sidewalk width, such as along stretches with utility poles, to maintain the 4’ minimum.

b. On some street types, the Amenity Zone is simply the esplanade, the grass strip between sidewalk and roadway.

c. Travel lane widths do not include shoulders. Shoulders are recommended to be minimized to 1’ so space can be devoted to other street users. Shoulders are not necessary to include where bike buffers or parking is present or where mountable curb is located adjacent to a travel lane. Minimize travel lane width to 10’ along bike buffers.

d. Bike lanes may be two-way cycle tracks, which are detailed under ***Design Elements***. Widths for bike lanes and buffers change under two-way conditions.

e. A Frontage Zone should be 2’ wide at a minimum to provide space for planters or signs. Benches with backs require a minimum of 3’ so neither the benches nor people’s legs obstruct the Pedestrian Zone. Cafe tables require 3’ at a minimum but 4’-5’ is recommended.

f. In commercial areas, Amenity Zones should be 3’ at a minimum to support trash cans and mailboxes, but 4’ may be needed to support lighting bases with some shy space to the curb. Benches in Amenity Zones need space for legs and curb shy space as well. Meet ADA / PROWAG for furniture and overhangs. In either commercial areas or on more suburban roads, trees should be planted in Amenity Zones that are at least 4’ wide.

g. Travel lanes of 12’ may be used only in special cases with frequent heavy freight movement. Do not use against parking or bike lane buffers. Do not match 12’ lanes with additional shoulders as this overwidens the roadway and encourages higher speeds.

h. Local Streets, City Core Slow Streets, and Neighborhood Byways should be considered in terms of total width when they are not striped. The streets can be designated as “yield streets.” Per the NACTO Urban Street Design Guide, “A yield street with parking on both sides functions most effectively at 24–28 feet, while yield streets with parking on only one side can be as narrow as 16 feet, assuming that parking utilization is low enough for cars to safely yield and pass one another.”

i. A minimum 4’ bike lane width on Local Streets, City Core Slow Streets, and Neighborhood Byways only applies to advisory lanes or lanes against edge of pavement without curb. Where curb exists, 5’ minimum bike lane width applies.

j. Advisory lanes are an option on narrow Neighborhood Byways with low vehicle volumes and speeds. See the ***Bike Lane*** section for more detail and dimensions.

Please Additionally Note

MaineDOT shall be consulted during the design process for all projects on state and state aid roads. Deviations from MaineDOT standards may require design exceptions from the MaineDOT Engineering Council.

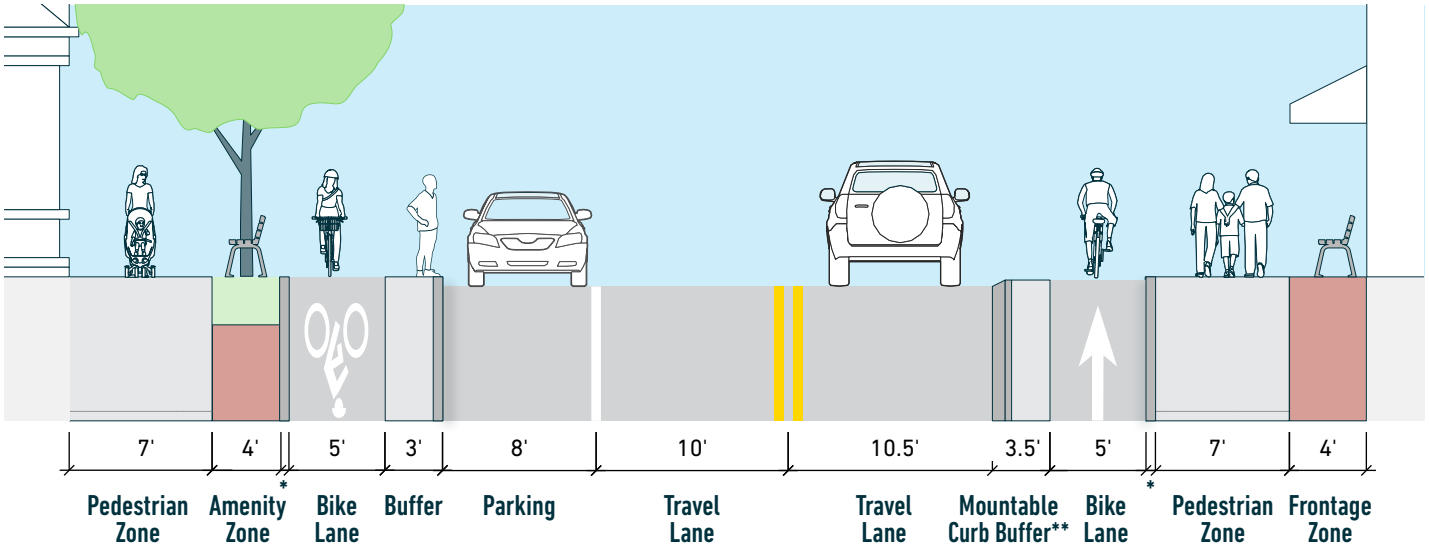
The following cross sections depict examples of Complete Streets for each street classification given selected example streets and right-of-way widths. Designs will vary according to the context and ROW available for each project.

City Core Connector

City Core Connectors are lively, high volume streets used heavily by all modes. These streets provide places for socialization in addition to travel and loading. City Core Connectors are lined with mostly commercial properties, with mixed-use residential and retail becoming more prevalent. Building setbacks are currently mixed but are envisioned to be limited to zero under redevelopment. Design should accommodate all modes while prioritizing wide sidewalks for pedestrian movement and comfortable amenity and frontage zones for use by businesses and the general public.

Existing ROW width	50’ - 70’	**Existing curb-to-curb width**	25’ - 50’
Design speed	25 mph	**Vehicles per day**	5,000-15,000
Example streets	Ocean St, Waterman Dr, Cottage Rd, Main St (Route 1)		

Example: 68’ ROW with separated bike lanes, including mountable on one side



*See *Sidewalks* for information on curb between bike and sidewalk zones
**See *Separated Bike Lanes* for buffer

Modal Priorities & Design Provisions

HIGH

- Maximized-width pedestrian zone and amenity or frontage zones
- Concrete pedestrian zone, lighting, furniture, trees, planters, and parklets
- Curb extensions and RRFBs** as needed at crosswalks

MED

- Separated bike lanes where volumes exceed 6,000 vehicles per day, or buffered or conventional below that volume, with conflict markings at intersections
- Bike parking in 3’ minimum amenity zone, curb extensions, or parking space

HIGH

- Floating bus stops or bus bulbs on high-frequency routes
- Bus stop seating and/or shelters where feasible along with ADA compliant surface, depth, lighting, and safe crossings

HIGH

- (2) 10’ wide travel lanes adjacent to bike lane buffer
- (1) 8’ wide parking lane, maximum

LOW

- Loading zones within 8’ parking lane where off-street loading not available

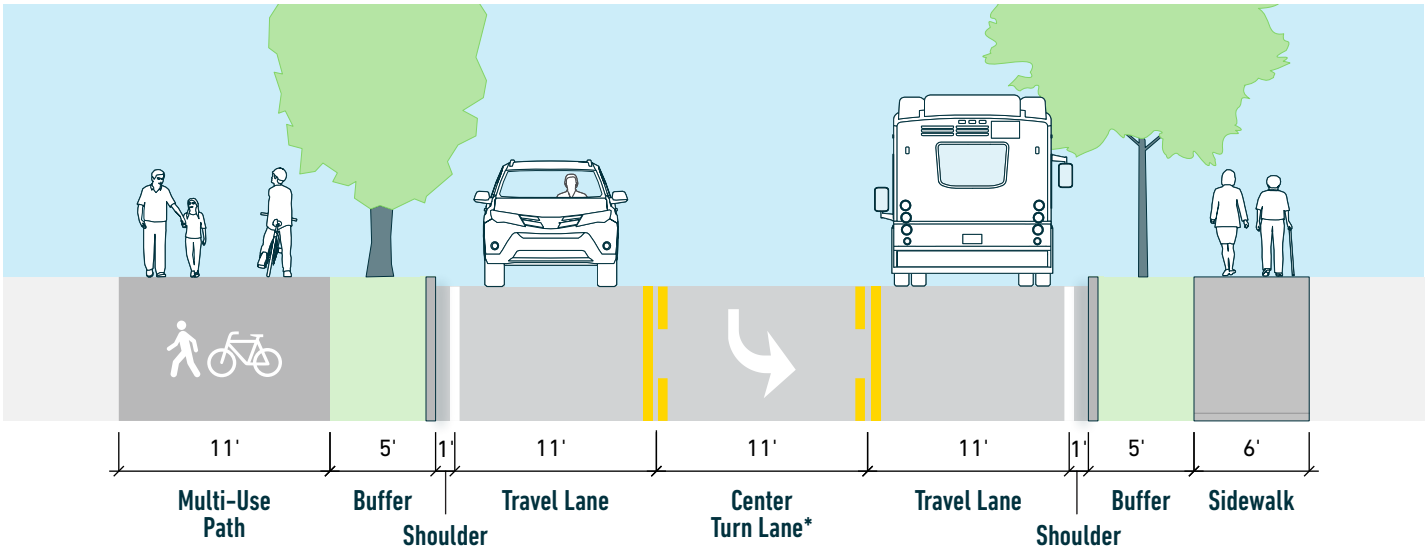
**Rectangular rapid flashing beacons (RRFBs)

Primary Connector

Primary Connectors are South Portland's main thoroughfares, connecting people between neighborhoods and to and from the city. These roads pass through each land use type and carry high vehicle volumes, including high-use bus routes. Primary connectors offer direct routes for pedestrians and people on bikes but also provide important connection points to the City's trail infrastructure. These roads require greater separation between vulnerable users and motor vehicles due to higher vehicle speeds and heavier traffic. Primary Connectors are maintained in partnership with MaineDOT.

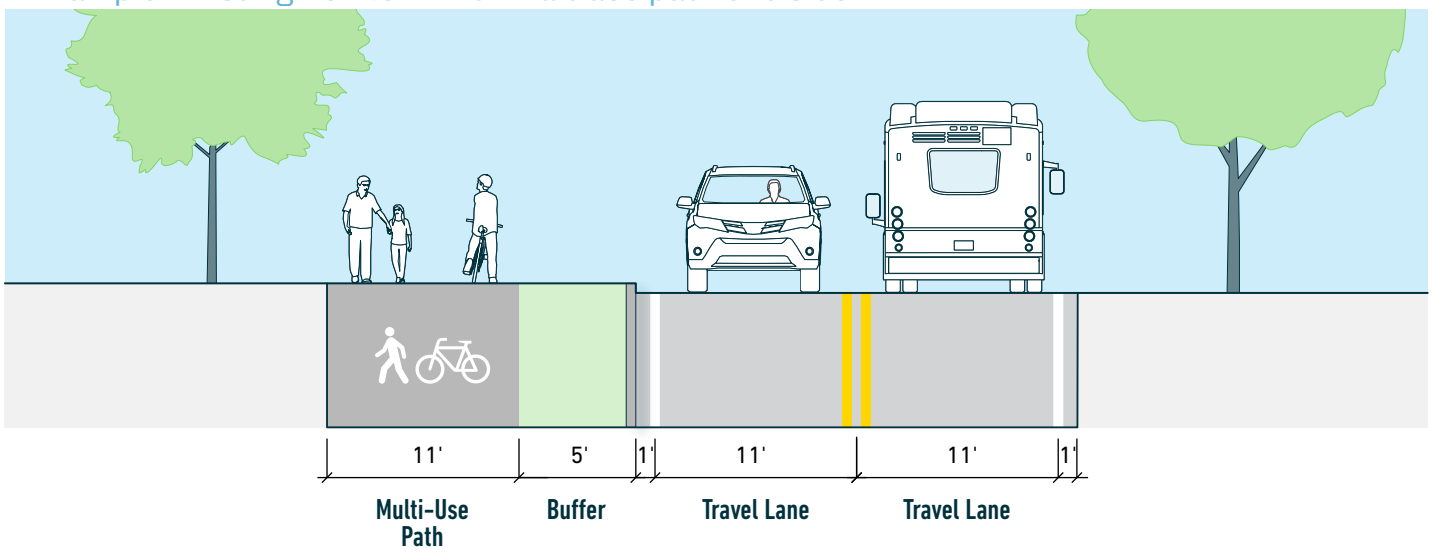
Existing ROW width	40' - 80'	**Existing curb-to-curb width**	28' - 69'
Design speed	25-35 mph	**Vehicles per day**	10,000+
Example streets	Westbrook St, Western Ave, Gorham Rd, Highland Ave, Broadway		

Example: 62' ROW with three travel lanes, multi-use path, and buffered sidewalk

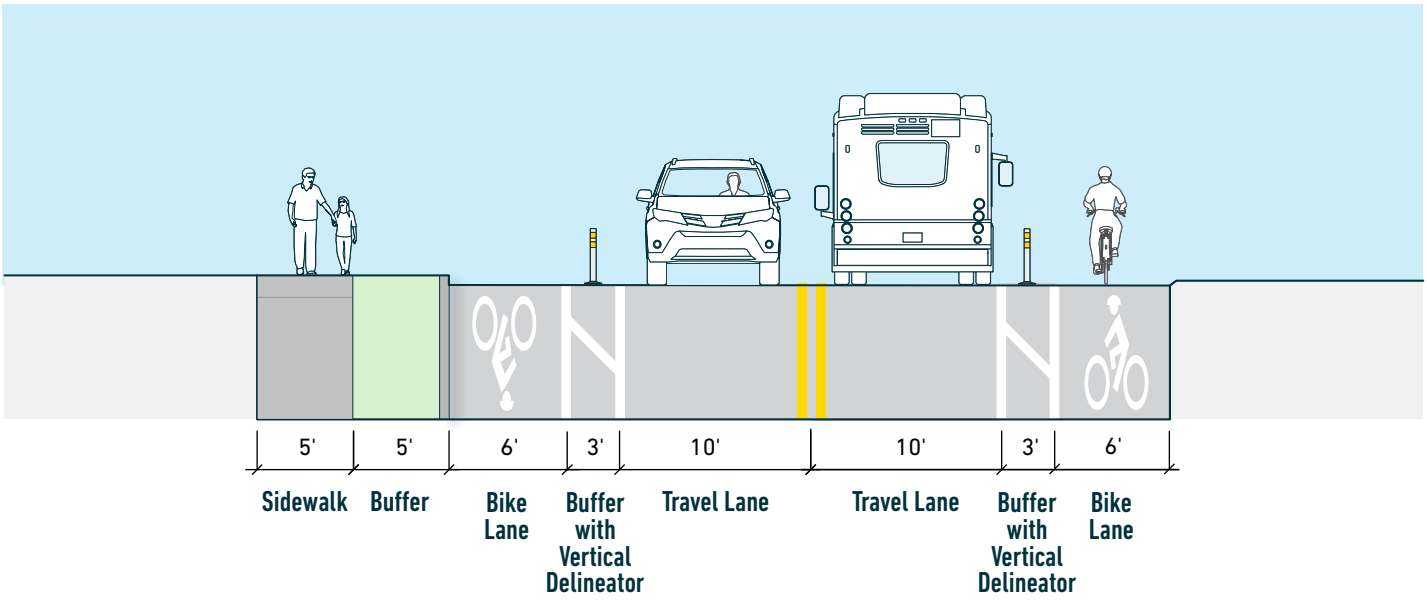


Primary Connector streets include both 3-lane and 5-lane cross sections with center turn lanes. Some Primary Connectors have 2 or 4 lanes without center turn lanes. The multi-use path design can be applied to all these cross sections as ROW space allows.

