6 Assessment of Effects on Parking, Access and Roads with Increased Traffic

6.1 Introduction

This section discusses the effects of the Project on parking (on and off-street) and access. Some parking will be removed for a variety of reasons including land required for the Project and to facilitate the change in function of the road due to the increase in traffic volumes. This section provides an assessment of the potential effects of the Project on property access including changes to turning movements and routes. The roads that are predicted to experience an increase in traffic flow with the Project in place in 2026 and 2036 were identified in Chapter 5. The impact of increased traffic flows on these streets is described from west to east below and any design response or mitigation measures are identified.

The existing and future road classifications in this section are from Auckland Transport's Road Classification. Where a future change in function to the road is proposed this is described in general terms with reference to the ATCOP classifications but it is noted any future road re-classifications are yet to be confirmed with Auckland Transport. The ATCOP classifications relate to the strategic planning function of the road network (i.e. how Auckland Transport wants the road to perform). Discussions have commenced with Auckland Transport about future road re-classifications and will be on-going as the Project progresses.

6.2 Gloucester Park Road (North)

6.2.1 Effects on Access

The section of Gloucester Park Road to the north of the intersection with Neilson Street will become a cul-de-sac to allow for improved performance of the existing Gloucester Park Road and Neilson Street intersection. This is shown on Figure 6.1. That improved efficiency is required to provide the ability to manage potential queues on the southbound off-ramp, which would create a safety hazard if blocked back onto the main SH20 carriageway.

Currently the businesses on Gloucester Park Road have access to both Neilson Street, to the south, and Princes Street to the north. With the Project in place, the southern access will be removed, making access from Princes Street and Selwyn Street. Vehicles will have to travel on a slightly longer route using Selwyn Street and Princes Street which could be up to 300m longer due to Gloucester Park Road becoming a cul-de-sac (depending on the turning movement that has been removed). However, any impact of this slightly longer route will be off-set by the benefits of less congestion on Neilson Street and the significantly reduced congestion accessing Onehunga itself.

6.3 Gloucester Park Road (South)

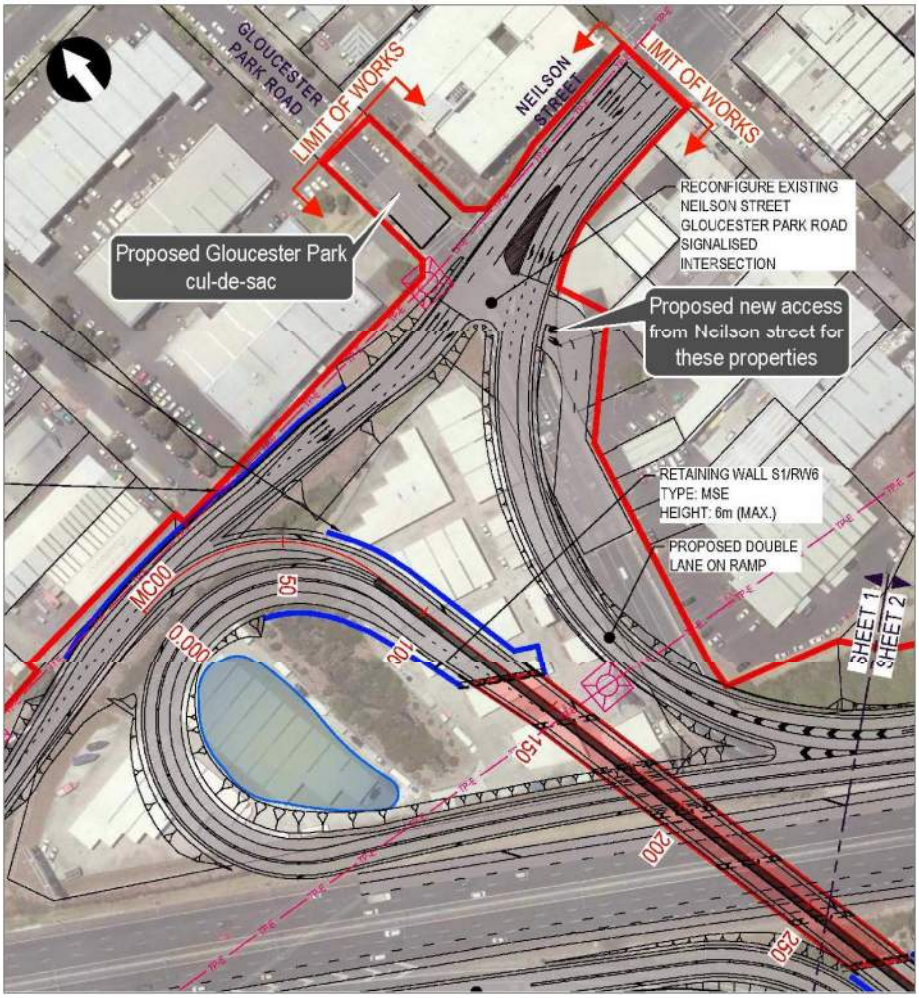
6.3.1 Effects on Access

The access for businesses located on the eastern side of Gloucester Park Road, to the south of the intersection with Neilson Street, will be changed. A new single access point will be provided from Neilson Street at the location shown on Figure 6-1. The existing signalised Neilson Street/ Gloucester Park Road intersection will be reconfigured to allow for this. The new signalised access point will mean vehicles wanting to turn right out the site will no longer cross three lanes of southbound SH20 on-ramp traffic which is considered to be safer for these vehicles and the Project will have a positive impact on safety in this location.

The only change in access for these businesses is that they will not be able to continue straight ahead to Gloucester Park North and they will need to use a more indirect route via Selwyn Street and Princes Street of an additional 300m. As mentioned previously any impact of this slightly longer route will be off-set by the benefits of less congestion on Neilson Street approaching from SH20 and a quicker travel

time between Gloucester Park Road and SH1. The business located on the western side of Gloucester Park Road is required for the Project so access to this property will no longer be required.

Figure 6-1: Gloucester Park Road (North and South)



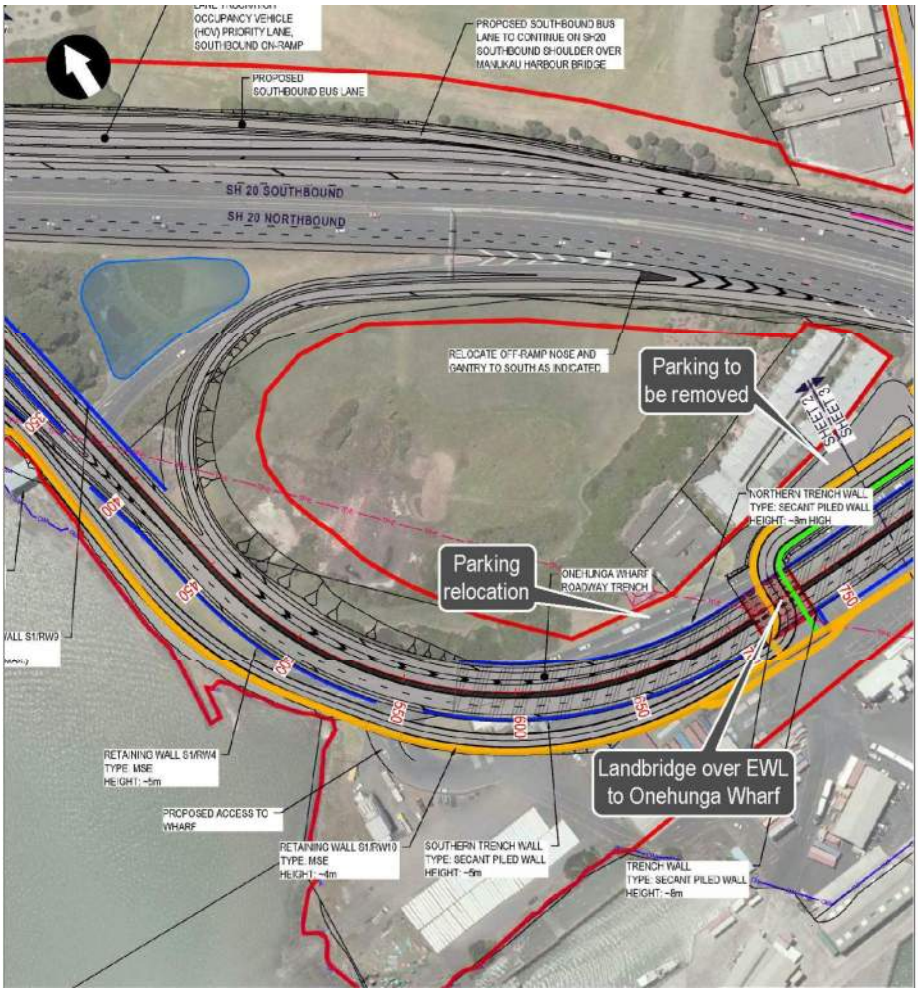
6.4 Onehunga Harbour Road

6.4.1 Effects on Access

The Landing Restaurant and Bar, Airport Harbour View Motel and the apartments at 2 Onehunga Harbour Road currently gain access from Onehunga Harbour Road.

With the Project, Onehunga Harbour Road will become a local road with its main function to serve these local properties, the Wharf and provide the connection to Orpheus Drive. Access will be provided to these properties using the Galway Street EWL exit, Galway Street, Galway Link and Onehunga Harbour Road as shown on Figure 6.2. This alternative access will be a longer route, up to 1km for the worst affected movement to/from SH20 northbound.

Figure 6-2: Onehunga Harbour Road Properties



However, currently vehicles are delayed in the congestion on Onehunga Harbour Road as this is heavily trafficked route for vehicles, including HCVs, to access the industrial area. This will no longer be the case with the Project as there will be a significant improvement in access to Onehunga from SH20, as well as to/from SH1. The traffic flows on Onehunga Harbour Road are expected to reduce significantly from 21,500vpd in 2026 to 300vpd (although this would be influenced by any future changes in use of the Wharf). It is considered that this predicted significant reduction of traffic will mean the function of the road will change to providing local access. It is likely that Onehunga Harbour Road will change in function from a Strategic Arterial to having either a local or collector function. However, as mentioned previously the future re-classification will be determined in discussion with Auckland Transport.

The access into Onehunga Town Centre (and further north), would be as direct as currently, albeit on a significantly decongested route.

The existing driveways to The Landing Restaurant and Bar, Airport Harbour View Motel and the apartments at 2 Onehunga Harbour Road will be reconfigured, but maintained, to all these properties.

Overall, accessing these properties is expected to be quicker and more reliable with the Project, albeit via a longer route for some movements.

6.4.2 Effects on Parking

There are approximately 38 on-street car parking spaces on the cul-de-sac end of Onehunga Harbour Road in front of The Landing Restaurant and Bar. There are approximately 23 spaces on the southern side of the cul-de-sac and 15 spaces on the northern side. It is assumed that visitors to the Landing, Airport Harbour View Motel and members of the public accessing the foreshore use these car parking spaces.

The Project could require the removal of up to 15, of the 23 parking spaces on the southern side to allow for the landing of the bridge over EWL from the Wharf and the shared path as seen in Figure 6-2. The loss of up to 15 car parking spaces can be mitigated by providing these spaces in the redundant portion of Onehunga Harbour Road to the west of the Airport Harbour View Motel as shown on Figure 6-2. There is also opportunity for these car parks to be re-provided on the newly realigned Onehunga Harbour Road close to the Landing, which will be lightly trafficked with the Project in place in 2026. There will be no net loss of on-street car parking in this location.

Parking is not permitted along the remainder of Onehunga Harbour Road so there will be no further loss of on-street parking on this road with the Project. Indeed, there could be a parking gain if parking is proposed to be permitted on Onehunga Harbour Road when the Project is in place.

6.5 Onehunga Wharf

6.5.1 Effects on Access

Access to Onehunga Wharf is currently provided directly from Onehunga Harbour Road. This is a 4ha site plus waterspace with opportunities to develop high quality mixed use development.

Direct access to the Wharf is currently from Onehunga Harbour Road, which will be altered as part of the Project. A local road connection (landbridge) is proposed over the EWL providing access between the Onehunga Wharf and Onehunga Harbour Road and along the southern side of the EWL onto Orpheus Drive as seen in Figure 6-2. This has been developed in consultation with Panuku Development Auckland to work with the “Transform Onehunga” strategy for the future of the Port and wider surrounding area. Vehicles accessing the wharf site via the new landbridge will use Galway Street EWL exit, Galway Street, Galway Link and Onehunga Harbour Road. The landbridge will be of sufficient width to accommodate future traffic generated by the development of the Wharf and will be used by pedestrians and cyclists. The current design provides for local connection with Orpheus Drive.

The same impacts and benefits described for the properties on Onehunga Harbour Road will apply to the Wharf. The Project therefore provides quicker and easier access by vehicles, with capacity to accommodate increased traffic generation on the Wharf, which is currently very limited. It retains or improves walking/cycling links to Waikaraka Cycleway and Old Māngere Bridge, and access to Onehunga Town Centre via a low-volume local road, rather than the current highly trafficked motorway access routes. The impacts of the improved walking and cycling facilities are discussed in Section 7.

It is noted that the Galway Link intersection and roundabout have been designed for heavy vehicles.

6.6 Onehunga Mall (south of Neilson Street)

6.6.1 Effects on Access

Direct access to businesses and residential properties from SH20 via Onehunga Harbour Road will not be available following the completion of the Project, with access provided via the Galway Street EWL exit, Galway Street and Galway Link as seen on Figure 6-2. There will be an increase in distance but improved journey time reliability as Onehunga Harbour Road and Onehunga Mall will have significant reduction in traffic. Any impact of this slightly longer route will be off-set by the

substantial benefits of less congestion on Neilson Street approaching from SH20 and a quicker travel time to Onehunga and SH1.

The traffic flows on Onehunga Mall (south of Neilson Street) are predicted to reduce significantly (84%) to 3,700 daily vehicles with the Project in place in 2026. This will substantially improve the access to properties as well as improving the amenity for pedestrians and cyclists.

It is considered that this predicted significant reduction of traffic on Onehunga Mall (south of Neilson Street) will mean the road's primary purpose will be to provide walking, cycling and public transport and local access. Although, there is a significant reduction in traffic volumes, it is likely that this length of Onehunga Mall will retain its function as an arterial road, however it is likely to change from a strategic arterial to a secondary arterial. However, as mentioned previously the future re-classification will be determined in discussion with Auckland Transport.

6.7 Orpheus Drive

6.7.1 Effects on Access

Orpheus Drive currently provides access to Aotea Sea Scouts Hall, Manukau Cruising Club and Taumanu-Onehunga Foreshore from Onehunga Harbour Road via a T intersection that requires Orpheus Drive traffic to cross the motorway on-ramp. Following the completion of the Project, access to Orpheus Drive via Onehunga Harbour Road in its current location will no longer be provided. However, a new local road connection (landbridge) is proposed over the East West Link providing access between the Onehunga Wharf and Onehunga Harbour Road and Orpheus Drive. This will be accessed via Galway Street EWL exit, Galway Street, Galway Link and Onehunga Harbour Road.

Before Orpheus Drive turns into Seacliffe Avenue, there is a car park and a pedestrian bridge from Orpheus Drive across SH20 to the Onehunga Bay Reserve. The same impacts and benefits described above for the properties on Onehunga Harbour Road will apply to Orpheus Drive.

A safety benefit of the Project is that new alignment will remove the right turn out of Orpheus Drive across the on-ramp traffic.

The connection of Orpheus Drive to Onehunga via a low-volume, local road instead of via the existing high-volume, congested motorway access road is considered to be more suitable to the recreational function of this road, and represents a significant enhancement. It is not anticipated that the function of Orpheus Drive will change and will remain a local road.

6.8 Selwyn Street (north of Neilson Street)

Selwyn Street is classified as a Secondary Arterial (north of Neilson Street) and in the ATCOP secondary arterial roads are described as typically carrying traffic flows of up to 25,000vpd[8]). Selwyn Street, between Neilson Street and Church Street, can be described as having four lanes, no parking on either side and provides access to adjacent commercial properties. One of the key functions of the street is to provide a link between Onehunga and Royal Oak.

With the Project in place in 2026 it is predicted that 15,100 vehicles will use Selwyn Street daily, compared to 13,300 vehicles without the Project. In 2036, with the Project in place, approximately the same number of vehicles will use Selwyn Street. These predicted daily vehicle numbers are below those typically carried on a secondary arterial (25,000vpd).

[8] Auckland Transport Code of Practice (ATCOP), Auckland Transport, 2013

It is considered that as a secondary arterial Selwyn Street will be able to accommodate the predicted 15,100 vehicles a day in 2026 and no upgrades are required as it is already four lanes. With the Project in place Selwyn Street will continue to function as a secondary arterial and provide for vehicle movements between Onehunga and Royal Oak.

6.9 Galway Street (south of Neilson Street)

Galway Street (south of Neilson Street) is currently classified as a local road and is a cul-de-sac with no centre line and no parking restrictions. The adjacent land uses are commercial and industrial. Galway Street will be extended south to provide a connection with the EWL and Galway Street will also connect to Onehunga Mall via a link road and roundabout as seen on Figure 6-2.

Therefore, with the Project in place very significant increases in traffic flows are predicted, with 7,300 vehicles using Galway Street (south) in 2026 and 9,200 vehicles in 2036. Due to the predicted increase in traffic volumes, Galway Street (south of Neilson Street), will be upgraded to four lanes with solid and flush medians separating the lanes of traffic to accommodate the predicted traffic flows.

The function of Galway Street (south of Neilson Street) will change from a local road and will be primarily for general traffic and a freight connection between Neilson Street and EWL. It is likely that Galway Street will change to a having a primary arterial function

The impact of this upgrade will mean changes to access and potential loss of parking which is discussed below.

6.9.1 Effects on Access

The Project proposes to ban all right turns into and out of Galway Street except that from Galway Street south to Neilson Street east. For business on Galway Street, south of Neilson Street, access will be provided via Onehunga Mall (south) and Galway Link. These properties will also have access from the EWL in all directions and have quicker access to SH20 northbound. Access to SH20 southbound is likely to be quicker as Neilson Street and Gloucester Park Road will have a reduction in traffic with the Project in place in 2026.

The right turn from Neilson Street into Galway Street (north) is proposed to be banned. Access to the properties on Galway Street (north) would require vehicles travelling from the east to turn earlier at Victoria Street or further west at Selwyn Street, with a return via Princes Street. Turning at Victoria Street would not involve a long detour; however, those who missed the turn would need to travel up to an extra 1km via Selwyn Street. The right turn from Neilson Street into Onehunga Mall that is currently banned is proposed to be reinstated. This would allow vehicles to access via Onehunga Mall.

6.9.2 Effects on Parking

Galway Street (south of Neilson Street) will be extended and upgraded from a low trafficked cul-de-sac with no centre line to a four lane road providing a new connection to EWL. Currently on-street parking for about 30 cars is provided. Parking occupancy along the length of Galway Street between Neilson Street and the end of the cul-de-sac was observed to be low at around 12 cars (40% occupancy) at its busiest. Parking on-street on the new Galway Street extension will not be permitted.

Although there will be a net loss of approximately 30 car parking spaces, it is anticipated that the observed demand for 12 car parking spaces could be provided off-street as the businesses on Galway Street were observed to have extensive off-street parking. A Clearway on one side of Galway Street during peak times will be considered to mitigate the net loss of approximately 30 car parking spaces in subsequent project design stages.

6.10 Accessibility to Businesses north of Neilson Street

Currently, vehicles heading west on Neilson Street can access the Onehunga Town Centre/businesses north of Neilson Street via four right turns at Victoria Street, Galway Street (North), Selwyn Street and Gloucester Park Road, with only the right turn from Neilson Street into Onehunga Mall being banned.

As discussed above, the Project proposes to ban the right turn into Galway Street (North) and ban all movements to and from Gloucester Park Road. By removing two right turns this will reduce the accessibility to the businesses north of Neilson Street from four access points to two. This is considered to be an adverse impact on accessibility into the Onehunga Town Centre/businesses north of Neilson Street.

To remedy this impact, the Project will re-instate the right turn into Onehunga Mall from Neilson Street (which is currently prohibited). Although an overall reduction from four right turns to three right turns with the Project, accessibility to the Town Centre will be improved and overall this is considered acceptable.

6.11 Victoria Street

Victoria Street is classified as a Collector Road has two lanes, uncontrolled parking on both sides (except at intersections), provides access to adjacent commercial properties. One of the key functions of Victoria Street is to provide movement between Neilson Street to the south and Mount Smart Road in the north.

In the ATCOP collector roads are described as typically carrying traffic flows of up to 10,000vpd[9]. There is a level rail crossing which vehicles need to cross. To the north of Church Street, the land use changes to residential.

With the Project in place it is predicted that 5,400vpd will use Victoria Street (between Neilson Street and the rail crossing) daily in 2026 compared to 3,400 vehicles without the Project. With the Project in place Victoria Street will continue to function as a Collector road. It is considered that Victoria Street will be able to accommodate the predicted 6,300 vehicles a day in 2036. These predicted daily vehicle numbers are below those typically carried on a collector road (10,000vpd).

It is considered that as a collector road Victoria Street will be able to accommodate the predicted 5,400 vehicles a day in 2026 and no upgrades are required. With the Project in place Victoria Street will continue to function as a collector road.

Vehicles waiting at the Victoria Street level rail crossing are protected by half-arm barriers plus flashing lights and bells and the existing daily rail traffic is 51 trains[10].

There are general safety concerns around collisions between trains and vehicles at rail crossings as acknowledged by Auckland Transport. However, it is not considered that the Project will materially exacerbate these general safety concerns as the crossings has arm barriers and flashing lights.

The predicted increase in traffic flows on Victoria Street was assessed with regard for any potential for queues to block back to Neilson Street or create excessive delays. This was done by developing a simple bottleneck model that estimated the build-up and dissipation of queues during a train crossing.

[9] Auckland Transport Code of Practice (ATCOP), Auckland Transport, 2013

[10] KiwiRail

This was done for the PM peak period on the northbound movement, as this had the highest predicted hourly flow of 524 vph at the crossing with the Project. This suggested that the maximum queue length during a train crossing would increase from 13 vehicles without the Project to 19 vehicles with the Project. This queue would not extend back to Neilson Street northbound. Queuing southbound would be less due to the lower predicted flows, however queuing can be accommodated on Victoria Street without blocking upstream intersections.

The assessment found that the maximum delay did not increase, but the number of vehicles affected obviously increased due to the higher flows. For example, in the PM peak the number of northbound vehicles expected to be delayed by trains increased from 21 to 46.

Vehicles will choose different routes depending on their perceived risk of being delayed by trains. However, this diversion would be relatively limited because the Onehunga Branch rail line crosses a number of north-south roads in this area. This is not an effect caused by the Project, but means the various crossings should be treated as a whole network. This assessment was only undertaken on Victoria Street due to the predicted increase in traffic. The additional queuing would be offset by the predicted reduction in traffic flows at the Galway Street, Church Street and Captains Springs Road rail crossings. In this network context, this effect on Victoria Street is considered to be minor.

6.12 Captain Springs Road

Captain Springs Road, south of Neilson Street, is classified as a local road and further north between Neilson Street and Church Street, changes function to a Collector Road. Captain Springs Road, south of Neilson Street, will experience a very significant change in traffic flows due to new direct access to the EWL and will become a through route between Neilson Street and EWL. It is predicted that in 2026, with the Project in place, the traffic will increase to approximately 14,200vpd compared to a daily flow of 3,700vpd without the Project. This increases to 17,900vpd in 2036.

At the southern end of Captain Springs Road, just past the entrance to Waikaraka Park, the road transitions into a private road providing access to the businesses located there. The private road will be required for the Project as it will form the southerly extension of Captain Springs Road and connect with EWL.

The function of Captain Springs Road will change from a local cul-de-sac road to a four lane road to accommodate these future predicted flows in the future. It is likely to be considered an arterial road in the future and under ATCOP, secondary arterials typically carry traffic flows up to 25,000vpd.[11] Its major function is to provide access to and from the EWL and continue to provide access to existing businesses. It is noted that any change in classification will be discussed with Auckland Transport however it is likely that it will become either a primary or secondary arterial.

Captain Springs Road will comprise two 3.5m wide lanes on the western (Waikaraka Park) side, a 2m flush median and two 3.5m lanes on the eastern side and can all be accommodated within the existing road corridor. The design objectives for Captain Springs Road are safe operation and retaining as much parking as possible.

The layout of Captain Springs Road will be developed in the detailed design process. It is recommended that a process is established with Auckland Transport in regard to engagement during the detailed design of Captain Springs Road. It is recommended that matters to be considered in collaboration with Auckland Transport during the design process include safe operation for all road users, retaining as much parking as possible and consideration of a mid-block crossing,

[11] Auckland Transport Code of Practice (ATCOP), Auckland Transport, 2013

6.12.1 Effects on Parking

The upgrade to Captain Springs Road from two to four lanes will impact on on-street parking and approximately 20 out of the available 70 parking spaces at the northern end of Captain Springs Road will be removed to allow for the intersection design as shown on Figure 6.3. This will leave 50 spaces for on street parking.

Figure 6-3: Concept Drawing: Proposed Changes to Captain Springs Road Layout

The existing private road at the southern end does not currently provide for public on-street parking. However, the private road will become the connection to EWL. A concept drawing is provided in Figure 6-3 and this shows the design of the intersection with EWL.

On balance approximately 30 new on-street parking spaces will be created. The loss of 20 on-street parking spaces at the northern end of Captain Springs Road will be balanced by the creation of 30 spaces at the southern end and overall there will be a net gain of approximately 10 new parking spaces. The total spaces available for parking on Captain Springs Road with the Project will be 80 spaces.

To retain as much on-street parking as possible a clearway will be implemented on the eastern side of Captain Springs Road as show in Figure 6-3. It is anticipated that approximately 38 parking spaces will be temporarily unavailable for up to two hours in the morning and evening peak periods only. This reduces the available parking spaces from 80 spaces during the clearway periods to 42 spaces.

The surveyed average parking occupancy on a weekday between 7am and 9am was 57% and 29% between 4pm and 6pm. Applying these average parking occupancies to understand the potential demand during the clearway periods 46 spaces will be required during 7am and 9am and 23 spaces between 4pm and 6pm. This means there will be a minor shortfall of four spaces between 7am and 9am only when the clearway is in operation. It is anticipated that this minor shortfall can be absorbed by private off-street parking.

Parking for 42 cars on the western (Waikaraka Park) side of the road will be available at all times during the day in the location shown on Figure 6-3.

In summary, some parking will be removed to allow for the safe operation of the intersections of Captain Springs Road with Neilson Street and EWL however there will be an overall net gain of 10 on-street parking spaces with the Project in place as a result of the private road converted into public road. A clearway will operate to retain as much parking as possible and the operation will likely result in a minor shortfall of four spaces in the morning peak which can be absorbed by off-street parking.

It is noted that there may be less parking availability on Captain Springs Road as a Clearway is proposed to be implemented on Neilson Street as part of the Early Works for the Project which may result in a small amount of parking displaced to Captain Springs Road. Therefore, the impacts stated above may be slightly increased.

The parking surveys discussed in Section 4 showed that there is plenty of capacity on Captain Springs Road even during the busiest time at the Onehunga Sports Centre on a Saturday afternoon when the first soccer team was playing at home. The Onehunga Sports Carpark was at capacity on Saturday afternoon and there was only a small amount of overspill parking observed on street near the entrance to the Sports Centre. It is noted that the temporary Clearways will not be implemented on weekends. The car park was not at capacity during a weekday and there was no overspill parking onto the street. The car park was the busiest on a weekday at 7pm when evening training was being held, however, the carpark was only 30% utilised. Therefore, it is considered that neither the permanent or temporary removal of on-street parking on Captain Springs Road will not have an impact on the Onehunga Sports Centre as sufficient parking can be provided on-site and any overspill on-street.

