

# Integrated Design - Appendix A Streets, Roads & Utilities

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# 1. Introduction

This appendix provides a step by step process to determining the appropriate road and street design standards and requirements for utility provision in new roads and streets. The appendix provides the following separate processes to determining the applicable Road or Street Typology Cross Section.

## **1.1.1 - New or existing roads or streets identified in a Local Plan**

## **1.1.2 - Existing roads or streets not identified in a Local Plan**

## **1.1.3 - New roads or streets not identified in a Local Plan**

A Road network plan may need to be prepared for new developments in order to determine the appropriate road and street functions and applicable cross sections (Refer to Figure 1). Further guidance on preparing a road network plan is contained in Planning Scheme Policy – Neighbourhood design as part of preparing neighbourhood layouts.

Once the appropriate road cross section has been located, the appendix also provides the following additional standards and guidance material for the design and construction of roads and streets in the region.

## **5. Primary and Secondary Active Transport Route** (additional criteria)

## **6. Transitions** - for guidance on transitioning between road types and zones.

## **7. Retrofitting Existing Streets** - for guidance on fitting the applicable attributes into existing situations.

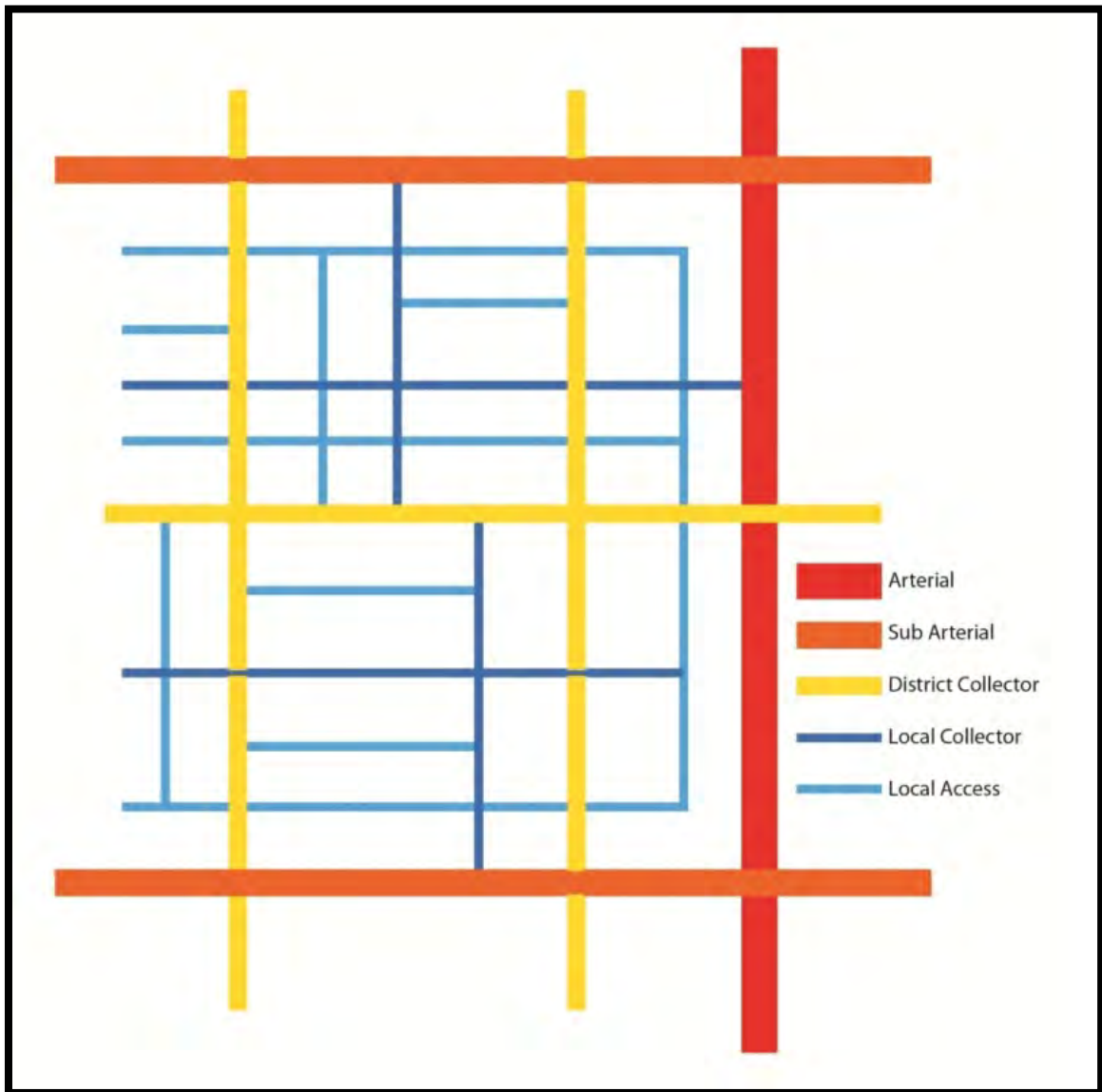
## **8. Pavement Design and Construction**

## **9. Street Lighting and Public Utilities** - for guidance on the provision of street lighting, gas, electrical and telecommunications infrastructure.

## **11. Intersection Management and Pedestrian Crossings** – for the desired intersection control types, pedestrian crossing types and maximum pedestrian crossing spacing.

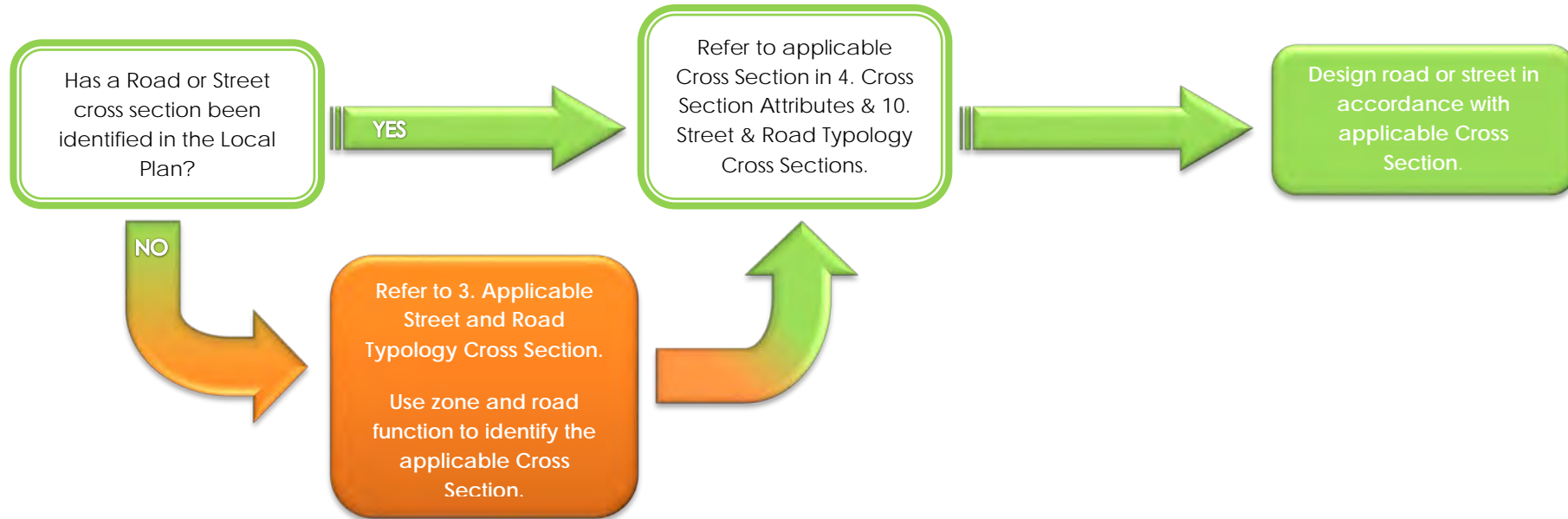
Reference is also made to Council's standard drawings listed in the Appendix H of this policy for specific detailed design standards for each component of roads, streets and utilities. The diagrams provided in this appendix are for conceptual purposes only, to illustrate how the attributes fit into an integrated cross section. Reference is also made to Appendix D - Landscape Design and Street Trees with regards to planting requirements for street trees and general landscaping within the reserve and Appendix C – Stormwater Management for design requirements for stormwater infrastructure including WSUD components.

Figure 1: Example Road Network Plan



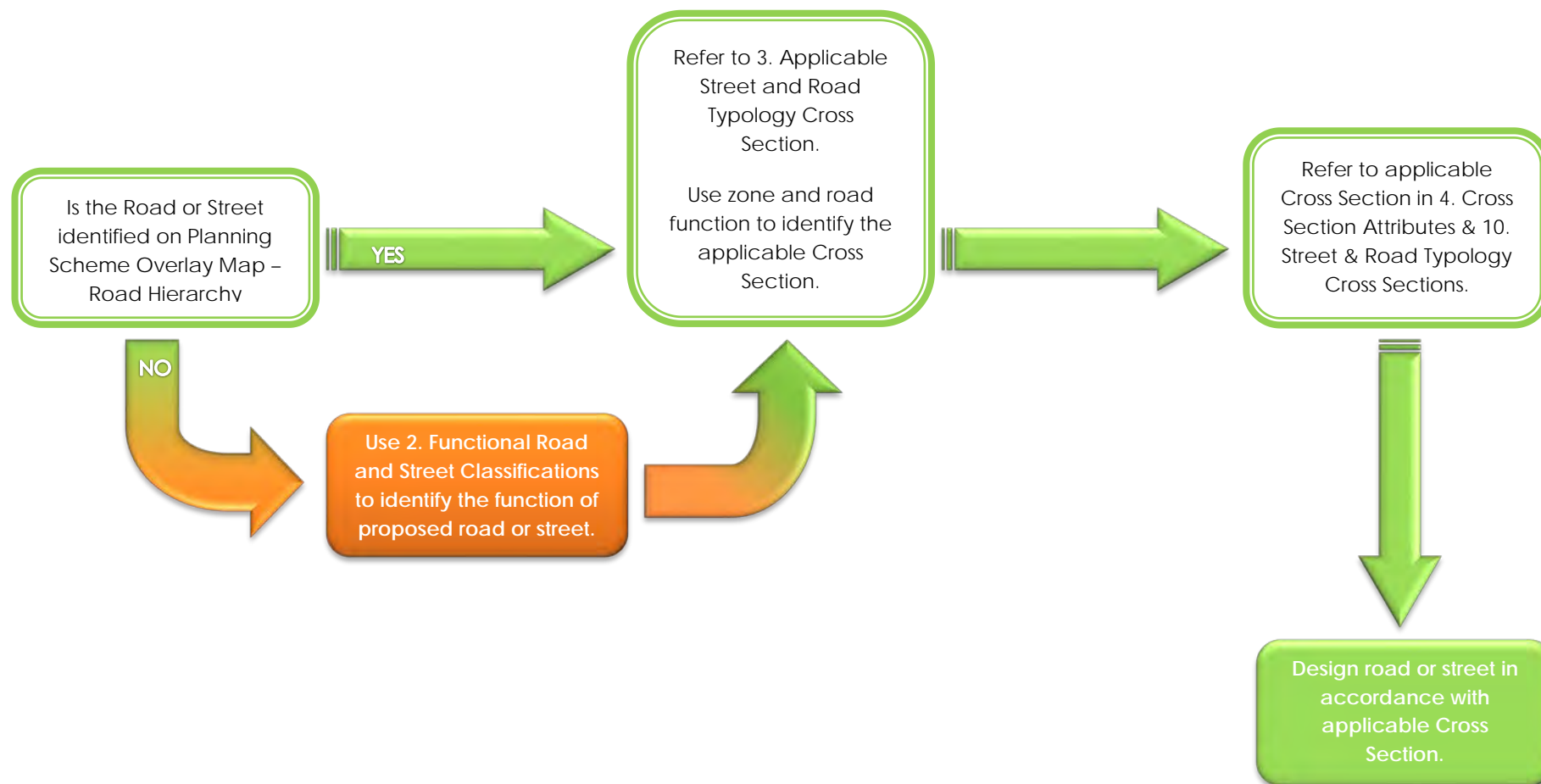
## 1.1 Road & Street Selection

### 1.1.1 New or existing roads or streets identified in a Local Plan



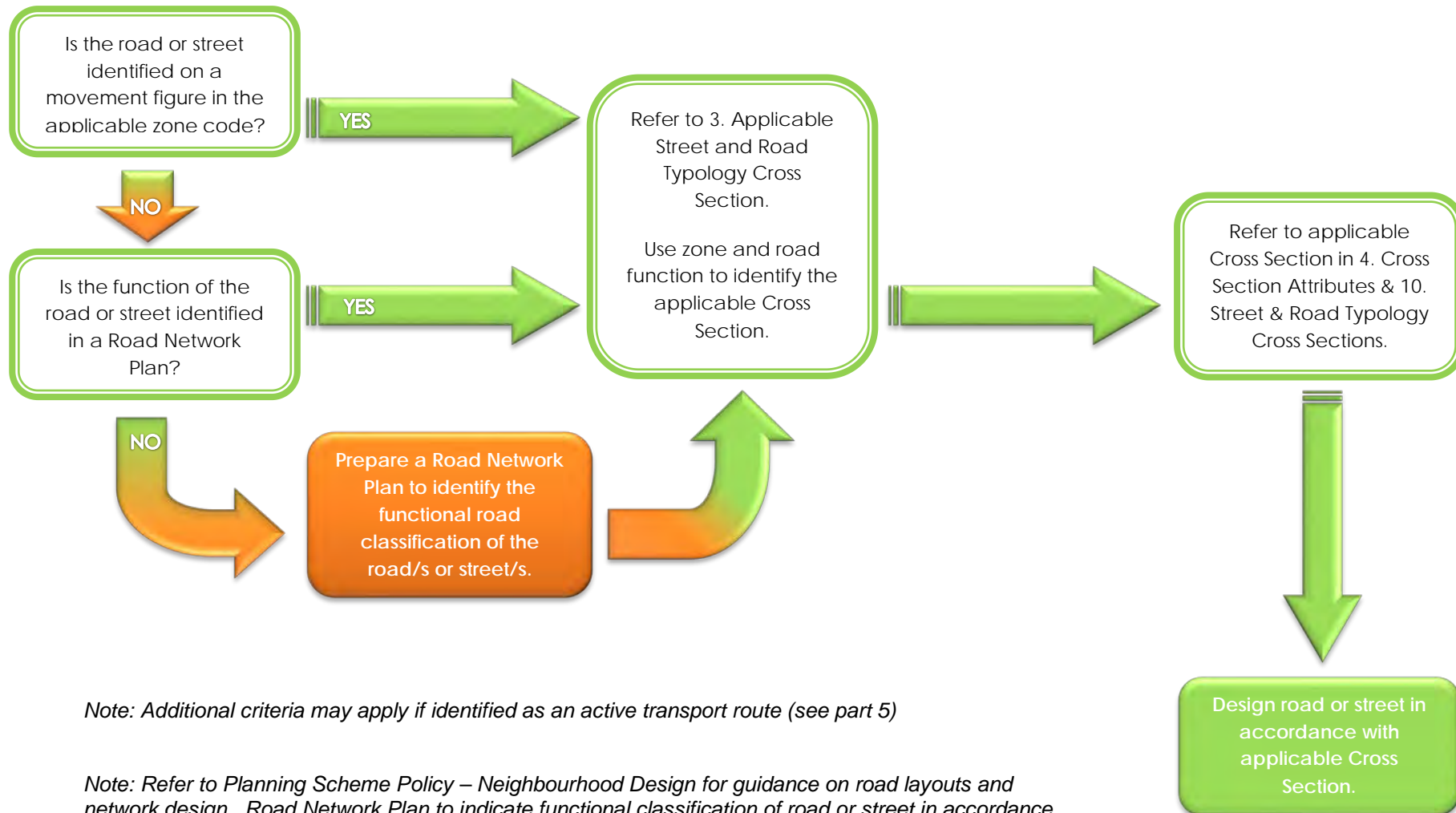
*Note: Additional criteria may apply if identified as an active transport route (see part 5)*

