Street Classification

Vaughan Transportation Plan

Final

Rev05

Vaughan, Ontario
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Contents

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1 Introduction

Street classification designates streets into different groups based on the type of service and function they intend to provide. Traditional classification systems, as currently used by the City of Vaughan, categorize urban city streets into three main categories based on the street's role and function in a transportation network:

- **Arterial Streets**: moves high volumes of traffic as quickly as possible;
- **Collector Streets**: provides access between arterial streets and local streets; balancing between movement and access needs; and
- **Local Streets**: provides access to abutting land uses.

This traditional classification system however focuses on vehicular movement and access, failing to recognize that multimodal streets must be sensitive to the surrounding environment. For example, a street in an industrial plaza may serve a similar level of vehicular traffic compared to one in residential neighborhood and thus be designed similarly in both areas based on the City's current system. However, differences in heavy vehicle volumes may necessitate different approaches to appropriately accommodate pedestrians and cyclists.

To address these varying needs, the current best practice for street classification observed in other jurisdictions relies on overlays of street functionality (e.g., arterial, collector, local) and land use character (e.g., urban versus suburban, residential versus employment). This approach allows for a broader range of street typologies which can better define modal priorities and identify required street elements sensitive to adjacent land use context to improve accessibility, comfort, and safety for all street users.

As a broad City initiative incorporating elements from the City's ongoing Official Plan Review, the Vaughan Transportation Plan (VTP) will propose a new street classification system using the best practice approach in close coordination with the parallel Vaughan Complete Streets Guidelines study. This initiative will result in a number of street typologies considering both transportation function (modal priority) and land use based on the City's Official Plan. This report as part of the VTP, will establish initial typologies with recommendations on modal priorities, design considerations, high-level cross section elements, and street Right of Way (ROW) widths, and ultimately provide input to upcoming studies including the Official Plan Review, Complete Streets Guidelines, future design standard updates, and other studies.

The contents of this report include a brief overview of the City's existing classification system (**Section 3**), best practice review (**Section 4),** new street classification considerations (**Section 5)**, and recommendations (**Section 6**).

2 How to Use

This document summarizes the background, analysis, and conclusions of the classification exercise of the Vaughan Transportation Plan. The street classifications are intended to inform the minimum rights-of-way for all streets in Vaughan under the jurisdiction of the City. Details on

the arrangement, width and design of cross-section elements, while alluded to in this document, should follow the guidance of the latest version of the City's following documents:

- Streetscape Implementation Manual and Financial Strategy
- Complete Streets Design and Implementation Plan
- Pedestrian and Bicycle Master Plan
- City's Engineering Design Criteria and Standard Drawings.

The City's street design guidance document structure is illustrated in **Figure 2-1**. The level of design detail increases at each level of the structure.

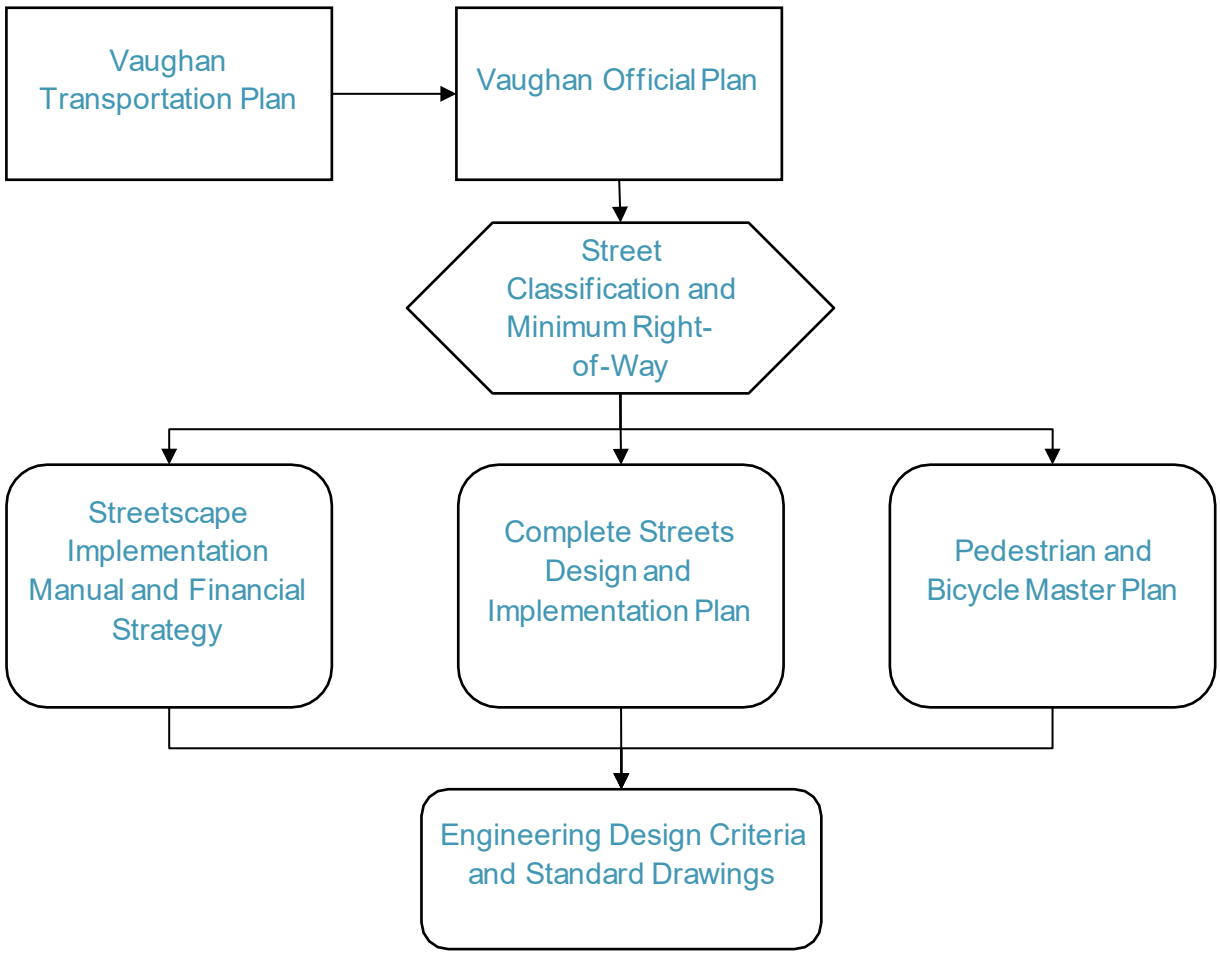


Figure 2-1 City of Vaughan Street Design Guidance Flowchart

3 Existing Road Classification

The existing road classification (shown in **Figure 4-1**) in the City of Vaughan is a hierarchy based on functional classification, traffic volume, access, transit service, pedestrian and bicycle activity and development density. In the City's Official Plan, classifications for streets under City's jurisdiction and their intended role are listed as following:

- **Minor arterial** (36m ROW): arterials play an important role in moving large volumes of traffic and are the primary location for transit service. In addition to the enhanced pedestrian, cyclist, and transit user capacity, arterials will be focus for streetscaping and other place-making initiatives to improve the quality of place;
- **Major collector** (26m ROW): collectors provide linkages between local and arterial streets and should be continuous to facilitate efficient traffic flow and provide effective routing for transit, cyclists, and pedestrians. Collectors should have dedicated bike lanes where feasible. Major collector streets generally have a maximum of four through-travel lanes and projected traffic volumes in the range of 500 to 800 vehicles in the peak hour;
- **Minor collector** (24m proposed, 23m existing ROW): minor collector streets generally have a maximum two travel lanes and projected traffic volumes less than 500 vehicles in the peak hour. Frontage on minor collector streets is encouraged;
- **Local**: local streets are generally low-speed and pedestrian- and cyclist-friendly. Local streets may accommodate community-oriented transit service. Dedicated bike lanes will not be required, but signed bike routes may be identified on local streets; and
- Lastly, special classifications are identified in some of the City's Secondary Plans, to generally address context-specific challenges and provide a wider variety of modal priorities as noted previously. For example, the Vaughan Metropolitan Centre Secondary Plan includes road classifications such as:
    - Special Collectors (33m ROW)
    - Minor Collectors with bike lanes (26m ROW)
    - Local Street A (22m ROW)
    - Local Street B (20m ROW)
    - Mews Streets (20m ROW)

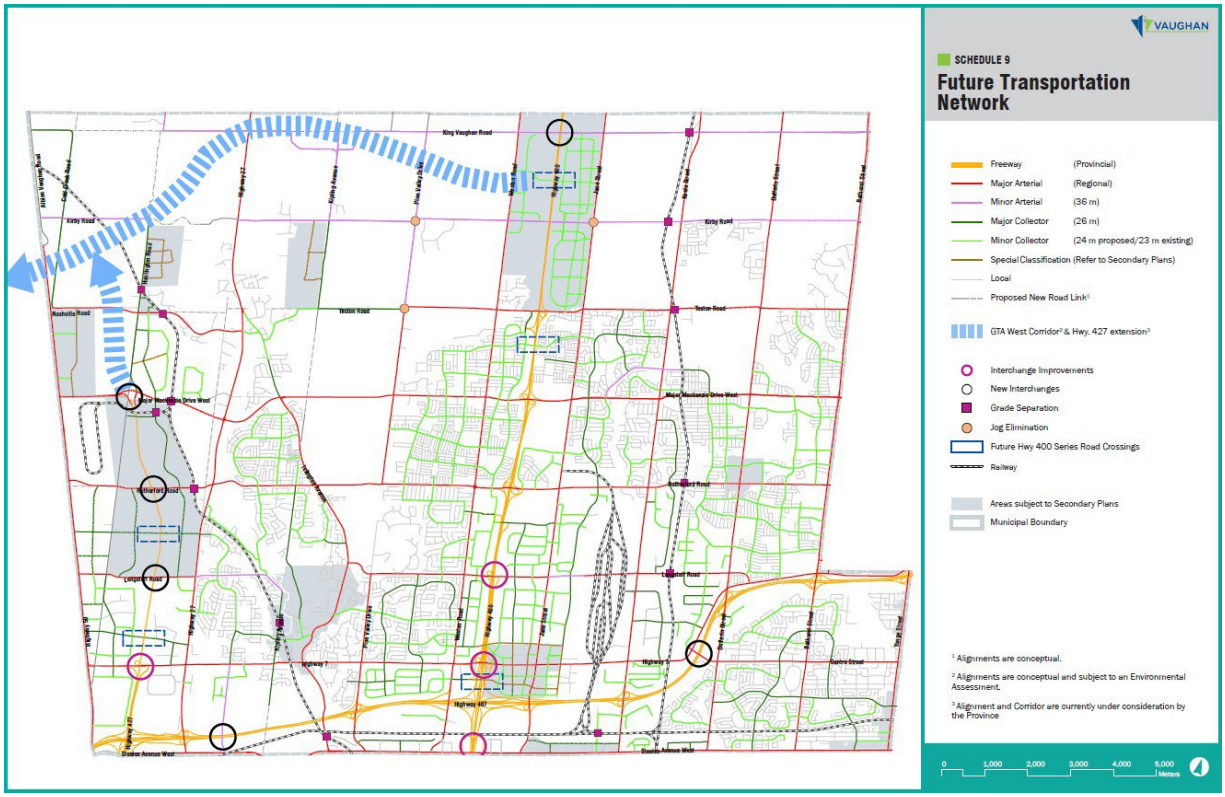


Figure 3-1 City of Vaughan Existing Road Classification (Reference: Vaughan Official Plan, Schedule 9, 2010)

4 Best Practice Review

4.1 York Region Designing Great Streets Guidelines (2019)

- **City Centre Streets (43-50m ROW):** envisioned to be the Region's most urban, dense, mixed-use places;
- **Avenues (43-45m ROW):** a vibrant urban context balanced with priority for all modes of transportation;
- **Main Streets (20-36m ROW):** support for established street-oriented built form with an urban, pedestrian-focused street;
- **Connectors (36-45m ROW):** generous landscaped boulevards, enhanced transit and active transportation elements for stable neighbourhoods;
- **Rural Roads (36m ROW):** safe, efficient vehicle movement through rural agricultural fabric; and

- **Rural Hamlet Roads (20-36m ROW):** small rural communities with street-oriented built form.

For each street classification, associated primary transportation function (transit, goods movement, activetransportation) are proposed, as well as land use attributes (such as land use designation and land use context) and operational attributes (such as ROW range, flow characteristics, design speed, maximum number of lanes). This guide sets up Regional context and template that are considered in the development of City of Vaughan's typologies.

4.2 City of Edmonton Complete Streets Design and Construction Standards (2018)

As part of the Complete Streets Guidelines study, the City of Edmonton adopted a classification approach that considers three factors:

- Relationship to street: street oriented, non-street oriented;
- Land use context: residential, community destinations and open spaces, commercial / mixed-use, and industrial; and
- Functional classification: arterial, collector, and local.

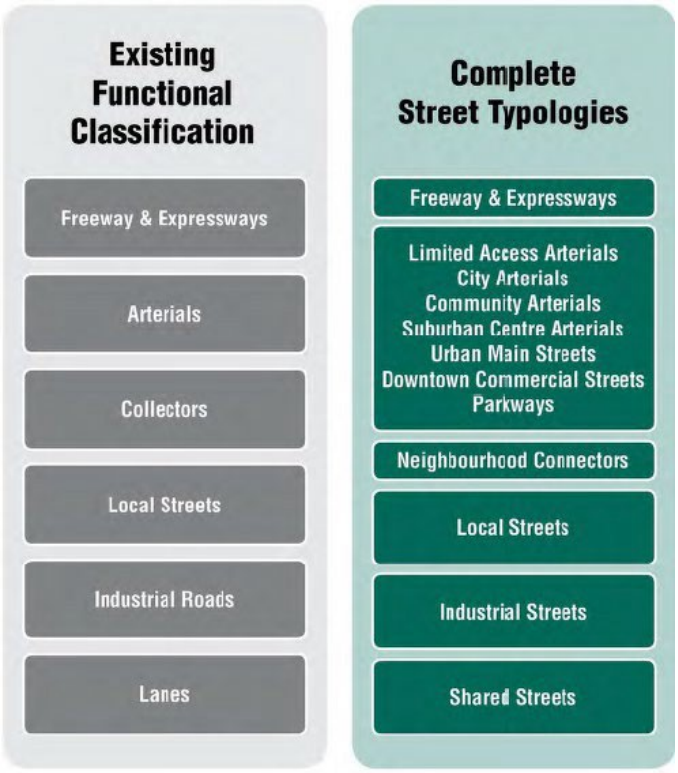
For each classification, the guide recommends appropriate design elements such as design vehicles, design speed and posted speed, and pedestrian through zone.

A modal priority network was developed based on the City's goods movement network, transit plan, and the recommended future bicycle network.

Factors used in Edmonton's Complete Streets Design Standards including, but not limited to, user expectation, adjacent land use, design speed, property and environmental features, and traffic volumes, are considered in Vaughan's new street classifications, with modal priorities identified for each one.

4.3 City of Saskatoon Complete Streets Design & Policy Guide (2017)

The City of Saskatoon developed a street 'typology' to strengthen the connection between streetdesign, land use character, and their multi-modal functions. The guide recommends changing the City's traditional functional classification into 12 complete street typologies as shown in **Figure 4-1**. For each typology, the appropriate land use and modal priorities are proposed, as well as the design elements such as sidewalk width, street furniture, and bicycle infrastructure. The approach used in Saskatoon's Guide is considered in Vaughan's new street typologies withmodal priorities and associated design elements identified for each typology.



Source: City of Saskatoon Complete Streets Design & Policy Guide (2017)
Figure 4-1 Recommended Complete Street Typologies, Saskatoon

4.4 City of London Complete Streets Design Manual (2018)

The Complete Streets Design Manual for the City of London, Ontario provided a street classification with consideration of mobility and place functions. The classification can be found in **Figure 4-2**.

freight, green infrastructure, utilities are recommended. This guide provides a good example for the City of Vaughan to identify elements for each type of street classification.

Functional Classification	The London Plan Classification
Arterial	Rapid Transit Boulevard Main Street Urban Thoroughfare Civic Boulevard
Primary/Secondary Collector	Neighbourhood Connector
Local	Neighbourhood Street
Rural Roads	Rural Thoroughfare Rural Connector

Source: City of London Complete Streets Design Manual (2018)
Figure 4-2 Complete Street Classification, City of London

4.5 Review of Right-of-Way Requirements

Table 4-1 provides a summary of ROW requirements for functional road classifications in adjacent municipalities. Note that the figures in the table represent City-owned streets only and may differ from one municipality to another in classification naming and range.

Table 4-1 Rights-of-Way Width Comparison

Classification	City of Vaughan (Current)	City of Brampton	City of Markham	City of Richmond Hill
Major Arterial [1]	n/a	40-45m	n/a	n/a
Minor Arterial	36m	26-30m	32.5m *maximum*	36m *minimum*
Major Collector	26m	23-26m	30.5m *maximum*	26m
Minor Collector	24m	23	24.5m *maximum*	n/a
Local	17.5m	20m	20m	20m

Note 1: Roads classified as 'major arterial' in City of Vaughan, City of Markham, and City of Richmond Hill are typically owned by the region, whereas the City of Brampton has major arterial roads under municipal ownership.

5 Street Classification Considerations

Based on the City's existing classification system and the best practice review, several factors are considered in the development of City's new street typologies, including:

- Functional classification;
- Urban structure and land use;
- Street Relationship (Uses are street-oriented vs. non-street oriented); and
- Existing and proposed transportation network.

5.1 Definitions

Functional Classification

Functional Classification is the City's current road network classification system and is generally based on the speed and volume of vehicular travel as discussed in **Section 3**. While functional classification is limited in capturing context and modal priorities, it informs the street's intended role in the overall transportation network.

Street Classification

Street Classification refers to the new classification proposed as part of this document and is distinct from Functional Classification as it includes context-sensitive elements such as urban structure, land use, and urban design.

5.2 Urban Structure

Vaughan's Urban Structure provides a framework for guiding growth in the city. From a street classification perspective, the urban structure is an important consideration in identifying a street's functional requirement and ensuring that the street classification system is aligned with the City's overall growth objectives. The City's Official Plan includes the urban structure designations as shown in **Table 5-1**. Not all designations include streets under the City's jurisdiction. Based on an overlay of City's streets and land use designations, the following land

use types are considered:

- Natural areas and countryside
- Community areas (including new community areas)
- Employment areas
- Intensification areas – Vaughan Metropolitan Centre (VMC), primary and local centres

Table 5-1 City of Vaughan, Urban Structure

Stable Areas	Intensification Areas
Natural Areas and Countryside	Vaughan Metropolitan Centre
Community Areas	Primary Centres
New Community Areas	Local Centres
Employment Areas	Regional Intensification Corridor
Rail Facilities	Regional Intensification Corridors within Employment Areas
	Primary Intensification Corridors
	Primary Intensification Corridors within Employment Areas

Source: City of Vaughan Official Plan (2019 Consolidation), Schedule 1 Urban Structure

Legend

Considered in Vaughan's Street Classification
Not considered in Vaughan's Street Classification (Not under City's jurisdiction)

An overlay of the City's existing functional classification and urban structure is shown in **Figure 5-1** based on this overlay, it can be observed that one street can pass through many distinct land use types, and a more granular approach for street classification is needed, with considerations of land use characteristics, in order to design context-sensitive streets.