Example: Existing 40' ROW with multiuse path one side



Example: Existing 48’ ROW and 37’ curb-to-curb width plus sidewalk with two travel lanes and separated bike lanes



Per the FHWA Bikeway Selection Guide, separated bicycle facilities with vertical delineation are recommended anywhere volumes exceed 6,000 vehicles per day and/or where speeds exceed 30mph. Primary Connectors are often not wide enough for adding separated bicycle lanes on both sides. The curb should be moved in this case to provide a multi-use path on one side within the ROW, as shown in the bottom section on page 14. Where the curb-to-curb width is 34’ or wider, separated bike lanes may be appropriate, as shown above.

Modal Priorities & Design Provisions

HIGH

- Asphalt multiuse paths or sidewalks buffered from the roadway
- Curb extensions, refuge islands, and RRFBs where needed at crosswalks

HIGH

- Separated bike lanes, cycle tracks, or multiuse paths. Buffered and conventional bike lanes not recommended given traffic volumes over 6,000 vehicles per day and/or where speeds exceed 30mph
- Conflict markings and protected treatments at intersections

HIGH

- ADA compliant bus stops with lighting, seating and/or shelter
- Floating bus stops or bus bulbs on high-frequency routes

HIGH

- (2) 11’ wide travel lanes with or without center turn lane
- (2) 10’ wide travel lanes against bike buffers
- Road diets where feasible on 3 to 4-lane roads. Center turn lane may not be necessary where commercial driveways and intersections are infrequent

HIGH

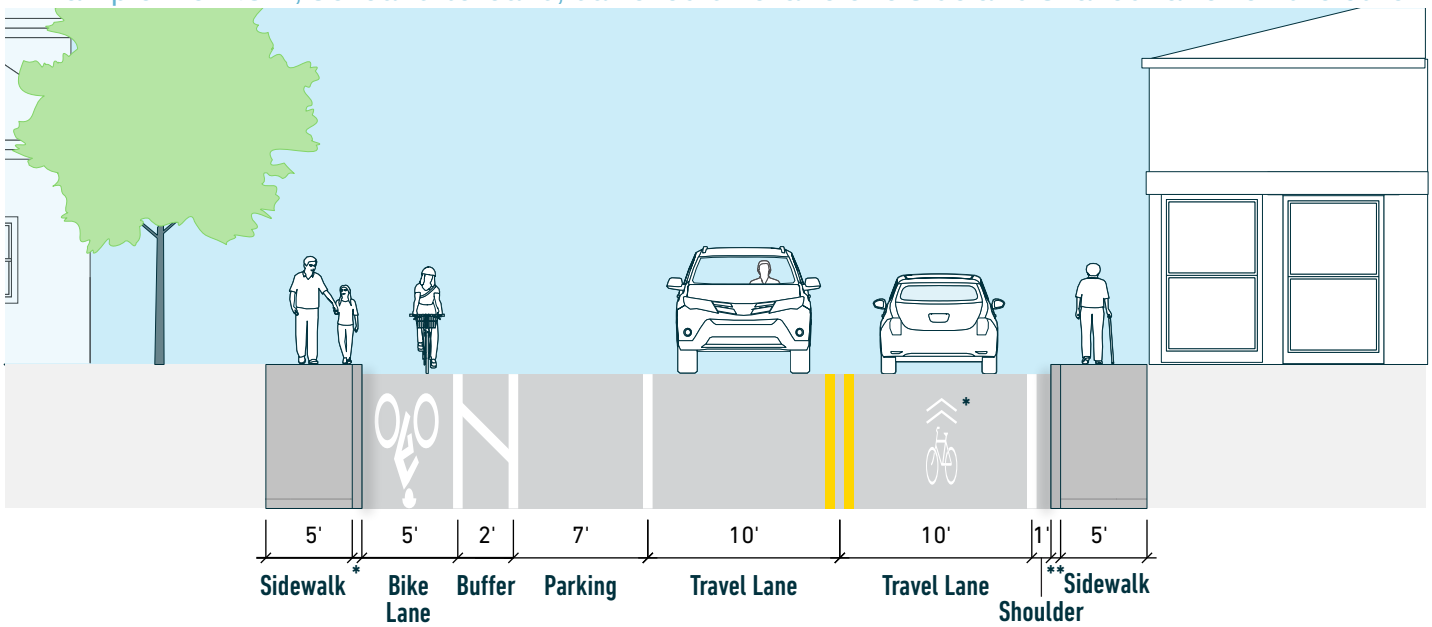
- Curb radii for larger vehicles where connecting to Industrial streets, with truck aprons to keep intersections narrow for passenger vehicles
- Infrequent on-street loading zones within commercial areas if needed

Neighborhood Connector

Neighborhood Connectors provide critical connections for all modes, providing access to destinations between and within neighborhoods. These streets are primarily residential and have a neighborhood feel, slower speeds, and mostly lower traffic volumes, with the exception of Evans Street. These streets also feature small neighborhood commercial centers that are sociable, with spaces to linger or eat along the sidewalk.

Existing ROW width	40’ - 60’, 60’ typical	**Existing curb-to-curb width**	24’ - 35’
Design speed	25 mph	**Vehicles per day**	2,000 - 15,000
Example streets	Preble St, Keswick Rd, Anthione St, Sawyer St, Evans St		

Example: 45’ ROW, 35’ curb-to-curb, buffered bike lane one side and shared-lane* on the other



*Shared lane markings may be used where width is highly constrained and operating speeds are mitigated. See *Bike Lanes*.
**See *Sidewalks* for information on curb, obstructions, & required minimum accessible width

Modal Priorities & Design Provisions

HIGH

- Asphalt sidewalks, typically, or concrete sidewalks with amenity or frontage zone in neighborhood commercial centers
- Curb extensions and RRFBs where needed at crosswalks

HIGH

- Separated facilities preferred with > 6,000 vehicles per day. Otherwise, buffered lanes, or conventional lanes when constrained. Shared lane markings with speed mitigation when highly constrained (see *Bike Lanes* for more info)
- Conflict markings in neighborhood centers / where crosswalks are marked
- Bike parking in 3’ min. amenity zone in commercial areas or curb extensions

MED

- ADA compliant bus stops with lighting, seating and/or shelter

HIGH

- 10’ travel lanes in neighborhood commercial centers, 10’-11’ elsewhere
- On-street parking not typical except in commercial centers

LOW

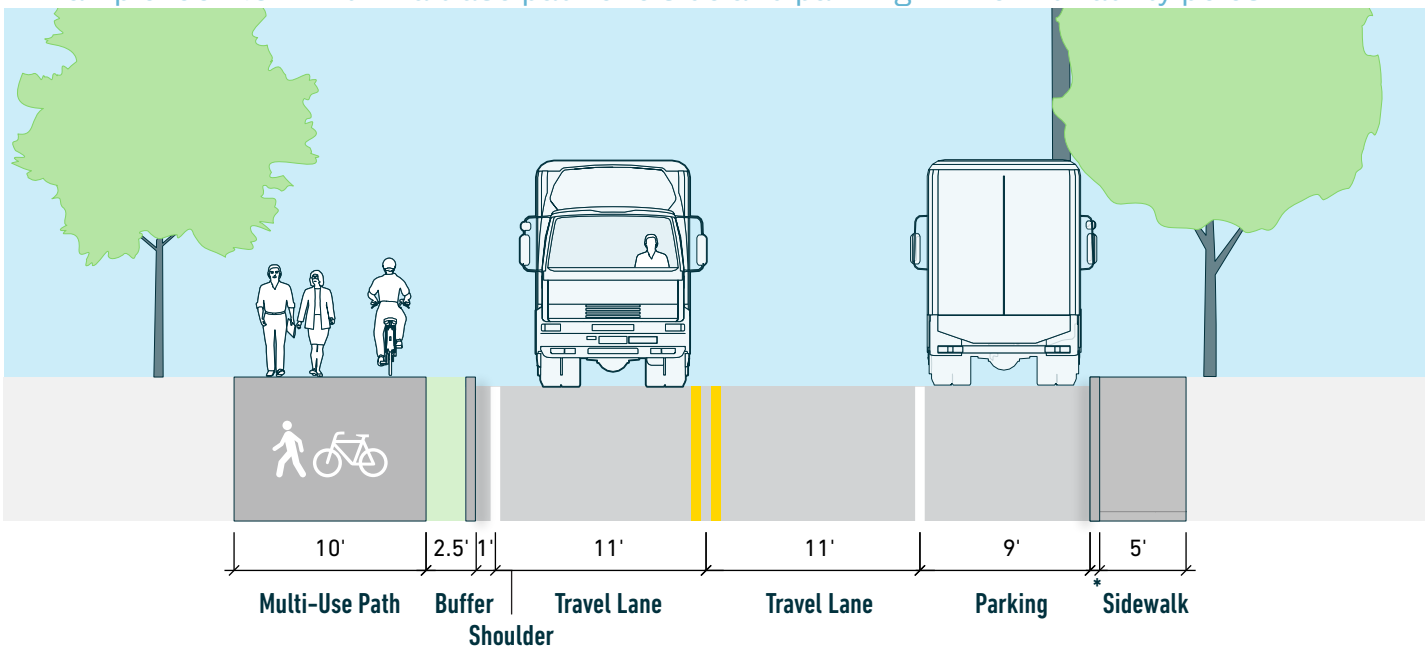
- Design streetscape primarily for pedestrians and passenger vehicles, but consider turning radii for small freight vehicles, and allocate delivery areas.

Industrial/Business Access

Industrial streets connect industrial sites to the rest of the City. These streets accommodate large vehicles with wider turning radii and provide truck parking where necessary. Where Industrial streets are also critical connections for pedestrians and cyclists, the street should feature safe, visible, and separated facilities for those users.

Existing ROW width	24’ - 60’, 50’ typical	**Existing curb-to-curb width**	22’ - 40’
Design speed	25-30 mph	**Vehicles per day**	2,000-10,000
Example streets	Rumery St, Dartmouth St, Southborough Dr, Chambers Ave, Darling Ave		

Example: 50’ ROW with multiuse path one side and parking in line with utility poles



*See *Sidewalks* for information on curb, obstructions, & required minimum accessible width

Modal Priorities & Design Provisions

MED

- Asphalt sidewalk or multiuse path on one or both sides, buffer preferred
- Shade trees in 6’ min. width buffers to help prevent branch clipping by trucks

MED

- Separated bike facilities strongly preferred with option for two-way cycle track or multiuse path
- Conflict markings and signage to improve visibility at intersections

MED

- ADA compliant bus stops with lighting, seating and/or shelter

MED

- Roadway design for freight vehicles provides ample space for passenger vehicles. Consider truck aprons to minimize vehicle speed at intersections where pedestrians and cyclists are likely to be present

HIGH

- Adequate turning radii to accommodate large vehicles without oversizing roadway. Encroachment allowed in low volume scenarios to minimize intersection size. Signage on designated freight routes.

Local Street

Local streets are low volume streets that primarily serve residences. They may have informal parking on either side. Where ROW is sufficient, an esplanade or planted buffer between sidewalk and roadway can provide a more comfortable environment for pedestrians. However, Local Streets are often used as shared streets due to low traffic volume, and many lack sidewalks and have limited width ROWs. Local streets are less likely to be reconstructed, so traffic calming can assist in reducing speeds.

