



**Weston Lea Ltd
Amberfield Subdivision
Peacockes**

Subdivision Consent Application

**Integrated Transportation Assessment
Report**

May 2018

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Peacockes**

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Report**

Quality Assurance Statement

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Executive Summary

This Integrated Transportation Assessment (ITA) report has been produced to accompany the application for subdivision consent for a large area of land comprising approximately 105 hectares between Peacockes Road and the Waikato River in the Peacockes area of Hamilton. This subdivision will be called “Amberfield” and will contain approximately 1,000 residential lots and a neighbourhood centre. Its traffic effects on the road network were the subject of a significant transportation assessment undertaken by TDG in 2016. That assessment was based on the existing road network with only the addition of the Wairere Drive link and the Waikato Expressway included in the modelling of the projected traffic volumes on the road network for 2021. The assessment identified that the existing network with the committed future projects would be able to accommodate the traffic generated by the Amberfield subdivision safely and efficiently without significant adverse effects with some mitigation measures.

Since that assessment the Government has introduced the Housing Infrastructure Fund (HIF) and identified Peacockes specifically as a candidate for such funding. The road network associated with the possible funding includes a new river bridge across the Waikato River which would enhance accessibility for the overall Peacockes area, the airport and the wider community. However the Amberfield subdivision application is being submitted on the basis of access being provided by the existing transportation network and committed future projects.

Also since the earlier assessment, it has been confirmed that a new roundabout will be constructed on Ohaupo Road (SH3) south of Dixon Road within the next two years. This will make it easier for drivers to turn right onto SH3 from the adjacent area reducing the need for traffic from the Peacockes Stage 1 area to use the Waterford Road – Peacockes Road – Bader Street route. More capacity will therefore be available on this route for traffic generated by the proposed Amberfield subdivision and it is unlikely that the mitigation measures previously identified in the 2016 transportation assessment for Normandy Avenue at the Lorne Street intersection will need to be implemented.

The Council has also subsequently adopted some proposed safety improvements to this route involving a roundabout at the Waterford Road/Peacockes Road/Plateau Drive intersection, cycle/pedestrian crossings and traffic calming in the vicinity of the local shops on Bader Street. In addition it is proposed that a further pedestrian/cyclist crossing/threshold will be provided at the urban boundary on Peacockes Road as part of mitigation measures associated with the subdivision. This will calm traffic entering the urban area and provide an interface with the shared pedestrian/cyclist path proposed to link the urban area with the Amberfield subdivision.

The existing rural section of Peacockes Road is capable accommodating all of the traffic that will be generated by the proposed subdivision safely and efficiently provided the off-road shared path is constructed along the east side of Peacockes Road to separate pedestrians and cyclists from traffic on the existing carriageway. While the rural section of Peacockes Road between the current urban boundary and the subdivision will be retained, it is proposed that the sections of Peacockes Road adjoining the site should be upgraded to an urban standard at the same time as the adjacent stages of the subdivision are developed.

The subdivision north of the neighbourhood centre/east-west arterial will be designed so that the access roads can be connected to either the proposed minor arterial road upgrade

of Peacockes Road or to a collector road upgrade if the minor arterial is not programmed for construction in the same timeframe as the subdivision. In the latter event the existing road reserve would be widened on the eastern side utilising some of the land subject to the existing designation, so that a new carriageway could be constructed to the standard for an urban collector road. The collector road would be constructed on the same vertical and horizontal alignment as the future minor arterial. It would include a 9m wide carriageway with kerb and channel, kerbside parking/bio-retention facilities, shared path and berm on the east side. The Council are to determine what would be constructed on the west side.

The high level design for the upgrading of Peacockes Road to a minor arterial prepared by AECOM to inform the Southern Links designation process has been refined to better match the existing land form, to reduce construction costs, to reduce the amount of land required for earthworks and to enable the flexibility to upgrade the existing road to a collector road in the interim or to a minor arterial road directly. As discussed with the Council, a revised cross-section is also proposed for the minor arterial replacing the swales with kerb and channel with alternating bio-retention facilities and kerbside parallel car parking but retaining the same road formation width. Off-road shared pedestrian/cyclist paths are also proposed on both sides.

Council staff have advised that the rationale for the section of Peacockes Road south of the neighbourhood centre being classified a minor arterial in the Peacockes Structure Plan is to future proof the long term possibility that the additional Waipa District land inside the Southern Links Bypass might be developed for urban use. However this section of Peacockes Road is predicted by the Waikato Regional Transport Model (WRTM) to carry traffic volumes that do not justify the construction of a minor arterial for a very long time. Therefore it is proposed that when the adjacent sections of the Amberfield subdivision are developed, the existing road reserve will be widened by 3m on the eastern side to 23m and the existing road upgraded to a collector road standard. Given that this road is expected to operate in this format for many years, the design of the road alignment has been improved to ensure a high standard facility but again the extent of the reconstruction on the west side will be decided by the Council. Future upgrading to minor arterial standard would still be possible by widening the road reserve to the west if that is required in the long term.

Peacockes Road is the spine road to which the subdivision road network will be connecting, and which provides all access between the subdivision and other areas. There will be three side roads off Peacockes Road north of the neighbourhood centre and five to the south providing access to the subdivision. The access roads link through to the riverside (or the gully) and a series of roads running parallel to the river and Peacockes Road provide further distribution of vehicles. All roads in the subdivision have cross-sections that are generally consistent with those specified in the District Plan.

A comprehensive network of cycleways / footpaths or shared paths are proposed to service the Amberfield subdivision and to link with the wider network of paths proposed under the Peacockes Structure Plan. The street network has a grid base with on and off-street paths that support accessibility and permeability for pedestrians and cyclists. This and the other transportation locations are consistent with the objectives and policies of the Hamilton District Plan.

It is proposed that provision should be made for a future bus route running along Peacockes Road to the neighbourhood centre and then using a loop through the southern area to improve service for residents on the "island" and to provide a turnaround for buses.

This may change subsequently with further development to the south. It is also expected that a shorter route might be able to be justified to service the first stage of the subdivision and this will be discussed with the Regional Council as the subdivision develops.

1. Introduction

1.1 General

This Integrated Transportation Assessment (ITA) report has been produced to accompany the application for subdivision consent for a large area of land between Peacockes Road and the Waikato River in the Peacockes area of Hamilton. The total site subject to the subdivision consent application comprises approximately 139 hectares of land. Excluding the two rural balance lots that will be created west of Peacockes Road, the site that will be subject to urban development and subdivision comprises approximately 105 hectares. An ITA is required by the Hamilton City Operative District Plan (the District Plan) for proposals that generate significant volumes of traffic and have the potential to create adverse transportation effects.

This subdivision will be called “Amberfield” and will contain approximately 1,000 residential lots and a neighbourhood centre and therefore falls into the category of having the potential to generate significant traffic effects on the road network. This assessment is in accordance with the requirements for a “Broad ITA” contained in Table 15-3b in Appendix 15 of the District Plan.

The main basis for the ITA is a significant transportation assessment undertaken in 2016 when three reports were produced by TDG using the 2006-based Waikato Regional Transport Model (WRTM) to assess the effects of the proposed subdivision. These reports are referenced in this report but for convenience the conclusions are summarised and included in later sections of this report. That assessment was based on the existing road network with only the committed roading projects, including the Wairere Drive link (to SH1) and the Waikato Expressway added for in the modelling of the projected traffic volumes on the road network for 2021.

Since that assessment the Government has introduced the Housing Infrastructure Fund (HIF) and identified Peacockes specifically as a candidate for such funding. The road network associated with the possible funding includes a new river bridge across the Waikato River from the Wairere Link interchange on State Highway 1 (SH1) to Peacockes Road which would enhance the accessibility for the overall Peacockes area, the airport and the wider community. The Amberfield subdivision application is being submitted on the standalone basis of access being provided by the existing transportation network and committed future projects.

1.2 Site Location

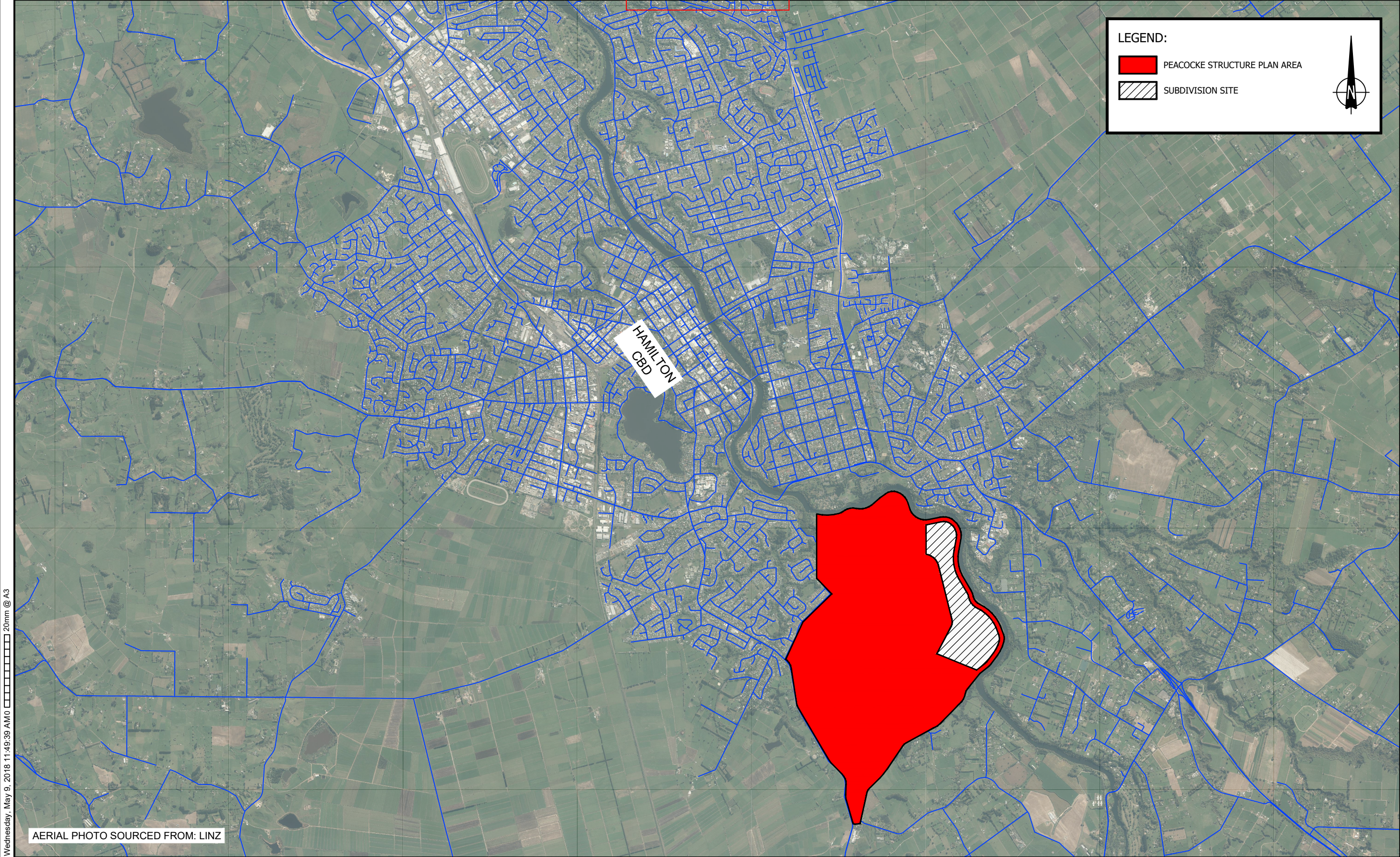
The location of the subdivision site is illustrated in **Figure 1** on the eastern side of Peacockes Road in the Peacockes Structure Plan Area. The proximity of the site to the Hamilton Central Business District (CBD) is clearly illustrated with the northern edge of the subdivision being some 4km away, the closest undeveloped land.

It will be seen that the proposed subdivision is separated from the existing urban boundary by some 1.5 km. While the intervening Structure Plan Area is expected to be converted to urban development at some stage in the future, it is anticipated that the Amberfield subdivision will occur first and therefore the transportation effects of this subdivision

application are based on retaining the existing rural form of Peacockes Road between the subdivision and the current urban boundary in the vicinity of the Hamilton City Council water treatment plant. However, a shared path and street lighting will be established along the rural section of road for safe use by pedestrians and cyclists.

That section of Peacockes Road will provide the main access to the Amberfield subdivision with a relatively small amount of generated traffic heading south along Peacockes Road towards Raynes Road and on to the airport or SH1 or Stage Highway 3 (SH3).

Received
PLANNING GUIDANCE
15 June 2018



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0	09/05/2018	AKJ	ISSUED FOR INFORMATION	N/A	N/A

WESTON LEA LTD - AMBERFIELD SUBDIVISION
SUBDIVISION SITE LOCATION

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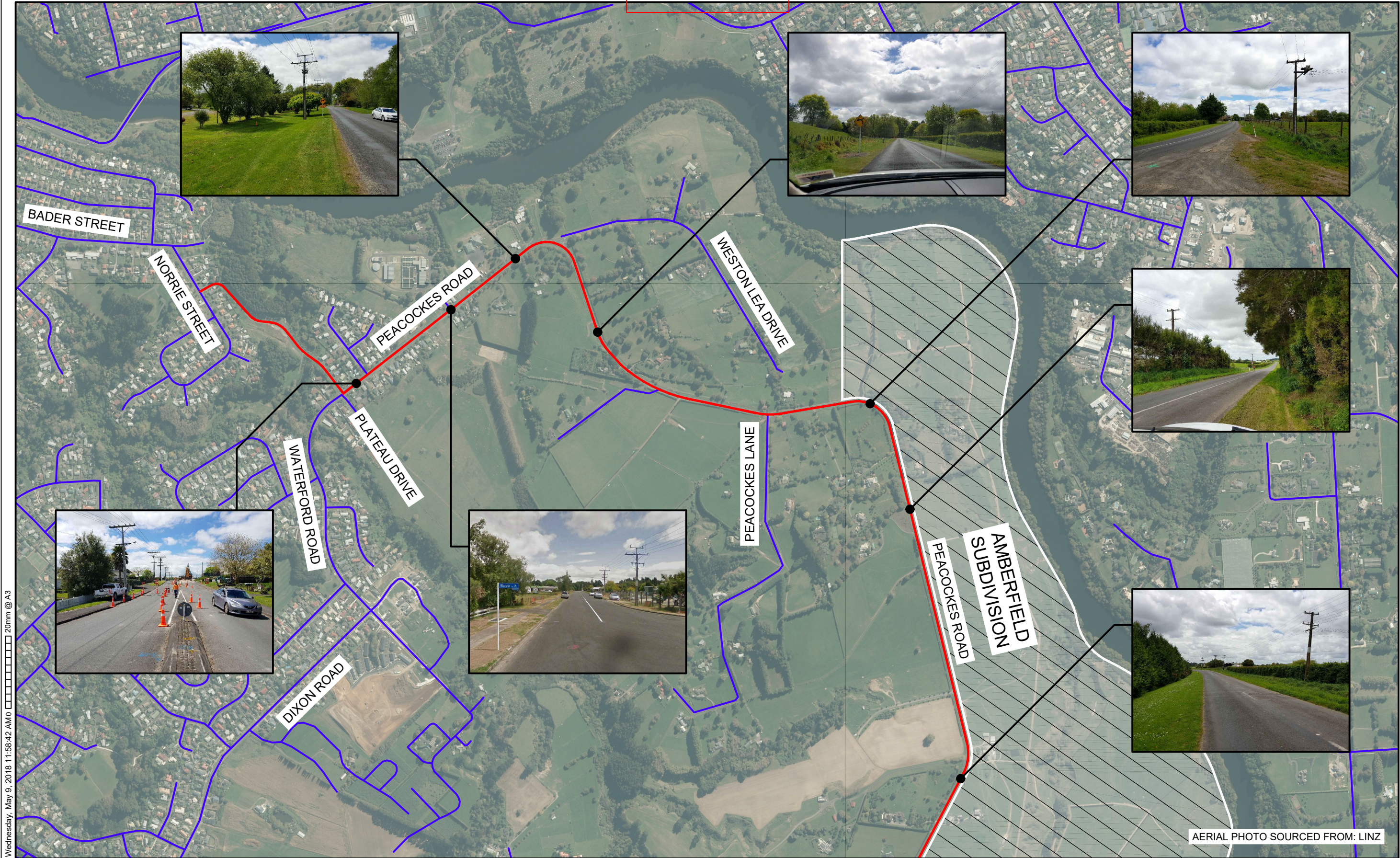
SHT 1 OF 1

Figure 2 includes a series of photographs illustrating the existing configuration of Peacockes Road at various locations along its length.

On reaching the urban area, the northern section of Peacockes Road connects to a crossroad intersection with Waterford Road and Plateau Drive. Peacockes Road turns through a right angle at this intersection and terminates at a T-intersection with Norrie Street. The main access route for the subdivision then proceeds around a bend into Bader Street which connects to Normandy Avenue (SH3) at a traffic signalised T-intersection. Normandy Avenue connects to SH3 which leads to the south and west and to SH1 which leads to the CBD and to the south.

At the Peacockes Road/Waterford Road intersection, a small amount of the traffic generated by the Amberfield subdivision will continue into Waterford Road and Dixon Street to reach local destinations. These local destinations include the Stage 1 subdivision of Peacockes which is well advanced, and which ultimately will contain some 1,000 residential lots. (The location of Stage 1 is indicated later in **Figure 12**). Some traffic generated by Stage 1 that currently uses the Peacockes Road-Bader Street route for access will be diverted to Ohaupo Road (SH3) when a new roundabout-controlled intersection is constructed on SH3 south of Dixon Road to relieve the delay for traffic turning right at the existing SH3 / Dixon Road intersection at peak times. This effect was not included in the 2016 assessment because the imminent construction of the new roundabout had not been confirmed at that time.

It is stressed that Dixon Road is not a major access route for the proposed Amberfield subdivision because of the right turn delays at the SH3 intersection and because it is not the shortest route for trips to more distant destinations. This will remain the case even with the new roundabout.



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0	09/05/2018	AKJ	ISSUED FOR INFORMATION	N/A	N/A

WESTON LEA LTD - AMBERFIELD SUBDIVISION
PHOTOGRAPHS OF EXISTING ROADS

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2. Existing Traffic Environment

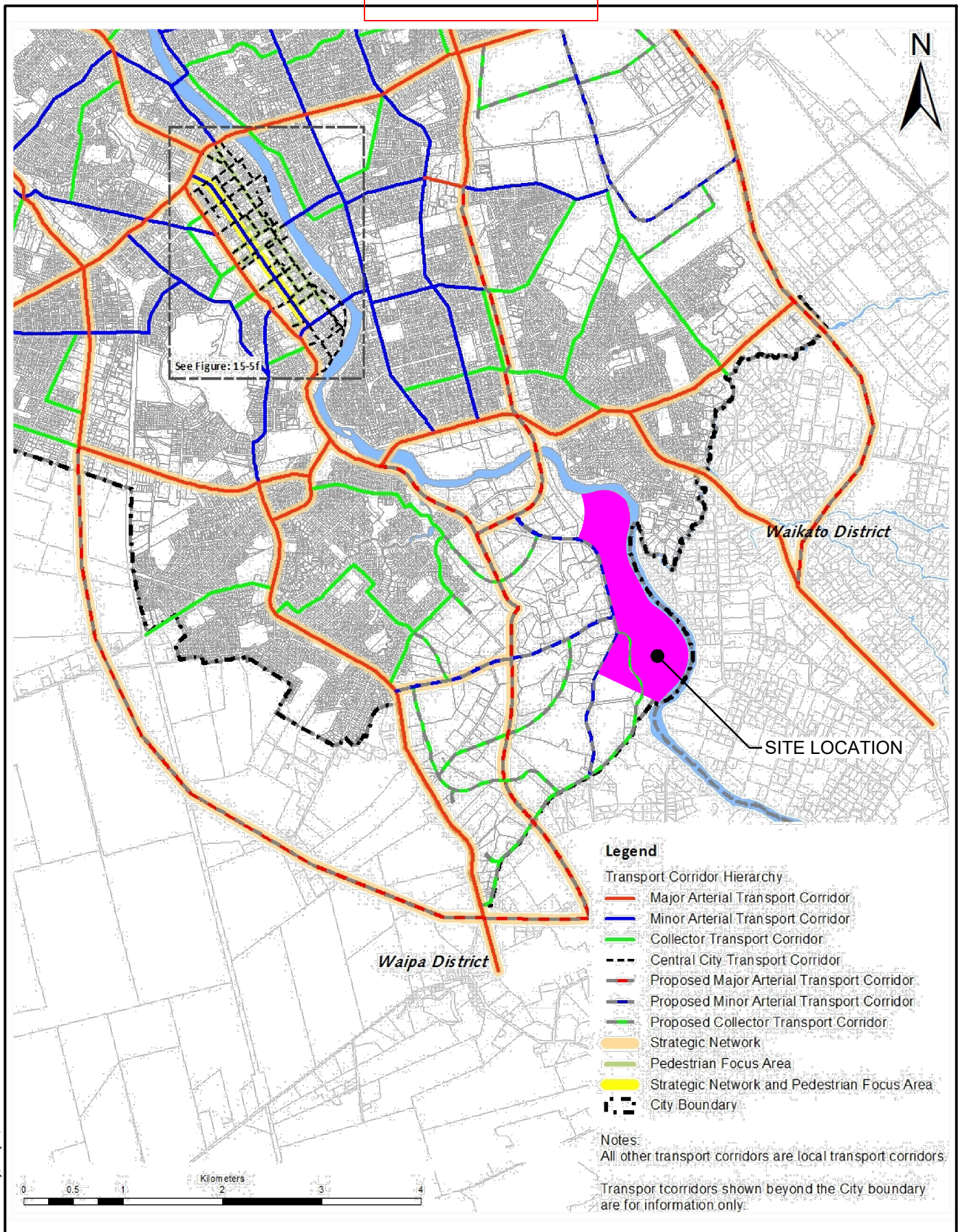
2.1 Existing Road Network

Figure 3 indicates the existing and proposed road network hierarchy as identified by the Hamilton District Plan. The rural section of Peacockes Road is currently classified as a local road but indicated in the District Plan as a “Proposed Minor Arterial Road”. The section of Peacockes Road between Waterford Road and Norrie Street is a collector road. The section of Norrie Street between Peacockes Road and Bader Street is also a collector road and this collector road route continues along Bader Street to Normandy Avenue. The roads on the route along Waterford Road and Dixon Road to SH3 are also classified as collector roads. Normandy Avenue and Ohaupo Road are major arterials that form part of SH3.

