Manual

Traffic and Road Use Management
Volume 1 – Guide to Traffic Management (2016)

Part 8: Local area traffic management

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1 Purpose

This supplement has been prepared to provide practical guidance where bicycle traffic and motor vehicle traffic is mixed with the installation of Advisory Bicycle Lanes (ABLs) and Cycle Streets (CSs). These are advisory treatments for bicycle riders suitable for low speed and low traffic volume streets in urban environments. There is currently no Australian or Queensland specific guidance on this topic.

Where exclusive bicycle space cannot be fitted (refer Section 4.1 and Figure 4.1), advisory bicycle treatments including ABLs and CSs are appropriate to improve safety and comfort for all road users.

This document supplements information contained in Austroads' *Guide to Traffic Management* Part 8*: Local Area Traffic Management*, and relates to information contained in the Department of Transport and Main Roads' *Traffic and Road Use Management* (TRUM) manual and the department's *Manual of Uniform Traffic Control Devices* (MUTCD). Austroads *Guide to Traffic Management Part 8: Local Area Traffic Management* and TRUM Volume 1 – *Bicycle Awareness Zones* both discuss advisory treatments for bicycles but do not provide guidance on ABLs or CSs.

1.1 Background

Information in this supplement is based on a research report commissioned by the Department of Transport and Main Roads which reviewed treatments in Australia and overseas, *Retrofit Bicycle Treatments for Low Speed, Low Volume Roads in Queensland Research Report* (GTA Consultants for the Queensland Department of Transport and Main Roads, 2015) and preliminary design guidelines prepared by the department for the Cycle Network Local Government Grants program, *2017–18 Technical Guidelines – Cycle Network Local Government Grants Program*, Appendix B – *Cycle streets and bicycle advisory lanes*.

2 Related documents

This supplement should be read in conjunction with the following guidelines:

- TRUM Volume 1, Part 10, Section 6.5.1: *Bicycle Awareness Zones*
- MUTCD, Part 13: *Local Area Traffic Management*
- MUTCD, Part 9: *Bicycle Facilities*
- Austroads, *Cycling Aspects of Austroads Guides*
- Austroads, *Guide to Traffic Management Part 5; Road Management*
- Austroads, *Guide to Traffic Management Part 8: Local Area Traffic Management*
- Austroads, *Guide to Road Design Part 3: Geometric Design*.

The documents listed below have been referenced in this supplement:

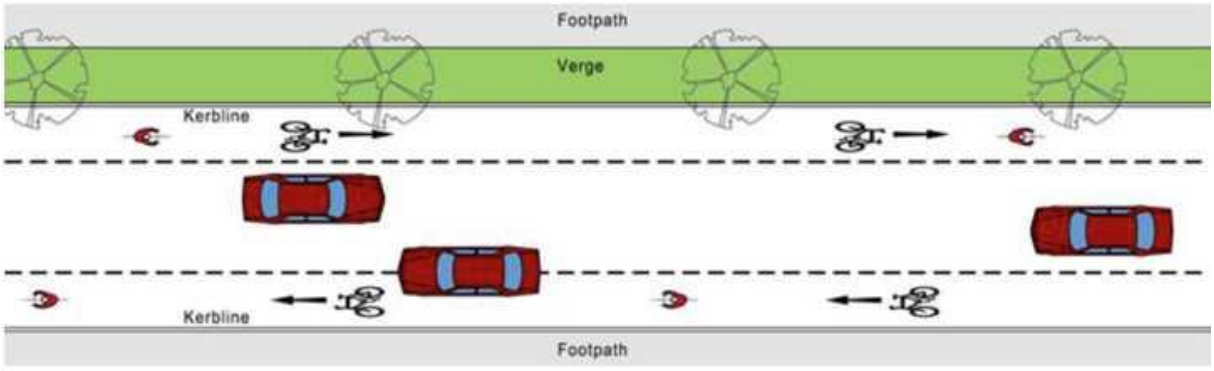
- Alta Planning + Design, *Lessons Learned – Advisory Bike Lanes in North America*, 2017
- Alta Planning + Design for Federal Highway Administration, US Department of Transportation, *Small Town and Rural Multimodal Networks*, 2016
- CROW *Design Manual for Bicycle Traffic*, 2017
- Department of Transport WA, *Safe Active Streets National Workshop Report*, 2017
- GTA Consultants for Queensland Transport & Main Roads, *Retrofit Bicycle Treatments for Low Speed, Low Volume Roads in Queensland Research Report*, 2015
- Outcomes Design Engineering Transport for London, *Centreline Removal Trial*, 2014
- Queensland Transport & Main Roads, *Technical Note 128 Selection and Design of Cycle Tracks*, 2015
- Queensland Transport & Main Roads, 2017-18 *Technical Guidelines – Cycle Network Local Government Grants Program, Appendix B – Cycle streets and bicycle advisory lanes*, 2017
- Sustrans, *Sustrans Design Manual: Handbook for Cycle Friendly Design*, 2014
- SWOV Institute for Road Safety Research, *SWOV Fact Sheet, Zones 30 – urban residential areas*, The Netherlands, 2010

3 Definitions

3.1 Advisory Bicycle Lanes

ABLs (also known as Suggestion Lanes) are commonly used in European and North American countries and are advisory bicycle facilities that indicate an area of the carriageway that is intended for the use by bicycle riders and is delineated from a central traffic lane by a 'dashed' longitudinal line with gaps. ABLs are not for exclusive use by bicycle riders; motor vehicle drivers can use them when no bicycle riders are present and when facing oncoming vehicle traffic. Parking must be indented beside ABLs and parking bays marked. Examples of ABLs are shown in Figures 3.1(a), (b) and (c).

Figure 3.1(a) – Advisory Bicycle Lane – Plan View Example



Source: National Cycle Manual – Ireland, Section 4.3.2.2, pg. 56 (National Transport Authority, 2011)

On roads with ABLs, no road centre line is provided. This results in vehicles travelling in the centre of the carriageway. When vehicles from opposing directions pass one another, they must enter the ABL where it is safe to do so. As such, ABLs are bicycle space that motor vehicle drivers may enter when there are no bicycle riders present. If there is a bicycle in the ABL, whoever is in front has the right of

way; that is, the motor vehicle will travel behind the bicycle until it is safe to move back into the centre lane.

ABLs also give the perception that the carriageway is narrower than it is which, in turn, functions as a method of traffic calming by reducing vehicle speeds. Safe vehicle speeds should be reinforced with appropriate traffic calming such as humps designed for buses, speed cushions or slow points (see Figure 3.1(c)). Further traffic calming treatments are shown in Appendix A.

In terms of familiarity of similar potential treatments for Queensland drivers, attention is drawn to rural road environments. Many rural roads have posted speed limits of 80 km/h or above and typically have minimal sealed shoulders. Some of these roads consist of a single sealed lane with unsealed shoulders forming the two-way carriageway. Vehicle volumes on these roads are typically low and passing of oncoming vehicles occurs in the unsealed shoulder. The behaviour required is similar in nature to ABLs but more forgiving in this situation as ABLs are implemented in lower speed environments.

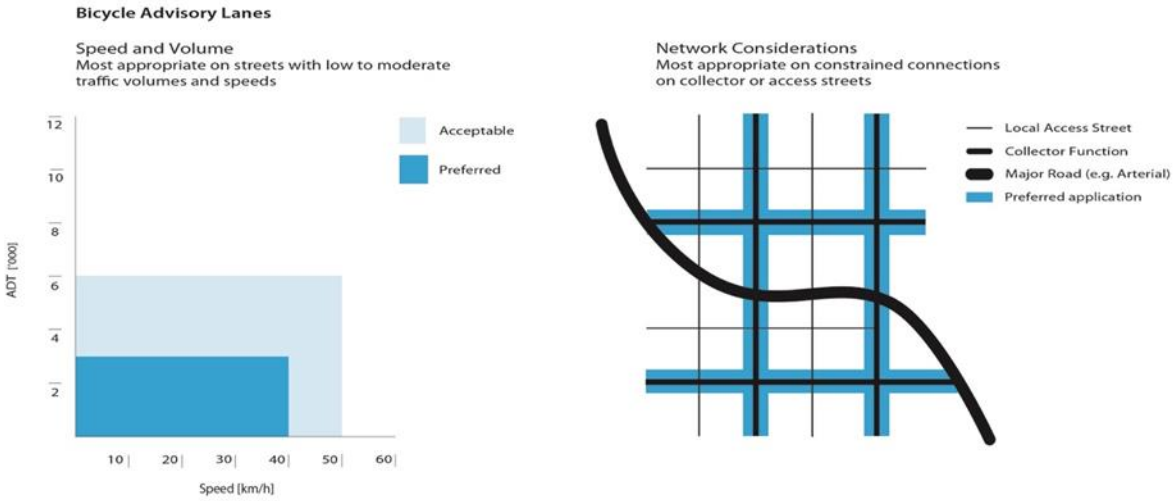
Figure 3.1(b) – Advisory Bicycle Lanes – Example from Nijmegen, Netherlands

Figure 3.1(c) – Advisory Bicycle Lanes – Example from Kanaalstraat, Ultrecht, Netherlands (Source: Google Streetview)

3.1.1 Where can they be implemented?

Recommended situations for the implementation of ABLs are detailed in Figure 3.1.1. Further explanation on the reasoning behind these conditions are discussed in Section 4.

Figure 3.1.1 – Recommended situations for use of Advisory Bicycle Lanes



3.2 Cycle Street

CSs (also called Safe Active Streets or Bicycle Boulevards in other jurisdictions) are local access roads that form part of the principal cycle network. CSs can also be considered as bicycle paths with limited vehicle access.

CSs are designed as a mixed traffic environment and encourage bicycle riders to use the centre of the road, as illustrated in Figure 3.2. When approaching or opposing motor vehicles, drivers must use the rough textured edges of the carriageway.

These treatments are typically adopted on low volume low speed environments, particularly on local residential streets.

A narrow service road along an arterial road is also ideal for design as a CS. The service road can accommodate access functions for motor vehicles (property access and parking), while performing the through function for bicycle traffic.

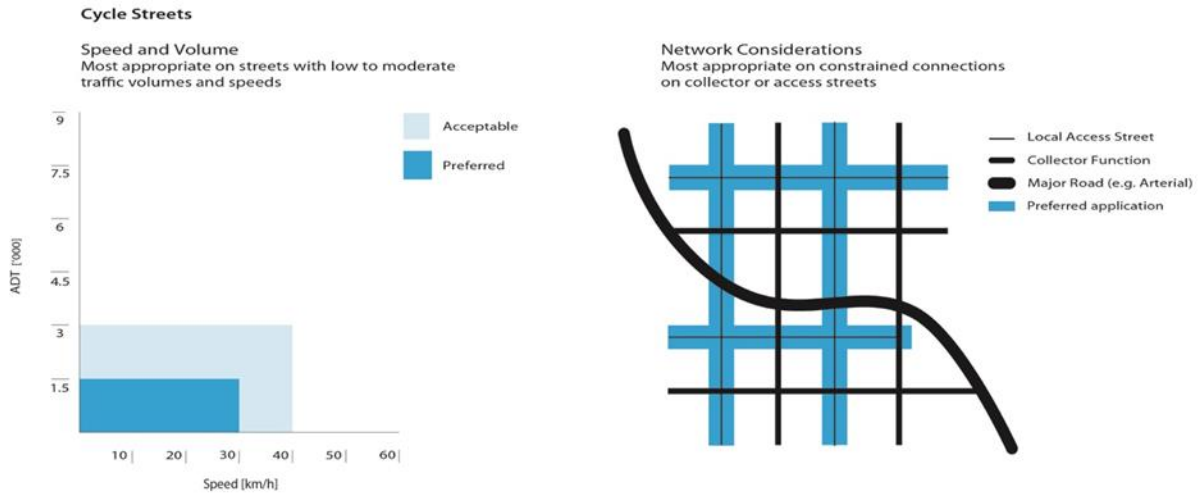
Figure 3.2 – Cycle Street – Example from Perth where red asphalt is used to highlight the cycle street (Source: Department of Transport Western Australia)

Note: red asphalt is not an essential characteristic of the treatment

3.2.1 Where can they be implemented?

Recommended situations for the implementation of CSs are detailed in Figure 3.2.1. Further explanation on the reasoning behind these conditions are discussed in Section 4.

Figure 3.2.1 – Recommended Situations for use of Cycle Streets



4 Application

Table 4 guides the selection of advisory bicycle infrastructure types within urban road corridors based on road function and speed. The table is not relevant for rural roads outside of main centres. ABLs and CSs are acceptable treatments in mixed traffic environments. These are typically local access streets and minor collector streets.

Table 4 – Urban road bicycle facility selection depending on road function

Road function	Vehicle operating speed (km/h)	ABLs appropriate?	CSs appropriate?	Explanation
Access function for example, local access street (with or without parking)	Up to 30 km/h	No	Yes	These treatments are appropriate in mixed traffic, low speed environments.
Collector function for example, minor collector street (without parking)	Up to 50 km/h	Yes	No	Bicycle lanes / cycle tracks are preferred where space. If not enough space, ABLs are ideal <3000 vpd and acceptable <6000 vpd
Collector function for example, minor collector (with parking)	Up to 50 km/h	Yes	No	Bicycle lanes not ideal with parking, unless appropriate buffers / clearances can be provided
Through traffic function for example, arterial road	More than 50 km/h	No	No	High quality parallel off-road bicycle path or cycle tracks preferred due to high speed difference
Regional through traffic function for example, urban motorway	More than 70 km/h	No	No	High quality parallel off-road bicycle path with grade separated, signalised or priority crossings at intersections is appropriate

The table and Figures 3.1.1 and 3.2.1 show that mixed traffic environments are generally considered acceptable when vehicle operating speeds are below 50 km/h and vehicle volumes below 6000 vpd. Best practice for cycling indicates that, to encourage riders of all ages and abilities, road design should achieve lower, safer, equitable speeds to ensure mixed traffic environments are acceptable and safe. As noted in Transport and Main Roads' Technical Note TN128 *Selection and Design of Cycle Tracks,* a desirable equitable speed is 25 km/h, and a maximum equitable speed is 30 km/h.

In Queensland, the general default urban speed limit is 50 km/h. 30 km/h zones in residential areas have been proven to save lives and money. The Queensland MUTCD Part 4*: Speed Limits* permits 40 km/h and 30 km/h speed zones. Reduced speed limits together with appropriate road designs are important safety measures for bicycle riders. Creating reduced speed differentials are required to support safer speed limits. If the road design does not result in desired operating speeds, well-designed traffic calming must be an implicit measure to support cycling safety in these situations.

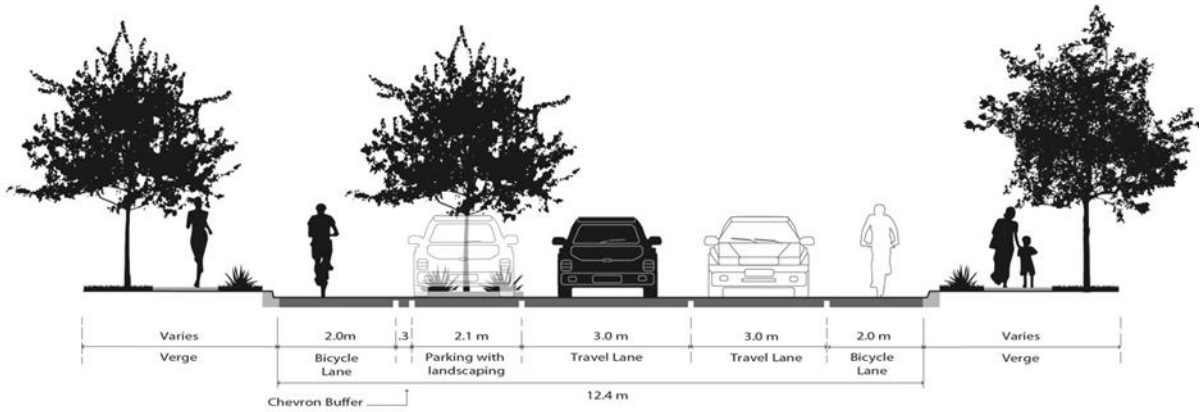
Similarly, vehicle volumes are also important for a successful mixed traffic environment. This particularly relates to the number of oncoming vehicle movements that are expected to occur. This has a direct impact on the number of times a vehicle would be required to move to the side into ABLs in order to pass another vehicle. Where motor vehicle volume is >4000 vpd, there are very few safe opportunities to overtake a bicycle rider. In this situation, the motor vehicle driver must drive at the speed of the bicycle rider ahead.