6.12.2 Effects on Access

There is a positive impact for existing vehicles accessing the businesses and recreational uses on Captain Springs Road as there will be an additional connection to the south onto the EWL providing them with quicker access to/from SH1 and to/from SH20.

The private road at the southern end will be converted to a public road. Currently trucks wait on this private road to enter the O-I Glass warehouse. O-I Glass has indicated that they will be trialling a new operation whereby trucks will wait on-site along the southern edge before entering the warehouse. All movements will be provided to/from this site and consultation with the landowner will continue through the design process.

6.13 Angle Street and Miami Parade

Access to the Heliport, Ports of Auckland Ltd and Green Vision is provided via Angle Street and Miami Parade. Angle Street intersects with Neilson Street and Miami Parade is a cul-de-sac which provides direct access to the Heliport, Ports of Auckland Ltd and Green Vision. Both Angle Street and Miami Parade are classified as local roads

The Angle Street / Miami Parade route is a wide two lane road with the primary function being access to businesses. On the western side, at the northern end of Angle Street there is no parking, with parking being permitted on the rest of the road (other than marked NSAAT on the corners). Due to the nature of the businesses on the road, the route is used by many large vehicles.

The new ports link road will connect to EWL and continues north as a cul-de-sac to provide access to the Ports of Auckland Ltd and MetroPort. The new ports link road connects with Miami Parade with a priority controlled intersection.

With the Project in place in 2026 it is predicted that 7,500 vehicles will use Angle Street (south of Neilson Street) and 5,900 vehicles are predicted to use the road in 2036. It is considered that Angle Street will be able to accommodate the predicted 7,500 vehicles a day in 2026 which reduces to fewer than 6,000 vehicles in 2036 as it is a wide road with industrial / commercial uses and will not need to be upgraded.

With the Project in place Miami Parade will connect with the new ports link road and it is anticipated that there will be 6,000 daily vehicle movements on this new link. It is not considered that the function of this road will change.

It is not considered that the function of these roads will change, however it is anticipated that some traffic will use the new ports link road, Miami Parade and Angle Street to access Neilson Street rather than Captain Springs Road as Miami Parade will provide a connection to EWL via the new ports link road. Any change in classification of these two roads will be discussed with Auckland Transport.

6.13.1 Effects on Access

Overall access to the network from these properties is expected to be significantly enhanced by the connectivity provided for by the EWL.

6.14 Ports link road

The new ports link road will provide access between the Port and EWL, and to Neilson Street via Miami Parade and Angle Street. This road will provide an important new freight function and is expected to carry approximately 7,700vpd With the Project in 2026 and 6,300vpd With the Project in 2036. It is anticipated that the new ports link road will have a collector function.

6.14.1 Effects on Parking

Approximately two on-street parking spaces will be removed near the intersection of Miami Parade and the new ports link road to allow for the Project at this location. It is anticipated that the demand for two parking spaces can be absorbed into the on-street parking on Miami Parade. The impact of the removal of these parking spaces is considered to be very low.

6.15 MetroPort

6.15.1 Effects on Access

Currently access to MetroPort is from Neilson Street and this will continue to be the main access if heading to SH1 north or other areas on Neilson Street. It is predicted that in 2036 there will be reduction in traffic on Neilson Street (east of MetroPort) with the Project of 7,700 fewer vehicles

compared to without the Project. This represents a 26% reduction in traffic which will make access to and from MetroPort easier. Access will also be provided to the new EWL, adjacent to the Ports of Auckland property. This is expected to provide substantial improvements to travel time and reliability accessing the strategic and local network from MetroPort.

As indicated in Chapter 5, travel times to/from MetroPort are expected to reduce by up to 14 minutes to Highbrook and eight minutes to the airport.

6.16 Hugo Johnston Drive

There is predicted to be a significant change in traffic patterns on Hugo Johnston Drive as it will provide a connection to EWL and become a potential through route. Westbound vehicles entering EWL from Great South Road/Sylvia Park Road will not be able to turn right into Hugo Johnston Drive. However, westbound traffic on the viaduct (from SH1) will be able to turn right into Hugo Johnston Drive. Vehicles turning left out of Hugo Johnston Drive will be able to access both Great South Road and the viaduct to SH1.

There is an increase in traffic flows predicted in 2026 at the northern end of Hugo Johnston Drive, with 10,400 vpd expected with the Project, compared to 8,700vpd without the Project. This is because of the additional connection between the EWL and Church Street and O'Rorke Road. The extra through traffic attracted to the route is partially offset by a proportion of the traffic from activities on Hugo Johnston Drive now being able to exit south to the EWL, rather than all having to exit to the north. This means that there will be a small increase at the northern end, but the southern end will get busier with the introduction of through traffic.

The northern end of Hugo Johnston Drive has a reasonably narrow carriageway with recessed parking, and the design guidance for local roads expects only some 5,000vpd.That traffic flow is already exceeded at the northern end, and is expected to increase even without the Project in place.

At the southern end of Hugo Johnston Drive it is predicted that in 2026, with the Project, the traffic will increase to approximately 7,600vpd and 8,300 in 2036.

Hugo Johnston Drive (south of Neilson Street) is classified as a local road and it is likely that the function of Hugo Johnston Drive will change from a local cul-de-sac road to having more of a collector function. Its major function will be to provide access to and from the EWL, continue to provide access to existing businesses and allowing some access to areas to the north.

The introduction of through traffic is likely to lead to increased conflicts along the full length of the road and the existing road layout is not considered suitable for its increased function in the network. Hugo Johnston Drive is not designed to act as a major through route, and the general amenity of the street is high. It is recognised that providing a higher through capacity could in turn attract more through traffic. As such, the high level of 'side friction' caused by parked and turning vehicles would be useful to discourage high volumes of through traffic.

To accommodate the increase in traffic volumes, design objectives for this road were developed that included safe operation, retaining the tree lined amenity and discouraging the road from becoming an attractive rat run for through traffic.

In order to accommodate the increase in traffic volumes a minimum cross section of 9.2m; comprising two 3.5m wide lanes and a 2.2m wide recess parking on one side of the road only is proposed. This is a minimum cross section as Hugo Johnston Drive is wider in places at the southern end and can achieve parking on both sides. The provision of 3.5m wide traffic lanes (rather than 4m maximum) is proposed in order to discourage Hugo Johnston Drive becoming an attractive rat run and is consistent with ATCOP for Collector/Connector Roads.

A flush median between traffic lanes will not be provided on Hugo Johnston Drive and the ATCOP states that for a Connector Road there is often no segregation between directions. Not providing a refuge for vehicles turning into and out driveways will further discourage the use of Hugo Johnston Drive as an attractive rat run as the friction of drivers slowing and turning in/out of driveways will be

maintained. It is acknowledged that there will be some increase in delays of vehicles accessing driveways on Hugo Johnston Drive due to increase in traffic volumes and not providing a median. However, this will be off-set by savings accessing the wider network via EWL. As mentioned below visibility and sight lines of vehicles acessing driveways and side roads will be a key part of the detailed design process.

The ATCOP also states that flush medians should be provided only in Collector roads which have significantly safety concerns or high volumes of through traffic. In the five years between 2011 and 2015 only two injury/non-injury crashes were reported on Hugo Johnston Drive and both were recorded in 2011. Therefore, there is no significant crash history on Hugo Johnston Drive from the intersection to the end of the cul-de-sac or occurring at the intersection with Autumn Place and Southpark Place.

There is no significant crash history on Hugo Johnston Drive and the percentage of through traffic is not expected to be high given the road will still primarily function to provide access to businesses.

The layout of Hugo Johnston Drive will be developed in the detailed design process. It is recommended that the design objectives for Hugo Johnston Drive (eg. safe operation for all road users, retaining the tree-line amenity and discouraging through traffic) along with other matters (e.g aiding visibility for vehicles accessing driveways and retaining as much parking as possible) are considered in collaboration with Auckland Transport during the design process. It is recommended that a condition is proposed to require these design objectives and other matters to be considered in this process of engagement and approval.

6.16.1 Effects on Parking

In order to achieve the design objectives for Hugo Johnston Drive approximately 15 on-street parking spaces will need to be removed at pinch points at the northern end as shown on Figure 6-4 To allow for the connection to the EWL and safe intersection performance at the southern end of Hugo Johnston Drive approximately 25 on-street parking spaces will be removed. This is a total of 40 parking spaces to be removed. This means there will be a reduction from 182 parking spaces to 142 spaces available for parking.

The peak average surveyed occupancy on Hugo Johnston Drive across the day is 63%, which equates to a potential demand of 115 spaces in the future. The demand of 115 spaces from an available 142 spaces means there is likely to be a peak average occupancy of 81% across the day, which is considered to be high. However, it is considered that most businesses have significant off-street parking, which may not be at capacity and can be utilised. Notwithstanding, there are opportunities to mitigate the loss of on-street parking through the provision of a u-turn facility and additional parking at the southern end of Hugo Johnston Drive in the approximate location shown on Figure 6-4.

Figure 6-4: Location of proposed car parking spaces to be removed on Hugo Johnston Drive

Further, through further design stages of the Project there may be opportunities to minimise the amount of on-street parking that needs to be removed and these opportunities will continue to be explored in consultation with AT.

The available parking spaces are likely be towards the southern end of Hugo Johnston Drive which may mean some people may have to walk further depending on their destination as currently most of the parking occurs at the northern end. The additional distance people may be required to walk between their cars and destinations may introduce personal safety issues. To mitigate this potential personal safety impact upgrade to existing street lighting should be considered, if required.

Hugo Johnston Drive will become a through road and the cul-de-sac will be removed. Currently, this cul-de-sac is used for recreational cyclist on the weekends who drive and park at this location as it provides convenient and direct access to the Waikaraka Cycleway. The on-street car parking closest to the connection to the Waikaraka Cycleway will be removed. The provision of a u-turn facility and additional car parking at the southern end of Hugo Johnston Drive will mitigate the loss of convenient parking close to the Waikaraka Cycleway.

It is also anticipated that a few additional parking spaces may also need to be removed to aid visibility of vehicles accessing driveways and these will be identified at subsequent design stages of the Project to be undertaken in consultation with AT. As discussed previously, it is recommended that a process is established with Auckland Transport in regard to engagement during the detailed design of Hugo Johnston Drive.

It is noted that a Clearway is likely to be implemented by Auckland Transport in 2016 on the western side of Hugo Johnston Drive near the intersection with Church Street which will mean that up to seven spaces will be temporarily unavailable for parking between 4pm and 6pm Monday to Friday.

6.16.2 Effects on Amenity

By designing a cross section with recessed parking on one side of the road only at identified pinch points it is anticipated that the tree lined amenity values of the street will remain.

6.16.3 Effects on Access

The right turn from Hugo Johnston Drive into EWL is banned to minimise impacts on the EWL and to reduce through traffic on Hugo Johnston Drive. To mitigate the potential safety concern of vehicles not being able to turn right out of Hugo Johnston Drive into EWL (and therefore attempting an unsafe u-turn), a facility to allow safe u-turns and some parking will be provided. Hugo Johnston Drive is currently a cul-de-sac and the current congestion on Church St often restricts egress for all vehicles. The reduced flows on Church Street and the alternative access provided via the EWL Project is expected to significantly enhance accessibility to businesses on this road.

The positive impact for existing vehicles accessing the businesses and recreational uses on Hugo Johnston Drive will be an additional connection to the south onto the EWL providing them with quicker access to SH1 and from SH20. Better connectivity will be provided for these existing businesses and a new north-south connection for through traffic.

6.17 Sylvia Park Road

A 29% increase in traffic flows (21,600 vpd With the Project compared to 16,700 vpd Without the Project) is expected in 2026 on the western end of Sylvia Park Road as a result of this forming part of the EWL. Sylvia Park Road is being widened to accommodate these higher flows, as well as having traffic to/from SH1 on elevated structures.

The eastern end of Sylvia Park Road, under the new ramps to SH1, is predicted to have similar flows in 2026 with or without the Project and a 5% increase in daily flows in 2036 With the Project compared to Without the Project. This is due to the reductions from traffic diverting to the new ramps

being offset by extra traffic attracted to the corridor from Mount Wellington Highway due to its access to the EWL.

Sylvia Park Road is classified as a Primary Arterial road and will provide direct access between the EWL and the new SH1 ramps, as well as retaining its important east-west function connecting Mount Wellington Highway to Great South Road. In the future it is likely that Sylvia Park Road will continue to function as an arterial road but will be upgraded from a primary to a strategic arterial due to its access to SH1.

A designated over-height and over-dimension route runs along the northern arm of Great South Road and along Sylvia Park Road. During the detail design and development of Site Specific Traffic Management Plans, collaboration will be required with Auckland Transport and the Heavy Haulage Association to either maintain the existing route or provide an alternative route during occasional closures.

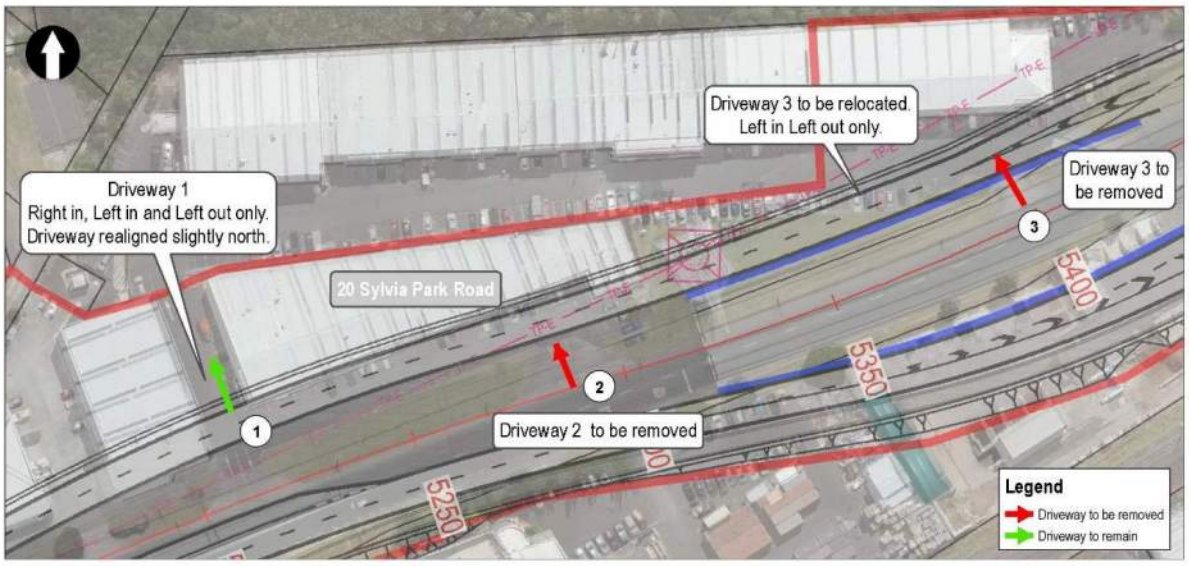
6.17.1 Effects on Access

6.17.1.1 20 Sylvia Park Road

20 Sylvia Park comprises of two blocks of commercial units with Units L to Q located on the Sylvia Park Road frontage and Units A-I located to the rear. As seen on Figure 6-5 there is a land requirement for the Project for the front units and one of the rear units.

Access to the commercial units at 20 Sylvia Park Road is currently via three driveways as shown on Figure 6-5. Currently all turning manoeuvres are possible in and out of this property. Sylvia Park Road will generally be widened from two lanes to four lanes and the traffic volumes at the western end of Sylvia Park are predicted to increase by approximately 29% in 2026 to 21,600 vehicles a day compared to 16,700 vehicles a day without the Project. A solid median will be provided along the majority of Sylvia Park Road separating the lanes of traffic in each direction. Outside 20 Sylvia Park there will be four westbound lanes and two eastbound lanes.

Figure 6-5: Proposed Access Arrangements for 20 Sylvia Park Road



The front units and their access (Driveway Number 2) will also be removed as seen on Figure 6-5. Driveway 1 will be reconfigured and moved north slightly to continue to provide access to the rear units. Driveway 3 will be removed and relocated slightly west of its' existing location and will continue to provide access to the rear units, however with a restriction in turning movements (left in and left only). This is an overall reduction from three to two access points for the site and is considered

acceptable as the rear units will have two access points. Driveway Number 2 will not be required as the units that use this driveway are required for the Project.

a. Driveway Number One

One of the two access points to the rear commercial units will be via Driveway Number 1 and will be provided via a left turn in, left turn out and a right turn in. A right turning bay will be provided within the solid median which will retain the right turn from Sylvia Park Road into the site.

The right turn out of the site will not be provided for in the future for the rear commercial units. Vehicles wanting to travel west will be able to turn left onto Sylvia Park Road and then use the proposed reconfigured Pacific Rise intersection, under the elevated EWL, to u-turn and head west back towards Great South Road. The extra distance these vehicles have to travel is approximately 1km. The traffic at this end of Sylvia Park Road is significantly less as a significant proportion of traffic will be on the SH1 on-ramp to provide opportunities to perform the u-turn. The westbound traffic will also be controlled by traffic signals at the newly reconfigured Mount Wellington Highway / Sylvia Park Road interchange providing gaps in the traffic to perform the u-turn.

The additional 1km westbound vehicles will need to travel can be offset by the new direct access onto EWL and overall journey time savings in the local area. Overall, it is considered that the impact on the property access is low.

b. Driveway Number Three

Driveway Number 3 will be removed and relocated slightly west of its' existing location via a left turn in and left turn out only and any other turning movements will be prevented by the presence of the solid median. However, vehicles wanting to turn right into the site will be able to use the right turning bay into Driveway 1, which will be located approximately 170m to the west. Those vehicles wanting to travel west will use the proposed reconfigured Pacific Rise intersection, to u-turn and head west back towards Great South Road.

c. Assessment of Banned Movements

A snapshot survey was undertaken on Tuesday 18th October 2016 (in good weather conditions) to determine the impact of the removal of the right turn out of the site from the remaining two driveways (Driveways 1 and 3). The snapshot survey was undertaken between 8am – 10am, 12pm - 1pm and 3pm – 3.45pm. Thesurvey results are included in Appendix B.

The survey showed that of the 98 vehicles leaving the site using Driveways 1 and 3 during the surveys, 36 of these vehicles turned right (approximately 37%). In the future, during these time periods, these vehicles will make a u-turn at the re-configured intersection at Pacific Rise.

The busiest driveway for right turners out of the site was Driveway Number 2 where 18 vehicles were recorded between 12pm and 1pm. It is likely that this is mostly because of the trips generated by the lunch bar. This driveway is the busiest for right turning movements out of the site and these will not be made in the future as the lunch bar is one of the front units that are required for the Project. It was observed during the survey that a number of cars would indicate to turn right, but when the traffic was too congested to make the turn, would then turn left instead.

The highest recorded number of right turners out of Driveway 1 during the survey was 11 vehicles between 12pm and 1pm. Very few vehicles turn right out of Driveway 3 with the highest recorded number of right turners during the survey was 2 vehicles between 12pm and 1pm. In the future this low volume of right turners will make a u-turn at the re-configured intersection at Pacific Rise.

The right turn in will be banned from Driveway 3 and a total of 49 vehicles turned right into the site across the three survey periods from Sylvia Park Road. In the future, these vehicles will be able to turn right into the site using Driveway 1.

The Pacific Rise intersection will be re-configured to allow for the ramp structure and to allow these u-turns as part of the Detailed Design process, which will include a Safety Audit. It is noted that the eastern end of Sylvia Park Road will only increase (1%) in 2026 and increase 5% in 2036 with the Project compared to Without the Project. The exact detail of this intersection will be confirmed during detailed designin collaboration with Auckland Transport and it is recommended that a condition is proposed to describe this process of engagement and approval.

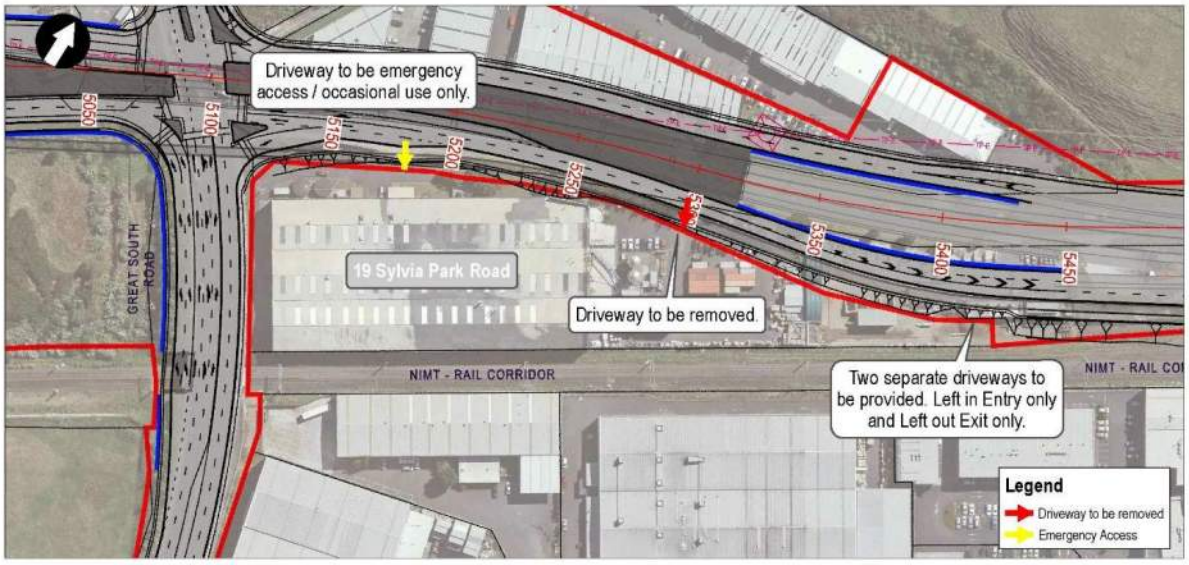
d. Effects on Parking

Approximately 40 parking spaces associated with the rear units are required for the Project as seen in Figure 6-5. The appropriate number of parking spaces, as determined by the PAUP parking provisions or relevant resource consents, will be provided for the remaining rear units. It is noted that there is more than sufficient space within the designation to provide these spaces.

6.17.1.2 19 Sylvia Park Road

Access to 19 Sylvia Park Road is currently via two driveways and all turning manoeuvres are possible in and out of this property as seen in Figure 6-6 below. Of the two driveways, the main access is the easterly one, which is further away from the Great South Road intersection. A solid median will be provided on Sylvia Park Road separating the three westbound lanes and two eastbound lanes outside this property.

Figure 6-6: Proposed Access Arrangements for 19 Sylvia Park Road



To minimise turning movements to/from Sylvia Park Road the driveway closest to the Great South Road intersection will be maintained but for emergency and occasional use only as seen in Figure 6-6

The main access to the site will be removed andtwo new separate driveways to the east of the existing driveway will be provided as seen on Figure 6-6 Access will be provided via a separate left in entry only driveway and a separate left out exit only driveway. This will be a total of three driveways for the site. The right turn into the site will not be provided for in the future due to the high volumes of traffic and proximity of the traffic signals. Vehicles will use the proposed reconfigured Pacific Rise intersection, under the viaduct, to u-turn and head west back along Great South Road to the site entrance. The extra distance these vehicles have to travel is approximately 1km. In the future vehicles wanting to travel eastbound to access Mount Wellington Highway / SH1 will use Great South Road and Vestry Drive as the right turn out of the site will be banned. The extra distance is approximately 1km. The Project will mean less convenient vehicle access compared to the existing arrangements particularly for those wanting to travel west.

The additional distance vehicles will need to travel can be offset by the new direct access onto EWL and overall journey time savings in the local area. Overall it is considered that the impact on the property access is low.

6.17.1.3 8 Sylvia Park Road and 1 Pacific Rise

Number 8 Sylvia Park Road and 1 Pacific Rise are located adjacent to each other and between Mutukāroa-Hamlins Hill Regional Park and Pacific Rise at the eastern end of Sylvia Park Road where only marginal increases (1%) are predicted in 2026 with the Project compared to Without the Project. Access to these properties and associated carparks are shared and gained from four driveways, two of which are located on Sylvia Park Road and two are located on Pacific Rise as shown on Figure 6-7. It is understood that vehicle circulation is shared and provided around, and between, these two properties.

Due to the location of the retaining walls for the SH1 ramps Driveway 5, as seen on Figure 6-7, will be removed. Access will be retained to both 8 Sylvia Park Road and 1 Pacific Rise however some movements will be banned.

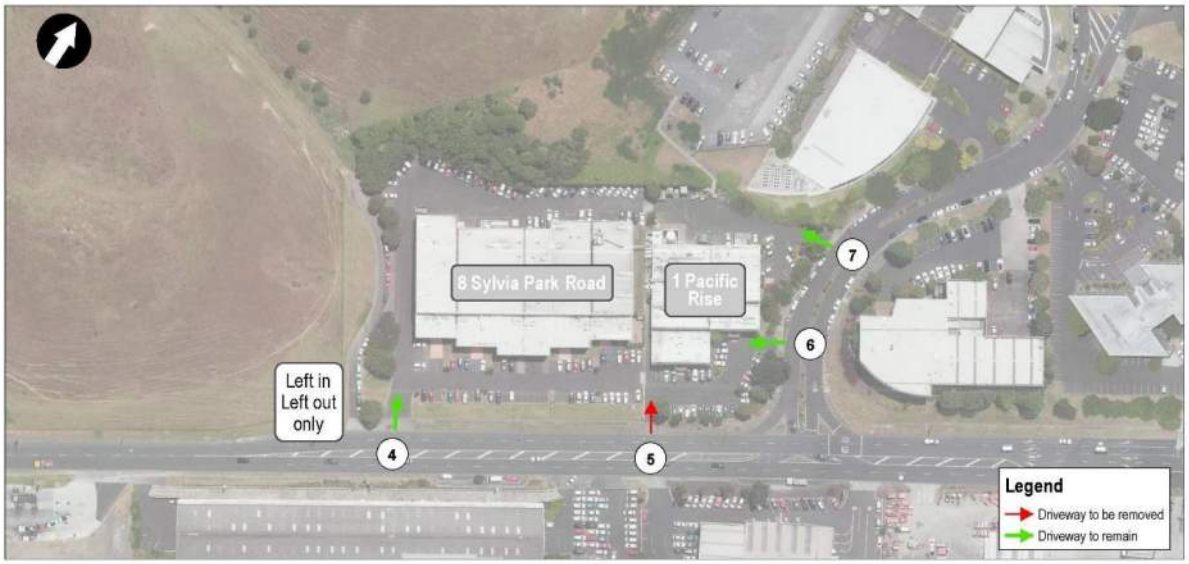
Future access to 8 Sylvia Park Road will continue to be provided through the existing driveway Number 4 however via left in and left out turns only. For those arriving from the north, instead of turning right into the site, these vehicles will use Mount Wellington Highway, Vestey Drive, Great South Road, Sylvia Park Road and left into the site. For those arriving from the south and east Mount Wellington Highway, Niall Burgess Road, Vestey Drive, Great South Road, Sylvia Park Road and left into the site will be used. These will mean an additional approximately 1km distance which is considered to be an inconvenience. To reduce this inconvenience, a right turn into Pacific Rise then access to 8 Sylvia Park (via 1 Pacific Rise) will be explored with the landowners.

The banned right turn will mean vehicles in the future will turn left and u turn at the reconfigured Pacific Rise intersection.