### 1.1.2 Existing roads or streets not identified in a Local Plan



*Note: Additional criteria may apply if identified as an active transport route (see part 5)*

### 1.1.3 New roads or streets not identified in a Local Plan



*Note: Additional criteria may apply if identified as an active transport route (see part 5)*

*Note: Refer to Planning Scheme Policy – Neighbourhood Design for guidance on road layouts and network design. Road Network Plan to indicate functional classification of road or street in accordance with 2. Functional Road and Street Classifications.*

## 2. Functional Road and Street Classifications

## What is the Primary function of the road or street?

- **Movement** - to carry through traffic



### Functions as a ROAD

#### Does or will the road provide:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Regional cycle movements</li> <li>• Line haul public transport</li> <li>• Primary freight routes</li> <li>• Provide through traffic intra-regional movements and longer distance travel to regional and destinations.</li> </ul> | <ul style="list-style-type: none"> <li>• Connections between destinations and arterial roads.</li> <li>• Pedestrian movements and crossing</li> <li>• Active transport facilities both on road and off road</li> <li>• Regional, local cycle movement</li> <li>• Accommodation of public transport</li> </ul> |
|---|---|



#### This is an Arterial Road

##### Does the arterial provide:

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Active transport physically separated from vehicles</li> <li>• Regionally and nationally significant movements</li> </ul> | <ul style="list-style-type: none"> <li>• Connection to Highways and motorways</li> <li>• Prioritize intra-regional movements</li> <li>• Pedestrian movements</li> </ul> |
|--|---|



This is a Highway



This is an Arterial Road

#### This is a Sub-arterial Road

- **Place** - to provide local property access and collect local traffic



### Functions as a STREET

#### Does or will the street provide:

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Connections between destination, suburb, access streets to higher order roads.</li> </ul> | <ul style="list-style-type: none"> <li>• Access to individual properties and the local area</li> <li>• Localized pedestrian movements</li> <li>• Local cycle movements</li> <li>• Direct property access</li> </ul> |
|--|---|



#### This is a Collector Street

##### Does the collector street provide:

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• A major connections between 2 or more suburbs or between higher order roads</li> <li>• Accommodation of public transport</li> <li>• Prioritized Pedestrian movements and crossings.</li> <li>• Dedicated cycle movement</li> </ul> | <ul style="list-style-type: none"> <li>• A connection from a destination or access streets within a suburb to higher order streets or roads.</li> <li>• Carry traffic having a trip end within the local area</li> <li>• Prioritized pedestrian movements and crossings</li> <li>• Dedicated cycle movement</li> </ul> |
|---|--|



This is a District Collector



This is a Local Collector

#### This is an Access Street



### 3. Applicable Street and Road Typology Cross Section

CENTRE		
Zone & Precinct	Role, Function or Location	Applicable Road Type
Higher Order Precinct <sup>1</sup>	Main Street (as identified in the planning scheme)	Main Street
	Roads located on the fringe of a centre (centre on one side of road only)	Urban Fringe
	District Collector roads or Above (other than Main Streets and roads on the fringe of the centre)	Urban
	Shared Streets (as identified in the planning scheme)	Shared Business
	Laneways (for service, loading or rear parking access)	Business Laneway
	All other roads and streets (Local Access or Local Collector)	Higher Order Access
District Precinct	Main Street (as identified in the planning scheme)	District Main Street
	Laneways (for service, loading or rear parking access)	Business Laneway
	All other roads (centre zone both sides)	Urban
	All other roads (centre one side only)	Urban Fringe
Local Precinct	Laneways (for service, loading or rear parking access)	Business Laneway
	All other roads (centre zone both sides)	Urban
	All other roads (centre one side only)	Urban Fringe
GENERAL RESIDENTIAL		
Zone & Precinct	Role, Function or Location	Applicable Road Type
Coastal Communities Precinct	Arterial and Sub-Arterial	Arterial and Sub-Arterial
	District Collector	District Collector
	Local Collector	Living Residential
	Access Streets	Access Residential
	Fringe of Centre Zone (centre on one side of road only)	Urban Fringe
Suburban Neighbourhood Precinct	Arterial and Sub-Arterial	Arterial and Sub-Arterial
	District Collector	District Collector
	Local Collector	Living Residential
	Access Streets	Access Residential
	Fringe of Centre Zone (centre on one side of road only)	Urban Fringe
Next Generation Neighbourhood Precinct <sup>2</sup>	Arterial and Sub-Arterial	Arterial and Sub-Arterial
	Access Streets	Living Residential
	District Collector	District Collector
	Fringe of Centre Zone (centre on one side of road only)	Urban Fringe
	Local Collector	Contemporary Residential
	Laneway	Laneway Residential
Urban Neighbourhood Precinct	Arterial and Sub-Arterial	Arterial and Sub-Arterial
	District Collector or Above	District Collector
	Fringe of Centre Zone (centre on one side of road only)	Urban Fringe
	All other roads	Contemporary Residential
	Laneway	Laneway Residential
INDUSTRY		
Zone & Precinct	Role, Function or Location	Applicable Road Type
All precincts	Access Streets	Industry Access
	Local Collectors	Industry Collector
	District Collectors	District Collector
	Arterial and Sub-Arterial	Arterial and Sub-Arterial
RURAL RESIDENTIAL		
Zone & Precinct	Role, Function or Location	Applicable Road Type
All Precincts	All Roads	Rural Residential
RURAL		
Zone & Precinct	Role, Function or Location	Applicable Road Type
All Precincts	All Roads	As per Austroads
RURAL TOWNSHIP		
Zone & Precinct	Role, Function or Location	Applicable Road Type
All Precincts	Main Street (as identified by Masterplanning)	Rural Main Street
	All other streets	Living Residential

## EMERGING COMMUNITY

Zone & Precinct	Role, Function or Location	Applicable Road Type
Transition precinct	Arterial and Sub-Arterial	Arterial and Sub-Arterial
	Access Streets	Living Residential
	District Collector	District Collector
	Fringe of Centre Zone (centre on one side of road only)	Urban Fringe
	Local Collector	Contemporary Residential
	Laneway	Laneway Residential
Urban Neighbourhood Precinct	Arterial and Sub-Arterial	Arterial and Sub-Arterial
	District Collector or Above	District Collector
	Fringe of Centre Zone (centre on one side of road only)	Urban Fringe
	All other roads	Contemporary Residential
	Laneway	Laneway Residential

## Redcliffe Kippa-Ring Local Plan

Zone & Precinct	Role, Function or Location	Applicable Road Type
<i>Kippa-Ring village precinct</i>	Main Street (as identified in the planning scheme)	Main Street
	Roads located on the fringe of a centre (centre on one side of road only)	Urban Fringe
<i>Redcliffe seaside village precinct</i>	District Collector roads or Above (other than Main Streets and roads on the fringe of the centre)	Urban
<i>Heath and Local services precinct</i>	Shared Streets (as identified in the planning scheme)	Shared Business
	Laneways (for service, loading or rear parking access)	Business Laneway
	All other roads and streets (Local Access or Local Collector)	Higher Order Access
Emerging communities precinct	Arterial and Sub-Arterial	Arterial and Sub-Arterial
	District Collector or Above	District Collector
	Fringe of Centre Zone (centre on one side of road only)	Urban Fringe
	All other roads	Contemporary Residential
	Laneway	Laneway Residential

## 4. Cross Section Attributes

<sup>1</sup> Note: *Parking on streets in the General Residential Zone is to be provided at the following rates:*

*Lots with frontages of 12.5m or less – 0.5 spaces per lot*

*Lots with frontages of greater than 12.5 metres – 1 space per lot*

<sup>2</sup> Note: *Pathway width can be narrowed in short sections along a street/road corridor to cater for the retention of existing trees/vegetation, inclusion of bus stops, street furniture etc. Minimum of 1.5m width.*

<sup>3</sup> Note: *If the development is proposing a new centre or industrial area outside of the existing centre or industry zone, the applicable road type for adjoining roads is taken to be if proposed in a centre or industry zone.*

**GENERAL RESIDENTIAL ZONE - ATTRIBUTES**

Road Type	Pathway Width <sup>2</sup>	Cycle Lanes	Street Trees	Possible Bus Route	On Street Parking <sup>1</sup>	Max. Posted Speed	Lot Vehicle Access	Traffic Lane Width	Front Verge Width	Rear Verge Width	Minimum Median Width
Arterial/Sub-arterial	3m both sides	✓ 2m wide	✓ In verge	✓	✗	-	✗ Rear or Consolidated only	3.5m	5.5m	1.5m	As identified in a Local Plan or required for protected turning.
District Collector	2.5m both sides	✓ 2m wide	✓ In build outs and verge	✓	✓ 2.6m wide w/ build outs every 50m	-	✗ Rear or Consolidated only	3.3m	1.5m	1.5m	As identified in a Local Plan or required for protected turning.
Urban Fringe	5m (Centre) 2m (other zones)	✓ 2m wide	✓ In build outs, footpath and verge	✓	✓ 2.4m wide w/ build outs every 50m	50kph	✓	3.3m	Centre – N/A Other Zones - 2m	Centre – N/A Other Zones – 1.5m	✗
Contemporary Residential	2m both sides	✗	✓ In build outs and verge	✓	✓ 2.4m wide w/ build outs every 50m	50kph	✓	3.3m	2m	1.5m	✗
Living Residential	2m one side	✗	✓ In verge	✗	Informal	50kph	✓	8m Carriageway	2m	1 m	✗
Access Residential	1.5m (one side only)	✗	✓ In verge	✗	Informal	50kph	✓	8m Carriageway	2m	1.5m	✗
Laneway Residential	1m both sides	✗	✓	✗	✗	-	✓	5m	✗	✗	✗

**INDUSTRY ZONE – ATTRIBUTES<sup>3</sup>**

Road Type	Pathway Width <sup>2</sup>	Cycle Lanes	Street Trees	Possible Bus Route	On Street Parking	Max. Posted Speed	Lot Access	Traffic Lane Width	Front Verge Width	Rear Verge Width	Minimum Median Width
Arterial/ Sub-Arterial	3m both sides	✓ 2m wide	✓ In verge	✓	✗	-	✗ Rear or Consolidated only	3.5m	5.5m	1.5m	As identified in a Local Plan or required for protected turning.
District Collector	2.5m both sides	✓ 2m wide	✓ In build outs and verge	✓	✓ 2.6m wide w/ build outs every 50m	-	✗ Rear or Consolidated only	3.3m	1.5m	1.5m	As identified in a Local Plan or required for protected turning.
Industry Collector	2m	✓ 2m wide	✓	✓	✓	50kph	✓	3.5m	2m	1.5m	✗
Industry Access	2m	✗	✓ Yes in Verge. Rain gardens in build outs.	✗	✓ 2.6m wide w/ build outs every 50m	50kph	✓	3.5m	2m	1.5m	✗

**CENTRE ZONE – ATTRIBUTES<sup>3</sup>**

Road Type	Pathway Width <sup>2</sup>	Cycle Lanes	Street Trees	Possible Bus Route	On Street Parking	Max. Posted Speed	Lot Vehicle Access	Traffic Lane Width	Front Verge Width	Rear Verge Width	Minimum Median Width
Higher Order Main	6.5m both sides	✗ Bicycle Awareness in lane.	✓ <i>In build-outs and medians where practicable</i>	✓	✓ 2.6m wide w/ build outs every 25m	50kph	✗ Rear or Consolidated only	4.5m	✗	✗	As identified in a Local Plan or required for protected turning.
District Main / Higher Order Access	6m both sides	✓ 2m wide	✓ <i>In build-outs and medians where practicable</i>	✓	✓ 2.6m wide w/ build outs every 25m	50kph	✗ Rear or Consolidated only	3.3m	✗	✗	As identified in a Local Plan or required for protected turning.
Urban	5m both sides	✓ 2m wide	✓ In build outs and footpath	✓	✓ 2.6m wide w/ build outs every 50m	50kph	✓	3.3m	✗	✗	✗
Urban Fringe	5m (Centre) 2m (other zones)	✓ 2m wide	✓ In build outs, footpath and verge	✓	✓ 2.4m wide w/ build outs every 50m	50kph	✓	3.3m	Centre – N/A Other Zones - 2m	Centre – N/A Other Zones – 1.5m	✗
Business Laneway	2m on one side	✗	✗	✗	✗	-	✓	7m Carriageway	✗	✗	✗
Shared Business	2.5m on both sides	✗	✓ Between Shared and Pedestrian Zones	✗	✗	-	✗	10m shared zone	✗	✗	✗

**RURAL TOWNSHIP & RURAL RESIDENTIAL – ATTRIBUTES**

Road Type	Pathway Width <sup>2</sup>	Cycle Lanes	Street Trees	Possible Bus Route	On Street Parking	Max. Posted Speed	Lot Access	Traffic Lane Width	Front Verge Width	Rear Verge Width	Minimum Median Width
Township Main Street	5m	✗ Bicycle Awareness in lane.	✓	✓	✓	50kph	✓ Consolidated	4m	✗	✗	✗
Access Residential	1.5m (one side only)	✗	✓ In verge	✗	✓ Informal	50kph	✓	8m Carriageway	2m	1.5m	✗
Rural Residential		✗	✓ In verge	✓	✓ Informal	50kph	✓	7m Carriageway	2m	2m	✗

**BOULEVARDS – WHERE IDENTIFIED WITHIN LOCAL AREA PLANS – ATTRIBUTES**

Road Type	Pathway Width <sup>2</sup>	Cycle Lanes	Street Trees	Possible Bus Route	On Street Parking	Max. Posted Speed	Lot Access	Traffic Lane Width	Front Verge Width	Rear Verge Width	Median Width
2 Lane Boulevard	3m both sides	✓ 2m wide	✓ <i>In verge and medians where practicable</i>	✓	✓ 2.6m wide w/ build outs every 50m	-	Rear or Consolidated only	3.3m	2	1.5m	3m
4 Lane Boulevard	3m both sides	✓ 2m wide	✓ <i>In verge and medians where practicable</i>	✓	✓ 2.6m wide w/ build outs every 50m	-	Rear or Consolidated only	3.3m	2	1.5	5m (if identified as a boulevard)

## 5. Primary and Secondary Active Transport Networks

The primary and secondary active transport networks are identified on the Primary and Secondary Active Transport Network Overlay Map. These networks incorporate the most critical inter and intra-regional trips for cyclists and pedestrians.