Existing ROW width	30’ - 50’, 50’ typical	**Existing curb-to-curb width**	18’ - 30’
Design speed	20-25 mph	**Vehicles per day**	< 2,000
Example streets	Meadow St, Cannon Rd, Dawson St, Henry St, Pierce St		

Modal Priorities & Design Provisions

- Traffic calming as needed to manage speeds and reduce cut-through traffic
- Esplanades in amenity zone between sidewalks and roadway where desired or existing. Plant trees in buffers a minimum of 4’ wide
- Asphalt sidewalk construction when more separation needed

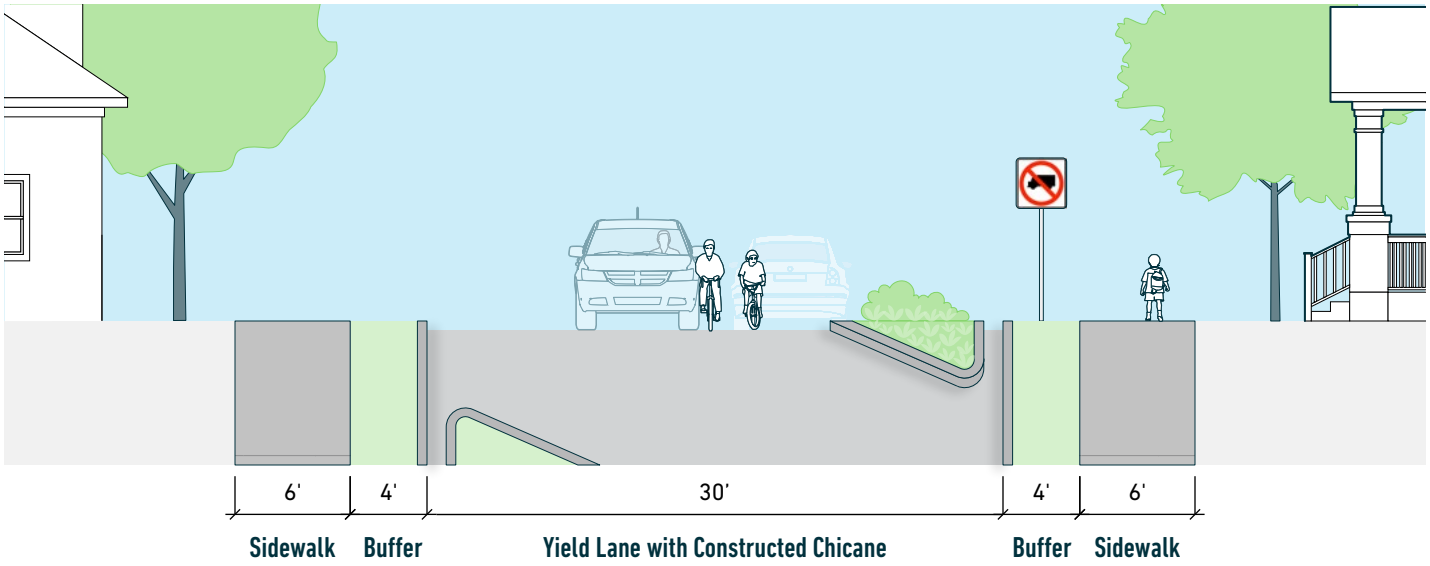
- Traffic calming to create multiuse roadway suitable for families on bikes

- Bus stops are not located on Local Streets

- Reduce vehicular speed with traffic calming measures
- On-street parking as needed, which can serve as part of traffic calming

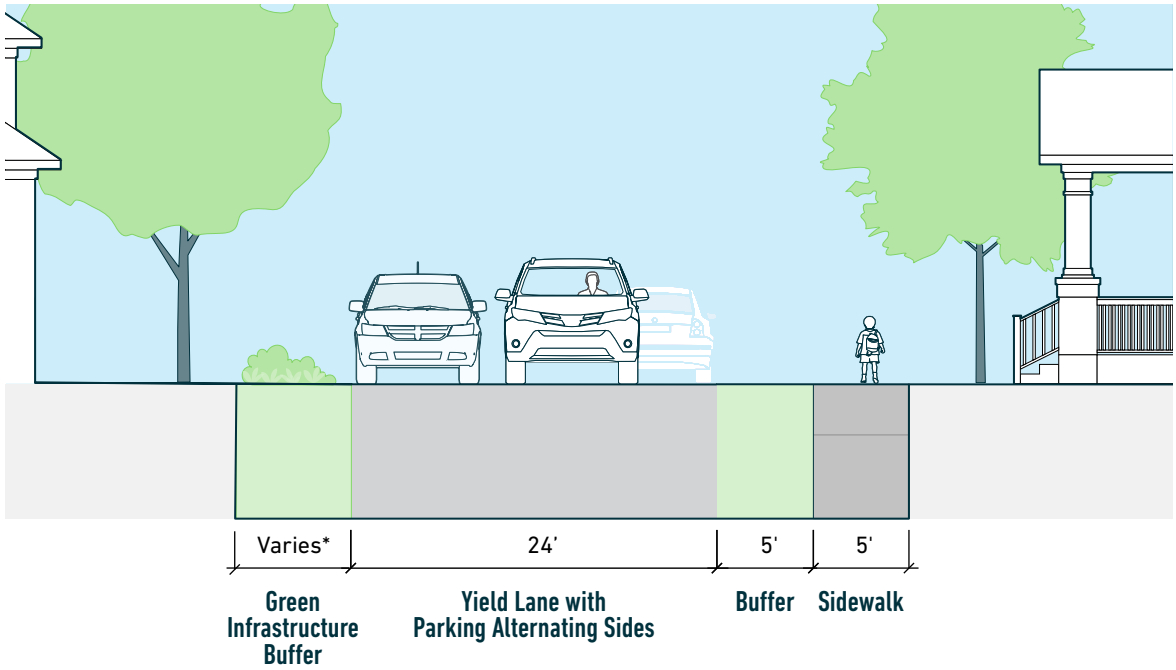
- Intersection curb radii to be minimized but accommodate parcel delivery
- Where needed, use curb extensions or diverters to restrict freight entry. MUTCD R5-2 or R5-2a NO TRUCKS signs may also be used to signal no freight access

Example: 50’ ROW with chicane treatment in 30’ wide roadway, assuming parking is present



The example above shows how chicanes can be installed on wider local streets, with or without existing curbs, to create a “yield street” and calm traffic. Vehicles must reduce speed to follow a curving path.

Example: 24’ wide roadway (ROW varies), assuming parking is present



Overall street width can also be narrowed to calm traffic. Depending on parking utilization, presence of driveways, and street width, parking on one or both sides can create “yield street” conditions that calm traffic. Alternating parking to each side of the street, as pictured in the example above, can also be used to create a chicane.

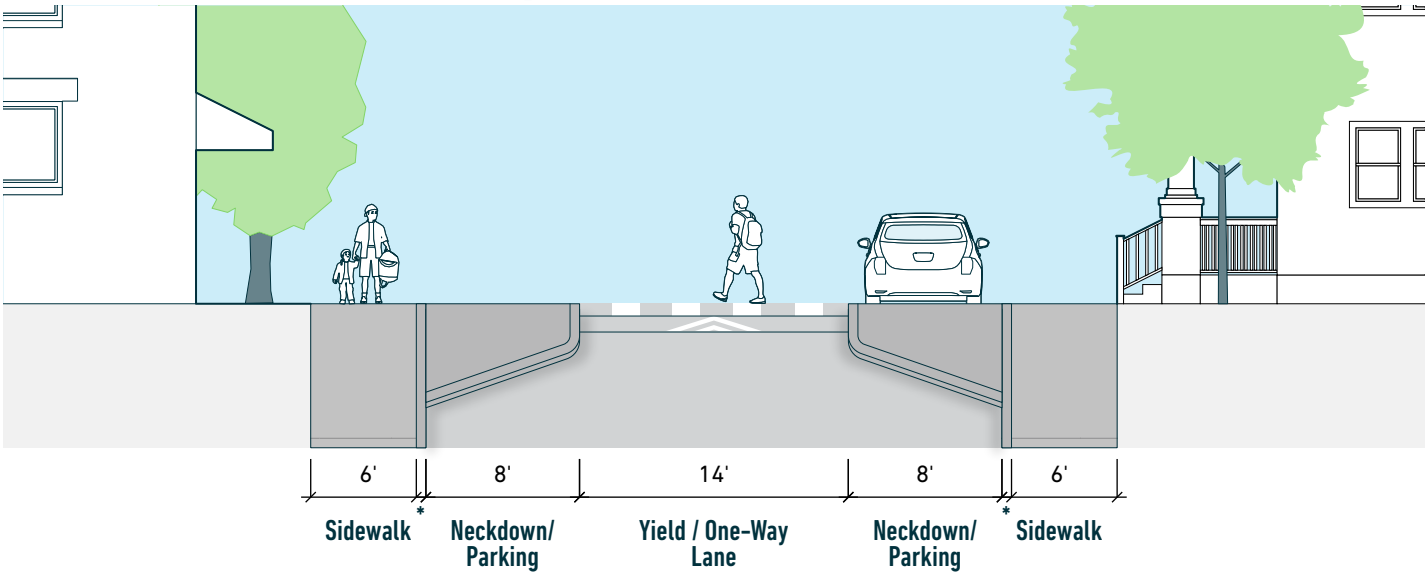
*In the example above, the width of green stormwater infrastructure (GSI), such as rain gardens, may extend to the back of ROW as needed. Avoid installation of GSI in spaces less than 5’ wide.

City Core Slow Street

City Core Slow Streets are dense, primarily residential streets with some commercial uses. These streets are also located adjacent to commercial uses on City Core Connector streets and serve as slow street connections for local vehicle and pedestrian traffic with some bicycle use as well. Buildings on City Core Slow Streets are closely spaced and have zero or minimal setback from sidewalks, often with landscaping between sidewalk and building. Parking is prevalent due to multi-unit residences with limited off-street parking and spillover from connector street businesses.

Existing ROW width	35’ - 50’, 50’ typical	**Existing curb-to-curb width**	24’ - 40’
Design speed	20 mph	**Vehicles per day**	< 2,000
Example streets	A St, C St, Aspen Ave, Thirlmere Ave		

Example: 50’ ROW with landscaping behind sidewalk, 30’ curb-to-curb with neckdown



**See Sidewalks section for information on curb*

Modal Priorities & Design Provisions

HIGH

- Sidewalks with landscaped amenity zone either between sidewalk and roadway or behind sidewalk. Maximize sidewalk width where possible
- Curb extensions / neckdowns at pedestrian crossings, particularly where sightlines around parking are an issue

MED

- Shared lane markings to notify drivers of bikes. Focus on traffic calming measures to make biking low-stress without separate facilities.

LOW

- Bus stops are not located on City Core Slow Streets except for Mill Creek Transit Hub, which should accommodate bus parking

HIGH

- 10’ travel lanes, if two; 9’-14’ yield lane (including curb offsets)
- On-street parking as needed, which can serve as part of traffic calming
- Horizontal and vertical traffic calming to achieve design speed

LOW

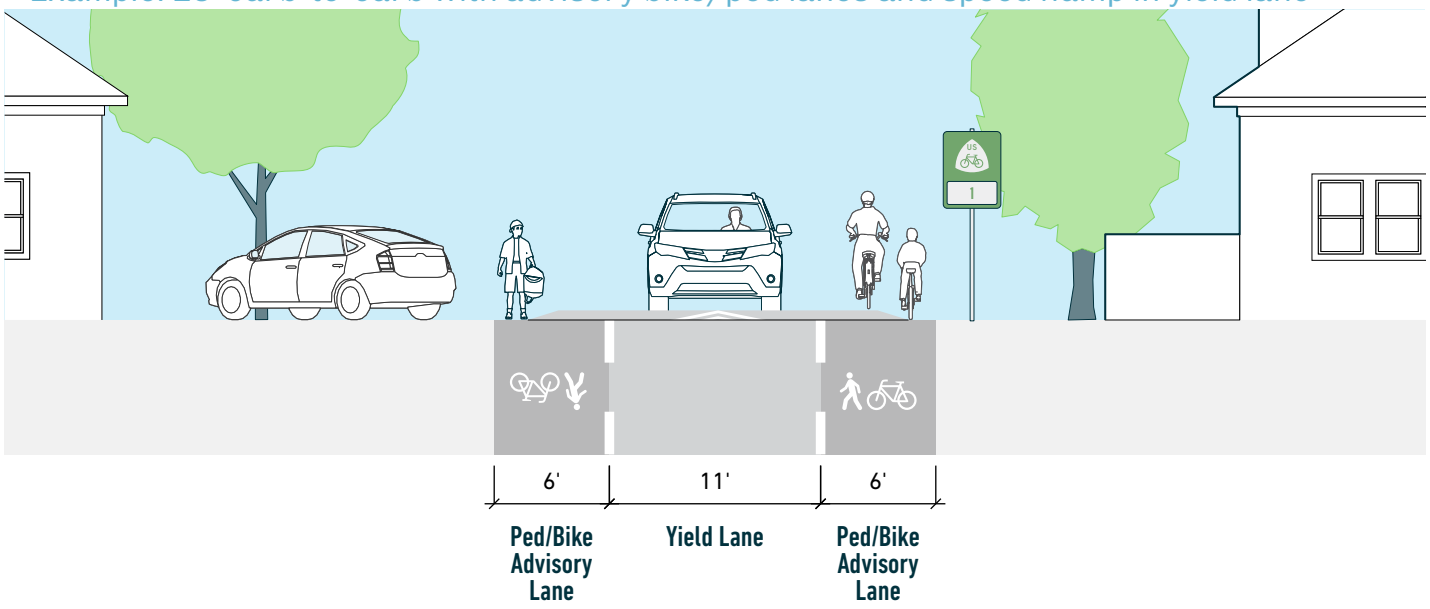
- Intersection curb radii to be minimized but accommodate parcel delivery

Neighborhood Byway

Neighborhood byways are designated local streets that provide cyclists and pedestrians a safe, convenient alternative to busier major streets and may be supplemented with trail connections or paper streets. Byways typically run parallel to and between major streets and feature safe means of crossing those bigger streets. Common attributes include traffic calming measures such chicanes, curb extensions, and speed humps; wayfinding, such as bike shared-lane markings and signage; and can include facilities such as advisory bike-ped lanes. Byways are not intended for through motor vehicle trips.

Right-of-way width	25’ - 50’, 50’ typical	**Existing curb-to-curb width**	23’ - 37’
Design speed	20 mph	**Vehicles per day**	< 2,000
Example streets	Chestnut St, SE Rd, Orlando St, Strout St, Maple St		

Example: 23’ curb-to-curb with advisory bike/ped lanes and speed hump in yield lane



Modal Priorities & Design Provisions

HIGH

- If no sidewalks are available or provided, consider advisory bike-ped lanes on each side of a central travel lane. See Bike Lanes for more.

