PART 5 INFRASTRUCTURE

Transportation

Utilities

Street and Public Realm

TRANSPORTATION

Street design in Historic Downtown plays a critical role in the success of this plan. This section supports the People-Centred Streets and Transportation Options policies in Part 3, and sets the stage for the Street and Public Realm Guidelines that follow at the end of Part 5. All of these components of the plan used together will create streets in Historic Downtown that encourage people to visit, gather, linger, and enjoy a vibrant retail district.

Streets are divided into two types: Standard and Enhanced. Standard Streets maintain the Development Bylaw standard and Enhanced Streets modify the Development Bylaw standard.

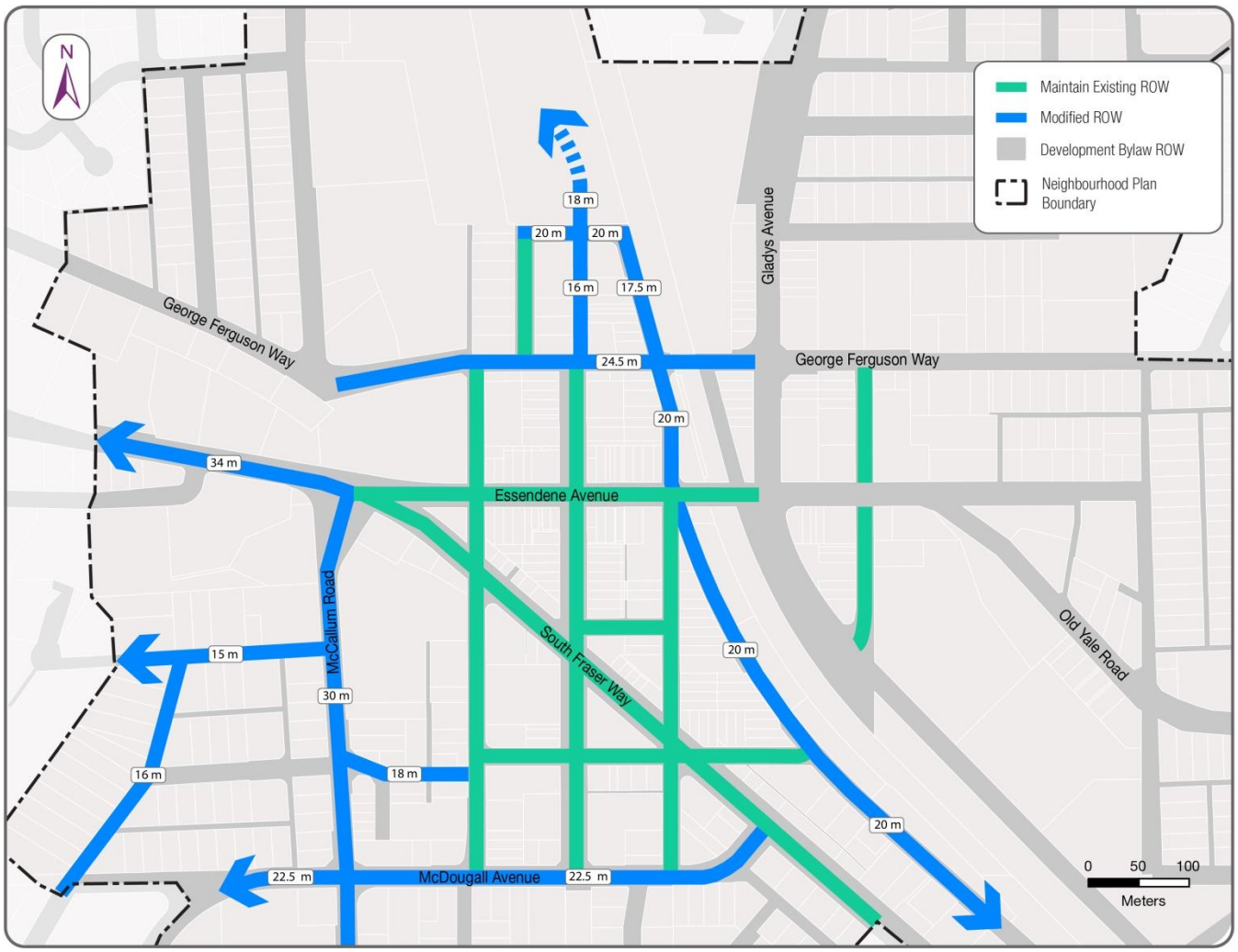
Figure 52 – Montrose Avenue Boulevard

All Streets

Historic Downtown streets were first established in the early 20th century. Over time, various events lead to areas of the neighbourhood being zoned for its highest and best use. The result is most streets today do not have the opportunity to expand the right of way and must be used in their existing, often constrained, conditions.

Right-of-Way Width and Setbacks

- Set dedication requirements to achieve the right-of-way width identified in Map 12. This may be balanced between both sides of the right of way or unbalanced based on fixed conditions. Additional right-of-way may be required at intersections.
- Update zoning to set minimum and maximum setbacks that support small increases in the amount of public space along streets as development occurs to help achieve public realm objectives in this plan.

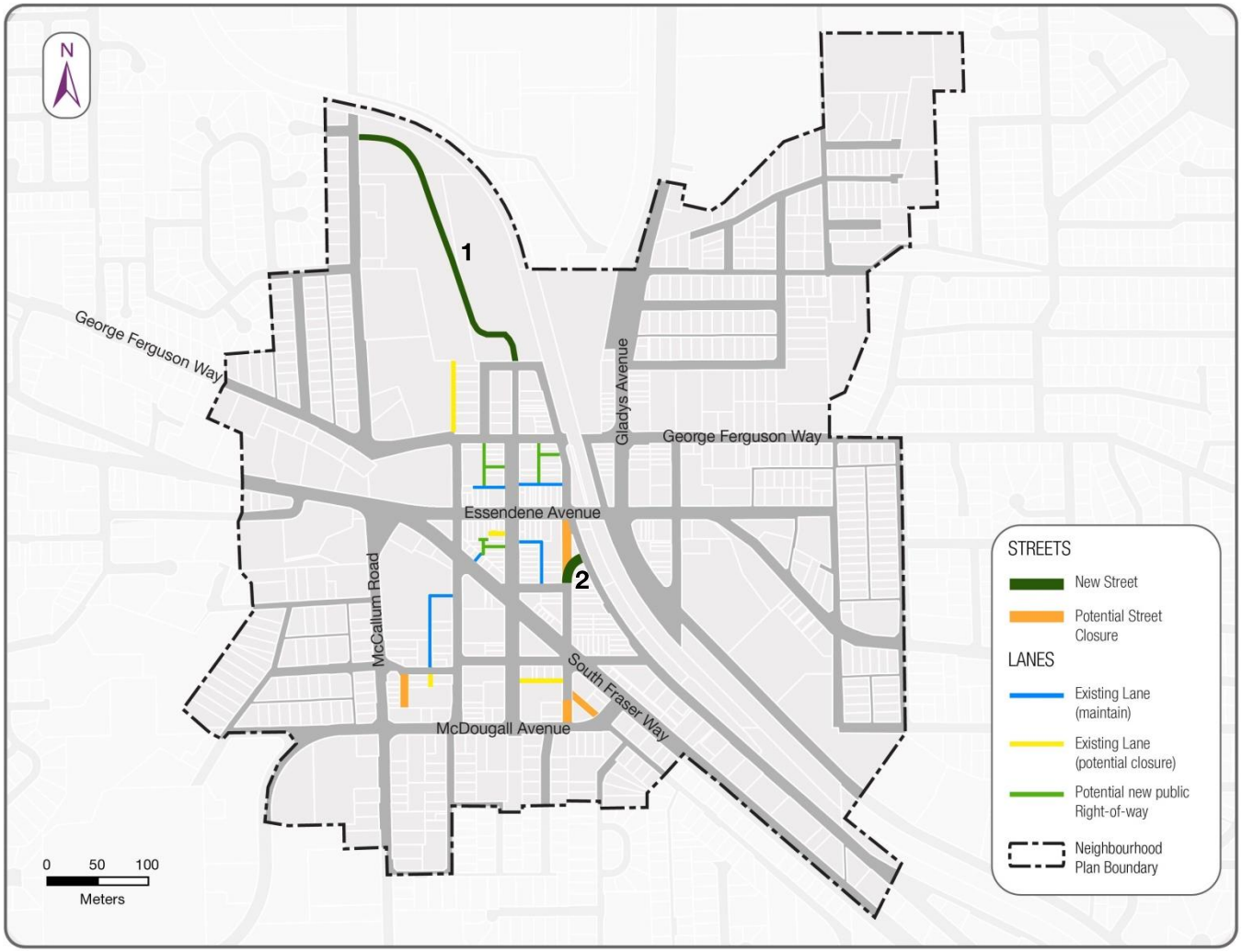


Map 12 – Right-of-Way Width

Street and Lane Connections

The following street and lane connection changes are proposed in Historic Downtown (Map 13):

- Create a new street extending Montrose Avenue from Pine Street north to McCallum Road through the former Clayburn Brick site (1).
- Create a realigned Montvue Avenue connecting into West Railway Street. This realignment enables a public plaza and gateway at the intersection of Essendene Avenue and West Railway Street (2).
- Create or formalize new lane connections in the Historic Centre in order to reduce vehicle and access interruptions along Commercial Streets. These do not necessarily need to be dedicated, but could be public access easements provided they are designed to a high quality standard like other public realm improvements.
- Consider closing surplus lanes or streets in areas where rights of way are not needed and underground utilities can be relocated to support additional development opportunities and achieve the objectives of this plan.