As development occurs, works and/or land may be required in the provision of these networks. A determination will be made as to the extent of works and/or land required as part of the development assessment process.

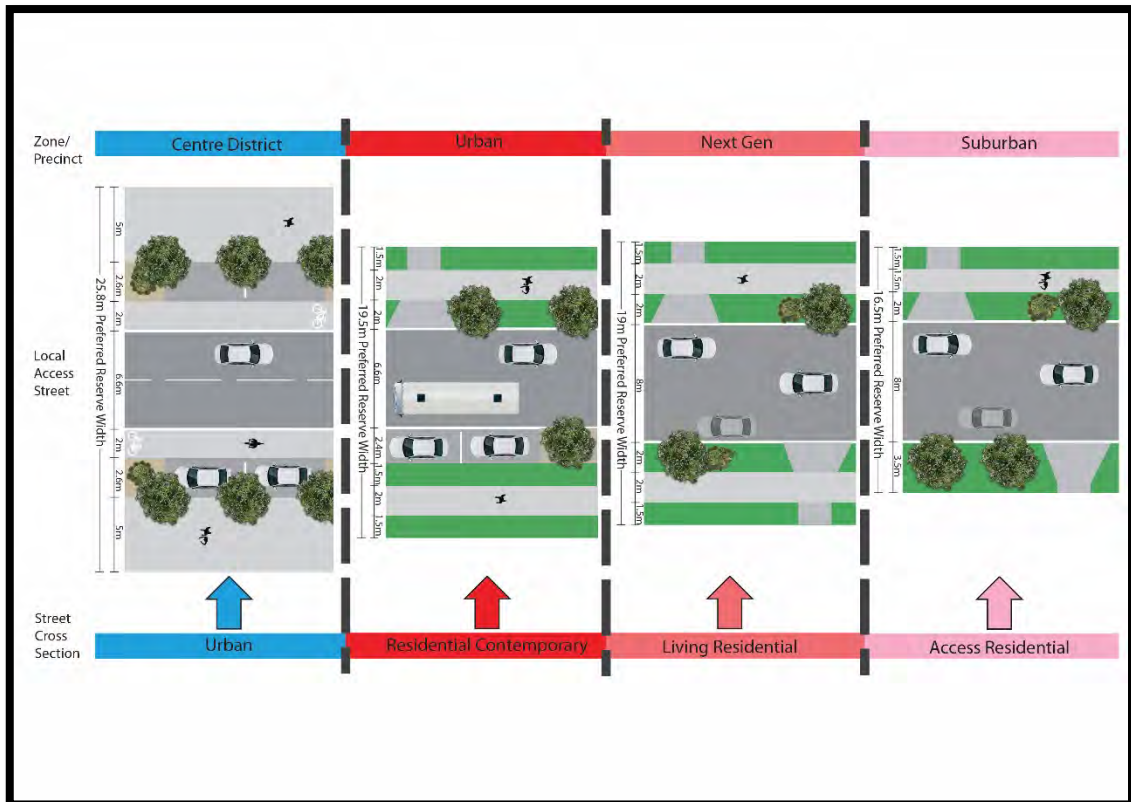
In circumstances where the attributes of the primary or secondary active transport network vary from the pathway width and cycle lane attributes mentioned in other parts of Appendix A of the PSP - Integrated Design, the attributes contained in Table 5.1 prevails –

### Primary and Secondary Active Transport Network Attributes

Facility	Environment	Width (Clear of obstructions)
Principal and Secondary Active Transport Route	>3km from major or principal centre	On-road facility and off-road facility: <ul style="list-style-type: none"> <li>as per the relevant cross section attributes table (contained within section 4); or</li> <li>if shared off-road pathway only &gt;3.0m</li> </ul>
	<3km from centre	On-road facility: <ul style="list-style-type: none"> <li>as per the relevant cross section attributes table (contained within section 4),</li> </ul> Plus off-road facility: <ul style="list-style-type: none"> <li>as per the relevant cross section attributes table widened by an additional 0.3m; or</li> <li>if shared off-road pathway only &gt;3.5 m.</li> </ul>

## 6. Transitions

The applicable cross section is to transition depending on its adjoining zone and precinct. As illustrated below, a single functional road and street classification such as a Local Access Street may have a different applicable cross section as it moves through different environments. How road and street types transition between each other will be specific to each situation, however, consideration needs to be given to safety for pedestrians, cyclists and vehicles as well as adjoining land uses and infrastructure. Generally, a higher order cross section should be continued to the next intersection.



Where a street or road adjoins a different residential precinct on the either side of the street or road, the cross section required for the particular street type in the higher order precinct is to be provided. For clarification the following table lists the priority of precincts for road and street type selection.

### 6.1 Precinct Priority

General Residential Zone	
1.	Urban Neighbourhood Precinct
2.	Next Generation Neighbourhood Precinct
3.	Suburban Neighbourhood Precinct
4.	Coastal Communities Precinct



## 7. Retrofitting Existing Streets

Where establishment of a desired road or street typology cross section is to be achieved through retro-fitting of an existing reserve, the following is to be used as a guide to which elements of the road or street typology cross section could be reduced if the existing reserve is inadequate. Every endeavour is to be made to maintain the existing alignment of kerbs, however the order of which elements are to be identified for modification will differ between those roads with a “place” function and those with a “movement” function as determined in Section 2 of this Appendix.

The hierarchy of modifications to be considered is as follows (with the elements to be considered for reduced first appearing first in the listings below):

### “Movement” types:

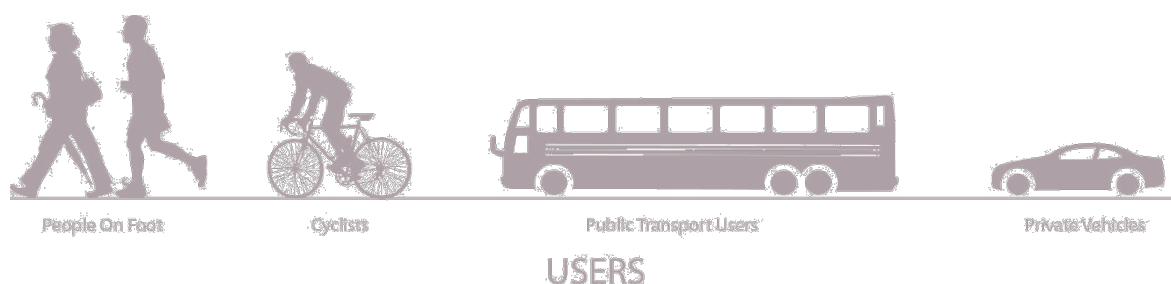
1. Reduce kerbside parking width (to a minimum of 2.4 metres)
2. Remove kerbside parking from one side
3. Remove kerbside parking from both sides
4. Reduce or remove “rear” verge (whilst maintaining a minimum 3.5 metre total verge width)
5. Reduce footpath (to a minimum of 2.0 metres whilst maintaining a minimum 3.5 metre total verge width)
6. Reduce cycle lanes (to a minimum of 1.5 metres where speed is not in excess of 60kph)
7. Reduce lane width to 3.3 metres

### “Place” types:

1. Reduce lane width to 3.3 metres
2. Reduce cycle lanes (to a minimum of 1.5 metres where speed is not in excess of 60kph)
3. Convert cycle lanes to Cycle Awareness Zones (in conformance with technical standards)
4. Reduce or remove “rear” verge (whilst maintaining a minimum 4.5 metre total verge width)
5. Reduce kerbside parking width (to a minimum of 2.4 metres)
6. Remove kerbside parking from one side
7. Remove kerbside parking from both sides

Where the existing configuration includes a road and street reserve and/or pavement width is wider than required by the applicable typology cross section, council will determine how the additional space is to be best utilised.

Where kerbside parking is retained and verge width is constrained for tree planting, consideration will be given to including tree planting within the parking lane using permeable pavements and structural soils. Note every endeavour must be made to retain existing vegetation within road and street design including through tunnel trenching (utility services), raised footpaths / bike paths with pier foundations to avoid tree root severance / damage.



## 8. Pavement Design and Construction

### 8.1 Pavement and Median Crossfall

Roads and streets on straight alignment shall be designed with a normal crossfall of pavement and shoulders of 3%. Where steeper or flatter crossfalls than the normal are required, for example on superelevated curves at intersections or turning areas, the maximum and minimum permissible pavement crossfalls shall be 5% and 2% respectively with consideration of high vehicles turning.

At intersections and cul-de-sac heads contour details are required to demonstrate that there is no ponding of water. Where minimum crossfall cannot be achieved the longitudinal grades may be used to shed the water.

The desired maximum crossfall for grassed medians on divided roads shall be 1 in 6 with an absolute maximum of 1 in 4. At median openings, the pavement crossfall should not exceed 5%.

Split level and divided roads/streets should be avoided. Where this is not possible, prior written approval shall be obtained from Council's nominated representative.

### 8.2 Pavement Tapers

Pavement tapers to existing construction shall be designed in accordance with the current AUSTRROADS based on the design speed as accepted by Council's nominated representative. Detailing should include lengths, typical section(s), linemarking and signing. Tapers shall be constructed to the same standard as the proposed full road pavements.

### 8.3 Kerb and Channel

Kerb or kerb and channel shall be provided on both sides of road pavements on all urban and rural residential roads unless otherwise approved by Council.

Kerb and channel or concrete lined table drains shall be provided on all Rural roads when grades are in excess of 10%. For soils which are easily eroded, kerb and channel or concrete lining will be required when the grades of rural roads are greater than 7%. Consideration may be given to using kerb and channel through deep cuttings.

Unless otherwise approved, the type of kerb and channel used shall be as listed below and shall be designed in accordance with IPWEAQ Standard Drawings for Kerb Profiles:

- Industrial and Commercial areas and Park frontages - Barrier kerb (B1 300)
- Traffic islands - Barrier (B5) Modified to key in 125mm below pavement surface
- Roundabouts – SM5
- Non-channelled roads – edge beam M6 or B3
- All other locations - Mountable kerb (M3)

The desirable minimum longitudinal grade for kerb and channel shall be 0.5%. Pavement of minimum depth of 125mm is to extend a minimum of 150mm behind kerb and channel.

Where proposed construction adjoins existing kerb and channel Council's nominated representative shall decide whether the existing profile shall be extended or whether the new construction will be tapered smoothly to the existing kerb and channel.

### 8.4 Subsoil Drainage

Subsoil drains shall be provided beneath all kerb and channel. On roads with no kerb and channel, subsoil drainage will be required where poor subgrade drainage exists and at locations directed by Council's nominated representative. Subsoil drainage is to be provided in accordance with I.P.W.E.A.Q. Standard Drawings subject to the details described below:

- Pavement of minimum depth of 125mm is to extend a minimum of 150mm behind kerb and channel; and

- Subsoil drainage trench backfill is to extend to the underside of the kerb.

Trimming and compaction of subgrade is to be completed and approved before subsoil drains and service conduits are constructed. The trenches shall then be excavated, and the excavated material placed on the footpath and not the subgrade.

Where subsoil drains pass under service conduits, the side drains are to be deepened and graded out to a normal depth at a minimum grade of 1:250.

For roads without kerb and channel the subsoil drainage trench is to be 300mm wide and positioned such that the outer edge of the trench is in line with the outer edge of the pavement seal. The subsoil drainage is to be centrally located within the trench.

In dispersive, soluble or fine grained soils, the developer's representative is to evaluate whether geofabric wrapped subsoil drains are required. Where geofabric wrapped subsoil drains are proposed the developer's representative is to provide details for approval by Council's nominated representative.

Road subsoil drainage must be 'daylighted' and discharged to an approved legal point of discharge. Caps are to be provided to upstream ends of subsoil drains.

### **8.5 Pedestrian and Cycle Infrastructure**

Pedestrian and Cycle infrastructure is to be provided for as identified in the Road and Street Typology Cross Section. Refer to AUSTRROADS for additional guidance in relation to detailed design and construction requirements.

Pathway construction is to be in accordance with I.P.W.E.A.Q. Standard Drawings. Where a concrete pathway crosses a commercial or industrial driveway the pathway is to be a minimum of 150mm thick N32 concrete with SL82 reinforcing.