HIGH

- Painted shared lane markings and traffic calming when sidewalks are present. Advisory bike-ped lanes and traffic calming where sidewalks are not present. See guidance under *Bike Lanes*

LOW

- Bus stops are not located on Neighborhood Byways

MED

- Reduce vehicular speed with traffic calming measures
- On-street parking as needed, which can serve as part of traffic calming

LOW

- Intersection curb radii to be minimized but accommodate parcel delivery
- Where needed, use curb extensions or diverters to restrict freight entry

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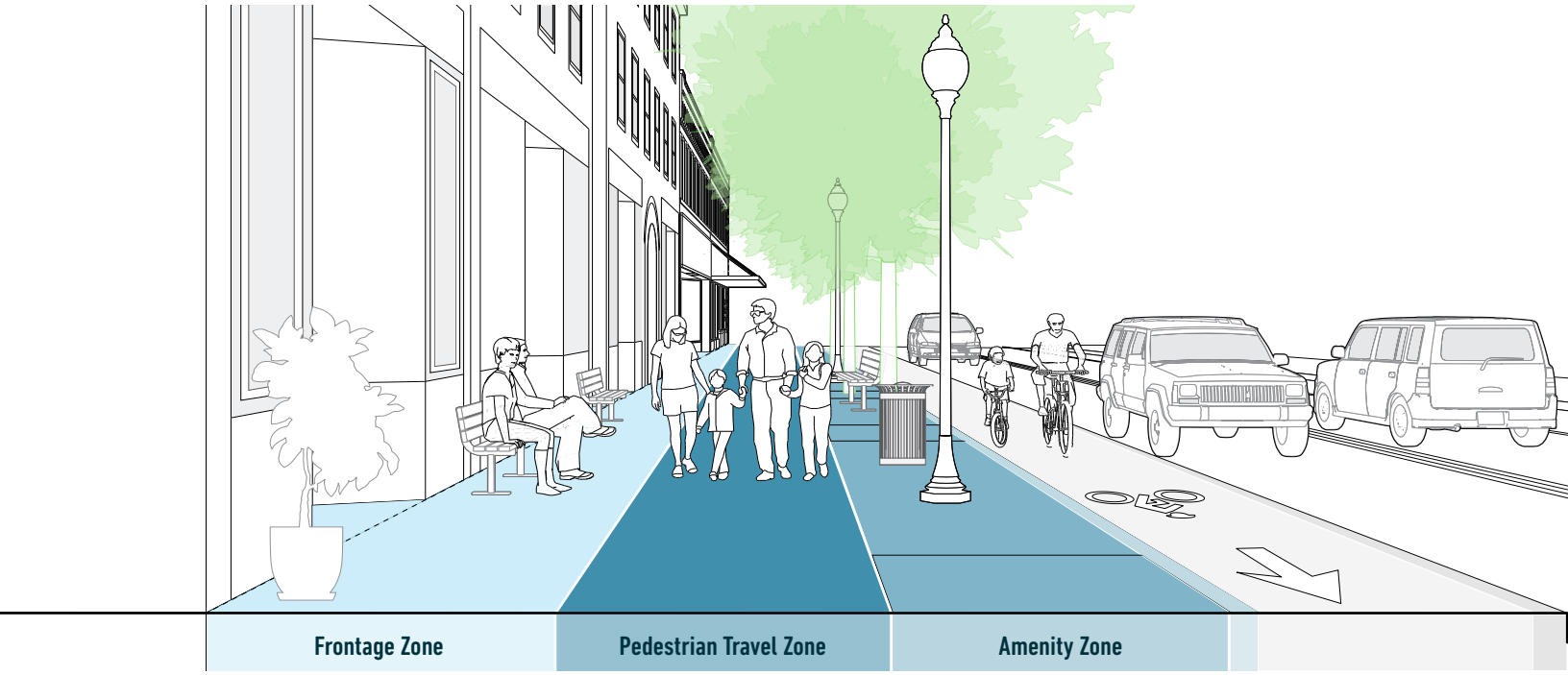
Design Elements

Sidewalks

Sidewalks are critical accessible routes that also contribute to the character of streets. Sidewalks not only allow walking or rolling access to businesses and residences, but provide space for relaxing, dining, and playing. Sidewalks always include a pedestrian zone for travel and may include amenity zones and/or frontage zones.



Typical Sidewalk Zones in South Portland

Pedestrian Travel Zone

- Used for active travel
- Keep clear of obstacles – furniture, signage, utility boxes, and utility poles
- In winter, clear snow to provide 5' minimum Pedestrian Travel Zone width on State roads, 4' minimum on City roads

Frontage Zone

- Provides buffer between pedestrians and doors, walls, and fences
- Used for commercial purposes, including benches, sidewalk cafes, outdoor retail displays, overhangs/ awnings, sandwich boards, and/or small planters

Amenity Zone

- Buffers pedestrians from vehicles and provides space for lighting, shade trees, planting, seating, trash collection, bus shelters, etc.
- Also used for benches, sidewalk cafes, outdoor retail displays, overhangs/awnings, sandwich boards, and/or small planters
- Can accommodate bike parking if 3' minimum width
- Provide snow storage space in winter
- Consider width in placement of outdoor dining, benches, and bike racks next to travel lanes, parked cars, and bike lanes
- The edge between amenity zone and bike lane can be defined with flush, vertical, or sloping curb, pavers, etc.

Requirements

- The Pedestrian Travel Zone should be a minimum of 5’ wide. Measure width from back of curb if used as full sidewalk area, whether next to travel, parking, or separated bike lanes. Per PROWAG, spot reductions to 4’ minimum are permitted. Where 4’ cannot be achieved, the sidewalk should be widened
- Provide a continuous Pedestrian Travel Zone without obstructions and a smooth, stable, and slip-resistant surface. Follow PROWAG for all aspects of sidewalk design when reconstructing streets

Considerations

- When space is limited, prioritize amenity zones over frontage zones on streets where both cafe seating and tree planting are desired
- Along transit corridors, provide shelters or waiting areas with benches and lighting. Meet ADA for depth and clear route
- At driveways or parking lot entrances, maintain the pedestrian zone as a level and continuous path. Do not lower to roadway level.
- Where feasible, provide green stormwater infrastructure (GSI) such as rain gardens to filter pollutants, reduce localized flooding, help cool streets, and improve aesthetics. GSI can be included in the amenity zone
- For all GSI and other planting areas, plant low-growing vegetation to maintain sightlines, and consider maintenance needs in plant selection
- Provide Dark Sky compliant lighting at intersections, crossings, and transit stops across all street types at a minimum. Ensure illuminance levels are compliant with Illuminating Engineering Society (IES) / 2018 AASHTO Roadway Lighting Design Guide. In commercial areas, provide a consistent lighting scheme to support evening sidewalk use
- In commercial areas, differentiate materials between the Pedestrian Travel Zone and Amenity Zone as budget allows to signal zone boundaries to pedestrians and help keep the Pedestrian Travel Zone clear of obstacles
- In unique locations and where budget allows, consider using permeable paving materials that allow stormwater runoff to infiltrate through the sidewalk and increase traction when wet

Pedestrian Travel Zone against an Amenity Zone

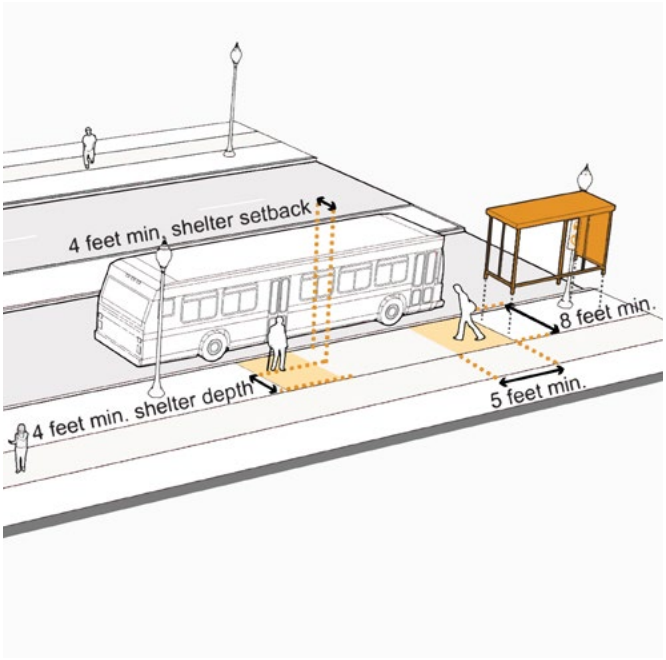
Curbside Considerations

Curbside use is an important concept to consider within street design as the curbside is the primary area of transition from one use to another. It can be said to incorporate both the sidewalk and roadway, but for the purposes of this guide, considerations for curbside use will be limited to this Sidewalk section given the many potential impacts on sidewalk widths and features.

Curbside use can include transitions to pedestrian travel or amenity zones from parking, from pickup/dropoff and loading areas, and from bus stops or, increasingly, from microtransit (see Transit Tomorrow plan listed on page 6) . Parklets may effectively expand the sidewalk into the roadway along the curb. Utility infrastructure, lighting, signage, EV charging, and fire hydrants are also frequently placed curbside. Thus, the curbside portion of a sidewalk has many demands on what is frequently a fairly narrow linear space.

Consider how to prioritize curbside use based off goals for a street and integrate with other street zones:

- Where parking or pick-up/drop-off is present with frequent turnover, consider providing extra space for entering/exiting parked vehicles outside the minimum required Pedestrian Zone. Provide 3' between parking and separated bike lanes.
- Provide 8' deep bus door entry/exit zones on the sidewalk at bus stops per PROWAG (includes the curb). It is best to provide this space as well outside the Pedestrian Zone as can be managed.
- Also provide 4' from back of curb to front edge of bus shelters per PROWAG

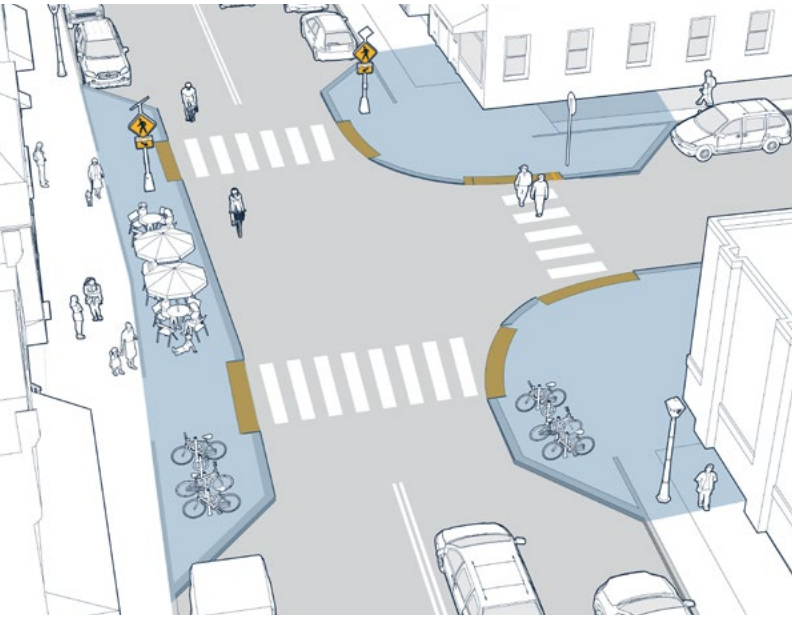


Bus stop with 8' deep door zone and accessible route between shelter and curb

- If supporting social commercial streets, several curbside uses could fall into an Amenity Zone, which could be specially paved and programmed. Parklets or bike parking could also fill an on-street parking space where sidewalk space is narrow.

Pedestrian Crossings

Pedestrian crossing design must prioritize the safety and comfort of people walking and rolling in assisted mobility devices. Safe pedestrian crossings will minimize pedestrians' exposure to vehicle traffic and maximize their visibility to drivers.



Directional crosswalks and curb extensions

Requirements

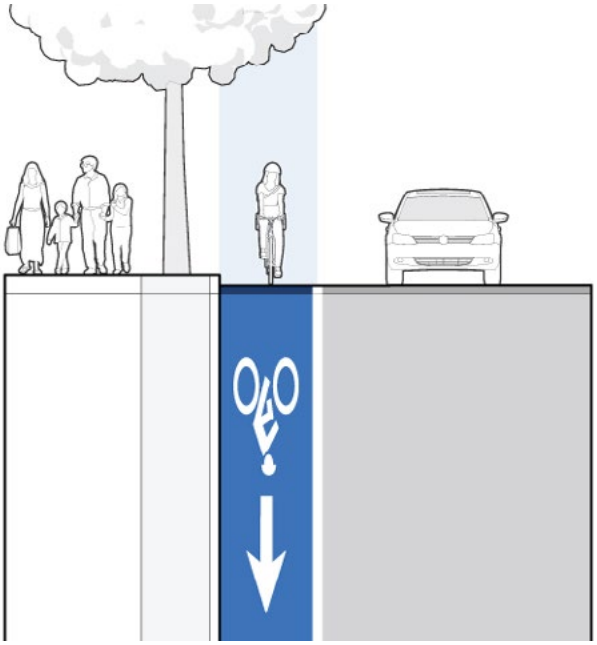
- Crosswalks should be striped at all signalized and unsignalized intersections in commercial areas. Mark crosswalks where connectors meet (e.g. City Core meeting Neighborhood Connector), at high-volume intersections, and where pedestrian demand exists midblock. Always mark crosswalks along byways as part of route navigation and on local streets along common walking routes
- Use high visibility continental crosswalk markings (known as piano keys in South Portland)
- Restrict parking at least 20' from marked crosswalks where no curb extensions exist. Curb extensions help bring pedestrians past the line of parked cars so do not require the same restriction
- Follow PROWAG for curb ramps and crossings during full reconstruction

Considerations

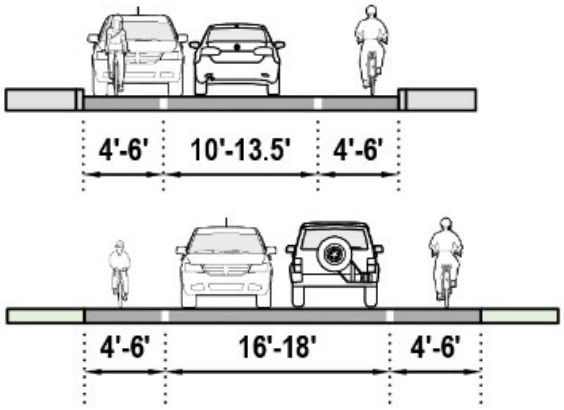
- Mark crosswalks and provide warning signage to drivers where pedestrian demand exists near trails, transit stops, schools, etc
- Add raised crosswalks at high use crossings to emphasize pedestrian priority. Design for adequate drainage
- Where crossings span multiple lanes, consider refuge islands, minimum 6' wide, to create a safe pedestrian waiting space between lanes
- Add curb extensions to reduce crossing distance, improve pedestrian visibility, and tighten curb radii to reduce vehicle turning speed
- Add Rectangular Rapid Flashing Beacons at midblock crossings to improve pedestrian visibility and slow vehicle traffic
- Prioritize directional rather than apex curb ramps to help direct pedestrians with low vision toward the next curb ramp
- Implement right-turn-on-red restrictions to prevent conflicts between right-turning vehicles, pedestrians, and cyclists. Eliminate slip lanes where possible
- Retime signals to reduce pedestrian delay and provide a sufficient walk phase for all crossings. Add Leading Pedestrian Intervals to allow pedestrians to begin crossing before vehicle traffic

Bike Lanes

Conventional bike lanes may be used to allocate space for cyclists on roadways with operating speeds ≤30 mph where insufficient right-of-way space prohibits buffered or separated lanes. Conventional bike lanes are not comfortable for cautious cyclists on roadways with traffic volumes >6000 vehicles per day. See below for considerations related to advisory bike lanes and shared lane markings.