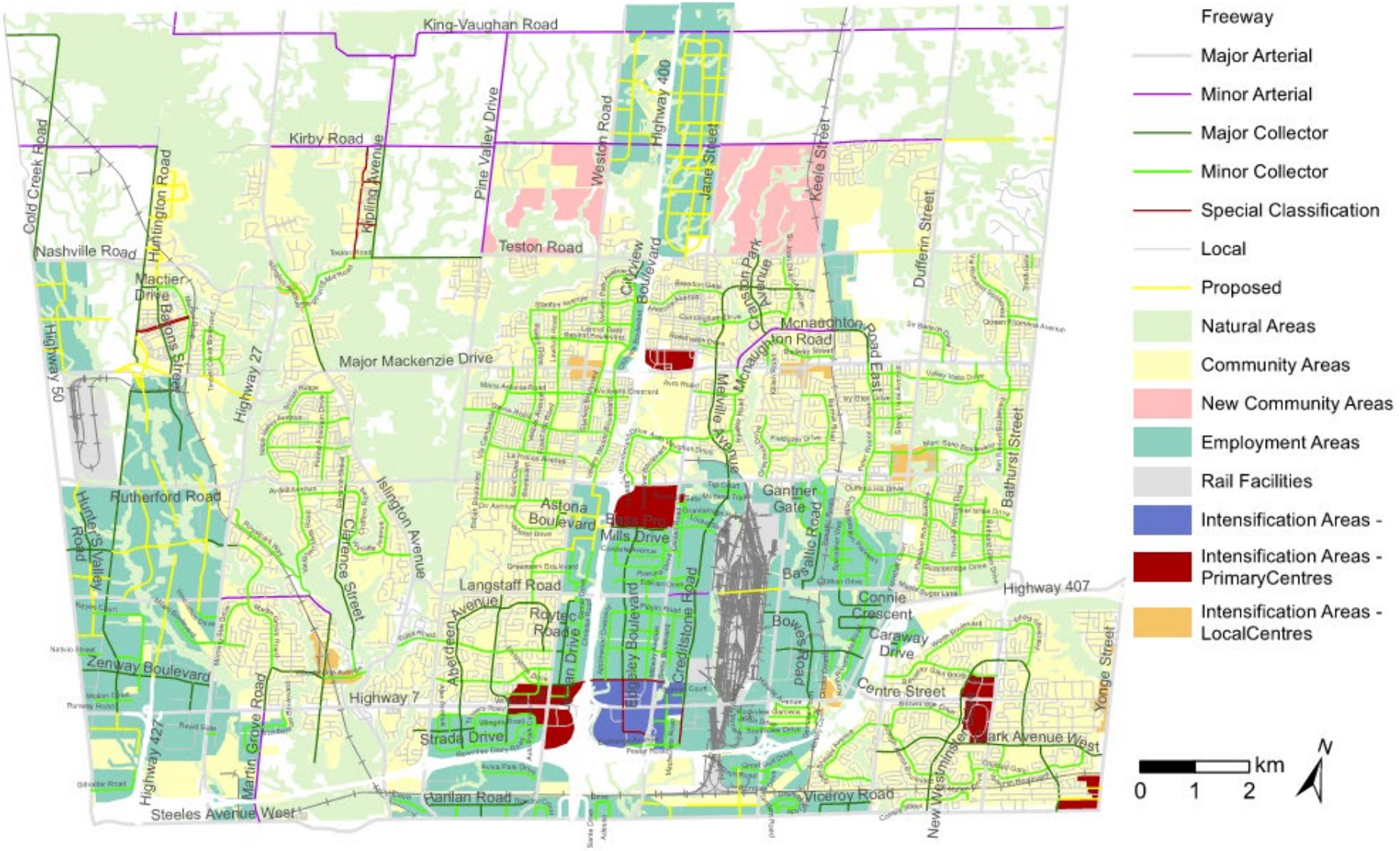


Figure 5-1 Functional Classification and Urban Structure

5.3 Land Use

Identifying land use in a street classification framework enables complete streets principles to be integrated with existing and planned land use policies. The consideration of land use provides amore granular view of an area; ensuring that the proposed modal priorities, cross section elements, and ROWs fits the needs, function, and character of aneighbourhood.

As per the City's Official Plan, there are 26 land-use designations:

- Natural Area
- Parks
- Private Open Spaces
- Agricultural
- Rural
- Low-Rise Residential
- Low-Rise Mixed-Use
- Mid-Rise Residential
- Mid-Rise Mixed-Use
- High-Rise Residential
- High-Rise Mixed-Use
- Community Commercial Mixed-Use
- Employment Commercial Mixed-Use
- General Employment
- Prestige Employment
- Major Institutional
- New Community Areas
- Theme Park and Entertainment
- Parkway Belt West Lands
- Infrastructure and Utilities
- Lands Subject to Secondary Plans
- Greenbelt Plan Area & Oak Ridges Moraine Conservation Plan Area
- Natural Core Area
- Natural Linkages Area
- Countryside
- Hamlets

Urban Design

Urban design provides a supportive role in the street's function and character. Urban design attributes are informed by land use; streets in High-Rise Mixed-Use areas should look, feel and function differently from streets in Community Commercial Mixed-Use areas. For a street classification, the consideration of urban design attributes informs whether the proposed cross section and ROW should provide space for future urban design features such as functional boulevard treatments (i.e. benches, lighting), or landscaping elements such as trees and planters.

Urban design elements will not be prescribed through the proposed typologies and example cross sections in this report. However, this will be integrated in the City's upcoming Complete Streets Guidelines study.

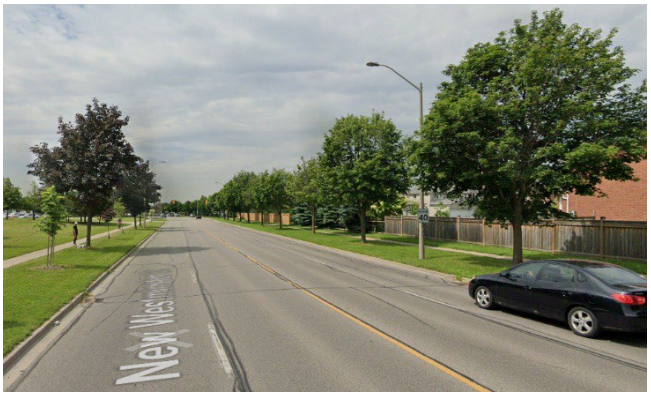
5.4 Street Relationships

The built environment in Vaughan shows many streets with different street frontage characteristics but hold the same functional classification and land use. These differences are especially prevalent on Major Collectors, as shown in **Figure 5-2** and **Figure 5-3**. Streets shown in **Figure 5-2** are neighbourhood-facing streets with properties fronting the street, while **Figure 5-3** illustrates a road where properties are turned away. The former promotes access to the street for all road users, and the latter emphasizes faster and more efficient movement.

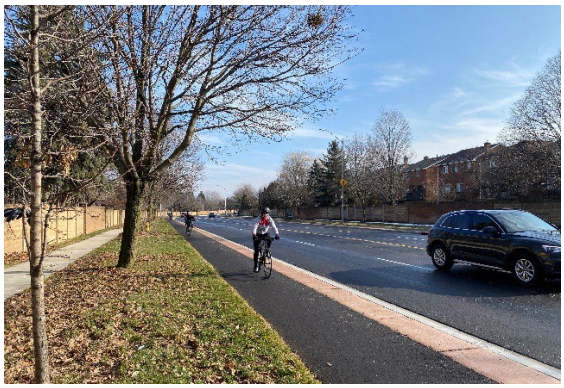
Belview Avenue

Drummond Drive

Figure 5-2 Street Oriented Major Collector



New Westminster Drive



Clark Avenue

Figure 5-3 Figure 5-3: Non-Street Oriented Major

5.5 Existing and Planned Transportation Network

Existing and planned walking, cycling, transit, and goods movement networks inform street typologies as each of these layers has distinct needs for different roadway users. The considerations include:

- The City of Vaughan completed the *2020 Pedestrian and Bicycle Master Plan (PBMP) Update.* The document adopts the National Association of City Transportation Officials (NACTO) contextual guidance for facility selection of all ages and abilities based on vehicular volumes and speeds. Based on current volumes and speeds, separated pedestrian, and cycling facilities are recommended on all streets classified as collector or higher. Cycling facilities on local streets should be provided based on Vaughan's All Ages and Abilities Framework as described in the Pedestrian and Cycling Master Plan. The intent is that these facilities are routinely accommodated through larger capital and development projects. Furthermore, the plan identifies pedestrian and cycling priorities to guide the City's active transportation program when there is no opportunity to leverage larger capital and development projects for implementation. The PBMP's Contextual Guidance for Selecting All Ages and Abilities Cycling Facilities (see **Figure 5-4**) has informed the selection of cycling facilities in this report.

Contextual Guidance for Selecting All Ages & Abilities Cycling Facilities (NACTO 2017)				
Roadway Context				All Ages and Abilities – Bicycle Facility
Target Motor Vehicle Speed	Target Max. Motor Vehicle Volume (ADT)	Motor Vehicle Lanes	Key Operational Considerations	
Any			Any of the following: High curbside activity, frequent buses, motor vehicle congestion or significant turning conflicts***	Cycle Track (Class 1)
≤15km/h	Less relevant	No centerline, or single lane one-way	Pedestrians share the roadway	Shared Street
≤30km/h	≤1,000 – 2,000		<50 motor vehicles per hour in the peak direction at peak hour	Bicycle Boulevard
≤40 km/h	≤500 – 1,500			
	≤ 1,500 – 3,000	Single lane each direction or single lane one-way	Low curbside activity or low congestions pressure	Conventional or Buffered Bicycle Lane or Cycle Track (Class 2)
	≤ 3,000 – 6,000			Buffered Bicycle Lane or Cycle Track (Class 1)
	Greater than 6,000	Multiple lanes per direction		Protected Cycle Track (Class 1)
>40 km/h	≥ 6,000	Single lane each direction or single lane one-way	Low curbside activity or low congestions pressure	Protected Cycle Track (Class 1), or Reduce Speed
		Multiple lanes per direction		Protected Cycle Track (Class 1), or Reduce to Single Lane & Reduce Speed
	Greater than 6,000	Any		Protected Cycle Track, or Bicycle Path (Class 1)
High-speed limited access roadways, natural corridors, or geographic edge conditions with limited conflicts	Any	High pedestrian volume		Bike Path with Separate Walkway or Protected Cycle Track (Class 1)
		Low pedestrian volume		Shared-Use Path or Protected Bicycle Lane (Class 1)

* While posted or 85th percentile motor vehicle speed are commonly used design speed targets, 95th percentile speed captures high-end speeding, which causes greater stress to bicyclists and more frequent passing events. Setting target speed based on this threshold results in a higher level of bicycling comfort for the full range of riders.

**Setting 40 kilometres per hour as a motor vehicle speed threshold for providing protected bikeways is consistent with many cities' traffic safety and Vision Zero policies. However, some cities use a 50 kilometres per hour posted speed as a threshold for protected bikeways, consistent with providing Level of Traffic Stress level 2 (LTS 2) that can effectively reduce stress and accommodate more types of riders.

***Operational factors that lead to bikeway conflicts are reasons to provide protected bike lanes regardless of motor vehicle speed and volume.

Figure 5-4 Contextual Guidance for Selecting All Ages and Abilities Cycling Facilities

- York Region's plans for a higher-order and frequent transit network identifies priority transit network and should be supported by streets to prioritize transit modes and promote safe and convenient access to transit for pedestrians and cyclists.

- York Region's *Strategic Goods Movement Network* identifies the needs for large vehicle movement, which are considered when identifying modal priorities. The classification also plays a strategic role by informing how key goods movement corridors and industrial land uses can be more transit-supportive to enable workers to commute safely and comfortably to work and allowing good pedestrian and cycling connections to the areas.

5.6 Additional Transportation Data

Overlaying City's transportation data on top its functional classification and land use conditions is an important step to consider before applying new street typologies to the transportation network; it draws a profile of the role the street plays in the overall network, and highlights opportunities to transition a street to a desired configuration to support future needs and planning objectives.

Additional data and information to be considered when applying street topologies to the City's network include:

- Existing and future pedestrian and cyclist activities, transit ridership
- Existing and future auto and goods movement vehicle volumes
- Trip generators / points of interest
- Demographics and equity indices
- Safety data

The above information is analyzed as part of the broader VTP study and will not be elaborated further in this report.

6 Recommended Street Classifications

This chapter provides an overview of the recommended street typologies. As discussed in **Section 4**, the attributes informing the street classification stem from an array of considerations, such as functional classification, land use, and the existing and planned transportation network. Other attributes contributing to the recommended street classification are informed by best practices.

Table 6-1 summarizes attributes and design considerations for each classification that informed the recommendations.

Table 6-1 Street Classification Attributes and Design Considerations

Attribute	Informed By
Functional Classification	Existing classification
Urban Structure Designation	Official Plan
Modal Priorities	Best practice, policy direction (Official Plan, 2020 Pedestrian and Bicycle Master Plan), existing and planned transportation network
Flow Characteristics	Access, crossings, and conflict points. Includes considerations for property frontage characteristics such as driveway access to residential or commercial/retail property
Design Speed	Based on best practice (2017 Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, York Region Designing Great Streets Guidelines), Design speed is assumed to be the same as posted speed for all street with speeds below 70km/h.
Maximum No. of Lanes	Traffic volume and best practice
ROW	Best practice. Note that ROW widths represent ideal mid-block conditions. In areas with closely spaced intersections, ROW requirements may expand if the need for back-to-back turn lanes or other such geometric features are identified.
Modal Considerations	**Informed By**
Walking Cycling Transit Vehicle Goods Movement On-street Parking Intersection Treatment Other	Best practice, policy direction, existing and planned transportation network (e.g., Official Plan, 2020 Pedestrian and Bicycle Master Plan, York Region Strategic Goods Movement Network) Cycling facilities are informed by the 2020 PBMP's Contextual Guidance for Selecting All Ages and Abilities Cycling Facilities

Based on considerations described in the previous section, the typologies with their associated land uses and ROWs are identified in **Table 6-1** supplement the existing functional classification system.

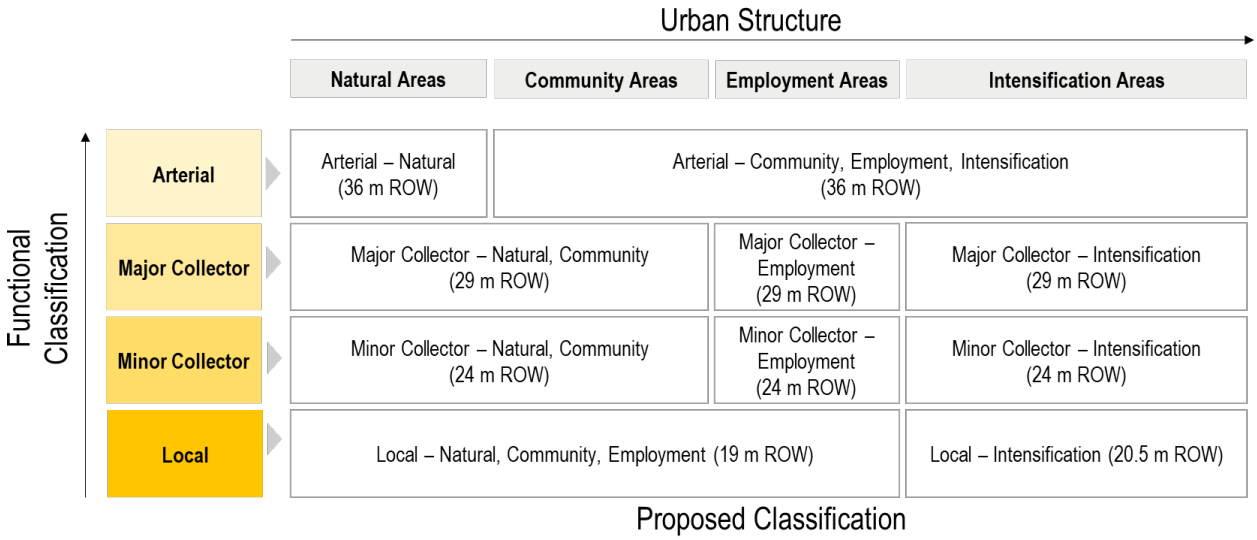


Figure 6-1 Proposed Street Classifications

Details for each classification and example streets for application are discussed in the following subsections.

October 2023 - Note to Reader: The above figure (6-1) will be updated through the Vaughan Complete Streets and/or Vaughan Official Plan documents published after July 2023. Please refer to those documents for the most updated information.

6.1 Arterial

Arterial – Natural Area

Natural arterials pass through the City's rural neighbourhoods in natural areas and countryside orindustrial areas (see **Figure 6-2**). They are designed for efficient vehicle movements and to accommodate agricultural and goods movement, though active transportation facilities should also be considered. Key attributes and design considerations are shown in **Figure 6-2**.

Figure 6-2 King-Vaughan Road

Table 6-2 Arterial – Natural Area Key Attributes and Design Considerations

Key Attributes	
Functional Classification	Minor Arterial
Urban Structure Designation	Natural Areas and Countryside
Modal Priorities (listed in order of priority)	Private Vehicles; Heavy Trucks; Walking and Cycling
Flow Characteristics	Uninterrupted flow except at signals, stop signs, or other controlled access points
Design Speed	60-80 km/h (as determined through EA and detailed design)
Maximum No. of Lanes	4
Minimum ROW (mid-block) *	36 m
Modal Considerations	
Walking	Paved shoulder with buffer; Multi-use path if high-demand and/or designated as priority corridor in the City's Pedestrian and Cycling Master Plan
Cycling	Shared-Use Path or Protected Bicycle Lane (Class 1) *
Transit	Typically no transit service
Vehicle	Heavy truck usage should be expected
Goods Movement	Support goods movement for streets in York Region's Strategic Goods Movement Network
On-Street Parking	No
Intersection Treatment	Additional turning lanes could be accommodated within existing ROW by reducing planting strip
Other	

* Once the street is urbanized (e.g., ditches removed, land use changes), classification should change to Urban Arterial with differentrequirements for cycling facilities.

Arterial – Community, Employment, Intensification

Community, Employment, Intensification arterials pass through the City's urban and suburban neighbourhoods (see **Figure 6-3** and **Figure 6-4**). They usually have an important role in providing efficient people movementwith priorities on transit, as well as goods movement. In-boulevard dedicated pedestrian and cycling facilities should be provided to provide a comfortable experience for people of all ages and abilities. Key considerations and design attributes are summarized in **Table 6-3**.