The rural section of Peacockes Road consists of a 6.0m wide (approximately) sealed carriageway without kerb and channel, with minimal gravel shoulders and large grass berms within a 20m wide road reserve. It generally follows an alignment with sweeping bends and relatively long straight sections. The vertical alignment is generally flat but there are some sag and crest curves with limited visibility. The speed limit on Peacockes Road in the rural area is 80 km/h.

Other than the sweeping bend at the northern end of the subdivision site, the alignment of Peacockes Road in the vicinity of the subdivision is generally straight and runs in a north-south direction. To the north of the site the road proceeds through two bends before arriving at the existing urban boundary in an east-west direction.

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To the south of the subdivision Peacockes Road continues in the same rural format with a series of bends before meeting Raynes Road at a T-intersection which is controlled by a Stop sign. Raynes Road heading to the east provides a connection towards the airport and towards SH1. The short section of Raynes Road to the west connects at a Stop controlled T-intersection with SH3 which provides an alternative route to the airport and a route to the south.

At the urban boundary to the north, the rural nature of Peacockes Road is transformed into an urban road with kerb and channel. There is a footpath along the southern side. On the northern side there is a grass berm only, which is about 5.0m wide, to a point about 85m east of Riley Place where a footpath begins. The carriageway for this section of Peacockes Road is approximately 10m wide which allows for kerbside parking on both sides.

At the crossroad intersection of Peacockes Road/Waterford Road/Plateau Drive, the northern leg of Peacockes Road and the opposite leg of Plateau Drive are controlled by Give Way signs. There are short median islands on the two Peacockes Road approaches (north and east) to channelise the major movements at the intersection which are between the two legs of Peacockes Road.

The carriageway of the section of Peacockes Road between Waterford Road and Norrie Street varies from approximately 7m to 8m wide. While kerbside car parking is not banned on either side of the road, there is little demand for car parking on this section and the two-way flow of traffic is not disrupted by parked vehicles. There is a footpath along the east side of this road which connects at the half way point with a shared path that links across an area with trees adjacent to the river to the Cobham Drive path at the SH1 river bridge. The footpath continues along the east side of Peacockes Road and into Norrie Street.

At the T-intersection of Peacockes Road with Norrie Street, the Peacockes Road leg is controlled by a Stop sign. The bend in Peacockes Road immediately before the Norrie Street intersection is relatively sharp (15m radius) and has restricted forward visibility for vehicles travelling westbound because of a fence very close to the edge of the road.

The section of Norrie Street south of Peacockes Road is a cul-de-sac with an 8.5m wide carriageway. The section heading to Bader Street has a similar carriageway with footpaths on both sides. Car parking is allowed on both sides of Norrie Street but the shoulder marked with "edge" lines is too narrow for a parking lane.

Bader Street has a footpath on both sides and a 11m wide carriageway which allows for car parking on both sides within appropriate width (2.2m) edge lines. On the approach to the Bader Street intersection with Normandy Avenue there is some angled parking on the north side associated with a local shopping centre. The Bader Street approach to the traffic signals at Normandy Avenue has two approach lanes, one of which allows exclusively for right turns and one which allows for left and right turns as indicated in **Figure 4**.

Normandy Avenue includes two lanes in each direction divided by a central median. Some 120m to the north of Bader Street, Normandy Avenue intersects with Lorne Street at another traffic signalised T-intersection which is also indicated in **Figure 4**. Normandy Avenue extends from Ohaupo Road (SH3) to Cobham Drive (SH1).

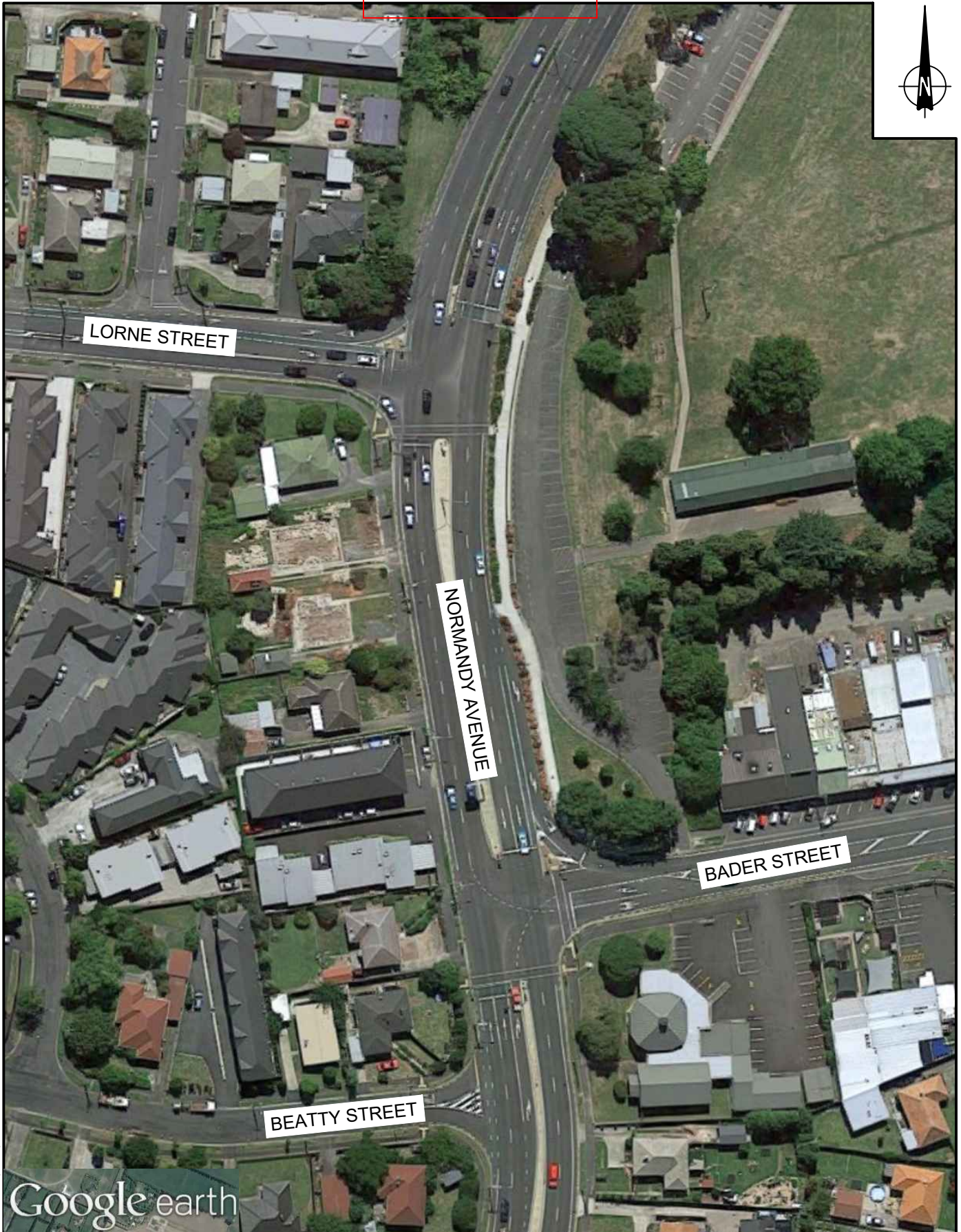
Waterford Road is a two-lane road which continues from Peacockes Road to Dixon Road. Both Waterford Road and Dixon Road have similar carriageways of approximately 10m with

kerbside parking and footpaths on both side. They intersect at a crossroad roundabout intersection and Dixon Road leads to SH3 where the approach to the intersection is controlled by a Give Way and is only about 4.5m wide. This does not allow for the formation of two lanes of traffic at peak times when a queue forms because of delays to the right turning traffic. As a result, left turning vehicles tend to drive onto the roadside which is partially sealed to bypass the right turning traffic queue.

The delay also causes traffic from the area to use the Peacockes Road-Norrie Street-Bader Street route. However there are alternative routes for traffic which would turn right out of Dixon Road onto SH3 at peak times. It can turn into Pelorus Street to get to Garden Heights Avenue which links onto SH3 at a Give Way or continue along Glenview Terrace to Tomlin Road which joins SH3 at a roundabout.



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WESTON LEA LTD - AMBERFIELD SUBDIVISION
EXISTING INTERSECTIONS ON NORMANDY AVENUE



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2.2 Existing Traffic Volumes

The existing traffic volume on Peacockes Road just beyond the current urban boundary is approximately 1500 vpd. In the morning peak there is a strongly tidal movement with some 140 vph travelling towards the city and only some 20 vph travelling in the reverse direction. This indicates that Peacockes Road serves a rural residential catchment which primarily has destinations in the city and that there are very few through traffic movements using Peacockes Road to travel to destinations to the south.

The traffic volumes on Peacockes Road as it enters the urban area and joins into Norrie Street and Bader Street increases gradually reaching a two-way volume of some 9,000 vpd on Bader Street at its intersection with Normandy Avenue.

At the intersection of Peacockes Road with Waterford Road and Plateau Drive the eastern leg of Peacockes Road carries approximately 3,000 vpd while around the corner on the northern leg of Peacockes Road the traffic volume is 5,000 vpd. Waterford Road carries approximately 2,500 vpd while Plateau Drive is a small cul-de-sac with less than 100 vpd.

The traffic volume on Normandy Avenue increases from approximately 15,000 vpd south of the Bader Street intersection to 30,000 vpd north of the intersection with Lorne Street.

Figures 5-7 show the detailed peak hour and midday turning movement counts on Normandy Avenue collected in April 2016. These demonstrate normal commuter route peak hours for the morning and the evening with relatively high directional splits and even splits through the middle of the day. In the morning peak there is a directional split on Normandy Avenue and Bader Street of some 70/30 towards the CBD. In the evening peak the directional split is 65/35 in the opposite direction.

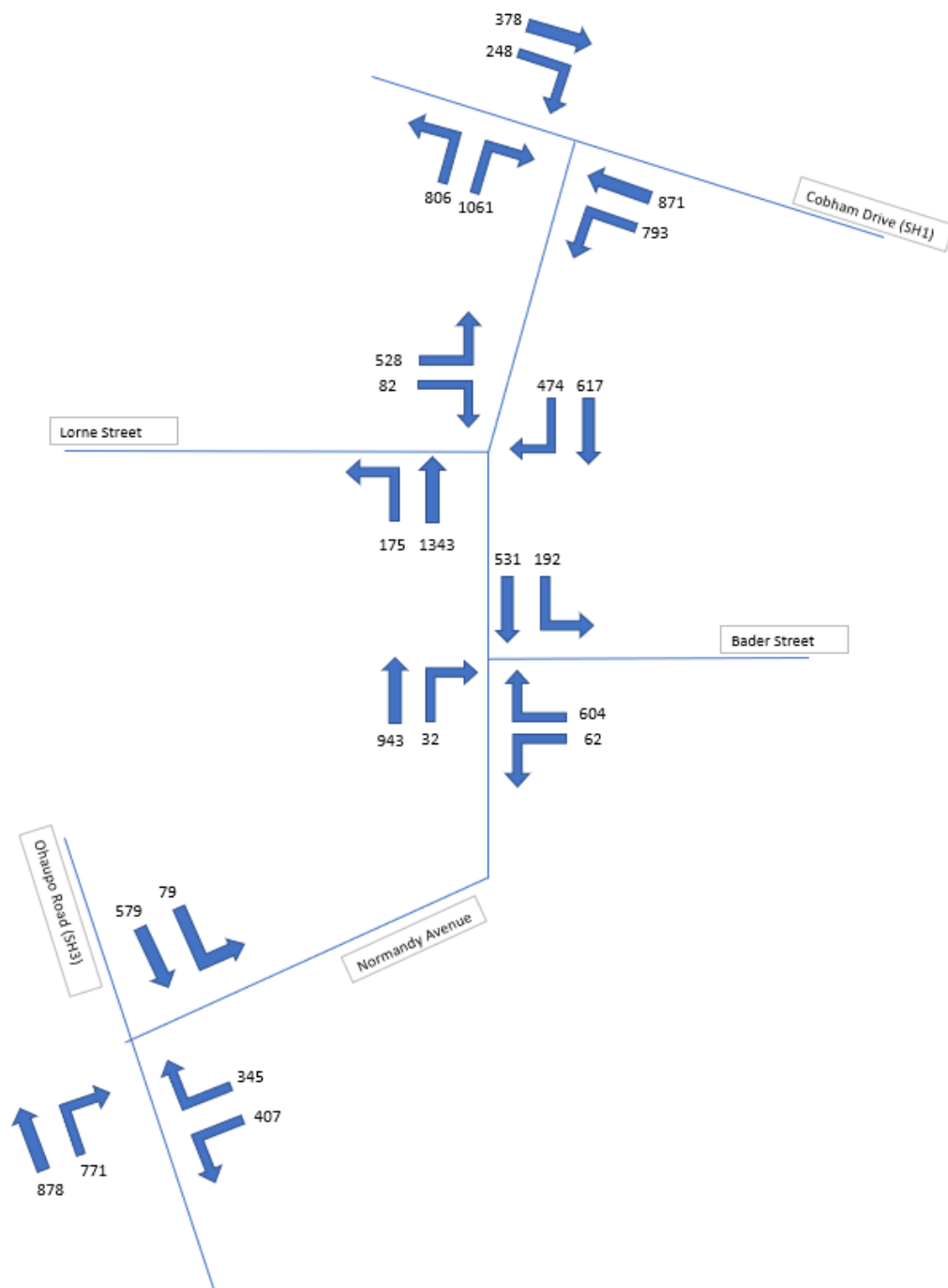


Figure 5: AM Peak Traffic Count on Normandy Ave (April 2016)

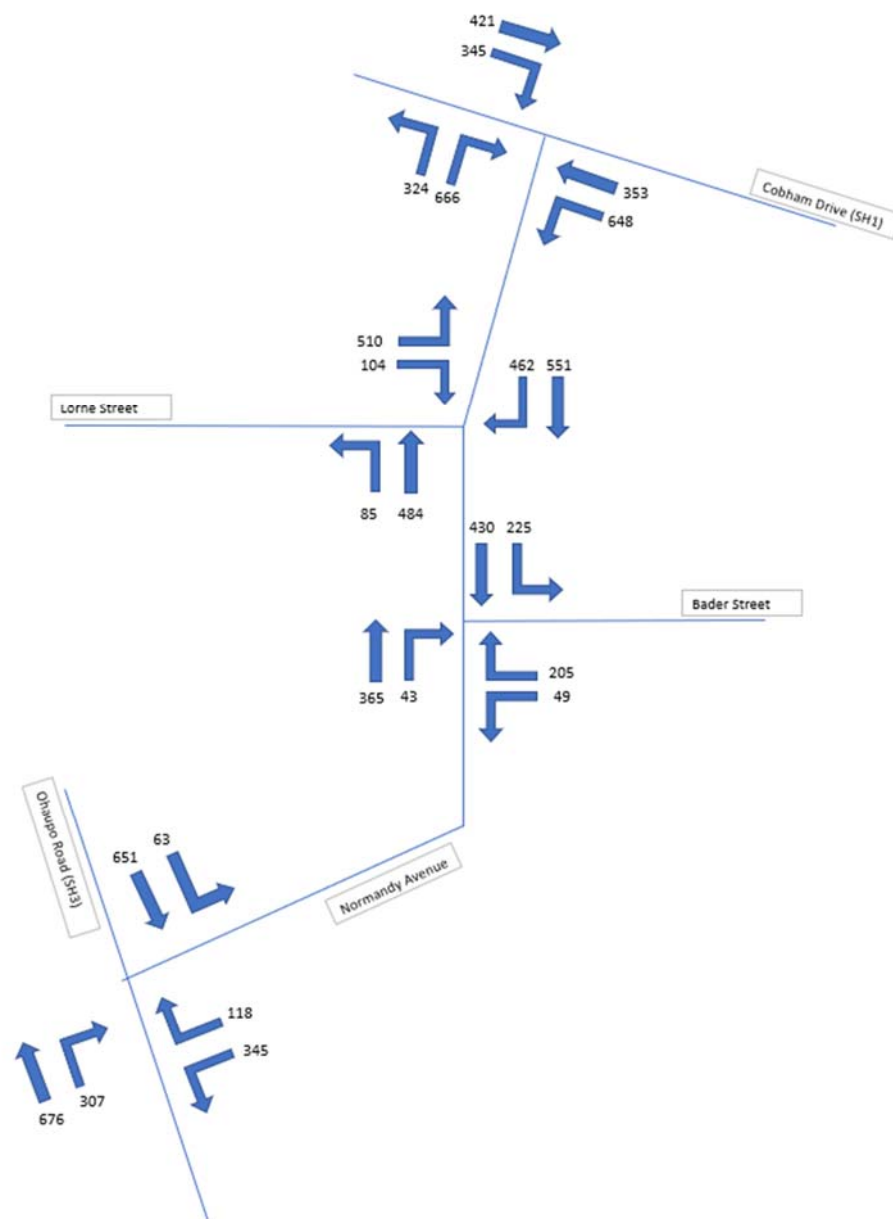


Figure 6: Midday Traffic Count on Normandy Ave (April 2016)

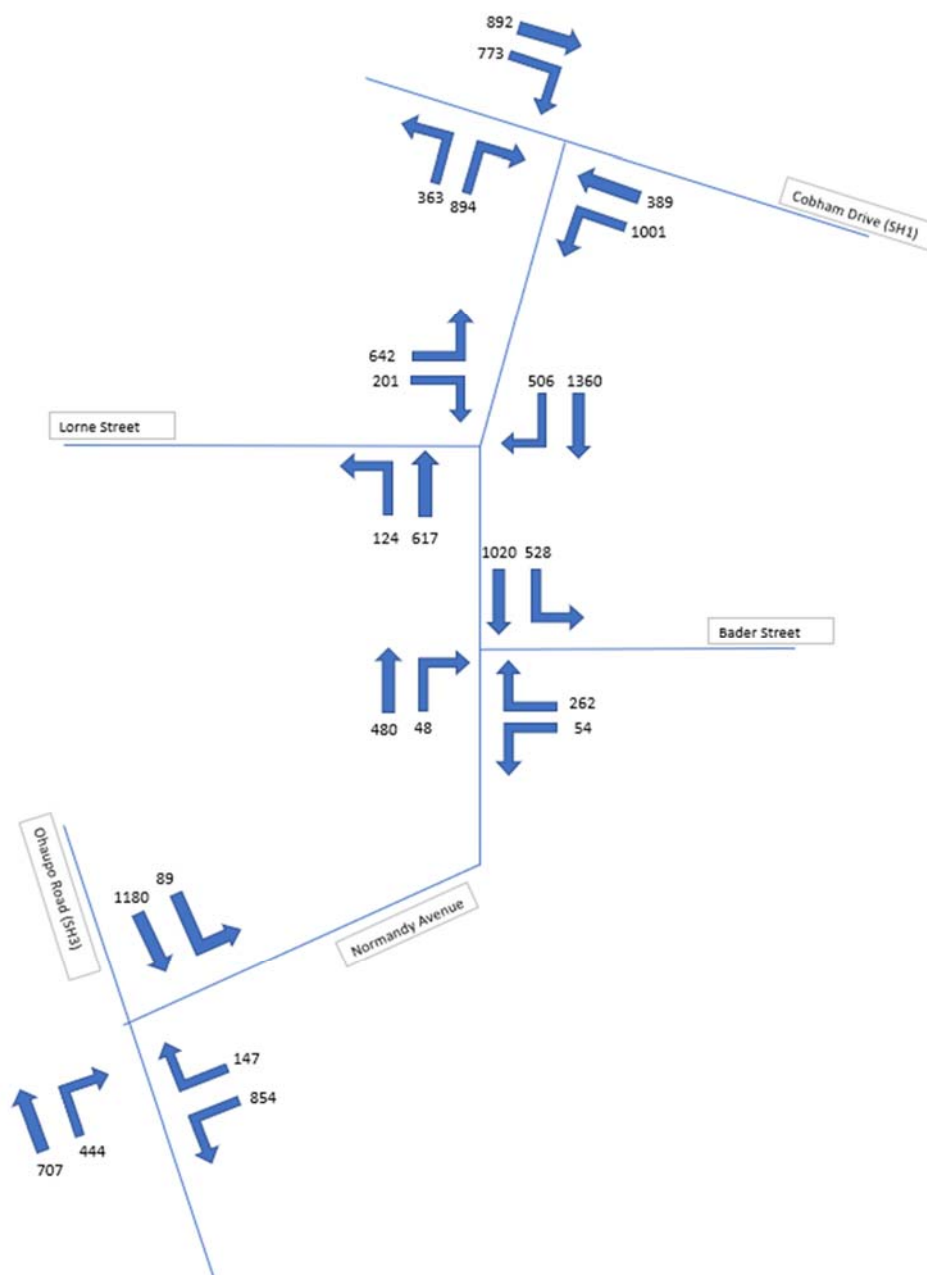


Figure 7: PM Peak Traffic Count on Normandy Ave (April 2016)

2.3 Accident History

The New Zealand Transport Agency Crash Analysis System (CAS) was used to assess all the injury crash records on the access routes to the proposed subdivision between 2007 and 2017. **Figures 8-10** outline the extent of the road network that has been reviewed and provides an overview of reported crash locations.