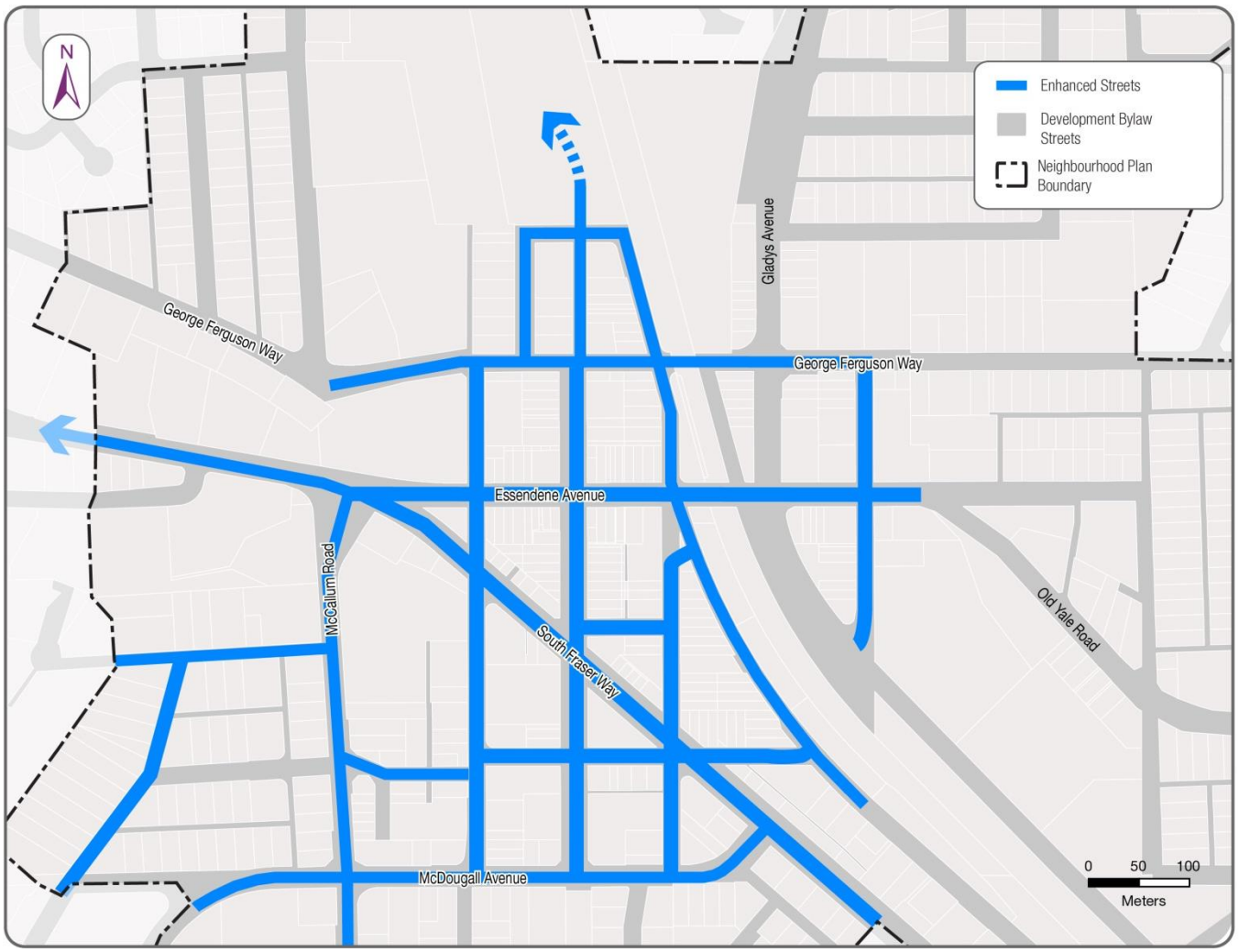
Map 13 – Street and Lane Connections

Standard Streets

Standard Streets maintain the standard prescribed in the City's *Development Bylaw* for all streets not identified as Enhanced Streets in Map 14.

Enhanced Streets

Enhanced Streets modify the standard prescribed in the City's *Development Bylaw* (Map 14), and serve as a model for the construction and improvement of the street network in Historic Downtown. All Enhanced Streets in Historic Downtown have a design and furnishing standard unique in the city that complement the direction of this plan. In addition, some Enhanced Streets also have specific cross sections to illustrate the intent for street function.



Map 14 – Enhanced Streets

Sidewalk Zones

A sidewalk can be divided into three zones: Frontage, Movement, and Furnishing (Figure 53). On Enhanced Streets in Historic Downtown these zones are the frame for how a sidewalk should be designed in order to achieve the policies in Part 3 and support the development permits in Part 4.

Furnishing Zone is the area between the curb face and the movement zone that includes street furniture (seating, bike racks, garbage/recycling containers, street trees etc). It acts as a buffer between pedestrians and vehicles.

Movement Zone is the area between the furnishing zone and frontage zone that is the main path for people walking. Nothing should protrude into this zone and it should be free of obstacles, taking into consideration universal access.

Frontage Zone is the area between the movement zone and building façade that is the space for indoor building uses to spill outdoors. It helps animate the street with retail displays, signage, seating, and patio spaces. The space can be provided in the public right-of-way or on private land when the building is set back from the property line.

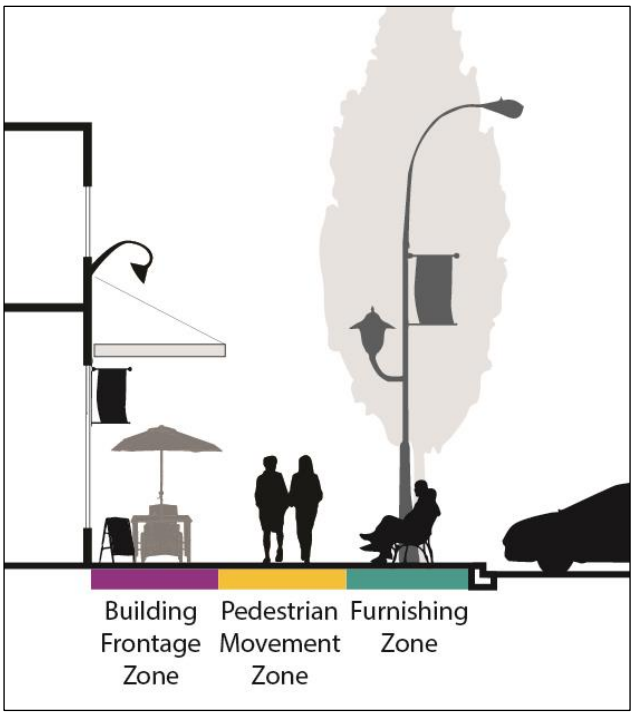


Figure 53 – Sidewalk Zones

Street Cross Sections

The street cross sections on the following pages serve as a guide for the construction and improvement of the street network in Historic Downtown. They provide an illustration of the function of the street that supports a complex mix of transportation movement and people activity.

- Individual elements may vary in width as fits the context, and should be determined on a case by case basis for each street block and corridor in Historic Downtown. Final dimensions and configurations may be subject to revisions in later stages of street and corridor planning and design.
- All Ages and Abilities (AAA) cycling elements are included on several cross sections, and final facility types may be determined in accordance with the Transportation and Transit Master Plan, Development Bylaw, and/or best practices.

Montrose Avenue – Clayburn site (18m)

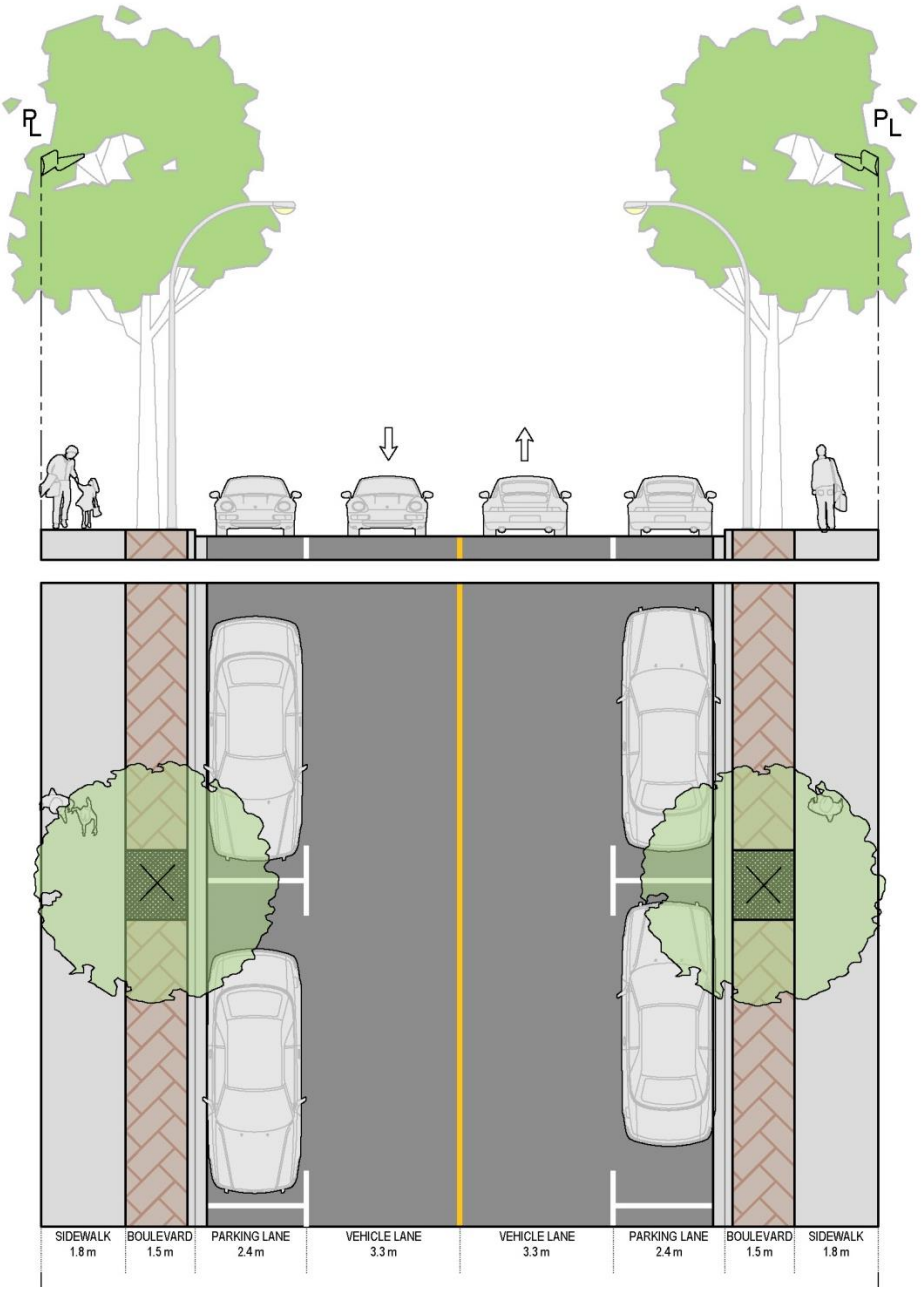


Figure 54 – Cross Section: Montrose Avenue (Clayburn site)