Figure 6-3 Langstaff Road west of Highway 27 (planned in-boulevard cycle tracks)

Figure 6-4 Langstaff Road east of Highway 27

Table 6-3 Arterial – Community, Employment, Intensification Area Key Attributes and Design Considerations

Attribute	
Functional Classification	Minor Arterial
Urban Structure Designation	Community Areas, New Community Areas
Modal Priorities (listed in order of priority)	Transit; Walking and Cycling; Private Vehicles; Heavy Trucks
Flow Characteristics	Uninterrupted flow except at signals, stop signs, or other controlled access points
Design Speed	60 km/h
Maximum No. of Lanes	4
Minimum ROW (mid-block)	36 m
Modal Considerations	
Walking	At a minimum, meet AODA requirements on both sides of the street
Cycling	• Protected Cycle Track (Class 1), and Reduce Speed • Protected Bicycle Lane, or Bicycle Path (Class 1)
Transit	Transit vehicles should be accommodated
Vehicle	
Goods Movement	Heavy trucks should be expected, especially those Community Arterials identified in York Region's Strategic Goods Movement Network
Intersection Treatment	Additional turning lanes could be accommodated within existing ROW or through widening at intersections as described in detailed design guidance
On-street Parking	No
Other	Some Community Arterials may be candidates for uploading to York Region, so adherence to Regional design standards may be appropriate.

6.2 Major Collector

Major Collector – Natural, Community Area

Major Collector – Natural, Community Area streets are non-street oriented, typically passes through the back-lotted residential neighbourhoods (see **Figure 6-5**). They are intended to provide efficient people movement through transit, active transportation, and vehicles, connecting arterials to either localroads or people's final destinations. For areas with higher density, frequent higher order transit service should be considered. Key considerations and design attributes are summarized in **Table 6-4**.

Figure 6-5 Clark Avenue

Table 6-4 Major Collector – Natural, Community Area Key Attributes and Design Considerations

Attribute	
Functional Classification	Major Collector
Urban Structure Designation	Community areas; new community areas
Modal Priorities (listed in order of priority)	Walking and Cycling; Transit; Private Vehicles; Heavy Trucks
Flow Characteristics	Mostly uninterrupted flow except at access points or signals
Design Speed	50 km/h
Maximum No. of Lanes	4
Minimum ROW (mid-block)	29 m
Design Considerations	
Walking	Meet AODA requirements on both sides of the street
Cycling	• Buffered Bicycle Lane or Cycle Track (Class 1) • Protected Cycle Track (Class 1)
Transit	Minimum lane widths to accommodate transit must be provided
Vehicle	Speeding may occur, especially in flat, straight segments of roadway. Narrower lane widths could be considered to prevent speeding
Goods Movement	Heavy vehicle usage should be infrequent
On-street Parking	Off-peak on-street parking could be considered
Intersection Treatment	Turning lanes may be accommodated through reallocating widths from other cross section elements (i.e. planting strip) or localized widening at intersections as described in detailed design guidance.
Other	

Major Collector – Intensification Area

Major Collectors – Intensifications Area streets are street-oriented on at least one side of the street. It usually connectshigher density land use in intensification areas (see **Figure 6-6**) with the intent to provide efficient people movement through transit, active transportation, and vehicles. The corridor is usually served by frequent transit. Key attributes and design considerations are summarized in **Table 6-5**.

Figure 6-6 New Westminster Drive North of Centre Street

Table 6-5 Major Collector – Intensification Area Key Attributes and Design Considerations

Attribute	
Functional Classification	Major Collector
Urban Structure Designation	Intensification areas – VMC, primary centres, local centres
Modal Priorities (list in order of priority)	Transit; Walking and Cycling; Private Vehicles; Heavy Trucks
Flow Characteristics	Interrupted flow by passive traffic calming (narrow lanes, drive access) and signals
Design Speed	50 km/h
Maximum No. of Lanes	4
Minimum ROW (mid-block)	29 m
Design Considerations	
Walking	Minimum 2.0m sidewalk to support pedestrian demand in intensification areas with enhanced streetscaping for comfortable pedestrian experience
Cycling	• Buffered Bicycle Lane or Cycle Track (Class 1) • Protected Cycle Track (Class 1)
Transit	Minimum lane widths to accommodate transit must be provided
Vehicle	
Goods Movement	Heavy truck usage is not expected unless designated as a truck route
On-street Parking	Off-peak on-street parking could be considered
Intersection Treatment	Turning lanes may be accommodated through reallocating widths from other cross section elements or localized widening at intersections as described in detailed design guidance.
Other	

Major Collector – Employment Area

Major Collector – Employment Area streets serve low-density employment or industrial land use (see **Figure 6-7**).They intend to provide efficient people and goods movement and connections from arterial to local streets. Key attributes and a sample cross section are summarized in **Table 6-6**.

Figure 6-7 Zenway Boulevard

Table 6-6 Major Collector – Employment Area Key Attributes and Design Considerations

Attribute	
Functional Classification	Major Collector
Urban Structure Designation	Employment areas
Modal Priorities (listed in order of priority)	Pedestrians and cyclists; Transit; Vehicles; Trucks
Flow Characteristics	Interrupted flow by passive traffic calming (e.g., drive access) and signals
Design Speed	50 km/h
Maximum No. of Lanes	4
Minimum ROW (mid-block)	29 m
Design Considerations	
Walking	Meet AODA requirements on both sides of the street
Cycling	• Buffered Bicycle Lane or Cycle Track (Class 1) • Protected Cycle Track (Class 1)
Transit	Minimum lane widths to accommodate transit must be provided
Vehicle	
Goods Movement	Heavy trucks should be expected and accommodated through design
On-street Parking	Off-peak parking could be accommodated as appropriate.
Intersection Treatment	Turning lanes may be accommodated through reallocating widths from other cross section elements (i.e. planting strip) or localized widening at intersections as described in detailed design guidance.
Other	

6.3 Minor Collector

Minor Collector – Natural, Community Area

Minor Collector – Natural, Community Area streets typically have low vehicle volumes and intend to provide a safe and comfortable environment for all modes of travel. For this classification, streets providing connections to residential areas are considered (see **Figure 6-8** and **Figure 6-9**). The key attributes and design considerations are discussed in **Table 6-7**.

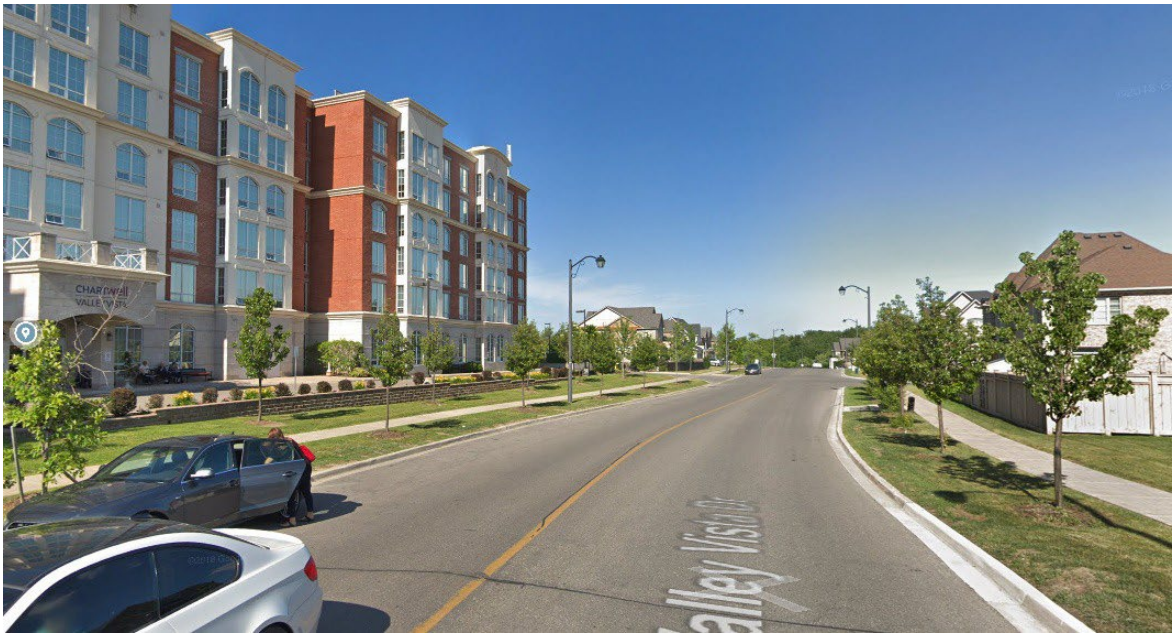


Figure 6-8 Valley Vista Drive

Figure 6-9 Peter Rupert Avenue

Table 6-7 Minor Collector – Natural, Community Area Key Attributes and Design Considerations

Attributes	
Functional Classification	Minor Collector
Urban Structure Designation	Community, New Community Area
Modal Priorities (list in order of priority)	Pedestrians and cyclists; Transit; Private Vehicles
Flow Characteristics	Interrupted flow by passive traffic calming (narrow lanes, parking / lay-by, drive access) and signals; property frontages that include frequent drive access to residential homes or commercial/retail property
Design Speed	40 km/h
Maximum No. of Lanes	2 driving lanes and 1 parking lane
Minimum ROW (mid-block)	24 m
Design Considerations	
Walking	At a minimum, meet AODA requirements with enhanced streetscaping for comfortable pedestrian experience
Cycling	• Buffered Bicycle Lane or Cycle Track (Class 1) • Protected Cycle Track (Class 1)
Transit	Minimum lane widths to accommodate transit must be provided
Vehicle	Speeding may occur, especially in flat, straight segments of roadway. Narrower lane widths could be considered to prevent speeding
Goods Movement	Heavy vehicle usage is not expected
On-street Parking	Provided on one side of the street or may be redistributed to other uses at the discretion of staff. The ROW cannot be reduced from 24m.
Intersection Treatment	Turning lanes may be accommodated through reallocating widths from other cross section elements (i.e., planting strip) or localized widening at intersections as described in detailed design guidance.
Other	

Minor Collector – Intensification Area

Minor Collector – Intensification Area streets provide connections to mid- to high-rise mixed-use areas and commercial/retail properties (see **Figure 6-10**). They support frequent transit service and typically have slower traffic flow, which may be frequently interrupted by drivewayaccesses. Generally, neighbourhood streets are low-speed, and pedestrian and bike-friendly. Key attributes and design considerations are discussed in **Table 6-8**.

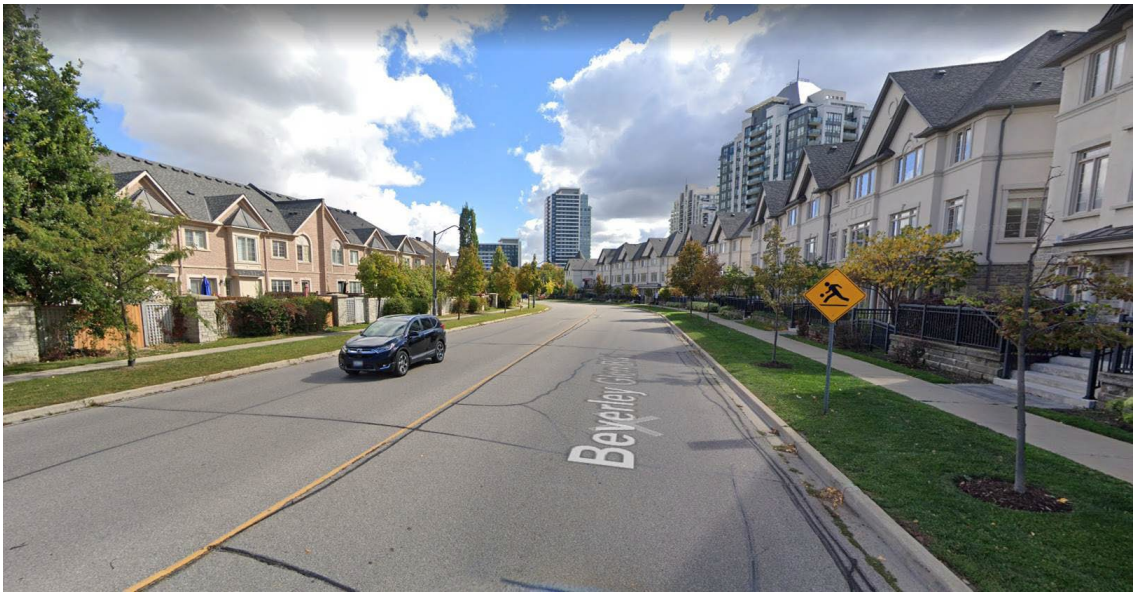


Figure 6-10 Beverly Glen Boulevard

Table 6-8 Minor Collector – Intensification Area Key Attributes and Design Considerations

Attributes	
Functional Classification	Minor Collector
Urban Structure Designation	Intensif ication areas – VMC, primary and local centres
Modal Priorities (list in order of priority)	Pedestrians and cyclist; Transit; Private Vehicles
Flow Characteristics	Interrupted flow by passive traffic calming (narrow lanes, parking / lay-by, drive access) and signals; property frontages that include frequent drive access to industrial / commercial property
Design Speed	40 km/h
Maximum No. of Lanes	2 driving lanes and 1 parking lane
Minimum ROW (mid-block)	24 m
Design Considerations	
Walking	Minimum 2.0m sidewalk to support pedestrian demand in intensif ication areas with enhanced streetscaping for comfortable pedestrian experience
Cycling	Protected Cycle Track (Class 1)
Transit	Minimum lane widths to accommodate transit must be provided
Vehicle	Speeding may occur, especially in flat, straight segments of roadway. Narrower lane widths could be considered to prevent speeding
Goods Movement	Heavy vehicle usage is not expected
On-street Parking	May be provided one side of the street at 2.2m width, or parking area can be redistributed to other uses at the discretion of staff. The ROW cannot be reduced from 24m. If parking is provided, encourage short-term duration of parking through regulations and/or pricing.
Intersection Treatment	Turning lanes may be accommodated through reallocating widths from other cross section elements or localized widening at intersections as described in detailed design guidance.
Other	

Minor Collector – Employment Area

Minor Collector – Employment Area streets serve low-density employment or industrial land use (see **Figure 6-11**). They typically have low vehicle volumes and intend to provide connections for people and goods to their final destinations. Key Attributes and design considerations are shown in **Table 6-9**.

Figure 6-11 N Rivermede Road

Table 6-9 Minor Collector – Employment Area Key Attributes and Design Considerations

Attribute	
Functional Classification	Minor Collector
Urban Structure Designation	Employment areas
Modal Priorities (list in order of priority)	Heavy Trucks; Pedestrians and cyclists; Transit; Private Vehicles
Flow Characteristics	Interrupted flow by passive traffic calming (narrow lanes, drive access) and signals
Design Speed	40 km/h
Maximum No. of Lanes	2
Minimum ROW (mid-block)	24 m
Design Considerations	
Walking	Meet AODA requirements on both sides of the street
Cycling	• Buffered Bicycle Lane or Cycle Track (Class 1) • Protected Cycle Track (Class 1)
Transit	Minimum lane widths to accommodate transit must be provided
Vehicle	
Goods Movement	Heavy trucks should be expected and accommodated through design
On-street Parking	No
Intersection Treatment	Turning lanes may be accommodated through reallocating widths from other cross section elements (i.e. planting strip) or localized widening at intersections as described in detailed design guidance.
Other	

6.4 Local

Local – Natural, Community, Employment Area

Local – Natural, Community, Employment Area streets are street-oriented with direct access from adjacent land uses, and generally has thelowest level of traffic volumes. They provide important connections for pedestrians and cyclists to their final destinations. In this classification, local streets within residential areas are considered (see **Figure 6-12**). The key attributes and design consideration are summarized in **Table 6-10**.

Figure 6-12 Oberfrick Avenue

Table 6-10 Local – Natural, Community, Employment Area Key Attributes and Design Considerations

Attributes	
Functional Classification	Local
Urban Structure Designation	Community, new community
Modal Priorities (list in order of priority)	Pedestrians and cyclists; Private Vehicles
Flow Characteristics	Interrupted flow by passive traffic calming (narrow lanes, drive access) and signals; property frontages that include frequent drive access to residential property
Design Speed	30 km/h
Maximum No. of Lanes	2 driving lanes and 1 parking lane
Minimum ROW (mid-block)	19m
Design Considerations	
Walking	Meet AODA requirements on both sides of the street.
Cycling	Shared on-street
Transit	Typically, no transit service
Vehicle	Additional traffic calming measures (such as curb extensions) may be required to encourage vehicles to operate at the design speed
Goods Movement	No major role in goods movement
On-street Parking	On-street parking provided on one side
Intersection Treatment	Turning lanes may be accommodated with localized widening at intersections as described in detailed design guidance. Please note that depending on intersection spacing, localized widening may need to span the entire segment between intersections
Other	

Local – Intensification Area

Local – Intensification Area streets provide access to individual properties in mid- to high-rise residential, and mixed-use areas, connect to collector streets, and an array of community amenities (see **Figure 6-13**). Generally, local streets are low-speed, and pedestrian and bike-friendly. The key attributes and design consideration are summarized in **Table 6-11.**

Figure 6-13 North Park Road

Table 6-11 Local – Intensification Area Key Attributes and Design Considerations

Attributes	
Functional Classification	Local
Urban Structure Designation	Intensif ication areas – primary and local centres
Modal Priorities (list in order of priority)	Pedestrians and cyclists; Private vehicles
Flow Characteristics	Interrupted flow by passive traffic calming (narrow lanes, drive access) and signals; property frontages that include frequent drive access to residential and commercial/retail property
Design Speed	30km/h
Maximum No. of Lanes	2 driving lanes and 2 parking lanes
Minimum ROW (mid-block)	20.5m
Design Considerations	
Walking	Minimum 2.0m sidewalk to support pedestrian demand in intensification areas with enhanced streetscaping for comfortable pedestrian experience
Cycling	Shared on-street
Transit	Typically, no transit service
Vehicle	Additional traffic calming measures (such as curb extensions) may be required to encourage vehicles to operate at the design speed
Goods Movement	No major role in goods movement
On-street Parking	On-street parking to be provided on at least one, and potentially both sides of the street
Intersection Treatment	Turning lanes may be accommodated with localized widening at intersections as described in detailed design guidance. Please note that depending on intersection spacing, localized widening may need to span the entire segment between intersections
Other	

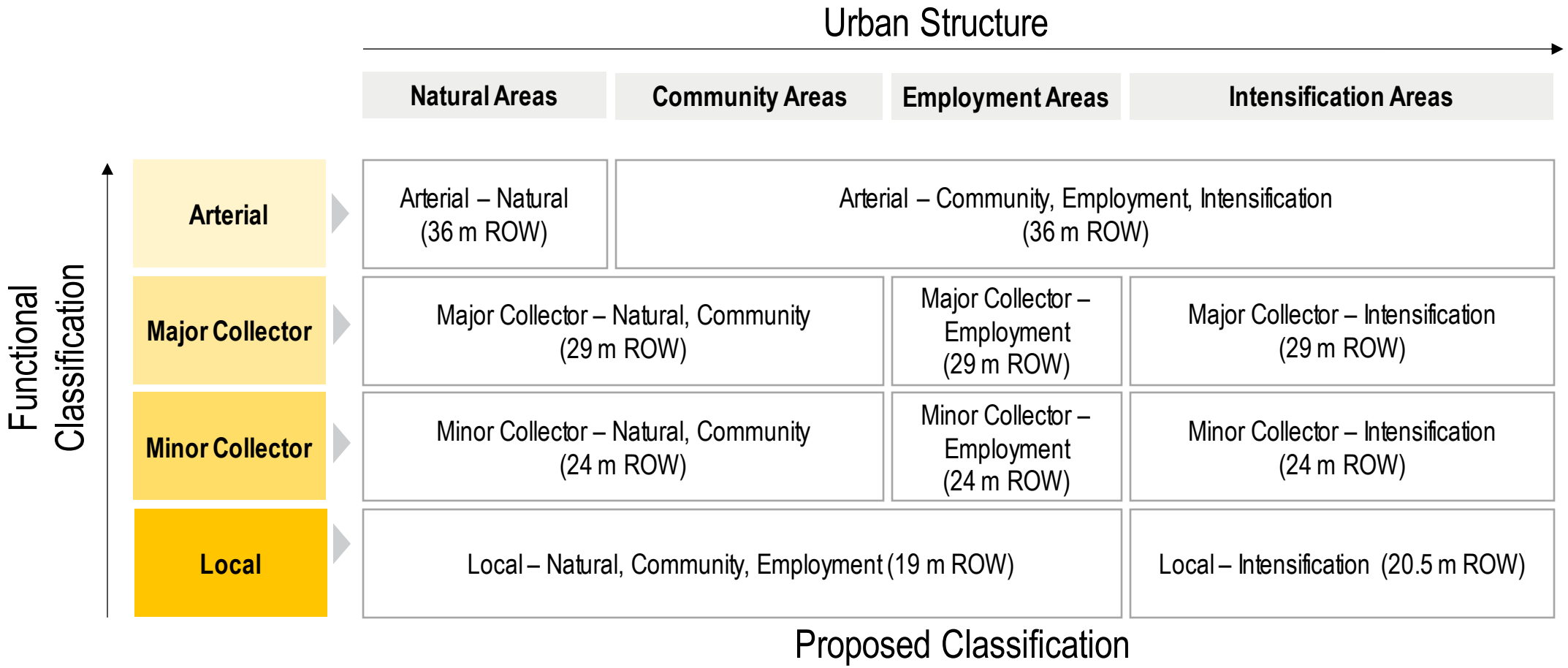
7 Next Steps

The initial typologies identified in this report will be further reviewed in the upcoming Complete Streets Guidelines study. The recommended typologies will be assigned to the preferred street network from the VTP and contribute to the City's Official Plan.