For vehicles wanting to turn right out of the site and head west there are two access points (Driveways 6 or 7) as shown in Figure 6-7 from the site onto Pacific Rise so vehicles can use the Pacific Rise intersection to turn right and travel west. This is a minor change in access arrangement. The traffic at this end of Sylvia Park Road is significantly less as a large proportion of traffic will be on the SH1 on-ramp to provide opportunities to perform the right turn from Pacific Rise. The westbound traffic will also be controlled by traffic signals at the newly reconfigured Mount Wellington Highway / Sylvia Park Road interchange providing opportunities to perform the u-turn.

For vehicles wanting to turn right into 1 Pacific Rise site they will turn right turn from Sylvia Park Road into Pacific Rise at the reconfigured intersection and then access the site via Pacific Rise using Driveways 6 or 7 as shown in Figure 6-7.

Figure 6-7: Proposed Access Arrangements to 8 Sylvia Park Road and 1 Pacific Rise



a. Proposed Driveway Removal and Banned Movements

A snapshot survey was undertaken on Tuesday 18th October 2016 (in good weather conditions) to determine the impact of the proposed closure of one of the driveway utilised by 1 Pacific Rise (Number 5 on Figure 6-7). The survey was undertaken between 1pm – 2pm and 4pm – 6 pm to capture those people leaving the site at the end of the day and the survey results are included in Appendix B.

Observations made during the survey period were that vehicles turning right out of 8 Sylvia Park Road would drive through the carpark and use driveway 4 to avoid the congestion from the traffic signals at Mount Wellington Highway. It was also observed that the quietest entry/exit was driveway 5 – possibly due to its configuration and size – confirmed by the fact that of the 103 vehicles entering/exiting the site during the survey period, only 23 used driveway 5. This is the driveway that will be removed by the Project.

The combined number of vehicles exiting the site turning right onto Sylvia Park Road using Driveway 4 and 5 during the surveyed period was 13 vehicles.

The biggest inconvenience is for those who currently turn right into Driveway 4 and Driveway 5. No vehicles were recorded turning right into Driveway 5 and only two were recorded turning into Driveway 4 (however it is noted that the survey was not undertaken in the morning).

With the Project in place, these vehicles will be able to use the remaining driveways 6 and 7 to enter/exit the site.

The Pacific Rise intersection will be re-configured as part of the Detailed Design process, which will include a Safety Audit. It is noted that the eastern end of Sylvia Park Road will only marginally increase with the Project compared to Without the Project.

b. Effects on Parking

The upgrade of Sylvia Park Road will require the removal of approximately 150 on-street parking spaces as No Stopping At Any Time (NSAAT) lines are proposed to be implemented along its length. There are three recessed parking bays on the southern side, two near the Mount Wellington Highway end and one near the Great South Road end of Sylvia Park Road. It is assumed that the parking is associated with the adjacent businesses.

Snap shot surveys undertaken in August 2016 show that the parking on this street is significantly underutilised with only 11 vehicles using the potential 150 spaces available. Only one truck was observed parking on the northern side during the three surveyed times and 10 was the highest number of vehicles observed parked on the southern side – nine cars and one truck. Only the three recessed bays were used for parking on the southern side.

The majority of the businesses on the southern side of Sylvia Park Road are required for the Project so the associated demand for parking will also be removed. The one business that will remain is at 13-21 Sylvia Park. One car was observed parked in the recessed bay so the impact of removing parking is negligible. Ample off-street parking available was observed on both sides of Sylvia Park.

Although the Project will mean the loss of 150 existing on-street parking spaces, these spaces are significantly underutilised with only 6% occupancy. The removal of the majority of the businesses on the southern side will mean the associated demand will also be removed and there will not be a significant impact on parking.

6.18 Pacific Rise Businesses

6.18.1 Effects on Access

Pacific Rise businesses will retain all existing turning movements using the reconfigured intersection. Vehicles from SH1 wishing to access Pacific Rise will not be able to use the new EWL ramps, instead continuing to use the existing Mount Wellington Highway ramps.

The traffic volumes on Sylvia Park Road passing the Pacific Rise intersection (i.e. excluding those on the elevated motorway ramps), are predicted to remain largely unchanged With the Project. However, the widened intersection form means that vehicles turning right out of Pacific Rise can make this manoeuvre in two stages, waiting in the wide median for a gap in the westbound traffic. This is expected to make it easier to exit Pacific Rise.

6.19 Vestey Drive

The western end of Vestey Drive and the whole length of Niall Burgess Drive are classified as Collector roads and these two roads provide a connection between Great South Road and Mount Wellington Highway. The eastern end of Vestey Drive is classified as a local road.

The eastern end of Vestey Drive is predicted to have an increase of some 1,100 vpd as a result of the Project. The resulting flow of some 4,300 vpd (2036) is not expected to create an adverse effect on this wide industrial road.

In 2026 it is predicted that the vehicles using the western end of Vestey Drive will increase from 7,600 vpd to 10,700 vpd. A similar increase is expected in 2036. This increase relates to the western end where the road is classified a collector road where typical traffic flows are up to 10,000 vehicles per day.

Analysis of the models indicated that these increases were mostly in the westbound direction and mostly from the interpeak period models. The increase relates to vehicles from Panama Road wishing to access the EWL (via Niall Burgess Road) and vehicles from Mt Wellington Highway choosing to use Vestey Drive rather than Sylvia Park Road. This was found to be sensitive to the predicted delays at the intersections at each end of Sylvia Park Road. The operation of those signals, and hence the predicted delays, are difficult to predict with certainty.

However, with the main SH1-EWL movements being elevated over both these intersections, it is expected that the signals could be operated in such a way as to reduce the number of vehicles using the western end of Vestey Drive. A sensitivity test in the model that only refined the signal timings on the interpeak period halved the increase in the daily flow.

It is considered that Vestey Drive will be able to accommodate the predicted increase in vehicles per day in 2026 and in 2036 as it is a wide road with parking restrictions where required to maintain two-way flow and will not need to be upgraded.

However, it is recommended that the destination of Māngere is included on any existing or future road signage located on Mount Wellington Highway which directs motorists to perform a right turn into Sylvia Park Road. This will help mitigate the increased flows predicted on Vestey Drive by encouraging vehicles wishing to access destinations to the west of Otahuhu (e.g. Māngere, Māngere East and Māngere Bridge) to use Sylvia Park Road, rather than Vestey Drive.

Bus service 323 uses the western end of Vestey Drive and the impact on proposed Central Suburbs Route 323 is discussed in Section 8.

6.20 Great South Road

6.20.1 781 Great South Road

Currently access to this site is restricted to left-in and left-out only. It is proposed that these restrictions are lifted due to the significant reduction in traffic flow on this section of Great South Road. It is understood that this property is used by TR Group and Johnston's Coachlines. This will provide this property with much improved access to SH1 and the new EWL, and is a positive impact of the Project.

Auckland Transport has agreed to reinstate the right-in and right-out turning movement as there are reduced traffic volumes outside the site. The re-instatement will be progressed as part of the detailed design of the Great South Road/East West Link/Sylvia Park Road intersection. Although AT have given agreement to this, final approval for the reinstatement of the right turning movements will be required from Auckland Transport which will include an assessment of sight visibility and safety. It is recommended that a condition is proposed to describe this process of engagement and approval.

6.20.2 1016 Great South Road

The Project will require a small amount of land at the front of 1016 Great South Road for the reconfiguration of the Great South Road / Sylvia Park Road intersection. This is likely to result in the loss of approximately eight spaces (less than 10%), located along the front of the site. With the Project in place the number of car parks on site will reduce from 93 to 85.

The observational surveys undertaken on a weekday in August 2016 suggests that at 8:30am there were approximately 60 spaces available and at 12:15 and 4:40pm there were approximately 30 spaces available for parking. These observations would suggest if the capacity of the carpark was reduced to 85 spaces the existing car park can accommodate the demand.

1016 Great South Road are required to provide 53 car parking spaces under the PAUP (Decisions Version) as outlined in Table E27.6.2.4 of the PAUP. This is broken down into 30 car parking spaces for the office use and 23 car parking spaces for the warehouse use and is based on the numbers within the resource consent decision for the site.

Although, the Project results in the removal of approximately eight car parking spaces (a reduction from 93 car parking spaces to 85 car parking spaces), 1016 Great South Road will be well within the PAUP car parking requirements of 53 spaces.

6.21 Panama Road Bridge

6.21.1 Access to Sylvia Park Town Centre (Hillside Road Properties)

Panama Road Bridge and the intersection of Panama Road and Hillside Road will be upgraded with Panama Bridge being raised. These improvements will enable the right turn from Hillside Road into

Panama Road to be re-instated. This will have a positive impact for those residents wanting to access Sylvia Park Town Centre and other destinations on the opposite side of SH1 via Panama Road Bridge. As seen in Figure 6-8 residents currently have a circuitous route to access the eastern side of SH1. By re-instating the right turn residents will travel 1.5km less and avoid using busy Mount Wellington Highway. This is a positive connectivity impact for this community. It would also have some network benefits by reducing the vehicles having to use Mount Wellington Highway.

The re-instatement will be progressed as part of the detailed design of the Hillside Road/Panama Road intersection. Final approval for the reinstatement of the right turn from Hillside Road into Panama Road will be required from Auckland Transport, which will include an assessment of sight visibility, safety and trip generation. It is recommended that a condition is proposed to describe this process of engagement and approval.

Figure 6-8: Hillside Road improved connectivity

6.21.2 Effects on Parking

Approximately two on-street parking spaces will be removed to allow for the Project at this location. It is anticipated that the demand for two residential parking spaces can be absorbed into the surrounding local residential streets. The impact of the removal of these parking spaces will be insignificant.

6.22 Frank Grey Place (north of Princes Street East)

6.22.1 Effects on Access

Due to the location of the re-configured SH1 Princes Street on and off-ramps a significant increase in traffic is predicted (71% in 2026 and 64% in 2036) on Frank Grey Place (north of Princes Street East). It is predicted that 13,400vpd in 2026 will use Frank Grey Place (north of Princes Street east) and the road has been widened to four lanes south of the on-ramp to accommodate this increase in traffic flows.

The proposed changes on Frank Grey Place between Princes Street East and the new motorway on/off-ramps will affect access to the remaining properties on the eastern side of Frank Grey Place. The traffic flows are expected to increase on this section of Frank Grey Place; however, it is being widened to four lanes to accommodate these flows. These eastern properties include 11, 29 and 31 Frank Grey Place.

There is no formal access to 13 Frank Grey Place and it is likely this is shared with the driveway at 29 Frank Grey Place. Residential driveways provide direct access to the properties at 11, 31 and 31a Frank Grey Place as shown on Figure 6-9

Number 31 Frank Grey Place has a partial land requirement for the Project and the balance of the land will allow future access to be provided via this property to 13 and 29 Frank Grey Place from Princes Street East. Number 11 Frank Grey Place will have a re-aligned access point from their southern boundary to their northern boundary. Access to these properties will therefore be retained.

Figure 6-9: Frank Grey Place

6.23 Princes Street East

6.23.1 Effects on General Access

The Princes Street East community east of SH1 currently only have access via the Princes Street interchange, or via the Trenwith Street underpass. However, during the afternoon peak periods the queuing from the motorway ramps block the interchange and hence also Frank Grey Place. This effectively gridlocks all access to this community with significant queues and delays. The upgraded interchange proposed with the Project includes larger on-ramp queue storage and a widened bridge. This is expected to reduce queuing on the local network, and allow non-motorway traffic to move around any residual queues. This is expected to significantly improve the quality and resilience of access to this community.

6.23.2 Effects on Parking

It is estimated that up to approximately 10 on-street parking spaces will be removed to allow for the shared path on either side of Princes Street East, east of the intersection with Frank Grey Place. It is anticipated that the demand for 10 residential parking spaces can be absorbed into the surrounding local streets. Nearby Fencible Street is a residential cul-de-sac with no parking restrictions and the majority of houses have generous off-street parking. Only two cars were observed parking on Fencible Street during the surveyed day in August 2016. It is anticipated that the demand for 10

residential parking spaces can be absorbed into Fencible Street which appeared to have ample capacity. The impact of the removal of these parking spaces will be insignificant.

6.24 Summary of Effects and Mitigation

The assessment of effects on property access and parking has identified the following:

- There are some properties on Gloucester Park Road, Onehunga Mall, Onehunga Harbour Road and Sylvia Park Road that require some access movements to be via a longer route. However, these are all off-set by the significantly improved access to SH1 and SH20 (and the local roads), offered by the Project;
- Access to the TR Group at 781 Great South Road is currently restricted to left-in and left-out only, however these constraints can be removed due to the significant reduction in traffic flows at that location. This will significantly enhance access to the site, especially to the EWL;
- Access to Orpheus Drive would be via a low volume, local road rather than the current high volume motorway access road, which would be more compatible with its recreational function.
- Access to Sylvia Park Town Centre for Hillside Road residents will be significantly improved by re-instating the right turn from Hillside Road into Panama Road. The route will be shorter and quicker and has a positive connectivity impact for this community;
- Access to businesses in Onehunga Mall, and especially on Galway Street (north of Neilson Street), will have reduced accessibility due to the banned turns proposed at Galway Street and Gloucester Park Road. The reinstatement of the right turn into Onehunga Mall will mitigate the impact on accessibility;
- The upgraded interchange at Princes Street is expected to reduce queuing on the local network, and allow non-motorway traffic to move around any residual queues. This is expected to significantly improve the quality and resilience of access to this community;
- The removal of up to 15 parking spaces on the southern side of Onehunga Harbour Road cul-de-sac (opposite the Landing) can be mitigated by providing these spaces in the redundant portion of Onehunga Harbour Road to the west of the Airport Harbour View Motel. There is also opportunity for these car parking spaces to be re-provided on the newly realigned Onehunga Harbour Road which will be lightly trafficked with the Project in place in 2026;
- It is anticipated that the demand for 12 parking spaces on Galway Street could be provided off-street as the businesses on Galway Street were observed to have extensive off-street parking. A Clearway on one side of Galway Street will be considered to mitigate the net loss of approximately 30 car parking spaces;
- It is considered that the demand for car parking spaces at 1016 Great South Road can still be accommodated with approximately eight car parking spaces removed from this property;
- There will be a loss of approximately 40 car parking spaces associated with the rear units at 20 Sylvia Park Road. An appropriate number of parking spaces, as determined by the PAUP parking provisions or relevant resource consents, will be provided for the remaining rear units.
- The loss of 150 existing on-street parking spaces on Sylvia Park Road will not have a significant impact on parking as the spaces are significantly underutilised with only 6% occupancy. The removal of the majority of the businesses on the southern side will mean the associated demand will also be removed as all observed cars were parked on the southern side;
- Vehicles exiting Pacific Rise onto Sylvia Park Road is anticipated to become easier with the widened intersection form.
- There will be an overall net gain of 10 on-street parking spaces with the Project in place on Captain Springs Road as a result of the private road converted into public road. There will be a temporary loss of 38 on-street parking spaces for short periods of time in the morning and evening peaks with the implementation of a Clearway. Parking for 42 cars on the western (Waikaraka Park) side of the road will be available at all times during the day;

- There is sufficient parking capacity on Hugo Johnston Drive following the removal of 40 car parking spaces for the Project. It is also considered that most businesses have significant off-street parking, which may not be at capacity and can be utilised. The available parking spaces will be towards the southern end of Hugo Johnston Drive, which may mean some people may have to walk further. To mitigate this potential personal safety impact upgrades to existing street lighting should be considered, if required;
- There are other locations where a small amount of on-street parking will be lost, however this can be absorbed into existing nearby streets; and

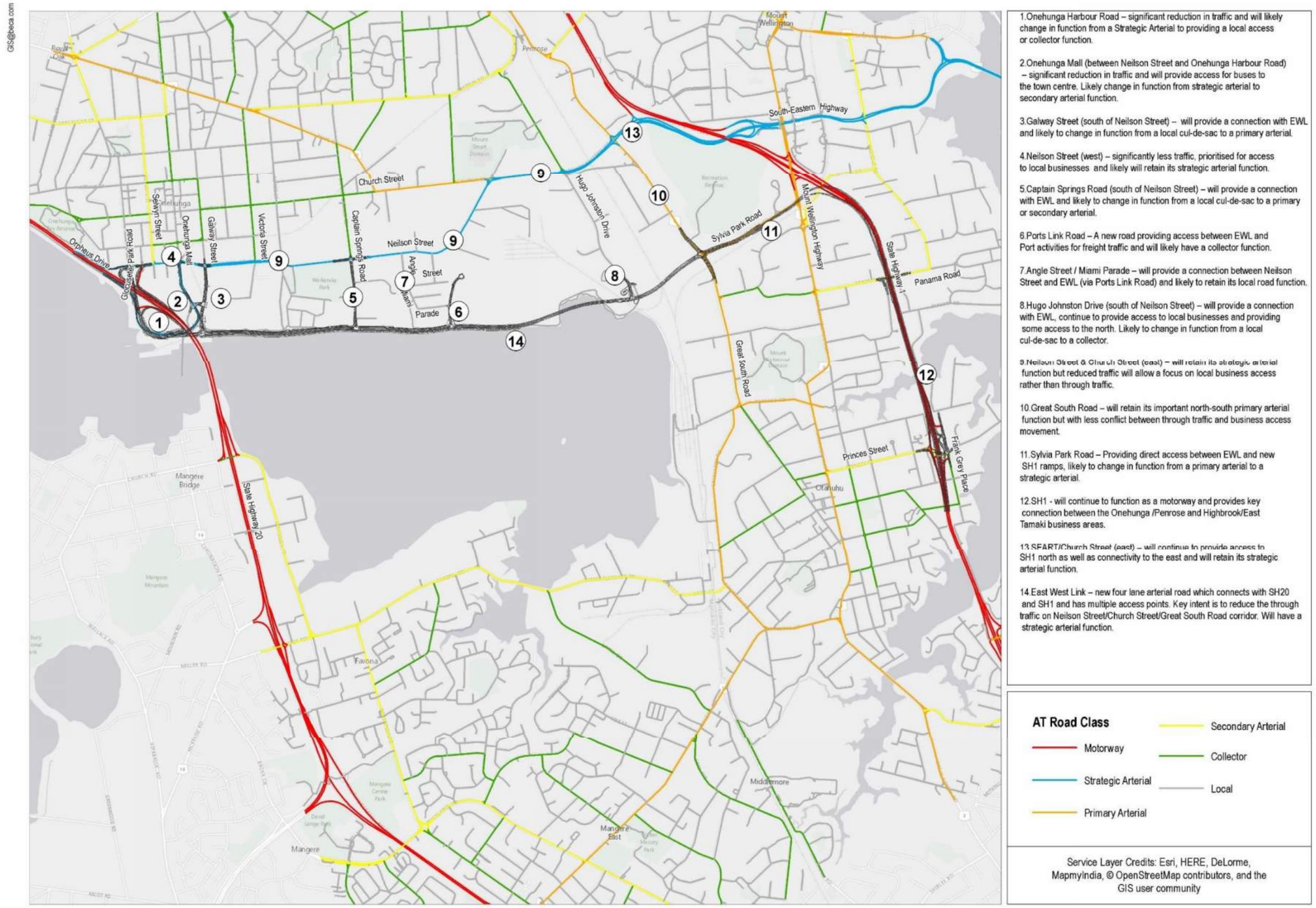
A summary description of the change in function to the existing road network, with the Project in place, is shown on Figure 6-10. Figure 6.10 shows the existing AT classifications and describes the change in function for a selection of roads. It is recognised that some existing roads will retain the same classification, some will be de-classified, and other roads will receive a higher classification. Discussions with Auckland Transport on the potential change to future road classification has commenced and will continue. Any changes to road re-classification will be agreed with Auckland Transport as the Project progresses through consenting.

Specific mitigation identified in this assessment includes:

- Use of redundant section of Onehunga Harbour Road to provide for replacement on-street car parking lost outside The Landing;
- Provision of clearways on Captain Springs Road and consideration of clearways on Galway Street to allow for off-peak parking;
- Provision of a u-turn facility and extra parking at the southern end of Hugo Johnston Drive;
- Removal of some parking on Hugo Johnston Drive, along with the consideration of upgraded street lighting to accommodate the change in function; and
- Inclusion of Māngere as a destination into any existing or any future highway signage on Mount Wellington Highway directing motorists to perform a right turn into Sylvia Park Road rather than using Vestey Drive.

Explore the potential to provide access to 8 Sylvia Park Road (via 1 Pacific Rise) with landowners. It is recommended that the process of engagement and approvals with AT for the design of Hugo Johnston Drive, Captain Springs Road, the re-instatement of right turn from Hillside Road and the re-instatement of right tuning movements at 781 Great South Road is described as part of a proposed condition.

Figure 6-10: Summary of the future changes to the function of the existing road network



1.Onehunga Harbour Road – significant reduction in traffic and will likely change in function from a Strategic Arterial to providing a local access or collector function.

2.Onehunga Mall (between Neilson Street and Onehunga Harbour Road) – significant reduction in traffic and will provide access for buses to the town centre. Likely change in function from strategic arterial to secondary arterial function.

3.Galway Street (south of Neilson Street) – will provide a connection with EWL and likely to change in function from a local cul-de-sac to a primary arterial.

4.Neilson Street (west) – significantly less traffic, prioritised for access to local businesses and likely will retain its strategic arterial function.

5.Captain Springs Road (south of Neilson Street) – will provide a connection with EWL and likely to change in function from a local cul-de-sac to a primary or secondary arterial.

6.Ports Link Road – A new road providing access between EWL and Port activities for freight traffic and will likely have a collector function.

7.Angle Street / Miami Parade – will provide a connection between Neilson Street and EWL (via Ports Link Road) and likely to retain its local road function.

8.Hugo Johnston Drive (south of Neilson Street) – will provide a connection with EWL, continue to provide access to local businesses and providing some access to the north. Likely to change in function from a local cul-de-sac to a collector.

9.Neilson Street & Church Street (east) – will retain its strategic arterial function but reduced traffic will allow a focus on local business access rather than through traffic.

10.Great South Road – will retain its important north-south primary arterial function but with less conflict between through traffic and business access movement.

11.Sylvia Park Road – Providing direct access between EWL and new SH1 ramps, likely to change in function from a primary arterial to a strategic arterial.

12.SH1 - will continue to function as a motorway and provides key connection between the Onehunga /Penrose and Highbrook/East Tamaki business areas.

13.SEART/Church Street (east) – will continue to provide access to SH1 north as well as connectivity to the east and will retain its strategic arterial function.

14.East West Link – new four lane arterial road which connects with SH20 and SH1 and has multiple access points. Key intent is to reduce the through traffic on Neilson Street/Church Street/Great South Road corridor. Will have a strategic arterial function.

AT Road Class

- Motorway
- Strategic Arterial
- Primary Arterial
- Secondary Arterial
- Collector
- Local

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7 Assessment of Walking and Cycling Effects

7.1 Introduction

This section considers the proposed changes to the pedestrian and cycling network for each sector and the potential effects on pedestrians and cyclists. This is primarily a qualitative assessment of changes in the type and quality of connections and facilities provided as indicated in *Volume 2: Drawing Set, Drawing Set 3: Road Alignment*. An assessment of how the proposed pedestrian and cycling facilities will connect with future urban cycleways and greenways. Simple estimates of potential usage of the proposed pedestrian and cycling facilities are discussed in this section. This section will also discuss how the Project will address the key issues of the existing walking and cycling network identified in Section 4.

7.2 Key Considerations

Key considerations in developing the walking and cycling network for the Project were as follows:

- *Improving connectivity*:
  - A continuous and direct walking and cycling network to key destinations such as Onehunga Town Centre and Sylvia Park Town Centre;
  - Access into Ōtāhuhu East;
  - Closing existing network gaps; and
  - New connections between the Māngere Inlet foreshore, the adjacent communities and the existing and proposed walking and cycling network.
- *High Amenity:*
  - A walking and cycling network which feels safe, separated from traffic and has appropriate dimensions;
  - Complementing the established network;
  - Off-road shared facilities where possible;
  - Minimum width of 3m for shared paths and 1.8m for footpaths;[12].
  - Where possible take advantage of natural surroundings;
  - Safe crossing points for pedestrians and cyclists; and
  - Direct routes wherever feasible.
- *Separating needs of different users:*
  - Separate facilities where feasible to minimise conflict between the predicted high volume and speed of commuter cyclists and recreational users along the straight foreshore alignment.
- *Integration with the existing and proposed walking and cycling network.*
  - Ensuring the design “ties in” allows for existing facilities and allows for future AT projects.
- *Overcoming severance:*

[12] As per ATCOP and Austroads Part 6A’s design guidelines

- Overcomes the challenges of natural (e.g. creeks) and man-made severance, especially that created by the EWL itself.

This section is focussed on transport functionality and does not assess the visual amenity or visual severance impacts of the Project on the proposed walking and cycling network.

It is noted that this section describes the general form and effect of the proposed facilities, but acknowledges that some details would be subject to further design in subsequent Project stages.

7.2.1 Key Connections

Figure 7-1 shows the desire lines the Project is facilitating and future desire lines the Project could support. The desire lines the Project is facilitating include the connections between Taumanu-Onehunga Foreshore connecting with the Waikaraka Cycleway, connections to the town centre from Māngere Bridge and connections through to Mutukāroa-Hamlins Hill Regional Park and Sylvia Park Town Centre. Figure 7-1 also shows walking and cycling connections to/from the Onehunga community and Waikaraka Park at Alfred Street and Captain Springs Road. The future desire lines the Project could support include the Māngere Inlet Path and the Ōtāhuhu Portage.

7.3 Overview of Proposed Changes to the Walking and Cycling Network

An overview to the changes to the walking and cycling network are shown in Figure 7-2 and in more detail in *Volume 2: Drawing Set, Drawing Set 3: Road Alignment*. Figure 7-2 also shows the proposed crossing points for pedestrians and cyclists within the Project area. The detail of the type of walking and cycling infrastructure, will be developed in the detailed design process, including both the form and connections. It is recommended that a process is established with Auckland Transport in regard to engagement and approvals during the detailed design.

7.4 Assessment of Walking and Cycling facilities by Sector

This sub-section considers the proposed changes to the pedestrian and cycling network for each sector and describes the potential effects on pedestrians and cyclists.