Overall the only noticeable patterns in crashes over the ten year period that has been examined are the concentration of crashes on Bader Street near the local shops close to Normandy Avenue, crashes at the Bader Street-Norrie Street bend and crashes at bends on the rural section of Peacockes Road.

Peacockes Road

There were a total of 23 crashes recorded on Peacockes Road with 20 occurring on a 3km rural section. Nine of the crashes involved injury and of these five were minor injury crashes, three were serious injury crashes and one was a fatal crash.

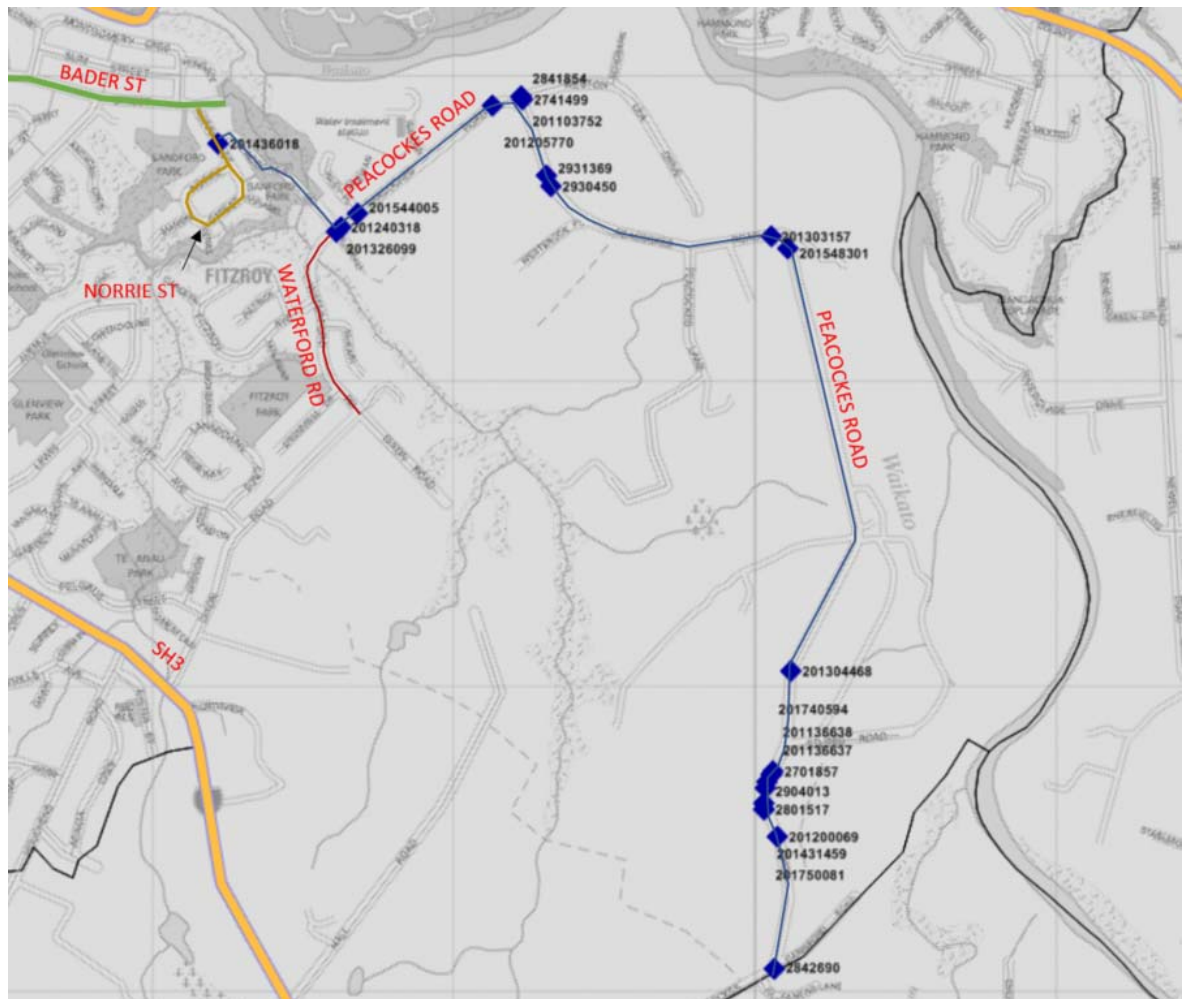


Figure 8: Collision Diagram - Peacockes Road (2007-2017)

The fatal crash occurred 440m north of Gainsford Road on a windy section of Peacockes Road south of the Amberfield subdivision boundary. The crash involved a car losing control

Three other injury crashes involved cars losing control negotiating curves close to the fatal crash site. There were also five non-injury accidents recorded on this section of Peacockes Road. This number of accidents on a relatively short section of road is indicative of an existing safety issue. One of the bends in the section has chevron signs but does not have advisory speed signs. It is considered that these should be provided along with additional chevron signs as a response to the existing safety issue.

Another injury accident occurred at the bend in Peacockes Road near the northern end of the proposed subdivision which is to be eased as part of the proposed upgrading of Peacockes Road.

The ninth injury accident occurred at the intersection of Peacockes Road with Waterford Road and Plateau Drive involving a motor cyclist failing to give way. It is likely that the probability of this type of accident occurring will diminish when the roundabout proposed by Council is constructed at this intersection.

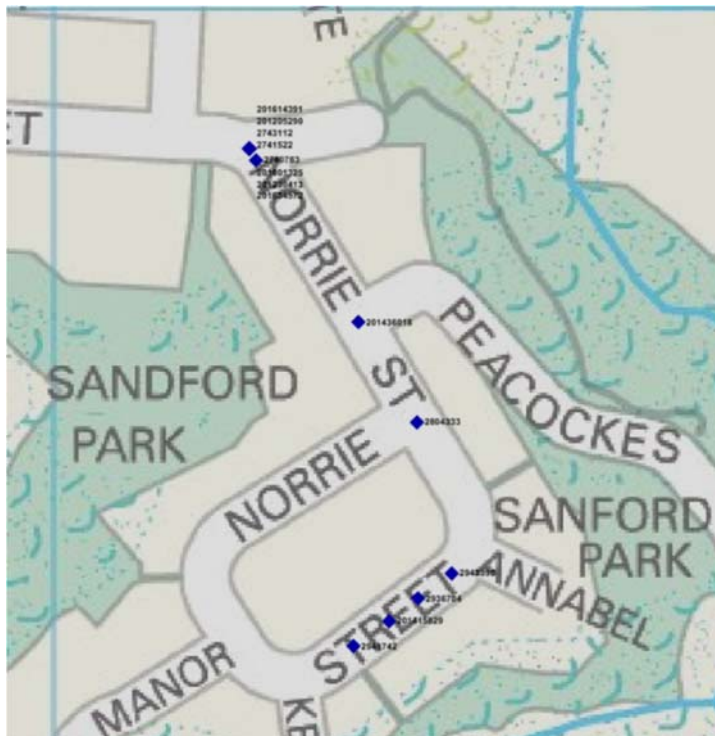
There were a total of 69 crashes on Bader Street over 50 of them in the vicinity of the local shops near the intersection with Normandy Avenue. Fourteen were minor injury crashes and one was a serious injury crash.



Nine of the minor injury crashes were due to vehicles failing to give way, two were due to the vehicle losing control on a curve, and the other three were due to inattentive drivers,

The serious injury crash occurred at the Normandy Avenue intersection when a driver failed to give way to oncoming traffic when turning. This intersection is signal controlled and it is unlikely that any improvement measures would be able to address this type of accident.

There were a total of fourteen crashes on Norrie Street. Nine of these occurred on the section of Norrie Street between Peacockes Road and Bader Street, of which three were minor injury crashes.



Two of the minor injury crashes involved vehicles losing control on the bend between Bader Street and Norrie Street. The third injury crash was due to a driver failing to give way to non-turning traffic when turning. Most of these accidents will be addressed by the Council improvement proposals for this route which involve road widening and adding median islands at the Norrie Street intersections (bend) with Bader Street and Peacockes Road (see Appendix B).

The Hamilton urban area has a relatively intensive system of bus routes which link to a central bus interchange.

In the vicinity of the Peacocks Structure Plan Area there is an existing bus route (No. 12) which extends along Bader Street into Peacocks Road and then along Waterford Road. It

loops through the local road network at Fitzroy and onto Dixon Road where a terminal is provided. This route has a frequency of 30 minutes and operates between 7am and 9pm.

There is another bus routes (No. 7) which utilises Ohaupo Road to service the Glenview urban area further to the west from Peacockes.

There are currently no bus services running down the rural section of Peacockes Road passing the Amberfield subdivision site.

2.5 Existing Active Transport Facilities

The rural section of Peacockes Road passing the Amberfield subdivision site does not have any facilities for cyclists or pedestrians. Currently cyclists share the road carriageway with motor vehicles because with the carriageway only being 6m wide there is not sufficient width for two cars to pass adjacent to a cyclist.

There are no footpaths along this rural section of Peacockes Road and the pedestrians who use the road for recreation use the road carriageway or the grass berm when motor vehicles are passing.

As described in Section 2.1, footpaths are provided along the urban sections of Peacockes Road on at least one side. There are footpaths on both sides of Norrie Street and Bader Street.

There is an existing network of cycleways and off-road shared paths linking to and crossing the section of Peacockes Road north of Waterford Road and also linking to Bader Street. These paths connect at the SH1 river bridge to the path along Cobham Drive leading to the CBD.

3. Transportation Planning

3.1 Future Roding Projects

The arterial roads in the Peacockes Structure Plan area have been planned as part of the long term Southern Links project. This includes a south-western bypass of Hamilton City linking to both SH3 and SH1 to the south.

Figure 11 indicates the Southern Links project road network designations and the other major future roding projects that are committed for funding and construction as part of the Hamilton arterial road network in the general vicinity of the Peacockes Structure Plan area.

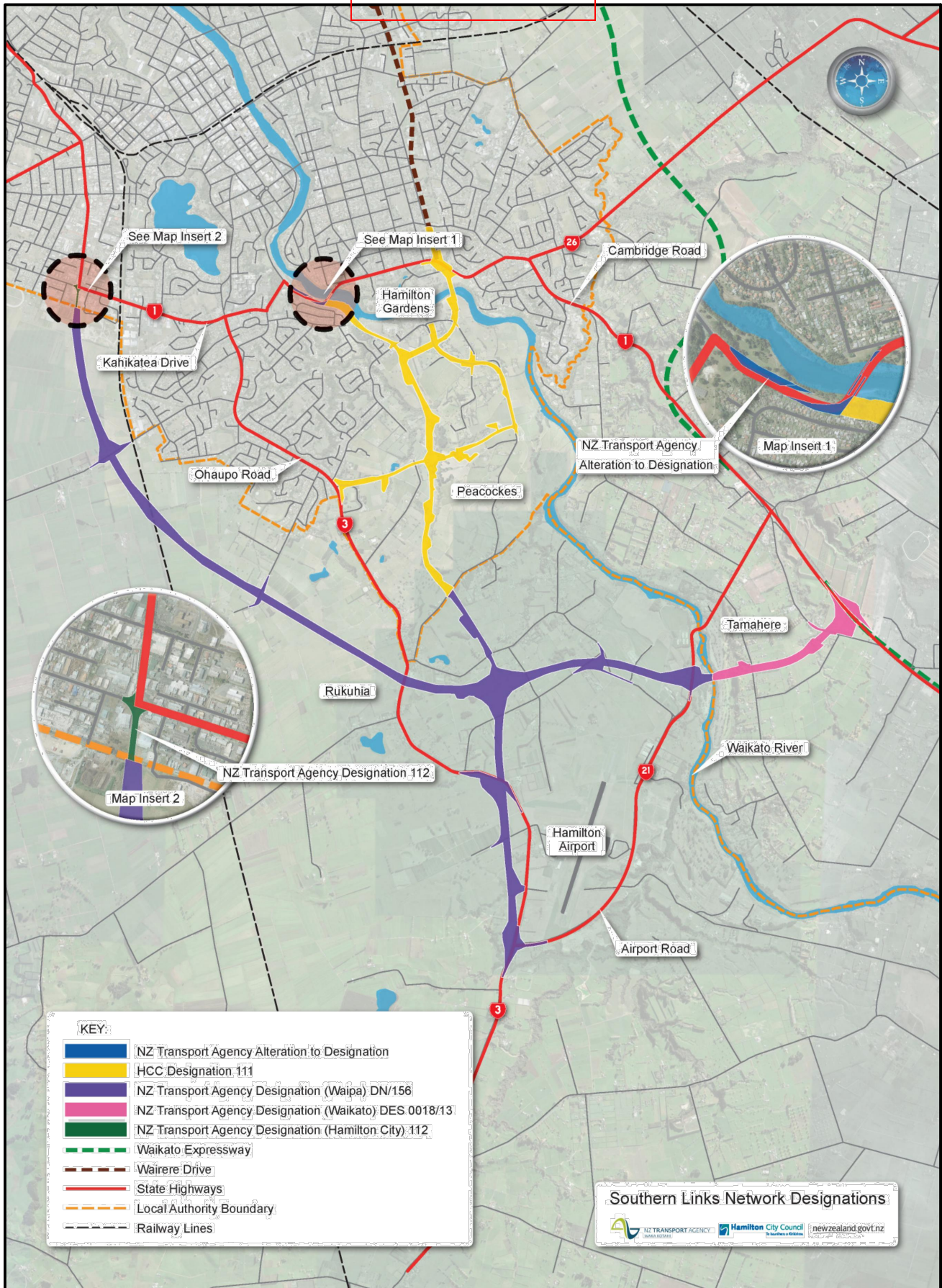
A major project which is currently under construction is the Waikato Expressway which forms a bypass of the Hamilton urban area for SH1 on the eastern side of the city. This will link back into the existing alignment of SH1 to the south of the city but north of the state highway (SH21) link from SH3 passing the airport. This will provide an alternative route for traffic from SH3 south to the eastern side of Hamilton and to the north of Hamilton. As a result, this will reduce the traffic volumes on the section of SH3 (Ohaupo Road and Normandy Avenue) from which access to the Amberfield subdivision will be obtained.

Figure 11 also shows the Wairere Drive link which will complete the inner circular route to SH1 in the vicinity of the Hamilton Gardens. This is programmed for early completion and construction has been started. It is being coordinated with an interchange at SH1 which will allow for the future construction of a new link and river bridge connecting to the Peacockes area.

Within the Peacockes area the Southern Links project allows for a north-south arterial formed as an extension of Cobham Drive and linking all the way to the southwestern links bypass and on to SH3. The Wairere Drive link and new river bridge is part of a route that links to the north-south arterial at the northern end of the Peacockes area.

There will also be an east-west arterial linking from a new intersection on SH3 south of Dixon Road to the north-south arterial and on to the neighbourhood centre proposed on Peacockes Road within the Amberfield subdivision. It is understood that a roundabout is currently being designed for the new intersection on SH3 and that it should be constructed within the next two years. The initial section of the East-West Arterial will be constructed to allow development of Stage 1B of Peacockes and to provide existing traffic with better access to SH3. This will reduce the amount of traffic from this area using the Waterford-Peacockes-Bader route at peak times and leave more capacity on this route for traffic generated by the Amberfield subdivision.

The Southern Links project also includes the urban upgrading of the section of Peacockes Road from the new Wairere Drive river bridge link to the east-west arterial to a minor arterial standard road. A high-level design has been prepared by AECOM for the City Council which defines a roding designation that allows for significant earthworks identified as part of the design process. However it is noted that the section of Peacockes Road south of the east-west arterial has not been designated for a minor arterial road as part of the Southern Links project, even though it is classified as a future minor arterial in the District Plan.



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While the Southern Links projects are not “committed” in terms of budgeting, some of the projects have been included in a proposal to the Government for funding through the Housing Infrastructure Fund (HIF) which was recently introduced to help high growth urban Councils with available land areas that require expensive infrastructure to facilitate further residential development.

3.2 Peacockes Structure Plan

Figure 12 illustrates the Structure Plan produced for the Peacockes area showing the proposed roading network that contains the elements described in the previous section. It also indicates the general location of lesser roads including Collector Roads and cycleway/walkway links.

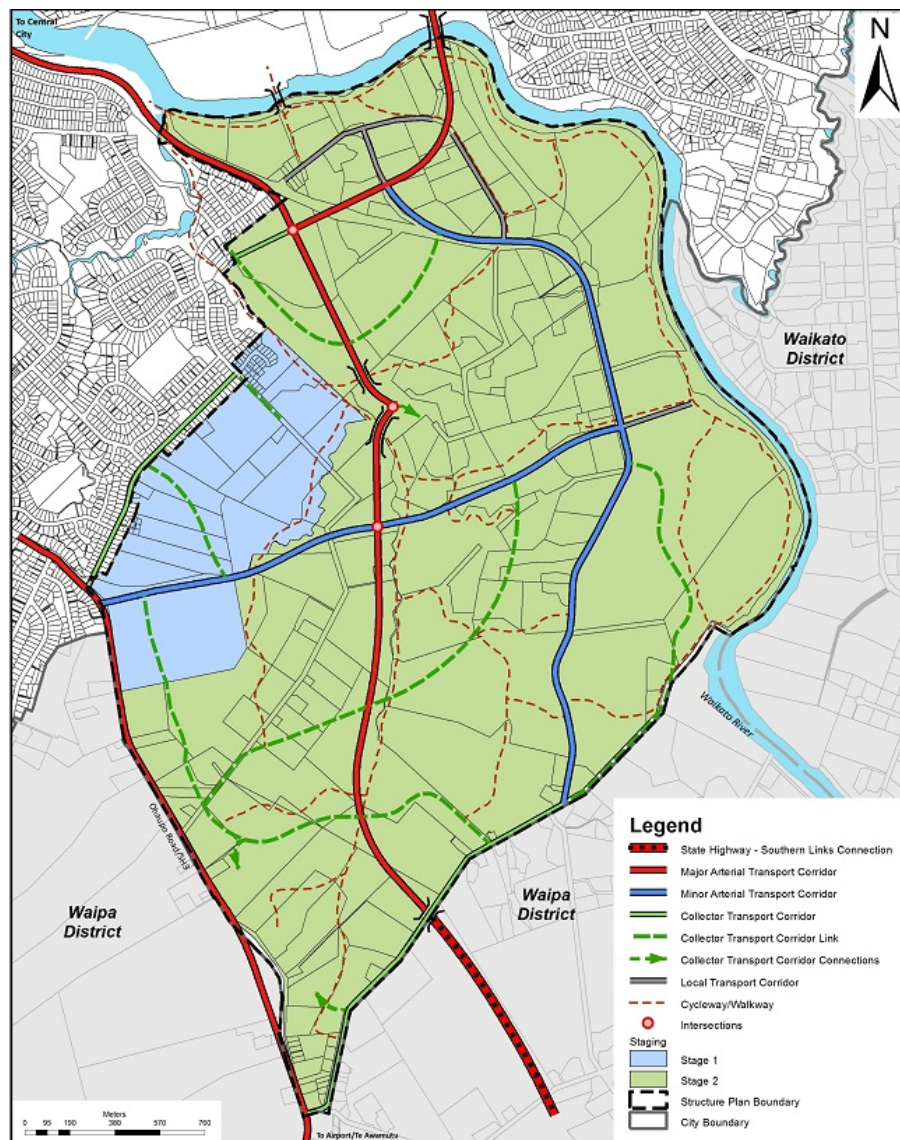


Figure 12: Proposed Roading Network Contained Within Structure Plan

The Structure Plan area is split into stages. Stage 1 is indicated in blue with the Stage 1A section above the east-west arterial (shown as a dark blue minor arterial route) permitted to accommodate approximately 660 lots. Stage 1B is the block to the south of the east-

west arterial and it will accommodate approximately 350 lots. The rest of the area is labelled as Stage 2 and indicated in green.

Peacockes Road is also shown as a blue road indicating a minor arterial standard for its entire length from the Waipa District boundary in the south to the new Wairere Drive and river bridge link (indicated in red) which is a major arterial.

The existing section of Peacockes Road north of the Wairere Drive link extending to the north-south arterial is indicated as a “local transport corridor” which will be severed by the north-south arterial and form a cul-de-sac at that point.

A Collector Road is indicated on the east side of Peacockes Road from just south of the east-west arterial passing through the Amberfield subdivision before connecting back to Peacockes Road at the Waipa District boundary. There is another Collector Road on the west side of Peacockes Road near Peacockes Lane that links to Plateau Drive. However it is understood from discussions with Council staff that Council no longer considers the collector road classification for this road to be necessary.

The Structure Plan map also indicates that Weston Lea Drive will be severed by the link from Wairere Drive and the new river bridge forming two cul-de-sacs; one using the existing intersection with Peacockes Road and one which requires an extension of Weston Lea Drive to form a new intersection on the north-east side of Peacockes Road opposite Peacockes Lane. The AECOM design indicates a future roundabout for this intersection.

A shared cycleway/walkway facility is proposed along Weston Lea Drive which is expected to be grade-separated from the new river bridge link. This connects across Peacockes Road but will also link to Peacockes Road and the shared path which is proposed along Peacockes Road. There are also links from Weston Lea Drive to the cycleway/walkway route that is indicated following the full length of the Waikato Riverbank adjacent to the Peacockes Structure Plan area and which is incorporated as part of the Amberfield subdivision proposals. The riverside path is likely to form part of the Te Awa Cycleway that is planned to follow the river from north of Hamilton to the south.

A cycleway link from Peacockes Road to the riverbank is shown on the Structure Plan as an extension of the east-west arterial. Another link follows the gully which separates the “island” at the eastern extremity of the Amberfield subdivision on the bend of the Waikato River.