A review of current *Queensland Road Rules* indicates that there are no road rules that would prevent the implementation of ABLs; however, a road centre line must not be marked in a road with this treatment. The removal of the road centre line encourages drivers to track in the centre of the road and not along the edge. If a centre line is marked, it would make it illegal to track in the centre of the road. Transport for London's analysis on road centre line removals showed that there was a statistically significant reduction in vehicle speeds as a result of removing road centre line markings on the carriageway[3]. Removal of the road centre line therefore represents a road safety improvement for all users.

4.1 Site selection

The aim of ABLs and CSs are to enhance safety and awareness of bicycle riders in a mixed traffic environment, where exclusive bicycle lanes or cycle tracks cannot fit. It is always preferred to provide exclusive bicycle lanes where space permits (refer Figure 4.1 following). Exclusive facilities for cyclists are required on higher order roads, roads with bus routes and / or high heavy vehicles numbers.

Figure 4.1 – BL1 – Preferred cross section for collector streets – exclusive bicycle lanes (two traffic lanes, kerbside bicycle lanes and marked parking bays on one side.)



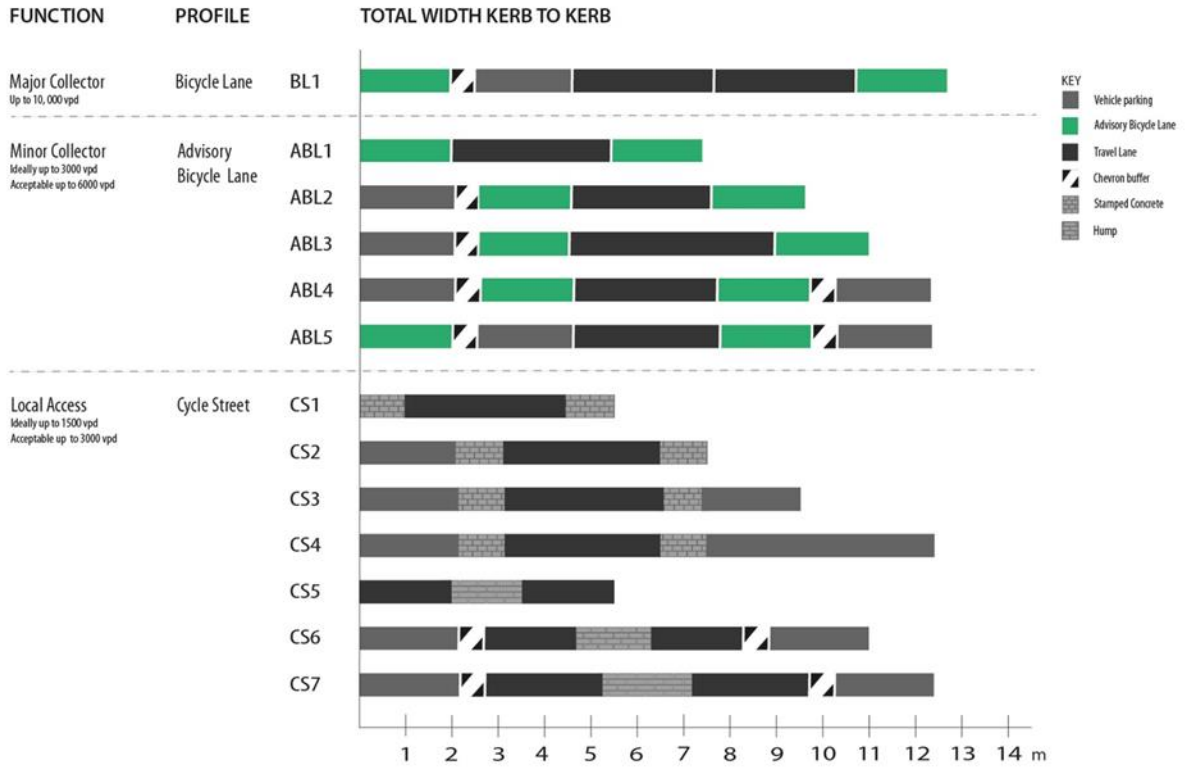
There are a number of conditions that make the installation of these facility types more desirable including:

- A roadway width that is too narrow to support exclusive bicycle facilities without roadway widening or removal of other demand elements. Typical carriageway widths on access streets / minor collector streets are between 7.5–12.4 m and include on street parking, therefore provision of exclusive bicycle lanes cannot be provided unless road widening or changes to car parking occurs. These street types often have limited opportunities for a wide off-road separated path within the verge due to verge width, street trees and sometimes services. ABLs could also be implemented as an interim treatment before making required changes to introduce exclusive bicycle lanes.
- An improved alternative or replacement to the Bicycle Awareness Zone treatment.
- Potential to be provided in a variety of urban land uses (for example, residential and commercial) and community scenarios (for example, dense urban areas, regional towns).
- Along lower order streets with an access function that provide important connections between principal cycle network routes with dedicated bicycle facilities such as separated bicycle facilities.
- Can be a useful treatment for low volume service roads where there is insufficient room to provide exclusive bicycle lanes.
- Retrofit situations.

4.2 Facility type selection

Sections 5 and 6 illustrate the cross section options available for ABLs and CSs. A summary of preferred facility type against road function, traffic volume and cross section width can be found in Figure 4.2 to assist in choosing the correct facility type to meet the specific site's characteristics.

Figure 4.2 – Cycle Facility Profile against road function, traffic volume and cross section



4.3 Advantages and disadvantages

The advantages and disadvantages of implementing ABLs and CSs are:

Table 4.3 – Advantages and disadvantages of each treatment

	ABLs	CSs
Advantages	Allow vehicles to overtake without having to cross a road centre line Lack of road centre line prompts driver negotiation and appropriate speeds Cost effective with narrow carriageways / easily retro-fitted Visual narrowing of the carriageway Provides predictable space for bicycle riders on a road otherwise too narrow for exclusive bicycle lanes Alternative to Bicycle Awareness Zones	Less use of space – a CS is open to vehicle traffic and requires less space than a bicycle lane or off road path. This makes a CS suitable for more locations and makes it cost-effective Improved accessibility – unlike full closure of a street or a route to motorised traffic. Increases comfort for cyclists by potentially reducing motor vehicle operating speeds and volumes. May reduce the incidence of serious injuries through reduced travel speeds. Improves quality of life for residents through calmer traffic and safer crossings. Better personal safety – a route through a residential district with a combined use of bicycle and car provides more social safety that a solitary off road path next to an urban main road Alternative to Bicycle Awareness Zones
Disadvantages	No exclusive dedicated bicycle space Not suitable for high volume or high speed roads Relies on motorists knowing how to navigate the road markings*	No exclusive dedicated bicycle space Relies on good driver behaviour* Not suitable for high volume or high speed roads

* These issues can be mitigated by providing education programs for motorists and cyclists, and by monitoring the use of the street following installation - refer Section 5.2 for more information

5 Advisory Bicycle Lanes

5.1 Design specifications

If the site is appropriate for the implementation of ABLs, then there are a number of design issues that need to be considered including:

- 2.0 m ABLs marked with dashed lane lines and yellow bicycle symbol. The bicycle symbol should be marked in accordance with TRUM Volume 1, Part 10, Section 6.5.1 *Bicycle Awareness Zones*. The placement of the yellow bicycle symbol should locate the bicycle rider away from the door zone. Green surface treatment may be used to highlight the complete length of the ABL, but is not mandatory. Hazardous locations must be highlighted with green surface treatment in accordance with Austroads *Guide to Road Design:* Part 3. An example of appropriate green surface treatment is shown in Appendix A.
- Minimum 0.5 m chevron buffers with audible tactile line marking every 5 m must be marked beside parking bays to highlight the 'door zone'

- Central shared traffic lane widths could vary between 3.0 – 5.5 m. Table 5.1 illustrates the issues to be considered when deciding on minimum shared traffic lane widths

Table 5.1 – Advisory Bicycle Lanes – considerations for shared travel lane widths

	Two way travel lane widths	**Considerations**
Minimum width	3.0 m	On low volume streets where oncoming vehicle occurrence is likely to be lower. Requires vehicle encroachment into the ABL when vehicles travelling in opposite directions meet
Preferred width	4.3-4.5 m	Two motor vehicles are able to meet each other within the centre lane at very low speeds. In practice, vehicles will encroach into ABLs
Maximum width	4.9 m	Permits two motor vehicles to meet each other at slow speeds without encroaching into the ABLs
Absolute maximum width	5.5 m	This is equivalent to two narrow travel lanes and regular encroachment into the ABL may not be necessary

- Importantly, a dividing road centre line must not be marked. A central shared traffic lane encourages lower vehicle speed, and the preferred vehicle driver behaviour of waiting to overtake bicycle riders after an oncoming vehicle has passed, instead of squeezing through too close to the bicycle rider.
- Dashed lane lines result in vehicle lateral tracking towards the centre of the road, away from bicycle riders. Dashed lane lines provide clear operating space for bicycle riders, which can be shared by vehicles. Dashed lane line is 1 m long, with 3 m long gap and is 150 mm wide (same as a continuity line).
- There are variations for uphill or downhill grades >2%, see Figure 5.1(e).
- Easy to retrofit, can work with existing car parking or on roads with no car parking. Parking can be located one side or both sides. If parking is marked on one side where >2% gradient, locate parking on uphill side to allow ABL to be located adjacent to kerb and away for the door zone on the downhill side. Landscaping can also be provided in line with car parking to frame and increase predictability. Car parking could be indented into the verge area or landscaping provided in car parking lane to frame/indent cars.
- Treat the ABL at T-intersections, curves, crests and at slow points to provide priority and visibility for cyclists at these potentially hazardous locations in accordance with Appendix A. These should also be considered in the context of area wide LATM measures and in accordance with Austroads *Guide to Traffic Management Part 8: LATM*.

The following figures illustrate the cross section options available for ABLs. Considerations of preferred facility type against road function, traffic volume and cross section width can be found in Figure 4.2.

Figure 5.1(a) – ABL1 – Advisory Bicycle Lanes – 7.5 m kerb to kerb, without parking

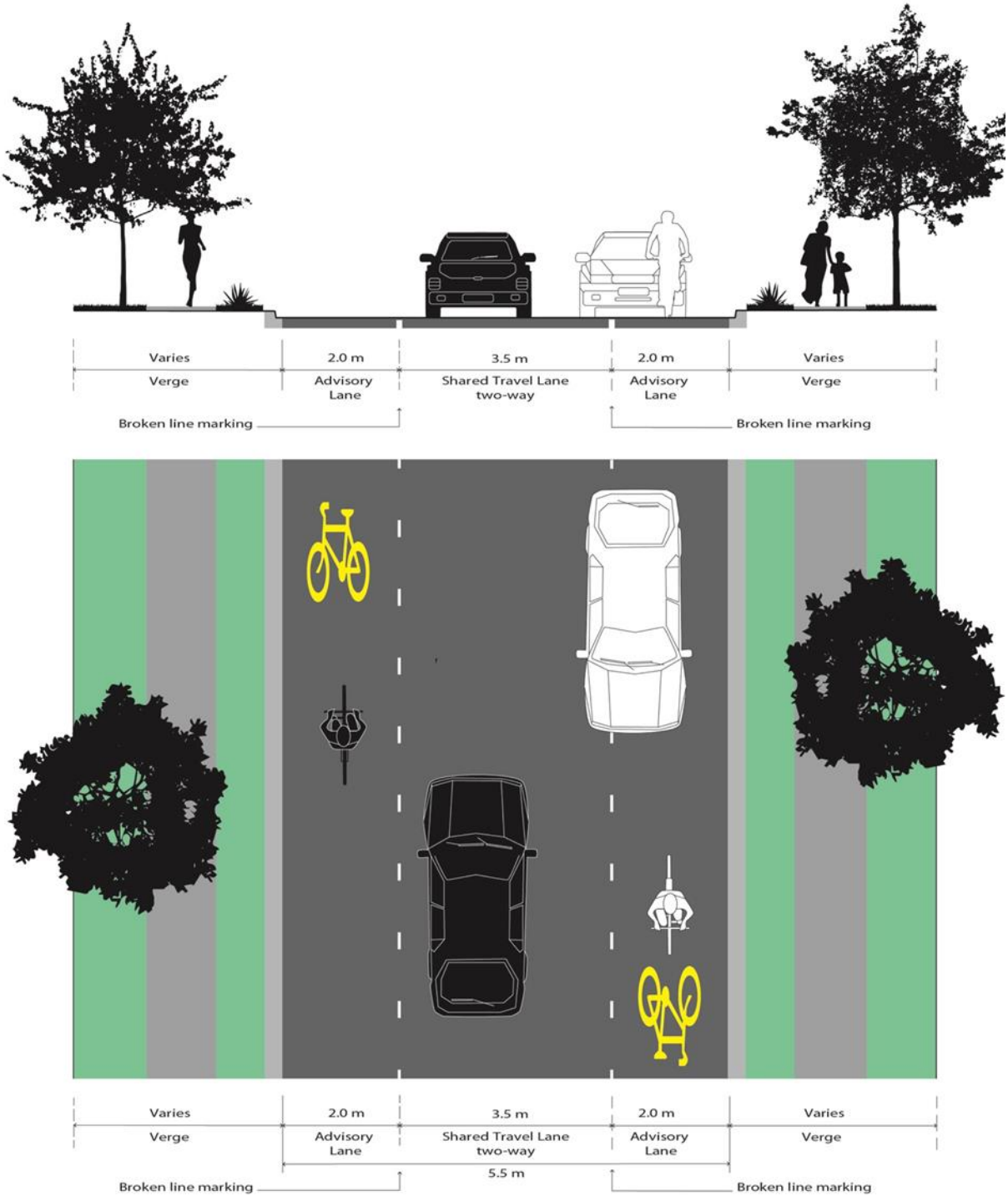


Figure 5.1(b) – ABL2 – Advisory Bicycle Lanes – 9.7 m kerb to kerb, parking one side