Elements

- From McCallum Road to Pine Street
- Sidewalk and tree strip on both sides
- Parallel parking on both sides
- One travel lane in each direction

Montrose Avenue – Transition (16m)

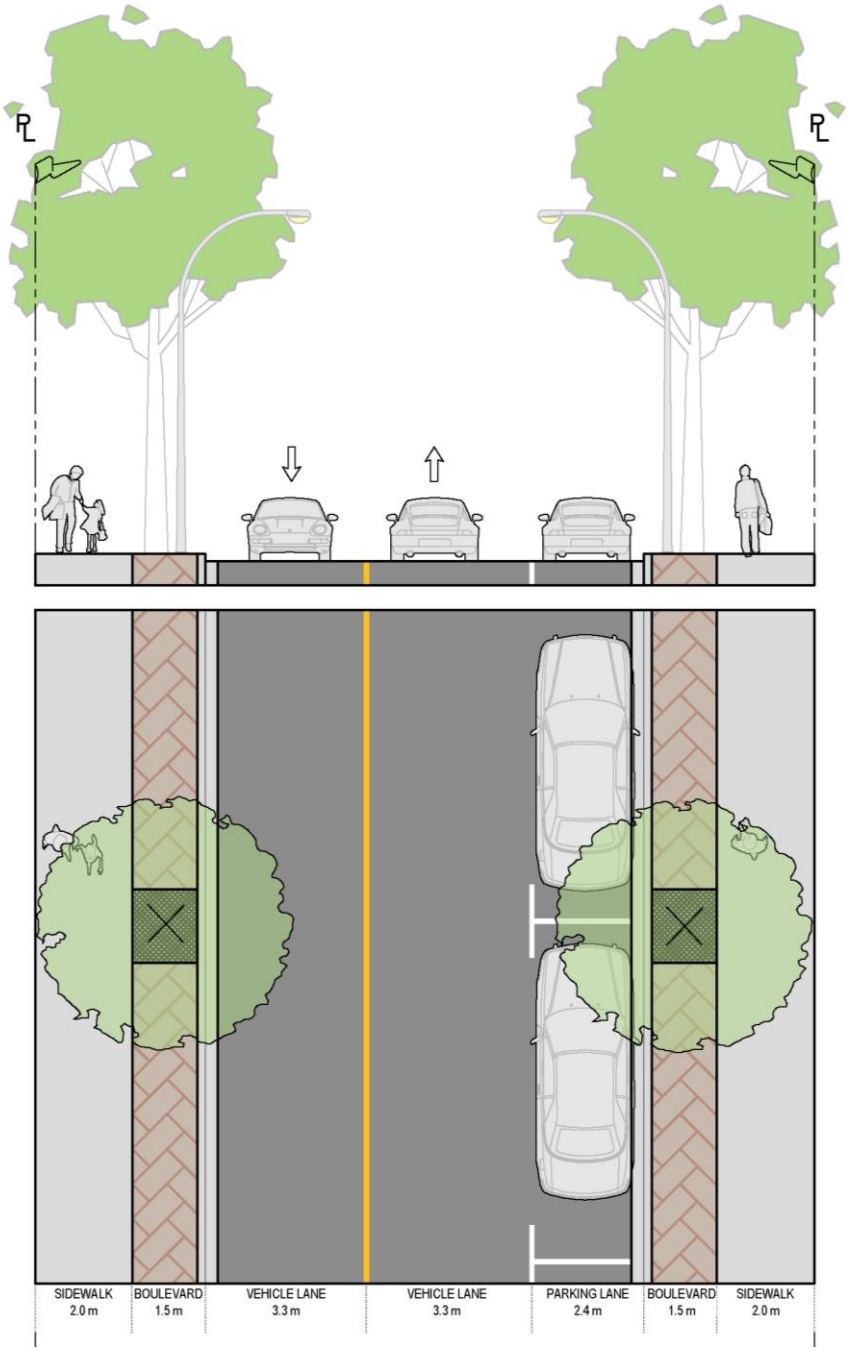


Figure 55 – Cross Section: Montrose Avenue (transition)

Elements

- One block from Pine Street to George Ferguson Way
- Sidewalk and tree strip on both sides
- Parallel parking on the east side
- One travel lane in each direction

Montrose Avenue – Retail (27.4m)

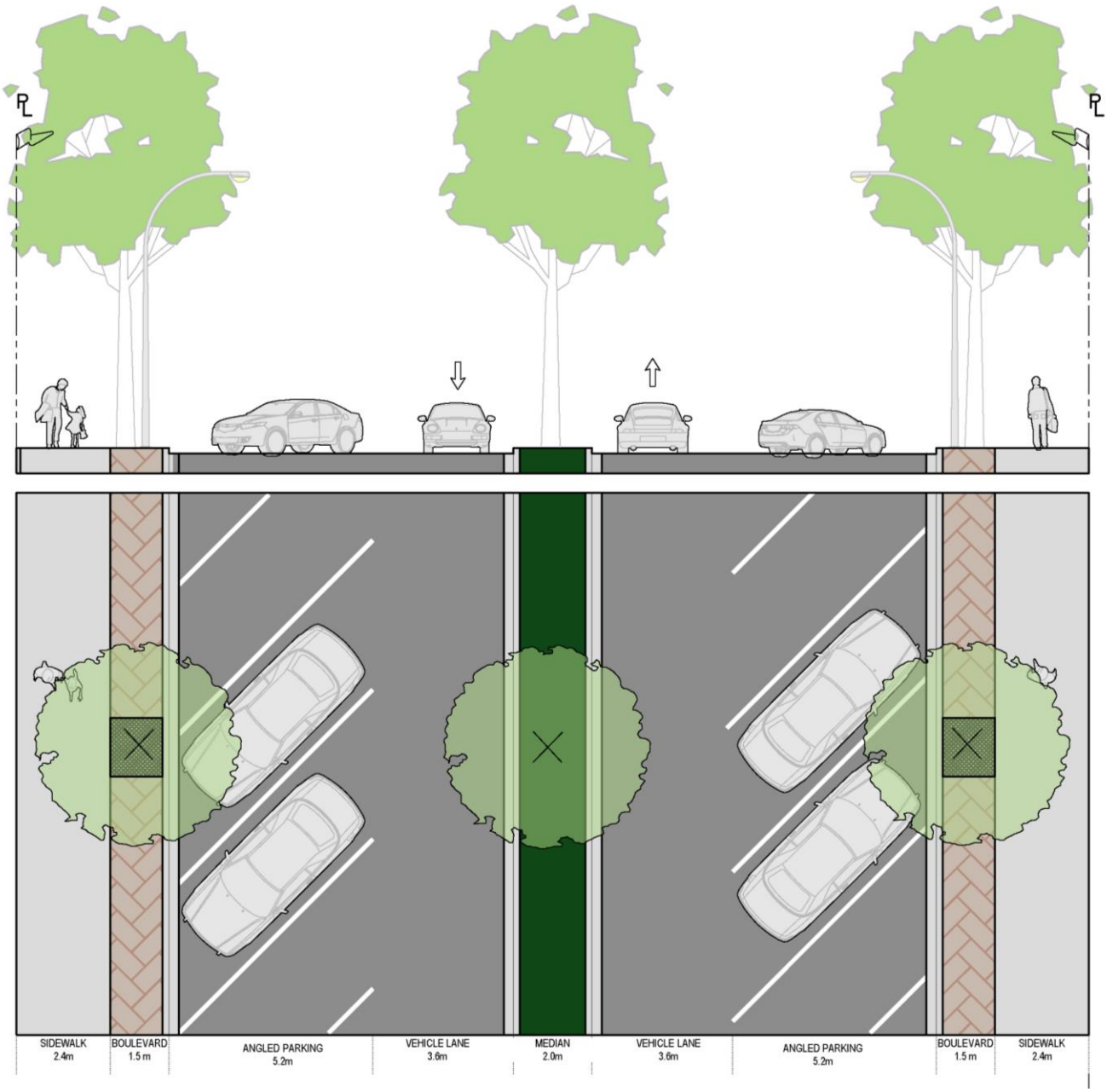


Figure 56 – Cross Section: Montrose Avenue (retail)

Elements

- Two blocks from George Ferguson Way to South Fraser Way
- Sidewalk and tree strip on both sides
- Angle parking on both sides
- One travel lane in each direction with added left turn bay at intersections
- Central boulevard with trees (without barrier fencing)

Montrose Avenue – Transit (27.4m)