3.3 Housing Infrastructure Fund

The HIF proposal includes elements of the Southern Links road network which was indicated in **Figure 11**. **Figure 13** indicates those elements intended to be constructed under the HIF. It includes the Wairere Drive extension and the new river bridge link extending to the future alignment of the north-south arterial and on to link with Plateau Drive.

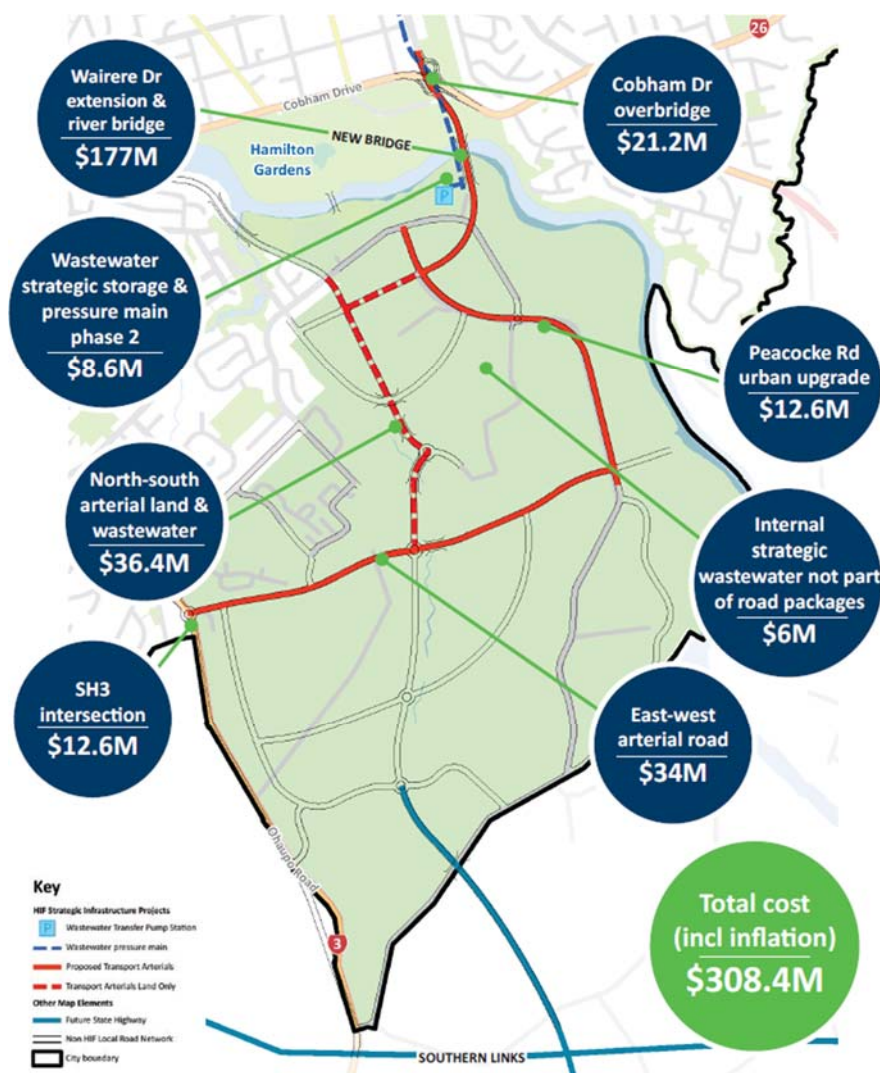


Figure 13: Infrastructure Intended to be Constructed Under the HIF and Related Costs

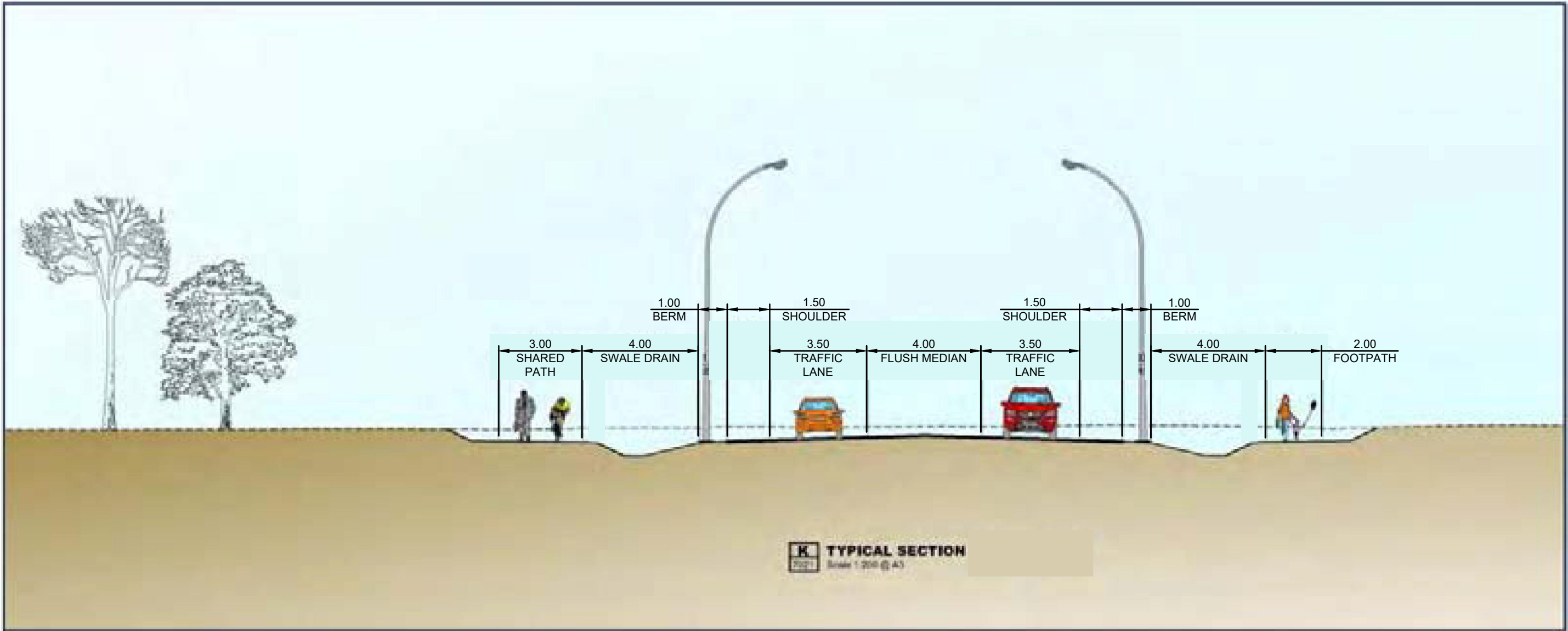
The HIF does not include funding for the construction of the north-south arterial but does include a budget for the purchase of land for the section of the north-south arterial between the existing road designation at Peacockes Road adjacent to the Council water treatment plant through to the east-west arterial.

The HIF road network proposal includes the new east-west arterial and the urban upgrading of Peacockes Road between the new river bridge link and the east-west arterial. As discussed before, the urban upgrading of this section of Peacockes Road (and the east-west arterial) will be to a minor arterial standard. **Figure 14** indicates the cross-section proposed by the AECOM concept design which was used for the identification of the roading designation for this section of Peacockes Road.

The cross-section includes a 4m wide median (either flush painted or raised), two 3.5m wide traffic lanes, 1.5m wide shoulders, 1m wide strip for services, 4m wide swales and a 3m shared path on one side and a 2m footpath on the other side. This requires a total road formation width of about 29m. The road designation is significantly wider in locations (up to 80m) where significant earthworks were identified.

It is understood that the Hamilton City Council has received confirmation from the Government for funding under the HIF to construct these elements in the relatively near future. However the funding is still dependent on the outcome of the Council's Draft 10-Year Plan which is currently being consulted on. Therefore final acceptance of the proposal has not been confirmed and no definitive timeframe for the construction of the various roading elements (and other infrastructure elements) has been identified at this time. Accordingly, while the proposed subdivision has been designed to be consistent with the roads to be constructed under the HIF, it is not dependent on any of those roads being constructed before the subdivision can be fully developed.

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K TYPICAL SECTION
Scale: 1:200 @ A3

REV	DATE	DRN	DESCRIPTION	CHK	APPR
0	09/05/2018	AKJ	ISSUED FOR INFORMATION	N/A	N/A

WESTON LEA LTD - AMBERFIELD SUBDIVISION
MINOR ARTERIAL URBAN UPGRADE OF PEACOCKES ROAD
TYPICAL CROSS SECTION (AECOM)

DRN: AKJ	DATE: 09/05/2018	REV: 0
SCALE: NTS		
STATUS:		
DWG NO: 13646_C6B		



4. Proposed Subdivision

4.1 General

The subdivision proposed by Weston Lea Ltd for Stage 2 of the Peacockes Structure Plan area will be a predominantly residential development containing a mixture of relatively low density and some medium density housing.

Figure 15 shows the proposed road network for the Amberfield subdivision together with the indicative lot configuration. The speed limit on all the roads within the subdivision (and on the adjacent sections of Peacockes Road) will be 50 km/h.

Provision will be made for a neighbourhood centre adjacent to the junction of Peacockes Road and the future east-west arterial road. The neighbourhood centre area will be retained in two super lots, informed by the Master Plan and subject to future land use and subdivision consent applications.












4.2 Peacockes Road (North)

Peacockes Road is the spine road to which the subdivision road network will be connecting, and which provides all access between the subdivision and other areas. Peacockes Road is indicated to be a minor arterial road in the Peacockes Structure Plan (and a proposed minor arterial road in the Hamilton District Plan roading hierarchy) for the entire length adjacent to the subdivision and also to the north and south of the subdivision. It is proposed that Peacockes Road will be upgraded under the HIF to an appropriate urban standard minor arterial road. This will involve the easing of the bend in the existing road at the northern end of the Amberfield subdivision and the construction of a wider road formation between the new road associated with the new river bridge and the neighbourhood centre. The widening will be largely on the eastern (Amberfield) side of the existing road reserve (see **Appendix A1**).

The Council has had a high level preliminary design prepared by AECOM for the upgrading of Peacockes Road to a minor arterial standard. This has been done as part of the Southern Links project to inform the designation boundaries and has also been used in the HIF negotiations with the Government. The designation is very wide as it allows for a 29m wide road formation plus earthworks required for cut and fill on each side of the road.

The high-level design has been revised slightly as part of this consent application process to better fit the existing land form and to reduce the amount of earthworks required. By doing this, the earthworks on the east side within the subdivision will be able to achieve land levels which will allow the development of residential properties immediately adjacent to the road formation. It is anticipated from discussions with Council staff that the Council will partly surrender the existing road designation to release this land within the designation so that it can be developed for residential lots.

LEGEND:

-  EXISTING BOUNDARY
-  PROPOSED LOT BOUNDARY
-  PROPOSED PEACOCKES RD DESIGNATION BOUNDARY
-  B. LOCAL ROAD: 20m
-  C. LOCAL ROAD WITH CYCLE LANE : 20m
-  D1. LOW VOLUME LOCAL ROAD (PARKING BOTH SIDES): 16.4m
-  D2. LOW VOLUME LOCAL ROAD SINGLE PARK LANE: 14.1m (COASTED LINE INDICATES SIDE OF ROAD WITH PARKING)
-  E. LOCAL PARK EDGE ROAD: 13.5m
-  FUTURE ROAD
-  PROPOSED PARKS
-  PEDESTRIANS PATH / LINK (REFER TO LANDSCAPE ARCHITECTS DRAWINGS FOR DETAILS)



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WESTON LEA LTD - AMBERFIELD SUBDIVISION
PROPOSED ROAD HIERARCHY PLAN



15

SCALE: NTS

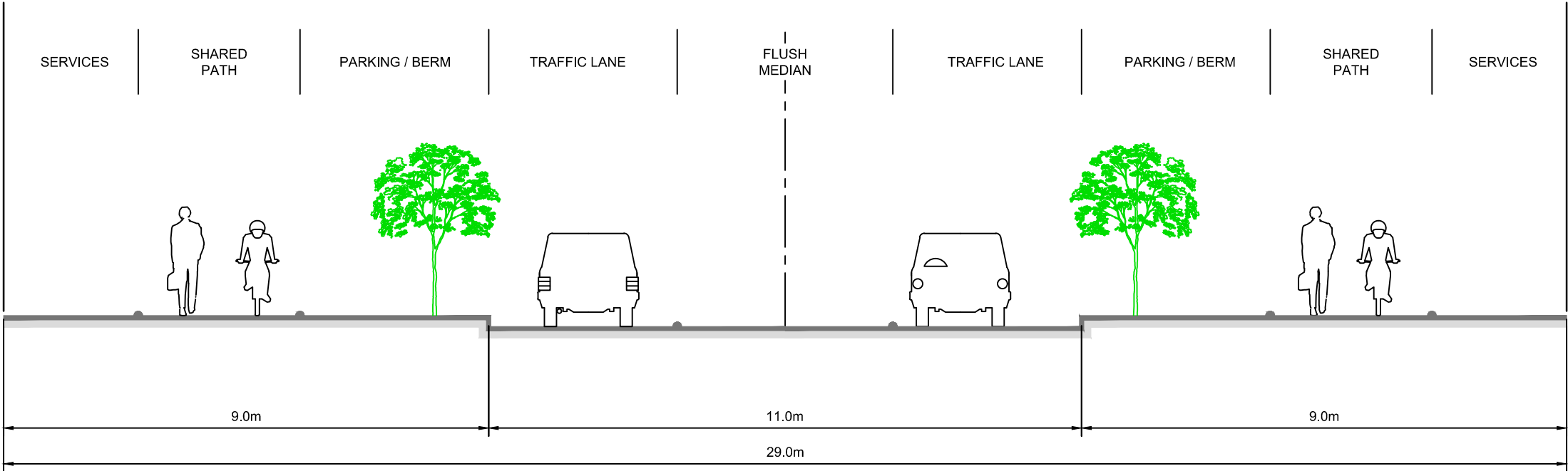
The earthworks for the subdivision and the access roads intersecting with Peacockes Road will be designed to match the levels of the full minor arterial upgrading of Peacockes Road. It would be possible to upgrade the existing road to a collector road standard initially. A collector road would be consistent with the vertical and horizontal alignment of the minor arterial so that subsequent further upgrading to the minor arterial could be achieved readily. The collector road upgrading could be achieved relatively easily because it would be generally offset to the eastern side of the existing road where it is adjacent to the subdivision. At the northern end of the subdivision the alignment crosses to the western side of the existing road where the current sharp bend is intended to be eased. So again the construction can be largely undertaken clear of the existing road.

The collector road would include a 9m wide carriageway with kerb and channel, kerbside parking/bio-retention facilities, shared path and berm on the east side. As noted before, the Council would decide what would be constructed on the west side.

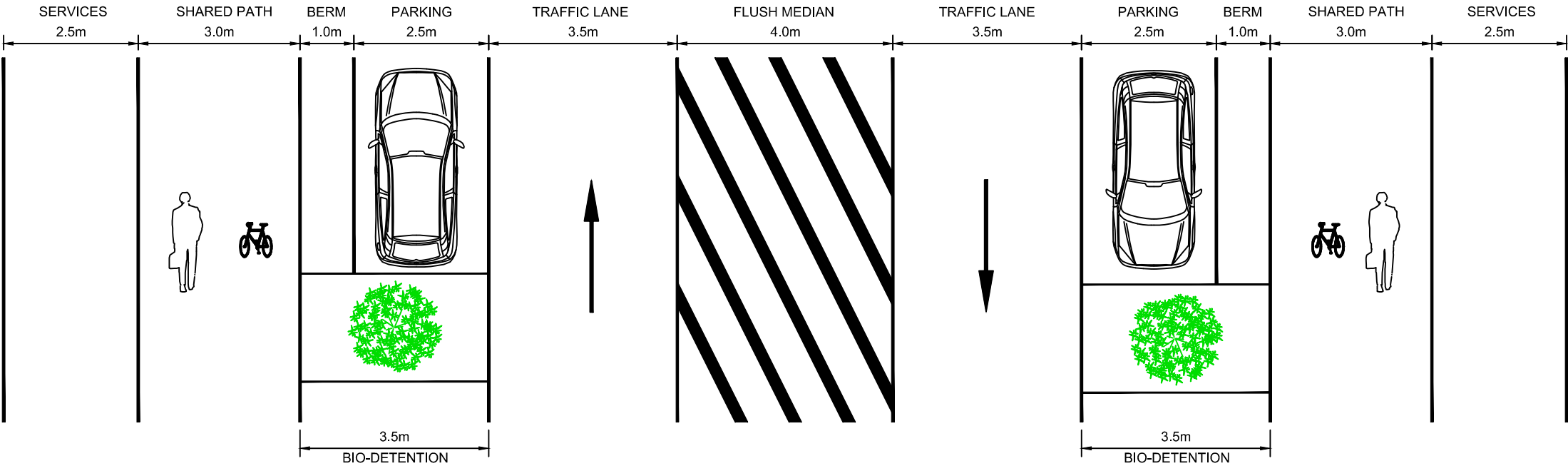
The Council have agreed that the cross-section for the minor arterial upgrade could be changed to include kerb and channel as well as kerbside carparking interspersed with bio-retention facilities. The cross-section proposed for the minor arterial standard section of Peacockes Road north of the neighbourhood centre is illustrated in **Figure 16a**. The carriageway is not altered but 3.5m is allocated on both sides for carparking and bio-retention instead of swales. It is proposed that 3.0m wide shared paths should be provided on both sides together with 2.5m wide services strips. This retains the 29m wide road formation on which the current designation is based.

There will be three side roads off Peacockes Road north of the neighbourhood centre providing access to that area of the subdivision. The traffic using these access roads will be dispersed by a local road running north-south parallel to Peacockes Road. The three access roads also link through to the riverside where a series of roads running parallel to the river provide further distribution.

To reduce the number of intersections along Peacockes Road and to achieve appropriate separation between intersections, some properties between the north-south local road and Peacockes Road will be served by either cul-de-sacs or accessways to rear lots. Lots adjacent to Peacockes Road will be accessed directly from Peacockes Road as much as possible. This together with the kerbside car parking proposed will create side friction which helps to provide traffic calming and limit the operating speeds along Peacockes Road. Council staff have advised that they favour access to properties directly off Peacockes Road where this is practical.



MINOR ARTERIAL ROAD
INDICATIVE CROSS SECTION
REFER BELOW FOR MORE DETAILED DIMENSIONS



16A

NOT FOR
CONSTRUCTION

Wednesday, May 9, 2018 0 20mm

REV	REVISION DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE	WESTON LEA LTD - AMBERFIELD SUBDIVISION PEACOCKES ROAD UPGRADE ROAD CORRIDOR CROSS SECTION MINOR ARTERIAL ROAD: NORTH OF EAST WEST ARTERIAL	TDG	ASSOCIATION OF CONSULTING ENGINEERS NEW ZEALAND ACENZ ISO 9001 QUALITY ASSURED	STATUS: WORKING PLOT DATE: 09/05/2018 TDG DRAWING NO: 13646N2C	SCALE: 1:100 @ A3 SHEET NO: 1 of 2	REV
A	Road corridor cross sections issued for discussion	MP			01/02/2018						
B	Change of title on sheet 1 and 2	MP			21/02/2018						
C	Change of title on sheet 1 and 2	AKJ			09/05/2018						
											A

It is intended that the first part of the subdivision to be developed will be the northern area. This part of the subdivision will be accessed from the northern-most intersection on Peacockes Road which will initially be formed as indicated in **Figure 17**. This will involve the proposed upgraded cross-section of Peacockes Road and the final intersection form for the access road which will be constructed on the final vertical and horizontal alignment that eases the bend in the existing road. This new section of road will tie into the existing road on either side of the realigned bend. The upgrading of Peacockes Road further south will continue progressively as later areas are developed and new access roads required.

The initial layout for the northern access off Peacockes Road also includes the retention of a section of the existing road carriageway on the south side of the subdivision access road, as indicated in Figure 17. This section will be used to provide access to adjacent subdivision lots and will function as a shared use public cul-de-sac although it will be accessed via a “crossing” on the new access road.