Asphaltic concrete (A.C.) and gravel path locations and depths are to be approved by Council's nominated representative. Where approved, pathways are to have 25mm thick A.C. surfacing on Class 2.3 gravel of an approved depth (minimum 100mm).

### **8.6 Kerb Ramps**

Kerb ramps are to be provided at all intersections, at all kerb returns and at the end of all pathways i.e. between lots, park access, etc. At intersections, the ramps are to be located in accordance with AS1428 Design for Access and Mobility to align with existing or future pathways. Tactile indicators are to be installed in accordance with AS 1428.4.

Kerb Ramps are to be constructed in accordance I.P.W.E.A.Q. Standard Drawings. Kerb ramps are to be directional in all instances.

### **8.7 Grassing**

Minimum fifty (50) millimetres compacted thickness of approved topsoil shall be placed over the balance areas of all footpaths and pathways, where the subsoil has the capacity to support sustained grass growth. In known problem soils, depth of topsoil is to be increased to 100mm. These areas are then to be grassed or landscaped and are to be properly established and maintained during the maintenance period. Refer to the Appendix D – Landscape Design and Street Trees.

### **8.8 Road Edge Guide Posts and Guardrails**

Road edge guideposts shall be provided at all locations where kerb and channel is not constructed e.g. half road construction, tapers, ends of roads, etc. in accordance with Department of Main Road Manual of Uniform Traffic Control Devices. Guard rail locations and installation is to be as per AUSTRROADS Guide to Road Design.

## 8.9 Pavement Design

This section is intended to facilitate the checking and approval of proposed pavement designs for roadworks associated with subdivisions, building development and re development works. It is not intended to be used in lieu of design manuals. Pavement designs are to be submitted and approved by Council.

The pavement is to be designed in accordance with AUSTRROADS Guide to Pavement Technology including design parameters, subgrade evaluations, laboratory testing and design charts.

The proposed pavement design is to be submitted for approval at least five (5) days prior to a subgrade inspection.

## 8.10 Determination of Subgrade Strength

A design California Bearing Ratio (CBR) is to be determined for each identifiable unit defined on the basis of topography, geological and drainage condition of the site. The four day soaked CBR at a compaction of 100% Standard compaction is to be the standard test. Tests are to be carried out in a NATA registered laboratory (National Association of Testing Authorities).

The test results are to be submitted with the proposed pavement design. The design CBR is to be detailed on plans.

The sampling is to be randomly located within each length of the proposed roadway with constant subgrade material. It is required that a minimum of 1 test per material type be carried out. The location of material type variances are to be detailed in accordance with sample test and adjoining lot. For less than five results the design CBR shall be the least estimated insitu CBR result. For more than four results, the design CBR shall be the 10th percentile of all estimated insitu CBR results. The samples shall be taken generally in the position of the outer wheel path on both sides of the proposed road. A sketch plan showing the location of all tests is to be submitted with the test results for pavement design approval.

## 8.11 Design Basis

The design traffic in Table 8.11 below shall be adopted unless the developer's representative submits to Council, and has approved, alternative design traffic values. To determine the design traffic the developer's representative shall use the methodology in the AUSTRROADS design manuals.

Street and Road Pavements shall be designed in accordance with AUSTRROADS Design Manuals, utilising such amendments and additional criteria stated in this manual. The pavement design life adopted for all roads is to be 20 years. The minimum pavement depth is 200mm. The minimum pavement depth does not include the asphaltic concrete surfacing.

Where pavement widening is required, testing/onsite inspection is to be undertaken to demonstrate that there is existing quality gravel in the road pavement to a depth that satisfies the classification typology of the road. Where this is evident the widening is required to be constructed to full pavement depth as approved by Council's nominated representative in accordance with the classification typology of road. Where existing quality gravel of suitable depth cannot be demonstrated the road must be constructed with full depth pavement to the (ultimate) centre line of the road or a minimum of 3 metres, whichever is the greater.

## 8.12 Pavement Materials

Pavement Materials shall be in accordance with Main Roads Technical Specifications (MRTS 05) for Unbound Pavements. The minimum gravel material types for lower sub-base, upper sub-base and base are 2.5, 2.3 and 2.1, respectively. Where a single sub-base layer is nominated Type 2.3 material shall be used.

A copy of the material grading and CBR are to be provided to the nominated representative at the time of sub grade inspection and attached to Council's checklist. Compaction testing results are to be recorded and provided to the nominated representative upon their request and as part of the on maintenance documentation. If these details are not available the Contractor shall carry out testing

suitable to verify the stability and quality of the pavement layers and submit these results to Council as part of the on maintenance documentation.

### 8.13 Surfacing

In urban and rural residential areas, the Asphaltic Concrete (A.C.) surfacing thickness is to be:

- 25mm (BCC Type 2) on Access type streets and Laneways with traffic volumes less than  $4 \times 10^5$ ;
- 50mm (BCC Type 3) for Arterial and Sub Arterial roads; and
- 40mm (BCC Type 3) for all other streets.

In Commercial and Industrial areas the minimum A.C. surfacing thickness is to be 40mm.

Where stencilled or patterned surface treatments are proposed an additional 5mm shall be added to the design thickness of the surfacing. The A.C. Binder type is to be in accordance with AUSTRROADS. A.C. Surfacing are to be constructed in accordance with Brisbane City Council Standards (BCC S310 Supply of Dense Graded Asphalt and S320 Laying of Asphalt).

Primers seals are required to be placed under all asphalt surfaces. Primer seals shall consist of cutback bitumen (AMC4) or bitumen emulsion to Main Roads Specification (MRTS 11 Sprayed Bituminous Surfacing excluding Emulsions) and MRTS 12 Sprayed Bituminous Emulsion Surfacing) with 10mm aggregate. Where cutback bitumen is used the minimum curing time before the next sealed layer (asphalt) can be placed will be fourteen (14) days. Where bitumen emulsion is used the minimum curing time before the next sealed layer (asphalt) can be placed will be four (4) days.

Application rates of primer binder and aggregate are to be designed in accordance with the current edition of AUSTRROADS Practitioners Guide to Design of Sprayed Seals.

In rural areas bitumen spray seal surfacing is to be provided in the form of a 2 coat Polymer Spray Seal (14mm/7mm) in accordance with Main Road Technical Specifications (MRTS 18 Polymer Modified Binders, MRTS 11 Sprayed Bituminous Surfacing excluding Emulsions).

The Degree of Saturation of base course prior to surfacing is to be less than 65%. Test results demonstrating this are to be provided to Council's nominated representative at the preseal inspection.

For Rigid pavements, unless otherwise approved by Council's nominated representative, the minimum thickness of the reinforced concrete pavement shall be 175mm with a minimum of 100mm type 2.3 compacted gravel.

Colouring of stencilled or patterned concrete shall be subject to approval of Council nominated representative. Particular attention is to be given to the selection of surface treatments which ensure that appropriate skid resistance is maintained. Where colouring of the rigid pavement is proposed, the complete pavement mix is to be coloured. Light colours are to be avoided.

Where the rigid pavement section being designed is less than 25m in length and is abutted by flexible pavement is greater than 275mm then the combined thickness of the rigid pavement and its supporting sub base shall be equivalent to the combined thickness of the abutting flexible pavement base, sub base and select material courses.

### 8.14 Pavement for Low Subgrade CBR

If the Design CBR determined for the subgrade is less than the minimum CBR 3, then the following is required:

- replacement with 300mm, minimum CBR 15 replacement material; and
- re-design pavement based on CBR 3 or design in accordance with AUSTRROADS.

Alternative designs incorporating geogrids and geofabrics will be considered when submitted for approval by an appropriately qualified and experienced engineer.

### 8.15 Construction

Each pavement course should not be commenced until the previous course, i.e. subgrade, sub base/s, base or existing pavement, has been inspected and approved and certified by the consultant with

respect to compaction, finished levels and texture of finish. Compaction tests of each layer are required and consultants must ensure that all tests are satisfactory before proceeding to the next layer. All test results are to be provided to Council's nominated representative prior to surfacing.

### **8.16 Subgrade Preparation**

Subgrade is to be trimmed to an even surface free from loose material and graded to be free-draining. Unsuitable material such as organic matter is to be removed. Subgrade affected by rainfall after final trimming shall not be accepted until appropriate drying out treatment has been affected. Appropriate management of subgrade with moderate to high shrink/swell index.

### **8.17 Unbound Pavement Course Placement**

Unbound pavement course material is to be placed only on underlying layers maintained at the correct moisture content. Prepared subgrades and preceding layers of base course shall be moistened immediately prior to spreading the next course.

Pavement material should be maintained at the specified moisture content prior to and during spreading. The leading edges of the pavement material are to be kept moist. Minimum compacted layer thickness shall be 100 millimetres and maximum compacted thickness shall be 150mm.

### **8.18 Compaction Testing and Frequency**

Determination of the compaction performance of the subgrade and pavement gravel materials – laboratory reference density, field density, optimum moisture content, field moisture content -shall be carried out in accordance with AS1289 Methods of Testing Soils for Engineering Purposes, in particular the E series tests. The laboratory reference density shall be:

- Natural Subgrade - 100% Standard Maximum Dry Density (MDD)
- Pavement upper and lower sub base layers – 100% Standard Maximum Dry Density (MDD)
- Pavement base layer - 102% Standard Maximum Dry Density (MDD)

The minimum frequency of testing shall be in accordance with Council's Planning Scheme Policy Operational Works Inspections, Maintenance and Bonding procedures.

A minimum of three (3) tests per project will be required. A sketch plan showing the location of the tests is to be submitted with the results. All tests are to be distributed reasonably evenly through the full depth and area of pavement.

The testing frequencies stated above are based on a "not one to fail" basis. Failure of compaction tests on any layer will require:

- Removal or reworking of material; and
- Re-testing; and
- Resubmission of failed test results, successful test results and description of remedial treatment undertaken at the developer's representative's directions to Council's nominated representative prior to the relevant inspection.

### **8.19 Pavement Depth Verification**

Pavement depths shall be verified by the provision of as constructed levels of the subgrade and pre-seal stage (or top of kerb if installed) at a frequency of three (3) levels (right hand side, centre and left hand side) every 50 metres. The surveyed information is to be provided in a tabulated format and is to be certified by both the surveyor and consulting engineer.

### 8.11 Design Basis

Road Typology	Functional Road Hierarchy Classification	Design Traffic ESA
<b>Centre</b>		
Urban	All	To be determined in accordance with Austroads Guide to Pavement Technology
District Main Street / Higher Order Access	All	
Higher Order Main Street	All	
<b>Industry</b>		
Industrial Access	Access Street	$3 \times 10^6$
Industrial Collector	Local Collector	$1 \times 10^7$
District Collector	District Collector	$1.5 \times 10^7$
<b>General Residential</b>		
Residential Laneway	Access Street	$2 \times 10^4$
Residential Access	Access Street	$8 \times 10^4$
Residential Living	Access Street	$1.2 \times 10^5$
	Local Collector	$2.5 \times 10^5$
Residential Contemporary	Access Street	$1.5 \times 10^5$
	Local Collector	$3 \times 10^5$
Urban Fringe	Access Street	$2.0 \times 10^5$
	Local Collector	$5.5 \times 10^5$
	District Collector	$1.5 \times 10^6$
District Collector	District Collector	$8 \times 10^5$
<b>Rural Residential</b>		
Rural Residential	Access Street	$2.5 \times 10^5$
	Local Collector/ District Collector	$2.5 \times 10^5$
<b>All Zones</b>		
Driveway		$2.5 \times 10^3$
Arterial / Sub Arterial	Arterial	$1.5 \times 10^7$
	Sub Arterial	$3 \times 10^6$
Where not otherwise specified.		To be determined in accordance with Austroads Guide to Pavement Technology



## 9. Street Lighting and Public Utilities

### 9.1 General Requirements

Unless stated otherwise, the Developer is responsible for the design of public utility services including liaison with the relevant public utility authorities, supply and installation of all service conduits, including the provision of all services and/or conduits along the full length of any rear allotment access or access easement. The Developer must also meet the cost of any alterations to the public utility mains, existing mains, services or installations required in connection with the development. This includes the relocation of any fire hydrant and/or valves from within the limits of the development's vehicular crossings, if applicable.

If road or street widening is required along the frontage of the development, the Developer must relocate the services onto the correct alignment within the verge. In some instances, the services may need to be lowered to provide sufficient cover when the footpath is graded to the design profile.

### 9.2 Location of Services

The service corridors and alignments must conform to the relevant Standard drawing. See Appendix H – Standard Drawings.

### 9.3 Street Lighting

#### 9.3.1 Principal Consultant

The Developer must appoint a suitably qualified Principal Consultant to liaise with Council for the approval of street lighting and electrical reticulation. The Principal Consultant must be a RPEQ and hold professional indemnity insurance to the value of not less than \$1,000,000.

#### 9.3.2 Standards

Unless specified otherwise in this chapter or as directed by Council, the provisions and detailed design of street lighting installations must conform to the following standards.

#### 9.3.3 Lighting Category

The lighting categories referred to in *AS 1158* are broadly described as follows:

- Category V lighting. Lighting which is applicable to roads on which the visual requirements of motorists are dominant, e.g. traffic routes.
- Category P lighting. Lighting which is applicable to roads on which the visual requirements of pedestrians are dominant, e.g. local roads and public activity areas.



### 9.3.3 Lighting Categories

Road/Location	AS1158 Lighting Category
<b>Major Road</b>	
Arterial	V3
Sub-arterial	V5
<b>Urban Road</b>	
District Collector	P4
Local Collector	P4
Access and Laneway	P5
<b>Rural</b>	
All roads	Refer requirements section 9.4
<b>Pathways</b>	
Between residential lots	P4
Open and civic space area	P4
Commuter links	P4
Other locations	As advised by Council
<b>Notes</b> (as per below)	

### 9.3.4 Alignment

Within access streets serving 20 lots or less, the streetlights are to be located on one side of the street only. Where a pathway is only located on one side of the street, the lighting is to be provided along the same side of the street as the pathway.

Within other access streets the streetlights are to be installed alternatively on opposite sides of the street (staggered arrangement).

The location of light poles should avoid the likely vehicle conflict points, minimise the risk of damage to both poles and vehicles and injury to vehicle occupants, minimise glare complaints, and minimise conflicting with driveway locations.