7.4.1 Taumanu-Onehunga Foreshore, Orpheus Drive to Aotea Scout Hall

7.4.1.1 Proposed Improvements

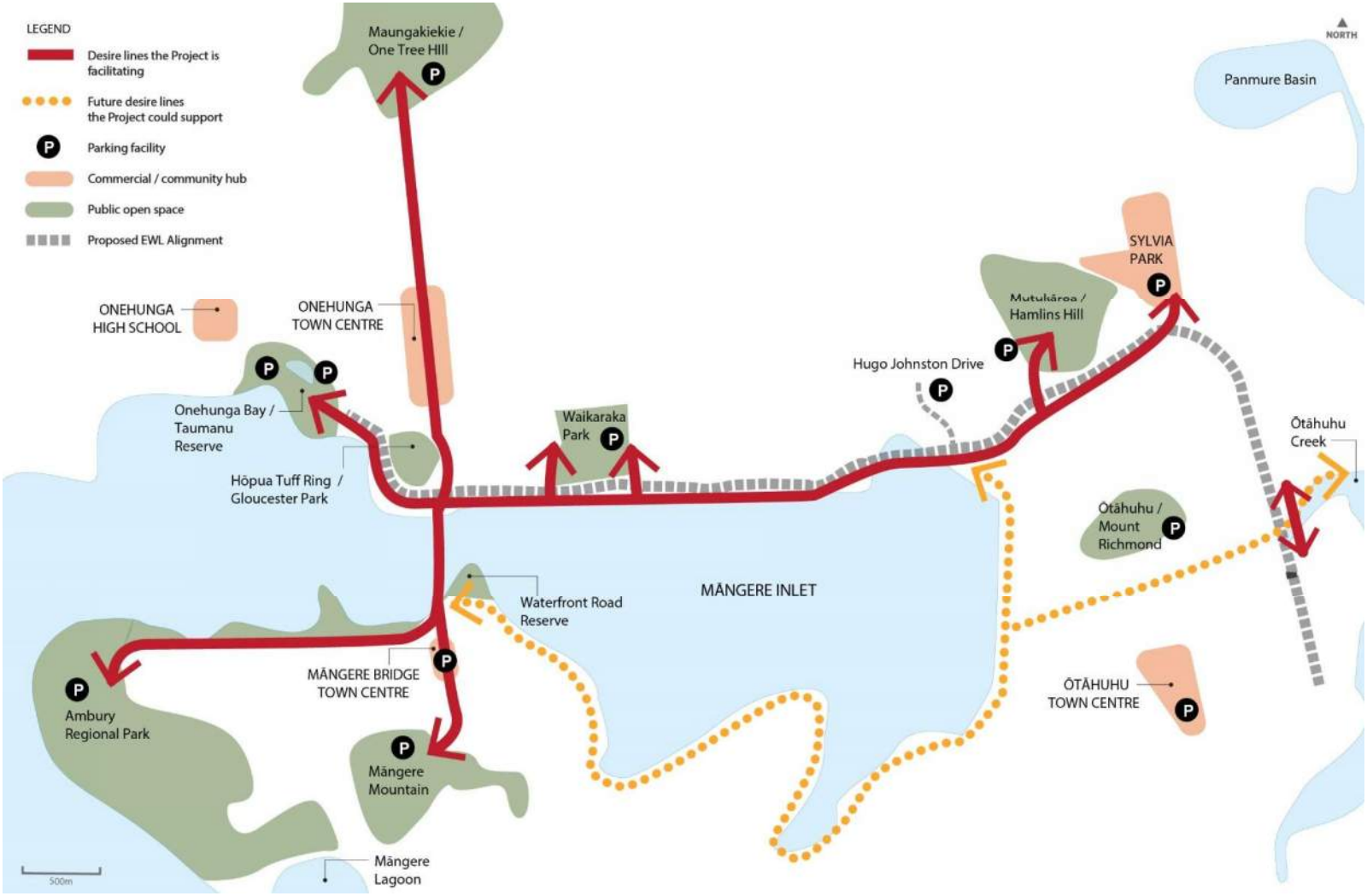
A continuous off-road 3m shared path from Old Māngere Bridge connecting with the existing walking and cycling facilities at the Taumanu-Onehunga Foreshore via Onehunga Harbour Road, the Onehunga Wharf and Orpheus Drive is proposed. Part of this length will be a boardwalk.

This is a total of approximately 300m of new pedestrian and cycling facilities in this sector as shown on Figure 7-3.

7.4.1.2 Assessment of Effects

The shared path will improve connectivity by closing the existing minor network gap on Orpheus Drive between the Aotea Sea Scouts Hall and Manukau Cruising Club. Accessibility will also be improved, as the shared path will provide a continuous link from Old Māngere Bridge to Taumanu-Onehunga Foreshore. The shared path will tie in with Taumanu-Onehunga Foreshore recreational route (pedestrians and cyclists) and commuter cycle route.

Figure 7-1: Project Walking and Cycling Desire Lines



The shared path is considered to be high amenity as it will be off-road, 3m in width, separated from traffic by a kerb and adjacent to low trafficked environment, particularly on Orpheus Drive.

The connectivity and accessibility improvements for this sector, particularly between Aotea Sea Scouts Hall and Manukau Cruising Club, will have a positive impact on pedestrians and cyclists.

Although positive, the scale of impact will be relatively modest as the existing connectivity on Orpheus Drive is not highly deficient and is lightly trafficked.

Figure 7-2: Overview of Proposed New Walking and Cycling Facilities

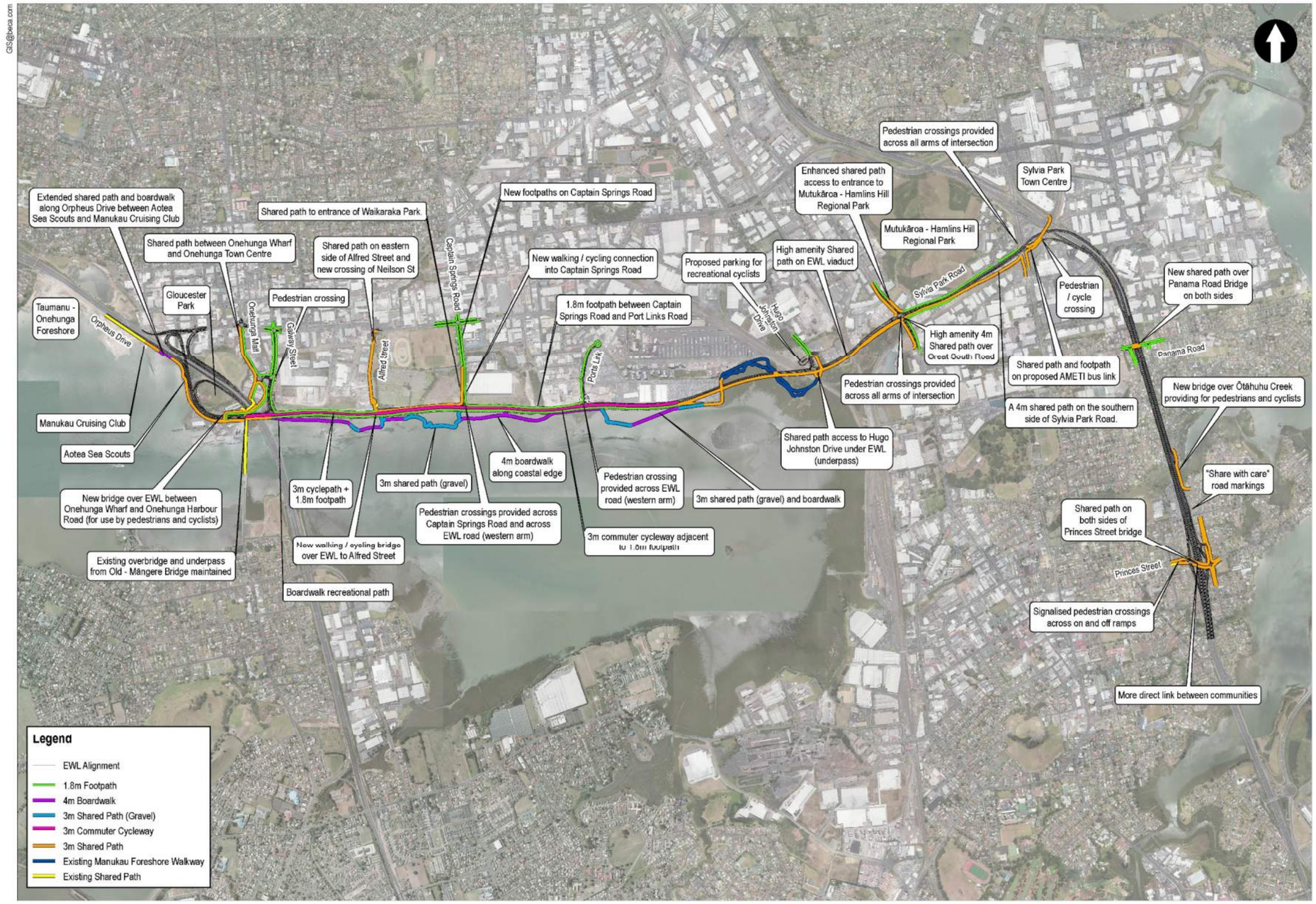


Figure 7-3: Cycling and Pedestrian Improvements (Neilson Street Interchange)

7.4.2 North/South connection Māngere Bridge to Onehunga Town Centre

7.4.2.1 Proposed Improvements

The proposed improvements as seen on Figure 7-3 are:

- A 3m shared path between the Onehunga Wharf landbridge (over the EWL) and the intersection of Onehunga Mall and Neilson Street. The shared path will pass underneath SH20 and along the western side of Onehunga Harbour Road and Onehunga Mall;
- A 3m shared path between Old Māngere Bridge and the cul-de-sac end of Onehunga Mall. The shared path will be on the western side only and join the shared path on Onehunga Mall which continues to Neilson Street.
- A 1.8m footpath between the Onehunga Wharf landbridge and the intersection of Onehunga Mall and Neilson Street via Onehunga Harbour Road and Onehunga Mall (eastern side).
- A 1.8m wide footpath on both sides of Galway Street (between Neilson Street and Galway Link Road) and a footpath on the eastern side of Galway Street between EWL to link with the footpath on the northern side of EWL. A pedestrian crossing will be provided across Galway Street to the north of the Galway Link Road,
- The existing overbridge over Onehunga Harbour Road will be replaced to also go over EWL, and the existing underpass to the cul-de-sac at Onehunga Mall will remain.

7.4.2.2 Qualitative Assessment

It is noted that the north/south connection already exists and is well used. However, there will be a significant improvement in the quality of connectivity for pedestrians and cyclists as there will be enhanced facilities (e.g. shared path) and significantly reduced traffic flows. There will be significantly increased accessibility between the Wharf and the town centre primarily due to traffic flows on Onehunga Mall reducing substantially. This reduction in traffic (especially trucks) will mean Onehunga Mall will be the main walking and cycling access into and between the EWL and Onehunga Town Centre providing a more positive experience for cyclists. Walking, cycling and public transport will be the priority on Onehunga Mall and a two lane (one traffic lane per direction) carriageway is proposed.

The shared path is considered to be high amenity as it will be off-road, 3m in width, separated from traffic by a kerb and adjacent to a low trafficked environment, particularly on Onehunga Harbour Road and Onehunga Mall (north) where traffic volumes will reduce by over 80% with the Project in place. The total volume of trucks passing through the Neilson Street/Onehunga Mall intersection will reduce by over 60%. This reduced traffic allows the use of a “Barnes dance” pedestrian crossing phase, allowing diagonal crossing to the rail station.

The connectivity and accessibility improvements for this sector, particularly between the Wharf and Onehunga Town Centre and train station, will have a significant positive impact on pedestrians and cyclists.

It is noted during the detailed design process for the Galway Link and roundabout, the circulating speeds and priority crossings for pedestrians and cyclists will be considered.

The Transport Agency plans to replace the existing Old Māngere Bridge with a New Old Māngere Bridge. The replacement Old Māngere Bridge will provide continued walking and cycling access between Māngere Bridge Township and Onehunga. The Project design does not preclude the current consented design of the future new Old Māngere Bridge. The EWL Project will enhance connectivity in and around the Neilson Street Interchange and onto the new network of paths on the foreshore of the Māngere Inlet. The Project design does not preclude the current consented design of the future new Old Māngere Bridge.

7.4.3 Waikaraka Cycleway

It is noted that some parts of the existing Waikaraka Cycleway will be re-aligned or replaced. There will also be additional walking and cycling facilities along the foreshore so on balance there will be a significant increase in the amount of facilities. These proposed paths will also include separate facilities for commuters and recreational users, where feasible.

7.4.3.1 Proposed Improvements

The proposed improvements are shown on Figure 7-4 and Figure 7-5.

- A 1.8m footpath on the northern side of EWL between Galway Street and Alfred Street.
- A 3m shared path on the northern side of EWL between Alfred Street and Captain Springs Road;
- A 3m shared path along the eastern side of Alfred Street (between EWL and Neilson Street) to connect with new foreshore shared path on the northern side of EWL. This will include a new signalised crossing at Neilson Street. Alfred Street provides a secondary link into the town centre from EWL with the primary link being via Onehunga Mall;
- An overbridge crossing the EWL is proposed to connect the southern side commuter/footpath to the Alfred Street shared path;
- A 3m bi-directional cycle path adjacent to a 1.8m footpath on the southern side of EWL (between Onehunga Wharf and just before the bridge at Anns Creek). This separation is proposed on the flat section where the highest recreational use is expected and cycle speeds are expected to be high. This cycle and footpath will tie in to the 3m shared path at Anns Creek to the east and the 3m shared path at Onehunga Wharf to the west;
- A combination of 4m board walk and 3m gravel path along the coastal edge between Onehunga Wharf and just before the bridge at Anns Creek). This will connect to the EWL at six locations along this approximately 3km route, with the shared path under Old Māngere Bridge, the shared path on the bridge over Anns Creek and the shared path underpass access to Hugo Johnston Drive;
- New walking/cycling connection from the shared path on the northern side to Captain Springs Road;
- Shared path on the western side of Captain Springs Road from EWL to the entrance of Waikaraka Park/ Onehunga Sports Club. A 1.8m wide footpath between the park entrance and Neilson Street and on the eastern side (currently there are none);
- The ports link road will have a 1.8m footpath on the western side of the road only. This route is not intended to be a through route and therefore shared paths are not proposed; and
- Three crossing points over or under EWL in this sector, or at grade signalised intersections, to allow pedestrians and cyclists to cross safely:
  - Overbridge at Alfred Street;
  - Pedestrian crossings provided across Captain Springs Road and across EWL road (western arm); and
  - Pedestrian crossings provided across EWL road (western arm) at intersection with the ports link road.

Figure 7-4: Cycling and Pedestrian Improvements (Waikaraka Cycleway)

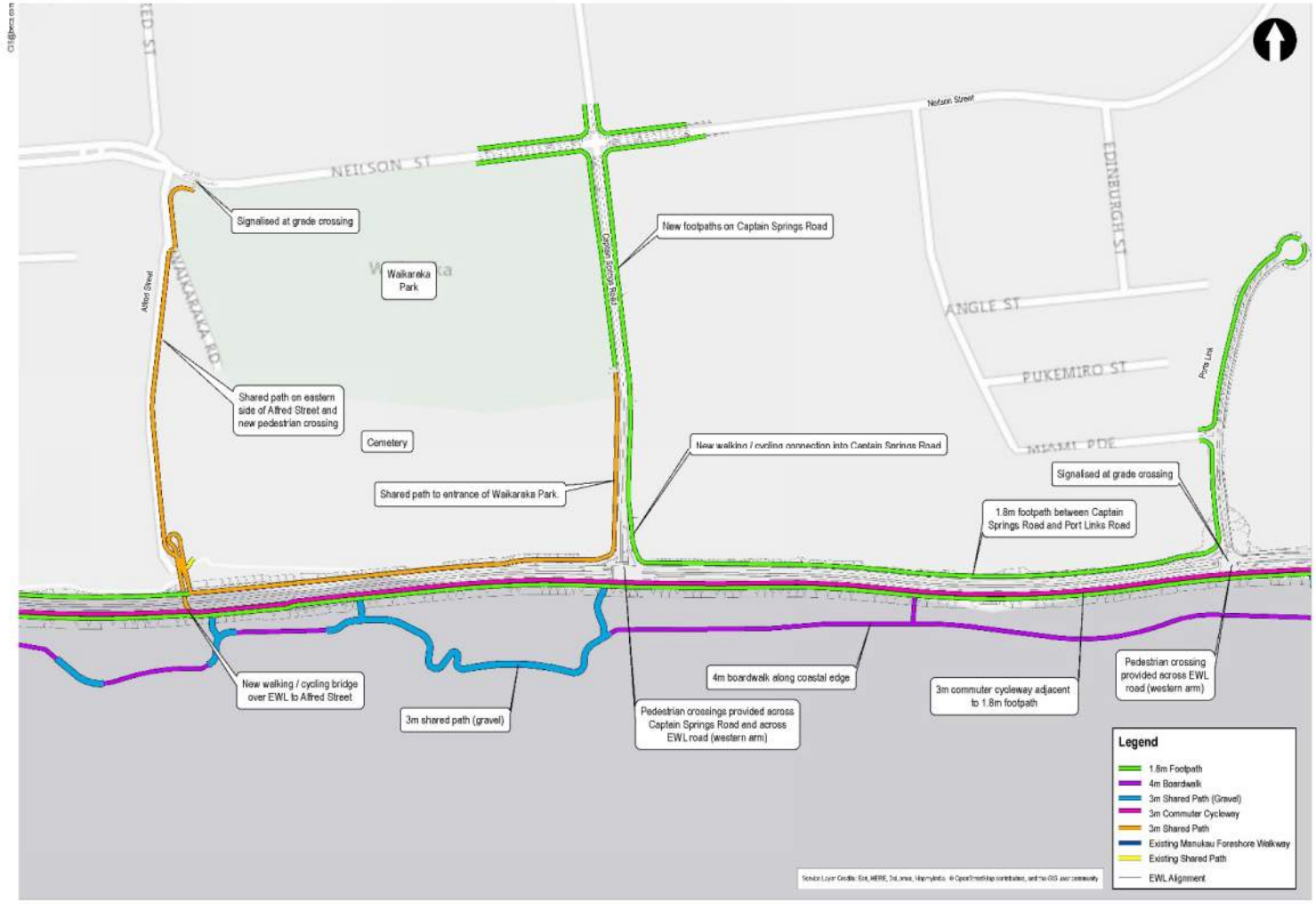
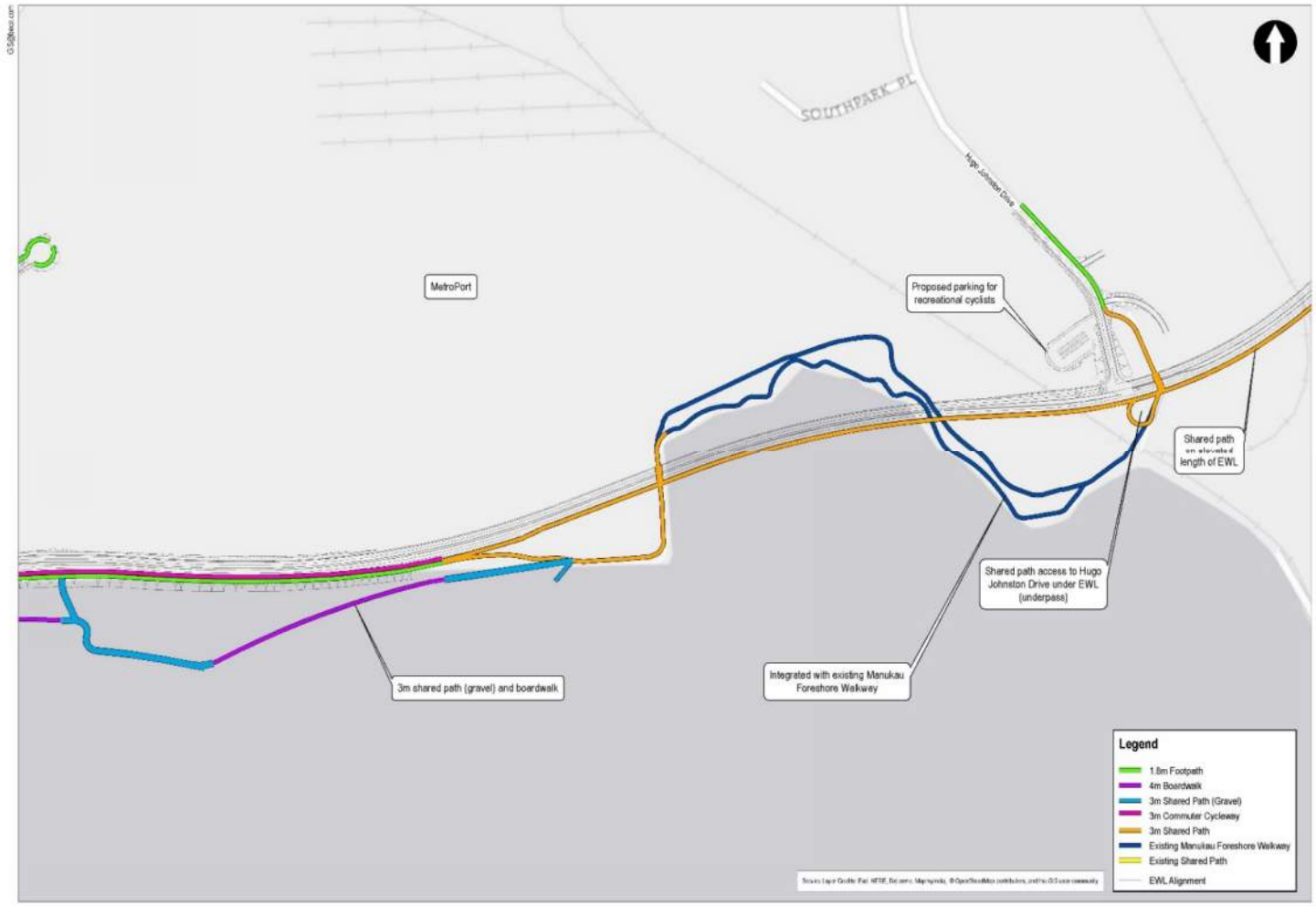


Figure 7-5: Cycling and Pedestrian Improvements (Waikaraka Cycleway)



7.4.3.2 Qualitative Assessment

Continuous and high quality walking and cycling facilities will be provided on both sides of the EWL in this sector. These high amenity facilities are off-road, of appropriate dimensions and separated by traffic. Opportunities for the natural surroundings of the Māngere Inlet to be enjoyed by pedestrians and cyclists using the shared path, boardwalk or footpaths contribute to the high amenity of these facilities. The different type of facilities allow recreational users and high speed commuters to be separated which also contributes to the high amenity of the facilities.

The proposed overbridges and at grade pedestrian crossings will allow pedestrians to cross safely contributing to their high amenity. The current Waikaraka Cycleway lacks any passive surveillance however, the proposed pedestrian and cycle facilities will allow passive surveillance from the EWL. This improvement on personal safety contributes to the high amenity of the facility.

A commuter cycle way next to a footpath running in parallel to a separate 4m wide boardwalk and gravel path which provides plenty of opportunities for different user groups. There will be six connections back to EWL from the recreational boardwalk and gravel path.

Significantly, improved connectivity is proposed with a new connection between the Māngere foreshore and Captain Springs Road, which is currently a private cul-de-sac. Enhanced connectivity between Māngere Inlet and Onehunga community with a shared path along Alfred Street and proposed signalised crossing for cyclists and pedestrians over Neilson Street. Priority crossing for pedestrians and cyclists over vehicles at the intersection of Alfred Street and the entrance to the Waikaraka Park and Waikaraka Cemetery will be considered during detailed design.

Improved accessibility with new footpaths on Captain Springs Road in locations where there are currently none and shared path facility to the entrance to Waikaraka Park/Onehunga Sports Club.

Although a new four lane road is introduced, there are significant connectivity and accessibility improvements for this sector, through the provision of new high amenity pedestrian and cycling facilities and new connections (Captain Springs Road), which will have a correspondingly positive impact on pedestrians and cyclists.

a. Current Connection to cycleway at Miami Parade

There is an existing walking/cycling connection between Miami Parade and the Waikaraka Cycleway adjacent to the Miami Parade stream. This facility is heavily overgrown and does not appear to be regularly used.

The Project includes proposed stormwater ponds along the Miami Stream, and while the design will only be confirmed at the detailed design stage, it is expected that a pathway may be able to be retained for pedestrian use. However, it would not be proposed as a cycle route.

In regards to effects, there is not expected to be an adverse effect on pedestrian access as the pathway could be retained, and a new a footpath will be provide to Miami Parade via the new ports link road.

Cyclists would have this access removed, however this is not considered to represent an adverse effect as it is not a highly used access, and because it is not considered to align with the proposed desire lines for cycle access. This is because users of that link would have to cycle along Neilson Street, which is an adverse environment for cyclists. Instead, the proposed desire lines encourage east-west movement along the foreshore route, with north-south movements via Onehunga Mall, Alfred Street, Captain Springs or Hugo Johnston Drive.

7.4.4 Anns Creek to Sylvia Park Town Centre

7.4.4.1 Proposed Improvements

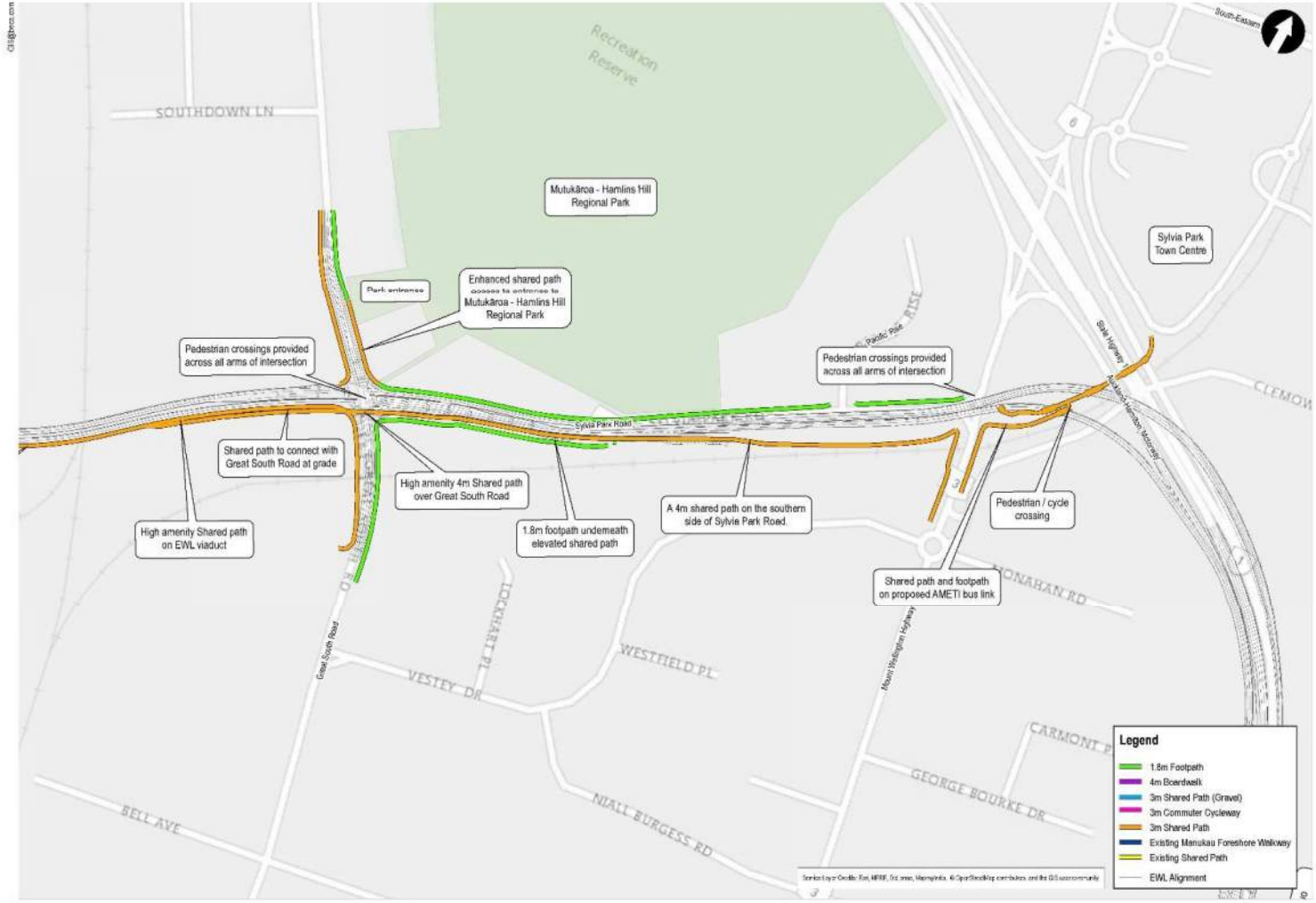
This sector provides the biggest benefit to pedestrians and cyclists as the current Waikaraka Cycleway ends at Hugo Johnston Drive. A significant portion of the shared path is segregated on a viaduct and passes over Great South Road. The separated high amenity shared path over Great South Road will benefit pedestrians and cyclists as it removes the need to make three separate crossing movements across the southern arm of Great South Road

The proposed improvements are shown on Figure 7-6 and are as follows:

- The 3m shared path with adjacent 1.8m footway will tie in with a 3m shared path at Anns Creek on the southern side and continue on the viaduct over Anns Creek. Access to Hugo Johnston Drive from the shared path will be under the EWL. This connection will extend the shared path along to the east of Hugo Johnston Drive a short distance then transition back to the existing footpath;
- A 4m shared path continues along the southern side of the viaduct over Anns Creek to Great South Road/Sylvia Park Road intersection linking to the key destination of Mutukāroa-Hamlins Hill Regional Park;
- A separate 4m, high amenity, elevated shared path over Great South Road to land on the southern side of Sylvia Park Road just east of the re-provided driveways at Number 19 Sylvia Park Road. This shared path continues on the southern side of Sylvia Park Road to Mount Wellington Highway intersection.
- A 1.8m footpath will be provided on Sylvia Park Road underneath the 4m elevated shared path. This footpath provides a connection for employees between Number 19 Sylvia Park and the Great South Road intersection. This footpath will tie in with the shared path further east along Sylvia Park Road.
- An enhanced 3m shared path, replacing the existing 2.2m “shared path”, on the eastern side of Great South Road between Great South Road/Sylvia Park Road intersection and the entrance to Mutukāroa-Hamlins Hill Regional Park;
- A 3m shared path on the western side of the northern and southern arms of the Great South Road near the intersection with Sylvia Park Road will be provided to future proof for future AT cycleways planned on Great South Road;
- A 1.8m footpath along the eastern side of the southern arm of the Great South Road near the intersection with Sylvia Park Road.
- A shared path to tie in with the proposed AMETI bus lane works under SH1 and continue to the key destination of Sylvia Park Town Centre. The details of this link is to be confirmed once AMETI’s revised alignment and works are confirmed;
- Pedestrian crossings will be provided across all arms of the intersections of Sylvia Park Road with Great South Road and Mount Wellington Highway. Currently there are no pedestrian crossing facilities at the Sylvia Park / Mount Wellington Highway intersection.
- There will be a shared path on both sides of the southern arm of the Mount Wellington Highway/Sylvia Park Road.