REVISION	DATE	DESCRIPTION

WESTON LEA LTD - AMBERFIELD SUBDIVISION
Initial Access Intersection - Peacockes Road

DRAWN: MP
DATE: 09/05/2018
SCALE: 1:1000 @ A3
DWG NO:13646N5B

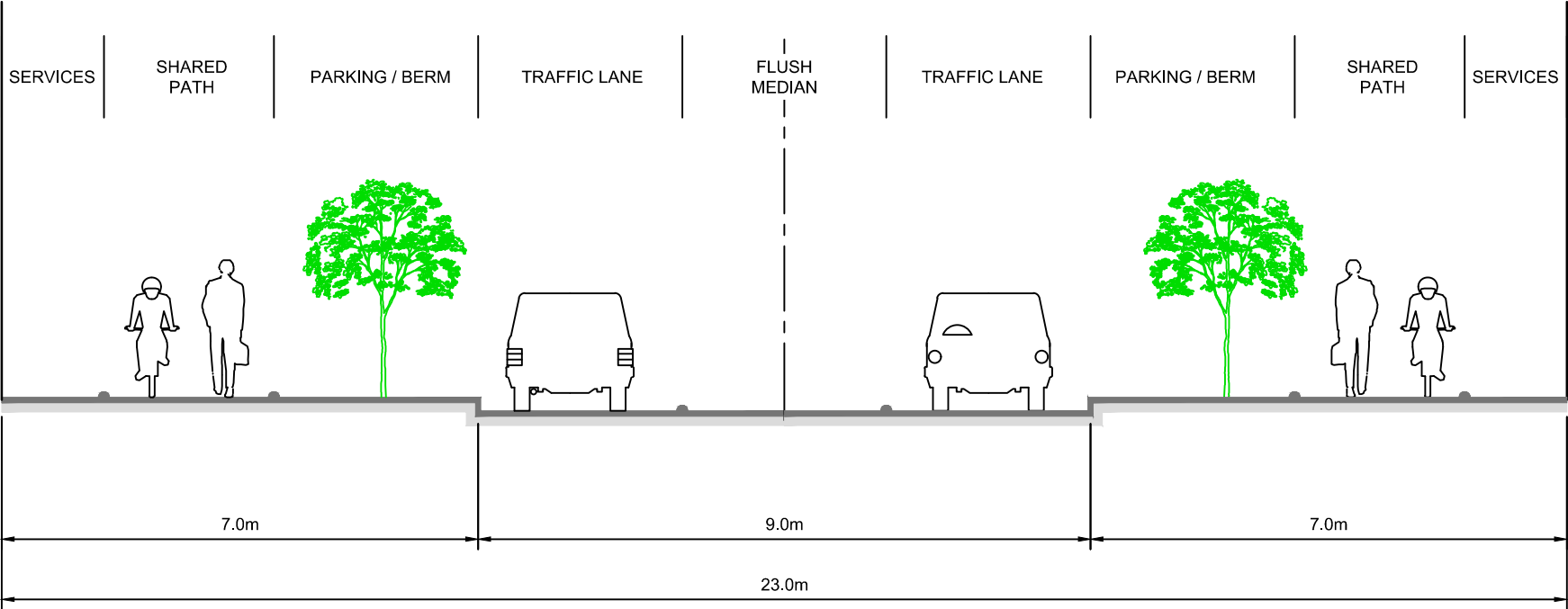


4.3 Peacockes Road (South)

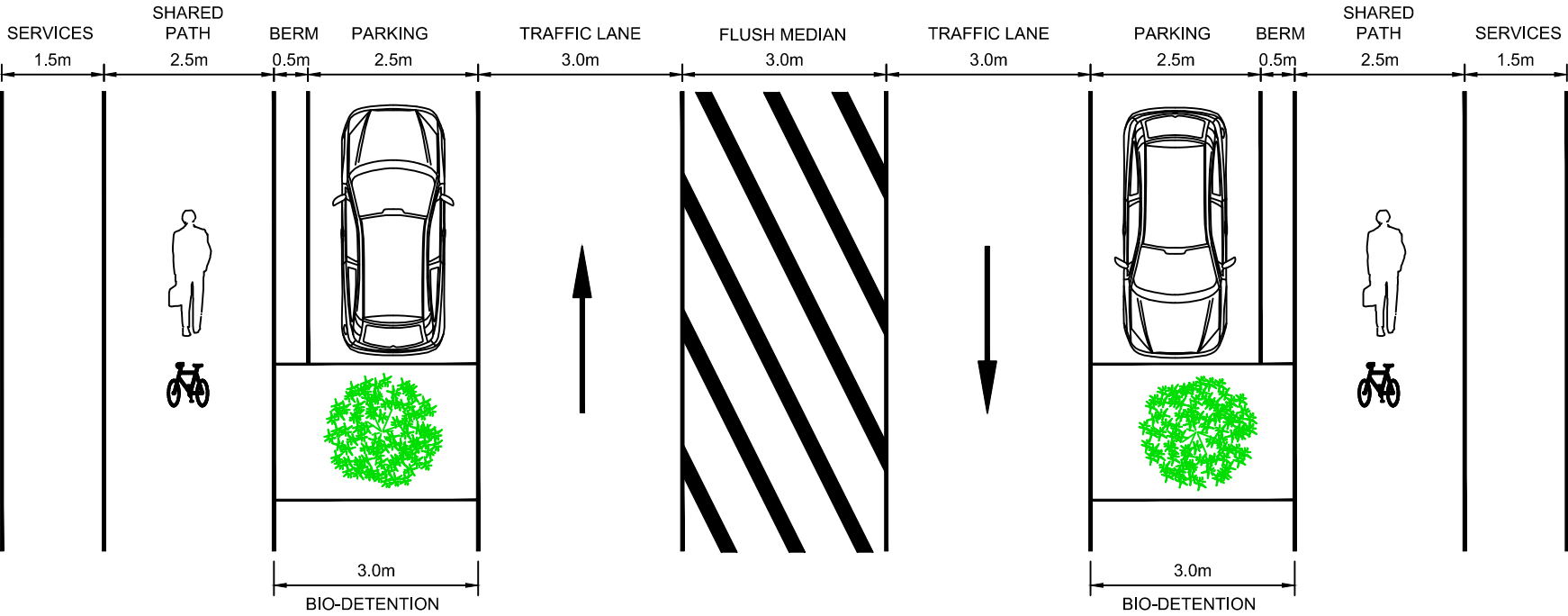
South of the neighbourhood centre Peacockes Road is also classified as a future minor arterial road but the traffic volumes on this section will be very low and do not justify the construction of a minor arterial for a long time. The Council wish to retain the minor arterial classification because of the expectation that at some stage in the future urban development will not only extend to the southern extremity of the Peacockes area but also over the existing Waipa District boundary as far as the natural boundary formed by the proposed south-western bypass expressway included in the Southern Links roading concept.

In the meantime however, the Council has indicated that it would consider the section of Peacockes Road south of the neighbourhood centre being upgraded to a collector road standard to service the Amberfield subdivision and future urban development on the western side of Peacockes Road.

Therefore it is proposed that when the adjacent sections of subdivision are developed, the existing road reserve will be widened and the existing road upgraded to a collector road standard (see **Figure 16b**). Given that this road is expected to operate in this format for many years, the existing road alignment which has some substandard vertical curves, will be improved to ensure a high quality facility. Again the extent and timing of the reconstruction of the west side of Peacockes Road will be decided by the Council.



COLLECTOR ROAD
INDICATIVE CROSS SECTION
REFER BELOW FOR MORE DETAILED DIMENSIONS



16B

NOT FOR
CONSTRUCTION

Wednesday, May 9, 2018
0 20mm

REV	REVISION DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE	WESTON LEA LTD - AMBERFIELD SUBDIVISION PEACOCKES ROAD UPGRADE ROAD CORRIDOR CROSS SECTION COLLECTOR ROAD: SOUTH OF EAST WEST ARTERIAL	TDG	ACENZ	ASSOCIATION OF CONSULTING ENGINEERS NEW ZEALAND	ISO 9001 QUALITY ASSURED	STATUS: WORKING PLOT DATE: 09/05/2018 TDG DRAWING NO: 13646N2C	SCALE: 1:100 @ A3 SHEET NO: 2 of 2	REV
A	Road corridor cross sections issued for discussion	MP			01/02/2018								
B	Change of title on sheet 1 and 2	MP			21/02/2018								
C	Change of title on sheet 1 and 2	AKJ			09/05/2018								

The current subdivision application proposes that 3m of the land owned by Weston Lea Ltd along the east side of Peacockes Road should be vested with the Council to form a 23m wide road reserve which is consistent with the width required by the Council for collector roads. The Council will then be able to require additional land to be vested on the western side of Peacockes Road as those properties are subdivided to form a higher standard minor arterial road if that becomes necessary at some stage in the long-term future.

A preliminary design for a collector road standard upgrade of Peacockes Road south of the east-west arterial and neighbourhood centre has been prepared as part of this subdivision application and the general configuration of that collector road proposal is included in Appendix A2.

There will be five access roads connecting the proposed subdivision with Peacockes Road south of the neighbourhood centre. One of these includes the existing Stubbs Road which will be upgraded to suitable local urban road standard. All of these roads link to the north-south local road which will provide the immediate distribution to lots close to Peacockes Road. However again the main access roads link further to roads running parallel to the gully that runs through the subdivision or in two cases to the “island” between the gully and the bend in the Waikato River.

The intersections along Peacockes Road will be constructed with pedestrian/cyclist crossings of the side road to promote the continuity and use of the proposed shared path along the east side of Peacockes Road.

These intersections will include right-turn lanes on Peacockes Road to optimise efficiency and road safety as indicated in the sample intersection layout plan included later in Figure 23. It is proposed that the northern-most intersection and the first intersection south of the neighbourhood centre will also have a left turn lane on Peacockes Road because they will attract more traffic movements than the other side roads.

In the future there will be a road on the east side of Peacockes Road to serve the proposed neighbourhood centre. This road will effectively be an extension of the east-west arterial albeit to a different “main street” standard that will be suitable for a retail street. The intersection of this road and the east-west arterial with Peacockes Road could be formed as part of this subdivision construction to facilitate the easy future construction of the east-west arterial and the neighbourhood centre if Peacockes Road was constructed to minor arterial standard from the outset. Previous designs for Peacockes Road have shown this intersection as a traffic signal-controlled facility. However it is not expected that this will be necessary in the foreseeable future (up to 2041) and therefore the intersection will be formed as a cross-road with provision for right-turning lanes on Peacockes Road and with Stop sign controlled approaches for the east-west arterial and the neighbourhood centre road.

4.4 Residential Roads

The next level in the road hierarchy is the “local” roads which provide access to the residential areas. This includes both local roads with cycle lanes and without cycle lanes. The local roads with cycle lanes include all the east-west aligned roads providing access into the subdivision from the section of Peacockes Road north of the neighbourhood centre. This is not because of the traffic volume they will carry necessarily but because of the

cycling link that the on-road cycle lanes will provide to the riverside paths. The first and fourth roads providing access from Peacockes Road into the subdivision south of the neighbourhood centre will also have cycle lanes that provide links to the paths through the gully and around the riverside.

The other local roads do not have cycle lanes and cyclists will be expected to share the carriageway with motor vehicles. This allows reduced carriageway widths that encourage slower vehicle speeds and improve safety. This is regarded as a positive benefit for road safety as cycle lanes on local roads where cyclist numbers are not high tend to result in the appearance of a wider carriageway and encourage higher vehicle speeds. These local roads will have parallel kerbside car parking bays which also add side friction and add to traffic calming, again lowering speeds and improving road safety.

The road reserve width for “local” roads is 20m in accordance with the District Plan.

The next standard of residential street is the “low volume” local road or minor local street. These are proposed to have a wider formation than the equivalent standard in the District Plan, in which a minimum road reserve width of 9m is permitted. The low volume / low speed local roads proposed for the Amberfield subdivision will all have a carriageway width of 5.6m with kerbside parking bays provided outside the carriageway. They also contain footpaths on both sides whereas the District Plan equivalent does not require footpaths and works on the basis of shared use of the road carriageway.

4.5 Residential Road Cross-sections

Drawings in **Figure 18a** and **Figure 18b** indicate the cross sections for the hierarchy of residential roads described in the previous section. Local residential streets with cycle lanes (C) will have an overall road reserve width of 20m with 3.0m wide traffic lanes and 1.8m wide cycle lanes. There will be 2.2m wide parking bays on both sides which will be interspersed with bio-retention areas proposed as part of the stormwater system. There will be 1.5m wide footpaths on both sides and also 1.5m wide berms which will act as service strips.

The local roads without cycle lanes (B) will also have an overall road reserve width of 20m and the traffic lanes will be 3.0m wide. In this case the parking bays will be 2.5m wide although 3.5m will be provided for the interspersed bio-retention facilities on one side. The footpaths will also be wider at 2.5m and the service strips will be 1.5m.

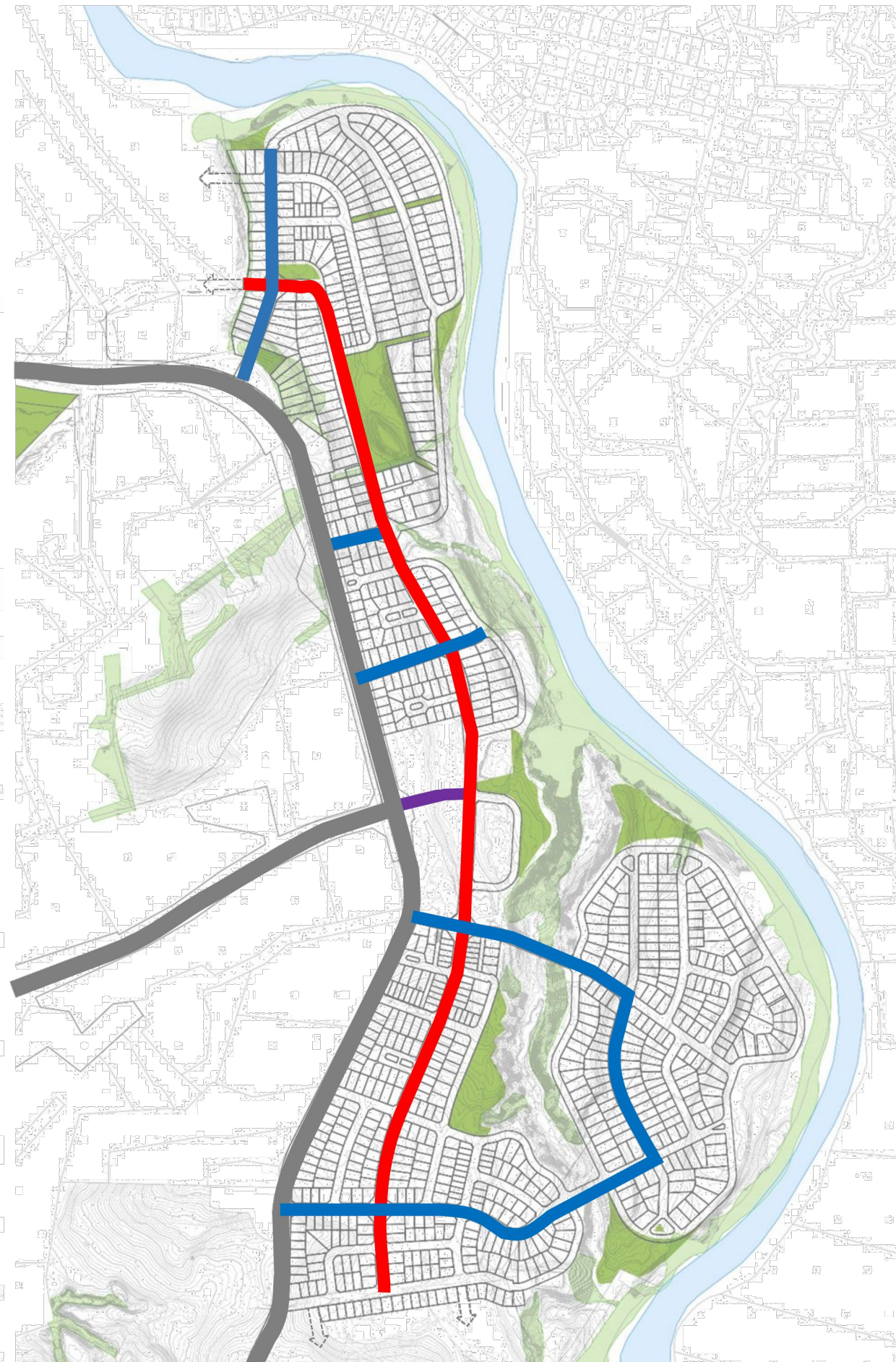
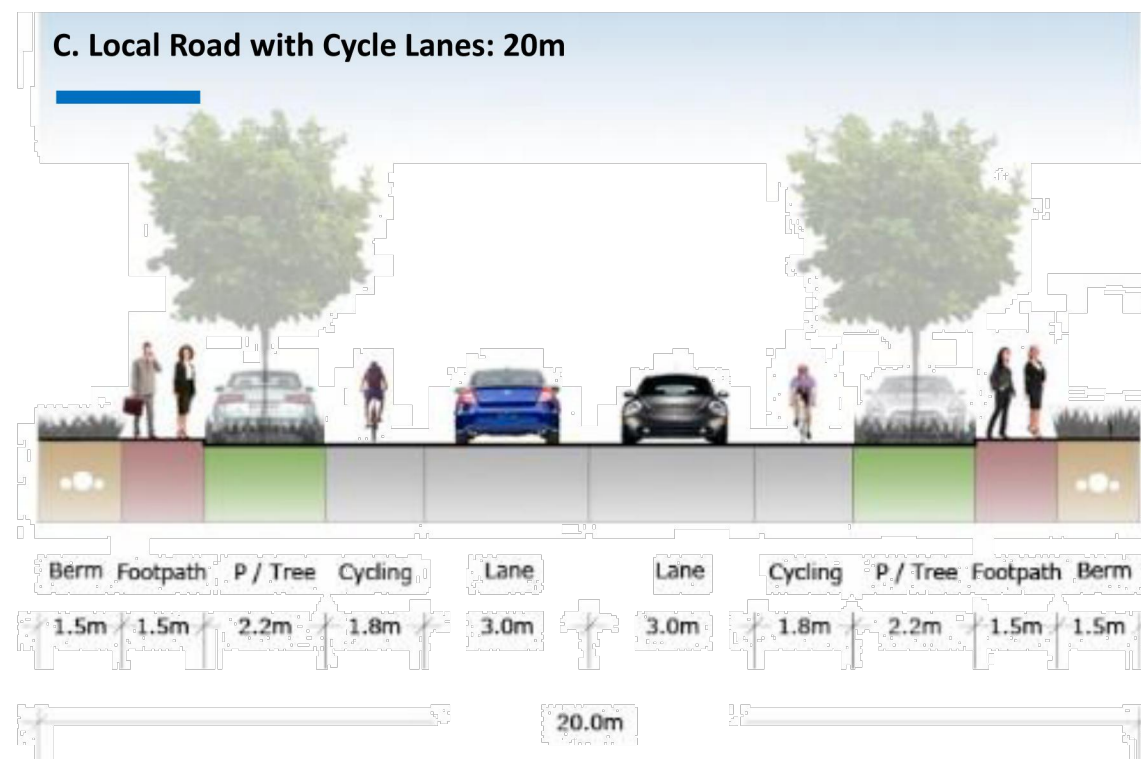
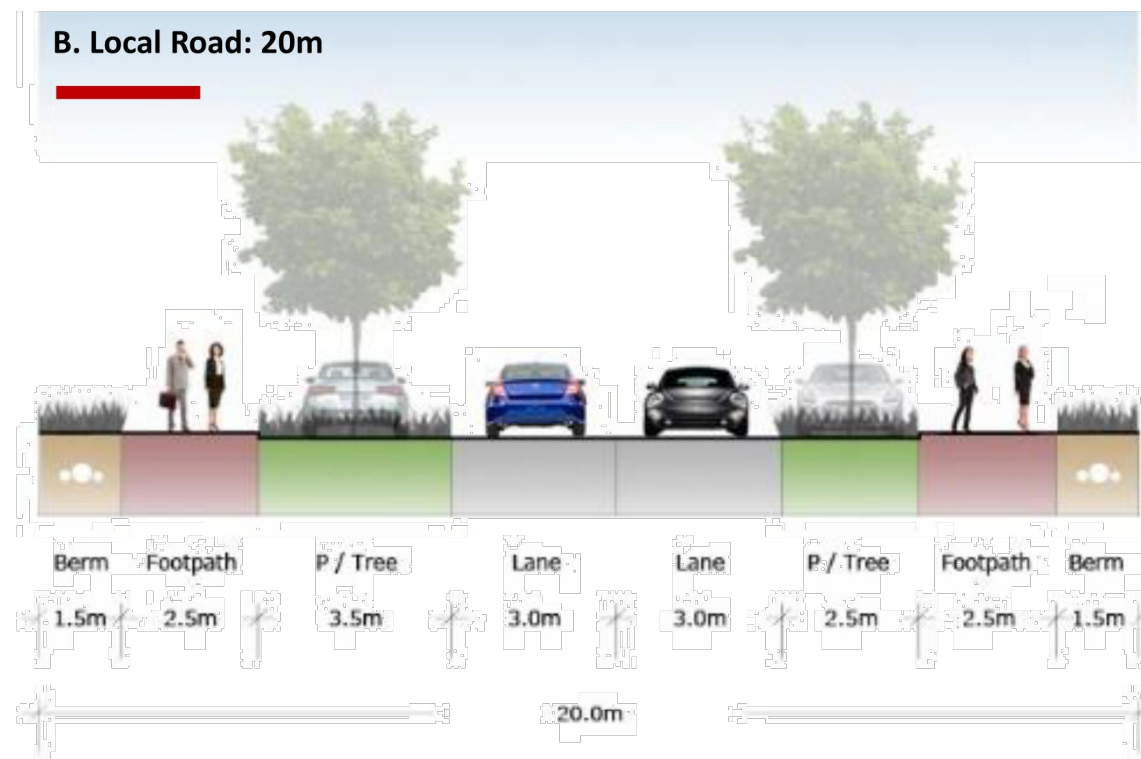
The low volume/minor local streets with parking on both sides (D1) will have an overall road reserve width of 16.4m with 2.8m wide traffic lanes. The parking bays in this case will be 2.4m wide with 1.5m wide footpaths and 1.5m berms for services.