The following factors should be considered when determining the street lighting alignment:

- a) The potential for vehicle collision on built to boundary lots and rear access lot driveways.
- b) The pole type installed is to be in accordance with the requirements of the relevant Australian Standards have regard for the pole location and speed environment
- c) Locate street light poles in line with abutting property boundaries or on truncation points at intersections. In cul-de-sac locations, the alignment is measured along a line projected lot side boundary to the kerb.

- d) Locating poles in cul-de-sac adjacent to narrow property frontages is undesirable due to possible conflict with adjoining driveways.
- e) Lighting poles must be located in accordance with the relevant Standard Drawings. See Appendix H – Standard Drawings.
- f) Where the footpath width exceeds 4.0 metres, the centre of the street lighting pole must be located 0.9 metres behind the kerb invert.
- g) The preferred configuration of lighting at a roundabout is for the light poles to be located on the approach side of each intersection street without poles in the central median island. Lighting poles must be located as far as practicable, away from the intersection. Council would only consider the installation of central island lights if the aforementioned preferred lighting arrangement cannot be achieved, then the poles are of the cantilever (pivot arm) type and satisfactory maintenance vehicle access is provided clear of landscaping.
- h) For bikeways, the lighting column must be located 1.2 meters from the edge of the bikeway pavement.
- i) The proposed light must be at least 7.0 metres clear from any existing street trees.

### 9.3.5 Subdivisions & Other Developments

The specific requirements of new developments, in particular subdivisions, are as follows:

- a) The lighting design must be cost effective in regard to minimising the annual operating costs and where possible, the installation capital costs. The Developer is responsible for all capital costs associated with the design and installation of the street lighting scheme. Where it may be advantageous for the Developer to install lighting work outside the specified limits at the time of development, Council may contribute towards some of the capital costs, but these must be specifically agreed between the Council and the Developer. Council will only bear operating costs under Rate 2 of Energex's *Public Lighting Tariff*.
- b) Where the new development adjoins an existing street, the new poles/lights must match the existing types to the maximum practicable extent. This is not applicable when the existing road or street contains GI poles.
- c) Where the development requires partial road or street construction (typically when the development adjoins an undeveloped site), the lighting must be designed for the full width. However the lights on the development side only would need to be installed (assuming a staggered arrangement is required). In this instance conduits must be placed for future lighting on the non-constructed side.
- d) Where major traffic routes (i.e. Category V road) are not likely to carry high volumes of traffic until the future stages are developed and occupied, either one of the following options is acceptable.
  - i) Install half the ultimate lighting with the provision of conduits for the remainder lighting in the future.
  - ii) Install smaller pole/lower wattage luminaries in the final position for upgrading at a later date. The use of base plate or rag bolt mounted columns in this case may be advantageous.
- e) The lighting design for the development must integrate aesthetically with the adjoining / developments / estates / stages. Also the design must incorporate as far as practicable, the future planning of the area.

- f) An aeroscreen luminaire on an integral 0.5 metre outreach must be used on a pedestrian laneway. The light will generally be located midway along the laneway at abutting property boundaries. If the laneway exceeds 60.0 metres then more than one light may be required. Hinging Base Plate Mounted (HBPM) columns must be used in this instance for maintenance purposes.
- g) Underground electricity supply pillars must be provided at 150 metre intervals along park frontages for future supply to internal park lighting and other electrical park equipment.
- h) Pedestrian underpasses require special consideration. The Principal Consultant must contact the Council Lighting Officer for site specific requirements before the commencement of design.
- i) For subdivisions in the Rural zone and where allotment reticulation electrical supply is provided, suitable flag street lighting is to be provided in the following situations:
  - i) Intersections & cul-de-sacs
  - ii) Sharp bends
  - iii) Traffic control devices
  - iv) Culverts and bridges
  - v) Identified traffic hazards
- j) Provision of access for maintenance of lighting located within pedestrian and vehicle laneways is to comply with the specific requirements of the energy provider. Suitable vehicle access is to be provided for light poles no further than 100 metre walking distance from the service vehicle.
- k) For subdivisions in the Rural residential zone, suitable street lighting to the required lighting category is to be provided in the following situations:
  - i) Intersections & cul-de-sacs
  - ii) Sharp bends
  - iii) Traffic control devices
  - iv) Culverts and bridges
  - v) Identified traffic hazards
- l) Notwithstanding all the above items a) – k), Council may vary the required street lighting category for any street or road in consideration of special circumstances or require additional lighting in the following situations:
  - i) Intersections.
  - ii) Roundabouts.
  - iii) Sharp bends.
  - iv) Traffic control devices.
  - v) Pedestrian crossings/refuges.
  - vi) Cul-de-sacs.
  - vii) Bridges (minimum Category V5 at abutments and minimum Category P4 on deck).

- viii) Night time accident locations.
- ix) Frequently used night time bus stops.
- x) Areas that may generate pedestrian traffic or vehicle night traffic.
- xi) Wildlife movement and crossing locations

### 9.3.6 Decorative Lighting

Decorative lighting must not be used on Category V traffic routes. Council will not accept any decorative light or supporting pole for the lighting of public roads and laneways unless it is a standard stock item of Energex. If the development is an extension of an existing estate already installed with Nostalgia units, then the Developer must continue to use matching Nostalgia units.

## 9.4 Electricity

### 9.4.1 General

In the context of these guidelines, 'underground electricity' means the installation of conduits and supply of services such as electrical reticulation (up to and including 11 kV), pilot cables, street lighting, traffic signals and public lighting to transport facilities, parks, bikeways and telephone booths, etc. The provision of underground electricity is required within new developments except those in the Rural zone where overhead electricity is acceptable.

### 9.4.2 Approval Process

All the design and construction work on the electricity supplier's (Energex) assets must be carried out by the electricity supplier or an approved electricity supplier's consultant/contractor.

Prior to signing and sealing of the survey plan, a copy of a letter of agreement from the electricity supplier to provide the necessary services in accordance with approved electricity reticulation plans, must be submitted to Council.

### 9.4.3 Subdivisions/Developments

The specific requirements of new developments, in particular subdivisions in other than the Rural zone are as follows:

#### a) New Dedicated Roads

- i) For newly dedicated roads, full underground electricity reticulation including consumer service pillars must be provided within the road reserve to all allotments including adjacent parkland.

#### b) Existing Dedicated Roads (Including Road Widening)

- i) Where the overhead electricity reticulation exists along the frontage of the development and all the proposed allotments are to take access off the existing dedicated road:
  - A) The lot voltage (240V single phase / 415V three phase) and 11 kV must be converted to underground and all allotments supplied underground from consumer service pillars.
  - B) Subject to Energex approval redundant overhead lines and power poles must be removed with the exception of small frontage (i.e. the development frontage lies wholly within 2 consecutive electricity poles spaced less than 100.0 metres apart) where the existing overhead lines may remain in parallel.
- ii) Where the overhead electricity reticulation exists along the frontage of the development, but the proposed allotments are to take access and have electricity supply from an internal road system:
  - A) The low voltage (240V/415V) component of the existing overhead system along the external frontage of the development must be converted to underground and all allotments supplied underground from consumer service pillars.
  - B) Subject to Energex approval redundant overhead lines and power poles must be removed with the exception of small frontages (i.e. the development frontage lies wholly within 2 consecutive electricity poles spaced less than 100.0 metres apart) where the existing overhead lines may remain in parallel.

C) Conduits must be installed for either the future undergrounding of the existing 11 kV component or new proposed future Low Voltage (240V/415V).

- iii) Where necessary the Developer must supply conduits across the road, such as existing properties on the opposite side of the road outside the development boundary, for the extent of any new road construction.
- iv) If the supply for the new development is to be taken from existing overhead mains, then the supply must be taken underground from the nearest existing overhead pole at or outside the development boundary. It is unacceptable to install new overhead conductors across the road or extend spans of overhead lines down a footpath to new underground termination poles.

**c) Existing Houses/Buildings**

- i) Where an existing dwelling/building is to remain within the limits of a development, then any existing overhead electricity (and telecommunication) service to the building must be converted to underground.

**d) High Voltage Feeders (33 KV and Higher)**

- i) All existing conductors of 33kV or higher may remain overhead. However if the Developer wishes to remove high voltage feeder lines, the necessary approvals must be obtained direct from Energex/Powerlink.
- ii) New or relocated > 33kV systems may be overhead at the discretion of Energex/Powerlink.

**e) Transformers (PMT and PT)**

- i) Generally all new transformers required for a development must be the pad mounted transformer (PMT) type even if their location is remote from the development, except under the following circumstances:
  - A) For a small development in a fully developed area, the use of a PT and extension of 11 kV may be considered upon request. This option is mainly restricted to industrial developments.
  - B) Existing pole transformers are not to be upgraded for supply of electricity to new subdivisions.
  - C) PMT locations are to be in addition to the nominated road reserve. Any PMT's located adjacent to park area are to be excised from the park area.

**f) Low Voltage Supply ( 240V/415V)**

- i) Where an existing Low Voltage Overhead supply traverses an existing parcel of land that is to be subdivided into smaller allotments, the supply to the newly created lots is to be serviced through the road fronting the development and any existing low voltage supply traversing the lots to be terminated. Council will not favour wayleave arrangements for electrical supply traversing lots on any new developments.

**g) Spare Conduits**

- i) Council reserves the right to specify spare conduits for future use on half/full width road crossings for the extension of service to/from adjacent existing and future developments. (Note: Where rear access lots or lots with a narrow access easements are proposed, future

electrical and telecommunication conduits are to be installed for the full length of the access handle or easement before any concrete driveways are installed).

- ii) It is the responsibility of the electricity supplier to ensure that the quantity of conduits installed within the development will also cater for any future mains upgrade.

**h) Costs**

- i) The Developer is responsible for all the design (including that pertaining to item 9.6.3 b) iii) above) and construction costs including any relocation of Energex assets, if required as part of the development.

## **9.5 GAS**

If underground gas is to be supplied to the new development, these service conduits must be shown on the engineering plans.

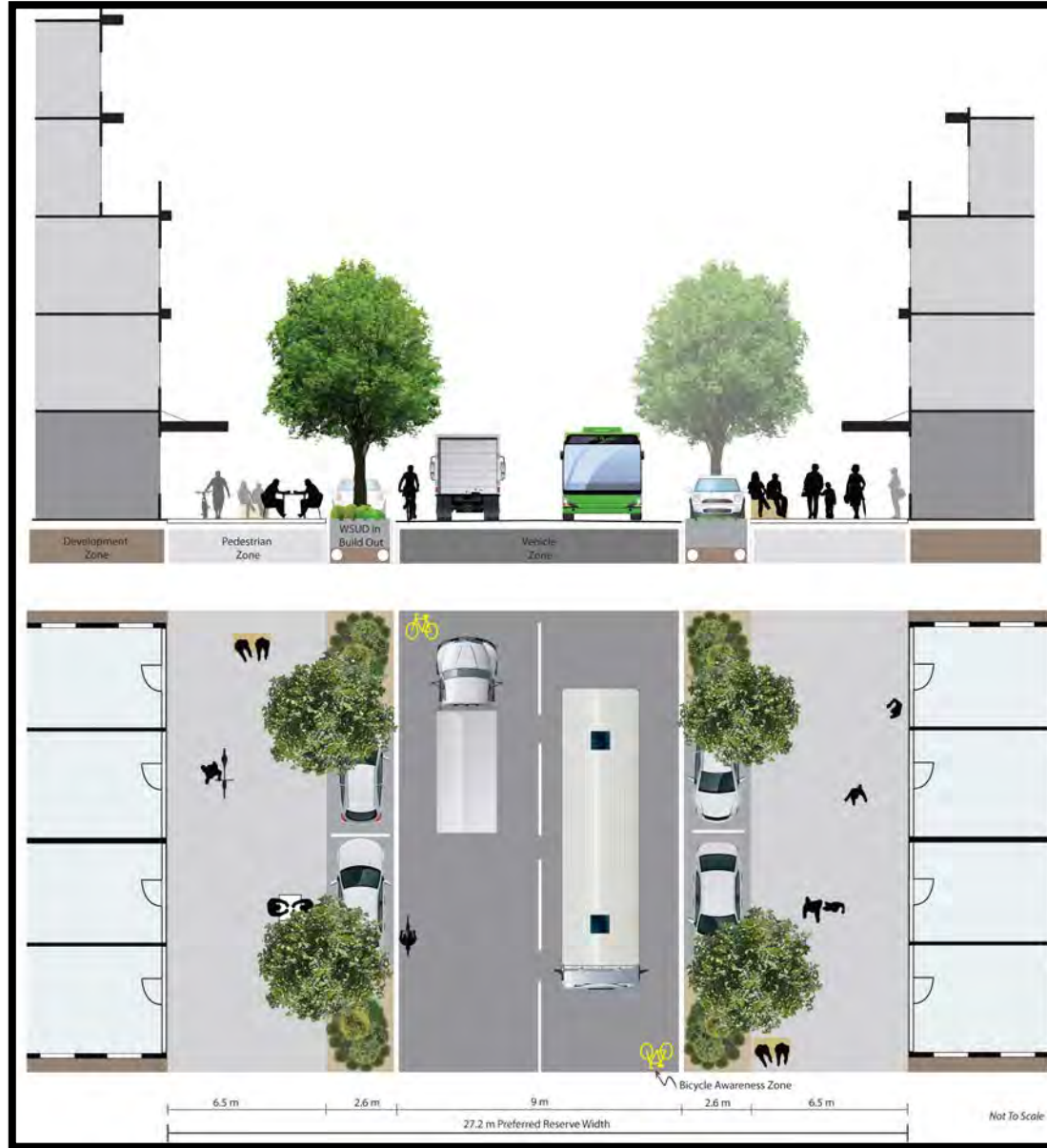
## **9.6 TELECOMMUNICATIONS**

- a) Underground telecommunication services must be provided separate to the electricity service, to all allotments. Where overhead telecommunication lines exist along the development frontage, the same conditions as per overhead electricity will apply (also refer Section 9.6.3 b) ii)).
- b) Prior to signing and sealing of the survey plan, a copy of a letter of agreement from the telecommunication carrier to supply the necessary services must be submitted to Council.
- c) Telecommunication cabinets are to be located in widened sections of the road or street reserve.