Conventional bike lane with symbol & arrow



Advisory bike lanes (or bike/ped lanes) are 4'-6' wide between either 1) a 10'-13.5' yield lane where a vehicle may move to the curb over the bike lane to allow another car to pass, or 2) a 16'-18' lane that allows two cars to pass without entering the bike lanes. Do not use yield lanes of 13.5'-16' as these appear to be two-way but cause encroachment on bike lanes when two cars pass. Monitor FHWA evaluation for status on use of these.

Requirements

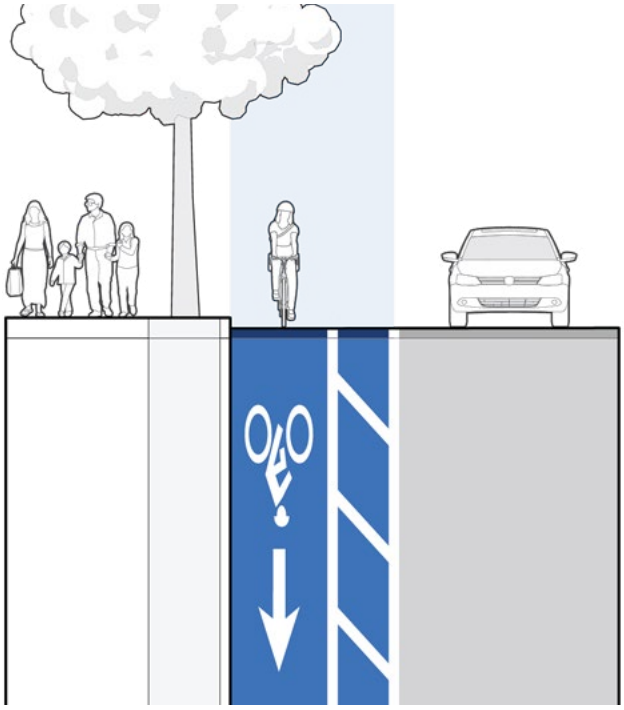
- Provide 5' minimum width bike lane, 6' preferred. 4' minimum may be used with advisory bike lanes (see left)
- Space bike symbols and arrows at intervals of 250' and no more than 50' downstream from intersections
- Provide conflict markings at intersections and major commercial driveways to signal to drivers that bicyclists may be present

Considerations

- Assess conventional bike lanes on Neighborhood and City Core Connectors with speeds ≤30 mph where ROW does not allow buffers or separated lanes
- Narrow travel lanes or remove a parking lane to allocate space for a conventional or buffered bike lane. Where space is still constrained once lanes have been narrowed or removed, shared lane markings (SLMs) may be used with speed mitigation measures to signal the presence of bicyclists. The FHWA Bikeway Selection Guide provides more information on the limitations of use for shared lane markings
- Green paint is preferred for use with conflict markings at intersections
- Use bike signage in addition to pavement markings to signal bicyclists' presence
- Where the bike lane is adjacent to guardrails or other continuous roadway elements, increase the buffer distance between the lane and element
- Use advisory bike lanes on Neighborhood Byways and Local Streets where traditional bike lanes do not fit. Shared lane markings are an additional option

Buffered Bike Lanes

Buffered bike lanes are at roadway level but separated by painted buffer zones. Buffered bike lanes provide extra space between cyclists and vehicles, creating a more comfortable facility than conventional lanes but not as comfortable as separated bike lanes.



Buffered bike lane against travel lane

Requirements

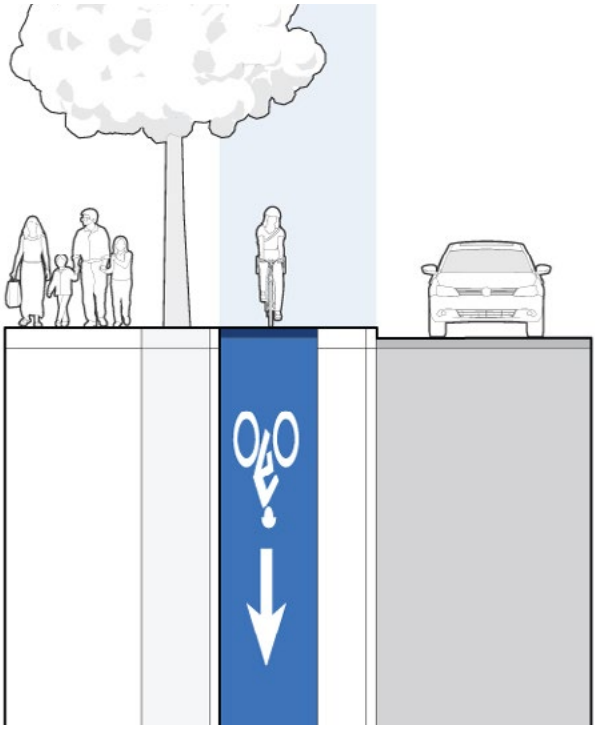
- Provide preferred 6'-7' wide bike lanes or minimum 5' bike lanes with a minimum 18" wide buffer between bike lane and travel lane where no parking is present
- Provide a preferred 3'-4' buffer or minimum 2' wide buffer between bike lane and parking for bike lanes between travel lanes and parallel parking
- Provide a buffer of 3' or greater if bike lanes are between parallel parking and the curb. This may be reduced in constrained sections to 2'
- Mark buffers with diagonal cross hatching (or chevron markings if wider than 4') at intervals of 15'-20'. Buffers of less than 2' may be shown as double white lines

Considerations

- Install buffered bike lanes where speeds are ≤30 mph on City Core Connectors, Neighborhood Connectors, and Industrial/ Business Access street types.
- Where on-street parking exists, buffers located between the bike lane and parked vehicles reduce potential for door strikes. However, consider placing the buffer to the left of the bike lane to separate cyclists from traffic where parking utilization is low (i.e. lower risk of door strikes) or cyclist speeds are low, such as a climbing lane.
- Prioritize buffers on roadways where heavy vehicles are expected
- For one-way streets, consider adding contraflow lanes opposite the direction of vehicle travel
- Provide conflict markings matching the width of the bike lane at crossings
- For rider comfort and to prevent encroachment by vehicles, two-way cycle tracks need to be separated from vehicle traffic with vertical elements and are not appropriate with painted buffers only

Separated Bike Lanes

Separated bike lanes separate cyclists from motor vehicles using vertical elements such as flexposts, curb, lighting elements, or planters in addition to horizontal buffers. Separated bike lanes can be one-way or two-way (allowing travel in both directions) cycle tracks.



Flexposts within buffer provide separation

Requirements

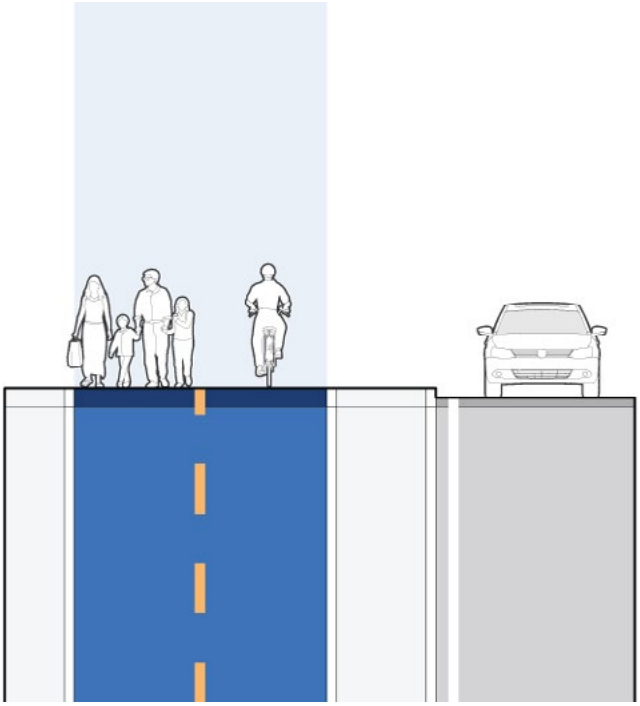
- All buffered bike lane requirements apply for separated bike lanes
- For two-way cycle tracks, a 10'-12' wide two-way lane is preferred and 8' minimum required, with a 3' minimum buffer required
- For roadway level bike lanes, provide vertical delineation with flexposts, precast concrete curb, planters, armadillos, etc. These must be kept in winter to ensure separation
- For sidewalk level bike lanes or a level between sidewalk and roadway, curb delineation is needed between bike lanes and parking/travel lanes, and a detectable edge is needed between bike lanes and sidewalk

Considerations

- Separated bike lanes are widely recommended but necessary for comfort on streets where volumes exceed 6000 vehicles per day and/or speeds are > 30mph
- Separated bike lanes are appropriate for all Connectors, and Industrial / Business Access streets
- Add vertical delineation in buffer between parking and bike lanes where parking utilization is low or potential for encroachment is high
- For sidewalk level bike facilities, provide separation between the bike lane and pedestrian zone with features such as light poles, benches, or planters to prevent pedestrian encroachment, and use materials different from the sidewalk to distinguish the bike lane
- Avoid designing short segments of two-way facilities that would require a person biking to cross the street twice to continue using the facility
- Use mountable bike lanes to add width for fire access if needed
- Implement separated facilities in areas with high numbers of vulnerable users, such a children
- Add yield markings for all conflicts with pedestrians
- Consult the MassDOT Separated Bike Lane Guide on design for separated bike lanes and pedestrian crossings at intersections
- Avoid two-way cycle tracks in commercial areas with frequent driveway locations and use

Multiuse Paths

Multiuse paths, also called shared use paths, trails, greenways, and sidepaths when directly adjacent to roadways, are paths used by all types of active transportation users including bicyclists and pedestrians. Multiuse paths provide a facility for a wider range of cyclists and a more pleasant walking experience separated from vehicle traffic for pedestrians.



Multiuse path with center line and wide buffer to travel lane

Requirements

- Follow PROWAG when designing multiuse paths
- Minimum width for two-way travel is 10', though widths of 12' or greater are ideal. A minimum 8' width may be used in highly constrained spot locations but is discouraged for long segments
- Provide lighting for visibility and safety of users
- At intersection and midblock crossings, provide, at a minimum, crosswalk markings and signage, plus pedestrian signals at signalized intersections

Considerations

- Provide 2' clear width on either side of the path for full capacity use
- Vertically separated multiuse paths should be prioritized for use on Greenbelt Path streets, Primary Connectors, and for Industrial/ Business Access streets.
- 6' buffers between paths and vehicles are preferred
- In areas where pedestrians are a large portion of the user group and right-of-way allows, prioritize separate paths for cyclists and pedestrians. Design intersection crossings for both pedestrian and cyclist use. Consult the MassDOT Separated Bike Lane Guide for more information
- Multiuse path design at intersections requires highly visible conflict markings and long sightlines, as drivers are less aware of cyclists in the oncoming direction
- Implement measures to enforce path right of way for both vehicles and path users such as yield markings, raised crossings, and signage or beacons for vehicles where sight lines are limited
- Add a center line for directional separation
- Provide amenities along the path such as benches and trash cans for an improved user experience. Provide landscaping and trees to shade users and wayfinding signage

Traffic Calming

Traffic Calming is a system of treatments that can be employed to reduce speeds. Some traffic calming, such as planters and green infrastructure, can contribute to a sense of place. Many of the techniques described below are most appropriate for use on Local and City Core Slow Streets and are a key component of Neighborhood Byways.

Neckdown with planted curb extension on one side and contraflow bike lane

Speed cushions reduce vehicle speeds while emergency vehicles pass unaffected

Planted chicane. Separate chicanes from the curb for drainage if needed

Requirements

- Design so people walking, biking, in a wheelchair, or pushing a stroller are able to move without obstruction
- Design for a speed of 15 mph where there are frequent conflicts between children playing and motorists. Place advisory speed signs to alert motorists to reduced speeds
- Apply a series of treatments throughout an entire street or network rather than disconnected stand-alone treatments to see the greatest speed reduction. Making network-level design decisions will also help avoid diverting traffic from one local street to another

Considerations

- Engage the surrounding neighborhoods to determine traffic safety issues and effective traffic calming measures
- Conduct demonstration projects with paint and other quick-build materials to illustrate and test potential long-term changes. See the MaineDOT Procedures for Implementing Demonstration Projects on State or State-aid streets. The following references may assist in design and materials selection:
  - Burlington Public Works Quick Build Design + Materials Standards
  - Tactical Urbanist's Guide to Materials and Design

- Use planters, art elements, and green infrastructure to improve aesthetics and place-making
- Assess maintenance needs, winter weather cleanup, and utilities when selecting traffic calming measures
- Visual measures, such as painting every other stripe in a crosswalk or playful patterns in neckdowns, can provide visual cues for vehicles while enlivening streets and expressing neighborhood character
- Use raised crossings to slow vehicles, express priority for pedestrians, and eliminate the need for pedestrians to navigate curb ramps
- Implement speed humps, speed cushions, chicanes, driver feedback signs, and neighborhood traffic circles to slow vehicle traffic
- Neighborhood Byways, described on page 21, are priority streets for temporary or permanent traffic calming features and wayfinding signage

Neighborhood traffic circles with planting can help slow and beautify streets

Driver feedback signs can help slow drivers by alerting them to their speed

Raised crosswalks give pedestrians priority while helping to slow drivers

Vehicle Parking

Vehicle parking includes on-street parking for passenger vehicles, loading and deliveries, and pick-up/drop-off areas. Vehicle parking is provided parallel to the curb. Sightlines around parked vehicles and space between doors and other users is of the utmost importance.