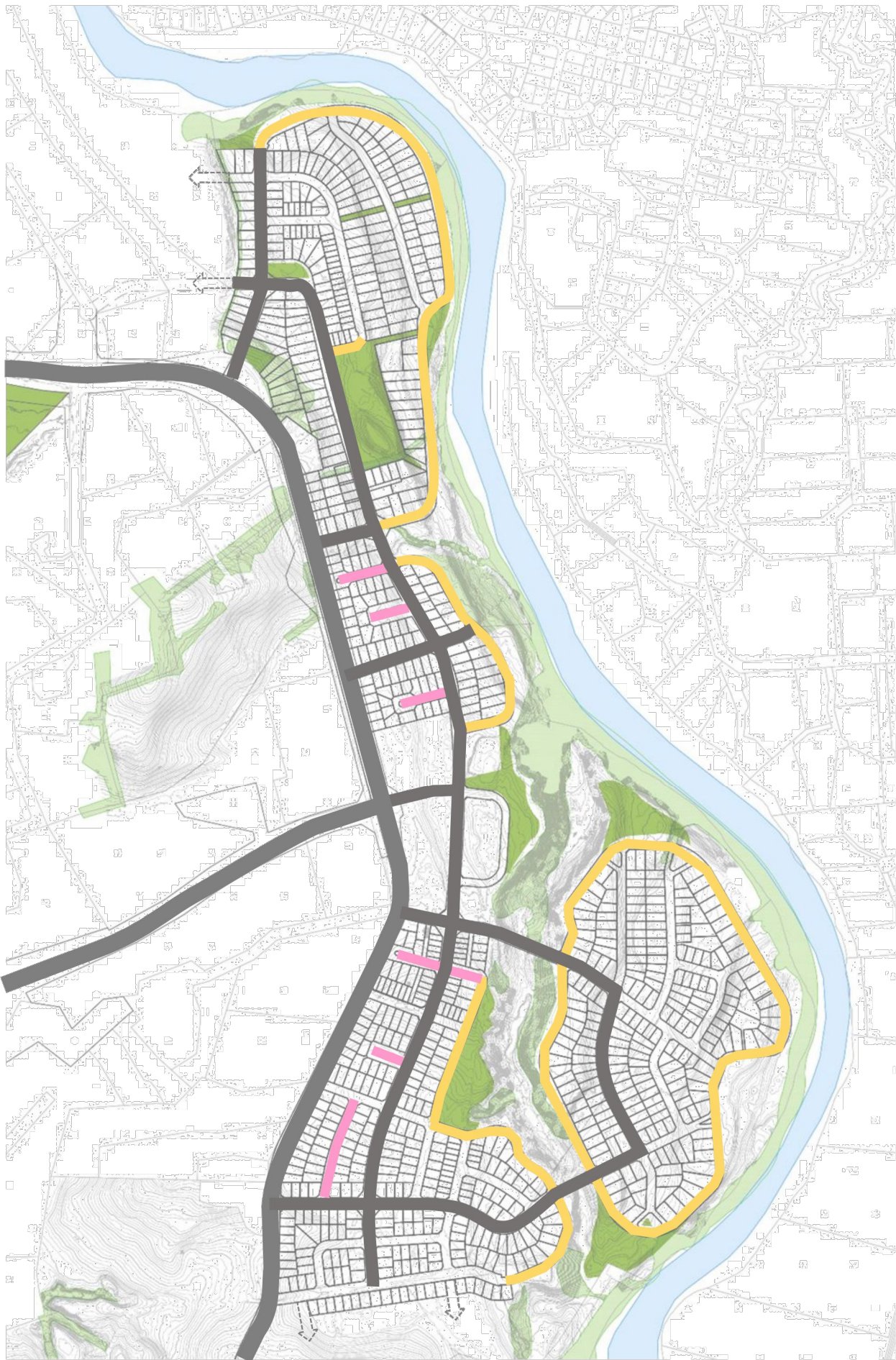
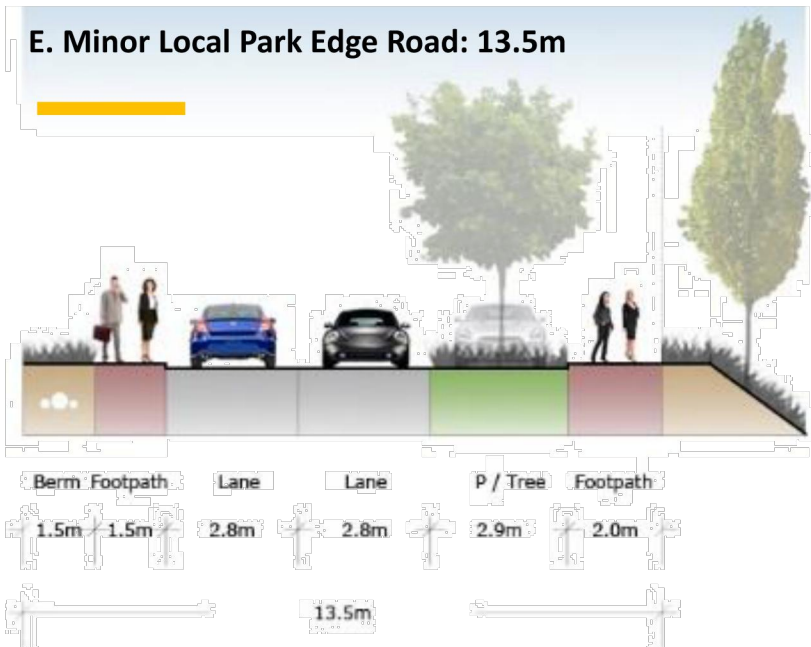
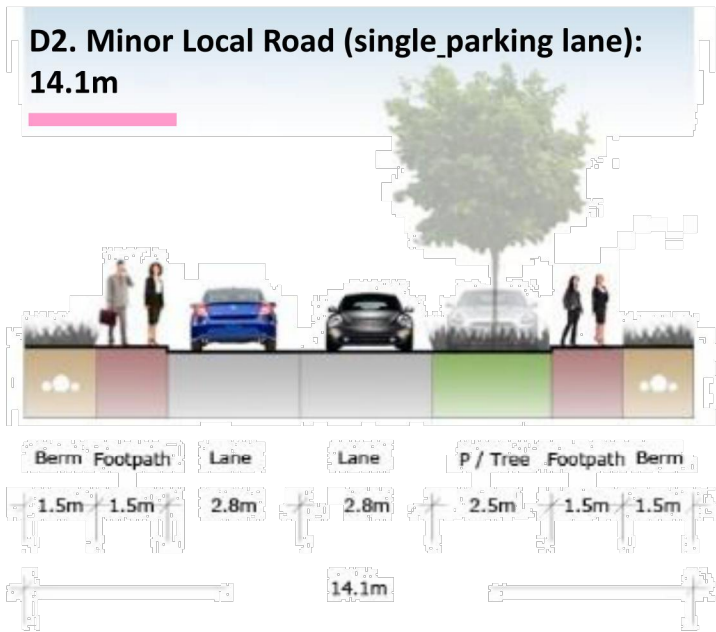
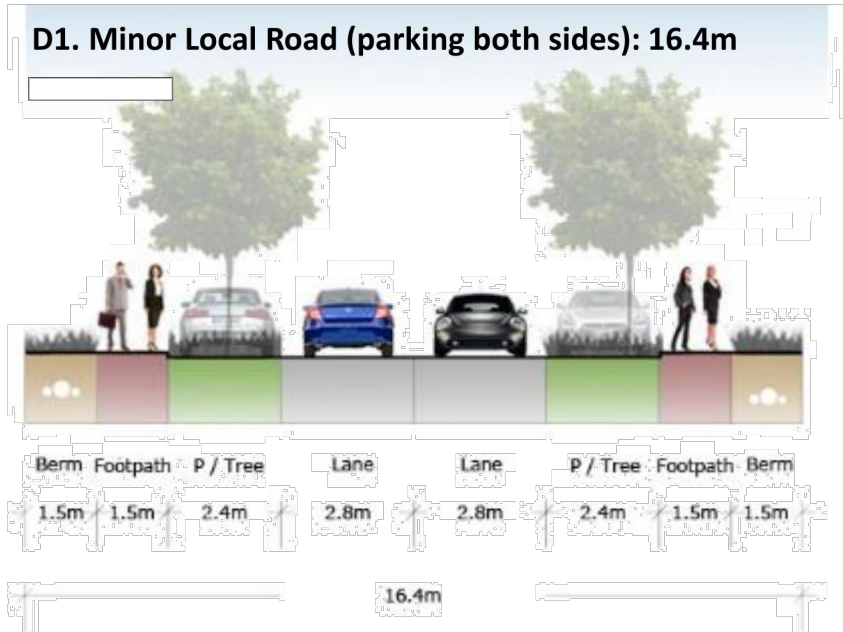
The minor local roads with parking on only one side (D2) generally serve less than 20 lots. The overall road reserve width will be 14.1m with 2.8m wide traffic lanes. The parking bays along one side will be 2.5m wide. There will be 1.5m wide footpaths on both sides and service berms that will be 1.5m wide also.

The minor local road standard with a single parking lane will only be utilised for the very short cul-de-sacs proposed for the blocks adjacent to Peacockes Road and one short through road in the southern area where there is limited width to develop lots.

The minor local park edge roads (E) will only need parking on one side and will not need to have a services berm along the side adjacent to the park or the river. Therefore the overall road reserve width can be reduced to 13.5m. The carriageway will remain at 5.6m but the parking bay on one side will be increased to 2.9m to accommodate the width required for bio-retention areas. The actual parking bay will only be 2.5m with a 0.4m wide strip adjacent to the footpath which will be 2.0m wide on that side (or 3.0m where it accommodates the shared path provided as part of river edge cycle facility). On the opposite side there will be a 1.5m wide footpath and 1.5m wide services berm.

Overall the subdivision design aims to provide one parking space in a bay for every three lots. This is not a Council requirement as there is no such requirement in either the District Plan or the ITS. It is a ratio that is applied by other Councils for new subdivisions and has proved to be appropriate. In most of the subdivision streets without cycle lanes cars can be parked on the carriageway between parking bays if there is an unusually high demand for parking. This will require one-way operation along the street but this is normal in many streets and does not cause a problem as vehicles can pull into spaces at driveways to let vehicles pass in the opposite direction.

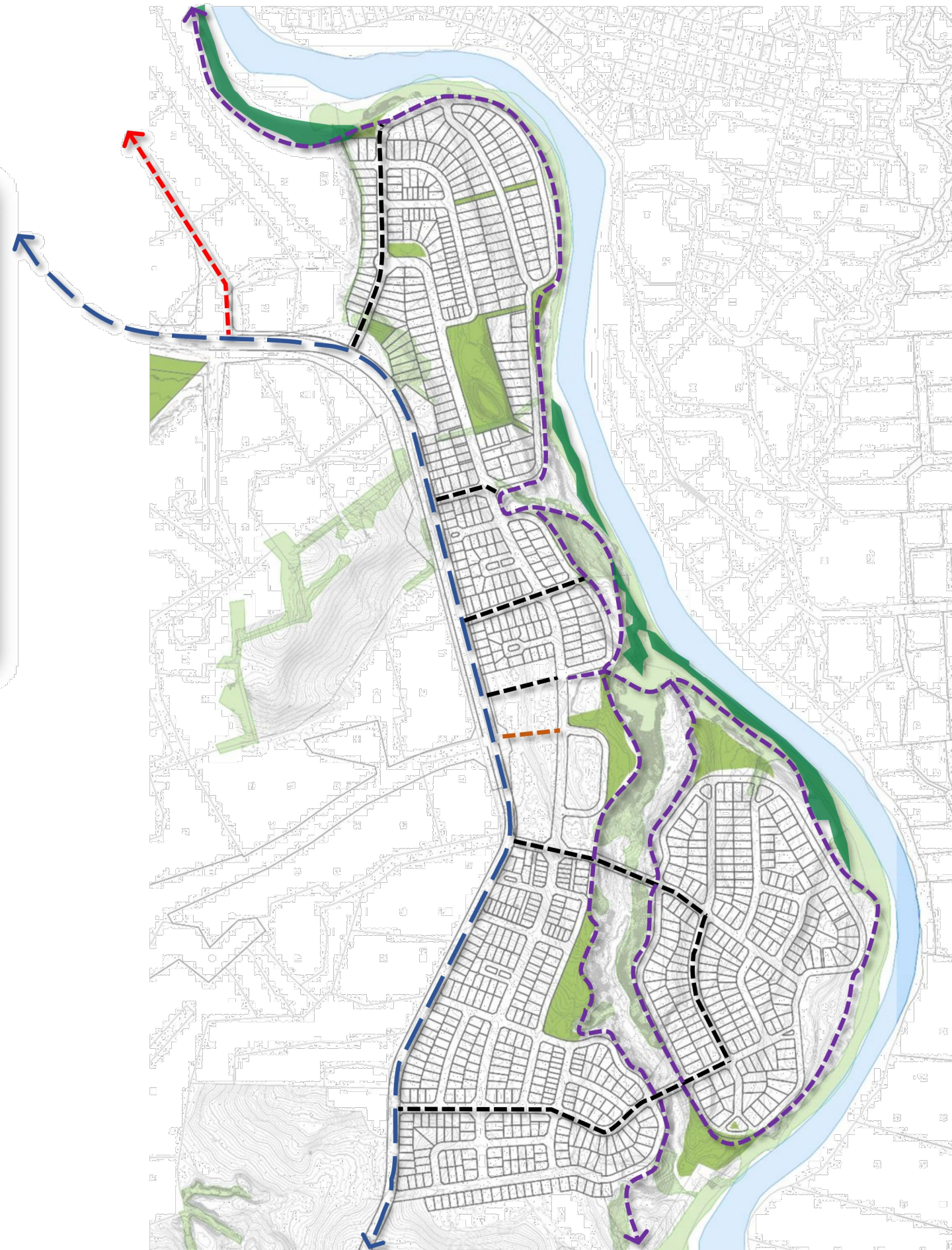










4.6 Facilities for Active Modes

Figure 19 indicates the network of cycleways / footpaths or shared paths proposed to service the Amberfield subdivision and to link with the wider network of paths proposed under the Peacockes Structure Plan. The shared path shown along the eastern side of the upgraded section of Peacockes Road will link to an off-road shared path along the eastern side of the remaining rural section Peacockes Road between the northern edge of the Amberfield subdivision and the existing urban boundary.

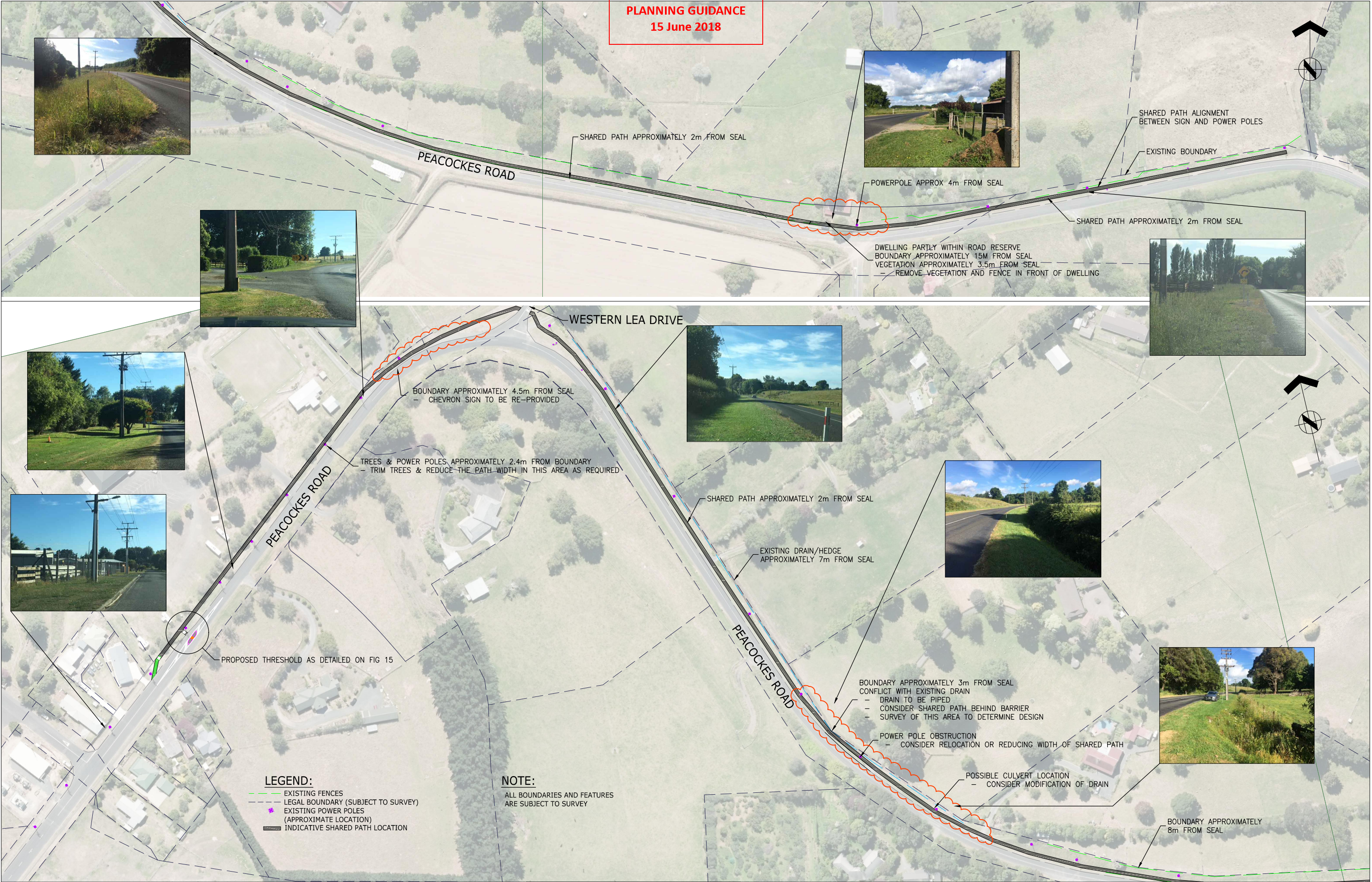
This path, which is indicated in **Figure 20**, will be 2.5m wide in general and will be constructed along the grass berm. It will be separated as far as practical from the existing road carriageway to provide optimum safety for pedestrians and cyclists. To encourage the choice of these active modes for travelling to the existing urban area (which will reduce traffic volumes) and to further improve safety, it is proposed that the path should be sealed and provided with street lighting.



LEGEND

-  Shared path on Peacockes Road
-  Cycle lane in road reserve
-  Shared Path in park or esplanade reserve
-  Low speed cycle friendly street without cycle lanes as these will clash with high pedestrian use
-  Alternative external cycle links to consider
-  Significant natural areas

Received
PLANNING GUIDANCE
15 June 2018



				ORIGINATOR:	DATE:	SIGNED:	PLOT BY:		ASSOCIATION OF CONSULTING ENGINEERS NEW ZEALAND	ISO 9001 QUALITY ASSURED		TAURANGA OFFICE LEVEL 1, 60 SPRING STREET TAURANGA 3110 T +64 7 578 0023 W www.harrisongrierson.com	PROJECT: WESTON LEA LTD - AMBERFIELD SUBDIVISION PEACOCKES ROAD HAMILTON	TITLE: PROPOSED SHARED PATH ALIGNMENT (2.5M WIDE)	ISSUE STATUS: FOR INFORMATION			
				DRAWN:	DATE:	SIGNED:	PLOT DATE:								THIS DRAWING AND DESIGN REMAINS THE PROPERTY OF, AND MAY NOT BE REPRODUCED OR ALTERED, WITHOUT THE WRITTEN PERMISSION OF HARRISON GRIERSON CONSULTANTS LIMITED. NO LIABILITY SHALL BE ACCEPTED FOR UNAUTHORISED USE OF THIS DRAWING.	9820-141842-01	SCALES: 1:1000 A1 1:2000 A3	A1
				CHECKED:	DATE:	SIGNED:	SURVEY BY:											
				APPROVED:	DATE:	SIGNED:	SURVEY DATE:											
REF	REVISIONS			BY	DATE													

There are however some locations where the shared path will need to be narrower for sections, such as adjacent to trees and power poles along the frontage of the camping ground. There is also a house opposite Peacockes Lane which has been constructed partly on the road reserve. It will be necessary to at least remove some of the fence and vegetation associated with this house to construct the path.

At the edge of the urban area in the vicinity of the Council water treatment plant, a threshold treatment is proposed which will act as a reinforcement of the change in the speed limit from 80 km/h to 50 km/h and to provide a crossing facility for pedestrians and cyclists. The threshold illustrated in **Figure 21** includes a central refuge island that can be used by pedestrians to cross from the shared path on the north side of Peacockes Road to an extension of the existing footpath on the south side. Cyclists can also use the refuge to cross from the shared path to cycle along the southern side of the carriageway which they will need to share with motor vehicles. In the eastbound direction cyclists will be provided with an extended cycle path facility to allow them to transfer from the road carriageway to the shared path without having to pass through the narrow road carriageway adjacent to the central refuge.

To the west of the urban boundary threshold, cyclists who share the carriageway with motor vehicles will be able to transfer to off-road shared paths shown in **Figure 22** which link to the path in Cobham Drive.

The shared paths along the east side of the upgraded section of Peacockes Road adjacent to the proposed subdivision will be 2.5m from the residential property boundaries and will be 3m wide. This is expected to provide sufficient intervisibility between cyclists and pedestrians and motor vehicles using the driveways which are proposed to have direct access onto Peacockes Road.

It is proposed that these paths will curve away from Peacockes Road to cross the access roads to the subdivision where limit lines can be provided for both the side road approaches. In this way cyclists (and pedestrians) will have priority over motor vehicles turning into and out of the side roads. With turning lanes provided on Peacockes Road for vehicles turning into these access roads the vehicles will be able to stop safely to give priority to cyclists and pedestrians using the shared path to cross the side roads. This intersection layout concept is indicated in **Figure 23**.

Figure 15 shows that several of these access roads will have cycle lanes that will provide links from the shared path along Peacockes Road to local streets but more particularly to shared paths provided along the riverside and the gully separating the "island" from the rest of the subdivision.

Several of the cul-de-sacs providing access to the lots adjacent to Peacockes Road will extend close to the Peacockes Road reserve such that pedestrians (and cyclists) on Peacockes Road will be able to use these cul-de-sacs in a way that will increase the permeability of the road network for pedestrians in particular. The road network is generally based on a grid pattern and all roads have footpaths and so permeability and accessibility will be maximised in this way.