**10. Street and Road Typology Cross Sections**



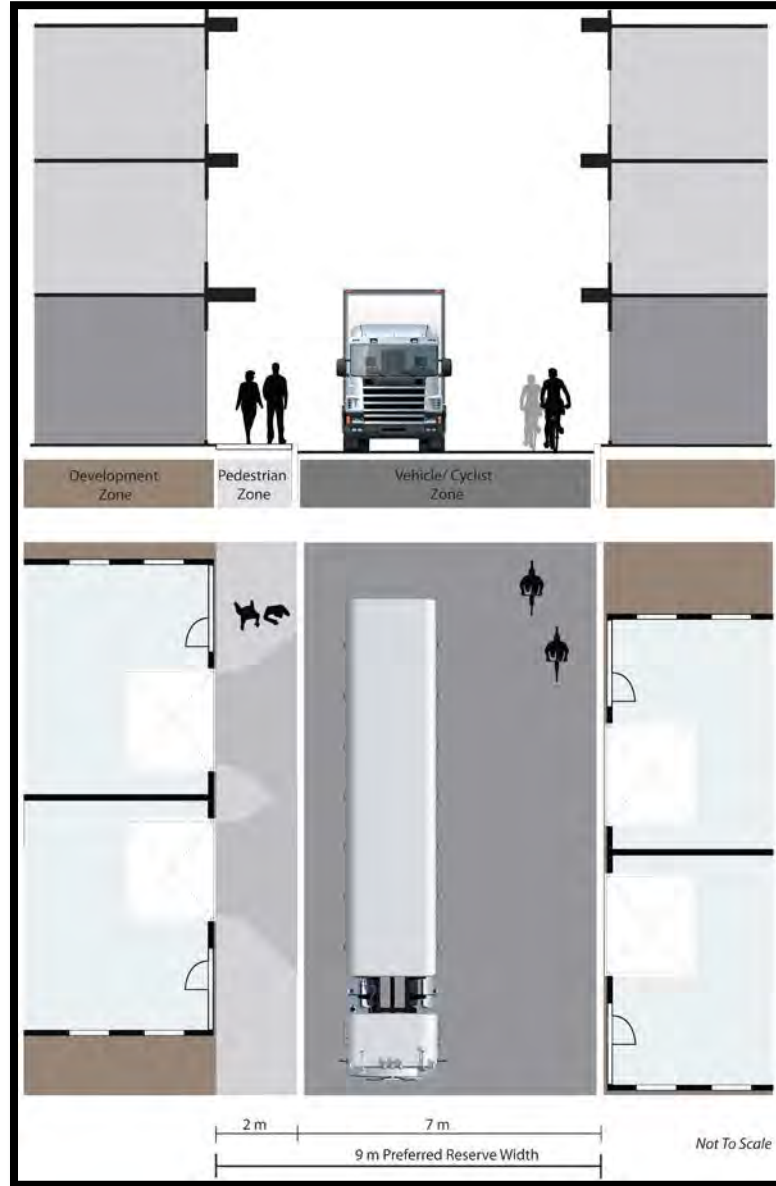
# 10.1 HIGHER ORDER MAIN STREET



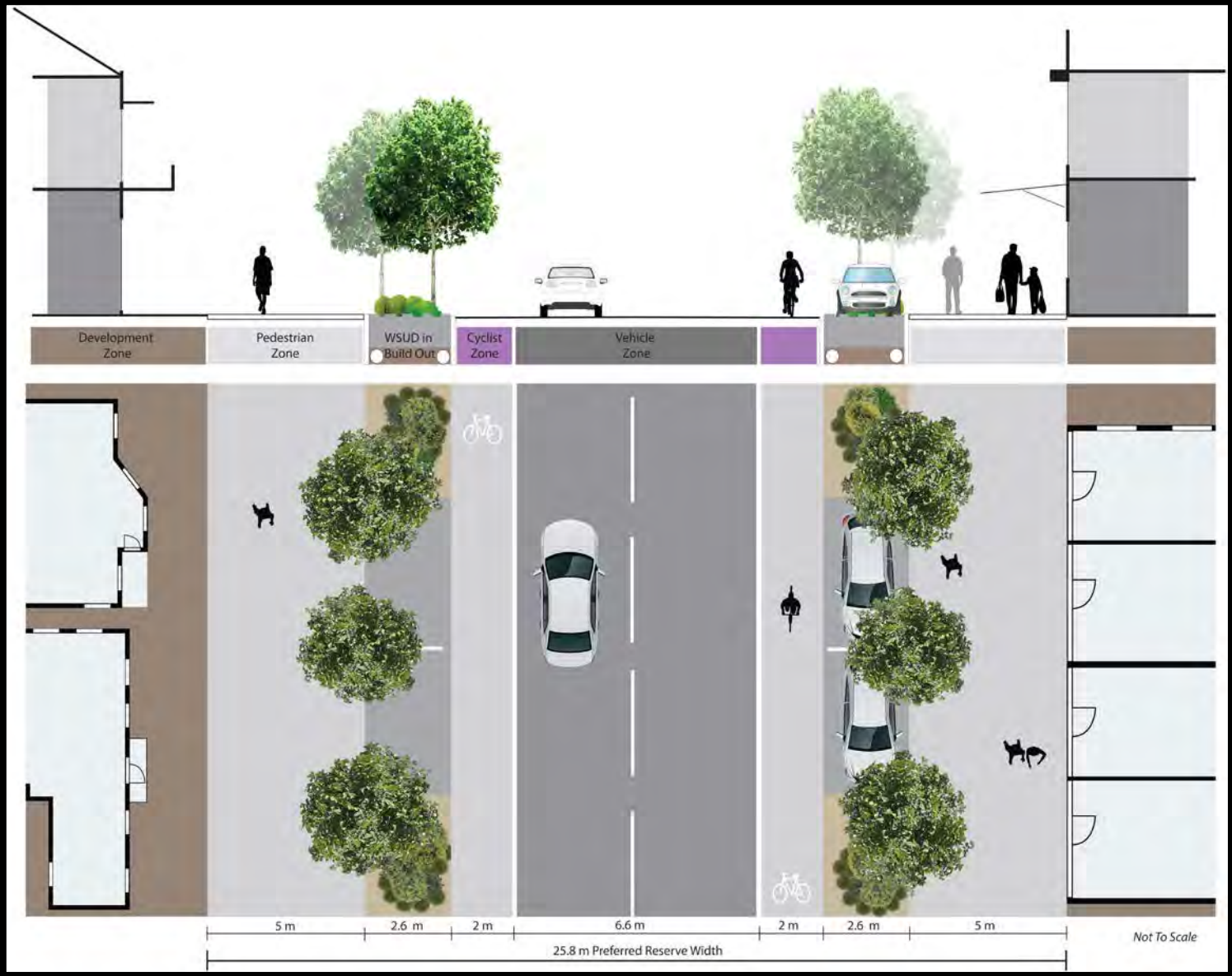
## 10.2 DISTRICT MAIN STREET / HIGHER ORDER ACCESS