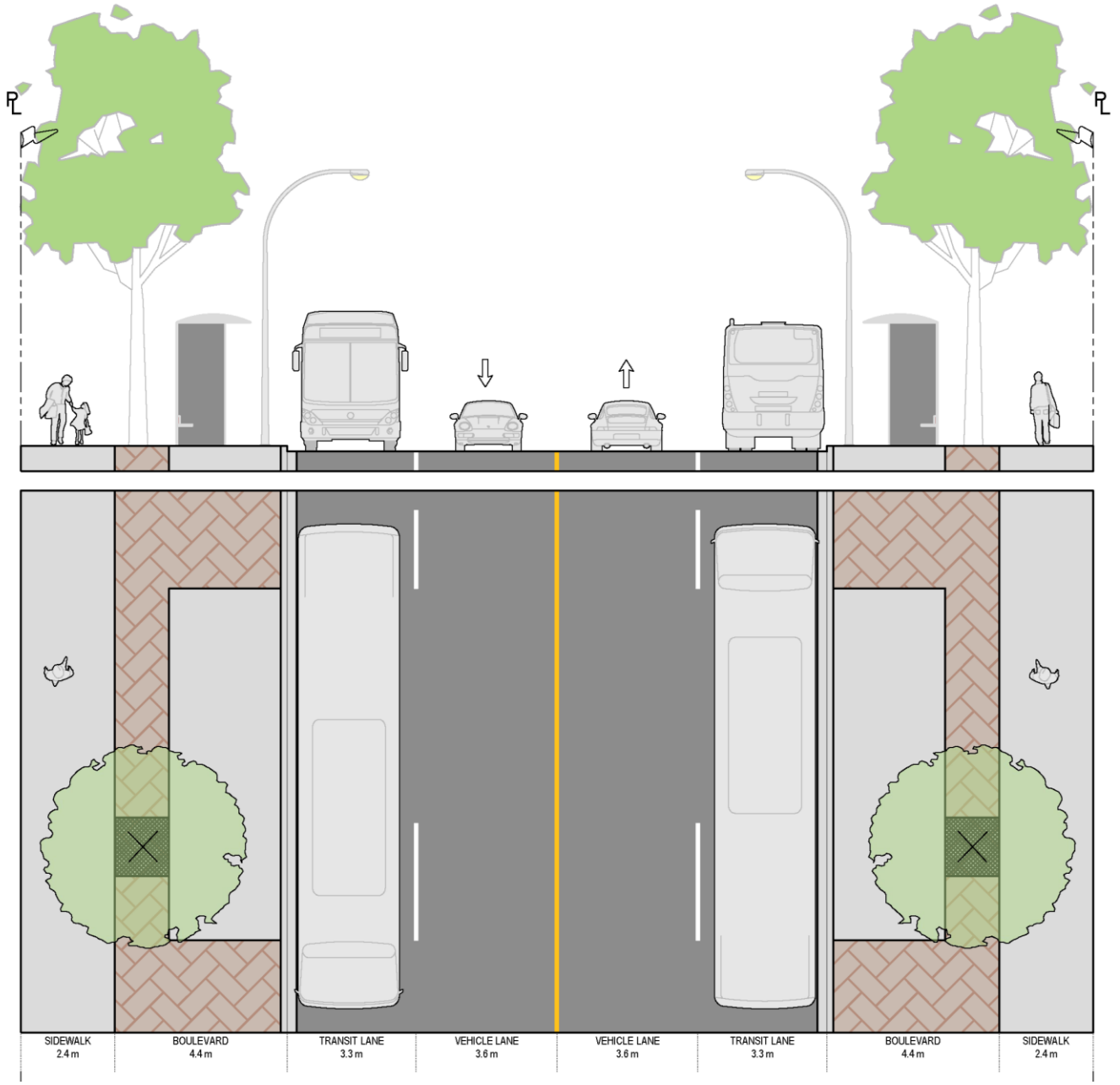


Figure 57 – Cross Section: Montrose Avenue (transit)

Elements

- Two blocks from South Fraser Way to McDougall Avenue
- Sidewalk, tree strip, and transit shelters on both sides
- One bus lane in each direction (sawtooth or straight curb)
- One travel lane in each direction

Essendene Avenue – (24.4m)

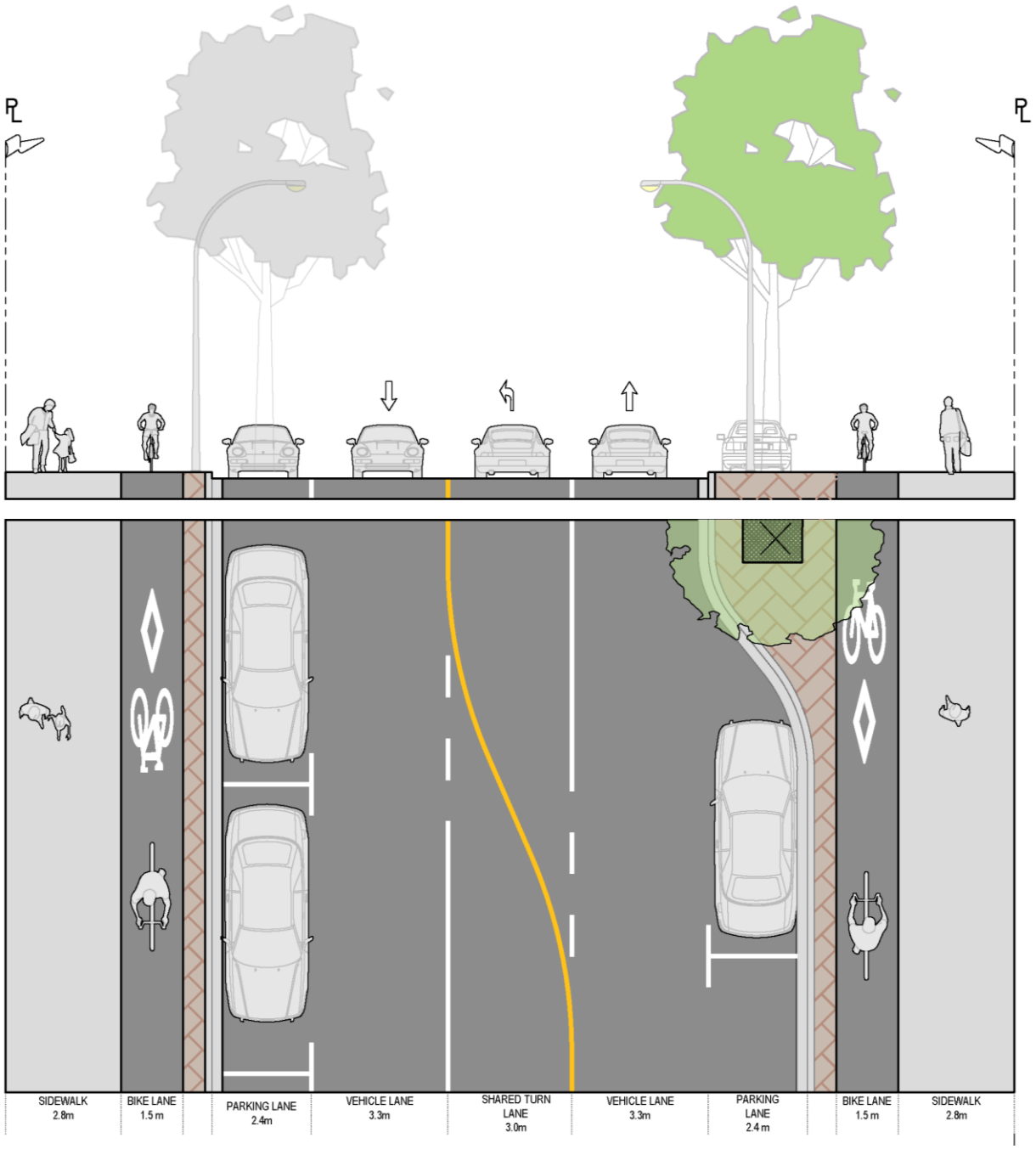


Figure 58 – Cross Section: Essendene Avenue

Elements

- From South Fraser Way to Cyril Street
- Sidewalk and AAA bike lane on both sides
- Parallel parking on both sides (with possible tree pockets)
- One travel lane in each direction
- Left turn lanes at intersections

South Fraser Way (27.3m to 30.3m)

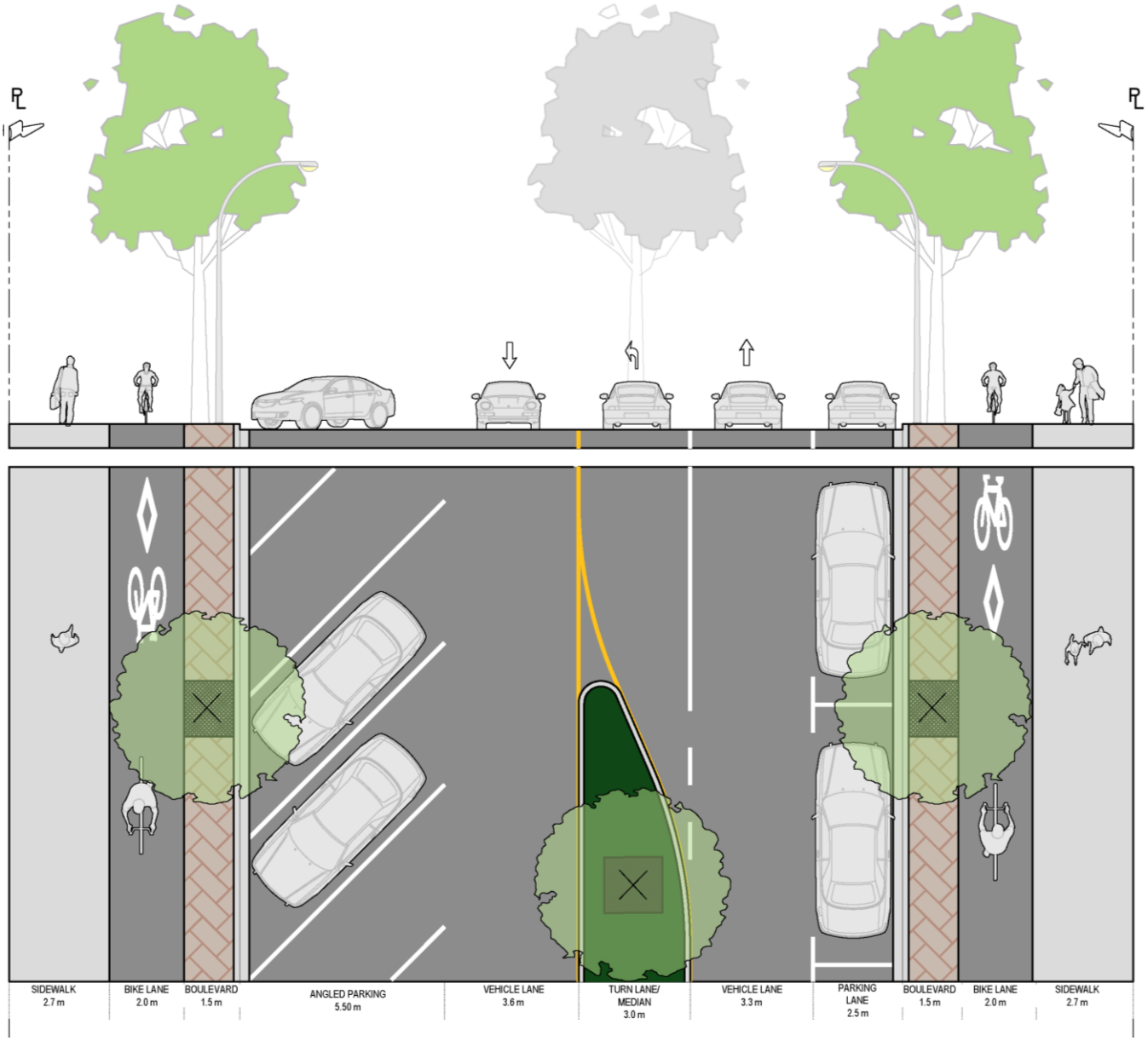


Figure 59 – Cross Section: South Fraser Way

Elements

- From McCallum Road to McDougall Avenue
- North side angle parking, south side parallel parking
- One travel lane in each direction
- Left turn lanes at intersections (with central boulevard and trees between intersections)
- West of Montrose Avenue has sidewalk/bike lane/boulevard elements reduced in width to accommodate cross section within a 27.3m ROW