Street Classification – Sample Cross-Sections

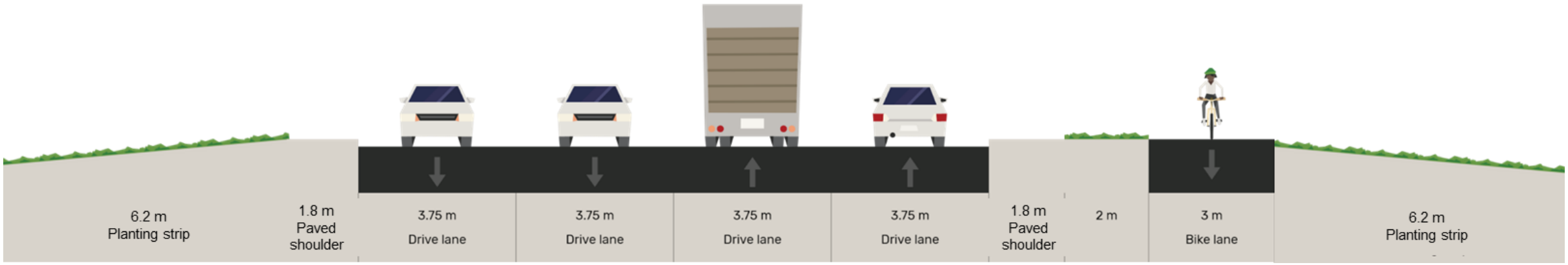
09/01/2021

Proposed Typologies

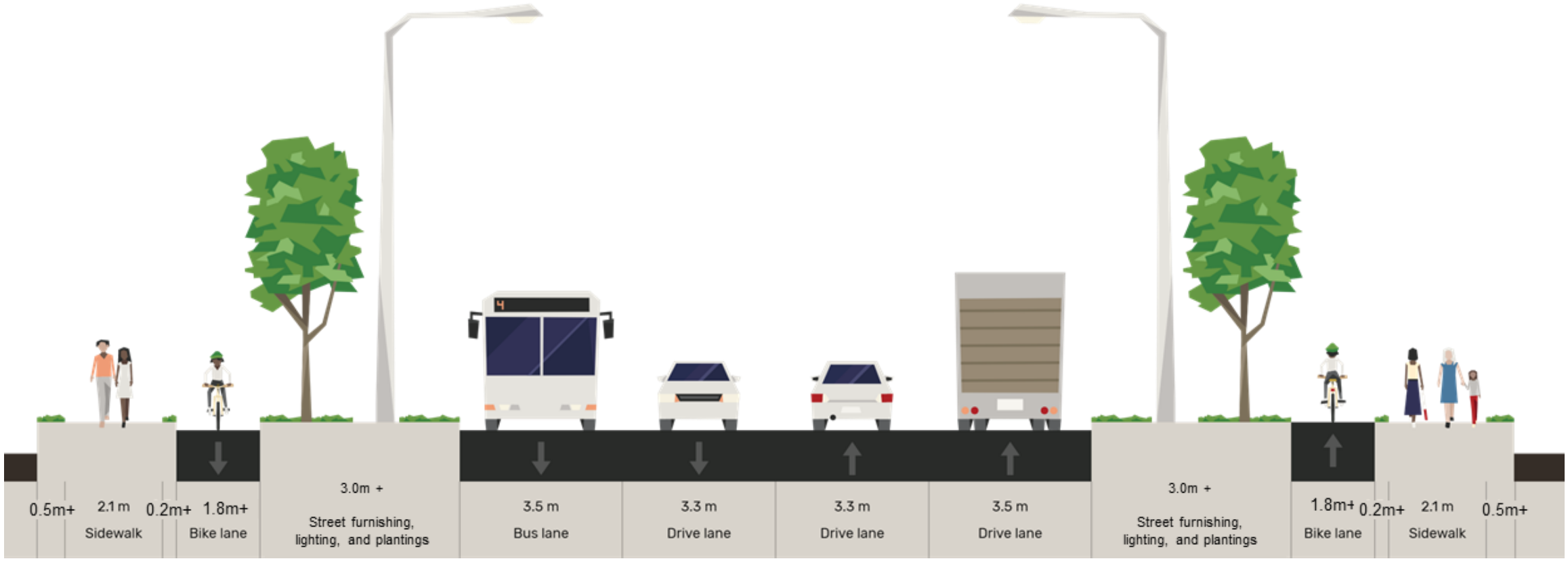


Arterial

Rural Arterial – 36m



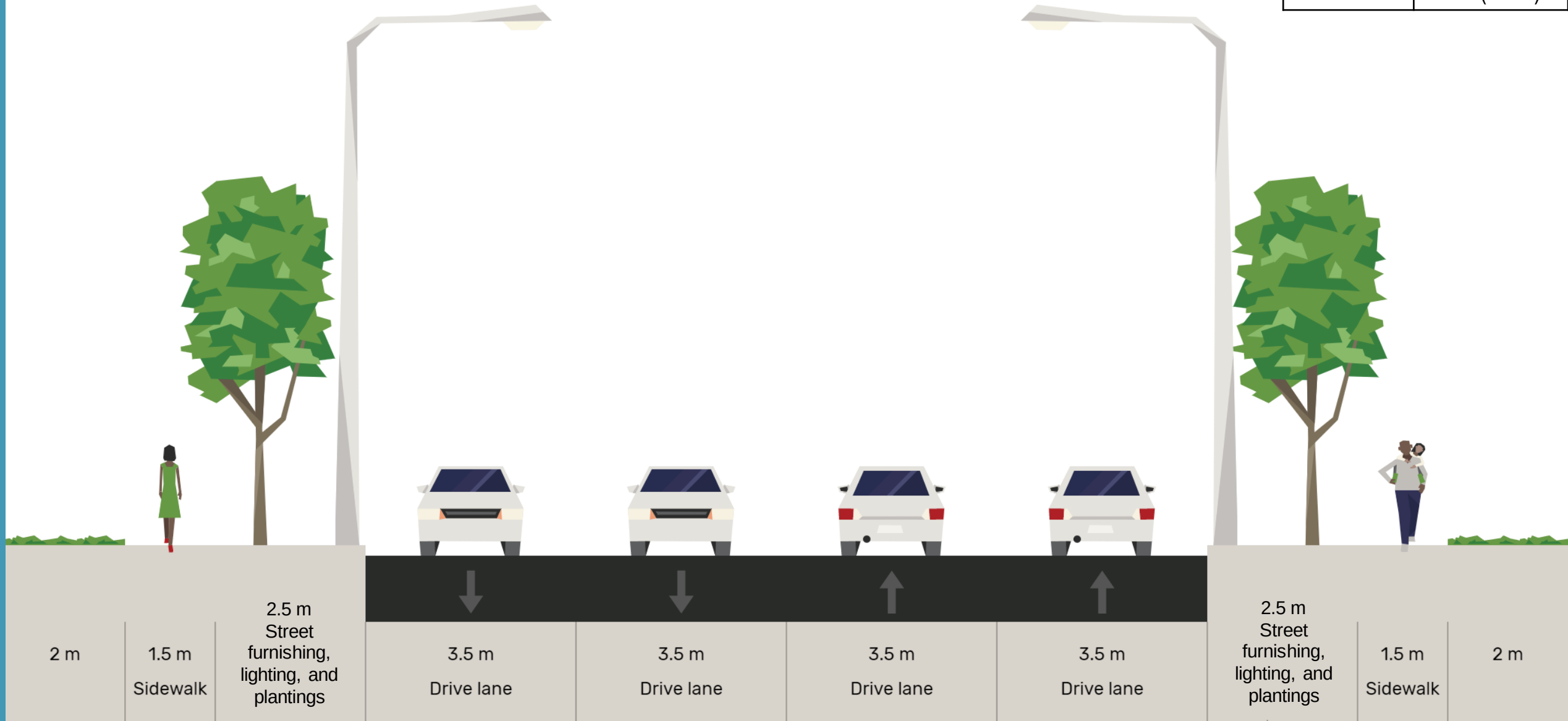
Arterial – Community, Employment, Intensification
36m ROW



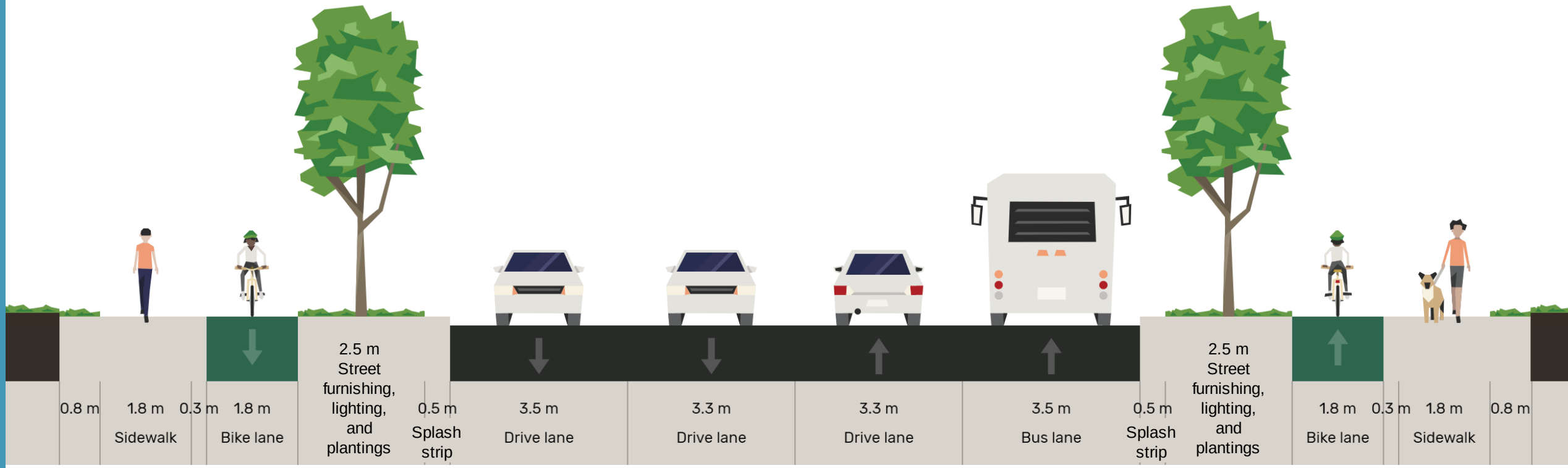
Major Collector

Current ROW
Major Collector

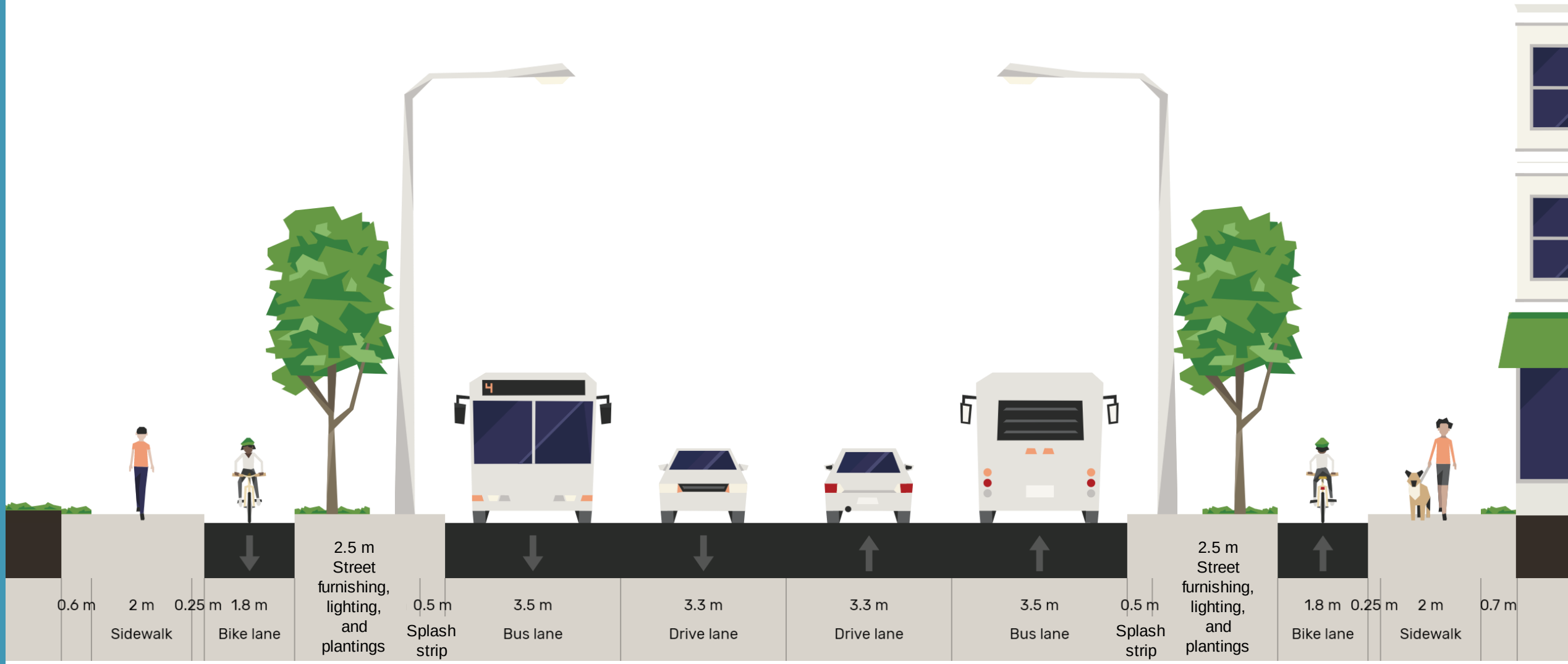
ROW	26 m
Pavement	14 m (54%)
Boulevard	12 m (46%)



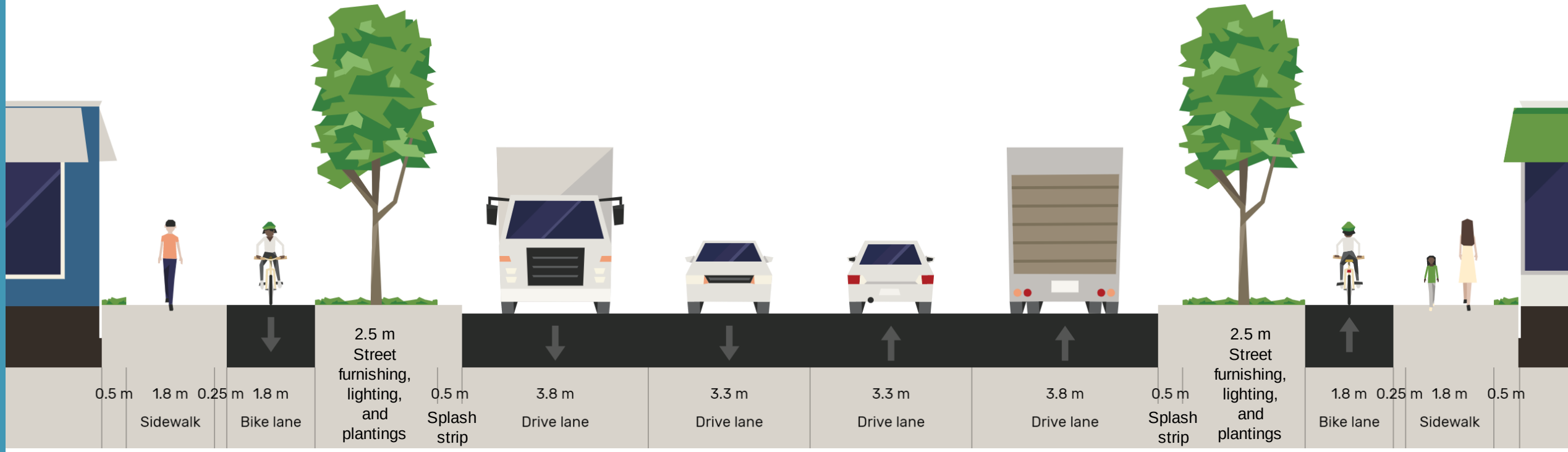
Major Collector – Natural, Community
Mid-block, 29m ROW