### 10.3 BUSINESS LANEWAY

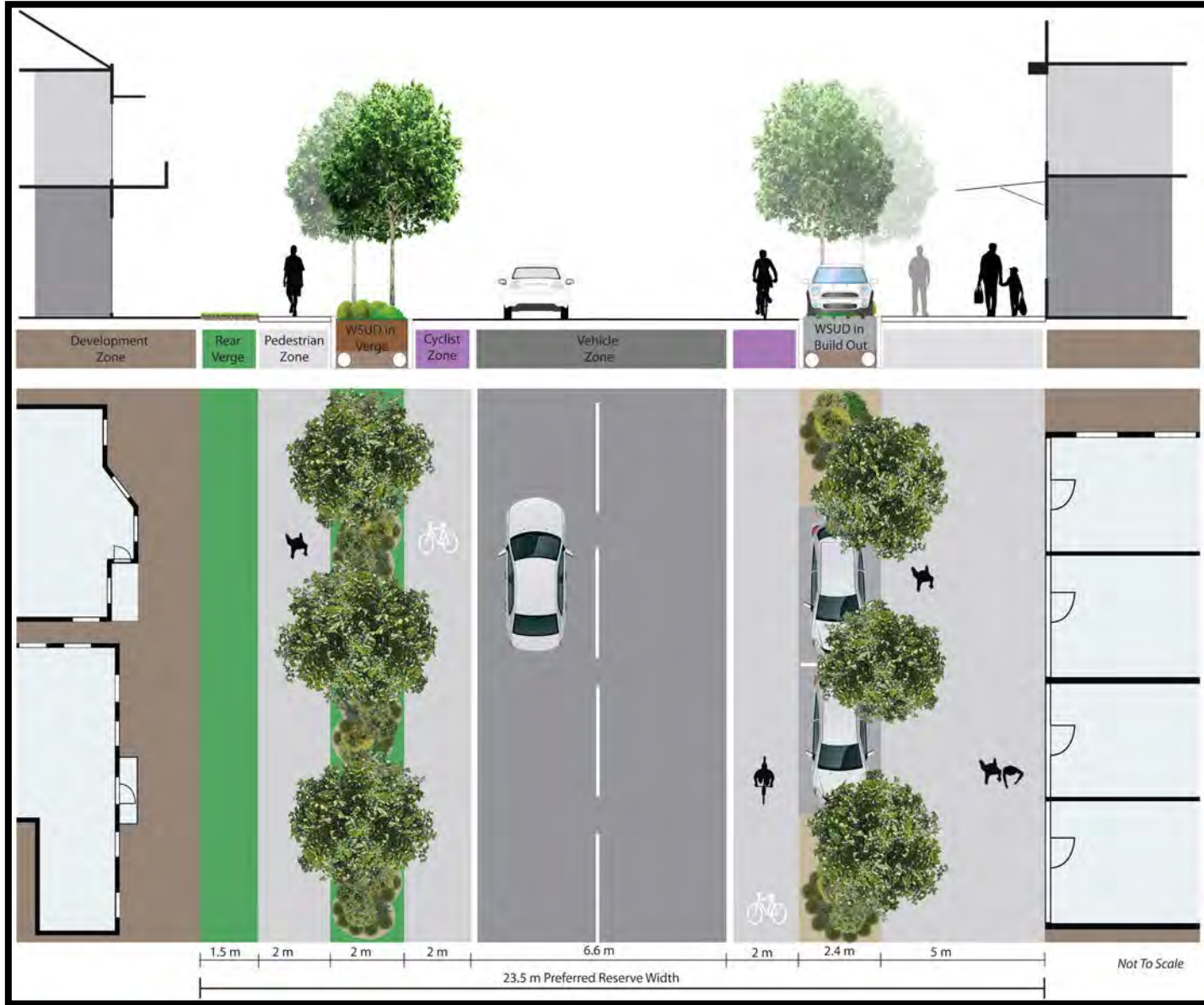


10.4 URBAN

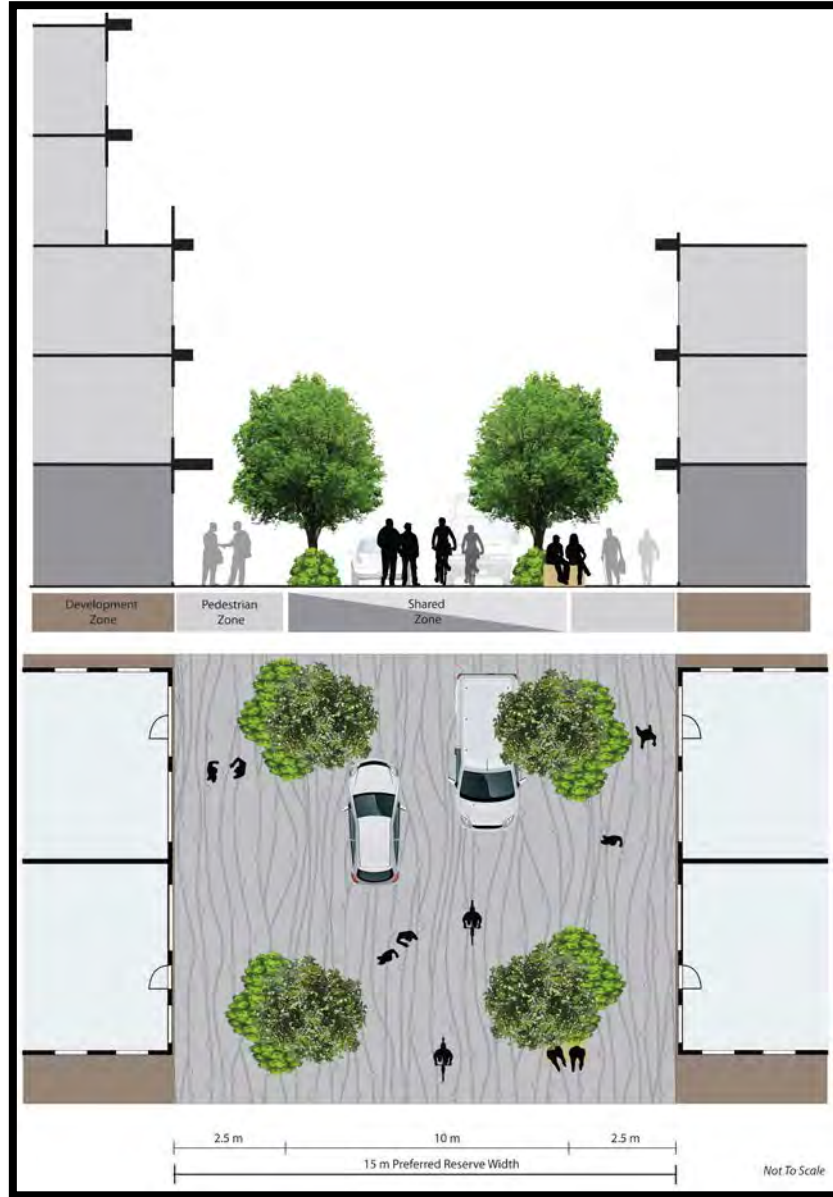




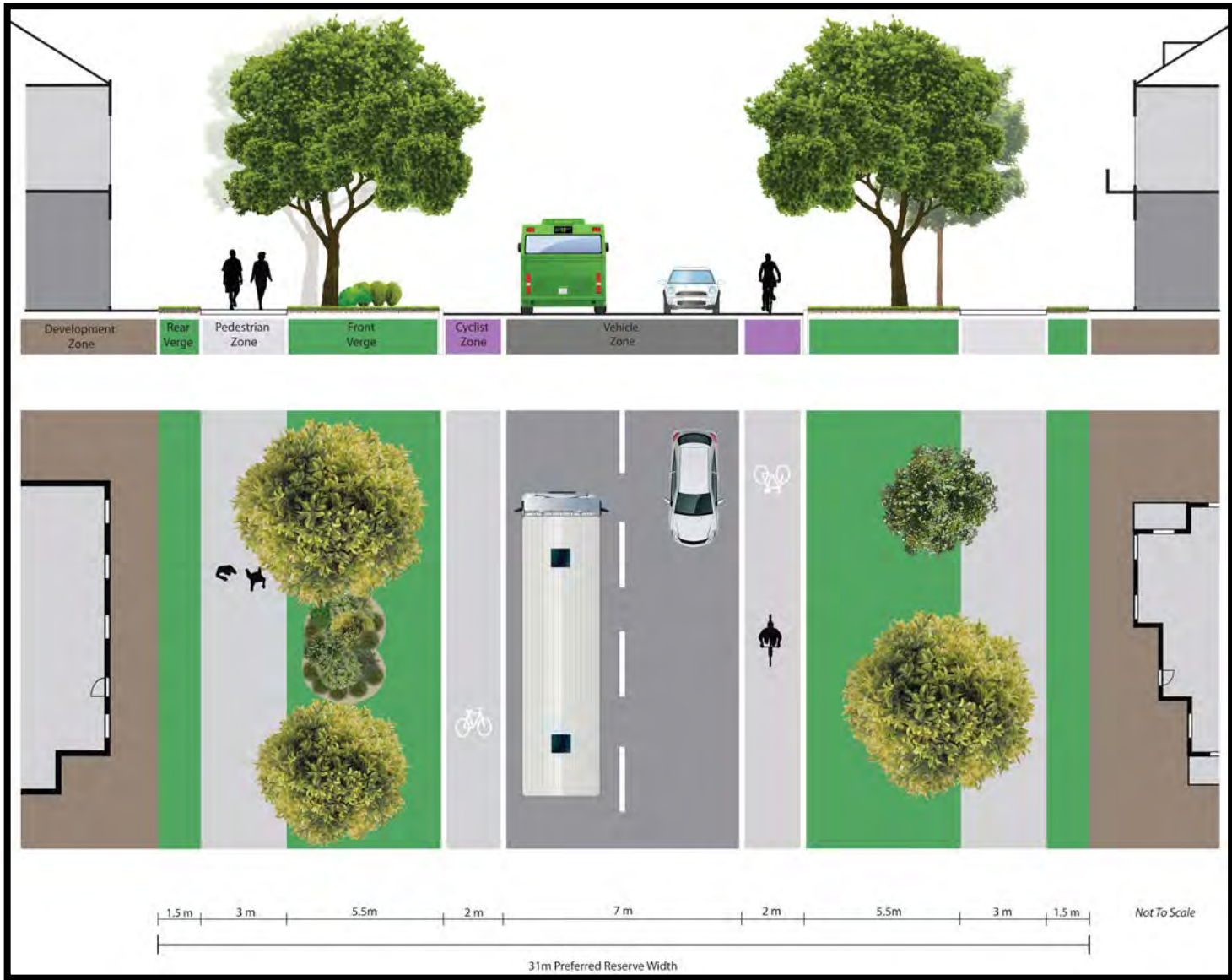
# 10.5 URBAN FRINGE



10.6 SHARED BUSINESS

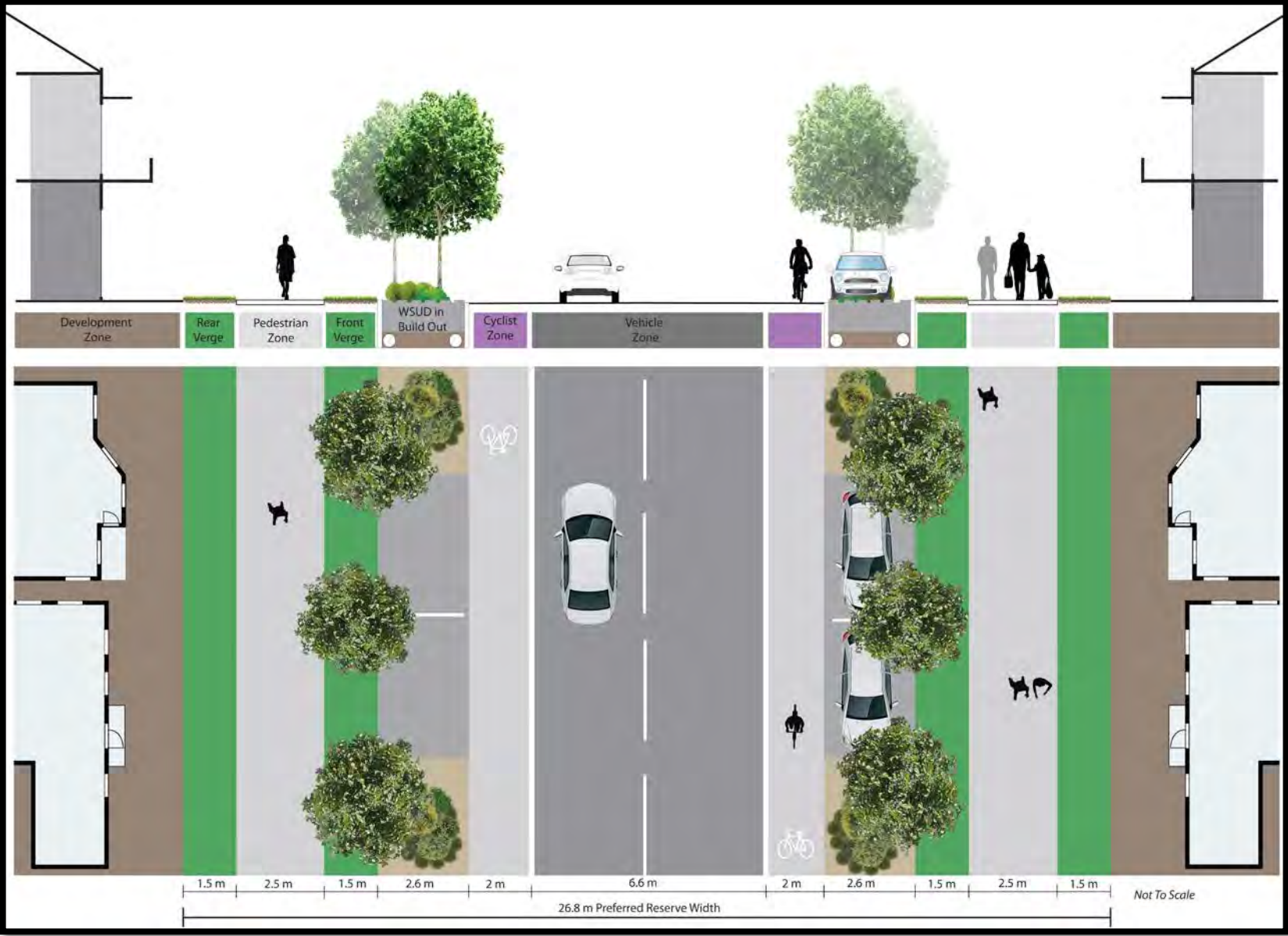


10.7 ARTERIAL AND SUBARTERIAL





10.8 DISTRICT COLLECTOR

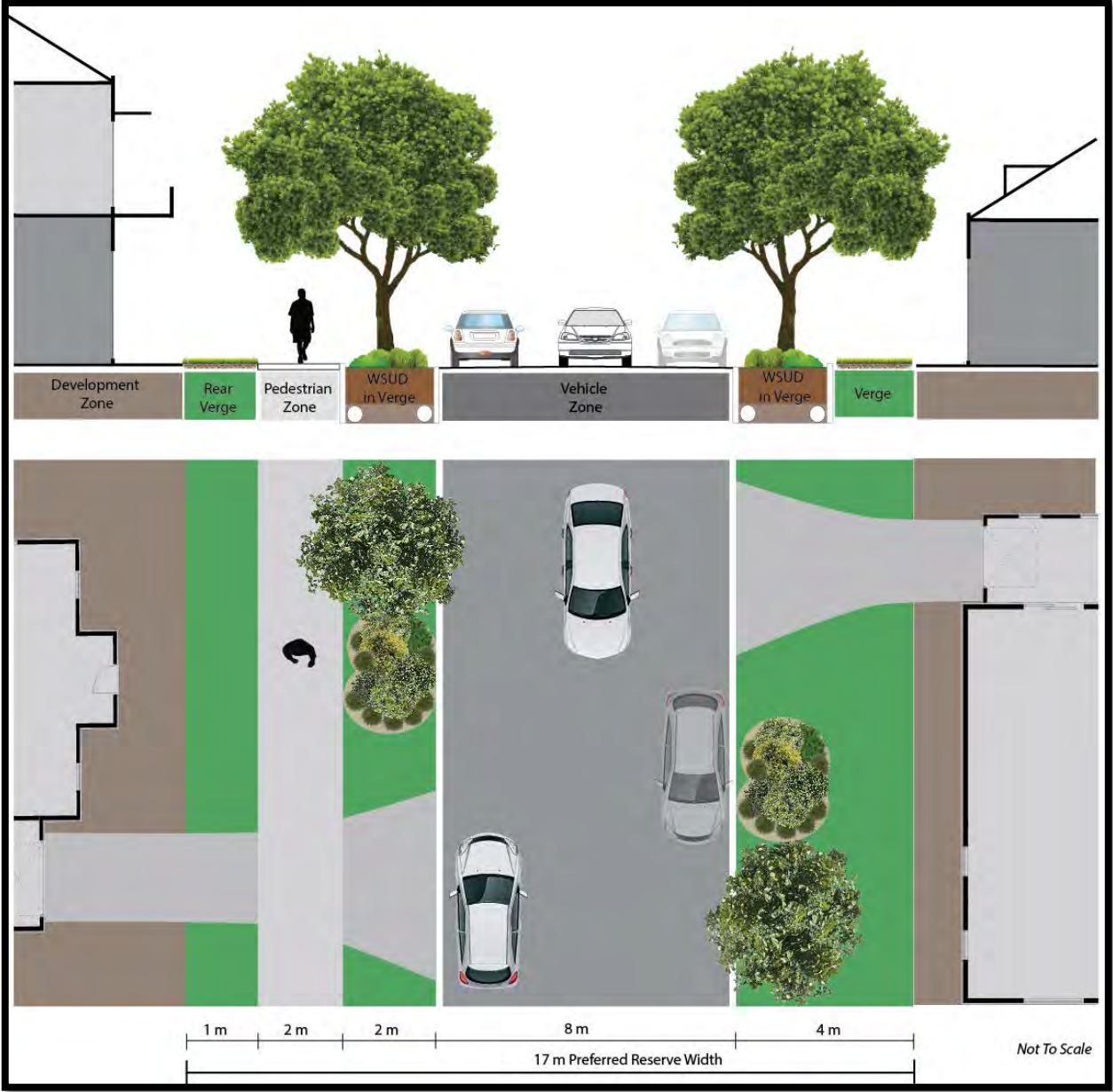




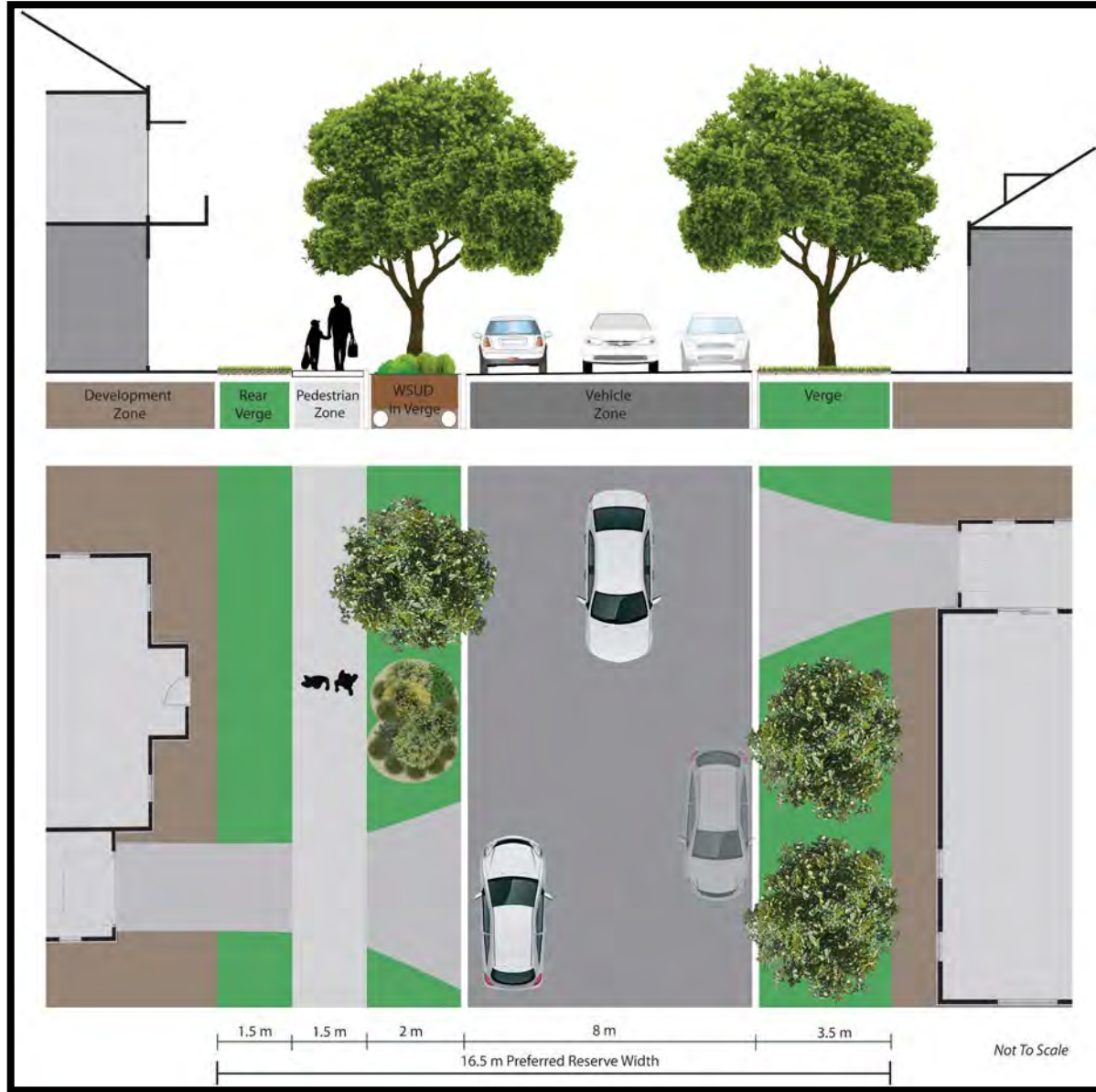
# 10.9 CONTEMPORARY RESIDENTIAL



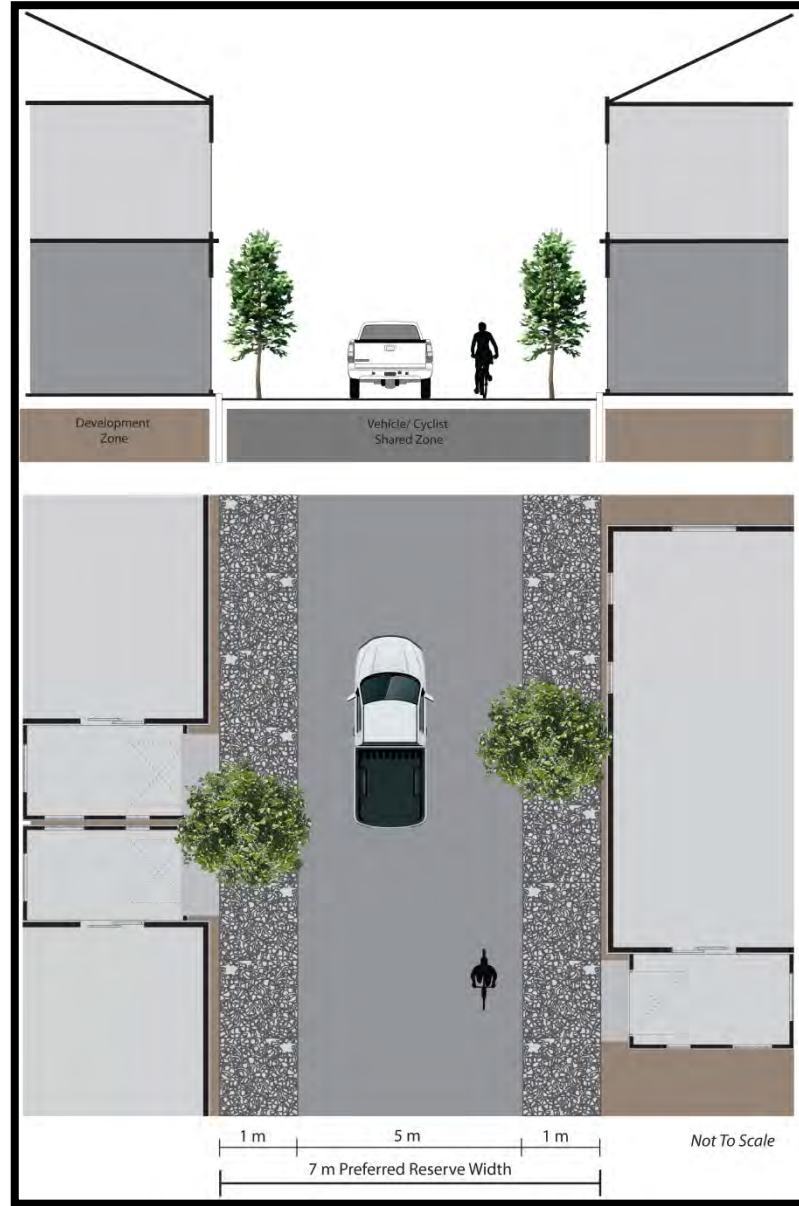
10.10 LIVING RESIDENTIAL



# 10.11 ACCESS RESIDENTIAL



10.12 LANEWAY RESIDENTIAL





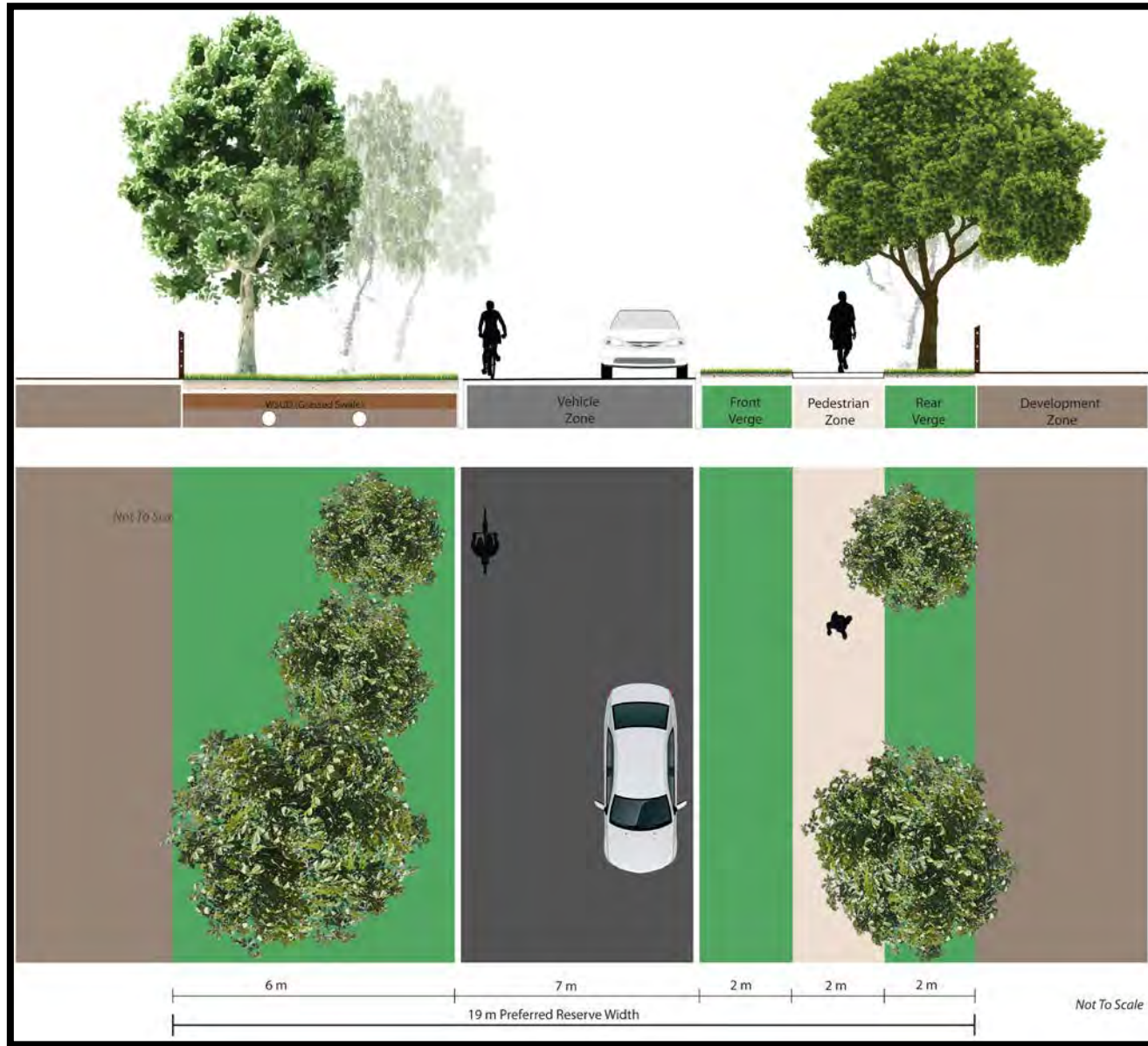
# 10.13 INDUSTRY ACCESS



10.14 INDUSTRY COLLECTOR



# 10.15 RURAL RESIDENTIAL





10.16 TOWNSHIP MAIN STREET

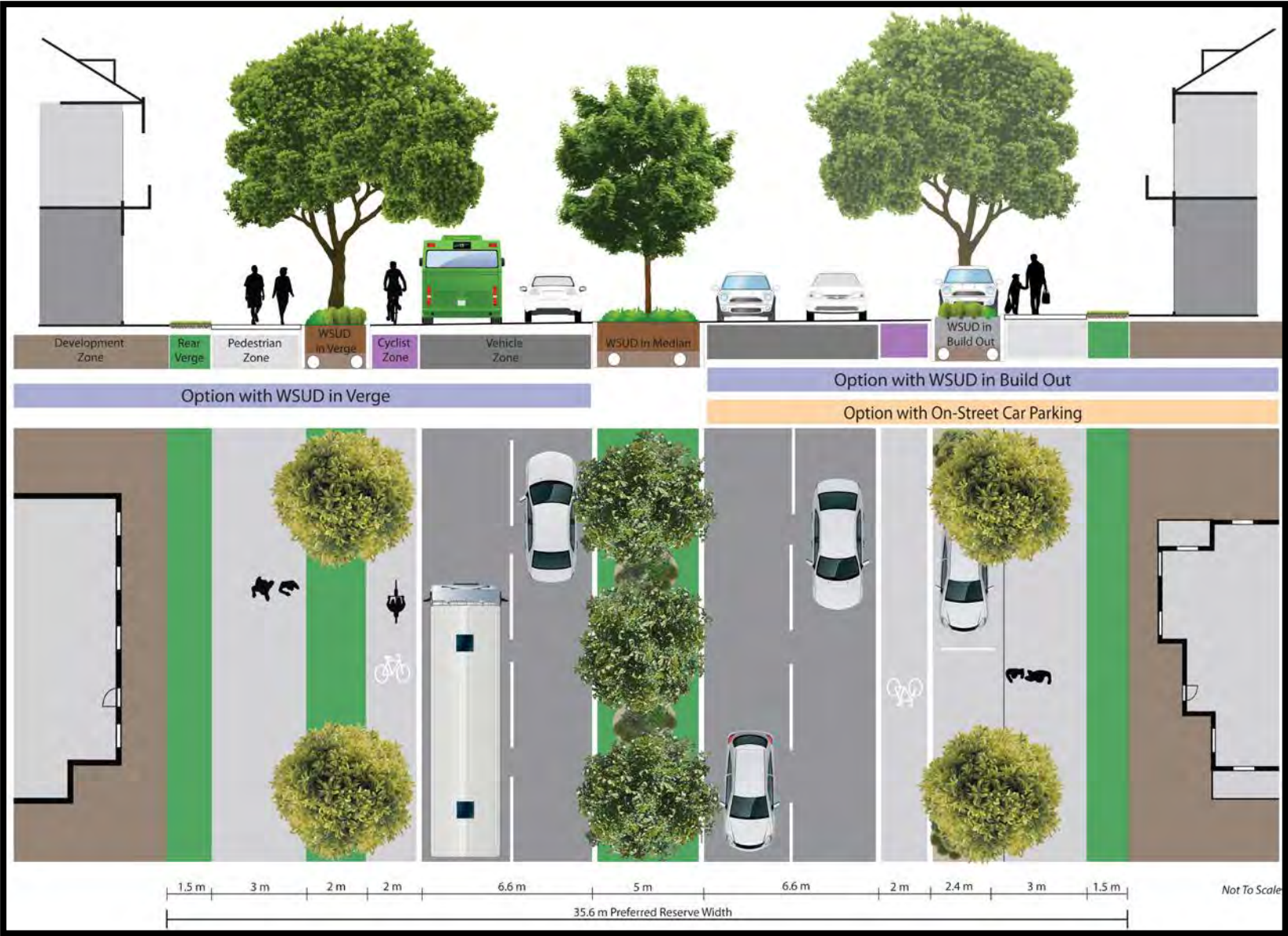




# 10.17 TWO LANE BOULEVARD



10.18 FOUR LANE BOULEVARD



## 11. Intersection Management and Pedestrian Crossings

Intersection management and Pedestrian crossing					
X	Arterial Road	Sub-Arterial Road	District Collector	Local Collector	Access Street
Arterial Road	Signalised	Signalised	Left-in and left out only access to/from district collector or signalised	Left-in and left out only access to/from local collector or signalised	No vehicular access pedestrians and cyclists only
Sub-Arterial Road	Signalised	Signalised	Left-in and left out only access to/from district collector or signalised	Left-in and left out only access to/from local collector or signalised	No vehicular access pedestrians and cyclists only