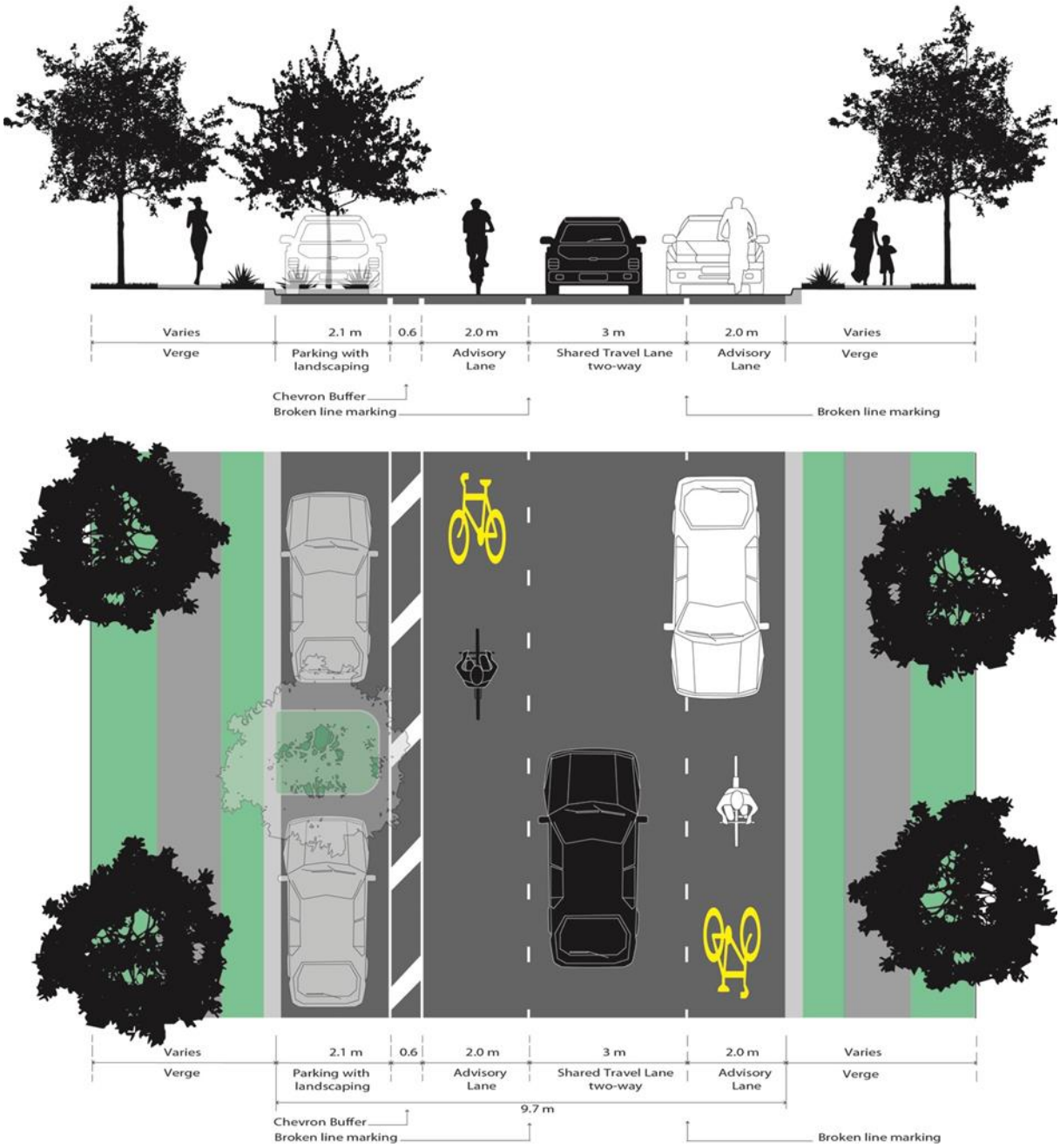


Figure 5.1(c) – ABL3 – Advisory Bicycle Lanes – 11 m kerb to kerb, parking one side

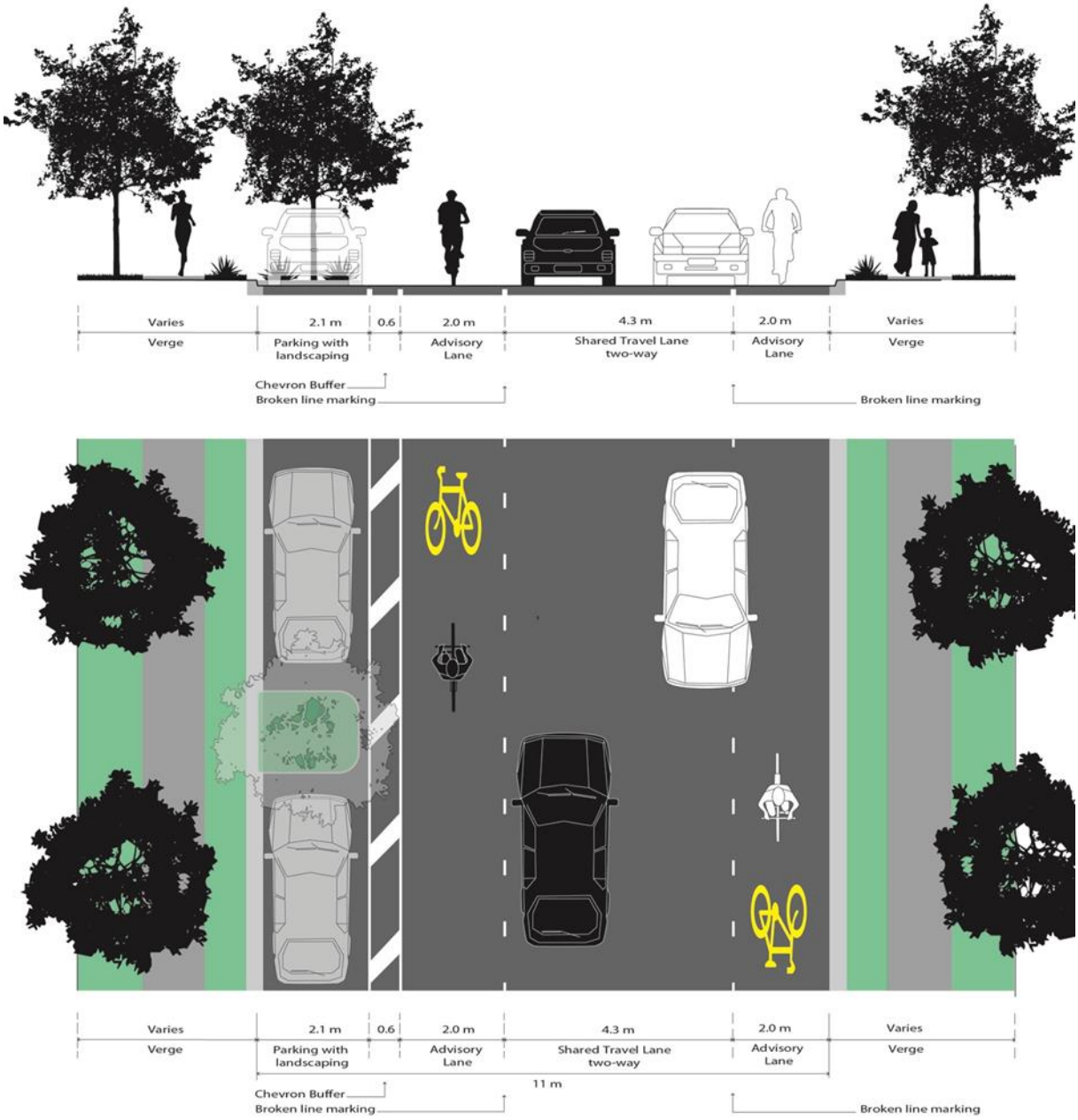


Figure 5.1(d) – ABL4 – Advisory Bicycle Lanes – 12.4 m kerb to kerb, with parking

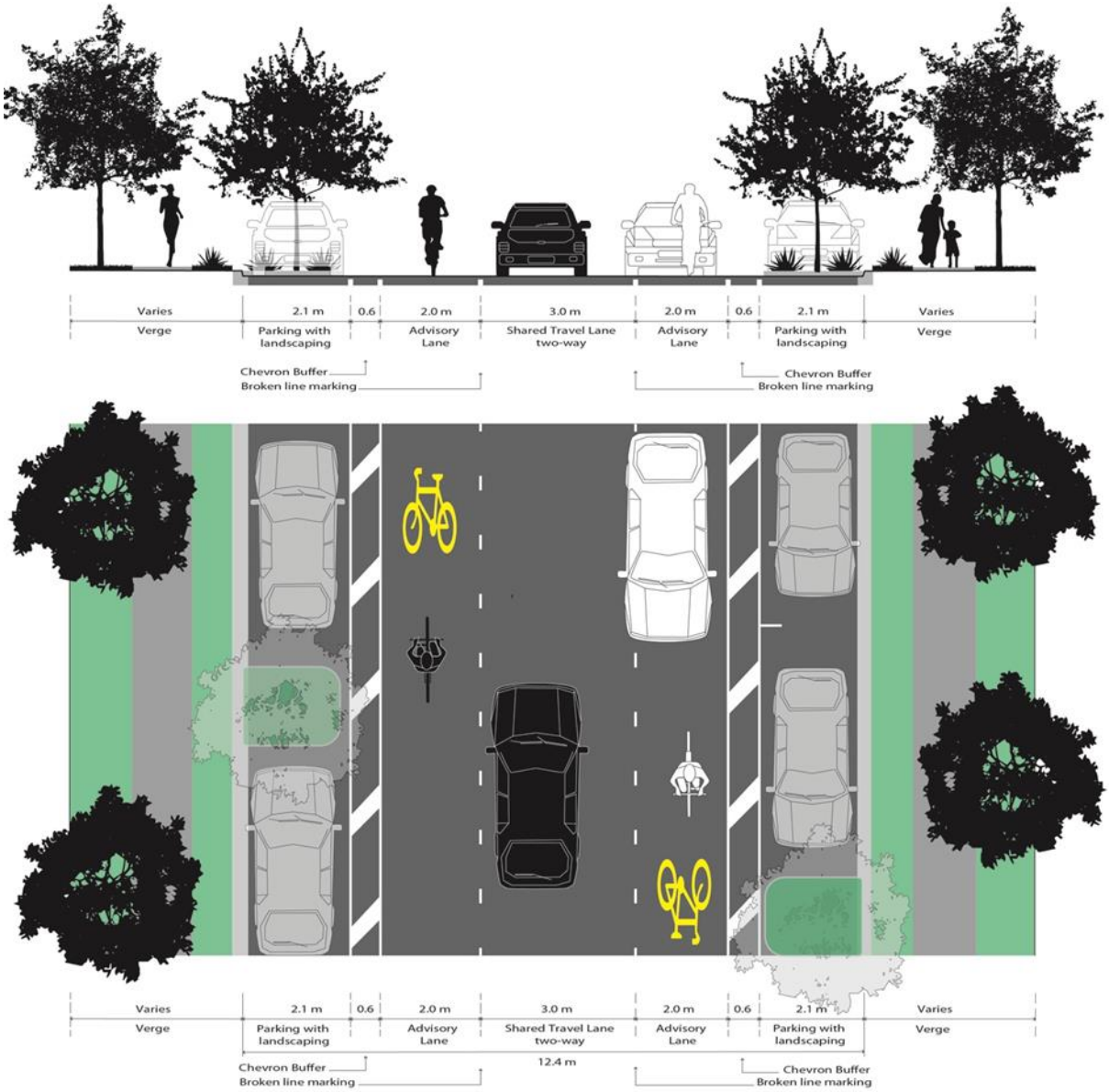
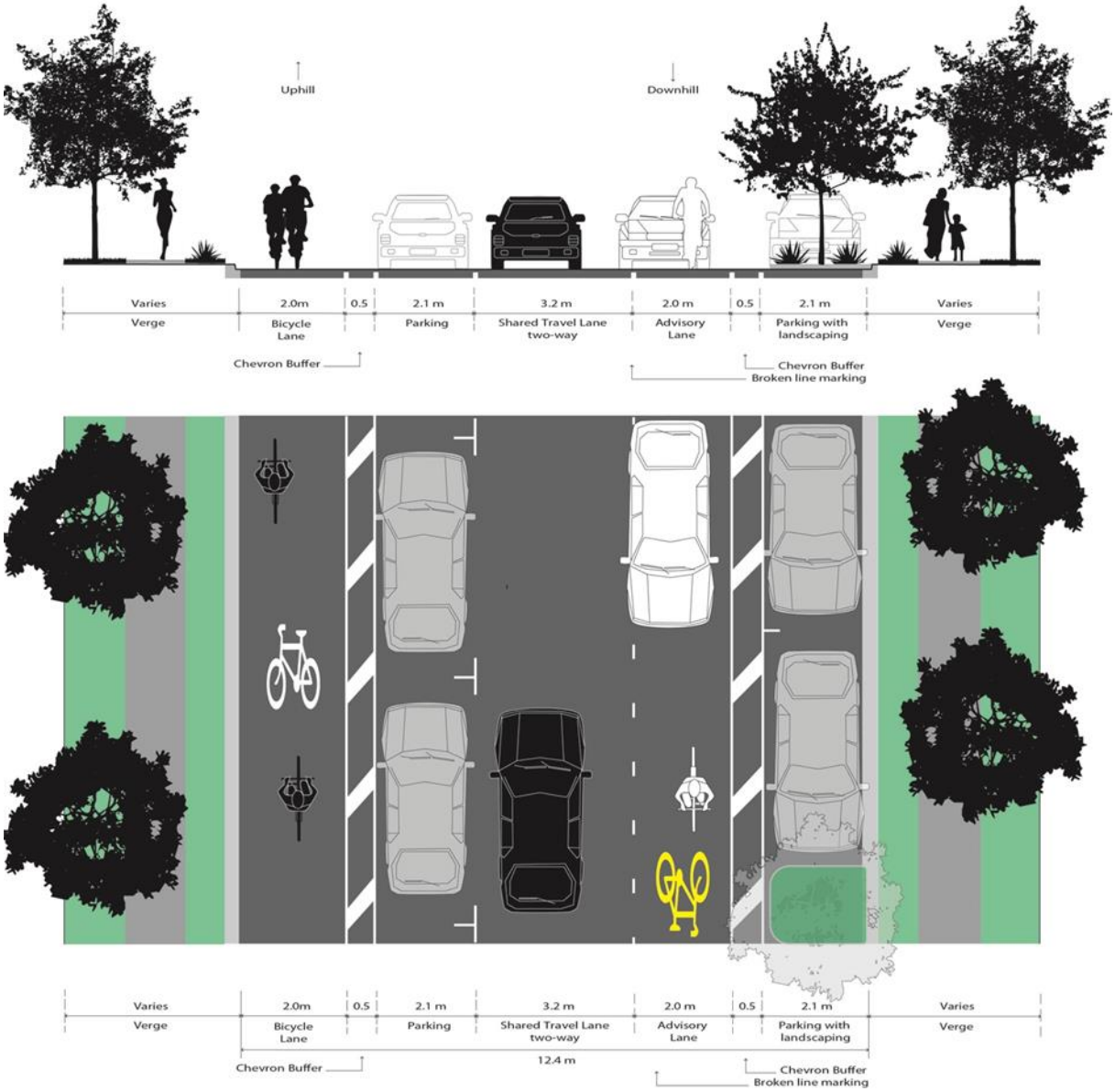


Figure 5.1(e) – One Way Advisory Bicycle Lane – Urban uphill exclusive bicycle lane* and Downhill ABL Cross Section (12.4 m kerb to kerb, >2% gradient, parking both sides, kerbside bicycle lane for uphill*, ABL downhill)



*A one way Cycle Track could be provided instead of an exclusive bicycle lane if suits site characteristics

5.2 Education and awareness

ABLs will be unfamiliar cycle facility treatments in Queensland, and therefore information on how all users behave on streets with these treatments may need to be provided until the facility type is more commonplace. Education and awareness campaigns should be considered before and during implementation.

Information on how the lanes operate and how users should behave could be promoted at the site and as part of various awareness campaigns.

Examples of useful information to guide users on ABLs are found in Figures 5.2(a) and (b) following.