Major Collector - Intensification
Mid-block, 29m ROW



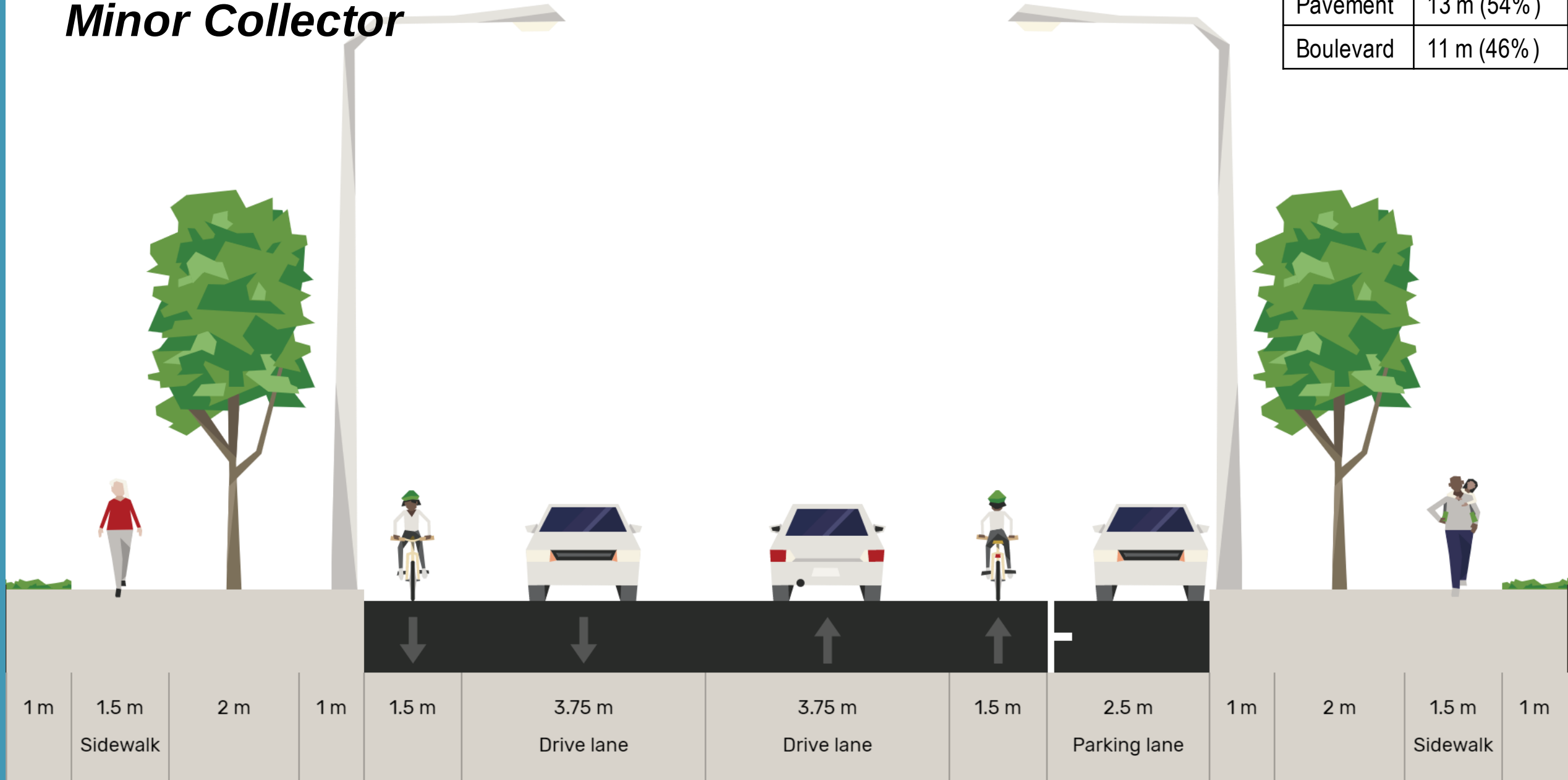
Major Collector – Employment
Mid-block, 29m ROW



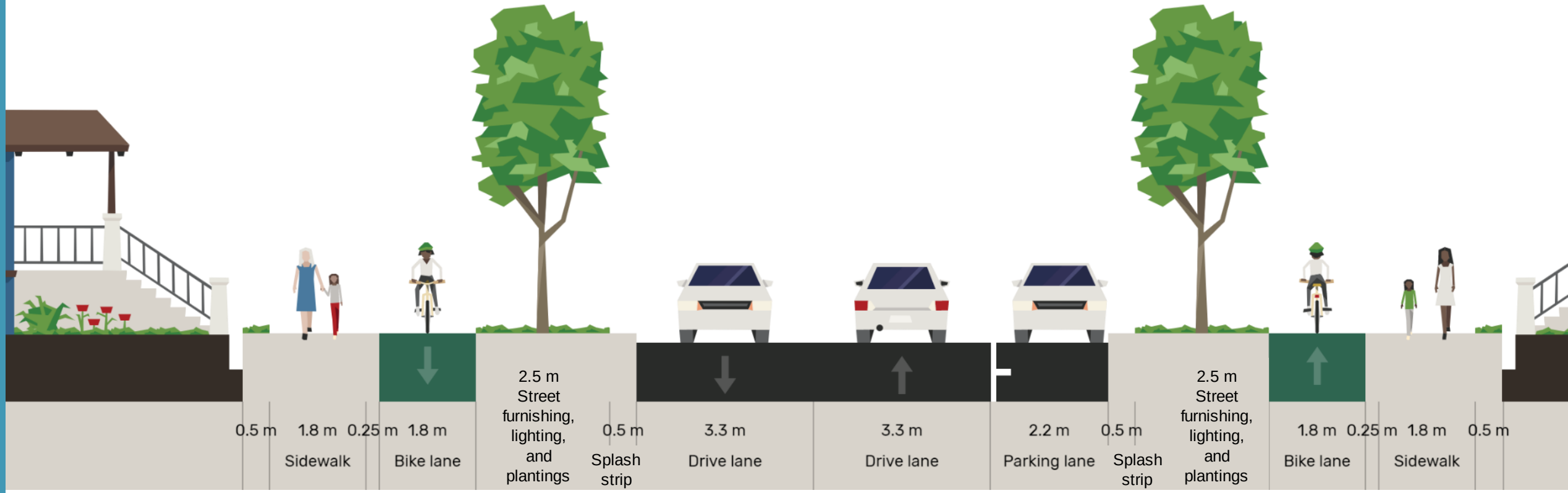
Minor Collector

Current ROW
Minor Collector

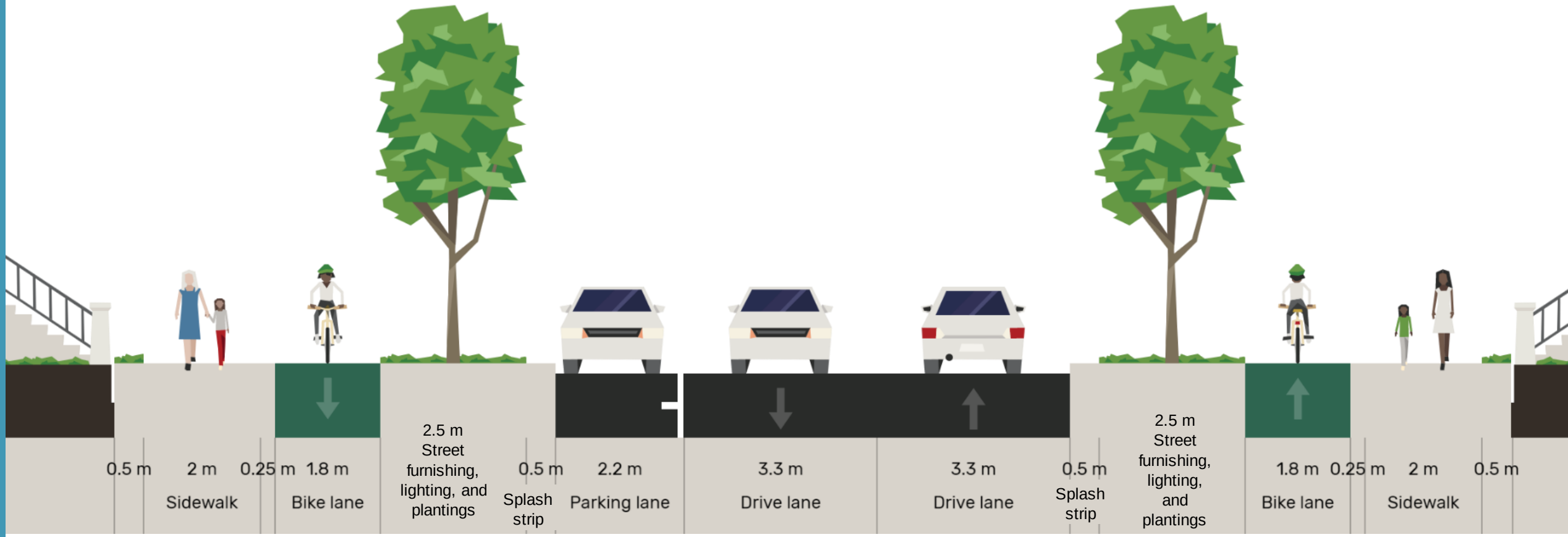
ROW	24 m
Pavement	13 m (54%)
Boulevard	11 m (46%)



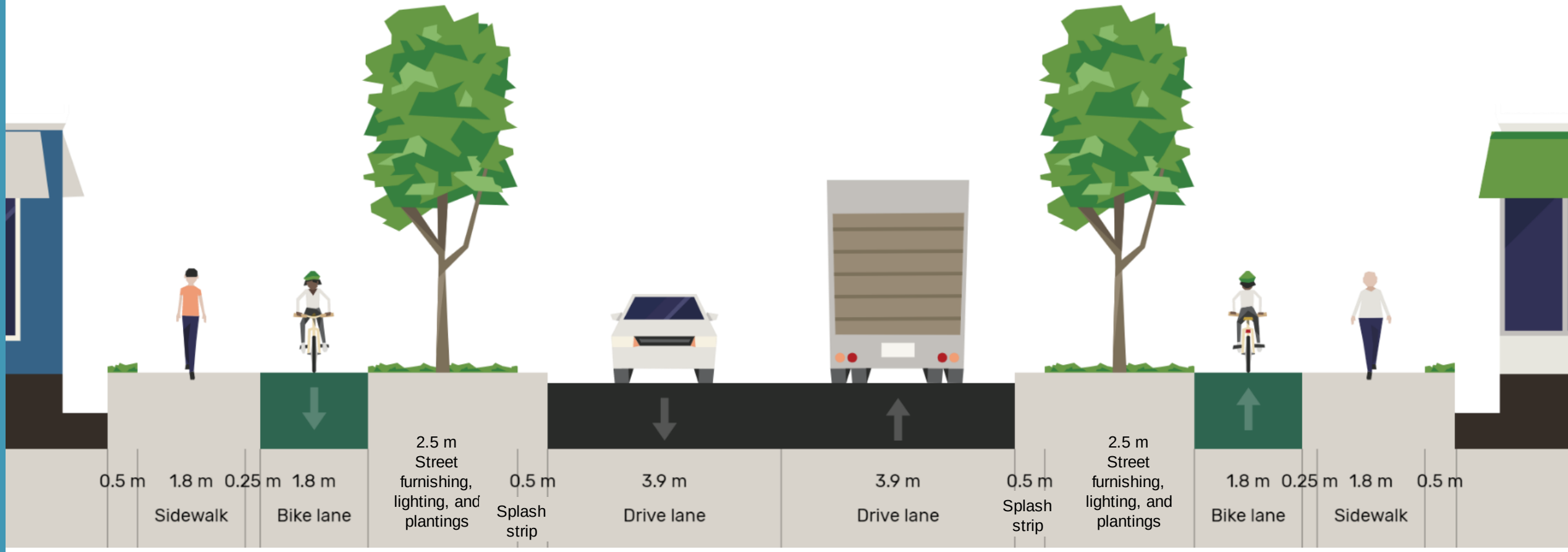
Minor Collector – Natural, Community
24 m ROW



Minor Collector – Intensification
24 m ROW



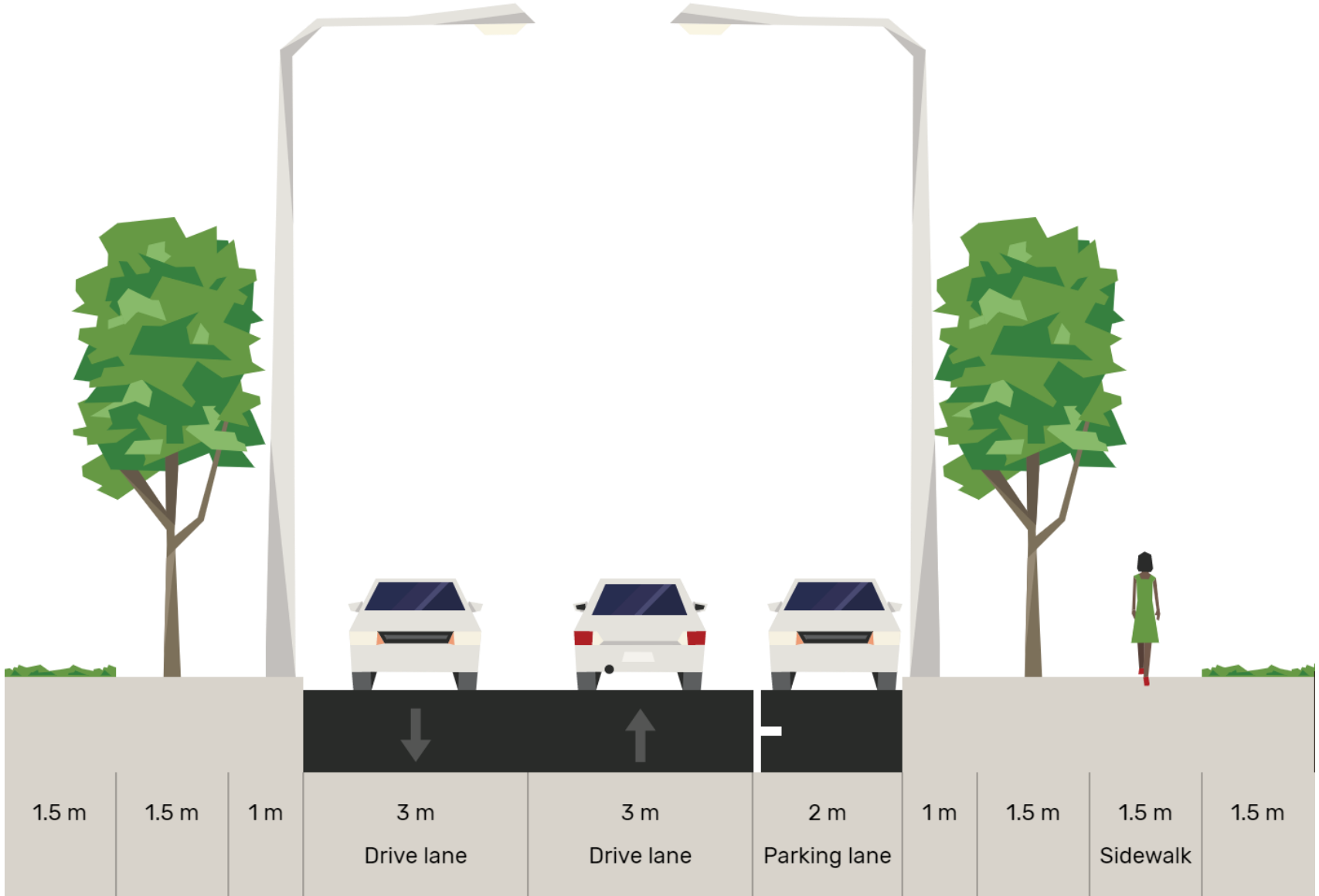
Minor Collector – Employment
24 m ROW



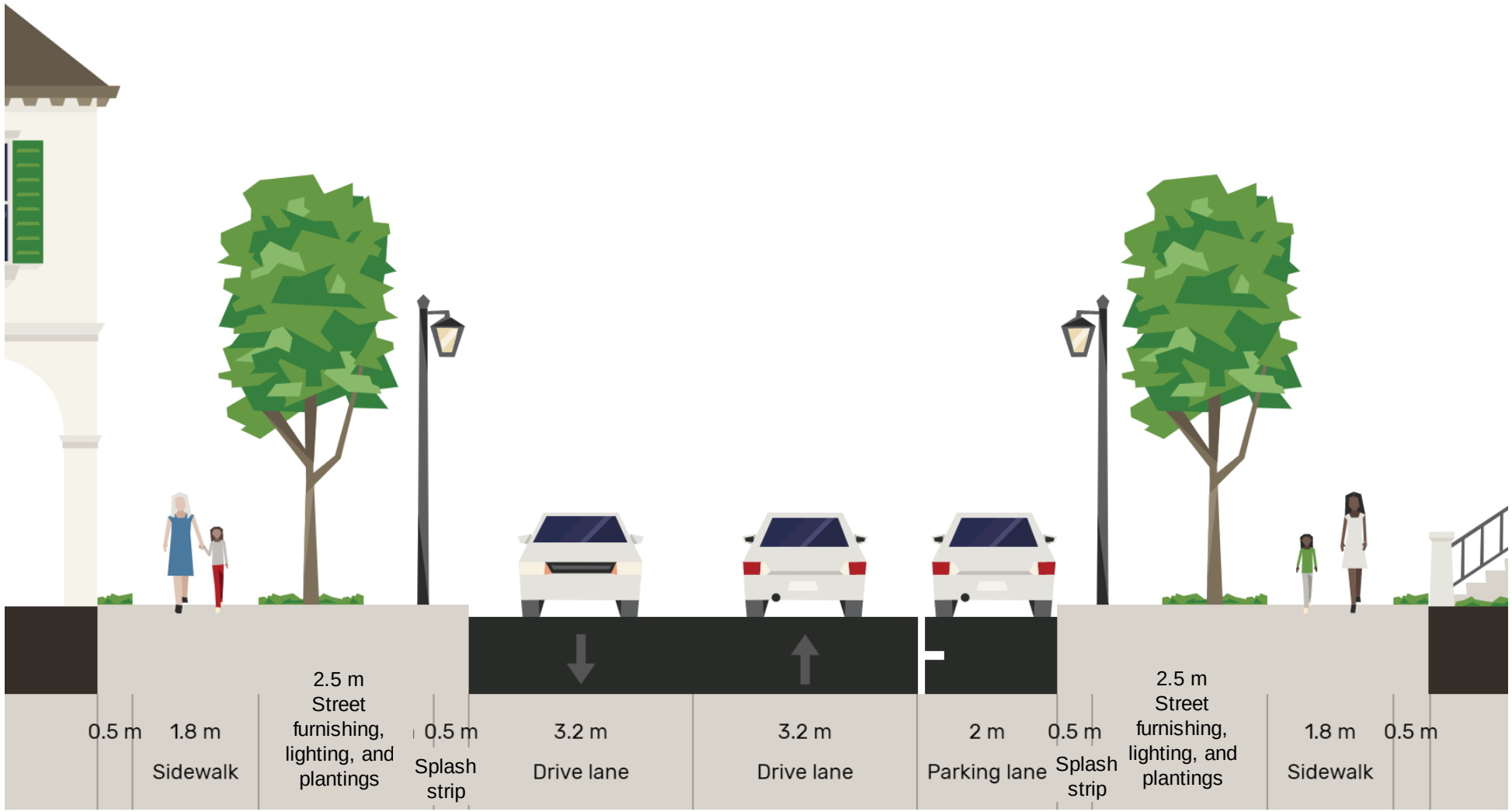
Local

Current ROW
Local Street

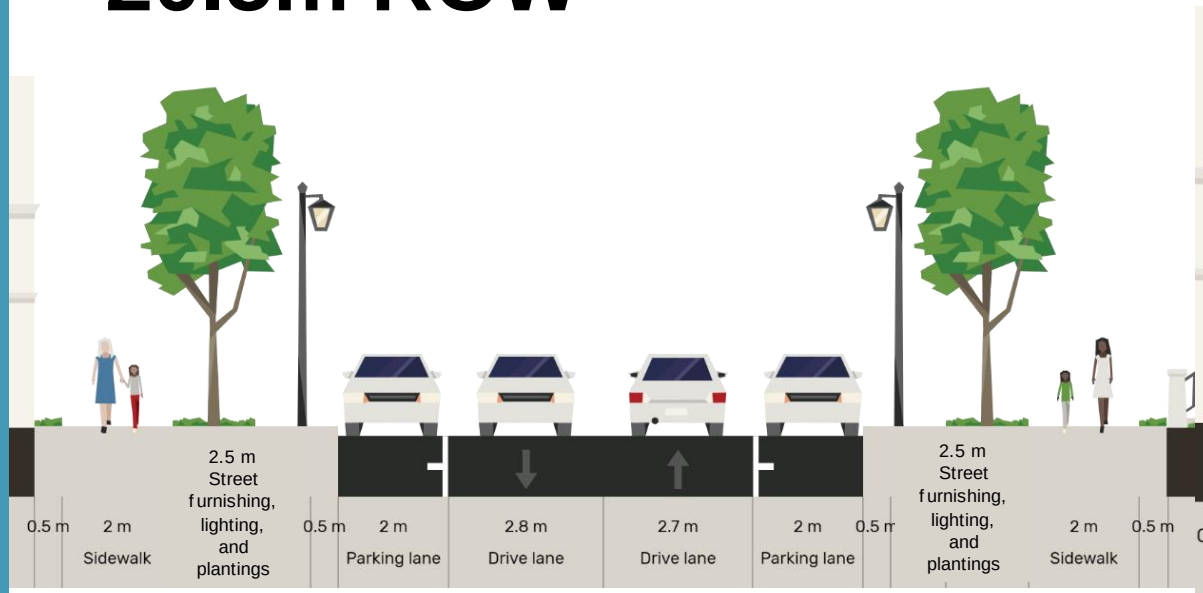
ROW	17.5 m
Pavement	8 m (46%)
Boulevard	9.5 m (54%)