The additional facilities will provide a more direct route between Onehunga and Sylvia Park, approximately 1.6km shorter.

Figure 7-6: Cycling and Pedestrian Improvements (Anns Creek to Sylvia Park Town Centre)



7.4.4.2 Qualitative Assessment

There will be a significant improvement in connectivity for pedestrians and cyclists in this sector due to the proposed off-road route between the end of the existing Waikaraka Cycleway at Hugo Johnston Drive and Sylvia Park Town Centre. This will link key destinations of Mutukāroa-Hamlins Hill Regional Park and Sylvia Park Town Centre and close this significant network gap. The new link will also mean significantly improved accessibility for pedestrians and cyclists wanting to travel between Māngere Bridge, Mutukāroa-Hamlins Hill and Sylvia Park Town Centre.

The severance between Anns Creek and Sylvia Park Town Centre (caused by the railway lines and Anns Creek coastal environment) will be significantly reduced with a new and very direct shared path which is approximately 1.6km shorter than the existing indirect, route beside SEART.

The shared path will be high amenity; off-road, separated from traffic and of appropriate dimensions.

The section between Hugo Johnston Drive and Great South Road / Sylvia Park Road intersection will be a continuous length of off-road shared path with no vehicle crossing points improving safety for pedestrians and cyclists.

The elevated portion of the shared path, which crosses over Great South Road, will have considerable benefits for pedestrians and cyclists (east-west movements) as they will not have to use the three at-grade crossings on the southern arm of Great South Road. The location of the landing point of the shared path is over, and east, of the two separate driveways at 19 Sylvia Park Road which means pedestrians and cyclists will not need to cross these two driveways.

It is noted that parts of this route will be on elevated structures (viaduct), pass under some significant motorway on-ramps under SH1 and is in proximity to a rail corridor. However, there are significant increases in connectivity, improved accessibility and reduced severance for this sector through the provision of new high amenity pedestrian and cycling facilities. The proposed facilities in this sector complete a direct route and significantly improve accessibility between Māngere Bridge, Mutukāroa-Hamlins Hill and Sylvia Park Town Centre. These improvements will all combine to have a correspondingly highly positive impact on pedestrians and cyclists.

Access to Mutukāroa-Hamlins Hill will be enhanced with a 3m shared path replacing the existing 2.2m “shared path” between the intersection of Great South Road / Sylvia Park Road and the entrance to the Regional Park. For pedestrians and cyclists arriving from the north and the south a 3m shared path will be provided on the western side of both northern and southern arms of Great South Road. Pedestrians and cyclists using the shared path on the Anns Creek viaduct would arrive at the intersection of Great South Road/Sylvia Park Road intersection and use the signalised crossing across Great South Road, then the signalised crossing across Sylvia Park Road. Cyclists would then use the enhanced 3m shared path 180m to the entrance to the Regional Park.

7.4.5 AMETI

A shared path will tie in with the AMETI bus lane works under SH1 and continue to the key destination of Sylvia Park Town Centre. A shared path is proposed on the southern side of the AMETI bus connection before swapping to the northern side to link into the proposed roundabout. It is likely a crossing facility will be provided to allow pedestrians and cyclists to cross the bus connection safely. It is noted that bus volumes along this connection road will not be that frequent and pedestrians and cyclists will be able to cross the road independently. Coordination with Auckland Transport should continue on design and programme details.

The full benefits of the enhanced connectivity to Sylvia Park Town Centre are dependent on the AMETI link. A condition is recommended which will ensure the shared path at the eastern end of the EWL main alignment is delivered in conjunction with AT and extends through to the Sylvia Park Town Centre boundary.

Route 32

Currently Auckland Transport is developing concept option plans in the Mount Wellington Highway/Sylvia Park area, which integrates the Route 32 walking and cycling improvements with the proposed AMETI project and walking and cycling improvements planned for Ōtāhuhu. Coordination with Auckland Transport should continue on design and programme details.

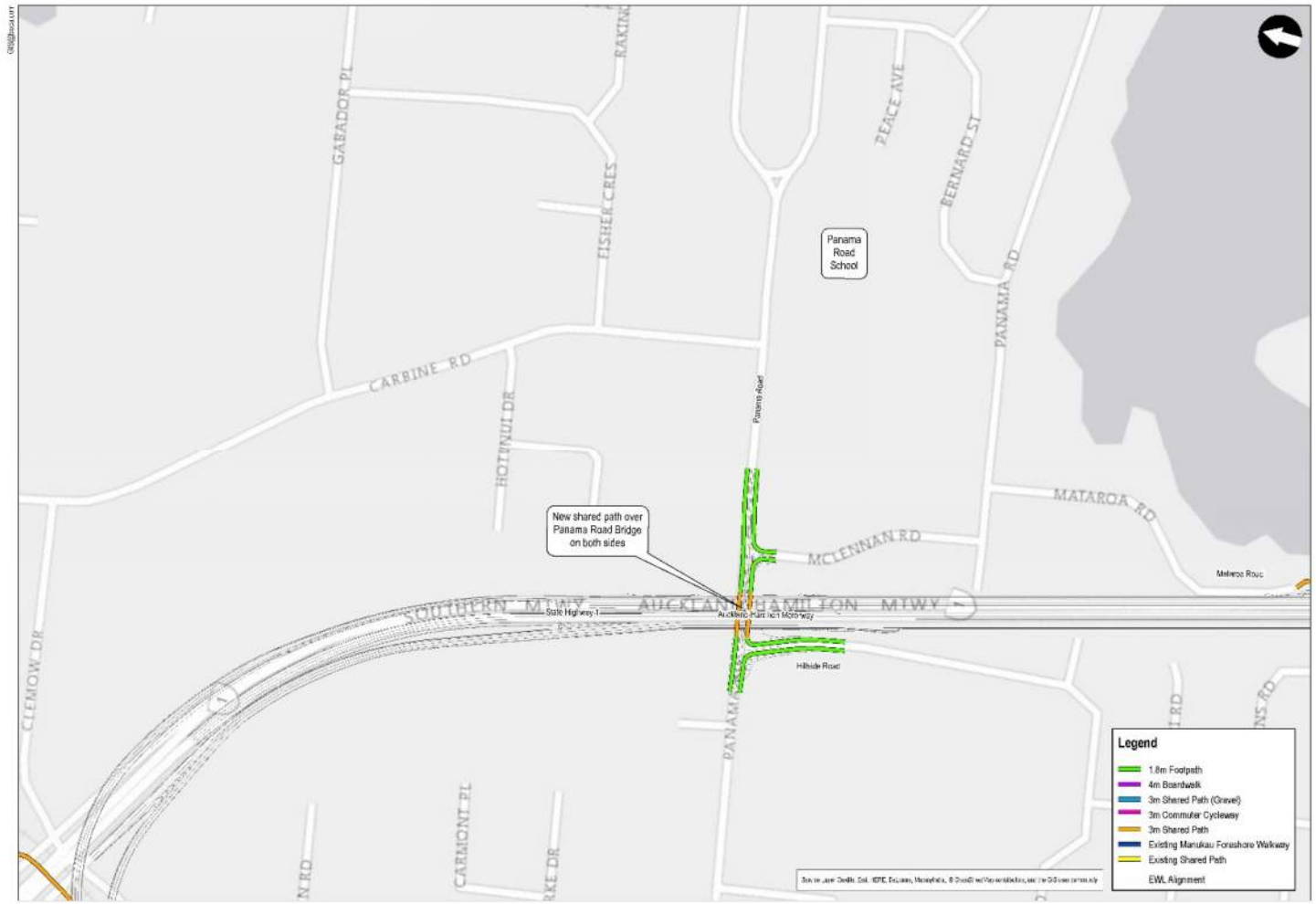
7.4.6 Panama Road Bridge

7.4.6.1 Proposed Improvements

The proposed improvements are shown on Figure 7-7:

- A 3m shared path on both sides of Panama Road Bridge; and
- A 1.8m wide footpath on Panama Road on either side of the bridge tying into the existing footpath and for a short length on both sides of Hillside Road from the intersection with Panama Road.

Figure 7-7: Cycling and Pedestrian Improvements (Panama Road Area)



7.4.6.2 Qualitative Assessment

The shared path on both sides of Panama Bridge and a short length of Hillside Road will improve connectivity for cyclists as there are currently no facilities for these road users. The shared path will be off-road, separated from traffic and of appropriate dimensions. This relatively short section will provide some localised improvements however it will provide for future network enhancements by Auckland Transport. The improvements will benefit school children walking and cycling to and from Panama Road School.

7.4.7 New Connection over Ōtāhuhu Creek

7.4.7.1 Proposed Improvements

A new bridge to provide for future pedestrian and cycling is proposed over Ōtāhuhu Creek, adjacent to SH1, joining these two Ōtāhuhu communities. As seen in Figure 7-9. It would connect between Deas Place and the end of the Mataroa Road cul-de-sac. A shared path connection to the bridge structure will be provided from these roads. “Share with care” road markings are also proposed between the end of the shared path on Frank Grey Place, along Luke Street to the shared path on Deas Place. The “share with care” road markings will alert drivers to slow down along this stretch of route between the two shared paths, however it is noted that Deas Place is a low volume cul-de-sac road.

7.4.7.2 Qualitative Assessment

There is currently no connection between these two communities on the eastern side of SH1. The existing route between Mataroa Road and Deas Place via the network on the western side of SH1 is approximately 4.3km long. The bridge is approximately 250m in length so there will be a significant distance and time saving of approximately 4km.

The proposed new bridge to provide for future pedestrian and cycling will have a significant positive transport impact by removing the severance of SH1 and the Ōtāhuhu Creek for the local communities on either side of the Creek. There will also be a significant improvement in connectivity, as it will link the Princes Street and Panama Road communities. There is anecdotal evidence of children walking along SH1 in this location so this proposed walking and cycling bridge will address this existing safety risk.

7.4.8 Princes Street

7.4.8.1 Proposed Improvements

The proposed improvements are shown on Figure 7-8 and Figure 7-9 and described as:

- A reconfigured interchange providing a controlled pedestrian crossing points across SH1 Princes Street on and off-ramps and across Princes Street (south);
- Provision of a large refuge for waiting pedestrians across the SH1 Princes Street on-ramps;
- A wider and more direct pedestrian route between two communities through the provision of a shared path and widened bridge;
- A 3m shared path on both sides of Princes Street Bridge, south to Albert Street on the western side and to tie in with the existing shared path outside the shops near the corner of Albert Street;
- A 3m shared path on both sides of Frank Grey Place between Luke street and 50m before the intersection with Avenue Road) and short length on both sides of Princes Street East;
- As discussed above “share with care” markings between the end of the shared path on Frank Grey Place, along Luke Street to the shared path on Deas Place; and
- Signalised crossings across SH1 on and off ramps (Frank Grey Place).

7.4.8.2 Qualitative Assessment

The shared path on both sides of Princes Street Bridge, Princes Street, Princes Street East and Frank Grey Place will significantly improve connectivity for cyclists as there are currently no specific cycle facilities. The shared path will be off-road, separated from traffic and of appropriate dimensions, which is a significant improvement to the existing narrow footpath on the bridge.

Providing a controlled crossing across SH1 Princes Street off-ramps will significantly improve the safety of pedestrians crossing the on and off-ramps as they will not have to undertake uncontrolled crossing movements.

The provision of a larger refuge for waiting pedestrians when crossing the SH1 Princes Street on-ramps is an improvement to the safety of pedestrians.

The more direct and shorter routes across SH1 between the two communities will improve connectivity particularly for those accessing Ōtāhuhu Intermediate who live on the eastern side of SH1.

Figure 7-8: Proposed Princes Street Interchange

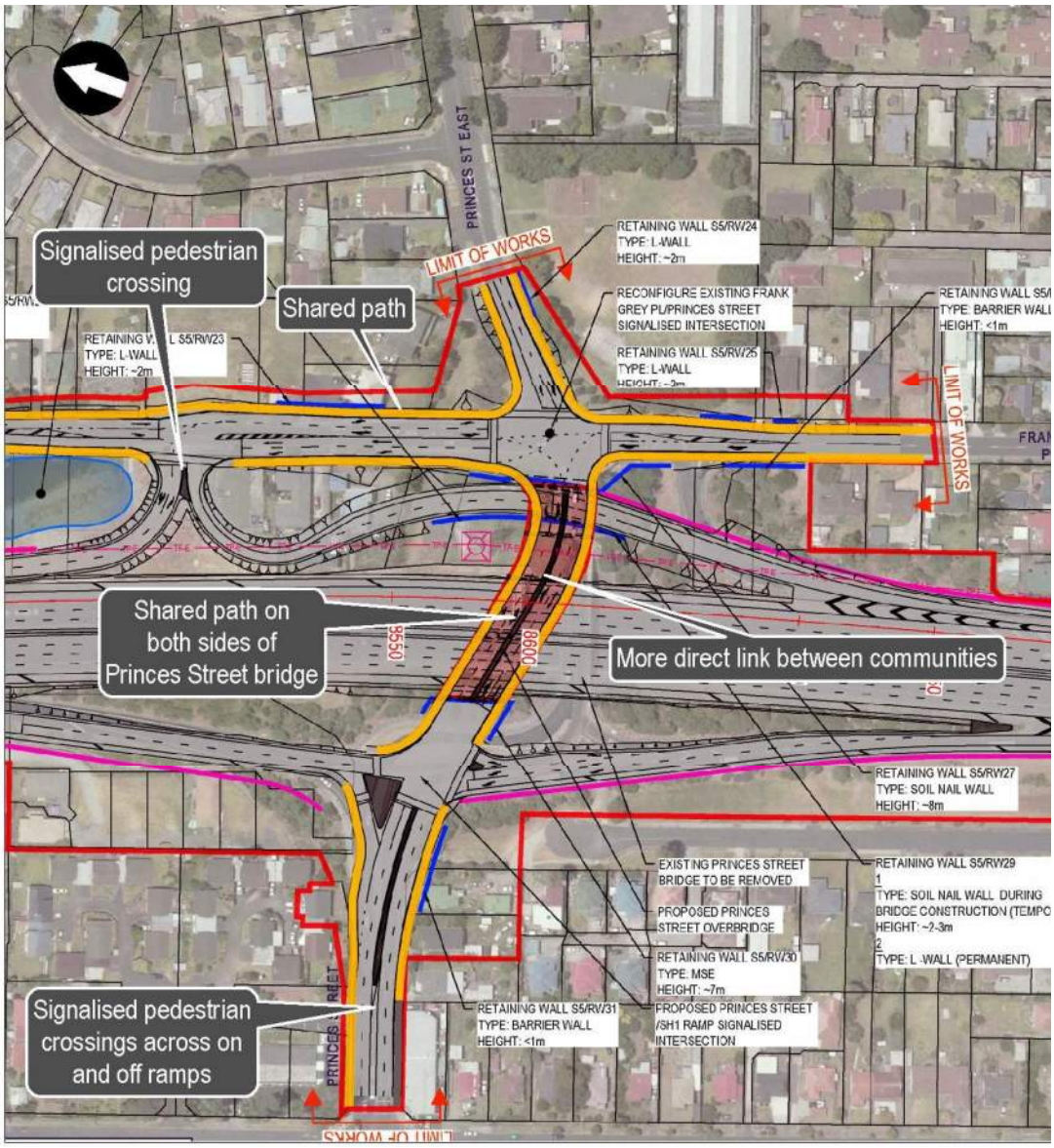
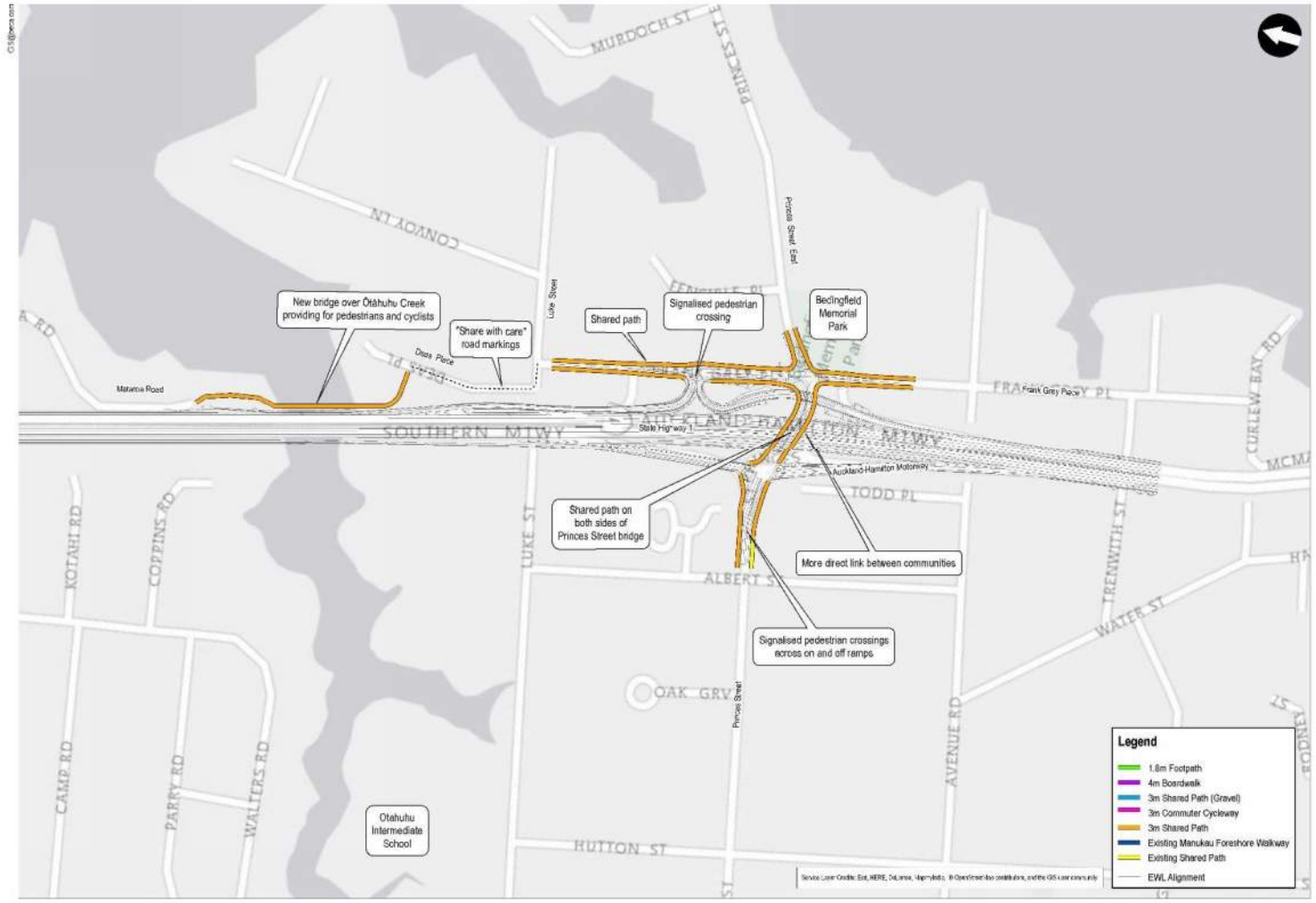


Figure 7-9: Cycling and Pedestrian Improvements (Princes Street Area)



7.4.9 Parking for Recreational Cyclists and Pedestrians

As discussed in Section 4, cars were observed parking under SH20 (adjacent to Onehunga Harbour Road) on Sunday 19th June 2016 and accessing the Waikaraka Cycleway for recreational purposes (walking and cycling). It is noted that these counts were undertaken in winter and the numbers of cars parking in this location are likely to be higher in summer months. The Project requires land under SH20 for stormwater treatment ponds so parking will no longer be available for users of the Waikaraka Cycleway. Although this is informal parking, this can be mitigated by providing some car parking spaces for these recreational users close by in the redundant portion of Onehunga Harbour Road to the west of the Airport Harbour View Motel. Further, it is recommended that discussions are held with Auckland Transport to promote the parking at the Taumanu-Onehunga Foreshore for recreational cyclists as a connection is proposed and cyclists can start their route earlier.

The mitigation of parking removal on Hugo Johnston Drive for recreational users is discussed in Section 6. Parking will be provided in an off-street parking facility at the southern end of Hugo Johnston Drive. Hugo Johnston Drive was also observed to include parking by recreational cyclists and this is expected to increase due to the easterly extension of the cycleway to Mutukāroa-Hamlins Hill and Sylvia Park Town Centre.

7.4.10 Estimating Predicted Growth in Cyclists and Pedestrians

The methodology used to predict the likely usage of the proposed walking and cycling infrastructure is contained in Appendix C.

7.4.10.1 Cyclists

The following tables summarise the predicted usage 5-years after opening, for the weekend, weekdays and the combined AADT. This indicates weekend usage could approach 1,000 cyclists per day, with weekday usage typically in the range 209-460. The AADT estimates are between 450 and 620 per day.

Table 7-1: Estimated daily cyclist growth (weekends)

Without Project 2023 Cyclists	Years	Total Estimated Growth With Project		
		Low	Medium	High
444	Year 1	489	511	534
	Year 2	538	588	641
	Year 3	592	677	770
	Year 4	652	745	847
	Year 5	718	820	932

Table 7-2: Estimated daily cyclist growth (Weekdays)

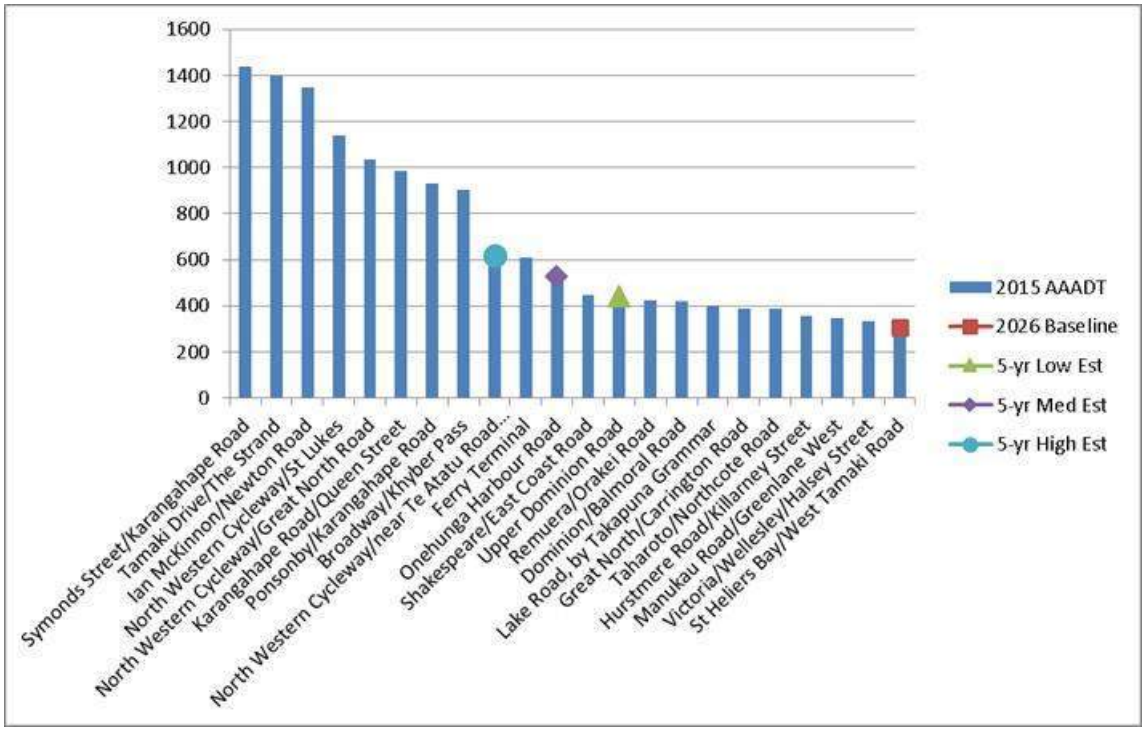
Without Project 2023 Cyclists	Years	Total Estimated Growth With Project		
		Low	Medium	High
123	Year 1	148	155	161
	Year 2	178	194	210
	Year 3	214	243	273
	Year 4	257	304	355
	Year 5	309	380	462

Table 7-3: Estimated daily cyclist growth (AADT)

Without Project 2023 Cyclists	Years	Total Estimated Growth With Project		
		Low	Medium	High
229	Year 1	260	272	284
	Year 2	296	324	352
	Year 3	338	386	436
	Year 4	387	449	517
	Year 5	443	525	617

It is recognised that these estimates are uncertain, so the AADT estimates were benchmarked against available data for other sites around Auckland. The following Figure 7-10 indicates where this usage would be relative to other sites. This indicates that it would have usage similar to upper Dominion Road or even the section of the NW Cycleway near Te Atatu. This does not appear unreasonable given it is in an area with very low current commuter cycling. Longer-term forecasts could be expected to be higher if the general trends of rapid growth in cycling across the region continue. Significant growth in commuter travel would not seem feasible without the increased connectivity offered by this Project.

Figure 7-10: Usage of Project Cycleway Benchmarked against Other Cycle Projects (AAADT)



7.5 Connectivity to Existing and Future Greenways

The proposed walking and cycling facilities will connect with Auckland Transport's existing and proposed Greenways. The new shared path between Old Māngere Bridge and the Manukau Cruising Club will provide access to the Taumanu-Onehunga Foreshore Greenway. The new shared path on Onehunga Mall will provide access to the Gloucester Park (north) Greenway. The new shared path into Alfred Street and connection into Captain Springs Road and shared path and 1.8m footpath and will provide access to Waikaraka Park – another identified Greenway. Access to Mutukāroa-Hamlins Hill Regional Park and the Great South Road Greenway will be provided via 3m shared path on Sylvia Park Road and crossing at the signalised at grade crossing at Great South Road.