Figure 5.2(a) – Educational Information on Advisory Bicycle Lanes operations (Source: Alta Planning + Design, Lessons Learned – Advisory Bike Lanes in North America, 2017)

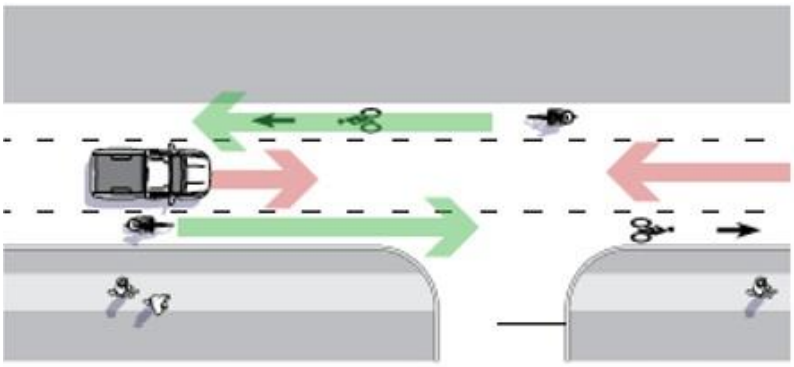


Exhibit 3: On a street with Advisory Bike Lanes during regular operations, motorists travel within the two-way travel lane and do not need to change lanes when approaching or passing bicyclists.

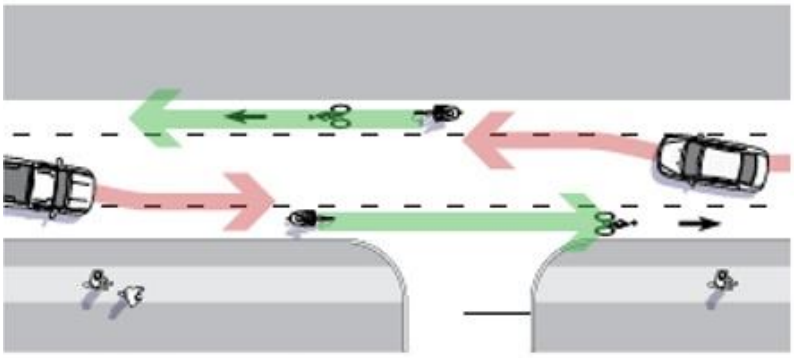


Exhibit 4: When approaching oncoming motor vehicles, motorists must merge into the Advisory Bike Lane. If a bicyclist is present, motorists must slow and yield to bicyclist traffic prior to entering the Advisory Bike Lane.

Figure 5.2(b) – Educational Signs on Advisory Bicycle Lanes from Ottawa and Burlington (Source: Alta Planning + Design, Lessons Learned – Advisory Bike Lanes in North America, 2017)

An example of a good educational video produced for the City of Ottawa is provided at the following link - https://www.youtube.com/watch?v=0zdDIvKXMxY&feature=youtu.be

5.3 Case studies

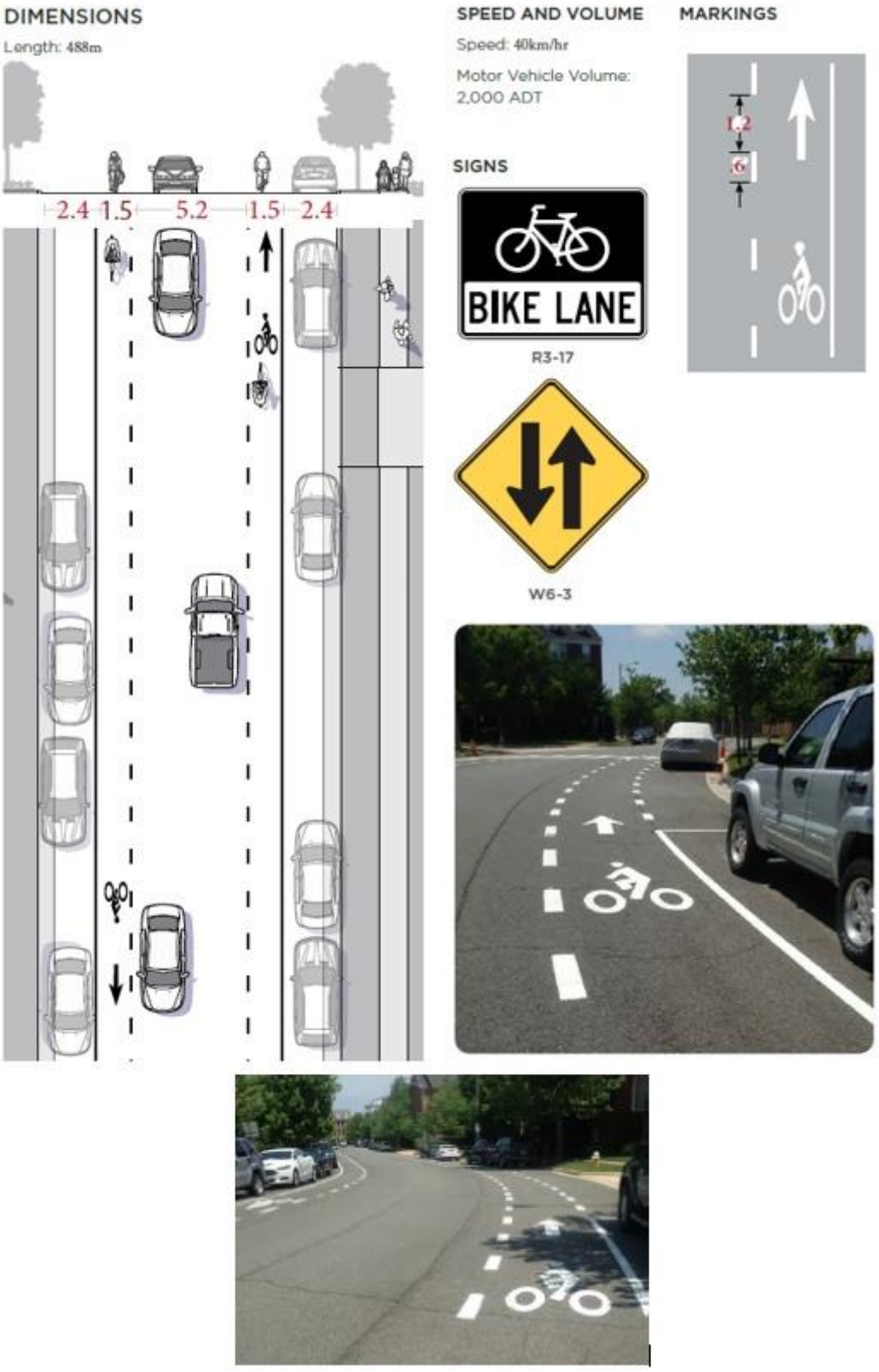
5.3.1 Potomac Greens Drive, Alexandria, Virginia

Potomac Greens Drive is one of two roads providing access to a medium density residential neighbourhood. It experiences no through traffic due to the neighbourhood being bordered by two railway lines and a major arterial road. The speed limit is posted at 40 km/hr with a vehicle volume of 2000 vpd. The road experienced demand by cyclists due to a bike share station located near the entry to the neighbourhood. An exclusive bicycle lane could not be achieved without removing a car parking lane, which was not an option as it received heavy use.

Residents felt that the road in its previously unmarked state encouraged speeding and recommended speed bumps be installed. After a traffic survey performed by the city showed inconclusive evidence of speeding, ABLs were installed as an alternate traffic calming solution. The City held two meetings to educate the community and received positive and negative responses from residents. After the installation of the ABLs, the City further distributed explanatory flyers and created an information web site for the community and little response was recorded from the residents.

The installation of the ABLs is working as intended and currently being evaluated.

Figure 5.3.1– Case Study – Advisory Bicycle Lanes – Potomac Greens Drive, Alexandria, Virginia



Note – this example shows 1.5 m wide ABLs. In Queensland, 2.0 m min width is recommended for this treatment to recognise door zone risk and the minimum passing distance to a bicycle rider rule of 1 m wide of the rider (refer design specifications previously)

5.3.2 East 14th Street, Minneapolis, Minnesota

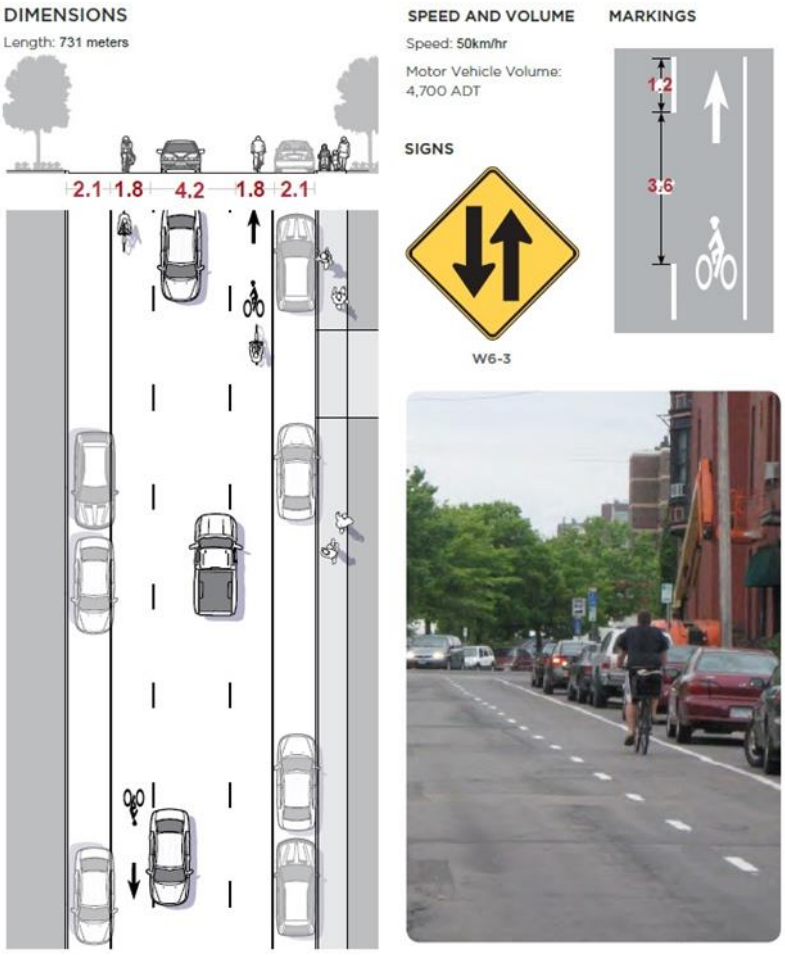
East 14th Street has a mix of commercial and dense residential uses along its length and is located along the edge of a downtown area. It is not a through traffic route but has important destinations along it such as hospitals and grocery stores, and hence has higher traffic volumes recorded at 4700 vpd. The recorded speed limit is 50 km/hr.

The street connects three north / south exclusive bicycle lanes and therefore an important part of the cycle network. There was not enough room to provide exclusive bicycle lanes and the car parking located on both sides of the road experienced high demands.

The city consulted with neighbourhood groups and other organisations during design and after installation published video and educational materials. Public concern declined significantly one month after installation.

The facility is operating as intended. There was some reported confusion about the narrow lane and lack of marked centre lane but the confusion was not reflected in reported crashes or observed user behaviour. The city believes the context provided by parking lanes on both sides of the road combined with narrow widths provided appropriate cues for two way operation and the need to negotiate space between users.

Figure 5.3.2 – Case Study – Advisory Bicycle Lanes – East 14th Street, Minneapolis



Note – this example shows 1.8 m wide ABLs. In Queensland, 2.0 m min width is recommended for this treatment to recognise door zone risk and the minimum passing distance to a bicycle rider rule of 1m wide of the rider (refer design specifications above)

6 Cycle Street

6.1 Design specifications

If the site is appropriate for the implementation of CSs, then there are a number of design issues that need to be considered including:

- A shared 3.0 – 3.5 m wide asphalt lane with yellow advisory bike symbols. The bicycle symbol should be located centrally and be line marked in accordance with TRUM Volume 1, Part 10, Section 6.5.1: *Bicycle Awareness Zones*. Narrow profile encourages safe 'equitable' speed and discourages overtaking of bicycle riders.
- 'Overrun areas' at edges are ≥0.75 m wide constructed with a textured / contrasting surface such as audible tactile line marking every 5 m, cobblestone, stamped asphalt or similar.
- Variations can be designed for one lane or two lanes with a 1.5 – 2.0 m wide mountable median as shown in Figures 6.1(e), (f) and (g). This treatment type enables implementation of CSs on local access streets with higher traffic volumes up to 3000vd.
- Easy to retrofit, no need to remove parking.
- Designed in conjunction with LATM measures such as road closures, slow points and humps to reinforce low speeds and low volumes of vehicles. Signage by itself is generally not enough to keep speeds down. LATM measures need to be considered on an area wide basis to understand impacts the measures have on surrounding street network, in accordance with Austroads *Guide to Traffic Management* Part 8*: LATM*
- Clearly designated parking using indented 2.1 m marked parking bays with landscaping placed in line with parking to delineate these areas. Parking can be located one side or both sides. If parking is to be restricted ensure the yellow no stopping line is provided to reinforce behaviour.

The following figures illustrate the cross section options available for CSs. Considerations of preferred facility type against road function, traffic volume and cross section width can be found in Figure 4.2.