West Railway Street (17.5m to 20m)

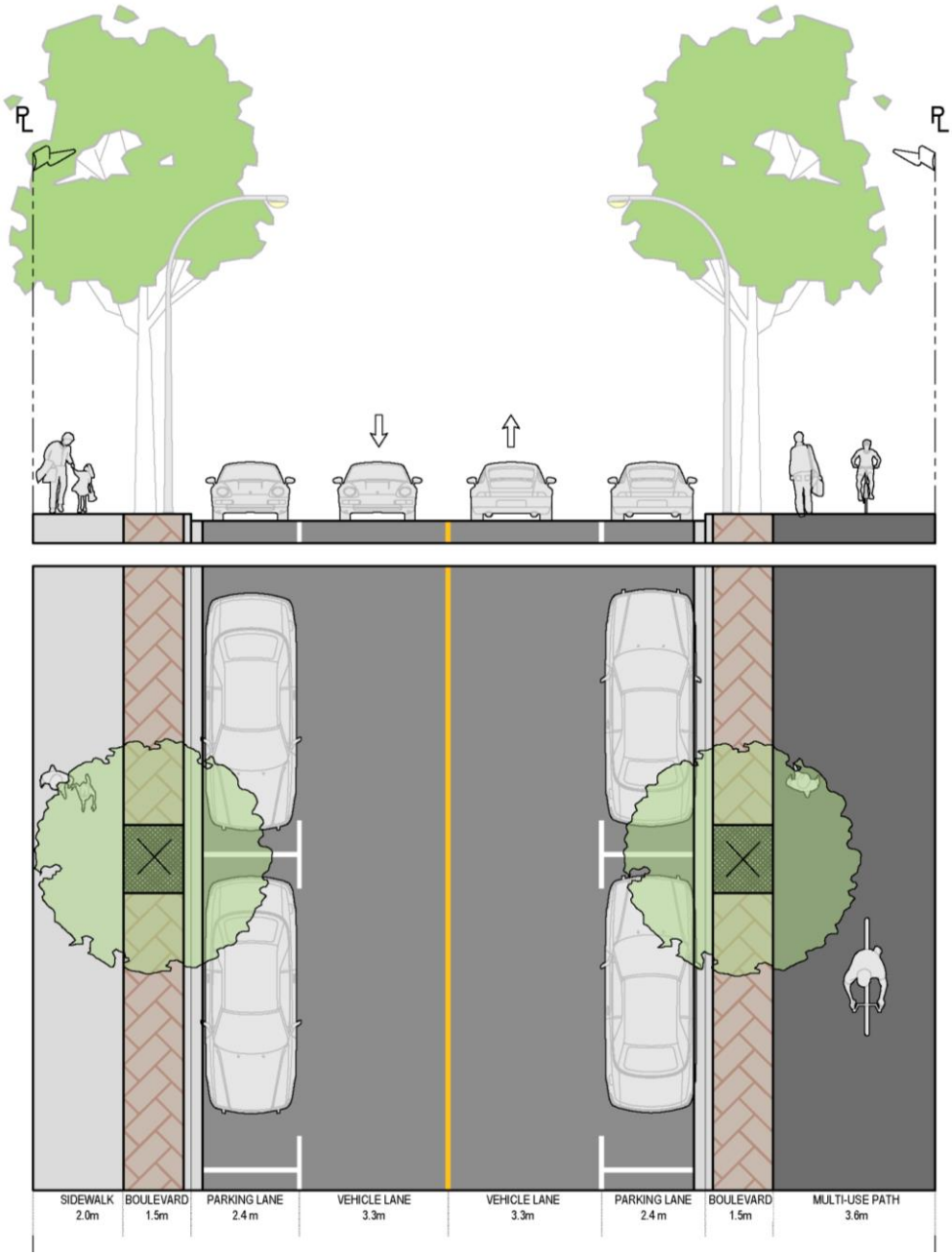


Figure 60 – Cross Section: West Railway Street

Elements

- From Laurel Street to Pine Street
- Multiuse path on east side, sidewalk on west side, tree strip on both sides
- Parallel parking on both sides
- One travel lane each direction
- North of George Ferguson Way has sidewalk/multiuse path elements reduced in width and one side parallel parking removed to accommodate cross section within a 17.5m ROW

McDougall Avenue (22.5m)

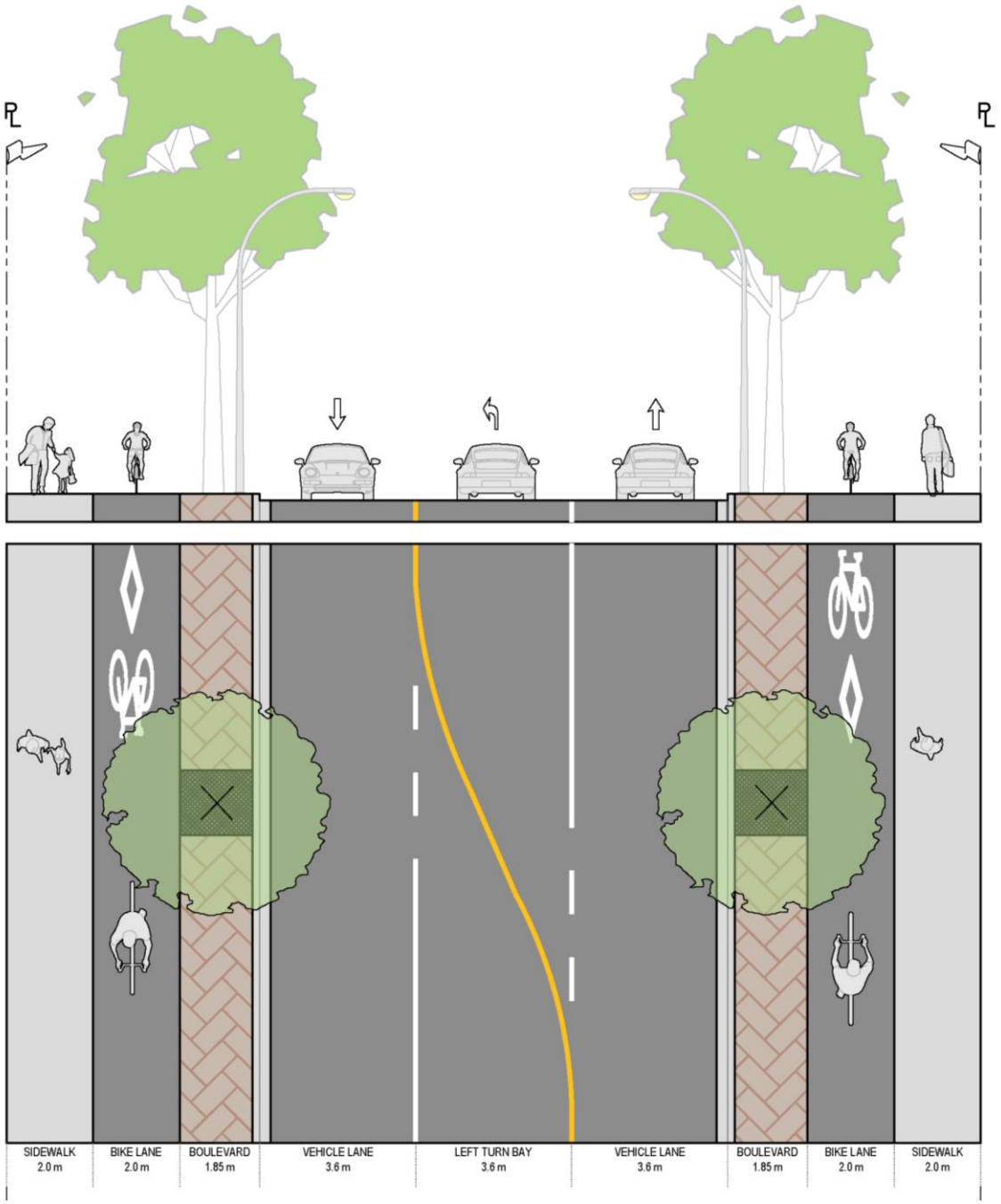


Figure 61 – Cross Section: McDougall Avenue

Elements

- From Cannon Avenue to South Fraser Way
- Sidewalk, tree strip and AAA bike lane on both sides
- One travel lane in each direction
- Left turn lanes at intersections

McCallum Road (30m)