Parking set 20' from crosswalk with striping and flexposts to increase sightlines

Requirements

- Parallel parking spaces should typically be 20' long and 8' wide, or 7' wide next to separated bike lane buffers. Use 8' in areas with on-street loading
- Accessible parking spaces must be provided for marked or metered on-street parking. Consult PROWAG
- Provide a preferred 3' buffer (minimum 2') between parking and 5' minimum bike lanes when bike lanes are separated/against the curb
- On pavement maintenance projects, 20' long spaces should be striped and blocked with vertical delineation between parking and crosswalks, as shown in the image above. These spaces are less needed with curb extensions when completing curb work or street reconstruction

Considerations

- If off-street parking is available, prioritize sidewalk width or bike lane width over on-street parking
- Maximum 9' wide parking may be used in Industrial / Business Access street types where large freight trucks frequently park on-street
- Stripe parking spaces in areas with high on-street parking utilization
- Underutilized parking contributes to wide open streets that encourage speeding. Consider removing parking and reducing open pavement in these areas
- Where parking is between bike lanes and the curb, 2'-3' buffers between parking and bike lanes are preferred to prevent dooring. If parking turnover is high, consider separated bike lanes against the curb over buffered
- For separated bike lanes, add vertical delineation in buffer between parking and bike lanes where parking utilization is low or potential for encroachment is high
- Add wayfinding signs in busy areas to the nearest off-street parking
- Implement parking time limits in busy areas to increase turnover
- On slower neighborhood streets with parking on one side, consider alternating the parking on each side of the road to create a chicane effect for slower vehicle speeds
- Provide vehicle or pedestrian scale lighting near vehicle parking for the safety of users

Bike Parking

Bike parking allows people to lock and leave their bicycles (plus e-bikes and e-scooters), enhancing the bike network for commuting, errands, and recreation. Bike parking design should be simple and easy to use, secure, and dimensioned to provide space for a diversity of bikes while maximizing capacity and being visually appealing.

Bike parking in an on-street parking space with racks on the sidewalk parallel to the curb

Requirements

- Install in amenity zone, curb extensions, or in on-street parking spaces blocked off for bike parking use
- Set racks at least 2' from the curb (3' preferred) if oriented parallel to the curb. Set 3' minimum, 4' preferred, if racks are angled or perpendicular to the curb
- Place racks at least 3' apart (4' for parallel racks) and 4' from streetscape elements and building corners
- Place racks at a minimum of 8' from fire hydrants
- Securely attach to a paved, level surface with in-ground mounting or bolts

Considerations

- Provide parking in commercial and downtown areas, in addition to high-density residential streets with multi-family housing
- Locate near transit hubs or stops
- Rack style should allow bikes of all shapes and sizes to be locked with two points of contact
- Where there is no curbside space, consider using a vehicle parking space, which can hold 8-10 bikes
- Add bike repair stands near bike parking areas
- Review manufacturer's recommendations for clear space when installing a particular piece of equipment

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3. MaineDOT Guidelines on Crosswalks
https://www.maine.gov/mdot/mlrc/docs/trafficissues/2022/MaineDOT%20Updated%20Crosswalk%20Policy%20%28August31%29revisions.pdf

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5. Transit Together Final Report (December 2022), Greater Portland Council of Governments
https://www.transittogether.org/_files/ugd/8365a2_5434a9c7391340a9bb8527bfadb0216c.pdf

6. Connect 2045, A Long Range Transportation Plan for Greater Portland, Maine
Adopted by PACTS Policy Board
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7. Regional Bicycle and Pedestrian Facility Design Guidance for the PACTS Metropolitan Planning Area
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8. Vision Zero Greater Portland Action Plan, Adopted by PACTS Policy Board
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9. Complete Streets Policy Adopted by PACTS Policy Board
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12. The FHWA Bikeway Selection Guide
https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf

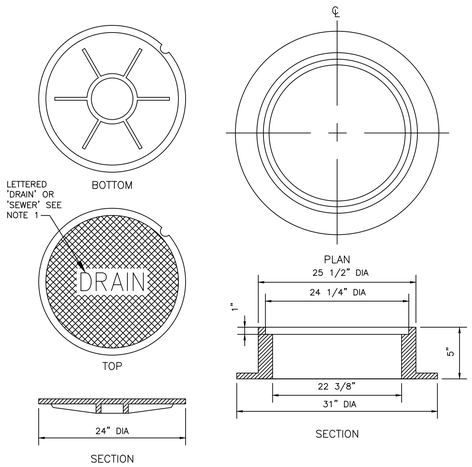
13. MassDOT Separated Bike Lane Guide
https://www.mass.gov/lists/separated-bike-lane-planning-design-guide

14. MaineDOT Procedures for Implementing Demonstration Projects
https://www.maine.gov/mdot/engineering/docs/policies/2021/Procedure%20for%20Implementing%20Demonstration%20Project%20and%20Non-project%20Related%20Roadway%20Changes.pdf

15. Quick Build Design + Materials Standards, Burlington Public Works
https://www.burlingtonvt.gov/sites/default/files/QUICK_BUILD%20GUIDE_0.pdf

16. Tactical Urbanist's Guide to Materials and Design, http://tacticalurbanismguide.com/

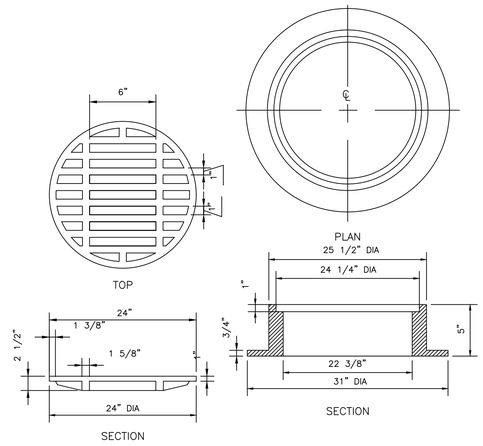
Appendices



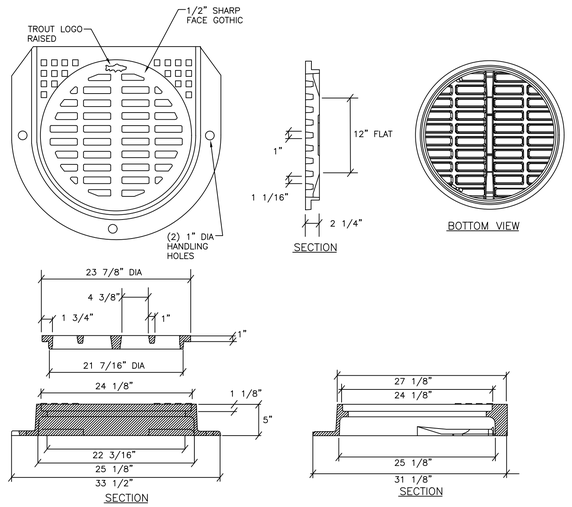
NOTES:

1. DRAIN MANHOLES COVERS SHALL BE LETTERED 'DRAIN'
2. SEWER MANHOLES COVERS SHALL BE LETTERED 'SEWER'

MANHOLE
STANDARD COVER & FRAME
N.T.S.



CATCH BASIN
STANDARD COVER & FRAME
N.T.S.



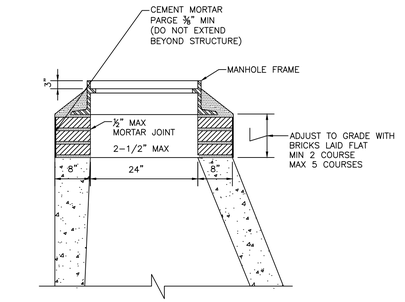
FRAME DETAIL

TYPE "D" – FRAME & COVER

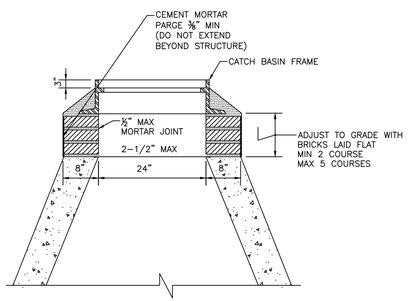
NOTES:

1. 4'–0" I.D. TYPICAL. SOME STRUCTURES MAY REQUIRE LARGER I.D. PROVIDE SHOP DRAWINGS FOR APPROVAL.
2. DRAINAGE STRUCTURES TO BE DESIGNED FOR H–20 LOADING.
3. PIPE SIZES AND INVERTS AS NOTES ON PLANS.

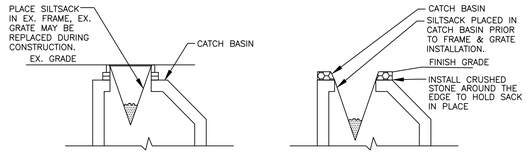
CATCH BASIN COVER AND FRAME FOR GRANITE HEADSTONE
NOT TO SCALE

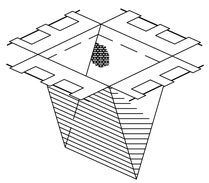


MANHOLE
FRAME INSTALLATION
NTS



TYPICAL CATCH BASIN
FRAME INSTALLATION
NTS



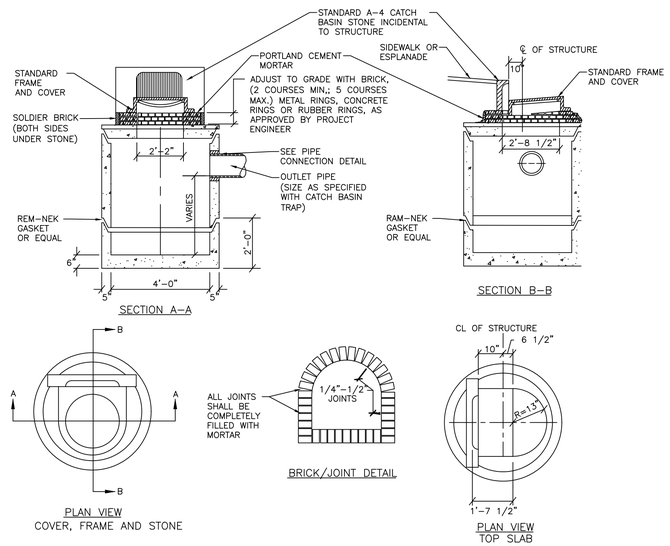


SILT SACK PROTECTION

NOTES:

PRIOR TO FINAL GRADING AND PAVING OPERATIONS BEGIN A CATCH BASIN INSERT (SUCH AS A SILT SACK OR A DANDY BAG II) MUST BE INSTALLED IN EACH BASIN PER MANUFACTURES INSTRUCTIONS. HAY BALES SHOULD BE REMOVED ONCE INSERTS ARE INSTALLED.

CATCH BASIN PROTECTION DETAIL
(FOR PAVED AREAS)
NTS



PRECAST CONCRETE CATCH BASIN – TYPE "A–1–P"

1. GRANITE HEADSTONE IS INCIDENTAL TO COST OF STRUCTURE NO SEPARATE PAYMENT WILL BE MADE FOR HEADSTONES.

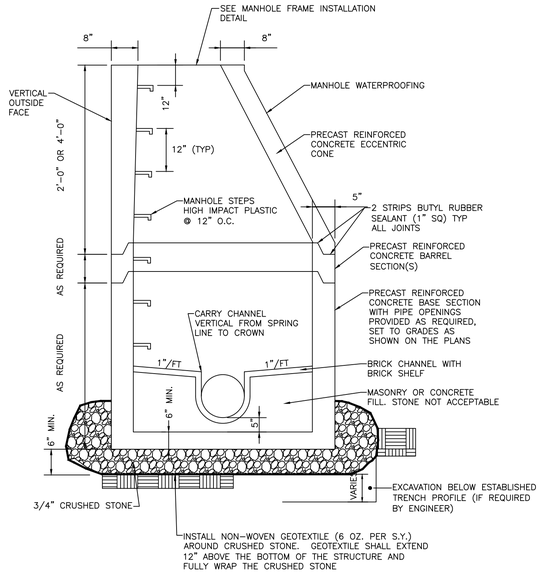
DATE	
APP'D	
REVISIONS	
DRAWN BY	TAP
CHECKED BY	CBW
DATE	–
APPROVED BY	CBW
DATE	–
PROJECT NO.	–
SCALE	AS NOTED

City of South Portland
Water Resource Protection
111 Waterman Drive
PO Box 9422
South Portland, ME 04116-9422
Ph # 207–767–7675
Fax # 207–767–5697

CITY OF SOUTH PORTLAND
STANDARD ROADWAY DETAILS

TYPICAL ROADWAY DETAILS I

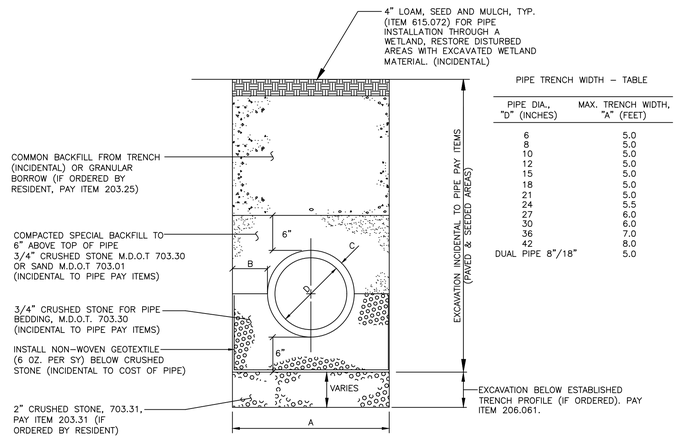
DWG
D1



NOTES:

1. MANHOLE CHANNELS REQUIRING CHANGE IN ALIGNMENT ARE TO BE BUILT ON A SMOOTH RADIUS. IF SIDE PIPES ENTER CHANNEL, SHAPE TO RECEIVE ADDED SIDE FLOW.
2. USE FLAT SLAB TOP MANHOLE WHEN THE DIFFERENCE BETWEEN INVERT AND RIM IS LESS THAN 6'-0" AND WHEN MANHOLE DIAMETER IS GREATER THAN 4'-0".
3. ALL BACKFILL WITHIN 3 FEET OF STRUCTURE SHALL BE SELECT FILL PLACED IN 8" MAXIMUM LIFTS.
4. ALL PIPES ENTERING MANHOLE STRUCTURE SHALL HAVE A FLEXIBLE PIPE CONNECTION WITH STAINLESS STEEL BANDS. FILL ANNULAR SPACE WITH NON-SHRINK GROUT.

TYPICAL SEWER AND DRAIN MANHOLE
N.T.S.