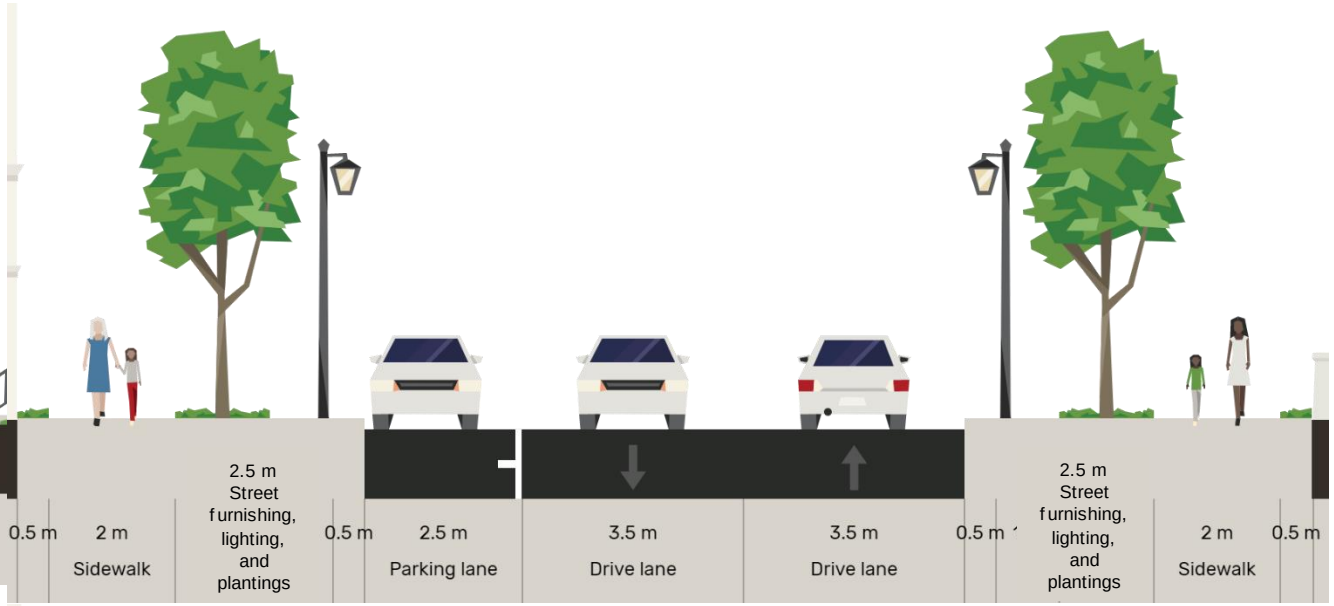


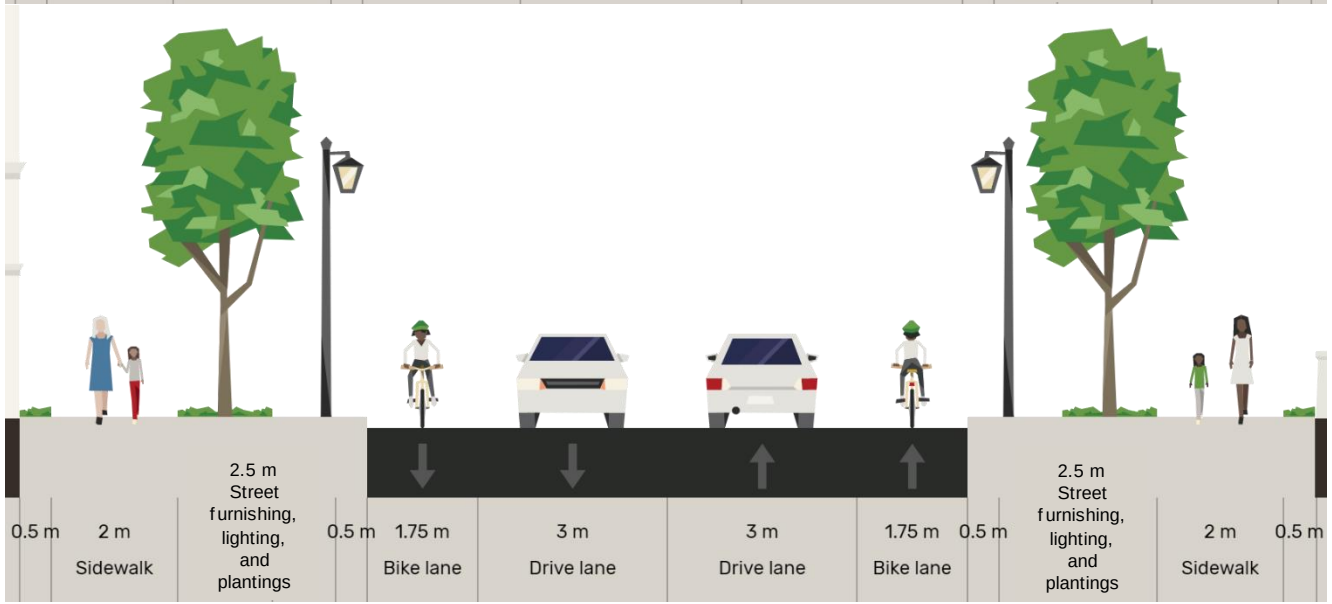
Local – Natural, Community Employment
19 m ROW



Local – Intensification (w/ Flex Space)
20.5m ROW





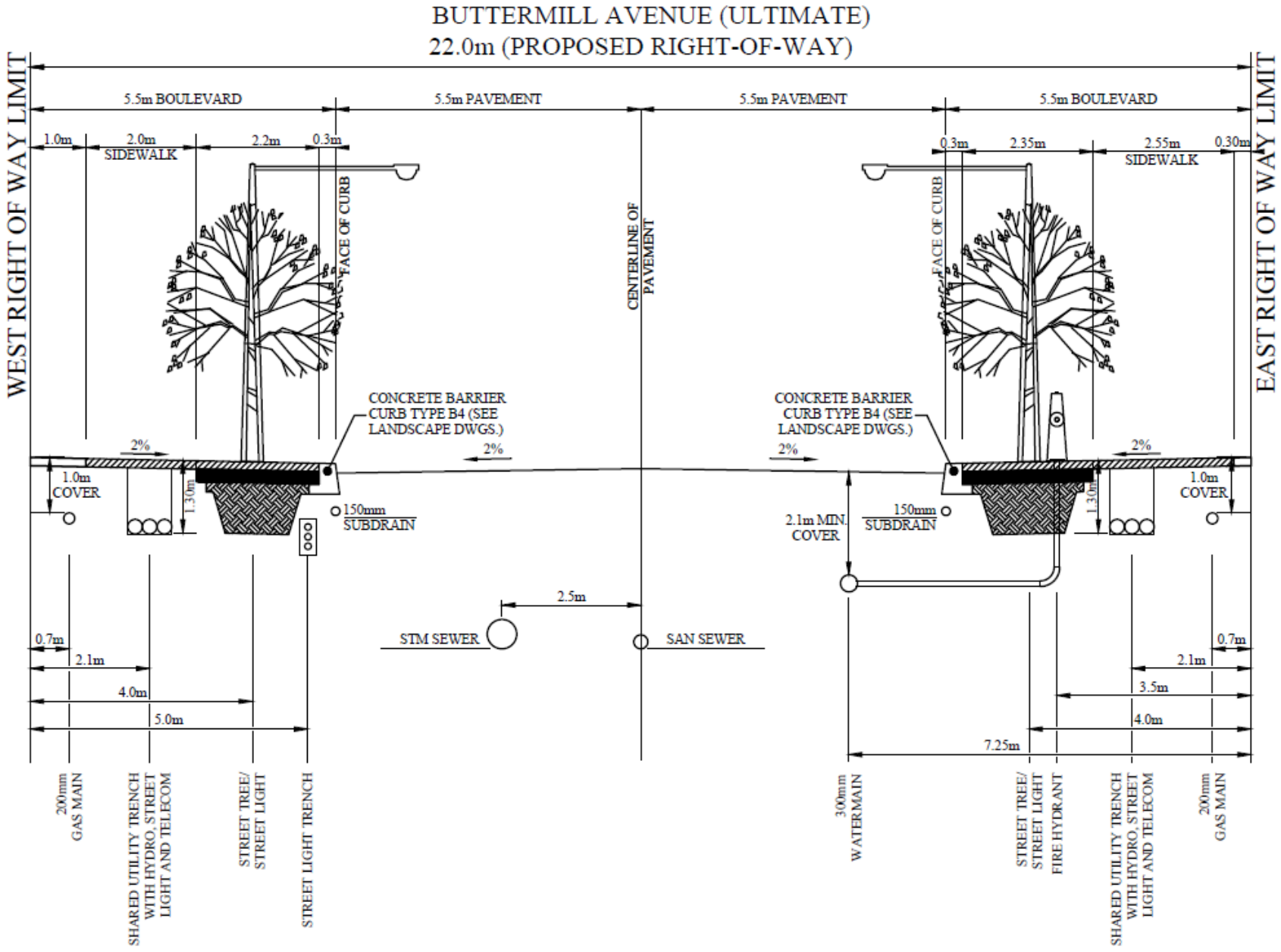


Reference

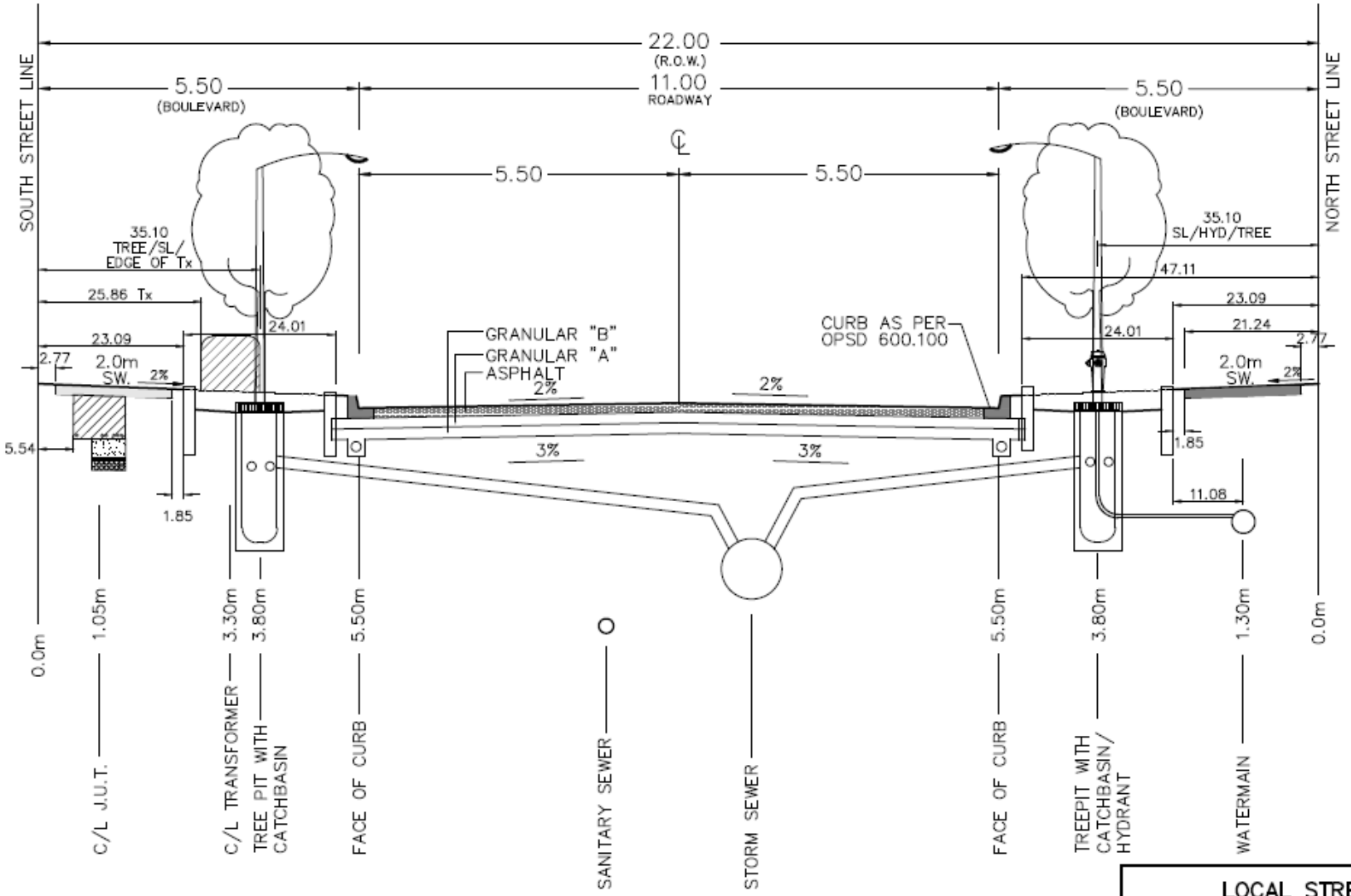
Proposed Typologies

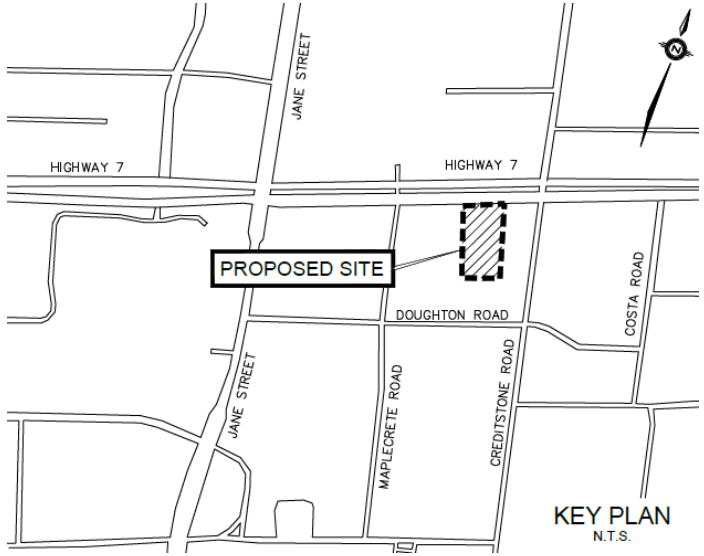
Existing Functional Classification	Proposed Typologies and ROW
Minor Arterial	Rural Arterial (36 m) Community Arterial (36 m)
Major Collector	Community Connector (29 m) Urban Connector (29 m) Employment Connector (28 m)
Minor Collector	Neighbourhood Street (24 m) Neighbourhood Street, Intensification Area (25 m) Employment Street (24 m)
Local	Local Street (18 m) Local Street, Intensification Area (18 m) Local Street, Intensification Area w/ Retail Frontage (20.5 m)