Figure 6.1(a) – CS1 – Cycle Streets – 5.5 m kerb to kerb, without parking

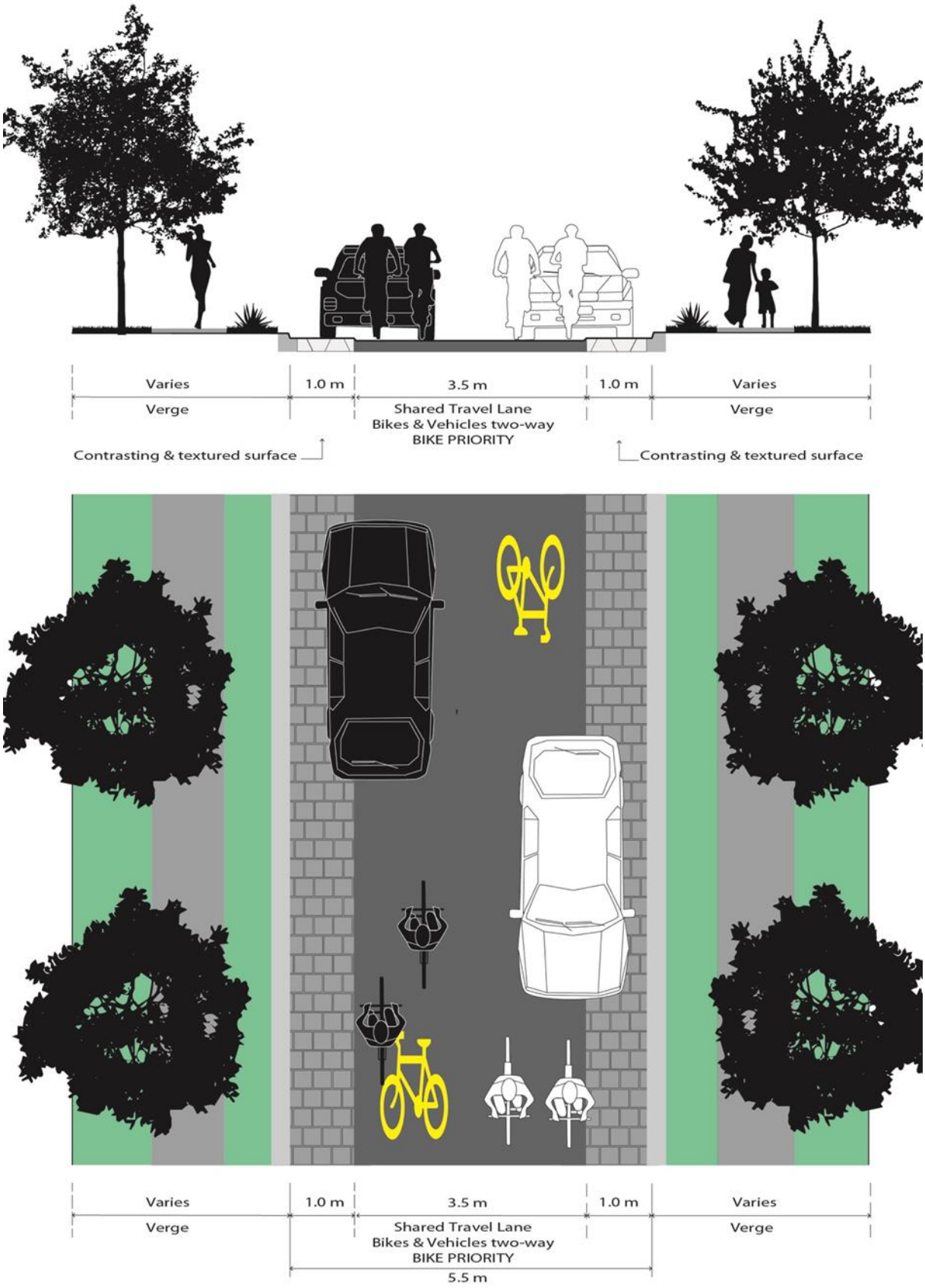


Figure 6.1(b) – CS2 – Cycle Streets – 7.5 m kerb to kerb, with parking one side

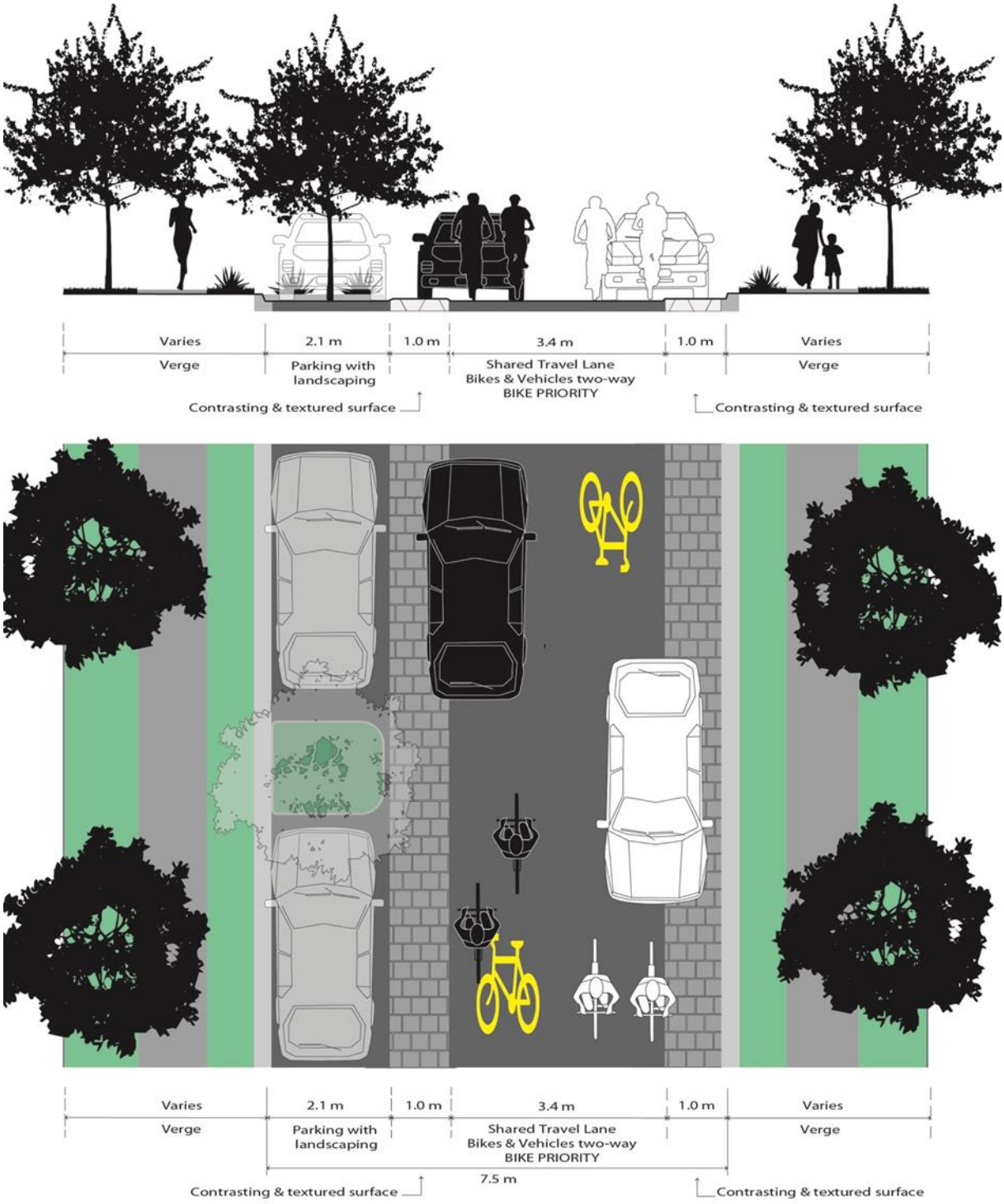


Figure 6.1(c) – CS3 – Cycle Streets – 9.5 m kerb to kerb, with parking both sides

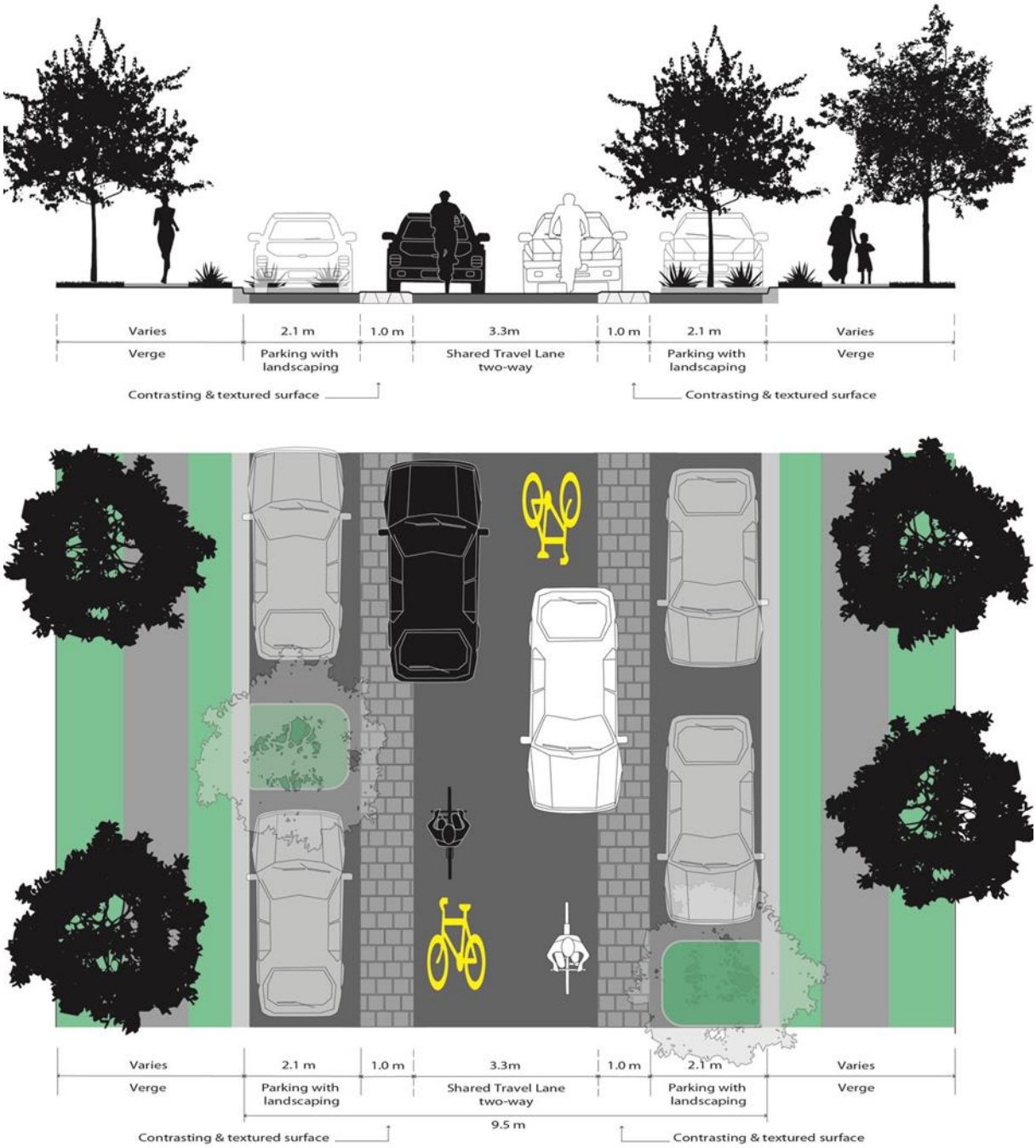


Figure 6.1(d) – CS4 – Cycle Streets – 12.4 m kerb to kerb, with parking both sides, one side angled

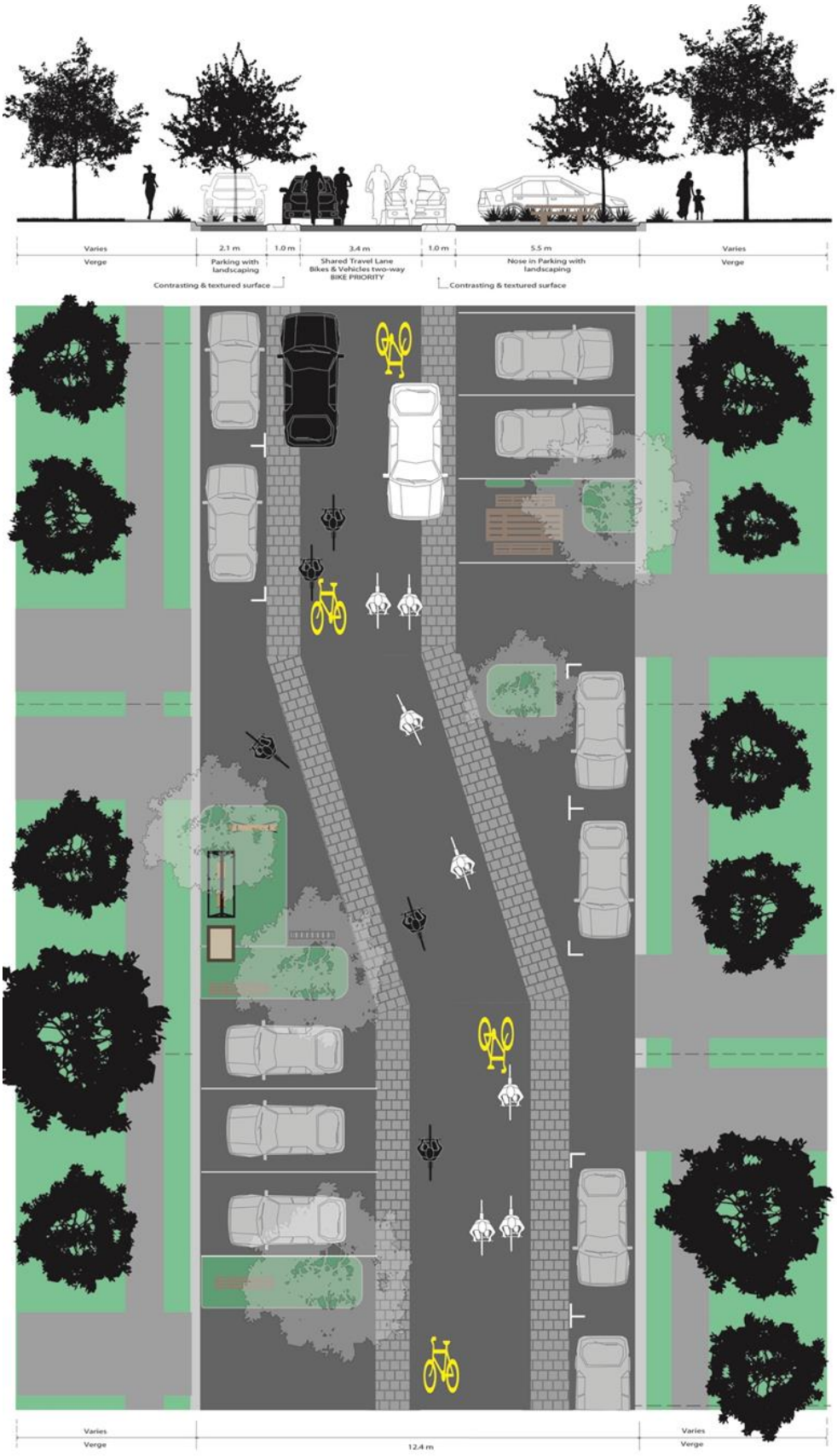


Figure 6.1(e) – CS5 – Cycle Streets – 5.5 m kerb to kerb, with central mountable hump, no parking

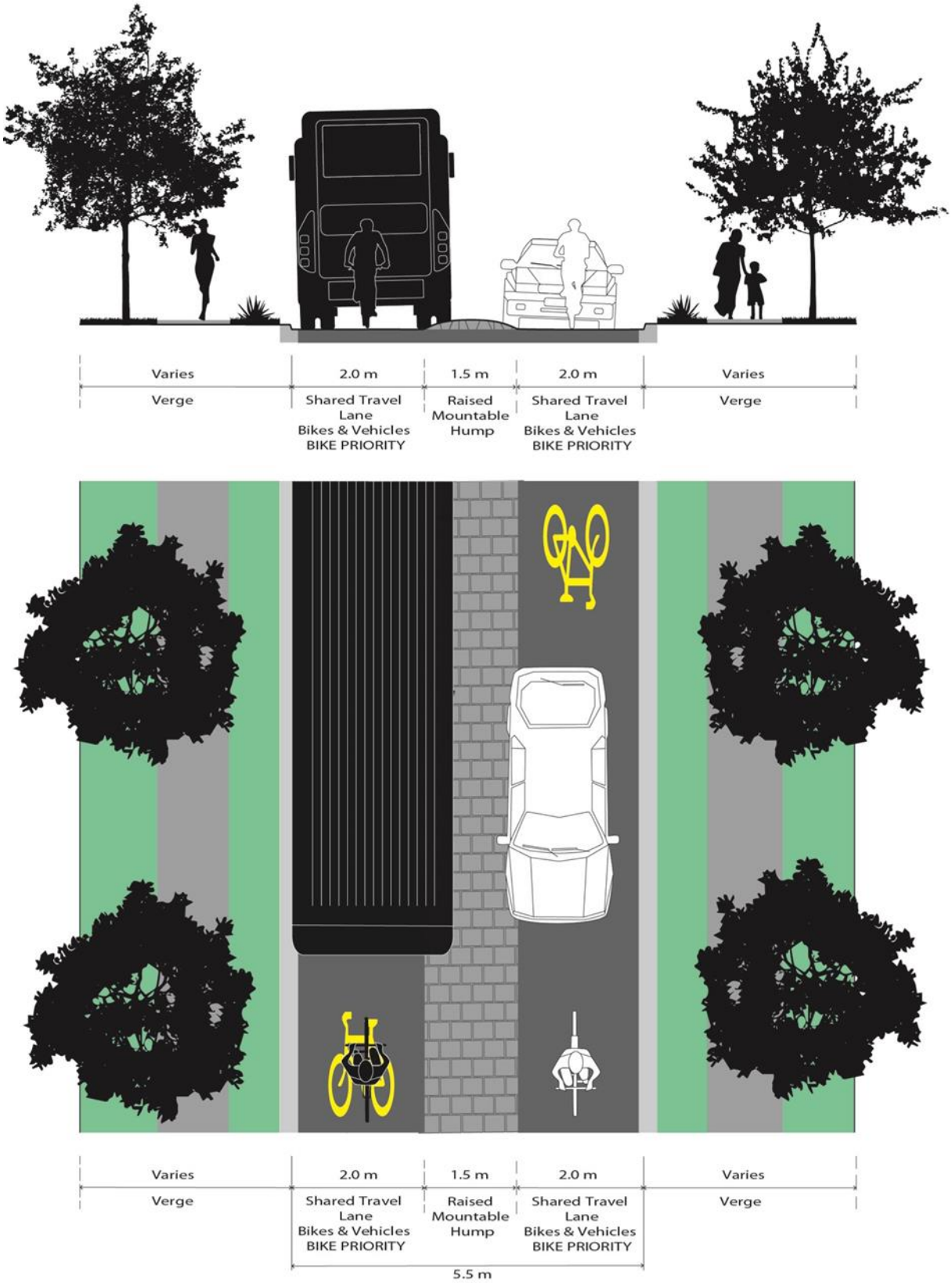


Figure 6.1(f) – CS6 – Cycle Streets – 11 m kerb to kerb with central mountable hump, with parking