7.6 Connectivity to Future Cycleways

Cycleways that are planned beyond 2018 have been identified by Auckland Transport and are shown previously in Section 4. These future cycleways are planned for roads both within the Project area and in the surrounding neighbourhoods. A selection of these roads is shown below in

Table 7-4 along with reductions in flows predicted on these roads in 2026 with the Project in place. This table shows that all the roads planned to become cycleways in the future are predicted to have a reduction in flow of traffic with the Project in place, which will have a positive impact on cyclists in the future.

In addition to the significant reductions on Onehunga Mall, these range from a reduction of 2% on Beachcroft Avenue (Onehunga) to 34% along Great South Road. The residential streets in One Tree Hill will see a predicted 7% reduction in traffic in 2026.

The Māngere Foreshore Inlet path and Portage Greenways are included in the approved Māngere-Ōtāhuhu Greenways Plan prepared by the Māngere-Ōtāhuhu Local Board. These are shown on Figure 4.33 (Proposed Walking and Cycling Network) and as seen on Figure 7.1 these are future desire lines the project could support and discussions with AT will continue.

Table 7-4: Changes in Traffic on Local Streets where future cycleways are planned

Road	2013	2026		
		Without Project	With Project	
Beachcroft Avenue: Arthur to Church Street	8,100	10,900	10,700	-200 (-2%)
Onehunga Mall south of Mount Smart	14,000	16,400	15,900	-500 (-3%)
Onehunga Mall north of Neilson Street	8,900	8,100	6,200	-1,900 (-23%)
Onehunga Mall South of Neilson Street	20,400	22,900	3,800	-19,100 (-83%)
Church Street Rail Crossing	11,500	12,500	12,000	-500 (-4%)
Church Street east of Neilson Street	43,300	48,400	41,600	-6,800 (-14%)
Mount Albert Road west of Royal Oak	25,200	31,700	30,000	-1,700 (-5%)
Mount Smart Road: north of Mays Road	19,800	23,400	22,100	-1,300 (-6%)
Campbell Road south of Wheturangi Road	21,400	24,700	23,000	-1,700 (-7%)
Mount Smart Road Rockfield Road to Maurice Road	16,600	20,700	18,600	-2,100 (-10%)
Great South Road at Southdown Lane	31,900	32,900	21,600	-11,300 (-34%)
Great South Road, north of Portage	25,800	28,100	25,300	-2,800 (-10%)
Station Road, east of O'Rorke Road	19,800	23,000	20,200	-2,800 (-12%)
Great South Road, north of Portage Road	25,800	28,100	25,300	-2,800 (-10%)
Great South Road, north of Penrose Road	19,100	22,400	19,200	-3,200 (-14%)
Great South Road north of SEART	19,600	21,500	18,900	-2,600 (-12%)
Panama Road Overbridge	9,800	7,100	8,100	1,000 (14%)
Princes Street west of Luke Street	11,200	12,000	10,800	-1,200 (-10%)

7.7 Summary of Effects

The Project will have significant positive impacts on pedestrians and cyclists and will provide approximately 24km of new cycling and walking facilities. The proposed direct route between Māngere Bridge and Sylvia Park Town Centre will also be approximately 1.6km shorter.

The Project will improve safety and accessibility for cycling and walking between Māngere Bridge, Onehunga Town Centre and Sylvia Park Town Centre by providing a direct continuous link and connecting key destinations. One new connection (Captain Springs Road) and one enhanced connection (Alfred Street) between the Māngere foreshore and the Onehunga community is proposed and will also improve accessibility and connectivity. New access will also be provided into Ōtāhuhu East with a bridge over Ōtāhuhu Creek providing for walking and cycling which will remove the severance between the communities on either side of the creek.

There are significant improvements in each sector which overall contribute to the Project having a highly positive impact on pedestrians and cyclists.

- **Taumanu-Onehunga Foreshore and Orpheus Drive and south to Scout Hall**
  - Connectivity and accessibility improvements, due to the closure of the network gap between Aotea Sea Scouts Hall and Manukau Cruising Club.
- **North/South connection Māngere Bridge to Onehunga Town Centre**
  - Significantly improved connectivity for pedestrians and cyclists between Old Māngere Bridge, Onehunga Wharf and key destinations such as Onehunga Town Centre and Onehunga Train Station. There will be significantly increased accessibility between the Wharf and the town centre; and
  - The shared path will be high amenity, separated from traffic and adjacent to low trafficked environment, particularly on Onehunga Harbour Road and Onehunga Mall where traffic volumes will reduce significantly with the Project in place.
- **Māngere Foreshore Walkway**
  - Significant connectivity and accessibility improvements through the provision of new high amenity pedestrian and cycling facilities on both sides of EWL. This includes shared paths, boardwalks, commuter cycle lanes adjacent to a footpath and footpaths;
  - New and enhanced connections between the foreshore and the Onehunga community (e.g. Captain Springs Road and Alfred Street) and with recreational spaces (e.g., Waikaraka Park);
  - High amenity facilities with opportunities for the natural surroundings of the Māngere Inlet to be enjoyed by pedestrians and cyclists;
  - Recreational users and high speed commuters will be separated which contributes to the high amenity of the facilities;
  - Proposed overbridges and at grade signalised intersections will allow pedestrians to cross the EWL safely contributing to their high amenity;
  - Improved personal safety as the proposed pedestrian and cycle facilities will allow passive surveillance from the EWL; and
  - Improved accessibility with new footpaths on Captain Springs Road in locations where there are currently none.
- **Anns Creek to Sylvia Park Town Centre**
  - Significant improvement in connectivity for pedestrians and cyclists in this sector due to the proposed off-road high amenity route between the end of the existing Waikaraka cyclepath at Hugo Johnston Drive and Sylvia Park Town Centre. This will link key destinations of Mutukāroa-Hamlins Hill Regional Park and Sylvia Park Town Centre and close this significant network gap;
  - A 4m, high amenity and elevated shared path, a proportion of which passes over Great South Road, and continues on the southern side of Sylvia Park Road to Mount Wellington Highway

and connects with Sylvia Park Town Centre. The elevated portion over Great South Road will have considerable benefits for pedestrians and cyclists (east-west movements) as they will not have to use the three at-grade crossings on the southern arm of Great South Road.

- The severance between Anns Creek and Sylvia Park Town Centre will be significantly reduced with a new, high amenity and very direct shared path which is approximately 1.6km shorter than the existing indirect, mainly on-road route.

This last sector completes the route between Māngere Bridge and Sylvia Park Town Centre.

- **Princes Street Interchange**
  - High amenity shared path will significantly improve connectivity for cyclists as there are currently no facilities and a significant improvement to the existing narrow footpath on the bridge;
  - Significant improvements to the safety of pedestrians crossing the SH1 on and off-ramps as these will be signalised and a larger refuge for waiting pedestrians when crossing the SH1 on-ramps; and
  - More direct and shorter routes across SH1 between the two communities will improve connectivity, particularly school children attending Ōtāhuhu Intermediate.
- **Panama Road Bridge**
  - The shared path on both sides of Panama Bridge and a short length of Hillside Road will improve connectivity for cyclists, as there are currently no facilities for these road users; and
  - The shared path will be off-road, separated from traffic and of appropriate dimensions which is a significant improvement to the existing width of footpath on the bridge for pedestrians, particularly school children attending Panama Road School.
- **SH1 New Bridge (Access into Ōtāhuhu East)**
  - To provide for future walking and cycling;
  - Removes the severance of the Ōtāhuhu Creek and SH1 for the local communities on either side of the Creek and the route is approximately 4km shorter;
  - Significant improvement in connectivity as it will link the Princes Street and Panama Road communities; and
  - Addresses an existing safety risk of children walking along SH1.

A number of roads planned to become cycleways by Auckland Transport in the future are predicted to have reductions in flow of traffic with the Project in place in 2026 which will have a positive impact on cyclists.

These facilities have been designed to safely accommodate the number of cyclists and pedestrians who are predicted to use them.

The Project design does not preclude the current consented design of the future new Old Māngere Bridge.

The detail of the type of walking and cycling infrastructure, will be developed in the detailed design process, including both the form and connections. It is recommended that a process is established with Auckland Transport in regard to engagement and approvals during the detailed design.

Overall, the Project will have a significant positive impact on pedestrians and cyclists.

8 Assessment of Public Transport Effects

8.1 Introduction

This section provides an assessment of the impact of the Project on bus services with a focus on those bus routes between SH20 and Onehunga Town Centre. Although the focus of this section is the impact on bus routes (travel time savings and journey time reliability) between SH20 and Onehunga Town centre, all bus routes and stops along the Project alignment have been assessed. The section also discusses the impact of the conversion of the T2 lane to a bus only lane, how the Project enables future public transport opportunities, changes in regional transport patronage and protecting future rail and bus opportunities.

8.2 Changes to the Road Network

The major changes to the road network impacts Routes 380, 313 and 309 (on the new bus network[13]) travelling between Māngere and Onehunga Town Centre via SH20. The proposed bus routes are described as follows and shown on Figure 8-1.

- Northbound Buses: A revised route via a realigned SH20 Neilson Street off-ramp, EWL off-ramp, Galway Street and Galway Link Road to connect with Onehunga Mall. Buses will no longer use Onehunga Harbour Road to access the Town Centre; and
- Southbound Buses: Existing southbound on-ramps to be realigned slightly. The existing T2 lane at Gloucester Park Road and SH20 on-ramp will be converted to bus-only and will connect directly into the existing bus lanes on SH20.

8.3 Methodology

All travel time savings in this section have been predicted using the SATURN model. The wider regional impact of the Project on public transport usage has been informed by the ART3 model. The impact on travel times related to the Project objective of improving journey time reliability for buses between SH20 and Onehunga Town Centre have been quantified from the models. The effect on other bus routes have generally been via a qualitative assessment, although some major routes have been quantified to demonstrate the quantum of change.

The bus routes that will be implemented as part of Auckland Transport's new South Auckland and Central Suburb bus networks are used in the assessment as these are due for implementation during 2016 and 2017 and will be operational in the proposed opening year for the Project. These bus routes are shown previously in Section 4.

8.4 Impact on Buses Accessing Onehunga

8.4.1 Northbound Buses

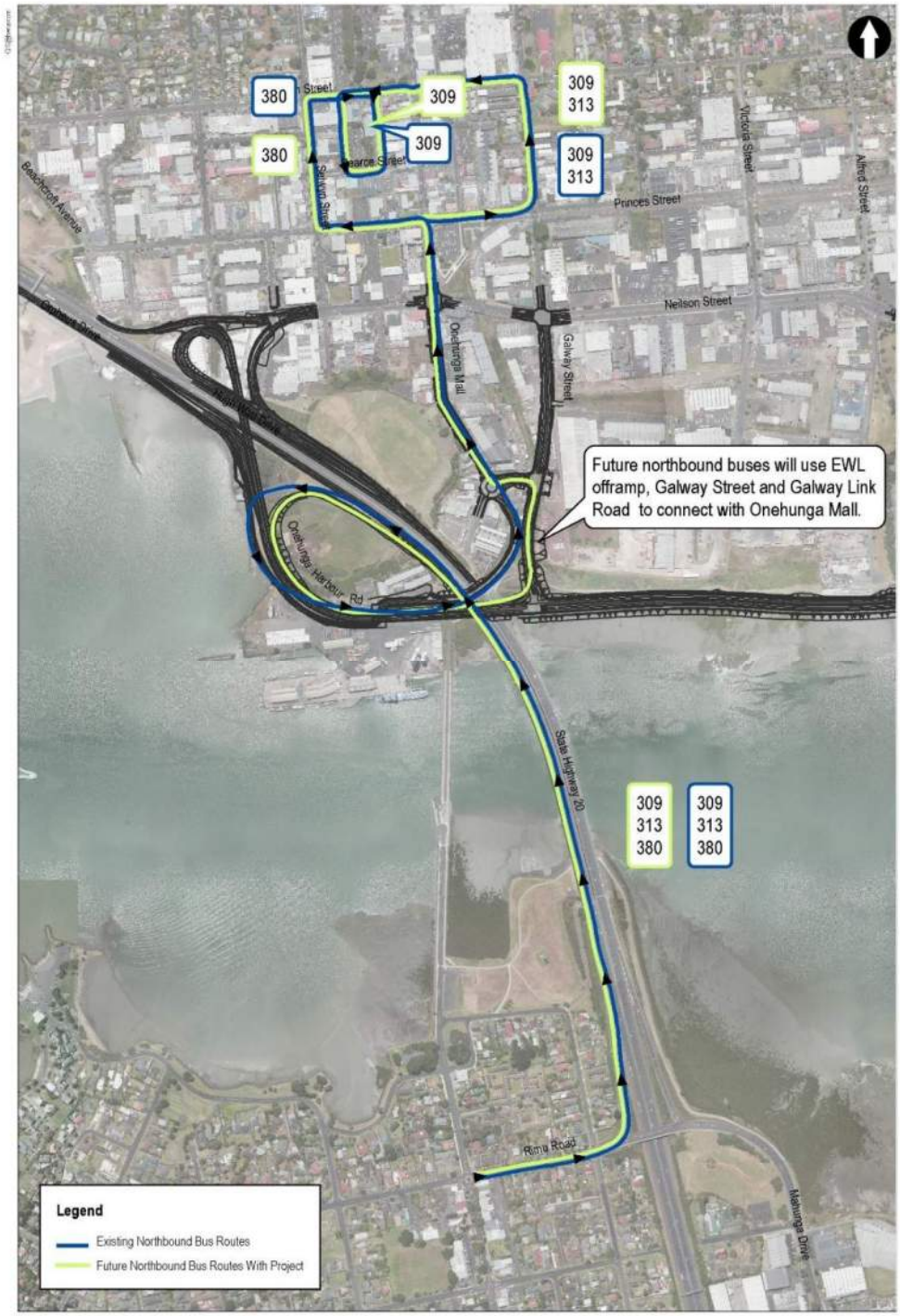
Currently northbound buses travelling to Onehunga Town Centre from Māngere (and other southern destinations) use SH20, Neilson Street off-ramp, Onehunga Harbour Road and Onehunga Mall. Currently buses are delayed in the congestion on Onehunga Harbour Road and Onehunga Mall as this is heavily trafficked route for vehicles, including trucks, to access the industrial area.

[13] At the time of the assessment the status of the new bus network for South Auckland was "proposed". However, the new bus network has changed status and was implemented on 30th October 2016.

Connector bus services 380, 313 and 309 will be in operation when the EWL is scheduled to open. As shown on Figure 8.1 buses will no longer use Onehunga Harbour Road and instead use the realigned SH20 off-ramp, the Galway Street EWL eastbound exit to access Galway Street, then use the new Galway Link Road to connect with Onehunga Mall. The buses then continue to Onehunga Town Centre using Onehunga Mall.

The existing bus stop on Onehunga Mall (south of Neilson Street) will be retained.

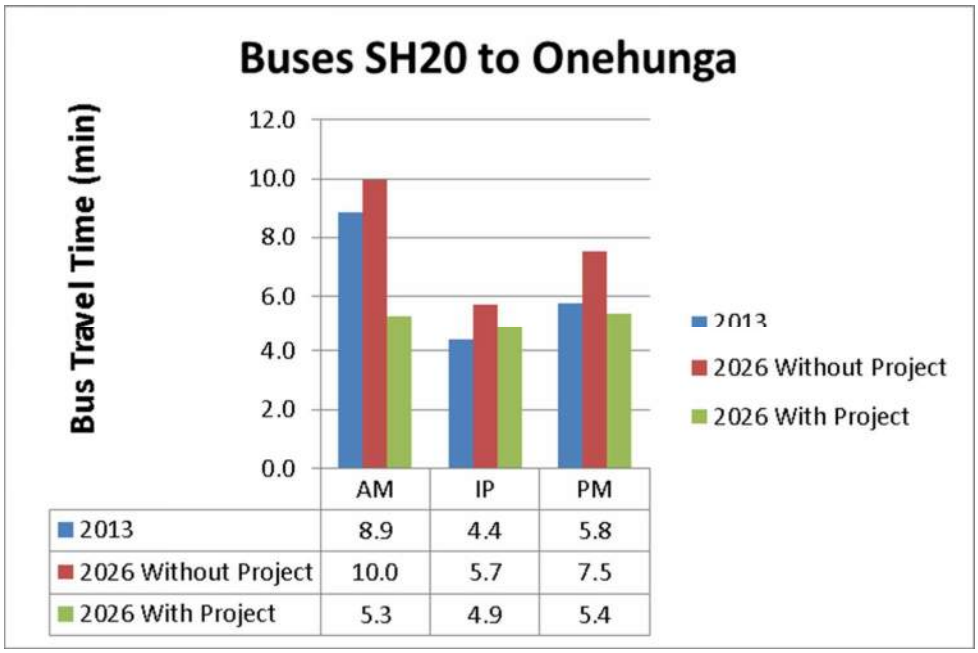
Figure 8-1: Existing and Proposed Northbound Bus Routes into Onehunga Town Centre from Māngere



It is predicted there will be a significant reduction in traffic on Onehunga Mall (south of Neilson Street) with the Project in 2026 – a reduction of approximately 19,000vpd. This represents an 84% reduction in traffic and can be expected to have a significant benefit for bus journey travel time. Further, a significant reduction in traffic on Neilson Street is also predicted in 2026 with the Project, with 8,200 fewer cars on Neilson Street (between Selwyn and Onehunga Mall). Buses will use Onehunga Mall (north of Neilson Street) to access the Onehunga Transport Centre. With the Project, 1,600 fewer vehicles are predicted to use this length of Onehunga Mall in 2026 – a 20% reduction compared to without the Project.

The new route will be approximately 400m longer than the current route, however buses will no longer get caught in congestion on Onehunga Harbour Road. There will be significant travel time savings for these three bus routes of approximately five minutes in the AM peak and two minutes in the PM peak as seen in Figure 8-2 below. The significant reduction in traffic on Neilson Street and Onehunga Mall will allow buses to move more easily towards and through the Town Centre.

Figure 8-2: Travel Time Savings for northbound buses travelling to Onehunga Town Centre from Māngere via SH20 (2026)



	AM	IP	PM
2013	8.9	4.4	5.8
2026 Without Project	10.0	5.7	7.5
2026 With Project	5.3	4.9	5.4

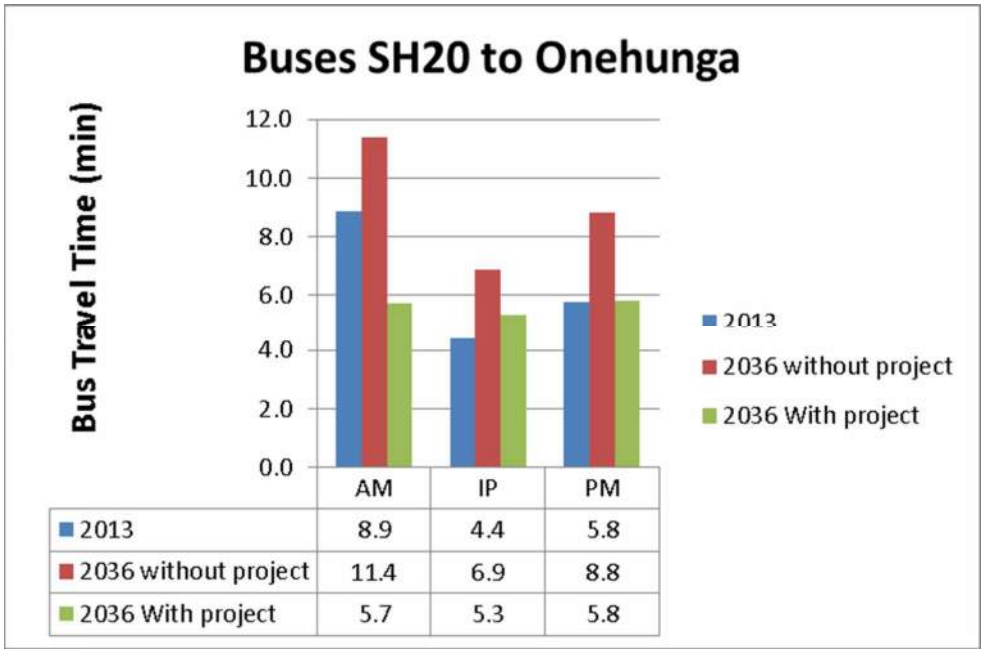
8.4.1.1 Bus Journey Time Consistency/Reliability

The Project will improve the consistency/reliability of journey times for buses particularly those buses travelling northbound from SH20 to Onehunga. To quantify this, an assessment has been undertaken looking at the northbound bus travel times from SH20 to Onehunga only.

It can be seen in Figure 8-2 that in 2026, with the Project in place, bus travel times are predicted to be consistent during the day with a predicted times of some five minutes across the three peak periods. This is compared to less consistent predicted bus travel times, without the Project in 2026, with a predicted AM peak of 10 minutes, inter-peak of 5.7 minutes and PM peak of 7.5 minutes.

Bus travel times in 2036 are also predicted to be remain consistent over the day with the Project in place as seen in Figure 8-3. An AM peak of 5.7 minutes, inter-peak of 5.3 minutes and PM peak of 5.8 minutes is predicted. This is compared to inconsistent predicted bus travel times, without the Project in 2036, with a predicted AM peak of 11.4 minutes, inter-peak of 6.9 minutes and PM peak of 8.8 minutes.

Figure 8-3: Bus Travel times SH20 to Onehunga (northbound) 2036



	AM	IP	PM
2013	8.9	4.4	5.8
2036 without project	11.4	6.9	8.8
2036 With project	5.7	5.3	5.8

Figure 8-3 show that without the Project the bus travel times will increase over time (2013 to 2026 and 2026 to 2036), but with the Project in place, travel times are shown to be only slightly higher, and remain consistent over the day. This shows that roads will be more resilient and reliable.

The peak times are shown to be consistent with those for the inter peak, thus indicating a higher level of reliability and not impacted by congestion. In addition to providing a more attractive service, this will allow for easier bus scheduling and lower operational costs.

8.4.1.2 Future Bus Patronage

In order to quantify how many future bus passengers will enjoy the predicted travel time savings with the Project, observed passenger counts plus the regional (ART3) model has been used to understand annual growth in passengers on the northbound bus routes into Onehunga Town Centre. The ART3 model suggests between 2013 and 2036 a 3% per annum growth in passengers on SH20 and 16% per annum increase in those entering Onehunga. This discrepancy is because the ART3 model does not replicate the current split between those entering Onehunga and those staying on SH20. Hence, a mid-point growth rate of 10% per annum has been assumed which could be more realistic.

Applying these growth rates to the existing 1,500 passengers per day currently using northbound buses to access Onehunga Town Centre via SH20 gives a forecast estimate of between 2,400 passengers per day (3% growth), 4,500 passengers per day (10% growth) and 6,300 passengers per day (16% growth). This means that between 2,400 and 6,300 passengers per day accessing Onehunga Town Centre from SH20 will enjoy the predicted travel time savings and reliability of up to five minutes. It is considered however that 4,500 passengers per day may be the more robust estimate.

8.4.2 Southbound Buses

Southbound buses will continue to use the same route to access SH20 from Onehunga Town Centre once the Project is in place. However, these buses will be given priority as the existing T2/Truck lane (on Neilson Street, Gloucester Park Road and the on-ramps) will be converted to a bus only lane.

The proposed bus only lane will connect with the existing southbound bus lane on the SH20 motorway shoulder, so buses will not mix or merge with other traffic. Buses will also be able to bypass the ramp signals. These proposed improvements will combine to provide a journey time saving for buses of around one minute in 2026 with the Project in place compared to without the Project. These savings are more modest than those for the northbound as the southbound buses are not extensively delayed at present.

It is predicted that there will be a decrease in traffic on Neilson Street (between Selwyn Street and Onehunga Mall) of 40% in 2026 when the Project is in place compared to without the Project. The decrease in traffic on Neilson Street will have a positive impact on southbound bus routes 309, 313 and 380 and will deliver journey time savings for bus passengers.

8.5 Other Bus Routes

In addition to the positive impact for bus passengers travelling between SH20 and Onehunga Town Centre, there will be further benefits for passengers on eight bus routes in the Sylvia Park, Onehunga, Penrose and Ōtāhuhu areas of the Project Area. It is anticipated that where a reduction in traffic is predicted buses will enjoy quicker journey times along this length. These bus routes are shown previously in Section 4.

On most routes the traffic is expected to reduce which could result in time and reliability benefits for the buses. Generally, the time savings for the buses have only been assessed qualitatively by assessing the level of flow reduction, as it was not considered necessary to calculate the savings on all routes. The Cross Town 7 and 8 routes pass thought the immediate study area, where large reductions in flow are expected and therefore travel time savings for these routes were explicitly quantified.

8.5.1.1 Route 723

Route 723 is a Connector service and will travel between Onehunga Town Centre and Glen Innes serving Sylvia Park and Panmure. Route 723 bus service uses Church Street, Great South Road, Sylvia Park Road and Mount Wellington Highway.

The major changes to Sylvia Park Road involve widening from two lanes to four lanes and a significant increase in traffic volumes. Most of the properties on the southern side of Sylvia Park Road (between Great South Road and Mount Wellington Highway) will be acquired for the Project, which reduces the catchment of bus passengers. These changes to Sylvia Park Road have the potential to impact on the operation of Route 723.

At the intersection of East West Link/Great South Road/Sylvia Park Road the delays to buses are expected to increase by some 40-60 seconds with the Project. However, this route will have reduced (and more reliable) travel times passing through the Church Street/Great South Road intersection, which more than offset those localised increases. Overall, the 723 service is therefore not considered to be adversely affected by the Project.

Most of the businesses on the southern side of Sylvia Park Road will be required for the Project which will reduce the potential bus passenger catchment along this section of the route. As discussed with AT, buses could be diverted from Sylvia Park Road to Vestey Drive to then rejoin the route at Mount Wellington Highway to improve the passenger catchment (if desired).This proposed diversion route will serve the businesses on Vestey Drive, which is an improved bus catchment when compared to Sylvia Park Road with the Project in place. There are existing bus stops on Vestey Road used by existing Route 358 and proposed to be used by future Route 323.

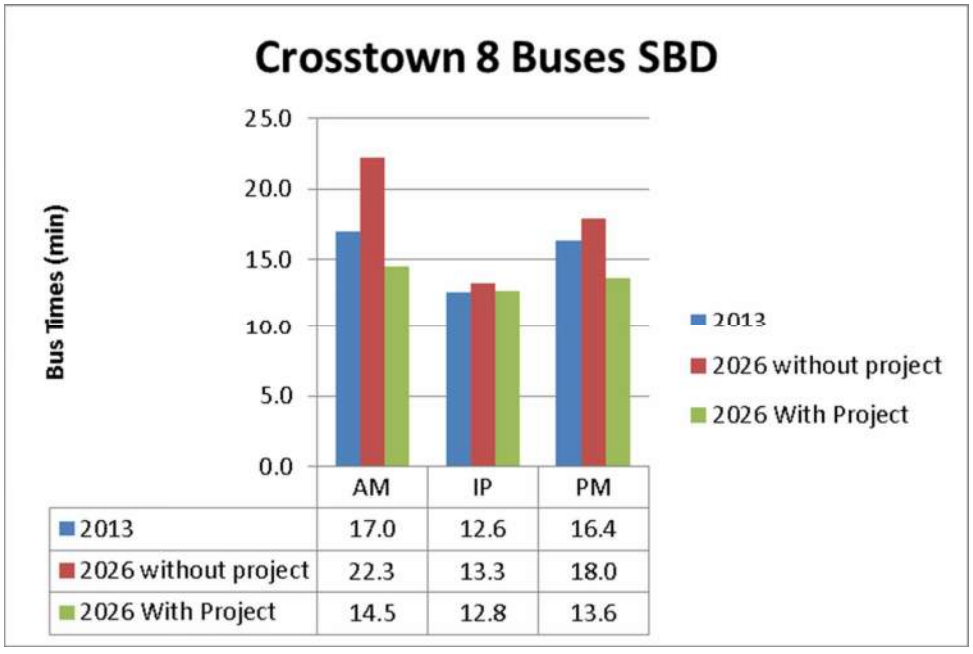
It is predicted there will be a decrease in traffic on Great South Road at Southdown Lane (between Sylvia Park Road and SEART) of 37% in 2026 when the Project is in place compared to without the Project. This equates to 12,100 fewer vehicles. In addition, there is a predicted decrease in traffic on Church Street (east of Neilson Street) of 18% in 2026 when the Project is in place compared to without the Project. The decrease in traffic on Great South Road and Church Street will have a positive impact on Route 723 and deliver journey time savings for bus passengers.