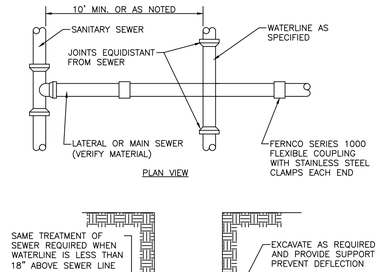
PIPE TRENCH WIDTH – TABLE

PIPE DIA., "D" (INCHES)	MAX. TRENCH WIDTH, "A" (FEET)
6	5.0
8	5.0
10	5.0
12	5.0
15	5.0
18	5.0
21	5.0
24	5.5
27	6.0
30	6.0
36	7.0
42	8.0
DUAL PIPE 8"/18"	5.0

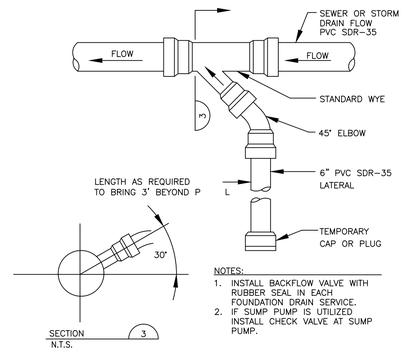
PIPE INSTALLATION DETAIL – NOTES

1. DIMENSION "B" SHALL BE SUFFICIENT TO ALLOW CRUSHED STONE BEDDING TO BE PLACED AND COMPACTED UNDER THE HAUNCHES OF THE PIPE; BUT IN ALL CASES "B" SHALL BE AT LEAST 9".
2. DIMENSION "A" IS THE MAXIMUM WIDTH ALLOWED FOR CALCULATING PAY QUANTITIES UNDER ITEMS 206.061 STRUCTURAL EARTH EXCAVATION, BELOW GRADE AND 206.17 STRUCTURAL ROCK EXCAVATION. DIMENSION "A" SHALL BE BASED ON PIPE DIAMETER, AS SET FORTH IN THE PIPE TRENCH WIDTH TABLE.
3. LOAM AND SEED SHALL BE INCIDENTAL TO THE COST OF THE PIPE

TYPICAL CROSS COUNTRY PIPE TRENCH SECTION
N.T.S.



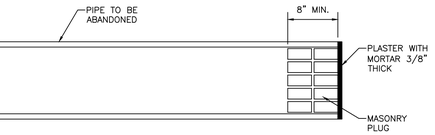
WATERLINE / SANITARY SEWER CROSSING
N.T.S.



NOTES:

1. INSTALL BACKFLOW VALVE WITH RUBBER SEAL IN EACH FOUNDATION DRAIN SERVICE.
2. IF SUMP PUMP IS UTILIZED INSTALL CHECK VALVE AT SUMP PUMP.

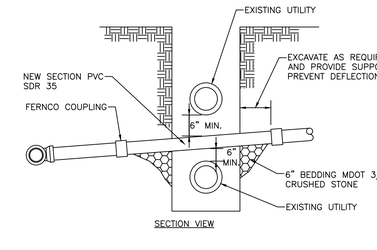
SEWER / FOUNDATION DRAIN SERVICE CONNECTION
N.T.S.



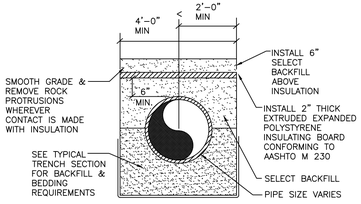
NOTES:

1. PIPE PLUGS SHALL BE INSTALLED TO THE SATISFACTION OF THE CITY ENGINEER.
2. BACKFILL IS TO BE EITHER FLOWABLE BACKFILL OR FINE AGGREGATE.
3. CAP PVC PIPE.

ABANDONED PIPE PLUG DETAIL
N.T.S.



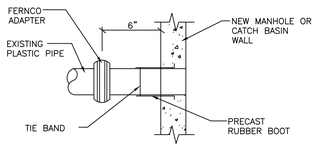
STORM DRAIN / SANITARY SEWER CROSSING
N.T.S.



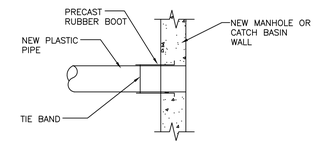
NOTES:

1. USE AT ALL LOCATIONS WHERE LESS THAN 3' OF COVER.
2. INSULATION SHALL EXTEND THE FULL WIDTH OF THE TRENCH. 4'-0" MIN FOR PIPES UP TO 24" DIA., 6'-0" MIN PIPES GREATER THAN 24" DIA.

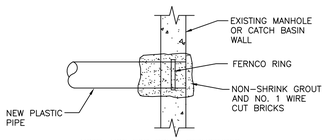
PIPE INSULATION DETAIL
N.T.S.



METHOD 1– EXISTING PIPE INTO NEW STRUCTURE

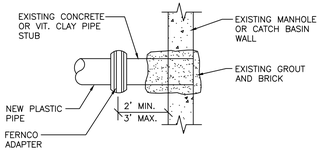


METHOD 2– NEW CONSTRUCTION



NOTE: USE FOR BRICK STRUCTURES.

METHOD 3– NEW PIPE INTO EXISTING STRUCTURE

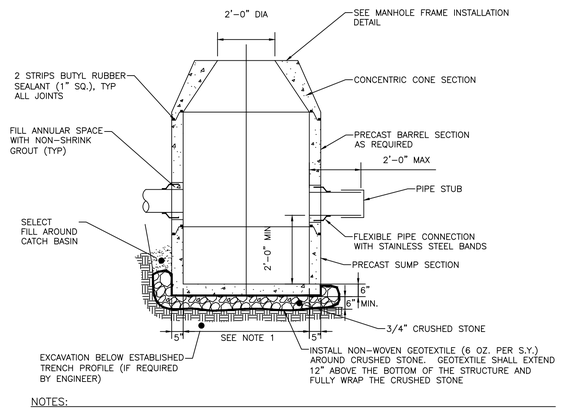


NOTE:

1. USE ONLY IF APPROVED IN FIELD BY THE INSPECTION ENGINEER.

METHOD 4– NEW PIPE INTO EXISTING STUB

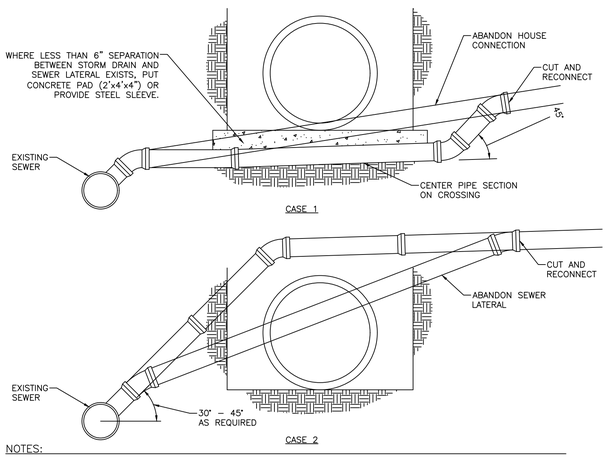
PLASTIC PIPE CONNECTIONS
N.T.S.



NOTES:

1. USE FLAT SLAB TOP MANHOLE WHEN THE DIFFERENCE BETWEEN INVERT AND RIM IS LESS THAN 6'-0" AND WHEN MANHOLE IS GREATER THAN 4'-0" IN DIAMETER. PROVIDE SHOP DRAWINGS OF ALL STRUCTURES.
2. DRAINAGE STRUCTURES TO BE DESIGNED FOR H-20 LOADING.
3. PIPE SIZES AND INVERTS AS NOTED ON PLANS.
4. CATCH BASIN AND DRAINAGE MANHOLES SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH CITY OF SOUTH PORTLAND PLANNING BOARD REGULATION 10.D AS INCORPORATED INTO THE CONSTRUCTION SPECIFICATIONS.
5. ALL BACKFILL WITHIN 3 FEET OF STRUCTURE SHALL BE SELECT FILL PLACED IN 8" MAXIMUM LIFTS. COMPACT EACH LIFT TO 95% OPTIMUM DENSITY.

TYPICAL CATCH BASIN
N.T.S.



NOTES:

1. ADJUSTED SEWER LATERAL CONNECTIONS SHALL BE SDR-35 PIPE. MATCH EXISTING LATERAL DIAMETER.
2. THE MINIMUM SLOPE FOR CONNECTIONS SHALL BE 1/4" PER FOOT.
3. A SADDLE SHALL BE USED WHERE NECESSARY AND SHALL BE CONNECTED TO THE PIPE CONSTITUTING EXISTING Y OR T, OR THE NEXT LOWER PIPE LENGTH.
4. Y'S MAY BE LAID "FLAT" UPON APPROVAL BY THE CITY OF SOUTH PORTLAND.
5. USE FERNCO SERIES 1000 FLEXIBLE COUPLING FOR CONNECTION TO NON-PVC PIPES.
6. RECONNECTIONS OF EXISTING LATERIALS TO THE NEW 8" SANITARY SEWER IS INCIDENTAL TO THE SEWER.
7. RECONNECTION OR ADJUSTMENTS TO EXISTING LATERALS THAT CONFLICT WITH THE NEW SEWER TRUNKLINE OR FORCE MAIN WILL BE PAID AT THE CONTRACT UNIT PRICE PER FOOT WHICH INCLUDES ALL PIPE, FITTINGS, EXCAVATION AND TRENCH REPAIR.

SEWER LATERAL ADJUSTMENT
N.T.S.

REVISIONS	DATE	APP'D

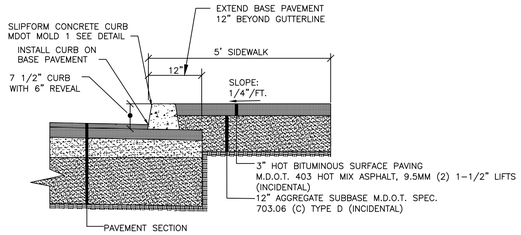
DRAWN BY TAP
CHECKED BY CBW
DATE –
APPROVED BY CBW
DATE –
PROJECT NO. –
SCALE AS NOTED

Water Resource Protection
111 Waterman Drive
P.O. Box 9422
South Portland, ME 04116-9422
Ph # 207-767-7675
Fax # 207-767-5697

CITY OF SOUTH PORTLAND
STANDARD ROADWAY DETAILS

TYPICAL ROADWAY DETAILS II

DWG
D2

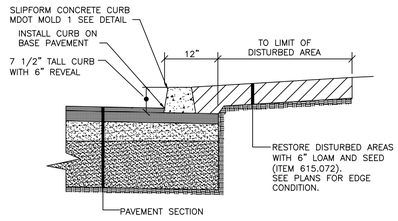


NOTES:

1. COMPACT GRAVEL SUBBASE, BASE COURSE TO 95% OF MAXIMUM DENSITY USING HEAVY ROLLER COMPACTION.
2. CONTRACTOR SHALL SET GRADE STAKES MARKING SUBBASE AND FINISH GRADE ELEVATIONS FOR CONSTRUCTION REFERENCE.
3. ALL EXCAVATION & SUBBASE GRAVEL AND BITUMINOUS PAVING FOR SIDEWALKS IS INCIDENTAL TO THE CONTRACTORS SQUARE YARD PRICE UNDER ITEM 608.50.

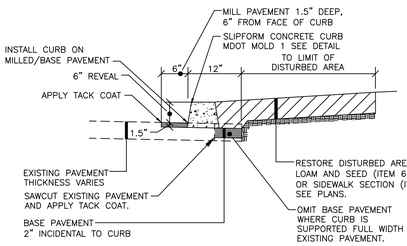
BITUMINOUS SIDEWALK & SLIPFORM CONCRETE CURB AT RE-PAVED ROAD

NTS



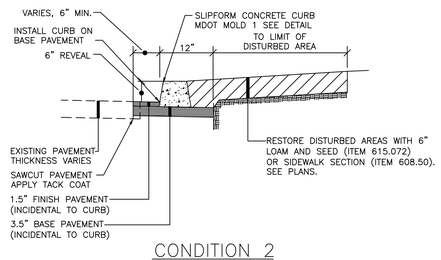
SLIPFORM CONCRETE CURB AT RE-PAVED ROAD

NTS



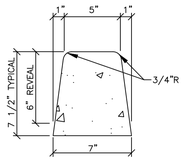
CONDITION 1
TYPICAL SLIPFORM CONCRETE CURB AT EXISTING PAVEMENT

NTS



CONDITION 2
TYPICAL SLIPFORM CONCRETE CURB AT EXISTING PAVEMENT

NTS

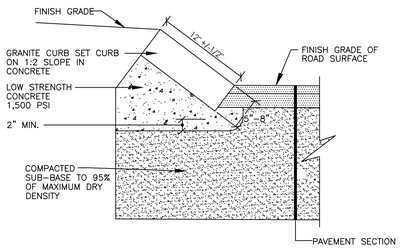


NOTES:

1. CONTRACTOR SHALL SUBMIT MOLD DIMENSIONS FOR APPROVAL BY ENGINEER PRIOR TO CONSTRUCTION.

TYPICAL SLIPFORM CONCRETE CURB MOLD

NTS

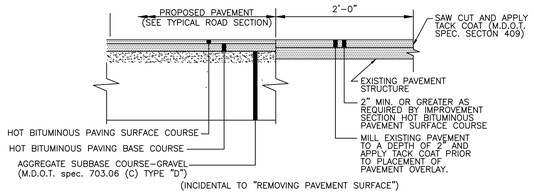


NOTES:

1. EXCAVATION SHALL BE INCIDENTAL TO THE CURBING ITEMS
2. THE AGGREGATE SUBBASE GRAVEL AND LOW STRENGTH CONCRETE FOR BEDDING THE CURB SHALL BE CONSIDERED INCIDENTAL TO THE CURBING ITEMS
3. SUBGRADE SHALL BE COMPACTED TO A FIRM EVEN SURFACE PRIOR TO SETTING OF CURB

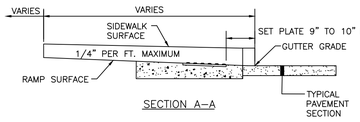
TYPE 5 CURB INSTALLATION

NTS

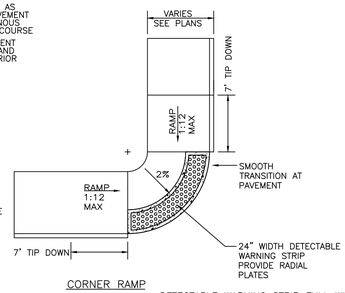


TYPICAL PAVEMENT JOINT

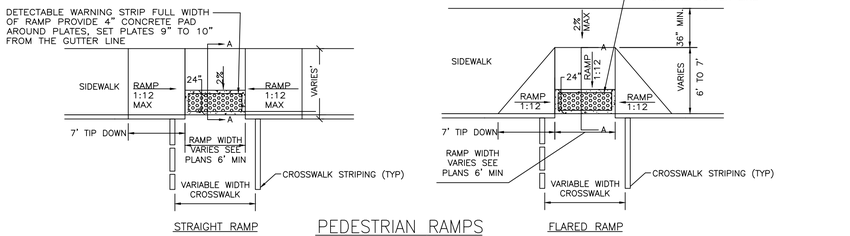
N.T.S.