District Collector	Left-in and left out only access to/from the collector or signalised	Left-in and left out only access to/from the collector or signalised	Stop or give way control to be used with priority assigned to suit local circumstances (sight lines, etc) or signalisation.	Give-way or stop treatment to local collector	Give way or stop treatment from access street left in and left outs 7 metre intersection corner radius
Local Collector	Left-in and left out only access to/from the collector or signalised	Left-in and left out only access to/from the collector or signalised	Give-way 7 metre intersection corner radius	Alternating give way priority treatment along length 7 metre intersection corner radius	Give-way treatment on access street 7 metre intersection corner radius
Access street	No vehicular access pedestrians and cyclists only	No vehicular access pedestrians and cyclists only	Give way or stop treatment from access street left in and left outs 7 metre intersection corner radius	Give-way treatment on access street 7 metre intersection corner radius	Give-way or Uncontrolled treatment 7 metre intersection corner radius
Pedestrian Crossing Type	Signalised	Priority (e.g. Zebra) or Signalised	Priority (e.g. Zebra) or Refuge	Priority (e.g. Zebra) or Refuge	Not Required
Maximum Pedestrian Crossing Spacing	200m Note: Only applicable in 'Urban Neighbourhood' and 'Centre' precincts. Otherwise as required by council, taking into account concentrations of activity and likely pedestrian desire lines.	200m Note: Only applicable in 'Urban Neighbourhood' and 'Centre' precincts. Otherwise as required by council, taking into account concentrations of activity and likely pedestrian desire lines.	200m (100m if Main Street)	200m (100m if Main Street)	N/A (100m if Main Street)