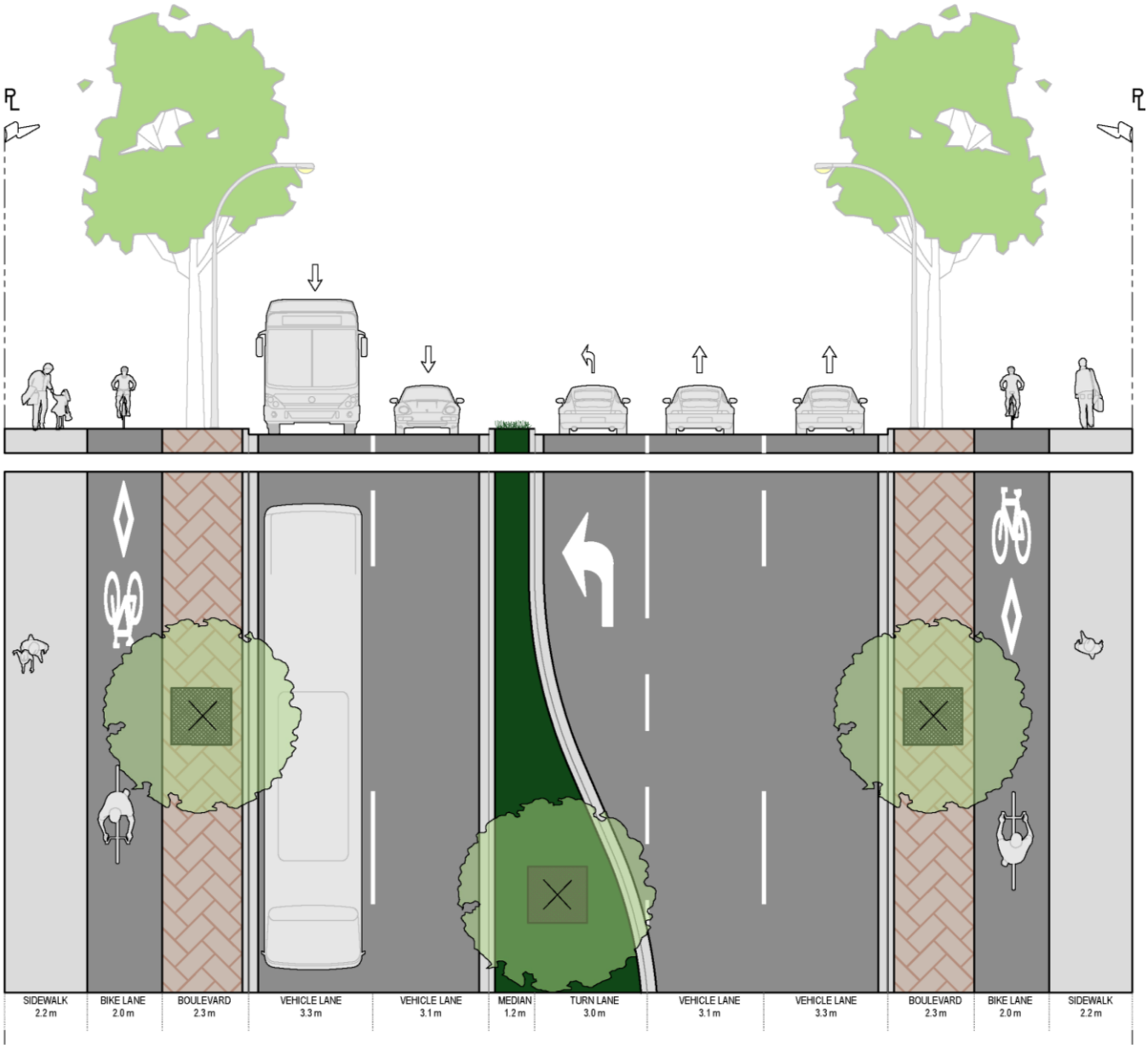


Figure 62 – Cross Section: McCallum Road

Elements

- From Marshall Road to South Fraser Way
- Sidewalk, tree strip and AAA bike lane on both sides
- Two travel lanes in each direction
- Left turn lanes at intersections (with central boulevard and trees between intersections)

UTILITIES

The utilities section of this plan outlines the water, wastewater, and stormwater systems to service the growth and development planned within the Historic Downtown Neighbourhood Plan. The servicing is based on the land use (Map 3), and considers population projections and anticipated site coverage in model analysis of infrastructure systems. Any proposed land use changes to what is shown in this plan may require re-evaluation or modification of servicing infrastructure. The following subsections provide more detail for each of the three servicing systems.

Water Assessment

Water servicing requirements for Historic Downtown have been assessed through hydraulic modeling of the impacts of increased water demand on system capacity due to projected population growth. Modeling was carried out for average day, maximum day, peak hour, and fire flow demands for each parcel in the neighbourhood.

The water assessment is meant to better understand system deficiencies at a neighbourhood scale and identifies improvements that make the entire system more efficient. These improvements do not preclude upgrades that may be required along property frontages at time of development permit, subdivision, or building permit, plus additional off site requirements at time of rezoning to meet the City of Abbotsford's Development Bylaw standard.

Existing Water Infrastructure

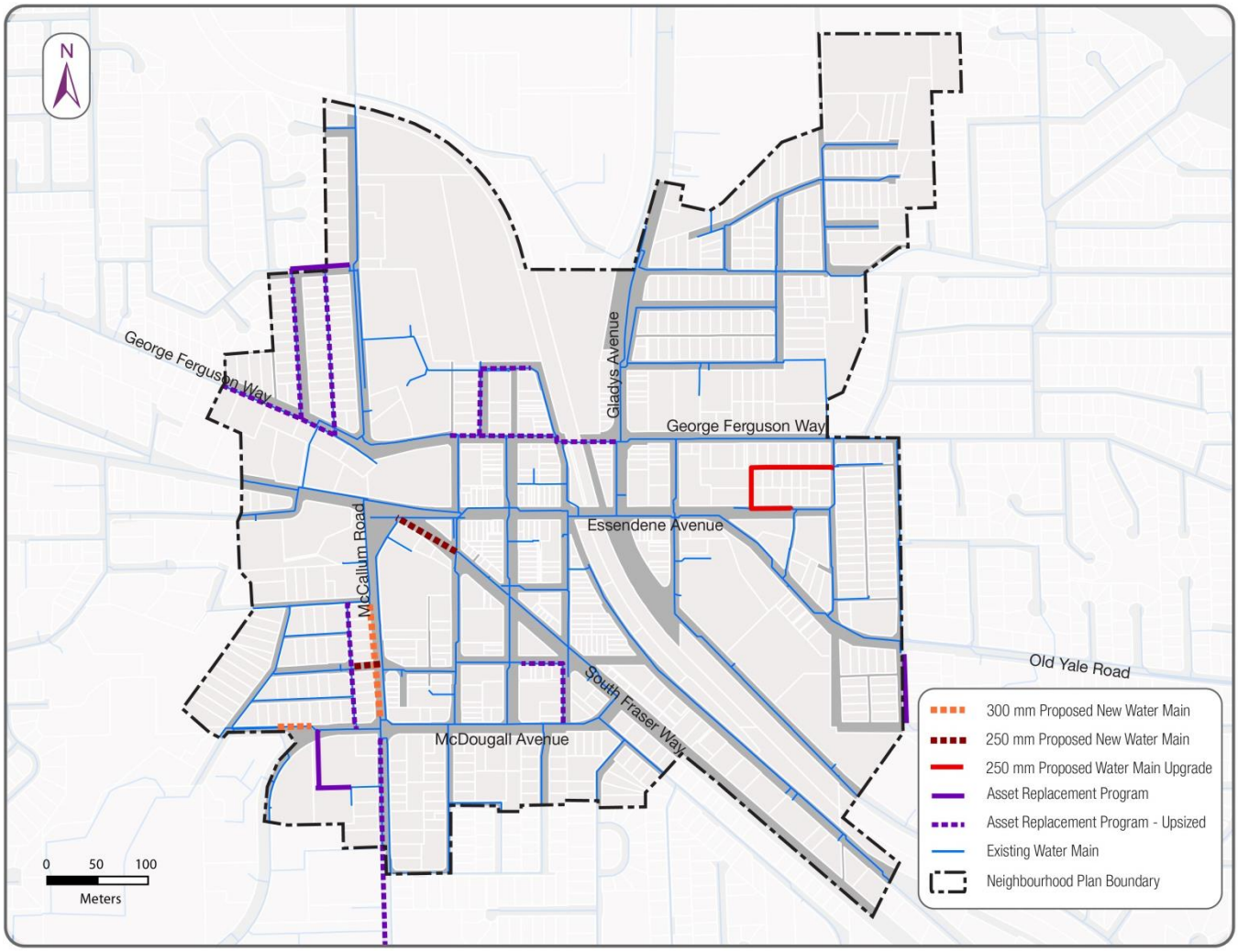
The majority of Historic Downtown is connected to the City's water distribution system and there are very few fire flow pressure deficiencies. The area is divided into two pressure zones.

Water System Improvements

Improvements have been modelled and recommended based on hydraulic capacity assessment of the City water distribution system under future development conditions. Table 4 summarizes the recommendations for the system based on deficiencies identified for servicing the planned development and growth in the neighbourhood. These recommendations may be subject to further review during the development application process. A total of ~500m of new pipes and ~200m of pipe upgrades are recommended at the locations shown in Map 15. An additional ~2,550m of pipes are part of the City's Asset Replacement Program and are not shown below. These pipes may be upgraded by development as it occurs, or at the end of the pipe's lifespan.

Pipe Location	Existing Diameter (mm)	Upgrade Diameter (mm)	Length (m)
Braun Avenue	n/a	250	~33
Cannon Avenue	n/a	300	~60
Car-Lin Lane	n/a	250	~85
McCallum Road	n/a	300	~197
South Fraser Way	n/a	200	~120
Car-Lin Lane	150 / 200	250	~113
Essendene Avenue	150	250	~81
Total			**~700**

Table 4 – Water Pipe Upgrades



Map 15 – Water Pipe Upgrades

Wastewater Assessment

The wastewater assessment was completed using the City's latest sanitary sewer hydraulic model (InfoSWMM). The model analysis was performed to determine Peak Wet Weather Flows (PWWF) in each sewer within the plan boundary. This analysis was completed for the current state, as well as anticipated future growth according to the land use in Map 3. Results from the modeling analysis provided a better understanding of system deficiencies and neighbourhood scale improvements.

Existing Wastewater Infrastructure

Most properties in Historic Downtown are serviced by the City's sanitary sewer collection system, and most of the system within the neighbourhood uses gravity mains, which collects wastewater and delivers it to the Gladys Trunk Sewer. This trunk sewer in turn leads into the CPR Trunk Sewer, and into the JAMES Trunk Sewer to the JAMES Wastewater Treatment Plant.