SECTION A-A

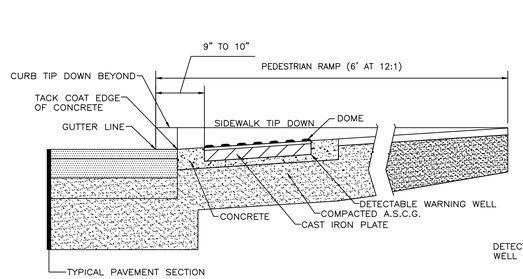


CORNER RAMP

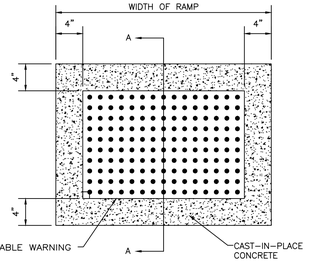


PEDESTRIAN RAMPS (BITUMINOUS SIDEWALK/CONCRETE CURB)

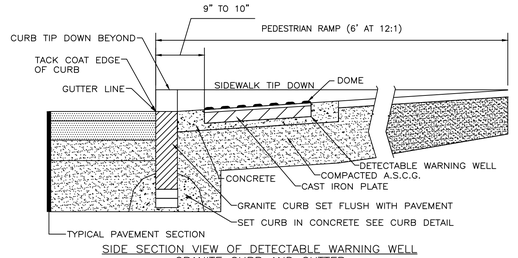
N.T.S.



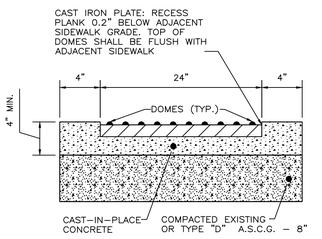
SIDE SECTION VIEW OF DETECTABLE WARNING WELL
SLIPFORM CURB AND GUTTER AND BITUMINOUS SIDEWALK



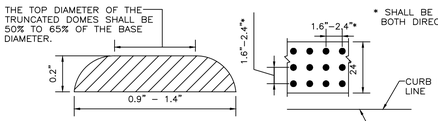
PLAN VIEW OF DETECTABLE WARNING AND WELL



SIDE SECTION VIEW OF DETECTABLE WARNING WELL
GRANITE CURB AND GUTTER



SECTION A-A



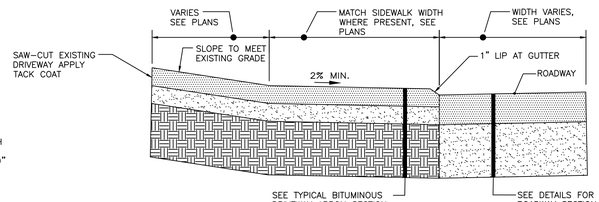
DOME AND DETECTABLE WARNING DETAILS

NOTES:

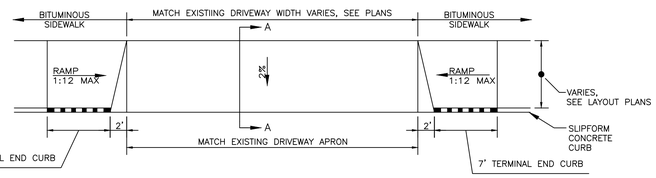
1. ALL DETECTABLE WARNING AREAS SHALL START 9" - 10" FROM THE FLOW LINE OF THE CURB, BE 24" IN DEPTH, AND COVER THE COMPLETE WIDTH OF THE RAMP AREA ONLY.
2. DETECTABLE WARNING PLATES SHALL BE:
   A. DURALAST DETECTABLE WARNING PLATES (NATURAL FINISH) BY EAST JORDAN IRON WORKS
   B. R-4984 DETECTABLE WARNING PLATES (NATURAL FINISH) BY NEENAH FOUNDARY COMPANY, OR EQUAL.
   C. DETECTABLE WARNING PLATES (NATURAL FINISH) BY PIONEER DETECTABLE, LLC

VIEWS AND DETAILS OF THE DETECTABLE WARNING AREAS

N.T.S.



SECTION A-A



BITUMINOUS DRIVEWAY APRON

NOT TO SCALE

DRAWN BY	BVD
CHECKED BY	DLR
DATE	-
APPROVED BY	DLR
DATE	-
PROJECT NO.	-
SCALE	AS NOTED

REVISIONS

APP'D

DATE

Water Resource Protection
111 Waterman Drive
P.O. Box 9422
South Portland, ME 04116-9422
Ph # 207-767-7675
Fax # 207-767-5697

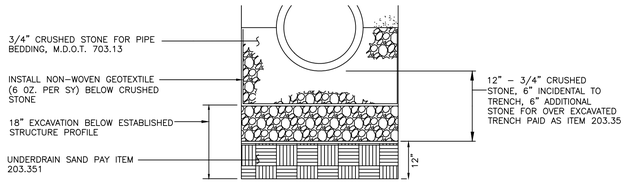
City of South Portland

CITY OF SOUTH PORTLAND
STANDARD ROADWAY DETAILS

TYPICAL ROADWAY DETAILS III

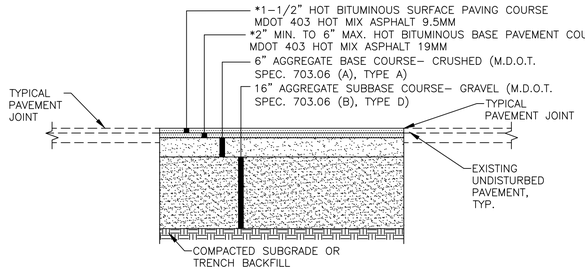
DWG
D3

Appendix A - Typical Construction Details



TRENCH BOTTOM DETAIL – SOFT SOILS (OVERDEPTH)

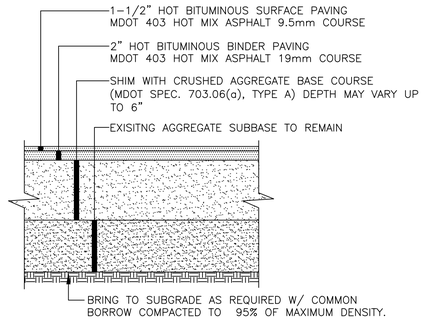
N.T.S.



NOTES:
1. *HOT BITUMINOUS BASE PAVEMENT COURSE SHALL MATCH THE BOTTOM OF THE EXISTING PAVEMENT SECTION INCLUDING COBBLESTONES WHEN PRESENT, UP TO A MAXIMUM OF 6" THICKNESS.
2. DEPTH OF BASE AND BASE GRAVEL SHALL MATCH GREATER OF EXISTING CONDITIONS OR THE DIMENSIONS SHOWN.
3. COMPACT GRAVEL SUBBASE, BASE COURSE TO 95% OF MAXIMUM DENSITY USING HEAVY ROLLER COMPACTION.
4. CONTRACTOR SHALL SET GRADE STAKES MARKING SUBBASE AND FINISH GRADE ELEVATIONS FOR CONSTRUCTION REFERENCE.
5. BINDER PAVING SHALL BE INCREASED TO 3" THICKNESS FOR ROADS CLASSIFIED AS INDUSTRIAL.

LOCAL ROAD FULL DEPTH PAVEMENT RECONSTRUCTION

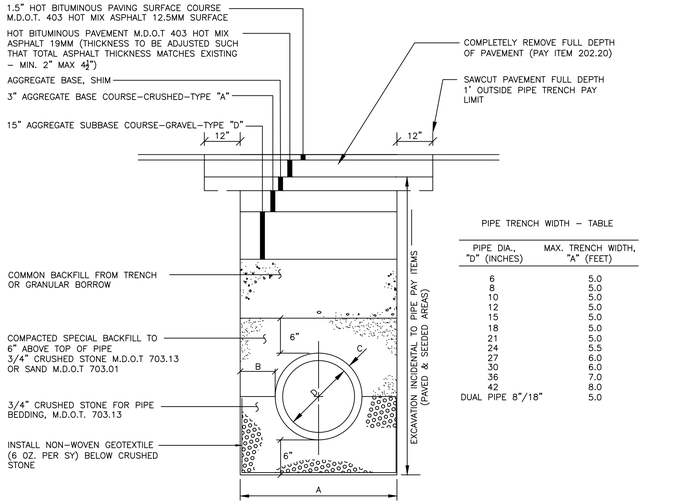
N.T.S.



NOTES:
1. COMPACT GRAVEL SUBBASE, BASE COURSE TO 95% OF MAXIMUM DRY DENSITY USING HEAVY ROLLER COMPACTION.
2. CONTRACTOR SHALL SET GRADE STAKES MARKING SUBBASE AND FINISH GRADE ELEVATIONS FOR CONSTRUCTION REFERENCE.
3. BINDER PAVING SHALL BE INCREASED TO 3" THICKNESS FOR ROADS CLASSIFIED AS INDUSTRIAL.

LOCAL ROAD PARTIAL DEPTH PAVEMENT RECONSTRUCTION

N.T.S.



PIPE TRENCH WIDTH – TABLE

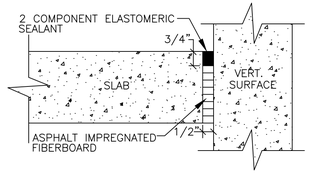
PIPE DIA., "D" (INCHES)	MAX. TRENCH WIDTH, "A" (FEET)
6	5.0
8	5.0
10	5.0
12	5.0
15	5.0
18	5.0
21	5.0
24	5.5
27	6.0
30	6.0
36	7.0
42	8.0
DUAL PIPE 8"/18"	5.0

PIPE INSTALLATION DETAIL – NOTES

1. DEPTH OF BASE AND BASE GRAVEL SHALL MATCH GREATER OF EXISTING CONDITIONS OR THE DIMENSIONS SHOWN.
2. DIMENSION "B" SHALL BE SUFFICIENT TO ALLOW CRUSHED STONE BEDDING TO BE PLACED AND COMPACTED UNDER THE HAUNCHES OF THE PIPE; BUT IN ALL CASES "B" SHALL BE AT LEAST 9".
3. DIMENSION "A" IS THE MAXIMUM WIDTH ALLOWED FOR CALCULATING PAY QUANTITIES UNDER ITEMS 203.35 CRUSHED STONE, 203.25 GRANULAR BORROW, 206.061 STRUCTURAL EARTH EXCAVATION, BELOW GRADE, 206.17 STRUCTURAL ROCK EXCAVATION, 304.10 AGGREGATE SUBBASE TYPE D, AND 304.14 AGGREGATE BASE TYPE A. DIMENSION "A" SHALL BE BASED ON PIPE DIAMETER, AS SET FORTH IN THE PIPE TRENCH WIDTH TABLE.
4. BACKFILL COMPACTED TO 95% OPTIMUM DENSITY.
5. ALL EXCAVATION, TRENCH SUPPORT AND DEWATERING IF REQUIRED IS INCIDENTAL TO THE COST OF THE PIPE AND NO SEPARATE PAYMENT WILL BE MADE.
6. ADDITIONAL AGGREGATE BASE AS REQUIRED TO SHIM AND RE–GRADE THE ROAD BASE SHALL BE PAID UNDER ITEM 304.14
7. BASE PAVEMENT 2.5" HOT BITUMINOUS PAVING 19MM SHALL BE PAID AS ITEM 403.207
8. FINISH PAVEMENT 1.5" HOT BITUMINOUS PAVING 12.5MM SURFACE SHALL BE PAID AS ITEM 403.208.
9. 3/4" CRUSHED STONE BEDDING, SPECIAL BACKFILL TO 6" ABOVE TOP OF PIPE IS INCIDENTAL TO PIPE ITEMS.

PIPE INSTALLATION – PARKING LOT

N.T.S.



ISOLATION JOINT

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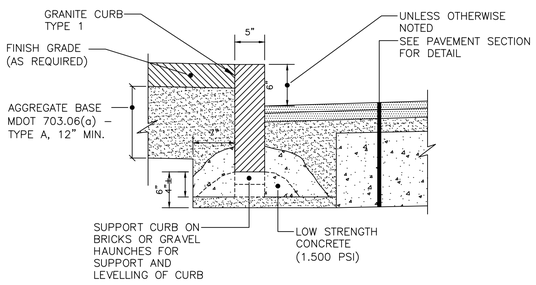
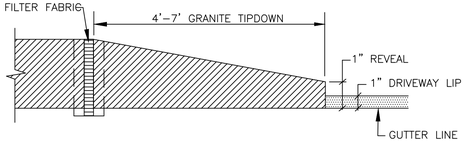


NOTES:
1. EXCAVATION SHALL BE INCIDENTAL TO THE CURBING ITEMS
2. THE CRUSHED BASE AGGREGATE GRAVEL AND LOW STRENGTH CONCRETE FOR BEDDING THE TYPE 1 CURB SHALL BE CONSIDERED INCIDENTAL TO THE CURBING ITEMS.
3. SUBGRADE SHALL BE COMPACTED TO A FIRM EVEN SURFACE PRIOR TO SETTING OF CURB

TYPE I GRANITE CURB INSTALLATION

N.T.S.



TYPICAL TIPDOWN CURB INSTALLATION

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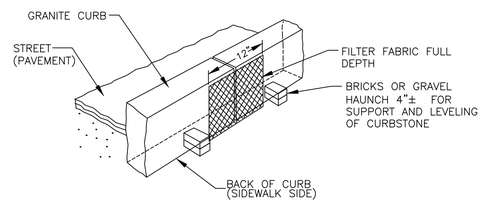

TYPICAL TIPDOWN CURB INSTALLATION

N.T.S.

DATE	
APP'D	
REVISIONS	
DRAWN BY	–
CHECKED BY	–
DATE	–
APPROVED BY	–
DATE	–
PROJECT NO.	–
SCALE	AS NOTED

Water Resource Protection
111 Waterman Drive
P.O. Box 9422
South Portland, ME 04116-9422
Ph # 207-767-7675
Fax # 207-767-5697

City of South Portland

CITY OF SOUTH PORTLAND
STANDARD ROADWAY DETAILS

TYPICAL ROADWAY DETAILS IV

DWG D4

Appendix B - Map of State & State Aid Roads

Appendix C - Complete Streets Classification Map