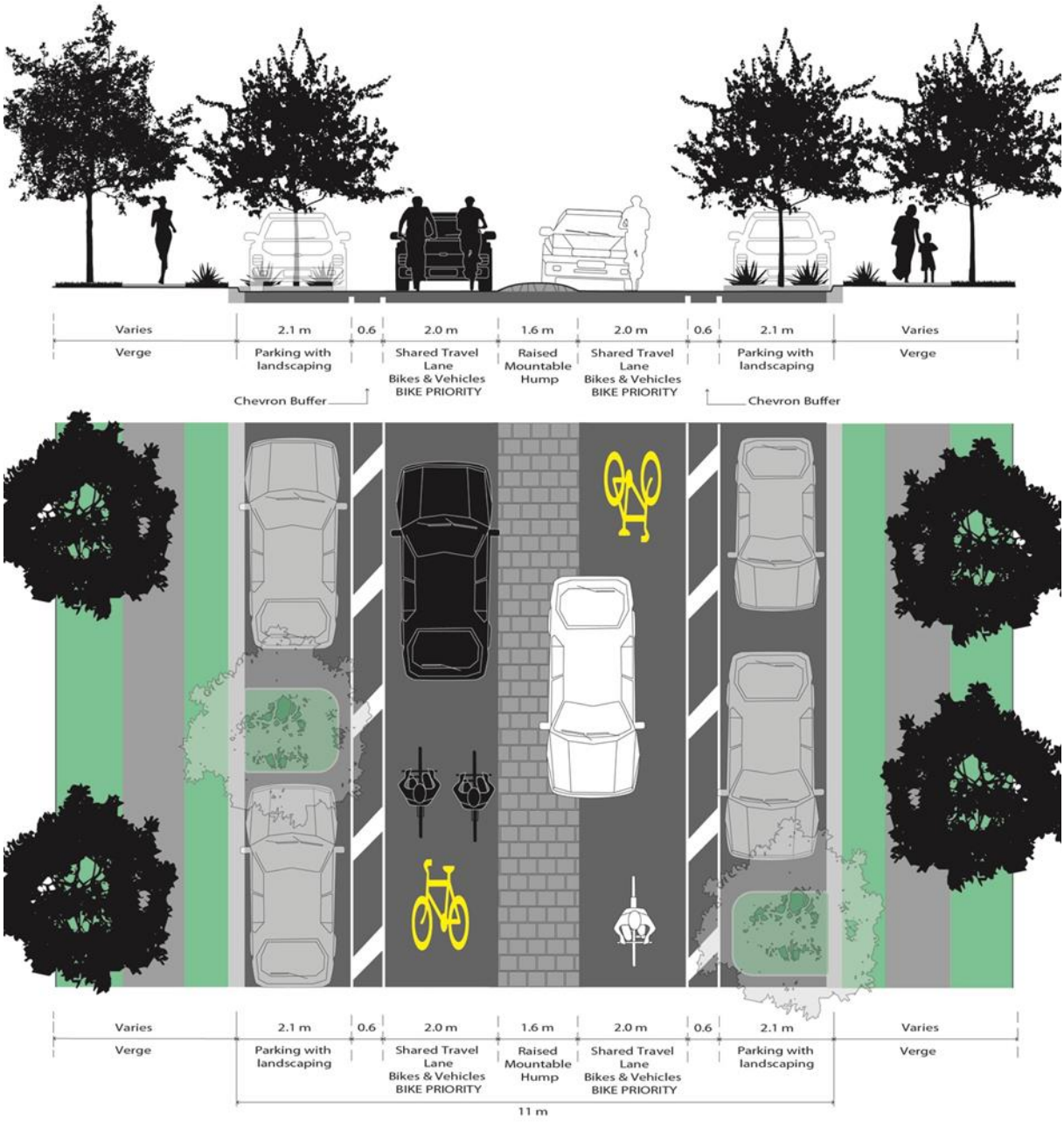


Figure 6.1(g) – CS7 – Cycle Streets – 12.4 m kerb to kerb, with central mountable hump, with parking

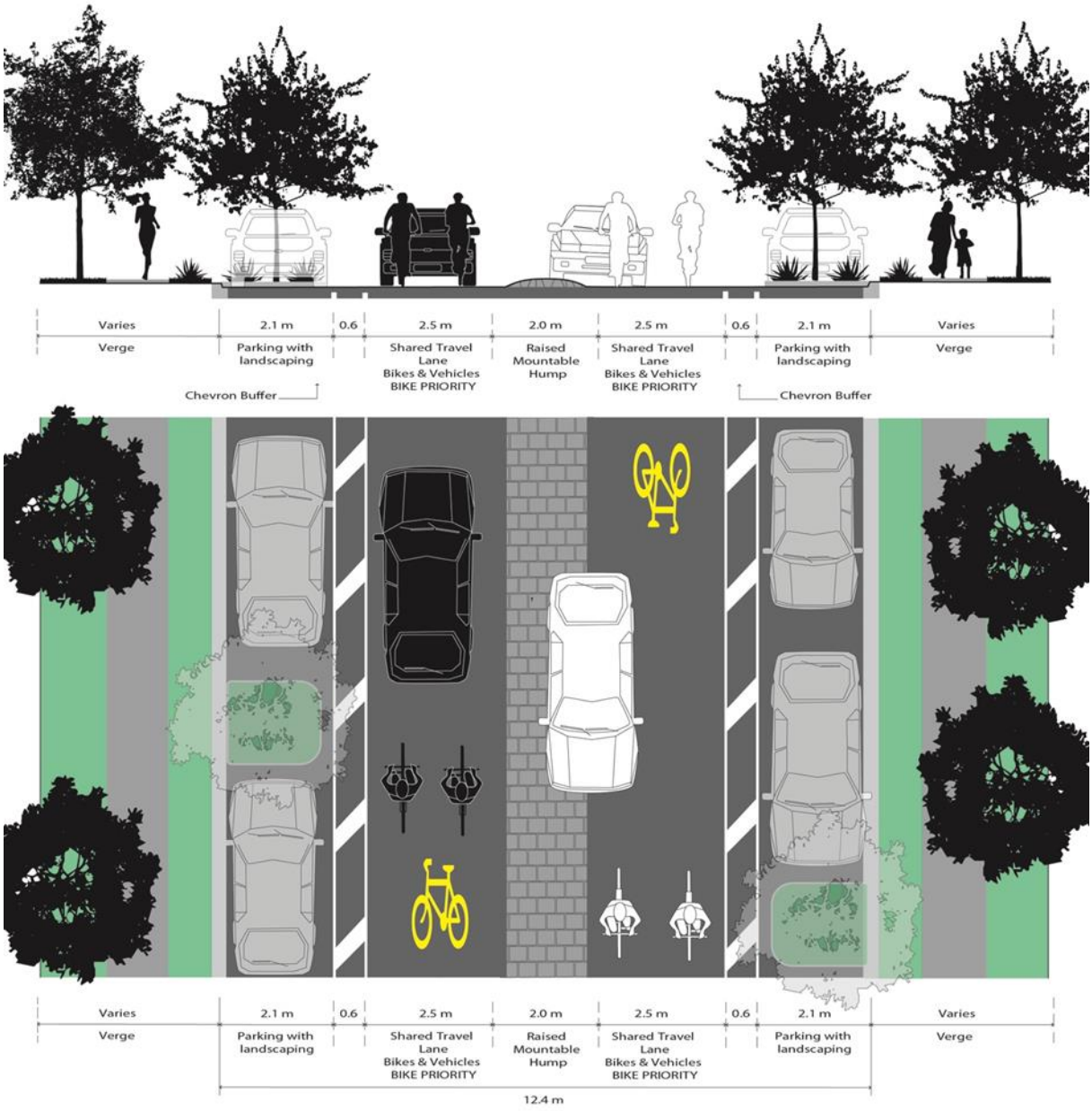


Figure 6.1(h) – Cycle Street with central mountable hump with car parking. Example from Milldale Way, Mirrabooka, Perth (Source: Google Streetview)

Figure 6.1(i) – Cycle Street with central mountable hump with car parking. Example from Netherlands

6.2 Case studies

6.2.1 Shakespeare Street Bike Boulevard, Mount Hawthorn

The Western Australian Department of Transport have been trialling Bike Boulevards (also called Safe Active Streets) in a number of locations in Perth, inspired by similar examples in Europe and North America. The bike boulevard (or CSs as discussed in this Section 6) is located on local streets with low traffic volumes and speeds.

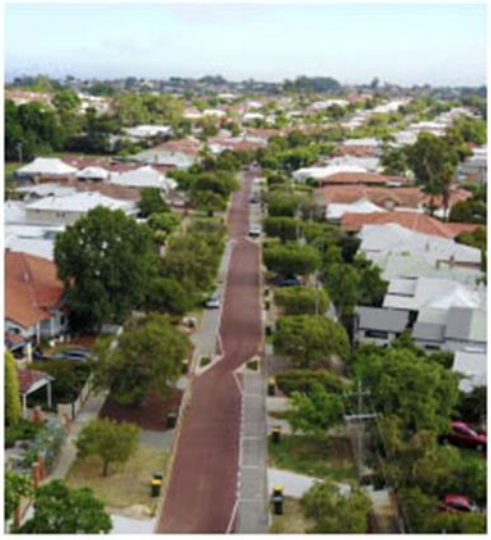
Shakespeare Street in the inner city suburb of Mount Hawthorn connects a major recreation and community hub to schools and the Leederville shopping centre. The route forms part of the Perth Bicycle Network, and connects into existing separated cycle facilities and bike lanes. The project used traffic reduction and calming measures to create attractive, comfortable riding environments in low speed streets so they can be safely shared by cars, bicycles and pedestrians. Another key project aspect included additional tree plantings to provide a shady and cooler street for users, as well as improve its visual appearance.

The project reduced traffic speeds to 30 km/h using one way slow points, priority changes and raised speed tables at intersections, turn bans and reduced lines of sight through horizontal deflection and streetscaping. It also formalised car parking on one side of the road (staggered) and introduced a red asphalt pavement surface. Evaluation of the trial has indicated reductions in 85th percentile speeds and increased pedestrian and bike volumes, including a slight increase in female users.

The Perth treatment is a high quality outcome. It is recognised that lower costs LATM treatments could be used to achieve a similar result.

There are differences in this case study to the design recommendations for Queensland implementation such as red asphalt and no over run area. The Queensland design guidance is based on review of national and international examples.

Figure 6.2.1 – Cycle Streets Case Study – Shakespeare Street Bike Boulevard, Perth



Speed and Volume: 30km/hr
Motor Vehicle Volume:
Less than 1,500vpd
Dimensions:
7.3m total kerb to kerb width
2.1m formalised on street parking (staggered)
5.2m shared lane
3.0m widths at slow points

7 Further information

For further information on this supplement, please contact: Transport and Main Roads - Engineering & Technology Branch.

Appendix A – Advisory Bike Lanes and Cycle Streets: Example treatments at intersections and slow points

Figure A1 – Advisory Bicycle Lanes – Acceptable T-intersection treatments – Option 1 Continuous ABLs through intersection

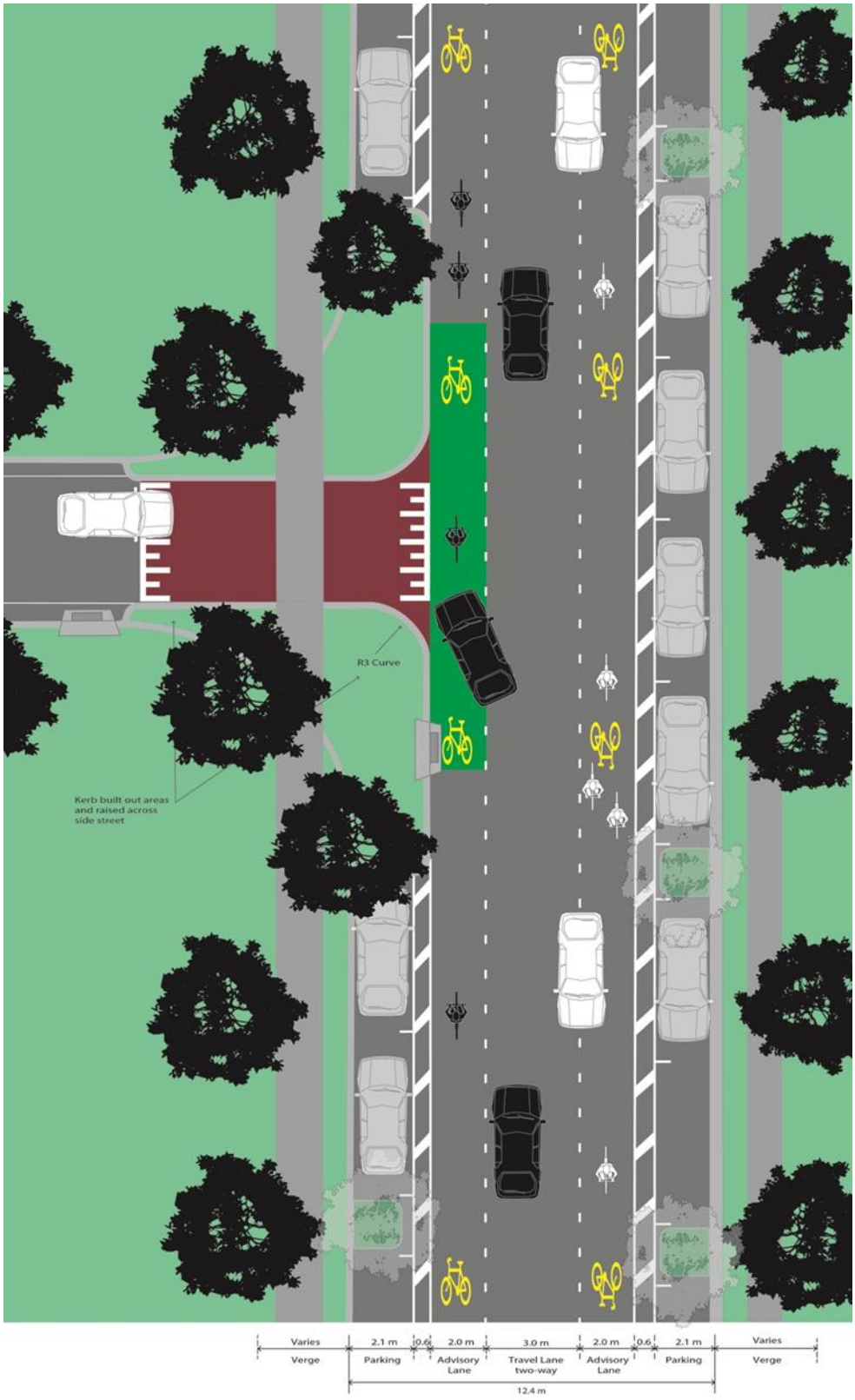


Figure A2 – Advisory Bicycle Lanes – Acceptable T-intersection treatments – Option 2 Two traffic lanes created through intersection (19 fewer car parks than shared lane intersection option)