Buttermill (VMC) between Portage and Apple Mill



Street B / Melrose (VMC), Highway 7 / Creditstone



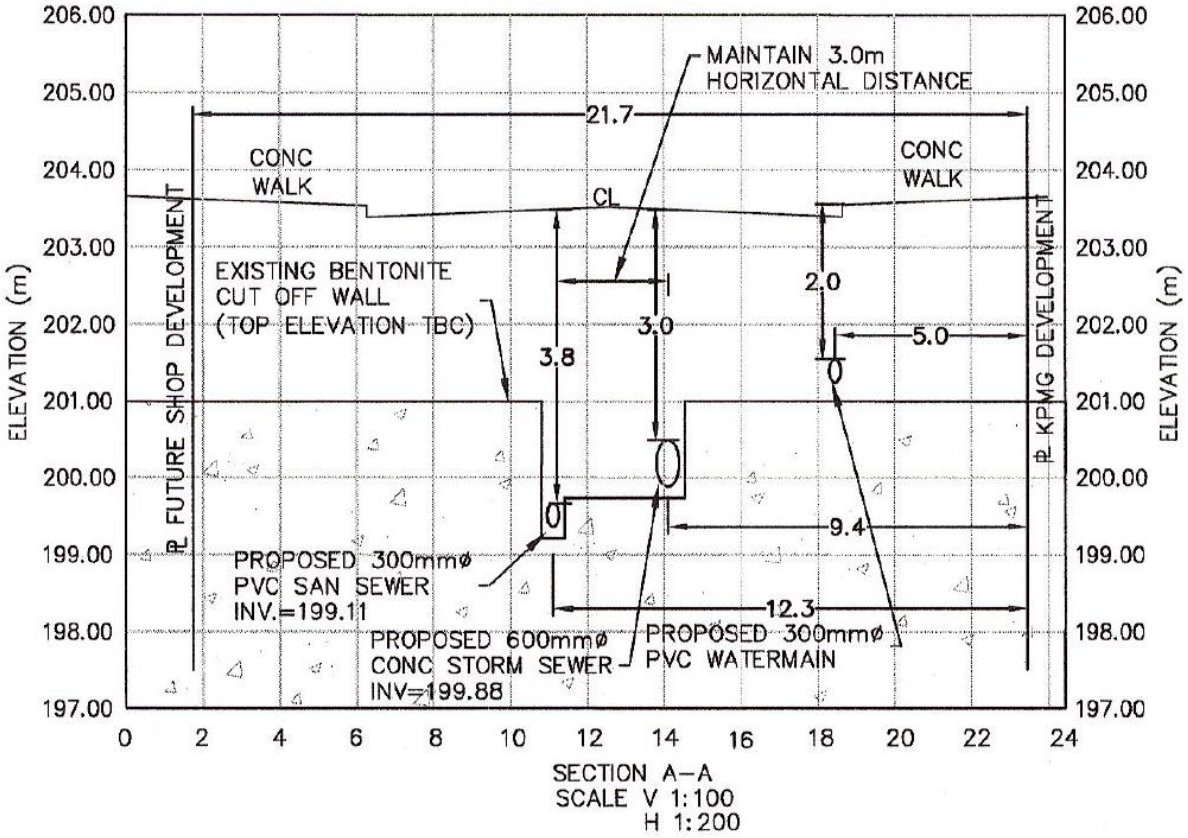


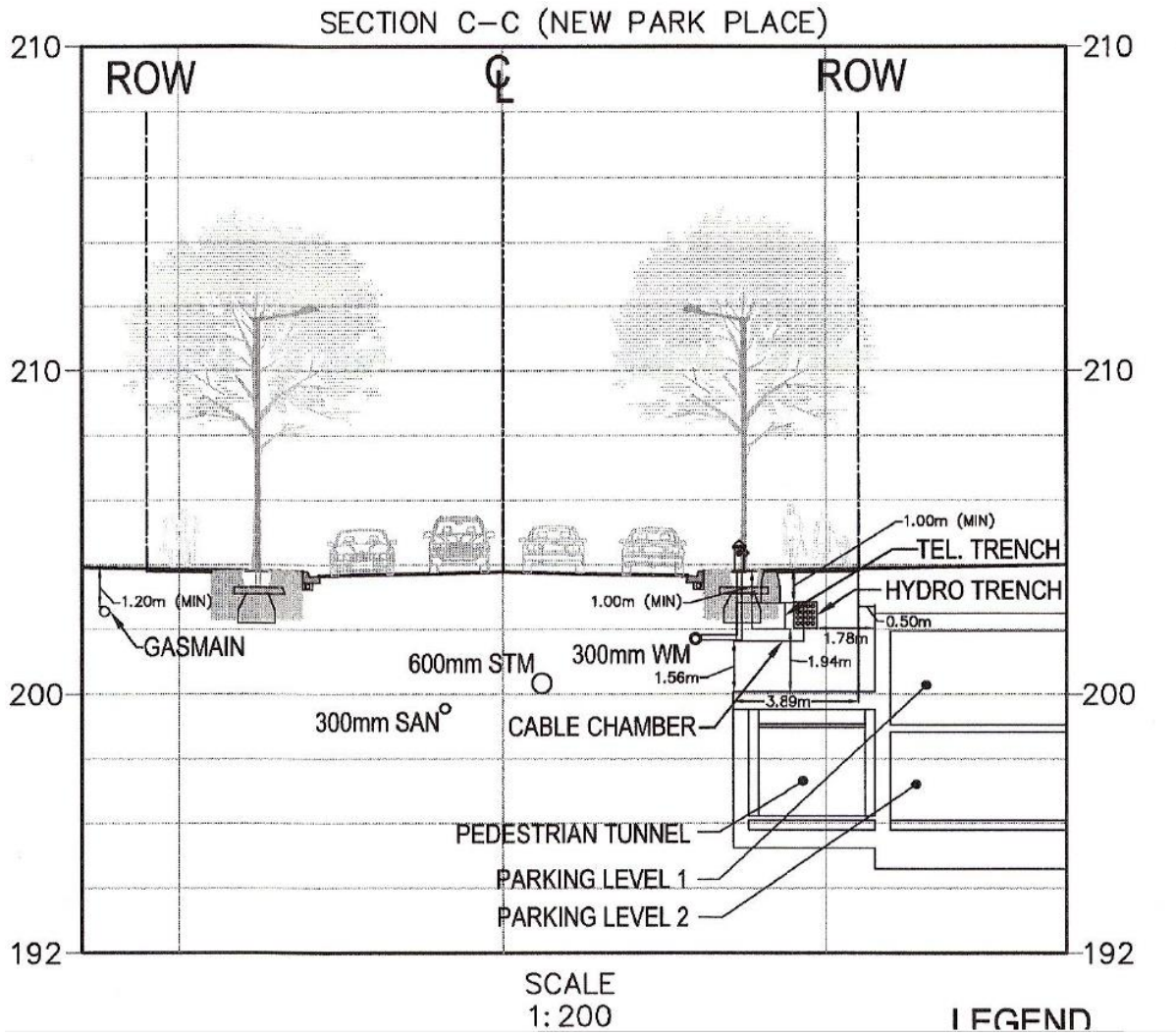
LOCAL STREET

22.0m R.O.W.
SCALE = 1:100

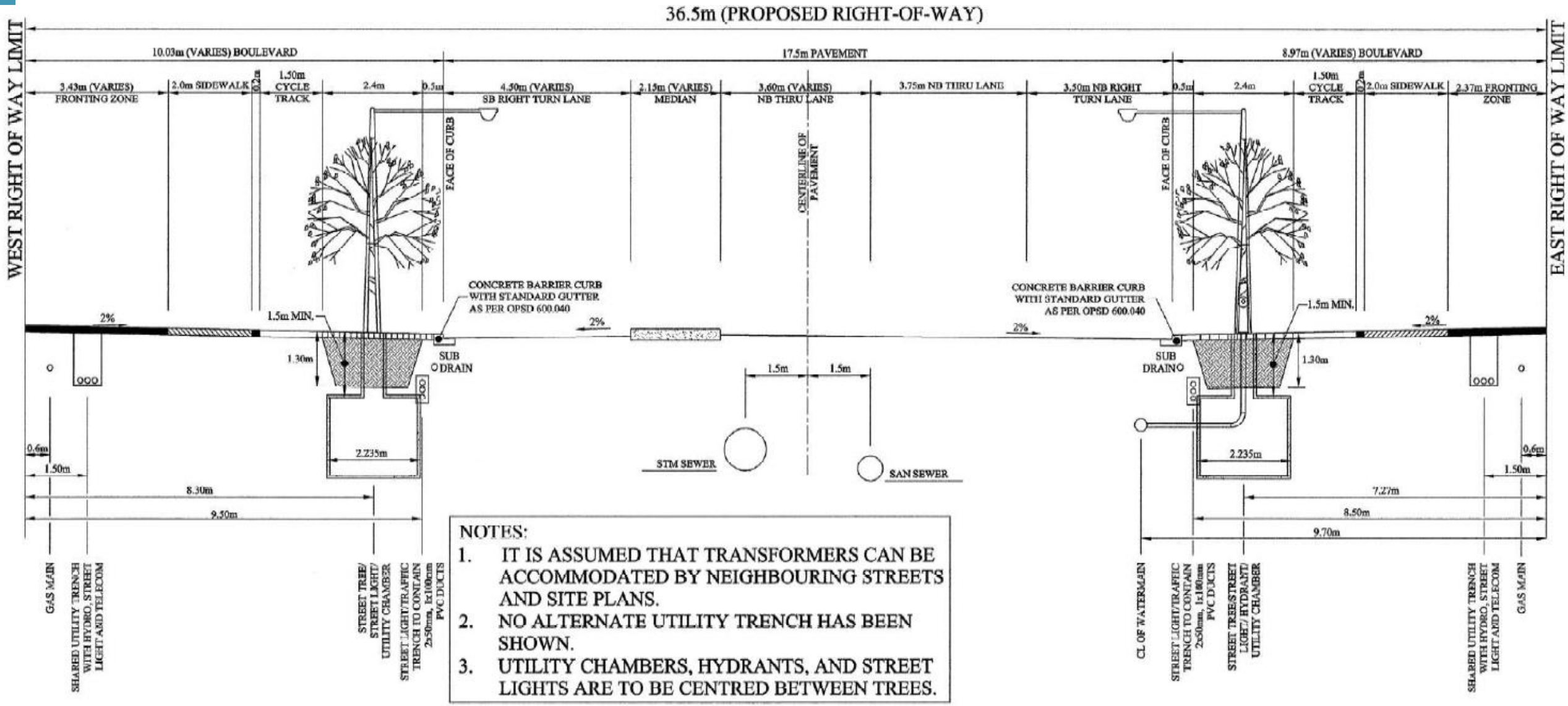
STREET 'B'

New Park Place





Applewood 36.5m



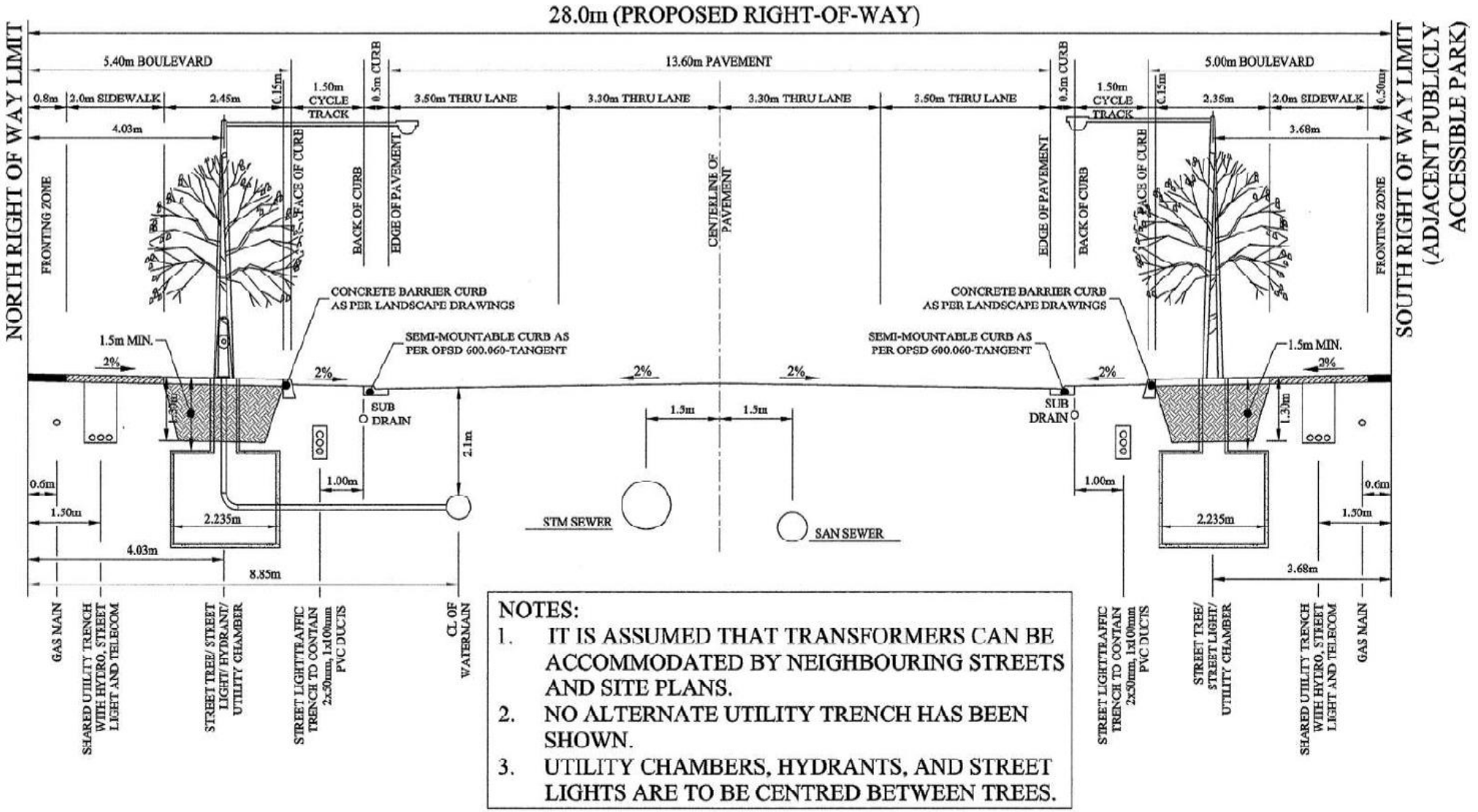
NOTES:

1. IT IS ASSUMED THAT TRANSFORMERS CAN BE ACCOMMODATED BY NEIGHBOURING STREETS AND SITE PLANS.
2. NO ALTERNATE UTILITY TRENCH HAS BEEN SHOWN.
3. UTILITY CHAMBERS, HYDRANTS, AND STREET LIGHTS ARE TO BE CENTRED BETWEEN TREES.

APPLEWOOD CRESCENT (BETWEEN HWY 7 AND NEW PARK PLACE) - CROSS-SECTION (TYPICAL)

SCALE: N.T.S.

Applewood 28m



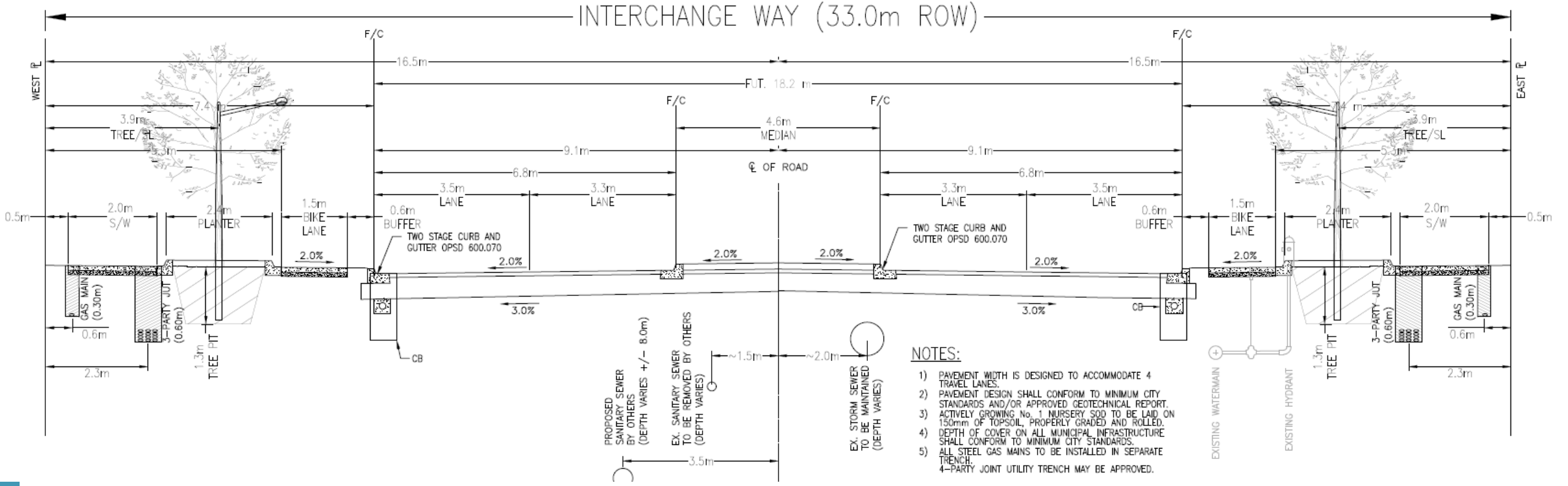
NOTES:

1. IT IS ASSUMED THAT TRANSFORMERS CAN BE ACCOMMODATED BY NEIGHBOURING STREETS AND SITE PLANS.
2. NO ALTERNATE UTILITY TRENCH HAS BEEN SHOWN.
3. UTILITY CHAMBERS, HYDRANTS, AND STREET LIGHTS ARE TO BE CENTRED BETWEEN TREES.

APPLE MILL ROAD - CROSS-SECTION (TYPICAL)

SCALE: N.T.S.