AERIAL PHOTO SOURCED FROM: LINZ



Tuesday, May 15, 2018 13:43:13 0 20mm @ A3

REV	DATE	DRN	DESCRIPTION	CHK	APPR
0	09/05/2018	AKJ	ISSUED FOR INFORMATION	N/A	N/A

WESTON LEA LTD - AMBERFIELD SUBDIVISION
PROPOSED PEACOCKES ROAD THRESHOLD

DRN: AKJ	DATE: 09/05/2018	REV: 0
SCALE: 1:500 @ A3		
STATUS:		
DWG NO: 13646_C7D		



LEGEND:

EXISTING SHARED PATH

PROPOSED SHARED PATH

FUTURE NORTH/SOUTH ARTERIAL

CYCLISTS SHARE STREET WITH VEHICLES

PROPOSED THRESHOLD/CROSSING

Wednesday, May 9, 2018 12:57:39 PM 20mm @ A3

AERIAL PHOTO SOURCED FROM: LINZ

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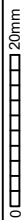
WESTON LEA LTD - AMBERFIELD SUBDIVISION
PROPOSED PEDESTRIAN / CYCLIST LINK TO EXISTING URBAN AREA

DRN: AKJ	DATE: 09/05/2018	REV: 0
SCALE: 1:4000 @ A3		
STATUS:		
DWG NO: 13646_C3E		

TDG

22

SHT 1 OF 1



Wednesday, May 9, 2018

WESTON LEA LTD - AMBERFIELD SUBDIVISION

Side Road Intersection - Peacockes Road



23

SCALE: 1:750 @ A4

The grid pattern does introduce a number of cross road intersections which involve potential conflicts for pedestrians and cyclists as well as vehicles. Four of these on the north-south local road will be controlled by small roundabouts where traffic volumes justify such measures and this will improve conditions for pedestrians and cyclists by slowing the north-south road traffic in particular. At other intersections the side roads will be slightly off-set to ensure that the Give Way controlled side roads provide a visual message that encourages motor vehicle drivers not to attempt to travel straight through the intersection without yielding priority. At the same time the road reserves will be aligned and the visual message to pedestrians will be one of continuity that enhances the permeability of the walking network.

For the minor local roads without cycle lanes cyclists will be expected to share the road carriageway with motor vehicles. This is the norm and together with carriageway widths which are not overly wide, will encourage slower vehicle speeds and improve road safety.

Footpaths are provided on all roads including the low volume local roads on both sides of the road. This will ensure an extensive and well connected pedestrian network.

4.7 Public Transport Proposals



The provision of public transport for the Amberfield subdivision has been discussed with the Waikato Regional Council and it is proposed that provision should be made for a future bus route running along Peacockes Road to the neighbourhood centre and then using the route indicated in **Figure 24** to improve the service for residents on the island. The road looping to the island and back to Peacockes Road has been designed as a full width local road with cycle lanes which will be able to accommodate the manoeuvring of buses into and out of bus stops and around the intersections along the route as indicated in **Figure 25**.

This routeing may change subsequently with further development to the south.

It is not known at this time at what stage of the subdivision development the Regional Council would want to introduce the proposed bus route and what route the busses might take in the interim. However with Peacockes Road upgraded to at least a collector road standard and with the access roads planned to be constructed to a local road standard with cycle lanes, it is expected that an interim bus route could be provided as early as the first stage with the loop indicated in **Figure 24**.

If that were introduced then the roundabout proposed for the intersection of roads RD001 and RD002 would not be constructed until after the bus route is changed to the island loop option. This will ensure an easier right turn manoeuvre for buses as indicated in **Figure 26**. This initial loop could be conveniently transitioned to the subsequent loop because the "island" is proposed to be Stage 2 of the subdivision. This strategy will be discussed and reviewed with the Regional Council as the subdivision develops.

LEGEND:

-  POSSIBLE STAGE 1 BUS ROUTE
-  BUS ROUTE AT COMPLETION OF SUBDIVISION



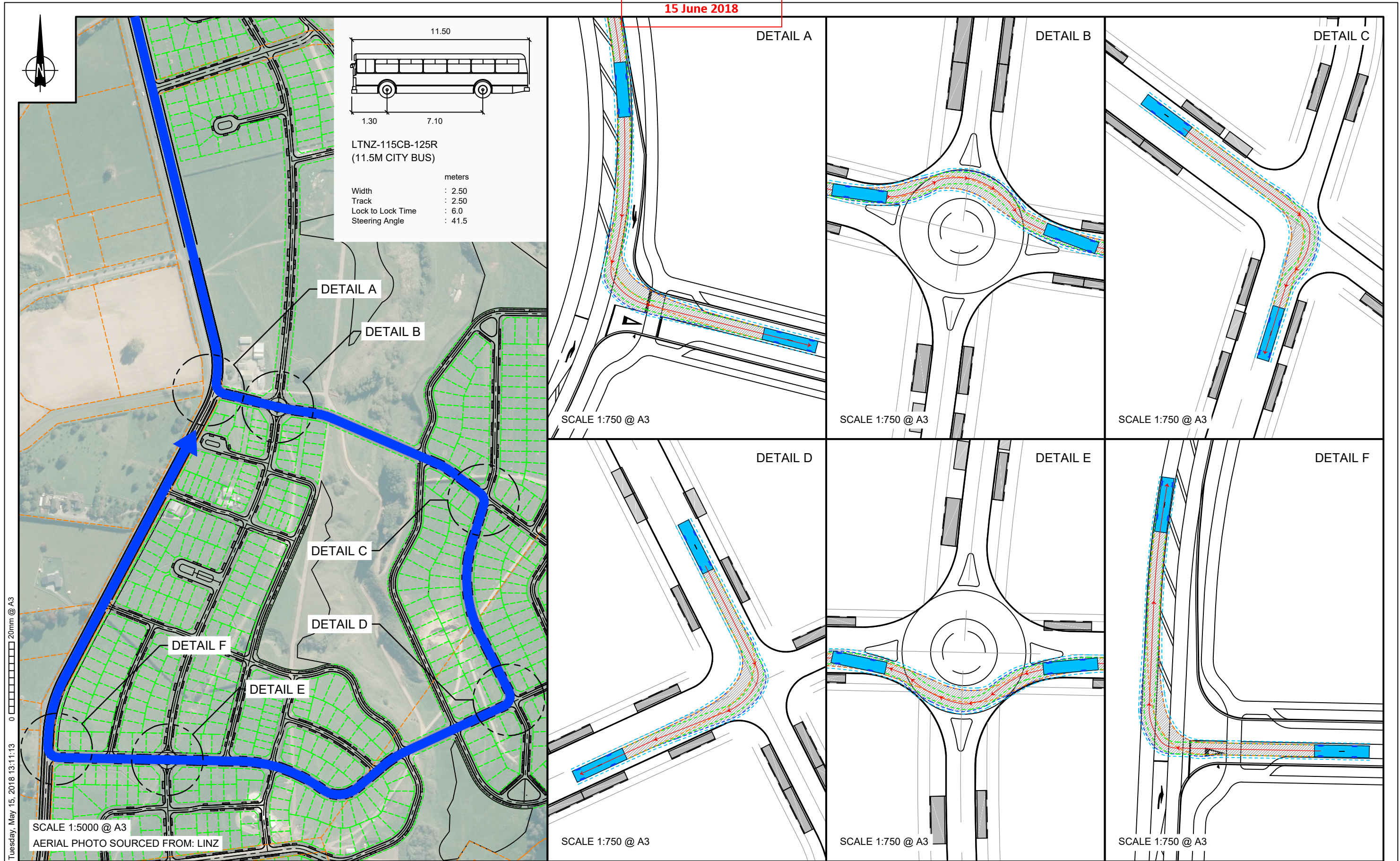
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WESTON LEA LTD - AMBERFIELD SUBDIVISION
BUS ROUTES



24

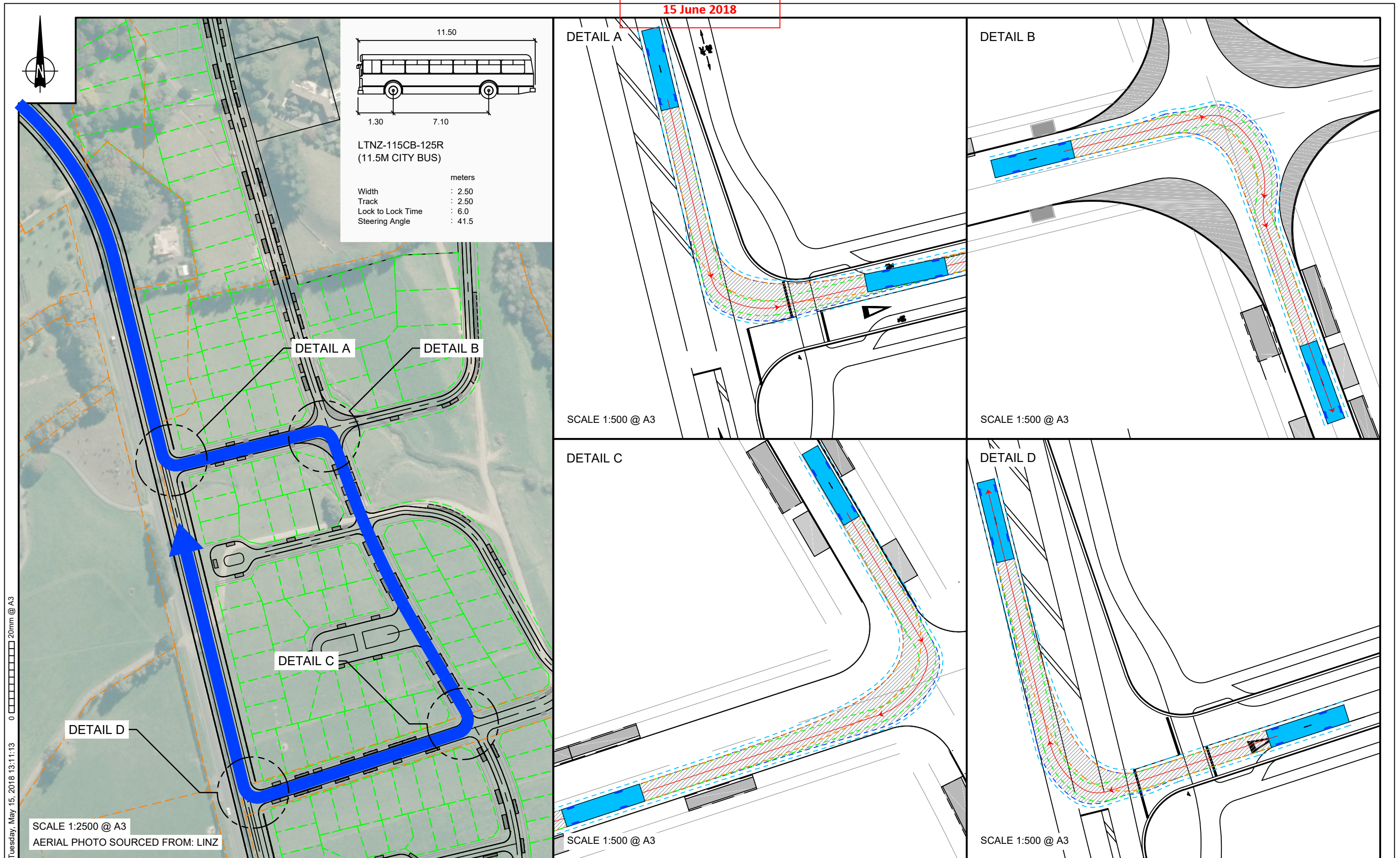
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REV	DATE	DRN	DESCRIPTION	CHK	APPR
0	09/05/2018	AKJ	ISSUED FOR INFORMATION	N/A	N/A

WESTON LEA LTD - AMBERFIELD SUBDIVISION
BUS ROUTE AT COMPLETION OF SUBDIVISION
VEHICLE TRACKING - 11.5M CITY BUS

DRN: AKJ | DATE: 09/05/2018 | REV: 0
SCALE: AS NOTED
STATUS:
DWG NO: 13646_C11C



REV	DATE	DRN	DESCRIPTION	CHK	APPR
0	09/05/2018	AKJ	ISSUED FOR INFORMATION	N/A	N/A

WESTON LEA LTD - AMBERFIELD SUBDIVISION
POSSIBLE STAGE 1 BUS ROUTE
VEHICLE TRACKING - 11.5M CITY BUS

DRN: AKJ	DATE: 09/05/2018	REV: 0
SCALE: AS NOTED		
STATUS:		
DWG NO: 13646_C11C		



26

SHT 1 OF 1

5. Hamilton District Plan

5.1 Objectives and Policies

The transportation infrastructure proposed as part of the subdivision application has been planned in a way that supports the transportation objectives and policies in the Hamilton District Plan, in particular Chapter 23 (Subdivision) and Chapter 25.14 (Transportation).

In general, the transportation infrastructure associated with the subdivision is consistent with the Peacockes Structure Plan and with HIF/LTP planning for future infrastructure. Appropriate infrastructure has been provided to ensure efficient and safe traffic access and effective integration with surrounding areas and the wider transportation network. In particular the proposal supports safe and efficient passenger transport and walking/cycling with provision for a bus route along Peacockes Road and an extensive network of walkways/cycleways. This will help to minimise the effects on existing and planned transport infrastructure.

Integrated transport modelling has been undertaken using the WRTM to ensure efficient operation of the road network and integration with the existing and future road network. However this will only occur in the future scenario if the Southern Links proposed through the HIF are not constructed before the subdivision is completed. This indicated some potential adverse effects for which mitigation measures have been identified.

The existing alignment and connectivity of Peacockes Road to the wider network has been used to orientate the secondary street network proposed for the subdivision with a series of side roads linking to roads running parallel with Peacockes Road and/or the Waikato River. In planning the layout of the internal street network opportunities for improved safety, accessibility, connectivity, amenity and efficiency have been investigated with small roundabouts and off-set cross-roads as well as landscaping, berms and kerbside parking. Provision has also been made for local road connectivity with adjacent undeveloped sites.

The street pattern has been designed to be permeable with a network that is generally a grid and also contains through-site linkages. As well as being safe and efficient, the transportation network is considered to be affordable, sustainable, and responsive. In the latter regard, specific consideration has been given to the effective staging of the development of the subdivision and the provision of on-street car parking to improve the integration of the infrastructure with land use.

5.2 Rules

While many of the transportation rules in the District Plan will not be addressed until resource consents are sought for individual lots, the subdivision road network has been designed to take account of the relevant rules.

Relevant rules from the Hamilton District Plan have been assessed through a compliance table in Appendix C.

The most significant is Rule 23.7.3f which specifies that a cul-de-sac should be no longer than 150m. The longest cul-de-sac in the Amberfield subdivision is approximately 100m.

As noted in Section 4.4 of this report, the local roads (B&C) and low volume local roads (D1, D2 and E) proposed for the subdivision meet or more than meet the respective District Plan cross-section dimensions specified in Table 15-17a. The only possible exception is that local road Type C includes cycle lanes to provide improved links between Peacockes Road and the riverside cycle (shared) paths.

Similarly the minor arterial and collector road standards specified in Table 15-7a are met by the proposed cross-sections for Peacockes Road. The possible exception in this case is that the collector road standard might be modified to provide a flush median and shared (two-way) paths rather than providing on-road cycle lanes.

6. Traffic Forecasts

6.1 Previous 2016 Model Assessment

The assessment of potential traffic effects of the Amberfield subdivision used the Waikato Regional Transport Model (WRTM) to predict future traffic patterns and to identify wide area effects. More detailed investigation of individual intersections within the primary area of influence has been undertaken using SIDRA with turning movements derived from traffic counts using growths forecast by WRTM. This analysis was consistent with the modelling protocols agreed with the Hamilton City Council (HCC).

The Phase 1 report¹ documents the local calibration of the Waikato Regional Transport Model (WRTM) in the Melville / Bader area of Hamilton. The recalibrated model has been used for assessing the effect of the additional 1000 households located in the Amberfield subdivision.

The WRTM Version 7.1, with a base year at 2006 and future year of 2021, was used for this project due to the newer Version 101, with a base year at 2013, not then having an approved future year model.

The Phase 2² report documents how the study area (or the area of influence) has been determined for the assessment. Using the WRTM that has undergone local area calibration changes in the Melville / Bader area, the 1000 households were added to the 2006 and 2021 models and the resulting traffic forecast changes assessed. The study area was then determined as the extent of the road network where the modelled link volumes changed by 10% or more with the addition of the 1000 households.

The ability of the existing road network in the study area to accommodate forecast traffic growth for 2021 without the subdivision has been investigated as described in the initial section of the Phase 3 report³. This found that:

- Ohaupo Road (SH3) / Kahikatea Drive intersection would be operating very close to capacity;
- Ohaupo Road / Dixon Road intersection would operate at a low level of service for the Dixon Road approach and improvements will be needed. It is noted that this intersection is planned to be supplemented or replaced by a new roundabout on SH3 to the south together with the initial stage of the east-west arterial;
- Ohaupo Road / Raynes Road intersection will also operate at a low level of service for the side road. The new roundabout at the SH3 / Airport Road intersection has improved the performance of movements from Airport Road and provided an alternative route for the through traffic using Raynes Road. Therefore an upgrade of the SH3 / Raynes Road intersection should not be necessary.
- A significant reassignment of traffic is predicted from SH3 through the Melville / Bader area to the Airport Road – Expressway route. Other strategic reassignments are also predicted which reduce traffic growth on the major roads through the Melville / Bader area.

¹ TDG Report: Model Calibration, August 2016

² TDG Report: Transportation Assessment Reports, December 2016

³ TDG Report: Assessment of Traffic Effects, December 2016

The current proposal for a further approximately 1000 residential lots in the Peacockes Stage 2 area will generate approximately 8,000 vehicle movements per day of which approximately 6,500vpd are expected to involve travel beyond the subdivision. This traffic generation is based on the calibrated generation rates developed for the WRTM. The movements beyond the subdivision are lower than would be indicated by traffic engineering generation rates because trips within the subdivision zones such as picking up a passenger are not included. Furthermore the lower external rates used are consistent with survey data from satellite urban areas separated from a main urban area by rural areas or geographical features such as rivers or hills. In these situations people are found to plan their trips more carefully and to include more than one purpose in a single trip outside their area/subdivision. While not included in the modelling undertaken, if a neighbourhood centre were developed before the subdivision is completed then the generation rate for trips beyond the subdivision could be expected to be even lower.

The traffic generated by the subdivision will result in an increase in traffic volumes primarily on the Peacockes Road - Bader Street route to Normandy Avenue. The main effect of this is to increase delays at the major intersections in the Melville / Bader area but the resulting effects on the levels of service are considered to be minor except for the increase in delay at the intersection of Normandy Avenue and Lorne Street. There will also be minor increases in traffic volumes and delays at two Ohaupo Road intersections, namely the right turn movements from Raynes Road and Dixon Road but as noted above, specific additional mitigation measures are not considered necessary. The main effect is that the proposed subdivision may trigger a need for intersection improvements at Normandy Avenue / Lorne Street.

The other increases in delays are expected to be minor because the diverted traffic reduces growth through the Melville / Bader area. Furthermore the delays are unlikely to be long term effects with the potential for the HIF to provide some major infrastructure such as a new river bridge linking to the interchange between Wairere Drive and Cobham Drive. Similarly the provision of facilities for alternative modes and public transport would reduce traffic effects on the road network and therefore potentially remove the need for interim road network mitigation.

The timing of the effects resulting from the subdivision will determine the need for the potential mitigation measure identified for the Normandy Avenue / Lorne Street intersection. The issue of timing is very dependent on the rate of development and that is why it has been recommended that the need for mitigation should be reviewed as development progresses to confirm the timing and fundamental need for mitigation of the existing network, given the longer term major roading infrastructure proposals. (See also Section 8.3). In general it is understood that the existing network with the addition of committed projects will have the capability to accommodate the traffic generated when the proposed development is completed without further mitigation.

The existing rural form of Peacockes Road is predicted to be able to accommodate the traffic forecast to be generated by the subdivision. The maximum traffic volume forecast for the rural section of Peacockes Road between the subdivision and the current urban boundary is only 8,000 vpd. However the road has no footpaths and the carriageway is not wide enough to safely accommodate cyclists with the expected increase in traffic and cyclists (and pedestrians). Therefore there is a need to provide an off-road shared path along the eastern side of the northern section of Peacockes Road as the other off-road

cyclist (and pedestrian) facilities indicated in the structure plan are unlikely to be provided in the same timeframe as the Amberfield subdivision.

Overall, the subdivision proposal can be supported from a transportation perspective subject to the potential for improvements being completed at Normandy Avenue / Lorne Street and for cycleway / walkway facilities to be provided along Peacockes Road to link to the existing urban area transportation networks.

Accordingly, it is considered that the existing road network with committed projects and these potential mitigation measures would accommodate the traffic generated by the proposed development safely, efficiently and effectively, such that adverse effects on transportation operations would be no more than minor.

6.2 2013 Model Assessment of HIF and Southern Links

An additional sensitivity analysis has been undertaken using the latest WRTM version based on a 2013 calibration to investigate the traffic forecasts for Peacockes Road in the situation with the HIF network and with the full Southern Links network. It was considered important to make sure that the proposed upgrading of Peacockes Road could accommodate the traffic volumes expected in these situations. For example, it is not immediately obvious which situation would involve the greater volume on Peacockes Road.

The previous modelling for the Amberfield subdivision based on the existing road network in the Peacockes area predicted a traffic volume of some 7,000vpd on Peacockes Road at the northern edge of the subdivision.

The 2021 model from the latest WRTM with the HIF network only shows about 2,000vpd using Peacockes Road but it did not include the Amberfield subdivision. If the subdivision traffic is added, the traffic volume could increase to 8,000vpd, only a marginal increase on the 7,000 vpd predicted without the HIF network.