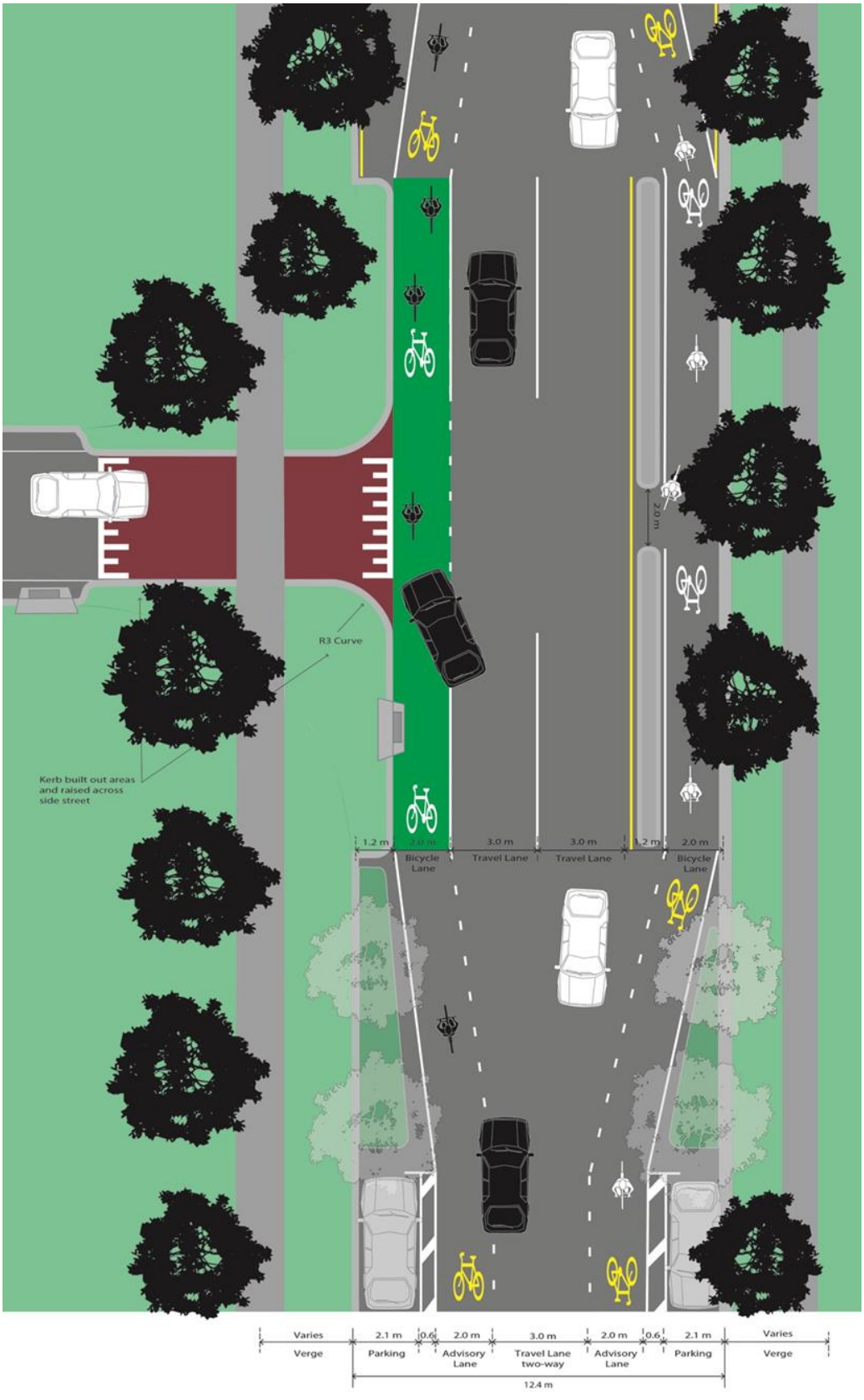


Figure A3 – Advisory Bicycle Lanes – Acceptable single lane slow point treatment

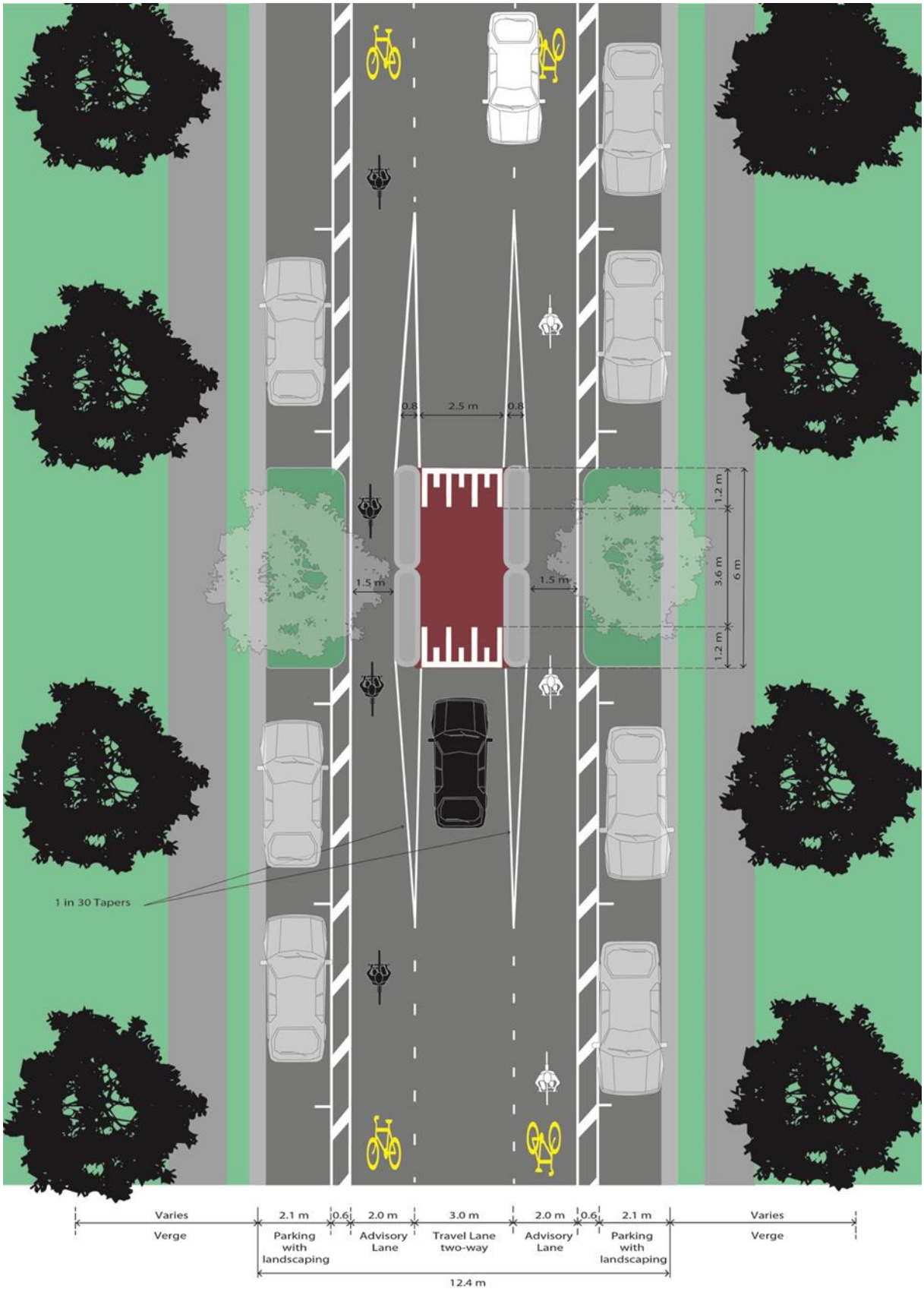


Figure A4 – Advisory Bicycle Lanes – Acceptable pedestrian refuge treatment

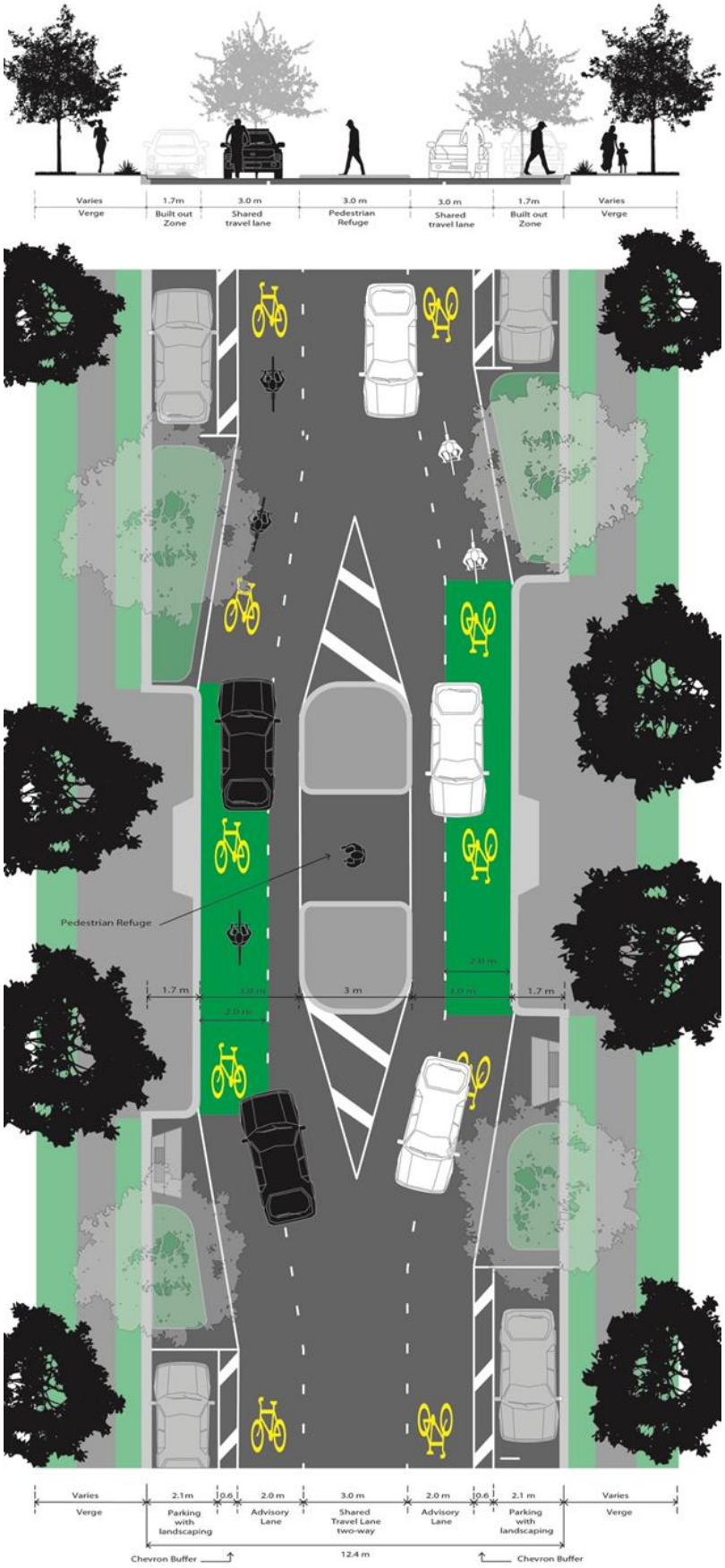


Figure A5 – Advisory Bicycle Lanes – Acceptable speed platform treatment

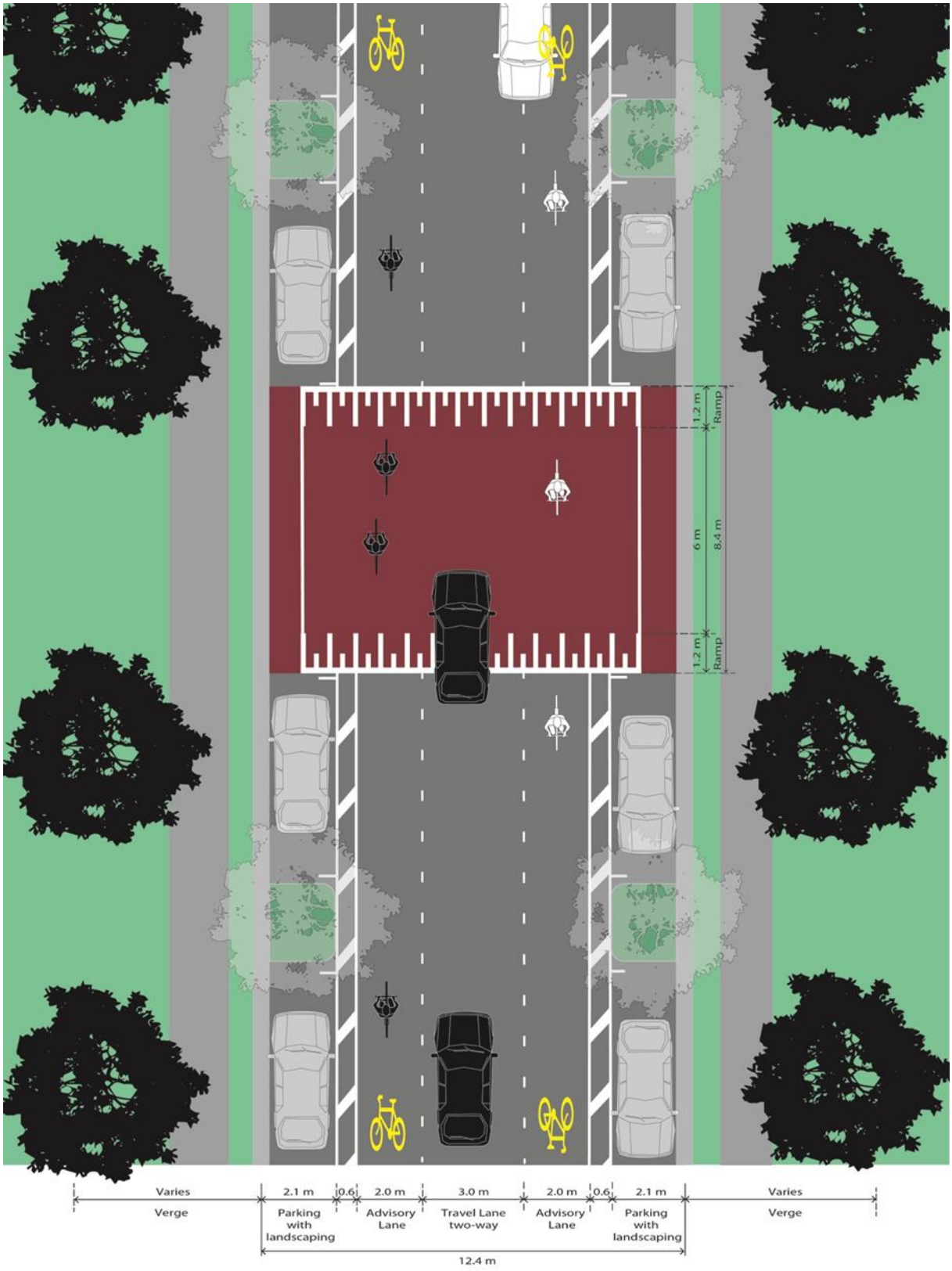


Figure A6 – Advisory Bicycle Lanes – Acceptable speed cushion treatment

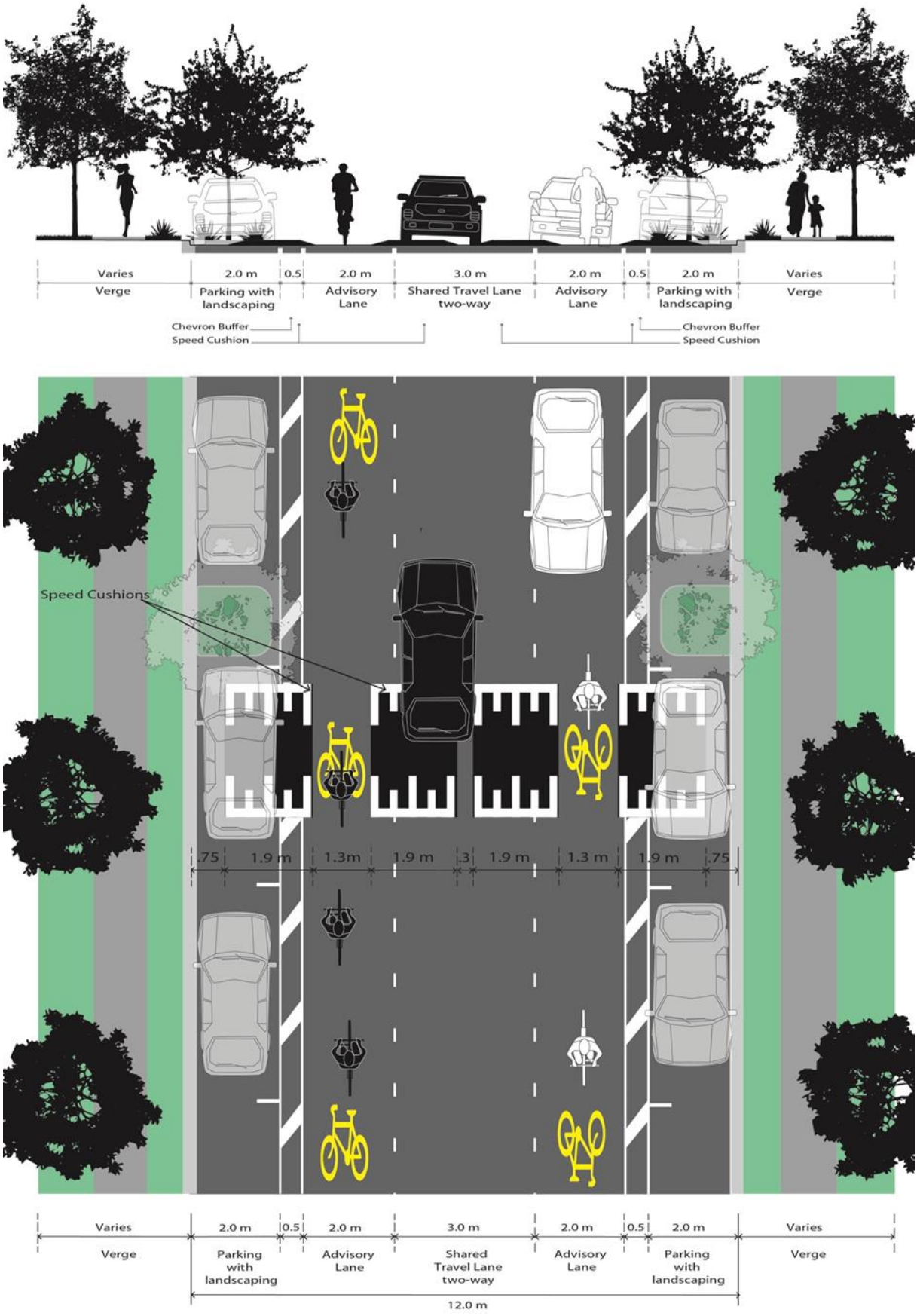


Figure A7 – Advisory Bicycle Lanes – Acceptable Curve treatment options – Option 1 Continuous ABLs through curve