8.5.1.2 Crosstown 8

The Crosstown 8 is proposed as part of the Central New Network, will travel between New Lynn and Ōtāhuhu via Onehunga and will use Church Street and Great South Road within the Project Area. The Crosstown 8 will pass through the intersection of East West Link/Great South Road/Sylvia Park Road and delays to buses are expected to increase by some 40-60 seconds with the Project. However, this route will have reduced (and more reliable) travel times passing through the Church Street/Great South Road intersection, which more than offset those localised increases. Overall, the Crosstown 8 service is therefore not considered to be adversely affected by the Project.

The Crosstown 8 will enjoy the same journey time savings on Church Street and Great South Road as Route 723. There will be a significant travel time savings for the southbound buses on this bus route of approximately seven minutes in the AM peak and four minutes in the PM peak as seen in Figure 8-4 below. By 2036 the savings to southbound buses is predicted to be 11 minutes. There will also be significant travel time savings for the northbound buses in this bus route of approximately two minutes in both the AM and PM peaks. By 2036 the PM peak savings are predicted to be nearly five minutes. Crosstown 8 also uses Onehunga Mall and there will be a reduction in traffic on this route. It can also be seen that the bus times will become more consistent across the day and hence more reliable.

Figure 8-4: Travel Time Savings for Southbound Cross Town 8 Buses (2026)



	AM	IP	PM
2013	17.0	12.6	16.4
2026 without project	22.3	13.3	18.0
2026 With Project	14.5	12.8	13.6

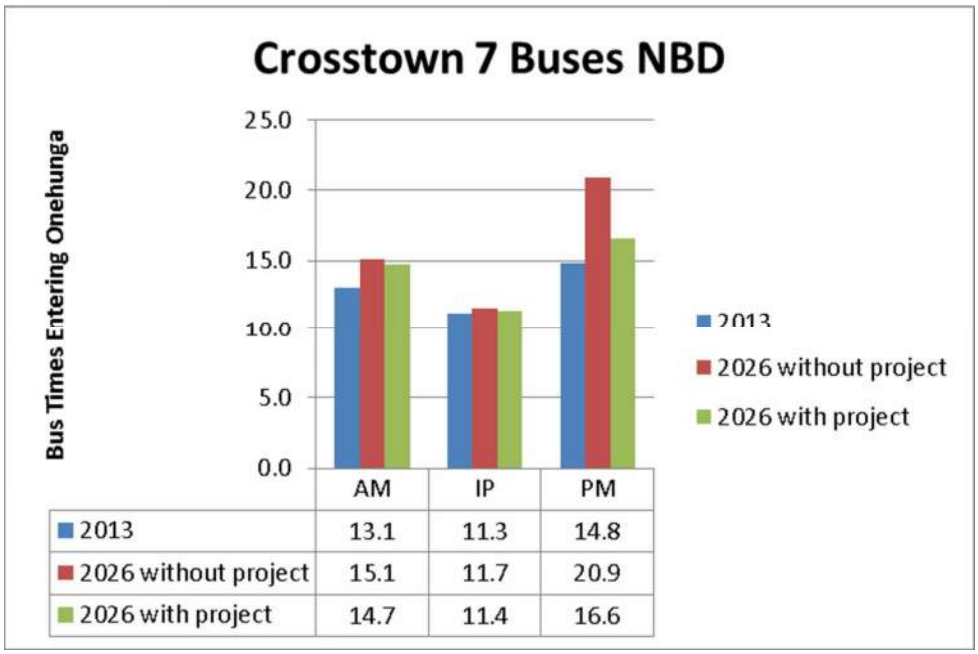
8.5.1.3 Crosstown 7

The Crosstown 7 is a Frequent Service proposed as part of the proposed Central New Network and will travel between Point Chevalier Beach and Sylvia Park using Mount Smart Road, Station Road East and Penrose Road. It is predicted there will be a decrease in traffic on Mount Smart Road and Station Road East (between Rockfield Road and Maurice Road) of 12% in 2026 when the EWL Project is in place compared to without the Project. The Project will have a positive impact on Crosstown 7 route and deliver journey time savings for bus passengers.

There will be significant travel time savings for the southbound buses on this route of approximately 4.5 minutes in the AM peak and 3 minutes in the PM peak. Northbound buses on this route will also have journey time savings of some 4.3 minutes in the PM peak as seen in Figure 8-5 below. By 2036 the

bus times and savings are predicted to increase to 7 minutes in the southbound in the morning and northbound in the evenings.

Figure 8-5: Travel Time Savings for Northbound Cross Town 7 Buses



	AM	IP	PM
2013	13.1	11.3	14.8
2026 without project	15.1	11.7	20.9
2026 with project	14.7	11.4	16.6

8.5.1.4 Route 321 and Route 322

Route 321 is proposed as part of the proposed Central Suburbs new network and will travel between Middlemore to Britomart via Ōtāhuhu and Ellerslie and will use Great South Road. Route 322 also uses Great South Road in peak periods when travelling between Ōtāhuhu and Britomart.

It is predicted there will be a decrease in traffic on Great South Road at Southdown Lane (between Sylvia Park Road and SEART) of 37% in 2026 when the EWL Project is in place compared to without the Project. The Project will have a positive impact on Routes 321 and 322 and deliver journey time savings for bus passengers.

These routes travel along a section of Great South Road which is also used by Cross Town 8 where significant savings are expected. At the intersection of East West Link/Great South Road/Sylvia Park Road, the delays to buses are expected to increase by some 40-60 seconds with the Project. However, this route will have reduced (and more reliable) travel times passing through the Church Street/Great South Road intersection, which more than offset those localised increases.

8.5.1.5 Route 323

Route 323 is proposed as a connector service as part of the proposed Central new network and will travel between Ōtāhuhu Station and Sylvia Park via Panama Road. This route will use the western end of Vestey Drive then turns left into Great South Road when travelling towards Ōtāhuhu Station.

Although the models predict an increase in traffic flows on the Vestey Drive section of this route, the models do not indicate any significant increase in delays on that section.

8.5.1.6 Route 324

Route 324 is a local loop service that connects Māngere Town Centre and Seaside Park and uses Frank Grey Place (north of Trenwith Street). A reduction in traffic is predicted in 2026 with the Project on Frank Grey Place (north of Trenwith Street) of 19%, which equates to 2,000 fewer vpd on this part of the bus route. The Project will have a positive impact and will deliver journey time savings for bus passengers on this route. Currently buses on this route are caught in the same motorway off-ramp queuing as the general traffic. The project provides a wider Princes Street bridge to allow cross motorway traffic to bypass the queues. While not quantified, these benefits may be significant.

8.5.1.7 Route 351

This route is a local service and travels between Botany and Ōtāhuhu using Princes Street. A reduction in traffic is predicted in 2026 with the Project on Princes Street (west of Luke Street) of 11%, which equates to 1,300 fewer vpd on this part of the bus route. The Project will have a positive impact and will deliver journey time savings for bus passengers on this route.

8.5.1.8 Route 30

This route is a frequent service and travels between Onehunga and the City using Onehunga Mall. A reduction in traffic is predicted in 2026 with the Project on Onehunga Mall, which will benefit bus travel times.

8.6 Impact on Bus Stops

No existing bus stops will be impacted by the Project alignment. Two new bus stops are proposed on both sides of Great South Road north of the intersection with Sylvia Park Road. It is anticipated that these two bus stops are likely to be constructed before the Project is open. There will be no impact on the proposed bus stop on the eastern side of Great South Road. Minor widening of Great South Road is proposed on the western side of Great South Road in the general location of the proposed bus stop and this bus stop will be retained as part of the widening design. The existing bus stop on Onehunga Mall (south of Neilson Street) will be retained.

8.7 Impact on School Buses

There are a number of school bus services that use the road network within the Project Area and this section provides a high level assessment of the impact of the Project on these school bus services in the future year environment. The assumption being that where there are reductions in daily traffic flows on the roads used by school buses this will likely deliver journey time savings for school bus passengers and potential safety improvements due to reduced potential conflicts between children and vehicles. We have assessed the routes to and from those schools that fall within the Key Community Facilities Areas reported on in *TR11: Social Impact Assessment.*

School bus services to Onehunga High School and Royal Oak Intermediate from Favona, Māngere and Māngere Town Centre use SH20 and Queenstown Road and then the local road network to reach these two schools. Northbound school buses use Beachcroft Avenue and Trafalgar Street which are close to these two schools. There are four school bus services in the morning and there is predicted to be a small reduction in daily traffic flows on these local roads in 2026 With the Project compared to Without the Project. In the afternoon, these four services use similar routes on the return and there is an additional service from Onehunga High School to Onehunga Town Centre using Mount Smart Road, Captain Springs Road and Church Street to the corner of Alfred Street. Small reductions in daily traffic flows are also predicted on these roads in 2026 With the Project compared to Without the Project.

St. Joseph's School is located on Church Street in Onehunga and is served by a school bus service to/from Māngere. The northbound buses use SH20, Onehunga Harbour Road, Onehunga Mall, Princes Street, Spring Street and Church Street in the morning and would enjoy similar journey time savings (5 minutes) as the northbound buses using this route in the AM peak discussed previously in this section.

In the afternoon the buses will use a similar route to the southbound buses and there will be traffic reductions on Onehunga Mall and Neilson Street.

A school bus serves Fairburn Primary, McAuley High School, Ōtāhuhu College, Ōtāhuhu Primary and St. Joseph's School (Ōtāhuhu) and uses Mount Wellington Highway. Those travelling to the College will enjoy a predicted 11% decrease in traffic in 2026 on Mount Wellington With the Project compared to Without the Project. There are minor increases and decreases in traffic volumes on other roads along the bus route, and it is noted that there is a decrease on Station Road (where Ōtāhuhu Primary School is located). In the afternoon, there is a school bus service from McAuley High to Onehunga Transport Centre, which also serves Ōtāhuhu College and St Josephs School. This service uses SH20, Onehunga Harbour Road, Onehunga Mall, Neilson Street and Church Street and overall there are significant decreases in traffic volumes on these roads.

A school bus serves Sylvia Park Primary and uses Carbine Road where there is expected to be a 6% decrease in traffic flows in 2026 With the Project compared to Without the Project. A small increase in traffic flows are expected on Panama Road but decreases on Great South Road.

It is recognised that school buses that serve schools outside the Key Community Facilities Areas may use roads that pass through the Project Area; however, these have not been assessed.

The assessment shows school bus routes are expected to gain potential travel time and safety benefits where they travel through roads with predicted reductions in traffic flows and congestion. No adverse effects on school buses were identified.

8.8 Conversion of T2 lane to Bus only lane

The existing T2 lane on Neilson Street/Gloucester Park Road (south)/SH20 southbound on-ramp will be converted to a bus-only lane. However, the new SH20 southbound on-ramp from the EWL will include a truck/T2 bypass of the ramp signals, meaning trucks and high-occupancy vehicles will be able to use this facility rather than Gloucester Park Road.

For those T2 vehicles who wish to continue using the Neilson Street/Gloucester Park Road south)/SH20 southbound on-ramp, they will have additional delay as they can no longer use the T2 lane. However, in the interpeak and PM peaks this extra delay is off-set by reduced delay getting through the Onehunga Mall/Neilson Street intersection, giving a net benefit of 2-3 minutes. In the morning peak the ramp signals are expected to operate, meaning those T2 vehicles remaining on Gloucester Park Road would experience additional delay accessing SH20 than without the Project. Those high occupancy vehicles will be able to use the new southbound ramp and its T2 bypass lane rather than Gloucester Park; however, an increase of some 1.6 minutes accessing SH20 in the morning peak is expected. This extra delay is only expected to occur in the morning peak, and only on T2 vehicles coming from Onehunga Town Centre area. This extra AM peak delay would be offset by the reduced delay during the rest of the day, as well as the reduced delays for buses using the new bus lane on Gloucester Park Road, and for the truck and T2 vehicles on the EWL being able to access the new bypass lane. Due to these off-setting effects, this impact to existing T2 vehicles is not considered to be a significant adverse effect.

8.9 Use of EWL by Public Transport

Auckland Metro have advised that they have no plans to run bus services along the EWL road.

8.10 Change to Future Regional Public Transport Patronage

The ART3 regional multi-modal model has been used to assess the changes in regional demand for public transport travel across the Auckland region. These predictions relate to the overall pattern of regional demand, due to mode shift, time-period shifting or trip redistribution (change in destination).

To provide context to the predicted impact of the Project, the ART3 model predicts substantial growth between 2013 and 2026 (without the Project in place): an increase of between 15% - 17% in daily

vehicle trips across the Auckland Region, with an increase of over 100% in public transport person trips. This implies a substantial mode shift to public transport between current conditions and the 2026 base case.

Table 8-1: Change in Daily Public Transport Person Trips

	2026 without Project	2026 with Project	Difference
Daily Public Transport person trips	457,979	456,294	-1,685

From Table 8-1 it can be seen that across the Auckland region there is a daily reduction of 1,685 public transport trips. At a regional level, these changes are very small.

The more detailed SATURN model predicted significant savings on a number of bus routes in the study area (up to seven minutes saved), however these savings were generally not reflected in the less detailed ART3 model. For example, the ART3 model does not fully reflect the high level of congestion for buses accessing Onehunga from SH20, and as such does not respond to the substantial improvements to these bus routes. Those substantially improved bus travel times would be expected to offset some of the predicted mode shift (away from buses), caused by the reduced vehicle travel times. As such, it is expected that the ART3 model is over-stating the reduction in bus travel.

8.11 Enabling Future Opportunities for Bus Travel

The Project benefits of reduced traffic and congestion on local roads will present future opportunities for passengers travelling by bus in the Project area. Reducing congestion, improving journey time reliability and journey time savings of approximately five minutes in the AM Peak for buses travelling into Onehunga Town Centre provides an opportunity for Auckland Transport to consider diverting the peak period service Route 309X from SH20 into Onehunga Town Centre. The Project provides an opportunity for Onehunga bus passengers to use a faster express bus service to the City Centre in the future.

This Project design allows for the AMETI bus corridor project connecting the Mount Wellington Highway into Sylvia Park Town Centre and liaison with Auckland Transport is ongoing on specific design details.

8.12 Impact on Rail Network

8.12.1 Protecting Mass Transit to the Airport

Auckland Transport has been developing a Business Case considering options for mass transit to Māngere and the Airport employment area. The future mass transit corridor follows a route south from Onehunga train station south between Onehunga Mall and Galway Street, (initially in the KiwiRail designation) and then to the east of Galway Street extension to the foreshore and across the Māngere Inlet as shown on *Volume 2: Drawing Set*. AT has advised that it is proposed to be an elevated route over Neilson Street and over the EWL as it crosses the Manukau Harbour.

The Project design has considered the planned future mass transit to the airport. Throughout the investigation period, various heavy and light-rail alignments for such rail were developed by Auckland Transport as set out in the South-western Multi-Model Airport Rapid Transit Interim Business Case. Auckland Transport advised that either option would be elevated over Galway Street and the EWL in order to cross the Manukau Harbour. The design of the EWL and its connection to Galway Street has sought to provide flexibility for future decisions on the mass transit link. This has included provision of an at-grade intersection of Galway Street onto the EWL.

8.12.2 Enabling Future Opportunities for Rail Travel

The Project benefits of reduced traffic and congestion on local roads will present future opportunities for passengers travelling by rail in the Project area.

Reducing congestion, improving journey time reliability and journey time savings provides passengers with a more reliable and shorter journey into Onehunga for onward travel by train into the CBD from their point of origin. The improvement in shorter and reliable overall point to point journey times using bus and rail will mean passengers are more likely to make their connections. It may also provide a future opportunity for mode shift from bus to rail from Onehunga Town Centre if passengers can connect with trains more reliably.

It is anticipated that passengers accessing the Onehunga train station via bus services into Onehunga Town Centre will experience an increase in reliability for their overall journey into the CBD.

8.12.3 Rail Freight Designation

A significant, and growing volume of freight passes through the MetroPort rail terminal. That movement is currently constrained by the rail network capacity at Wiri and the constraints on the road network to distribute the freight. Additional rail capacity at Wiri (a third track) is being implemented by KiwiRail (separate to this Project). The EWL Project will provide significantly increased road freight capacity within the Onehunga-Penrose area, and to the rest of Auckland. This is expected to allow significant increases in capacity and efficiency of rail freight. This would be especially important to long-haul routes between Auckland and Tauranga and other North Island locations and removing road freight on those longer routes.

KiwiRail have designations in place and plans to add siding capacity. These plans have influenced the Project design and liaison with KiwiRail is ongoing.

8.13 Summary of Effects

The Project will address the key issue of congested travel times and poor journey time reliability for buses travelling between SH20 and Onehunga Town Centre. Faster travel times are predicted for northbound buses accessing the town centre from SH20 with savings of up to five minutes. The travel time savings will benefit between 2,400 and 6,300 passengers per day in the future (2036).

Congestion will cause bus travel times to increase between now and 2036 (without the Project), but with the Project in place, travel times are shown to be only slightly higher (between 2026 and 2036), and remain consistent over the day, hence are more resilient and reliable.

The peak bus travel times are predicted to be consistent with those for the inter peak, thus indicating a higher level of reliability and not impacted by congestion.

The improvements for travel time reliability will also benefit passengers by making it easier to make onward rail and bus connections. It is anticipated that passengers accessing the Onehunga train station via bus services into Onehunga Town Centre will experience an increase in reliability to the overall journey into the CBD.

The more reliable journeys that are predicted with the Project in place are expected to reduce bus operating costs by allowing more efficient service scheduling around these reliable journeys.

In addition to the positive impacts for bus passengers accessing Onehunga Town Centre, the Project will provide benefits for other bus routes. Significant journey time savings on eight other bus routes are predicted in 2026 with the Project in place. This includes a predicted seven-minute saving on southbound Crosstown 8 bus in the AM peak in 2026 with the Project in place compared to without the Project.

At the intersection of East West Link/Great South Road/Sylvia Park Road the delays to 723 and Crosstown 8 bus services are expected to increase by some 40-60 seconds with the Project. However, these routes will have reduced (and more reliable) travel times passing through the Church Street/Great South Road intersection, which more than offset those localised increases. Overall, the 723 and Crosstown 8 services are therefore not considered to be adversely affected by the Project.

Where there are reductions in daily traffic flows on the roads used by local school buses this will likely deliver journey time savings for school bus passengers and no adverse effects on school (or scheduled) buses was identified.

The conversion of the existing T2 lane on Neilson Street/Gloucester Park Road (south)/SH20 southbound on-ramp will be converted to a bus-only lane. However, the new SH20 southbound on-ramp from the EWL will include a truck/T2 bypass of the ramp signals, meaning trucks and high-occupancy vehicles will be able to use this facility rather than Gloucester Park Road. There will be some increased delay in the morning peak as these vehicles can no longer use the existing T2 lane, however, these delays will be off-set by reduced delays throughout the rest of the day. Therefore, the impact on existing T2 vehicles is not considered to be a significant adverse effect.

The Project will not impact any existing bus stops and two future bus stops planned for Great South Road can be accommodated by the Project design.

The at-grade design of the EWL at Galway Street will not preclude future mass transit plans to the airport at this location and the Project integrates with Auckland Transport's proposed AMETI bus link at Sylvia Park Town Centre.

Overall, the Project will have a highly positive impact on public transport in the local area particularly for buses travelling northbound between SH20 and Onehunga Town Centre with significant (5 minutes) journey time savings for between 4,500 and 6,300 passengers in the future. The Project will also have a positive impact on eight bus routes in the wider area with significant travel time saving benefits. The Project does not preclude any future bus, or future mass transit plans to the airport.

9 Effects on Safety Performance

9.1 Approach

This section discusses the expected effect on road network safety. The purpose of this assessment is to undertake a high level appraisal about the predicted safety outcomes. A high crash rate was not identified as a major problem in the Business Case investigations of this area. Addressing safety problems is not a specific key issue of the Project, however it remains a critical concern of the Agency in planning and operating on its networks.

The significant increase in capacity and connectivity expected with the Project is expected to cause a major redistribution of traffic across the remaining network. The general pattern of change (as discussed in earlier Chapters) is to divert traffic off parts of the surrounding (non-highway) roads, with a concentration of traffic on the new EWL Project.

Crash-prediction models have been developed by the Agency for specific road facilities, however the relatively rare and random nature of crashes makes such predictions subject to significant uncertainty when applied across a whole network. As such, and given that safety has not been identified as a key existing problem, this assessment is qualitative, rather than quantitative.

9.2 Existing Roads

Crash rates are generally a function of the type of facility and its use (measured in terms of traffic flow). Therefore, the predicted reductions on the wider network would be expected to result in some reduction in road crashes in those areas. Significant reductions would be expected on adjacent roads such as Neilson Street, Church Street, Great South Road, Onehunga Mall and Princes Street. Smaller-scale reductions would be expected in the wider network, such as on Favona Road, Campbell Road, Mt Smart Road and Mt Albert Road.

The roads where significant increases in traffic are expected have been assessed specifically, both in terms of traffic and safety effects. These include specific assessments on Captain Springs Road, Victoria Street, Hugo Johnston Drive and Miami Parade, as reported in Section 6.

9.3 New Roads

In relation to the new roads, consideration of safety has been a critical part of the design process. This has included use of design standards, Safety in Design workshops and independent Safety Audits at various stages of the design development. Issues raised in the Safety Audit have been discussed in detail with the Agency's Regional Safety Engineer, and the design revised or confirmed as appropriate. Overall, it is considered that the new facilities are expected to appropriately address safety issues in their design, with crash rates likely to be lower than those on existing local roads. This is due to the specific design features, including limited direct property access, appropriate lane and shoulder widths, raised median islands and an appropriate arterial road environment.

It is however acknowledged that although the crash rate measured on a per-vehicle basis is likely to be lower than existing roads, the overall increase in traffic passing through this corridor could result in a net increase in the number of crashes in this specific area. However, that is expected to be off-set by the reductions in crashes on the wider network.

9.4 Pedestrian/Cyclist Crashes

The analysis of recent recorded crashes described earlier (Appendix D) showed few recorded crashes for cyclists and pedestrians, except on Neilson Street where a serious and fatal cyclist crash was recorded.

The low number of recorded crashes is likely to reflect the low level of current pedestrian and cyclist activity in the area, as well as the typically low level of crash reporting of such crashes, especially when these are non-injury or occur off the road network (such as on the cycleway). The crashes on Neilson Street demonstrate the very high consequences of conflicts between cyclists and trucks.

Generally, the Project is considered to enhance pedestrian and cyclist safety in a range of ways:

- Providing an extensive network of off-road/separated facilities connecting key communities and destinations;
- Safe crossing facilities of the route and at existing roads;
- Reductions of truck and traffic flows on a range of local streets, which could be used by cyclists; and
- Providing a strong east-west link along the foreshore (with north-south access routes), that would reduce the need or desire for cyclists to use Neilson Street, which would continue to have very high levels of truck movements.

The detail of the type of walking and cycling infrastructure, will be developed in the detailed design process, including both the form and connections. It is a recommended that a process is established with Auckland Transport in regard to engagement and approvals during the detailed design.

10 Conclusions

10.1.1 Introduction

This Assessment has considered the impact of the Project on the transport system. Given the dynamic and on-going changes in travel patterns and performance, the Project has been assessed against a future Without Project scenario. The assessment has utilised both baseline data and future conditions forecast by transport models to assess the impacts.

The Assessment has been segmented by travel mode and issue, rather than by specific geographic segment. The assessment has covered impacts on:

- Travel times, travel reliability and traffic flows;
- Walking and cycling;
- Public transport network; and
- Parking, access and roads with increased traffic

10.1.2 Existing and Future Baseline Environment

The analysis found that there are significant issues with the transport network in this area, including:

- Highly congested, unreliable and inconsistent journey times accessing SH20 and SH1
- Poor accessibility for local businesses, with conflict between through and local access traffic on Neilson Street, Church Street and Great South Road
- Congested and unreliable journeys for buses between SH20 and Onehunga Town Centre.
- Use of residential streets, particularly by trucks, to access the industrial hub due to congested strategic connections.
- Connectivity, severance and amenity issues for pedestrians and cyclists.

There are also significant land use growth pressures both locally and across the Region, that will result in increased traffic demands and exacerbate the congestion and amenity problems that already exist.

10.1.3 Assessment of Travel times, travel reliability and traffic flows

There are significant positive outcomes regarding travel time and reliability accessing the Onehunga-Penrose area, as well as positive effects on the wider road network. These include:

- Significant travel time savings for business vehicles accessing the Onehunga-Penrose industrial area to the strategic network, including[14]:
  - Reductions accessing SH1 north of up to 6.3 minutes (37%);
  - Reductions accessing SH1 south of up to 18 minutes (68%);
  - Reductions accessing SH20 north of up to 4.1 minutes (43%);

[14] Note: The time savings vary across the peak periods and forecast years. For the purposes of this summary the highest indicated savings are referenced.

  - Reductions accessing SH20 south of up to 6.5 minutes (48%).
- When expressed in changes in average speed, these improvements include:
  - Increases from 25 to 62km/h from SH1 south;
  - Increases from 45 to 60 km/h from SH20 south.
- The times saved vary across the day, however the traffic expected to benefit from these access movements is estimated to include:
  - Some 30,000vpd accessing SH20 North;
  - Some 40,000vpd accessing SH20 South;
  - Some 42,000vpd benefiting from improvements on Church St, including those accessing SH1 North;
  - Some 17,400vpd accessing SH1 South.

The Project is expected to improve journey times over a much wider area than just Onehunga-Penrose, including:

- Up to 9 minutes between SH20 and Highbrook;
- Over 4 minutes between Onehunga and the Airport;
- Some 3 minutes between Royal Oak and the Airport;
- Over 3 minutes between SH1 and the Airport;
- Over 14 minutes between MetroPort and Highbrook; and
- Over 3 minutes between Pakuranga and Onehunga.

Significant improvements in the consistency and reliability of travel times for trips accessing the strategic network from the Onehunga-Penrose area are predicted. These include the range of travel times (across the directions and times of day) accessing SH1 south reducing from 16 minutes without the Project to under two minutes with the Project. With the Project in place, the access times become much more consistent and reliable across the day, which is expected to allow improved and more flexible journey and logistics planning for businesses in the area, and result in increased freight efficiency

When the Project is in place, travel times on SH1 and SH20 have been shown to stay the same or experience marginal improvements. This shows that the extra capacity provided on SH1 (as part of the Project) and on SH20 (as separate works), means that the extra EWL ramp flows can be accommodated without a detrimental impact on the travel along SH1 and SH20.

The general pattern of changes in daily flow suggest that traffic moves from the adjacent corridor to the EWL, with large reductions in flow (and therefore congestion), seen on Neilson Street, Church Street and Great South Road. This will allow easier access to properties and local streets.

There is a decrease in vehicle and truck movements predicted on other routes in the wider network, particularly in residential areas, therefore improving amenity for residents. This includes streets such as Favona Road, Mt Smart Road, Mt Albert Road and Campbell Road.