The latest WRTM model forecasts for 2041 with the Southern Links and land use that includes the equivalent of the Amberfield subdivision, indicate 7,000vpd for the section of Peacockes Road at the northern edge of the Amberfield subdivision. So clearly for all potential future networks Peacockes Road in the vicinity of the proposed subdivision will attract relatively low volumes for the standard proposed for the upgrading.

Minor arterials generally cater for 8,000-20,000 vpd. Accordingly Peacockes Road in the vicinity of the Amberfield subdivision will struggle to attract traffic volumes that justify a minor arterial standard upgrade for all the potential situations with the Amberfield subdivision – ie without the HIF network (7,000vpd), with the HIF network (8,000vpd) and with the full Southern Links network and 2041 development (7,000vpd). Accordingly a collector road standard upgrade would be adequate at least for the short term.

The latest WRTM model forecasts for 2041 with the Southern Links do indicate a maximum of 15,000 vpd for the northern most section of Peacockes Road intersecting with the proposed road from the new river bridge. Accordingly the minor arterial standard road design for the urban upgrading of Peacockes Road proposed under the HIF is considered appropriate for the northern sections of Peacockes Road.

However, the 2041 WRTM forecasts for the section of Peacockes Rd south of the neighbourhood centre are very low (~ 5,000vpd immediately south of the centre and ~1,000vpd south of the subdivision).

This is much more appropriate for a collector road standard and that is what is proposed as part the upgrading of Peacockes Road for the sections adjacent to the subdivision south of the neighbourhood centre. Traffic volumes of 2000-8000vpd are generally expected for collector roads.

Simulation modelling indicates that most east-west access roads within the subdivision will serve relatively very few lots and even though traffic is expected to use these to travel north-south on Peacockes Road, they will not carry traffic volumes between 2000-8000vpd expected for collector roads. This will not change in the future because of the constraint imposed by the adjacent river. Accordingly all internal roads are designed as various types of "local" roads. Some access roads are designed with cycle lanes to provide links with the riverbank paths but it is not considered appropriate for the road immediately parallel with Peacockes Road to have on-street cycle lanes when there will be parallel shared paths along Peacockes Road and along the river bank. Accordingly it does not justify a collector road standard design on traffic volumes or on cycling needs. Similarly it does not need to accommodate a bus route (other than as a potential initial loop) because a route along Peacockes Road provides suitable walking distances.

The modelling also indicates the new river bridge proposed with the HIF would reduce the effect of the Peacockes Road development on Normandy Avenue and the major intersections in the Melville / Bader area. Accordingly the relative timing of the subdivision completion and the bridge being constructed would need to be monitored to determine if the proposed upgrade of the Normandy Avenue / Lorne Street intersection is necessary as what would potentially be an interim mitigation measure.

7. Transportation Effects

7.1 Network Efficiency

The subdivision network is relatively intensive and being longitudinal, relies largely on Peacockes Road as the main feeder road. Accordingly the internal roads carry relatively low traffic volumes and the internal intersections will all provide a high level of service. The main potential adverse effect within the subdivision is inappropriate speeds. This has been addressed by proposing minimum road widths and roundabouts on the only roads that have relatively long continuous sections.

With regular side road connections from the subdivision to Peacockes Road, the traffic volumes on the side roads are relatively low. Most are lower than 1,000vpd (two way) and only the northern-most side road and the side road south of the neighbourhood centre are predicted to attract approximately 2,000 vpd.

Of the proposed intersections along Peacockes Road serving the Amberfield subdivision, the northern-most side road intersection (RD 002) will accommodate the most traffic because of the relatively high side road volume and the conflict with traffic from the rest of the subdivision. The morning peak will see the highest conflict with traffic heading for the rest of Hamilton mostly. That involves traffic turning right out of the side road (approximately 100vph) conflicting with some 700vph travelling along Peacockes Road with a very high tidal flow demand northbound. Intersection analysis indicates that all movements at the intersection can operate at a high level of service; LOS A for turns from Peacockes Road and LOS C for turns from the side road with a maximum delay of approximately 20 seconds per vehicle.

The intersection south of the neighbourhood centre has a similar side road volume but the volume expected on that section of Peacockes Road will be much lower. All the other intersections will have much lower side road volumes and lower volumes on the conflicting sections of Peacockes Road. Accordingly all intersections along Peacockes Road will be able to efficiently (and safely) accommodate the traffic movements expected to be associated with the proposed subdivision.

The assessment of the wider road network performance with and without the proposed subdivision conducted in 2016 indicated that there would be negligible difference in the context of the network within the area of influence. This is because of the fact that traffic on the access route along Peacockes Road-Norrie Street-Bader Street generally has priority or is not opposed by significant traffic flows between the subdivision and Normandy Avenue. On the rest of the network in the area the relatively large volumes of traffic on the roads associated with the network make the effect of the subdivision traffic relatively minor.

7.2 Intersection Performance

Table 1 shows a comparison for intersections on the wider network between 2021 intersection performance with and without development traffic.

INTERSECTION	LEVEL OF SERVICE				
	Control	AM		PM	
		Base	Developed	Base	Developed
Ohaupo Road / Kahikatea Drive	Signals	C	C	E	D
Ohaupo Road / Normandy Ave	Roundabout	B	B	B	B
Normandy Ave / Bader Street	Signals	B	B	B	B
Normandy Ave / Lorne Street	Signals	D	E	C	C
Normandy Ave / Cobham Drive	Signals	C	C	C	C
Ohaupo Road / Dixon Road	Priority	E	E	F	F
Ohaupo Road / Raynes Road	Priority	E	E	F	F

Table 1: 2021 Intersection Levels of Service With and Without Development

Table 1 indicates that the development will have little effect on the major intersections in the area with levels of service generally being maintained.

When development traffic is added, it can be seen that the Normandy Avenue / Lorne Street intersection is expected to degrade from LoS D to E in the morning peak because of increased northbound traffic volumes added by the Peacocke Road subdivision.

The levels of service at intersections along the Peacockes Road-Norrie Street-Bader Street route retain an acceptable level of service even without the improvements now proposed at the Waterford Street and at the Norrie Street intersections.

Ohaupo Road / Kaihikatea Drive

The operational performance of this intersection will be sensitive to changes in approach volumes because it is operating close to its capacity.

However, since the change in travel patterns with the redistribution of trips associated with the Peacockes Road subdivision results in lower traffic volumes using the intersection, the intersection as a whole is expected to operate more efficiently.

Normandy Avenue / Bader Street

Without the Peacockes Road subdivision, this intersection is expected to cater for 2,600 vehicles in the AM peak hour and 2,500 in the PM in 2021. The Peacockes Road subdivision is expected to add 500 vehicles in the AM and PM peak hours respectively, but again redistribution of trips will result in other reductions in flows through the intersection.

The intersection is predicted to operate at LoS B by 2021 and has spare capacity to accommodate the additional traffic movements. The analysis of the intersection with the additional traffic from the Amberfield subdivision suggests that there will be only very small changes in the average delays and the intersection will continue to operate with LOS B. On this basis, no improvements to the intersection are considered necessary.

Normandy Avenue / Lorne Street

The Normandy Avenue / Lorne Street intersection currently carries approximately 3,400 and 3,700 vehicles in the AM and PM peak hours respectively. These volumes are expected to increase to 3,700vph in the AM peak hour and 4,100vph in the PM peak hour in 2021 when the Peacockes Road subdivision is developed. The Peacockes Road subdivision is expected to add 300 and 500 vehicle movements to the intersection in the AM and PM peak hours respectively.

By 2021 the intersection is expected to be operating at over 90% degree of saturation in the AM peak hour. When full development trips are included, the average intersection delays are expected to rise to LOS E. However, intersection improvements could be implemented as mitigation, as discussed in Section 8.3.

Ohaupo Road / Dixon Road

The Ohaupo Road / Dixon Road intersection already operates at LoS F in the PM peak hour. The Peacockes Road subdivision is expected to add a very low number of vehicle movements to this intersection and will have little effect on how it operates. Analysis indicates that improvement for this intersection is necessary even without the development traffic. The need for mitigation at this intersection has already been recognised by HCC and provision is being planned for construction of a new intersection on Ohaupo Road to the south (and the first section of the east-west arterial included in the Peacocke Structure Plan) is proposed within the next two years.

Ohaupo Road / Raynes Road

The Ohaupo Road / Raynes Road intersection also currently operates at LoS F. Development of the Amberfield subdivision is only expected to increase movements through the intersection by approximately 30 vehicle movements in the AM peak hour and 15 in the PM peak hour. Very few of these will make the right turn from Raynes Road onto Ohaupo Road. Accordingly, the Peacockes Road subdivision traffic will not cause a significant increase in delay and it is considered improvements to the intersection are not necessary.

7.3 Road Safety

As discussed in the Gray Matter report⁴ on Peacockes Stage 1A, intersection improvements and traffic calming measures will be implemented to address existing road safety concerns at the Waterford Road / Peacockes Road intersection and along the Peacockes Road-Norrie-Bader Street route. The additional traffic generated by the Amberfield subdivision is not expected to adversely affect the road safety of the upgraded route.

The proposed shared path will mitigate any possible road safety issues that the increased traffic generated by the subdivision could cause on the rural section of Peacockes Road between the subdivision and the urban area.

⁴ Peacockes Stage 1 Development Limits Relating to Transport , 14 December 2016

The upgrading of the sections of Peacockes Road adjacent to the subdivision to a high urban standard with wider lanes and better delineation will remove any road safety issues associated with the existing rural road. For example, this is expected to address crashes that have occurred on the bend to the north which will also have an increased radius and a crash north of Stubbs Road where the alignment will also be improved.

However as noted in Section 2.3 it would be desirable that improvements were made to the section of Peacockes Road south of the Amberfield subdivision to resolve the existing road safety concern. This is expected to involve the addition of speed advisory signs and chevron signs on the bends where accidents have occurred. The bend at the Weston Lea Drive intersection could also be investigated to address past accidents. It may be necessary to consider better warning signs and/or trimming overhanging trees.

7.4 Active Modes

Currently facilities for active modes in the vicinity of the proposed subdivision are virtually non-existent. However relatively minor use is made of Peacockes Road by pedestrians and cyclists. With the proposed subdivision pedestrian and cyclist activity will increase substantially. Within the subdivision and along the adjacent section of Peacockes Road high quality facilities are proposed for these active modes. Accordingly the effects for users will be positive.

Along the rural section of Peacockes Road that will remain between the existing urban boundary and the subdivision (at least in the early stages) the proposed off-road shared path will mitigate potential adverse road safety effects of pedestrians and cyclists continuing to use the existing carriageway with increased traffic.

Within the urban area along Peacockes Road-Norrie Street-Bader Street the road safety improvements works proposed to mitigate the effects of Stage 1B development will also mitigate the effects associated with the Amberfield subdivision. Beyond that route the relative increase in traffic on the wider network is not expected to have any noticeable effect on the road safety or amenity of active modes particularly as the busier roads already have cycle lanes and traffic signal controlled pedestrian crossings.

8. Mitigation

8.1 Peacockes Stage 1 Development

Investigations undertaken to assess the effects of increased development in the Peacockes Stage 1A area have identified a series of safety mitigation measures for the route along Bader Street, Norrie Street and Peacockes Road to the intersection with Waterford Road. These measures have been adopted for implementation by the Council. The details are indicated in the Gray Matter drawings included in **Appendix B**. They include a roundabout at the Waterford Road/Peacockes Road/Plateau Drive intersection, cycle/pedestrian crossings and traffic calming in the vicinity of the local shops on Bader Street. They also include measures to improve visibility on the Peacockes Road approach to its intersection with Norrie Street.

Also the new roundabout on SH3 south of Dixon Road which is proposed to be constructed in the next two years will resolve existing delays to traffic at the Ohaupo Road / Dixon Road intersection and reduce Stage 1 traffic that would use the Peacockes Road – Norrie Street – Bader Street route.

8.2 Shared Path Proposal

As already discussed in Section 4.6 and illustrated in **Figure 20**, a shared path is proposed along the east side of Peacockes Road from the northern edge of the subdivision to the existing urban boundary as mitigation of road safety effects that could otherwise arise for pedestrians and cyclists with the expected increase in traffic along the remaining rural section of Peacockes Road.

It is proposed that this path will be sealed and have lighting to encourage maximum use of the facility and a consequential reduction in traffic.

8.3 Lorne Street / Normandy Avenue Upgrade

This intersection currently includes two northbound lanes, three southbound lanes, including a right turn lane to access Lorne Street, and two eastbound lanes, including a slip lane to travel north. The critical movements at this intersection are the Normandy Avenue through movement from the south and the right turn into Lorne Street from the north. With full development traffic the delays in the AM peak could increase significantly.

An additional 30m left turn only lane from the south was evaluated to increase capacity on this approach by separating through and left traffic allowing more efficient signal phasing.

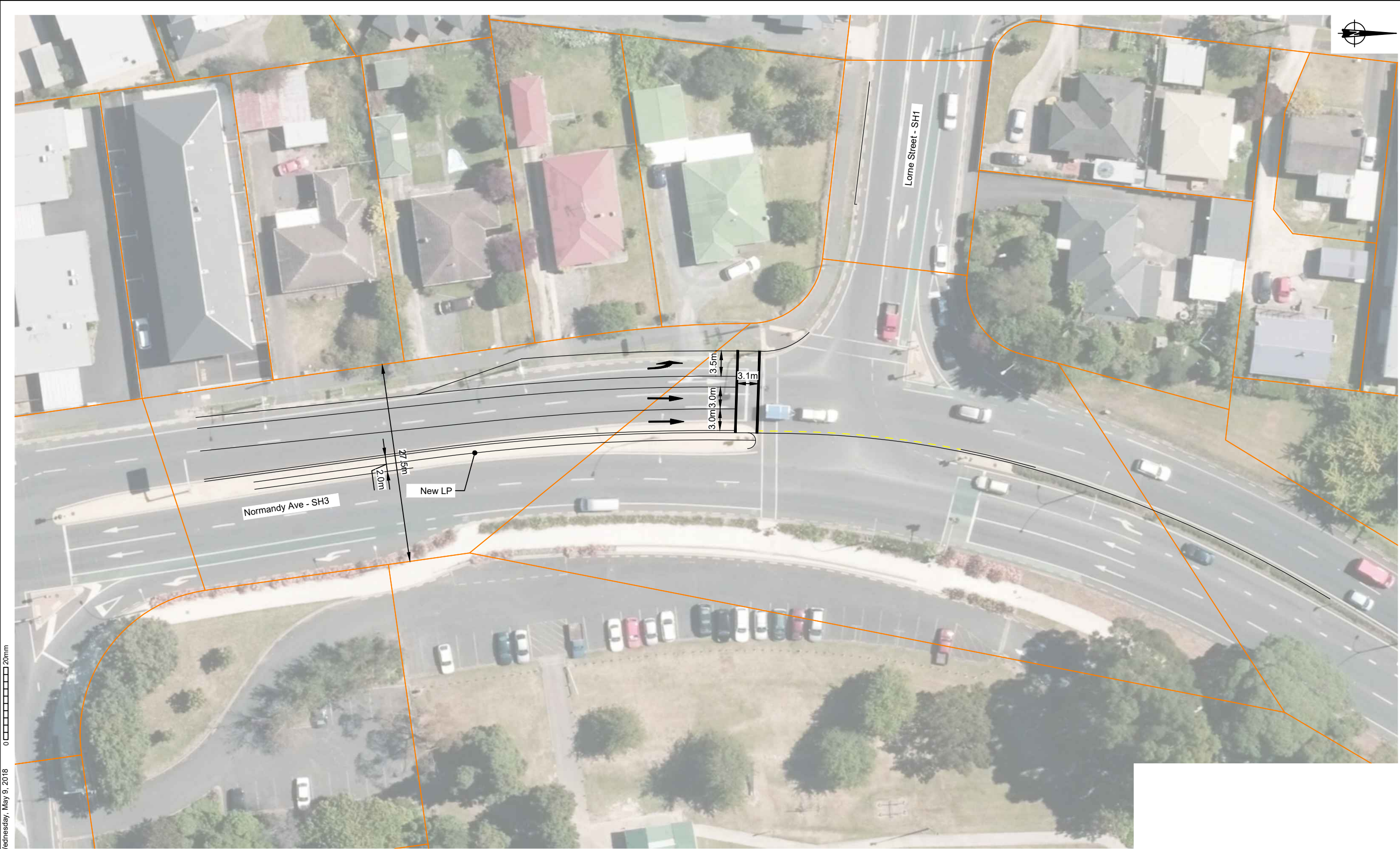
With this mitigation option, the intersection is expected to operate at LoS D when the Peacockes Road subdivision reaches full development.

It is anticipated that the current carriageway can be retained and that no land take will be required by removing the current grass verge between the footpath and the road. The carriageway may then be adjusted by:

- Narrowing current centre island to consistent 2m (currently tapers to ~ 4.5m);

- Narrowing both current through lanes to 3m;
- Moving 1.5m current cycle lane to the east ~2m; and
- Adding the 3.5m left turn lane.

While detailed intersection design has not been undertaken **Figure 27** shows a preliminary concept of the proposed intersection upgrade.



Wednesday, May 9, 2018 0 20m

REVISION	DATE	DESCRIPTION
A	21 Sept 16	Rough costing plan
B	09/05/2018	TITLE CHANGE

WESTON LEA LTD - AMBERFIELD SUBDIVISION

Normandy Ave and Lorne Street Intersection Potential Upgrade

DRAWN: AMC
DATE: 09/05/2018
SCALE: 1:500 @ A3
DWG NO:13646-N1B



The operation of Normandy Avenue / Lorne Street was investigated at various stages of the Peacockes Road subdivision and the results are shown in **Table 2** below.

STAGE OF DEVELOPMENT	AM PEAK HOUR	
	Level of Service	
	No Mitigation	Added Left Turn from South
No Development	D	C
20% Developed	D	D
40% Developed	D	D
60% Developed	D	D
80% Developed	E	D
Fully Developed	E	D

Table 2: AM Peak Hour Normandy Avenue / Lorne Street Operation at Various Stages of Development

The analysis shows that the current configuration is not expected to degrade to a LoS E until the development is about 70% complete. Accordingly the mitigation should not be considered in the short term and if the HIF network is to be implemented before the subdivision is completed then the upgrade will not be justified.

8.4 HIF Proposals

It is anticipated that once the wider road improvements identified for the HIF Structure Plan (See **Figure 13**) are in place, the traffic volumes on the existing road network will be reduced, including at the Normandy Avenue / Lorne Street intersection.

Modelling indicates that when the proposed new river bridge has been constructed, the through volumes on Normandy Avenue at Lorne Street will reduce by about 25-30%. With this reduction in volumes, the existing intersection configuration is expected to operate at a LoS C in the AM peak hour and a LoS B in the PM peak hour, and the mitigation measures identified above would not be necessary.

Accordingly the timeframes for the HIF road network should be taken into account when considering intersection improvements at Normandy Avenue / Lorne Street or any other mitigation measures as they are likely to be rendered unnecessary with the construction of major components such as the proposed bridge.

For example, if the proposed urban upgrading of Peacockes Road as part of the HIF road network were to be completed prior to substantial development of the Amberfield subdivision, then the construction of the interim shared path along Peacockes Road to the existing urban area may not be required.

However it should be stressed that the mitigation measures that have been identified would enable the Amberfield subdivision to operate without significant adverse transportation effects, if the HIF network upgrades were delayed for whatever reason.

8.5 Alternative Modes

If effective bus services and / or cycling facilities are provided to give alternative options for travel to / from the Peacockes Road subdivision, then the effects of traffic generated by the development will be reduced. Again, these options should be investigated in the later stages of planning and the need for mitigation measures reviewed accordingly.

9. Summary and Conclusions

The Amberfield subdivision in Peacockes is planned to accommodate approximately 1,000 households between Peacockes Road and the Waikato River. The main access to the site will be provided by the Peacockes Road-Norrie Street-Bader Street route until the Southern Links infrastructure proposals are commenced, possibly through the HIF.

The WRTM in association with 2016 traffic counts has been used to assess how the existing transport network in the study area to the southwest of Hamilton currently operates, how it is expected to operate in the future and the impact of the development of the Amberfield subdivision on the network.

The current network is operating acceptably with the exception of the intersections on Ohaupo Road (SH 3) with Dixon Road and Raynes Road where the side roads are performing at a level of service F at peak times. However a new roundabout is proposed on SH3 to resolve the issue at Dixon Road and Raynes Road is likely to be relieved when the Waikato Expressway is completed. The former will allow local traffic to divert from the Bader Street route and the latter will reduce traffic on Ohaupo Road.

The Amberfield subdivision could generate unacceptable delays at the Normandy Avenue / Lorne Street intersection towards the completion of the subdivision. However it has been identified that improvements could be implemented to mitigate this effect. They involve the construction of a signalised left turn lane on the southern approach which is expected to be able to be implemented within the current road reserve. If the HIF infrastructure projects, such as the proposed new river bridge and the Wairere Drive extension, are in place before the Amberfield subdivision is completed, the Normandy Avenue / Lorne Street improvements are unlikely to be necessary.

If the subdivision is developed prior to the possible HIF upgrading of Peacockes Road, a shared off-road pedestrian and cyclist facility along the rural section of Peacockes Road will be required to ensure safe and efficient operation of the road with the traffic generated by the subdivision. Bus services will also need to be provided once the subdivision has been developed to a level that creates sufficient demand to justify a bus service. Such provision for alternative modes could also trigger lesser effects on access roads from vehicular traffic and reduce the need for mitigation. This can be reviewed as the subdivision progresses and as the status of the HIF is determined.

As well as providing safe and efficient transportation links to adjacent areas and the wider network, the subdivision proposal provides an internal network of traffic, cyclist and pedestrian facilities that will ensure convenient and safe accessibility, connectivity and amenity. This will be integrated with the adjacent sections of Peacockes Road which will be upgraded to either a minor arterial or collector road standard depending on the Council's requirements at the time.

TDG