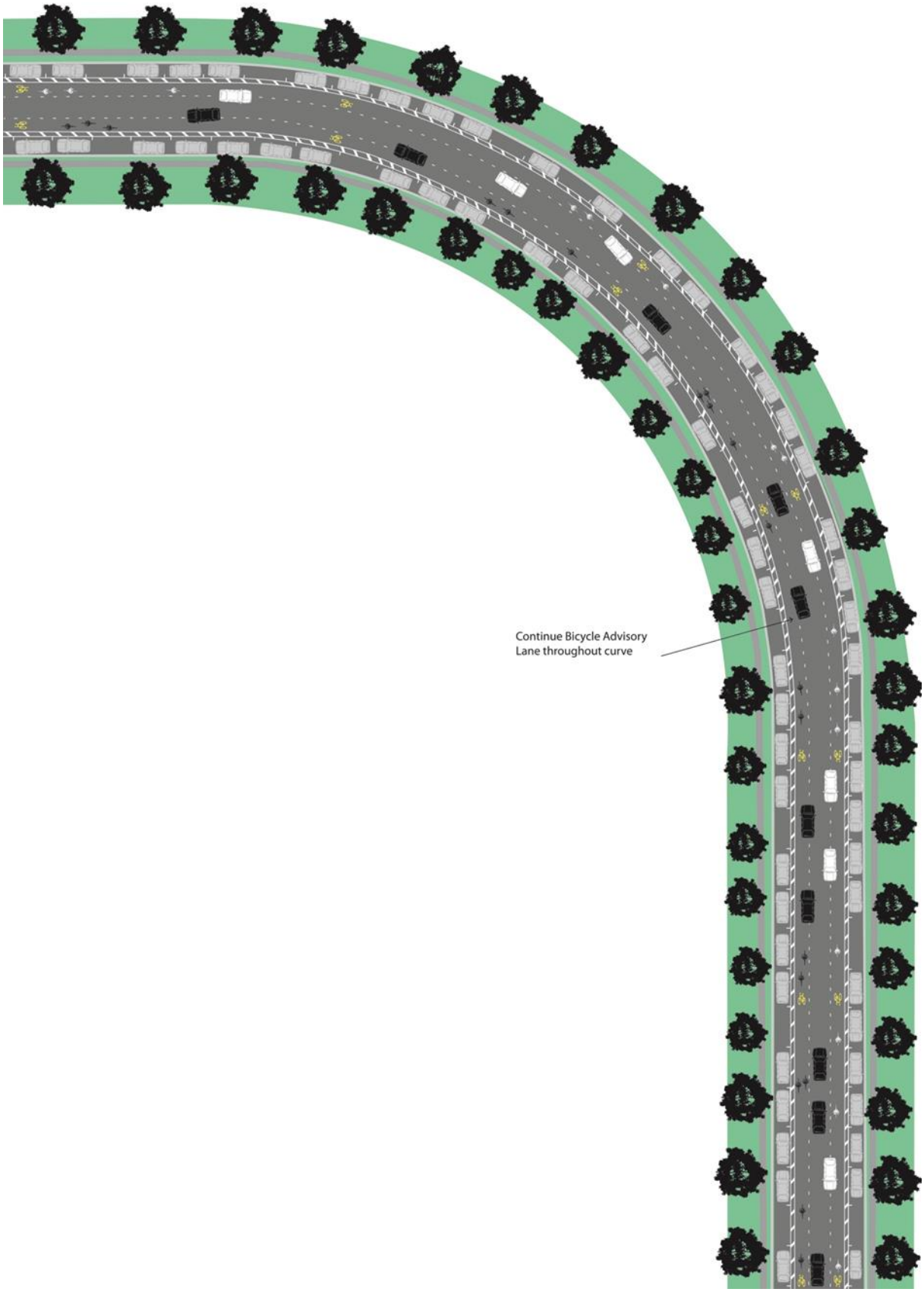


Figure A8 – Advisory Bicycle Lanes – Acceptable Curve treatment – Option 2 Transition to exclusive bicycle lanes with road centre line (requires removal of car parking)

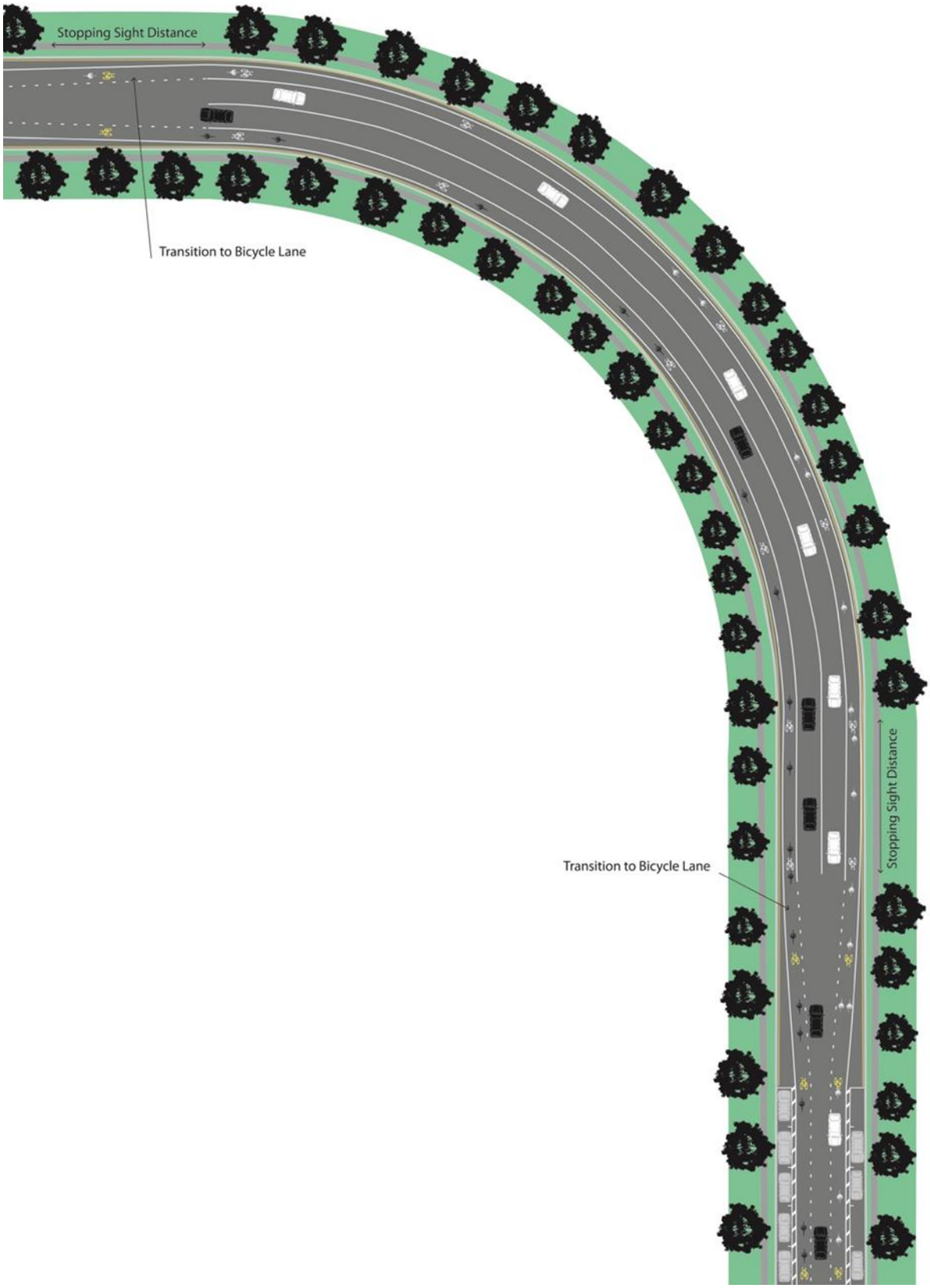


Figure A9 – Advisory Bicycle Lanes – Acceptable crest treatment – Option 1 median separated transition to road centre line

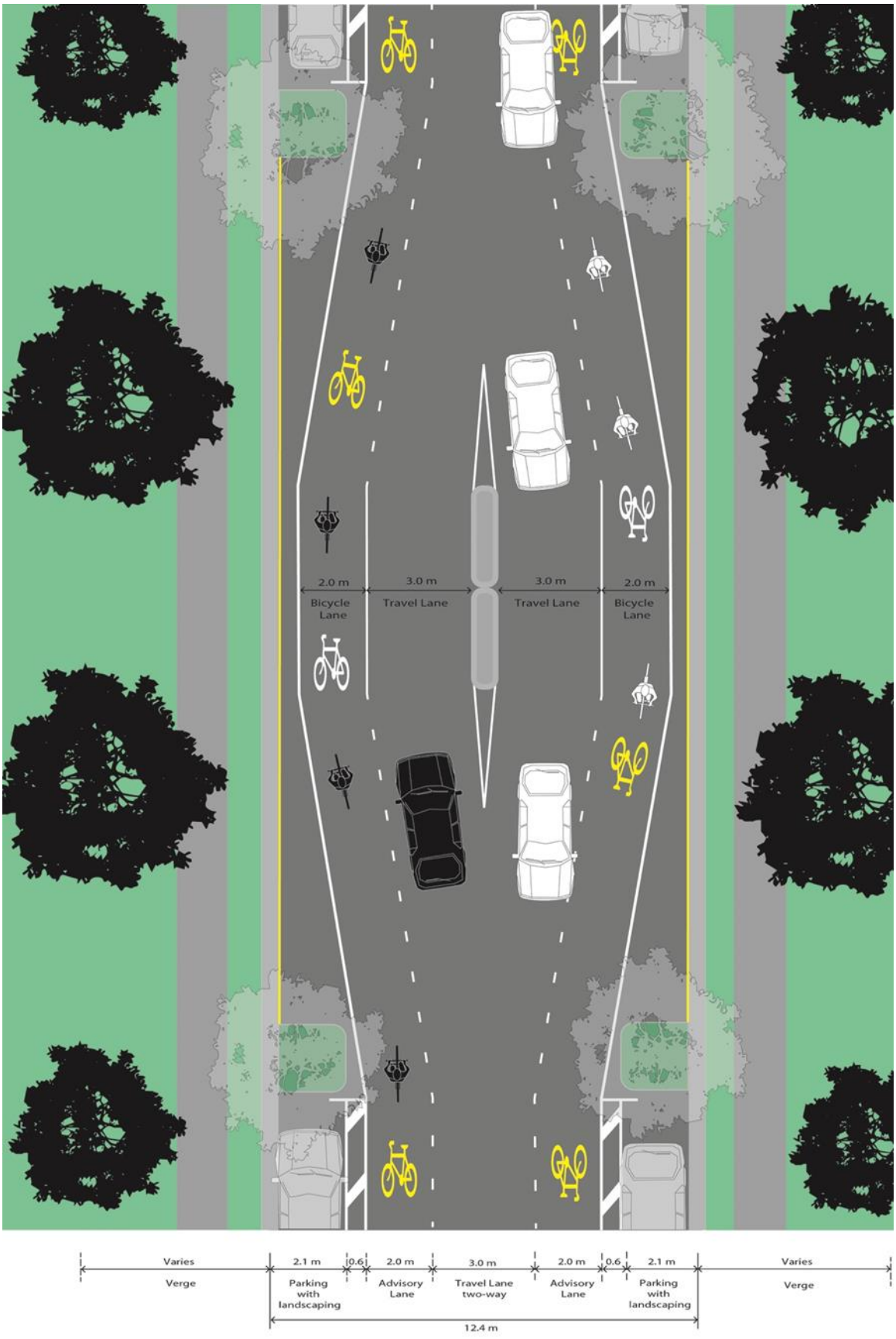


Figure A10 – Advisory Bicycle Lanes – Acceptable crest treatment – Option 2 – Transition to road centre line