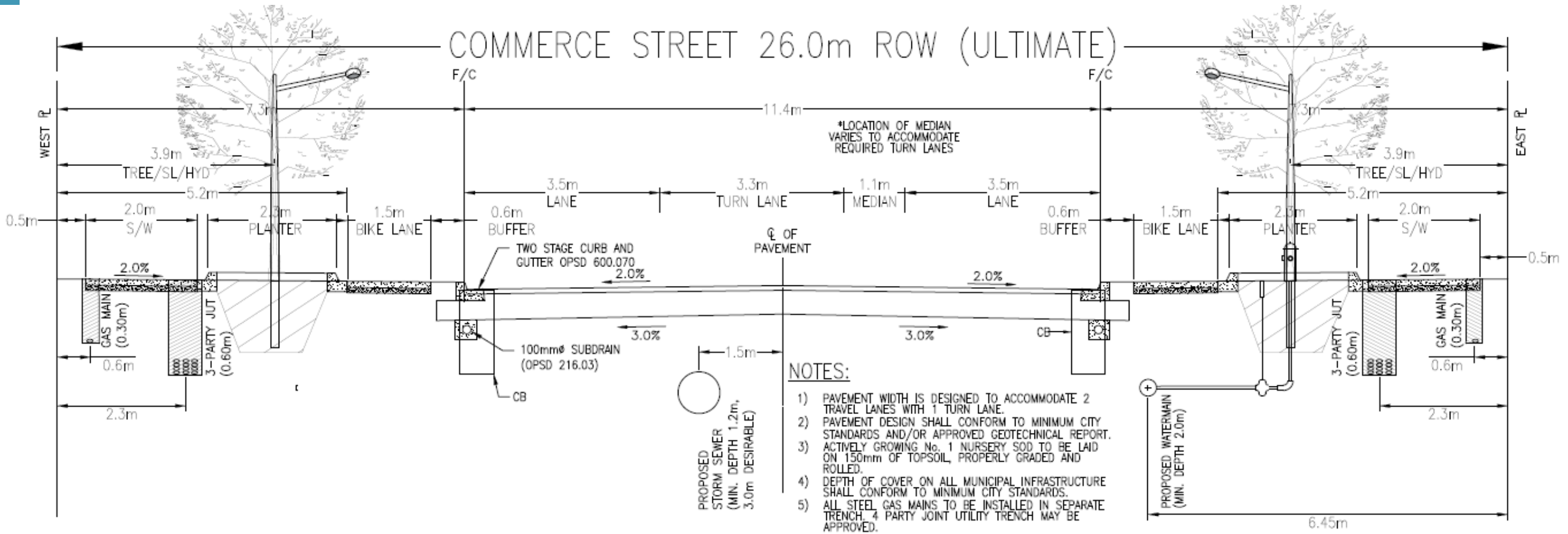
Interchange Way



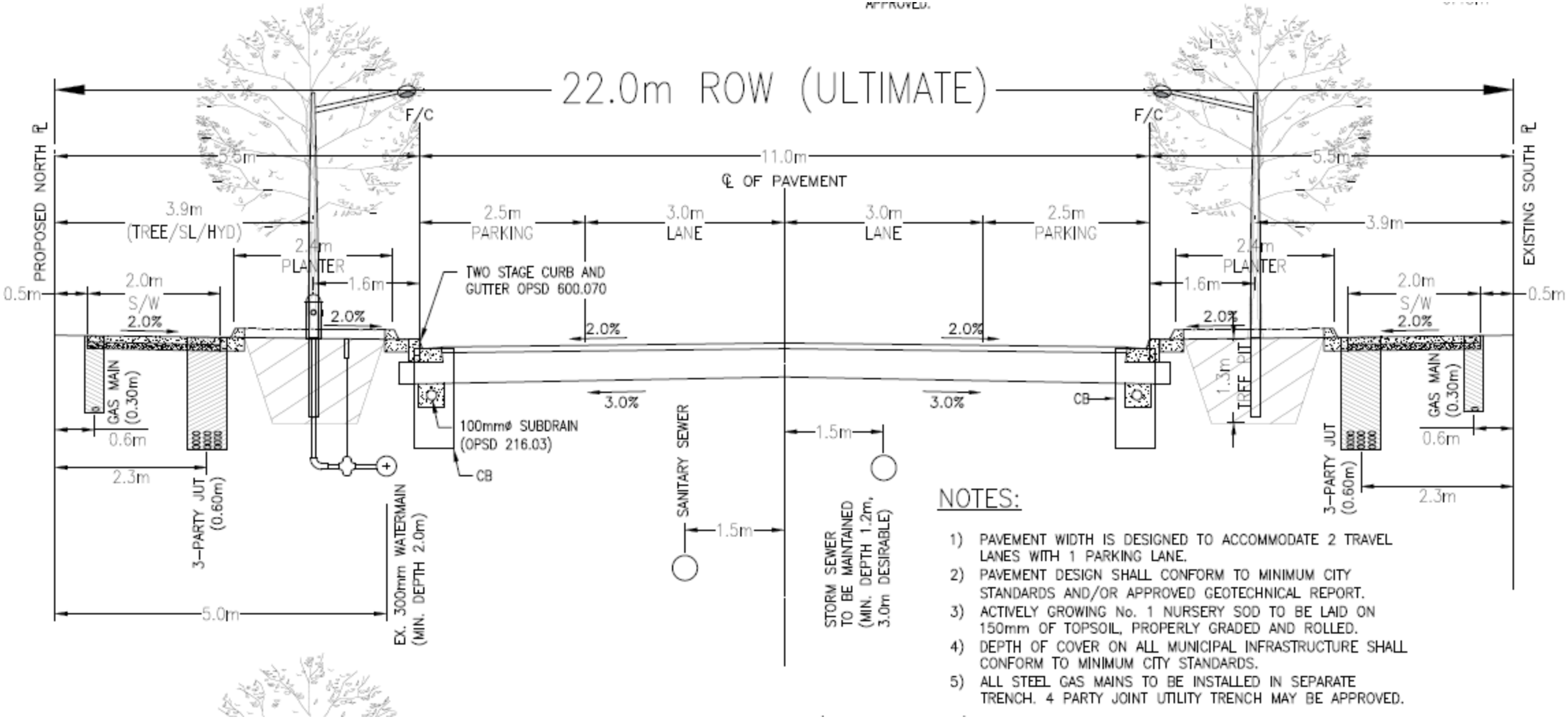
NOTES:

1) PAVEMENT WIDTH IS DESIGNED TO ACCOMMODATE 4 TRAVEL LANES.
2) PAVEMENT DESIGN SHALL CONFORM TO MINIMUM CITY STANDARDS AND/OR APPROVED GEOTECHNICAL REPORT.
3) ACTIVELY GROWING No. 1 NURSERY SOD TO BE LAID ON 150mm OF TOPSOIL, PROPERLY GRADED AND ROLLED.
4) DEPTH OF COVER ON ALL MUNICIPAL INFRASTRUCTURE SHALL CONFORM TO MINIMUM CITY STANDARDS.
5) ALL STEEL GAS MAINS TO BE INSTALLED IN SEPARATE TRENCH.
   4-PARTY JOINT UTILITY TRENCH MAY BE APPROVED.

Commerce Street



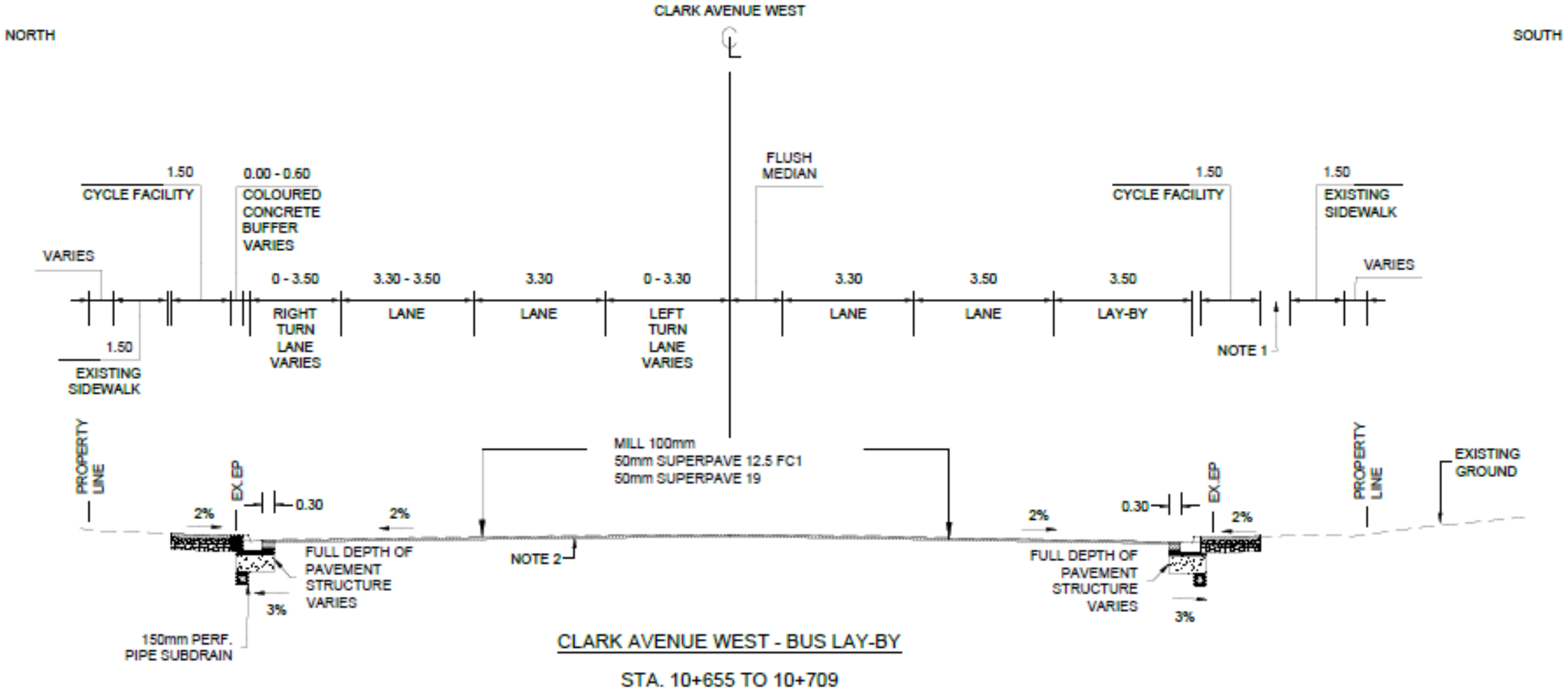
22m ROW



NOTES:

1) PAVEMENT WIDTH IS DESIGNED TO ACCOMMODATE 2 TRAVEL LANES WITH 1 PARKING LANE.
2) PAVEMENT DESIGN SHALL CONFORM TO MINIMUM CITY STANDARDS AND/OR APPROVED GEOTECHNICAL REPORT.
3) ACTIVELY GROWING No. 1 NURSERY SOD TO BE LAID ON 150mm OF TOPSOIL, PROPERLY GRADED AND ROLLED.
4) DEPTH OF COVER ON ALL MUNICIPAL INFRASTRUCTURE SHALL CONFORM TO MINIMUM CITY STANDARDS.
5) ALL STEEL GAS MAINS TO BE INSTALLED IN SEPARATE TRENCH. 4 PARTY JOINT UTILITY TRENCH MAY BE APPROVED.

Clark



CLARK AVENUE WEST - BUS LAY-BY

STA. 10+655 TO 10+709

Lessons Learned

ROW

- VMC Examples

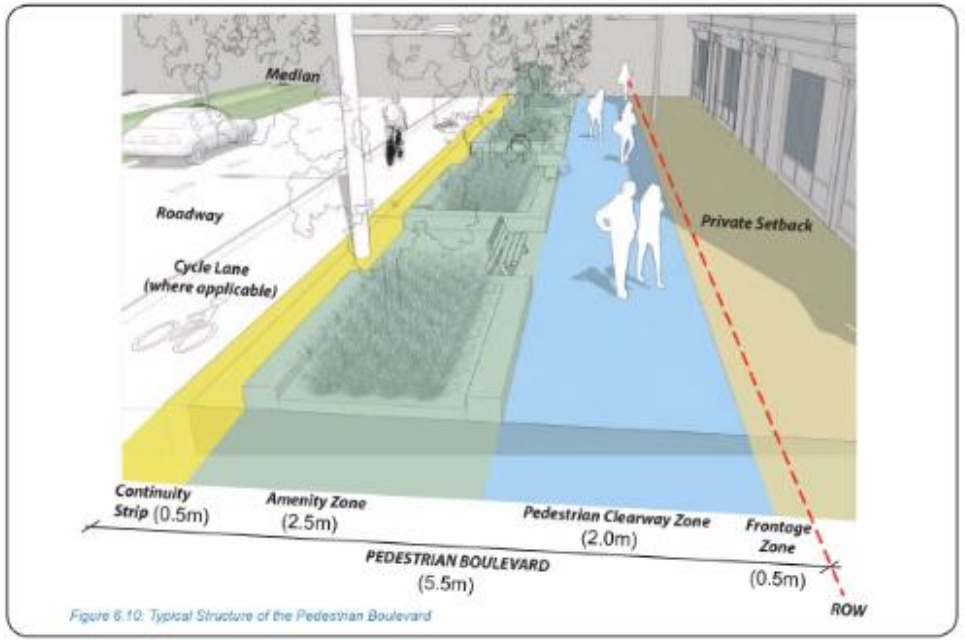
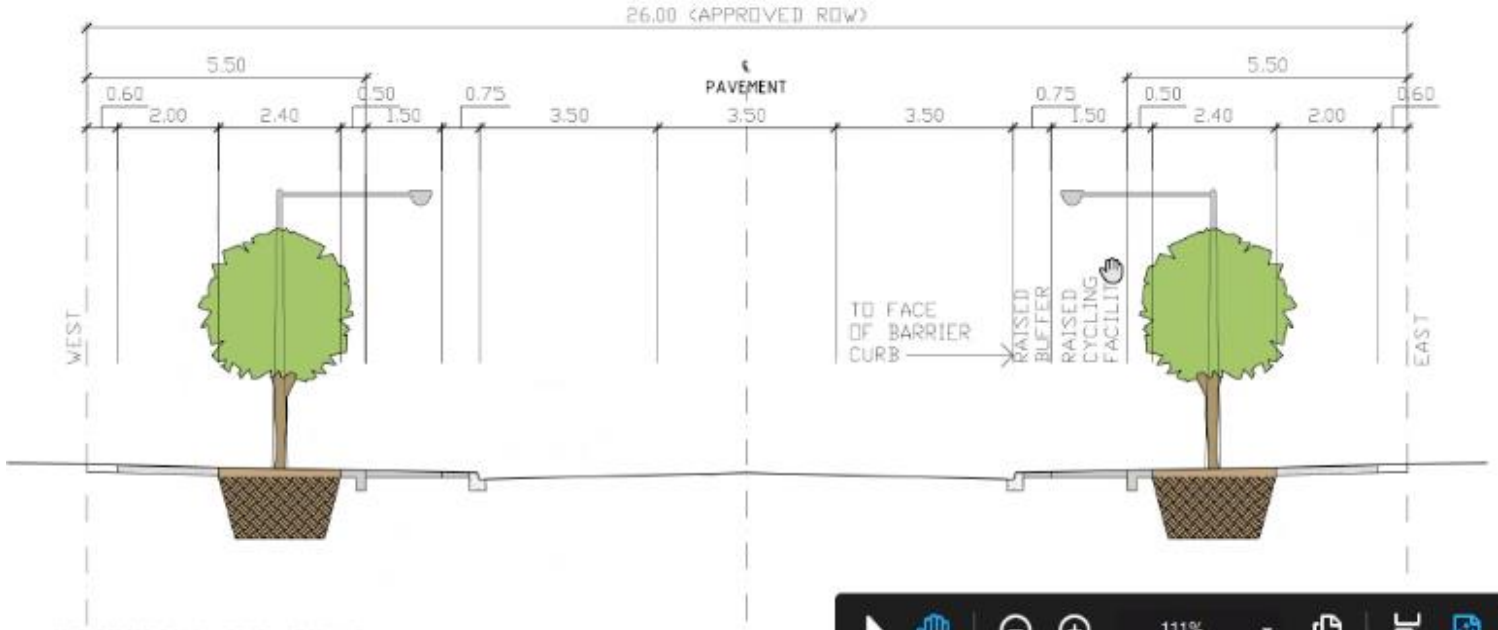


Figure 6.10: Typical Structure of the Pedestrian Boulevard



MAPLECRETE ROAD - SOUTH OF HWY-7
(LOOKING NORTH) (26m ROW) - SCALE 1:100m
MAY 6, 2019 - FOR REFERENCE ONLY

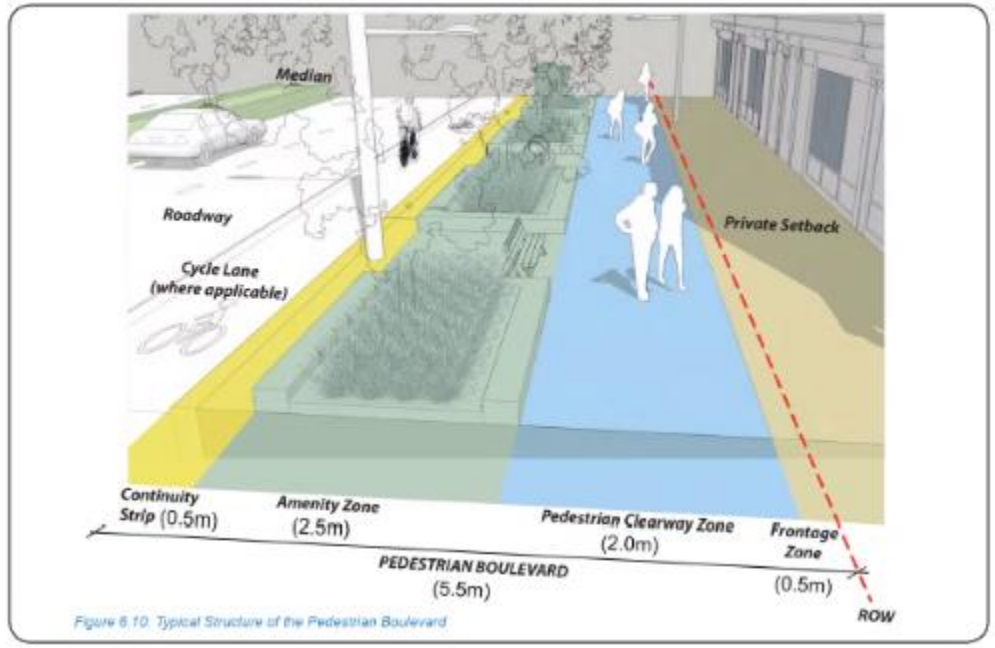
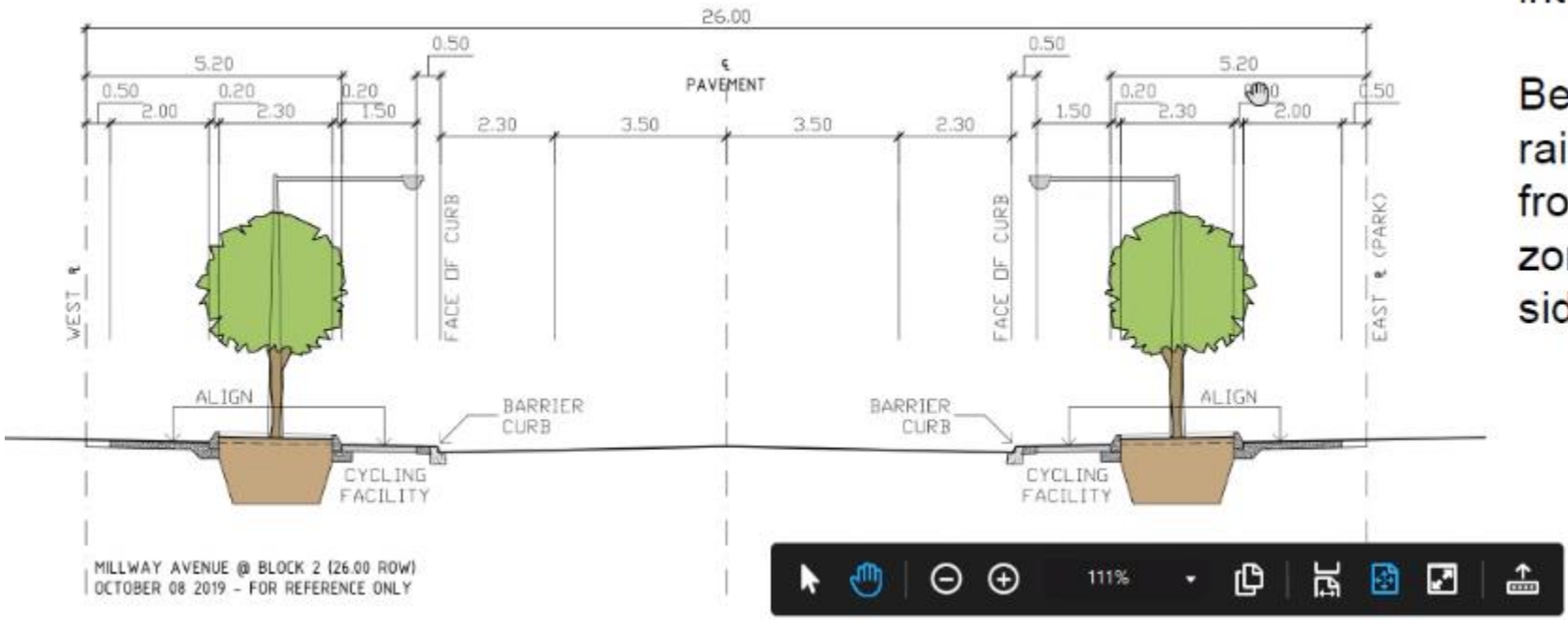


Figure 6.10: Typical Structure of the Pedestrian Boulevard



Lessons Learned

Other Design Considerations

- **Avoid conflicts between cars, cyclists, and pedestrians wherever possible.**

  Avoid cyclist immediately next to sidewalks as both tend to encroach into each other's spaces.

  Best result would be a curbside, raised cycling facility with a buffer from adjacent traffic, an amenity zone landscaped/tree buffer, and the sidewalk.

DOWNTOWN vaughan METROPOLITAN CENTRE