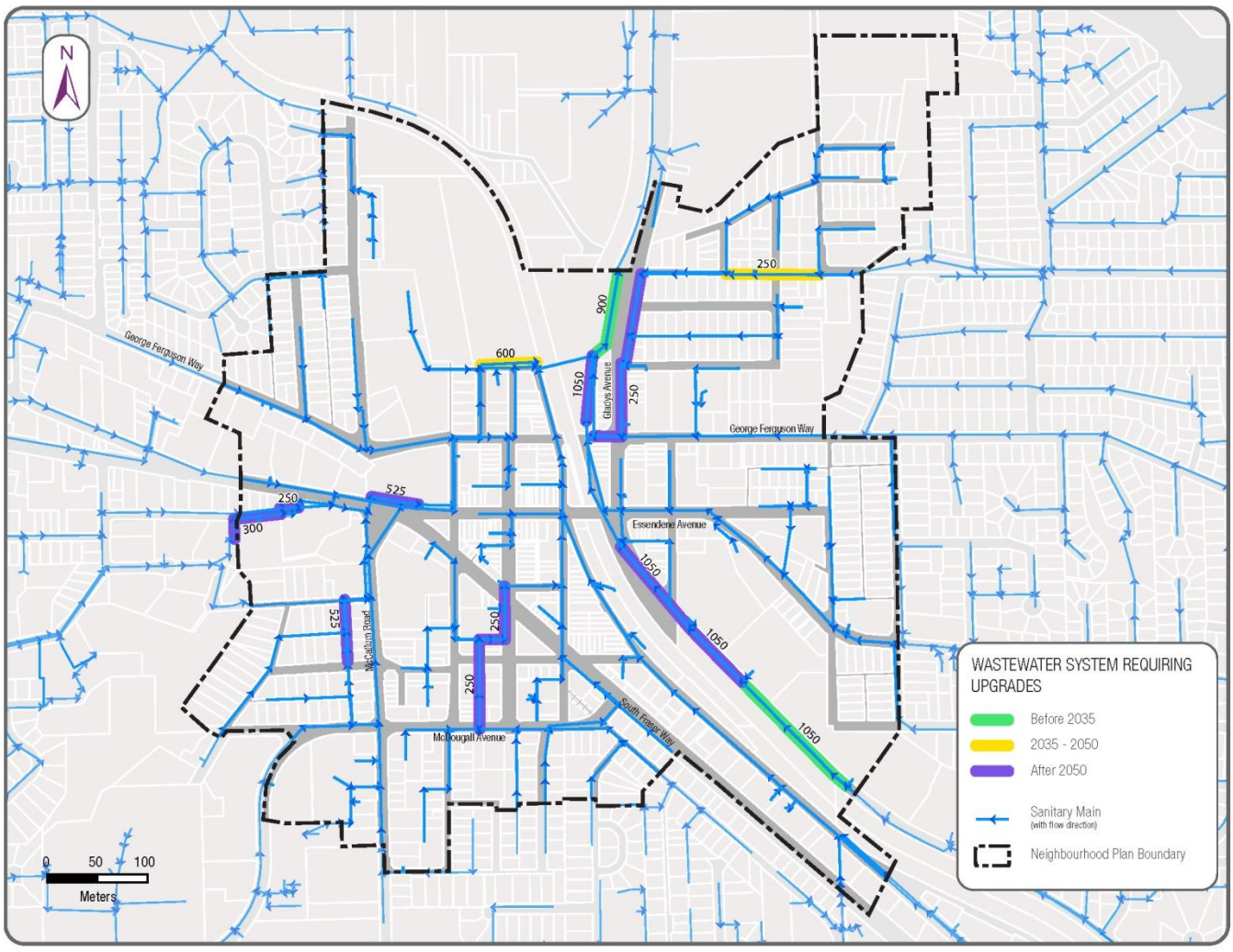
Wastewater System Improvements

Based on the modeling results, wastewater collection system upgrades have been recommended for servicing the planned development and growth of the neighbourhood. Table 5 summarizes the recommended upgrades. A total of ~2,100m of pipe upgrades are recommended at the locations shown in Map 16. Timing of the upgrades listed below may change depending on the location of developments as the neighbourhood grows and evolves.

There may be additional recommended upgrades that involve relocating wastewater mains from utility rights of way on private properties to road rights of way over the long term. This may require further study and case by case analysis as development occurs to determine the best new alignment and systematic implementation.

Pipe Location	Existing Diameter (mm)	Upgrade Diameter (mm)	Length (m)
Railway ROW (north of George Ferguson Way)	600	900	~164
Gladys Avenue (south of George Ferguson Way)	750	1050	~260
Pine Street	450	600	~98
Montrose Street	200	250	~297
Gladys Avenue (south of George Ferguson Way)	750	1050	~320
Walnut Avenue	200	250	~155
Roberts Avenue	200	250	~26
Roberts Avenue	250	300	~124
South Fraser Way	450	525	~84
McCallum Lane	450	525	~116
Railway ROW (north of George Ferguson Way)	750	1050	~115
Gladys Avenue (north of George Ferguson Way)	200	250	~346
Total			**~2,105**

Table 5 – Wastewater Pipe Upgrades



Map 16 – Wastewater Pipe Upgrades

* the entire neighbourhood is in one sanitary catchment area, the Gladys truck sewer.

Stormwater Assessment

The stormwater assessment was completed by building on the current Willband Creek Integrated Stormwater Management Plan (ISMP) project, which represents the existing conditions. Future conditions were applied in the Historic Downtown Neighbourhood Plan area to ensure a level of service for 1:10 year events. This is the City's current minimum requirement.

The assessment was done under three servicing scenarios:

1. **Worst Case:** Future land use build out with no on-site controls, climate change increases, and existing City infrastructure.
2. **Best Case:** Future land use build out with on-site controls, climate change increases, and existing infrastructure.
3. **Conservative/Preferred:** Future land use build out with no on-site controls, climate change increases, and storm sewer improvements preventing surcharge under a 1:10 year event.

Existing Stormwater Infrastructure

A large portion of Historic Downtown is entirely impervious and lack on-site controls. Over time redevelopment represents an opportunity for some on-site controls to be introduced and improve the stormwater system.

The most significant stormwater infrastructure in the neighbourhood is a large main under Essendene and Montrose Avenues that conveys stormwater from Ravine Park in the southwest to Willband Creek in the north. The upstream source for this main is Mill Lake, which acts as a large detention facility controlling flow through Historic Downtown. Despite this upstream detention capacity, the stormwater main is a critical component that faces surcharging impacts in safely conveying 1:100 flow through the neighbourhood.

Stormwater System Improvements

Table 6 summarizes the recommendations for the system based on deficiencies identified for servicing the planned development and growth in the neighbourhood. A total of ~1,500m of pipe upgrades are recommended at the locations shown in Map 17.

Priority	Minor (1:10 yr) Pipe Length (m)	Major (1:100 yr) Pipe Length (m)
Priority 1: Performance does not meet criteria with or without the application of site controls	~60	~180
Priority 2: Performance does not meet criteria if site controls are not applied	~1,130	~110
Total	**~1,190**	**~290**

Table 6 – Stormwater Pipe Upgrades

Ravine Park Communal Detention Facility

There is a possibility of creating a communal detention facility with the use of a flow control structure in Ravine Park where Willband Creek enters the stormwater main under Historic Downtown (Map 17). The stormwater assessment determined a required capacity of 15,000m^3 with a release rate of 2m^3/s, which could be accommodated at 33m elevation. Although this option requires further study and likely approvals from senior

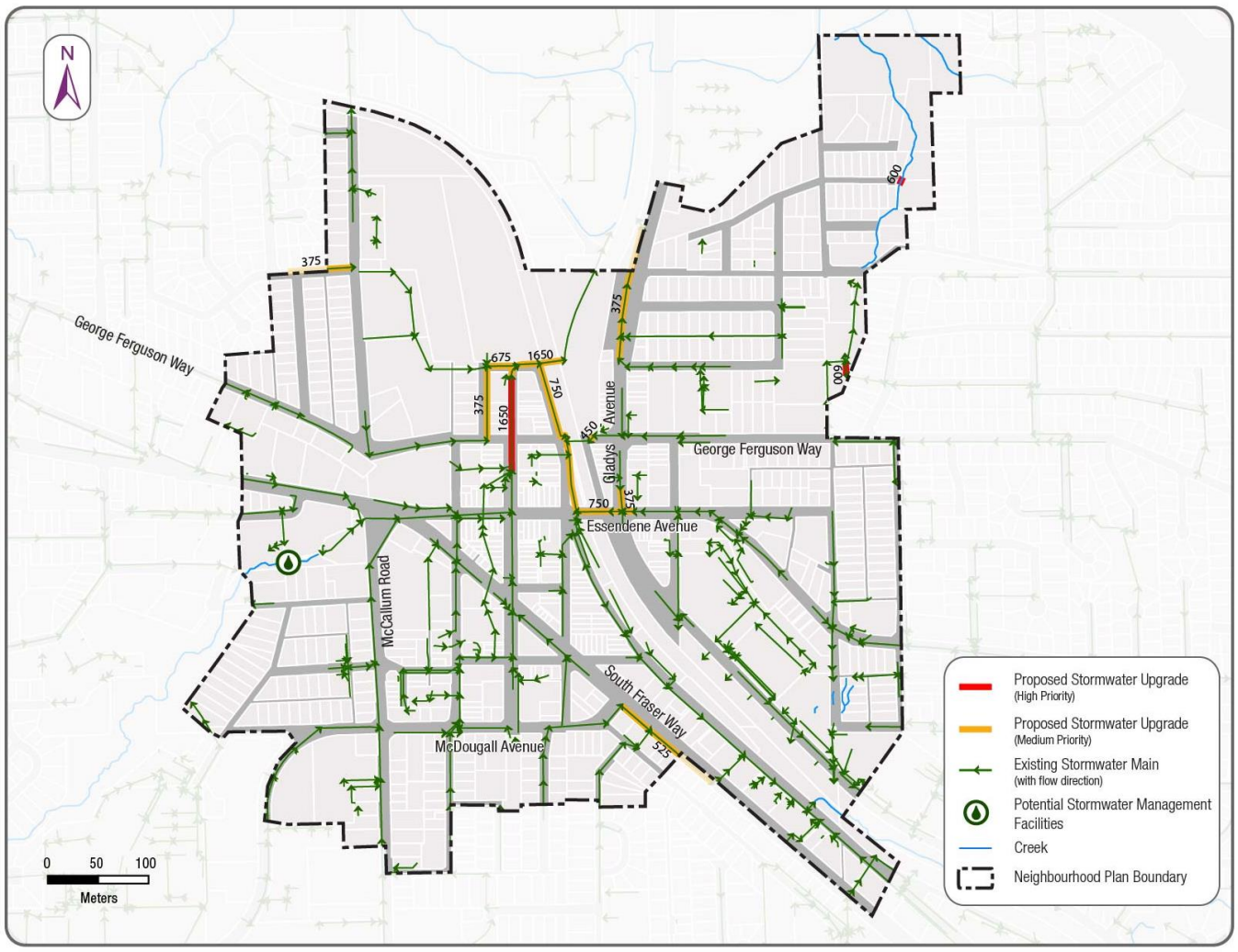
levels of government, it should be explored further. If it were implemented it would alleviate the need to upgrade the stormwater main under Montrose Avenue and eliminate the 1:100 year upgrades shown above (Table 6).

Montrose Avenue – decommissioned main

There is a stormwater main that parallels Montrose Avenue and runs below historic buildings on the west side of the street. This main is proposed to be abandoned with flow directed into new/upgraded mains in the South Fraser Way and Montrose Avenue right of ways.

Historic Centre – reduced requirements

All three scenarios included a sensitivity analysis for the Historic Centre land use designation (Map 3). This additional analysis determined that regardless of whether this area had, or did not have, on-site controls, there was no significant impact on storm sewer replacement requirements. Based on this finding, the City may relax the on-site control requirements for this land use designation only.



Map 17 – Stormwater Pipe/Detention Upgrades

STREET AND PUBLIC REALM

Street design in Historic Downtown plays a critical role in the success of this plan. This section supports the People-Centred Streets and Transportation Options policies in Part 3, the Development Permit Guidelines in Part 4, and the Transportation infrastructure described earlier in this Part 5. All of these components of the plan used together will create streets in Historic Downtown that encourage people to visit, gather, linger, and enjoy a vibrant retail district.

Historic Downtown Gateways

Gateway elements can help identify entrances and signal to visitors and residents that they have arrived at the threshold of a special community, neighbourhood or precinct. They can help define a sense of identity, place and community pride, and they can be key locations for special events, seasonal festivities or public art installations, or simply provide a compelling spot for photos to be taken. This plan identifies four gateways in Historic Downtown, which align with four neighbourhood plazas (Map 5).

Gateway Character

- Emphasize visual appeal through building massing and detailing, plantings, signage and/or public art and/or landscape structures, in conjunction with the Development Permit Guidelines in Part 4. For Essendene Avenue and West Railway Avenue, endeavor to integrate both sides of West Railway Avenue and include Christmas Tree Park into the design consideration of the gateway.
- Create a unique public realm feature at each gateway to draw visitors and pedestrians to and through different parts of the neighbourhood. This could be through art, sculpture, water, or some other structure.

Pedestrian Aspects

- Ensure gateway features are well integrated with improvements to pedestrian access, comfort and safety, with good sight lines, feature lighting, and seating.

Figure 63 – Concept Rendering: West Railway Plaza

Plazas and Sidewalks

There is great potential to build on the finer grained character of the streetscape environments through Historic Downtown. Sidewalks are the main thoroughfare of any successful urban setting, and the retail environment is a very lively place, featuring commercial activity, site furnishings and adjacent landscaped areas.

Plazas

- Establish four large neighbourhood plazas (Map 5) that provide opportunity for public life, enjoyment of views, create anchors on important Commercial Streets, and align with the neighbourhood gateways. They should primarily be intimate spaces, but large enough to accommodate temporary, seasonal, or long term programming. Frequent access points from abutting sidewalks to the edges of these plazas and other open spaces should be provided.
- Where plazas are shared or interface with vehicles, use special paving that is drivable, but fine-grained for pedestrian appeal. Consider raising the street to sidewalk level and replacing curbs with bollards.

a. **West Railway Plaza** – Create a signature gateway plaza (approximately 1,000m^2) at the intersection of Essendene and West Railway Avenues, forming a space that can be used for gathering and events next to Christmas Tree park and support neighbouring retail and restaurants. Design it primarily as a gathering space with site furnishings for daily use that can be adapted during special events. Incorporate a feature structure that offers partial weather protection and defines and buffers the space from vehicle traffic. Elements of this feature structure could also be used on the east side of West Railway Avenue to tie the plaza with the Christmas Tree park.

b. **Transit Plaza** – Create a large plaza integrated with the Transit Hub (500 to 1,000m^2) to create an interesting, safe, and dynamic public space adjacent to transit waiting areas, with connections to the adjacent buildings.

c. **Clayburn Brick Plaza** – Create a medium sized plaza (250 to 500m^2) at the north end of Montrose Avenue in the development of the former Clayburn Brick site, bookending this important north-south Commercial Street.

d. **Pauline Plaza** – Create a medium sized shared use plaza (250 to 500m^2) at the western end of Essendene Avenue in the Pauline Street parking lot, improving the entry into the historic core from Jubilee Park across South Fraser Way. The pedestrian connection across South Fraser Way into Jubilee Park should be considered in conjunction with this plaza design.

Sidewalks

Essendene Avenue

- In the redesign of Essendene Avenue, reconfigure curb extensions at the intersection of Essendene Avenue and Pauline Street, Montrose Avenue, and West Railway Street to increase areas for gathering and landscaped features, and to decrease lengths of crosswalks across Essendene Avenue.

Figure 64 – Concept Rendering: Essendene Avenue

Montrose Avenue

- In the improvements of Montrose Avenue, establish a wider movement zone, free of any obstructions, for pedestrian traffic on both sides of the street. Combine this with a formal frontage zone along the building façade for spill-out activities, and a clear furnishing zone along the curb edge for landscaping, seating, and more.
- Choose a set of high quality paving materials as suits the context, which could include unit pavers and brushed, stamped, sandblasted, or sawcut concrete.

Figure 65 – Concept Rendering: Montrose Avenue

Boulevards

- Plant street trees at regular intervals along Montrose Avenue, Essendene Avenue, South Fraser Way, West Railway Avenue and other streets where feasible. Use as tight a spacing as possible to enable continuous canopies.
- Locate site furnishings at strategic locations within boulevards relating to building use and high-use outdoor areas.
- Locate utilities such as hydrants, kiosks, roadway and pedestrian lights and signage in boulevards.

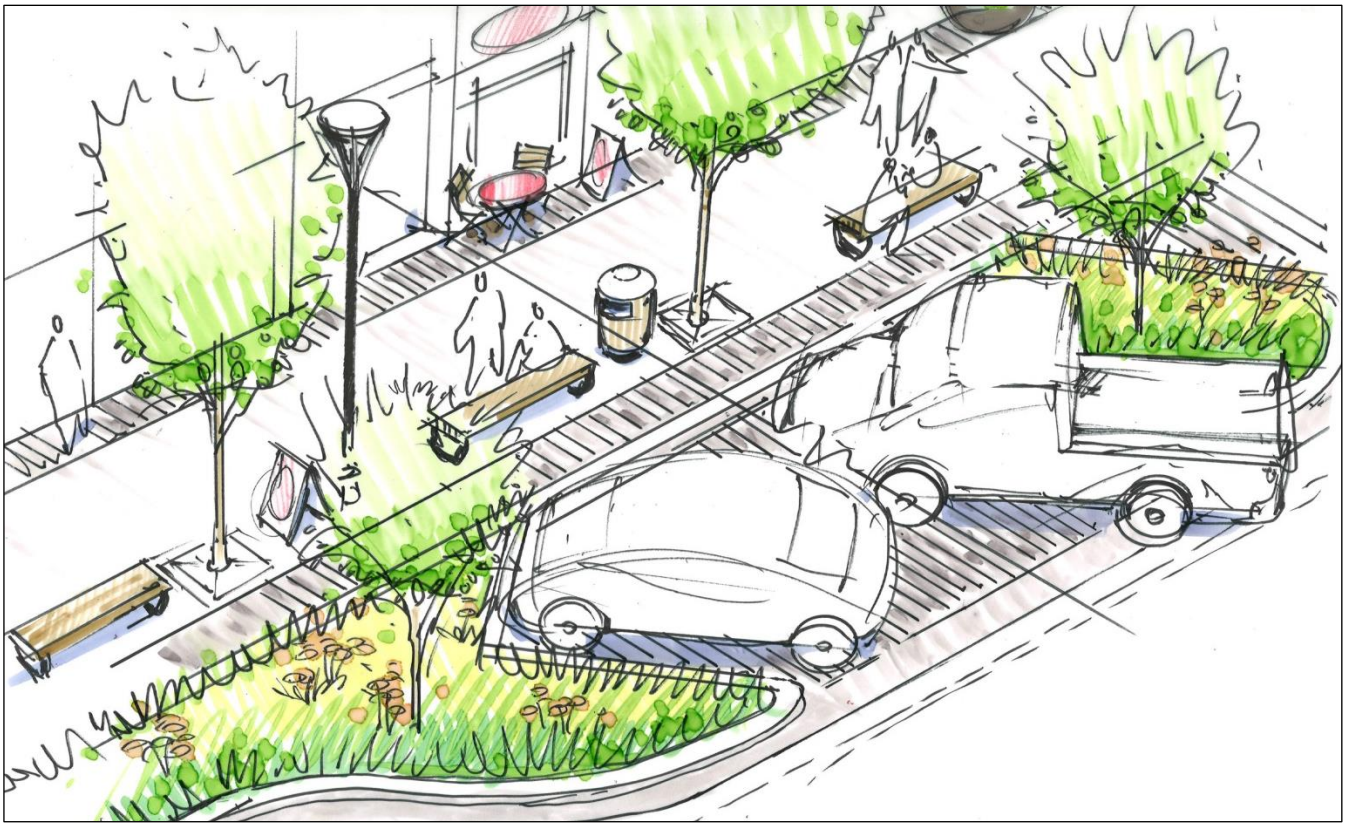


Figure 66 – Concept Rendering: Wide Sidewalks with Boulevards and Parking Pockets

Crosswalks

- When changing rights of way and renovating streets, increase boulevard widths at intersections to shorten crossing distances.
- Install durable, high-visibility crosswalk markings at crosswalks that highlight the features of the neighbourhood.
- Consider decorative and/or enhanced crosswalk markings.

Figure 67 – Decorative and Enhanced Crosswalks

Supporting Streets

- Implement a minimum 1.8m width movement zone on all other Enhanced Streets in Historic Downtown.
- Ensure a minimum 0.5m furnishing zone where street trees are not possible, and 1.5m when street trees are used on all other Enhanced Streets in Historic Downtown.