Some 57% of the total traffic and 64% of the truck movements are expected to be removed from the Neilson Street/Onehunga Mall intersection. This reduction in flow allows improved pedestrian and cycling facilities and amenity, and reduced traffic severance between Onehunga and the Foreshore/Old Māngere Bridge.

The EWL is forecast to generally operate a LoS B over its length, with the intersections performing at the Project design target of LoS D or better. The key capacity constraint in the corridor will be the Great South Road intersection, which is expected to be approaching (but below) capacity in the 2036 pm peak.

10.1.4 Assessment of Walking and cycling

The Project will have significant positive impacts on pedestrians and cyclists and will provide approximately 24 km of new or replacement cycling and walking facilities. The proposed direct route between Onehunga and Sylvia Park Town Centre will also be approximately 1.6km shorter than the current route.

The Project will improve safety and accessibility for cycling and walking between Māngere Bridge, Onehunga Town Centre and Sylvia Park Town Centre by providing high quality, off-road and continuous links connecting these key destinations. New and enhanced north-south connections will improve connectivity to the Māngere foreshore from the residential community north of Neilson Street, including at Captain Springs Road and Alfred Street.

There are significant improvements in each sector which overall contribute to the Project having a highly positive impact on pedestrians and cyclists, including:

- Accessibility improvements due to the closure of the network gap between Aotea Sea Scouts Hall and Manukau Cruising Club;
- Significantly improved connectivity for pedestrians and cyclists between the Old Māngere Bridge, Onehunga Wharf and the Onehunga Town Centre (and train station). This will be due to the improved off-road facilities and the substantial reduction in traffic flows on the adjacent streets;
- Significant connectivity and accessibility improvements through the provision of new high amenity pedestrian and cycling facilities on both sides of EWL. This includes shared paths, boardwalks, commuter cycle lanes and footpaths;
- New and enhanced connections between the foreshore and the Onehunga community (e.g. Captain Springs Road and Alfred Street) and with recreational spaces (e.g., Waikaraka Park);
- High amenity facilities with opportunities for the natural surroundings of the Māngere Inlet to be enjoyed by pedestrians and cyclists;
- Significant improvement in connectivity for pedestrians and cyclists with the proposed route between the end of the existing Waikaraka Cycleway at Hugo Johnston Drive and Sylvia Park Town Centre. This will link key destinations of Mutukāroa-Hamlins Hill Regional Park and Sylvia Park Shopping Centre and close this significant network gap. This includes a high amenity elevated shared path over Great South Road removing the need for pedestrians and cyclists to make three separate at-grade crossing movements;
- The shared paths on Princes Street and Frank Grey Place and the signalisation of the northbound on/off ramp intersection will significantly improve safety and amenity for pedestrians and cyclists crossing SH1 at Princes Street;
- The shared path on both sides of Panama Bridge will improve connectivity for cyclists as there are currently no facilities for these road users. The shared path will be off-road, separated from traffic and of appropriate dimensions which is a significant improvement to the existing width of footpath on the bridge for pedestrians; and
- The proposed new bridge to provide for pedestrian and cycling removes the severance of SH1 and the creek and provides highly significant improvements in connectivity as it will link the two isolated communities east of SH1 (being Princes Street and Panama Road communities) with a route that is up to 4km shorter than the existing route.

10.1.5 Assessment of Public transport network

The Project will address the key issue of congested travel times and poor journey time reliability for buses travelling between SH20 and Onehunga Town Centre. Faster travel times are predicted for northbound buses accessing the town centre from SH20 with savings of up to five minutes. The travel time savings will benefit between 2,400 and 6,300 passengers per day in the future (2036).

With the Project in place, travel times will become uncongested and consistent over the day. This increased reliability is expected to improve attractiveness of the bus system, improve linkages to the rail network and reduce bus operating costs.

In addition to the positive impacts for bus passengers accessing Onehunga Town Centre there are expected to be significant journey time savings on eight other bus routes, due to the reduced traffic flows and congestion on those routes.

The at-grade design of the EWL at Galway Street will not preclude future mass transit plans to the airport at this location and the Project integrates with Auckland Transport's proposed AMETI bus link at Sylvia Park Town Centre.

10.1.6 Assessment of Parking, access and roads with increased traffic

There are some properties on Gloucester Park Road, Onehunga Mall, Onehunga Harbour Road and Sylvia Park Road that require some access movements to be via a longer route. However, these are all off-set by the significantly improved access to SH1 and SH20 (and the local roads), offered by the Project.

Access to business in Onehunga Mall, and especially on Galway Street (north of Galway), will have reduced accessibility due to the banned turns proposed at Galway Street and Gloucester Park Road. The recommended reinstatement of the right turn into Onehunga Mall will mitigate the impact on accessibility.

Access to Orpheus Drive would be via a low volume, local road rather than the current high volume motorway access road, which would be more compatible with its recreational function.

Access to the TR Group at 781 Great South Road is currently restricted to left-in and left-out only, however these constraints can be removed due to the significant reduction in traffic flows at that location. This will significantly enhance access to the site, especially to the EWL

Access to Sylvia Park Town Centre for Hillside Road residents will be significantly improved by re-instating the right turn from Hillside Road into Panama Road. The route will be shorter and quicker and has a positive connectivity impact for this community.

The upgraded interchange at Princes Street is expected to better manage motorway queuing on the local network, and allow non-motorway traffic to move around any residual queues. This is anticipated to significantly improve the quality and resilience of access to this community.

The change in function on key roads such as Onehunga Harbour Road, Galway Street, Captain Springs Road, Hugo Johnston Drive and Sylvia Park Road will require loss of some existing parking. Generally, this loss can be accommodated by the existing spare parking capacity. However, specific mitigation of the loss of parking has been recommended, as outlined further below.

10.1.7 Recommendations

Specific local mitigation to be included either in the design or subsequent agreements with stakeholders have been identified as outlined below:

- The redundant section of Onehunga Harbour Road should be used to provide for replacement car parking lost outside The Landing and under SH20 (informal parking for users of the Waikaraka Cycleway);
- Provision of clearways on Captain Springs Road and consideration of clearways on Galway Street to allow for off-peak parking;
- Removal of some parking on Hugo Johnston Drive, along with the consideration of upgraded street lighting to accommodate the change in function;

- Provision of a u-turn facility and extra parking at the southern end of Hugo Johnston Drive;
- Explore the potential to allow internal access arrangements to 8 Sylvia Park Road via 1 Pacific Rise;
- Reinstatement of the right turn into Onehunga Mall from Neilson Street;
- Inclusion of Māngere as a destination into any existing or any future highway signage on Mount Wellington Highway directing motorists to perform a right turn into Sylvia Park Road rather than using Vestey Drive.
- It is recommended that ongoing engagement is undertaken to ensure the shared path at the eastern end of the EWL main alignment is delivered in conjunction with AT and extends through to the Sylvia Park Town Centre boundary.
- The detail of the type of walking and cycling infrastructure will be developed in the detailed design process, including both the form and connections. It is recommended that a process is established with Auckland Transport in regard to engagement and approvals during the detailed design; and
- It is recommended that the process of engagement and approvals with AT for the design of specific locations where the Project interfaces with the existing local road network is established. This includes the design objectives, features and mitigation measures of Hugo Johnston Drive, Captain Springs Road, Pacific Rise intersection, the re-instatement of right turn from Hillside Road and the re-instatement of right tuning movements at 781 Great South Road is established.

10.1.8 Conclusion

The assessment has found substantial positive improvements to the transport system in the Onehunga-Penrose and Ōtāhuhu areas. These positive outcomes cover a wide range of modes and an extensive study area. They range from improved business access to the strategic network, improvements to walking, cycling and bus networks and improved local access between communities. They affect both local communities and the wider strategic movement.

The assessment concludes that the Project will strongly contribute to the all three of the Project Objectives and addresses the key issues identified in the report.

Appendix A

Future Bus Network Information

Table 1: Future New South Auckland Bus Frequencies relevant to the Project

Bus Service	Type of Service	Frequency (Weekday)			Frequency (Weekend)		Key Roads	Description of Route
		Peak	Peak	All Day	All Day	Evening		
309	Connector	30	30	30	30	30	SH20 / Onehunga Harbour Road/ Onehunga Mall	Māngere Town Centre, Favona, Māngere Bridge, Onehunga, Queenstown Road, Pah Road, City
313	Connector	20	30	30	30	30	SH20/ Onehunga Harbour Road/ Onehunga Mall	Onehunga, Māngere Bridge, Māngere Town Centre, Manukau Station
380 (Airporter)	Connector	30	30	30	30	30	SH20/ Onehunga Harbour Road/ Onehunga Mall	Onehunga, Māngere Bridge, Māngere Town Centre, Airport, Papatoetoe, Manukau
309X	Peak Period	30	30	-	30	-	SH20 (bypasses Onehunga Town Centre)	Māngere Town Centre, Favona, Māngere Bridge, Queenstown Road, Pah Road, City
360X	Peak Period	3 inbound 20 minutes apart 3 outbound 30 minutes apart			-	-	SH1 South of South Eastern Highway	Papakura, Manurewa Express, via Motorway, City
321	Local	Frequency and days of week vary			-	-	Great South Road	Middlemore Hospital to Britomart
322	Peak Period	Every 30 minutes 5.30am-8.00am towards city and 3.00pm-6.30pm towards Otāhuhu			-	-	Great South Road	Otāhuhu Station, Great South Road, Britomart
32	Frequent	15	15	15	15	15	Mount Wellington Highway	Māngere Town Centre, Otāhuhu Station, Otāhuhu Town Centre, Sylvia Park.
324	Local	Frequency and days of week vary					Princes Street East	Māngere Town Centre to Otāhuhu Station

Table 2: Future New Central Suburbs Bus Service Frequencies relevant to the Project

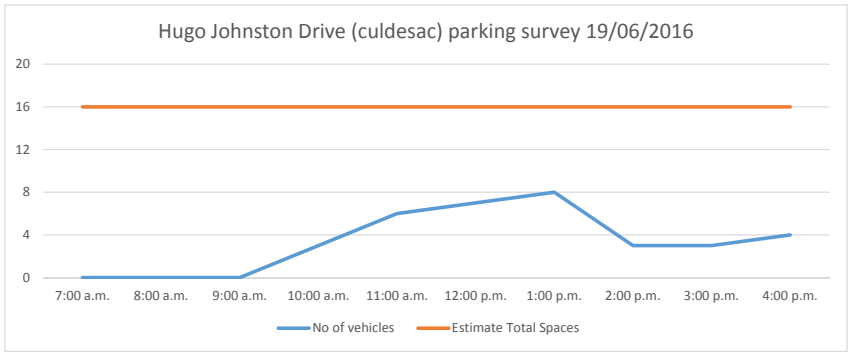
Services	Type of Service	Frequency (Weekday)			Frequency (Weekend)		Key Road in Relation to the Alignment	Description of Route
		Peak	Peak	All Day	All Day	Evening		
*309	Connector	30	30	30	30	30	SH20 / Onehunga Harbour Road/ Onehunga Mall	Māngere Town Centre, Favona, Māngere Bridge, Onehunga, Queenstown Road, Pah Road, City
*309X	Peak Period	30	30	-	30	-	SH20 (bypasses Onehunga Town Centre)	SH20 (bypasses Onehunga Town Centre) Māngere Town Centre, Favona, Māngere Bridge, Queenstown Road, Pah Road, City
723	Connector	15	15	30	30	30	Church Street/Great South Road/Sylvia Park Road/Mount Wellington Highway	Glen Innes to Onehunga via Tripoli Road and Sylvia Park
323	Connector	20	20	30	30	30	Great South Road/ Church Street	Otāhuhu Station to Sylvia Park via Panama Road
321	Connector	15	15	30	-	-	Great South Road	Middlemore to Britomart via Otāhuhu , Ellerslie Station and Hospitals
*32	Frequent	15	15	15	15	15	Mount Wellington Highway	Māngere Town Centre, Otāhuhu Station, Otāhuhu Town Centre, Sylvia Park.
Crosstown 8	Connector	15	15	30			Church Street / Great South Road	Stoddard Road Crosstown – New Lynn to Otāhuhu via Onehunga
Crosstown 7	Frequent	15	15	15	15	30	Mount Smart Road / Great South Road	Mount Albert Road Crosstown – Point Chevalier Beach to Sylvia Park
298	Local	Frequency and days of week vary					Great South Road	Onehunga to Sylvia Park via Ellerslie
30	Frequent	15	15	15	15	30	Onehunga Mall	Onehunga to City Centre via Manukau Road

Appendix B

Parking Surveys

Hugo Johnston Drive (culdesac) parking survey 19/06/2016

Date	Section	Time	No of vehicles	Estimate Total Spaces	%age occupied
19/06/2016	Hugo Johnston Drive culdesac	7:00 a.m.	0	16	0%
19/06/2016	Hugo Johnston Drive culdesac	8:00 a.m.	0	16	0%
19/06/2016	Hugo Johnston Drive culdesac	9:00 a.m.	0	16	0%
19/06/2016	Hugo Johnston Drive culdesac	10:00 a.m.	3	16	19%
19/06/2016	Hugo Johnston Drive culdesac	11:00 a.m.	6	16	38%
19/06/2016	Hugo Johnston Drive culdesac	12:00 p.m.	7	16	44%
19/06/2016	Hugo Johnston Drive culdesac	1:00 p.m.	8	16	50%
19/06/2016	Hugo Johnston Drive culdesac	2:00 p.m.	3	16	19%
19/06/2016	Hugo Johnston Drive culdesac	3:00 p.m.	3	16	19%
19/06/2016	Hugo Johnston Drive culdesac	4:00 p.m.	4	16	25%
				Average Occupancy	**21%**
				Average Peak occupancy	**39%**



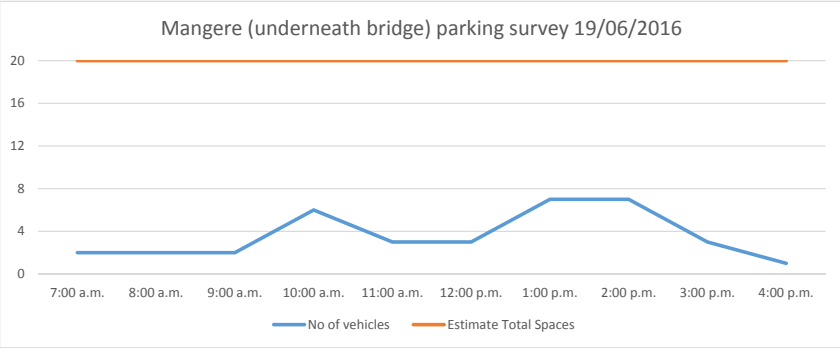
Observations:

A group of three vehicles turned up (3 families) with bikes on racks and went cycling, they left around three to four hours later

2 other groups (individual of each other) turned up with bikes on racks and went cycling for around two hours each

Mangere (underneath bridge) parking survey 19/06/2016

Date	Section	Time	No of vehicles	Estimate Total Spaces	%age occupied
19/06/2016	Mangere (underneath bridge)	7:00 a.m.	2	20	10%
19/06/2016	Mangere (underneath bridge)	8:00 a.m.	2	20	10%
19/06/2016	Mangere (underneath bridge)	9:00 a.m.	2	20	10%
19/06/2016	Mangere (underneath bridge)	10:00 a.m.	6	20	30%
19/06/2016	Mangere (underneath bridge)	11:00 a.m.	3	20	15%
19/06/2016	Mangere (underneath bridge)	12:00 p.m.	3	20	15%
19/06/2016	Mangere (underneath bridge)	1:00 p.m.	7	20	35%
19/06/2016	Mangere (underneath bridge)	2:00 p.m.	7	20	35%
19/06/2016	Mangere (underneath bridge)	3:00 p.m.	3	20	15%
19/06/2016	Mangere (underneath bridge)	4:00 p.m.	1	20	5%
			Average Occupancy		**18%**
			Average Peak occupancy		**29%**



Observations:

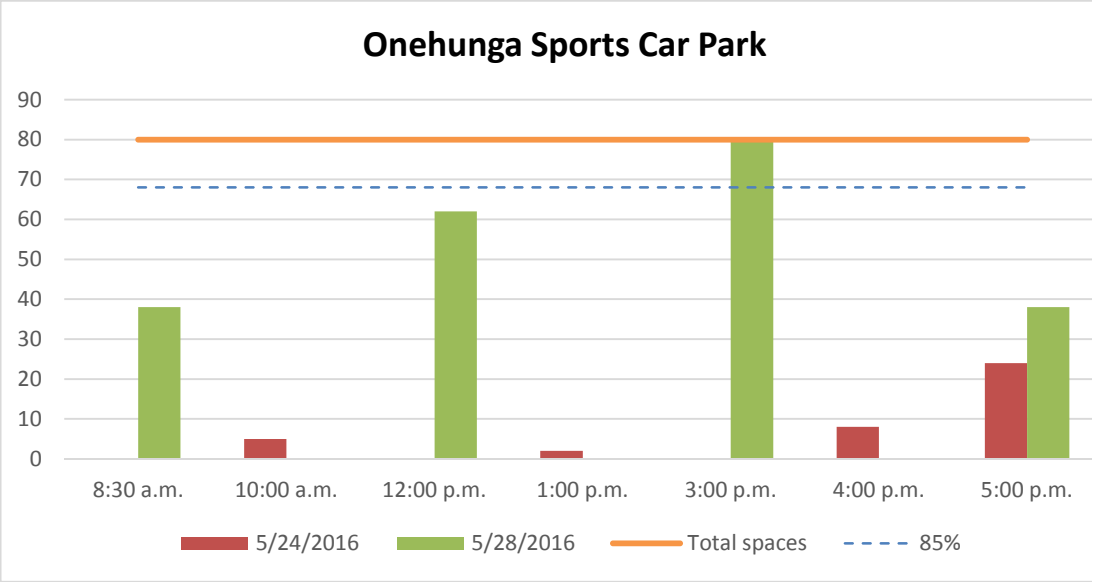
Snapshot parking survey

16-Aug-16

Sylvia Park Road				Galway Street			Onehunga Mall			Alfred Street			Fencible Place		
Time	North - On Street	South - On Street	South - Recessed	Time	East	West	Time	East	West	Time	East	West	Time	East	West
8:30	1t	0	10 (4c, 5c, 1t)	9:00	6c (+1 grass)	6c	9:15	0	0	9:30	14c	18c, 2t, 1s	11:00	2c	0
12:15	0	0	9 (4c, 5c, 0)	13:20	5c (+1 grass)	7c	13:30	4c	2c	12:30	10c	21c, 1t, 1s	-	-	-
16:40	0	0	(1c, 5c, 0)	16:15	5c (+1 grass)	3c	16:20	1c	1c	16:00	9c	21c, 2t, 1tr	-	-	-

Legend:	
c	car
t	truck
tr	trailer
s	sweeper

ALEPH

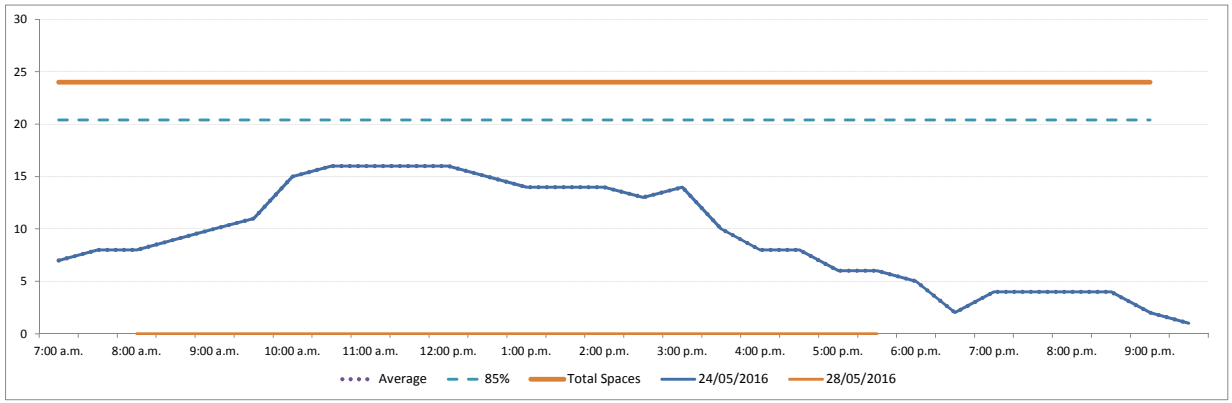


	24/05/2016			
	10:00 a.m.	1:00 p.m.	4:00 p.m.	7:00 p.m.
Total spaces	80	80	80	80
Occupied spaces	5	2	8	24
Available Spaces	75	78	72	56

	28/05/2016			
	8:30 a.m.	12:00 p.m.	3:00 p.m.	5:00 p.m.
Total spaces	80	80	80	80
Occupied spaces	38	62	80	38
Available Spaces	42	18	0	42

ALEPH

Captain Springs Road - Captain Springs Rd Parking Occupancy Survey May 2016



No of Parks	24		AO 7am to 12pm	48%
Average Occupancy	40%	10	AO 12pm to 3pm	60%
Average Peak Occupancy	67%	16	AO 3pm to 7pm	31%
			AO 7pm to 10pm	13%

	Tue 24th May	Sat 28th May
Average occupancy	39%	
Average peak occupancy	67%	
Approx length of stay	3 hr 36 min	
Approx t/over every hour	0.05	

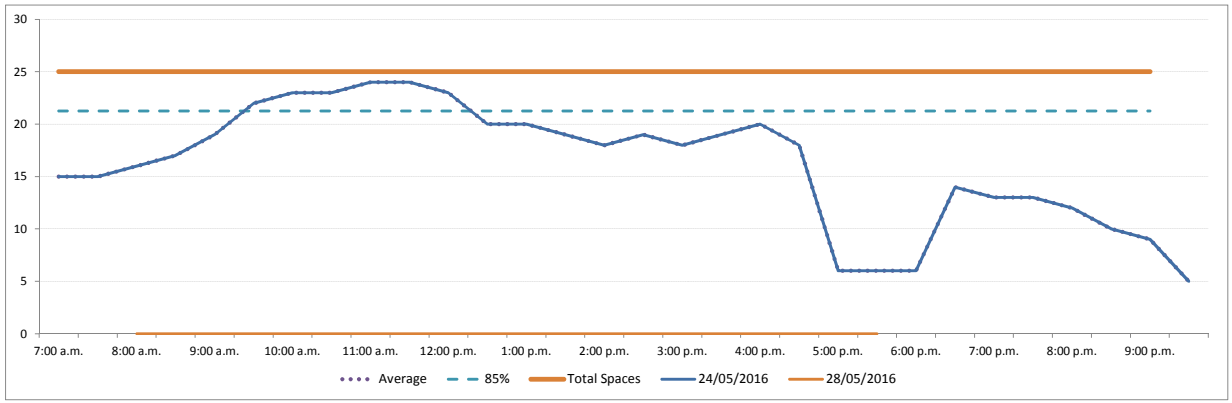
Length of Stay

0 to 30 mins	9	0
30 mins to 1hr	1	0
1 hr to 1hr 30 mins	4	0
1 hr 30 mins to 2 hrs	2	0
2 hrs to 2 hrs 30 mins	3	0
2 hrs 30 mins to 3 hrs	3	0
3 hrs to 3 hrs 30mins	2	0
3 hrs 30 mins to 4 hrs	1	0
4 hrs to 4 hrs 30 mins	0	0
4 hrs 30 mins to 5 hrs	0	0
5 hrs to 5 hrs 30 mins	0	0
5 hrs 30 mins to 6 hrs	0	0
6 hrs to 6 hrs 30 mins	0	0
6 hrs 30 mins to 7 hrs	0	0
7 hrs to 7 hrs 30 mins	0	0
7 hrs 30 mins to 8 hrs	3	0
8 hrs to 8 hrs 30 mins	3	0
8 hrs 30 mins to 9 hrs	2	0
9 hrs to 9 hrs 30 mins	1	0
9 hrs 30 mins to 10 hrs	2	0
10 hrs to 10 hrs 30 mins	0	
10 hrs 30 mins to 11 hrs	0	
11 hrs to 11 hrs 30 mins	0	
11 hrs 30 mins to 12 hrs	0	
Longer than 12 hours	0	

Approx average length of stay Tue 24th May	3 hr 36 min
Approx average length of stay Sat 28th May	

ALEPH

Captain Springs Road - Captain Springs Rd Parking Occupancy Survey May 2016



No of Parks	25		AO 7am to 12pm	79%
Average Occupancy	66%	17	AO 12pm to 3pm	79%
Average Peak Occupancy	94%	24	AO 3pm to 7pm	54%
			AO 7pm to 10pm	41%

	Tue 24th May	Sat 28th May
Average occupancy	65%	
Average peak occupancy	94%	
Approx length of stay	4 hr 0 min	
Approx t/over every hour	0.06	

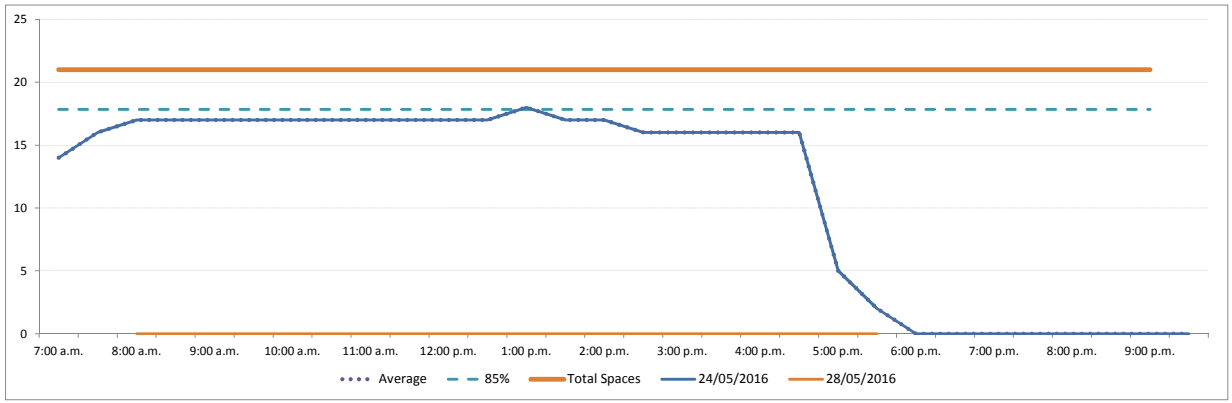
Length of Stay

0 to 30 mins	3	0
30 mins to 1hr	6	0
1 hr to 1hr 30 mins	2	0
1 hr 30 mins to 2 hrs	1	0
2 hrs to 2 hrs 30 mins	2	0
2 hrs 30 mins to 3 hrs	7	0
3 hrs to 3 hrs 30mins	7	0
3 hrs 30 mins to 4 hrs	1	0
4 hrs to 4 hrs 30 mins	1	0
4 hrs 30 mins to 5 hrs	4	0
5 hrs to 5 hrs 30 mins	0	0
5 hrs 30 mins to 6 hrs	1	0
6 hrs to 6 hrs 30 mins	1	0
6 hrs 30 mins to 7 hrs	0	0
7 hrs to 7 hrs 30 mins	0	0
7 hrs 30 mins to 8 hrs	0	0
8 hrs to 8 hrs 30 mins	0	0
8 hrs 30 mins to 9 hrs	1	0
9 hrs to 9 hrs 30 mins	1	0
9 hrs 30 mins to 10 hrs	6	0
10 hrs to 10 hrs 30 mins	1	
10 hrs 30 mins to 11 hrs	0	
11 hrs to 11 hrs 30 mins	0	
11 hrs 30 mins to 12 hrs	0	
Longer than 12 hours	0	

Approx average length of stay Tue 24th May	4 hr 0 min
Approx average length of stay Sat 28th May	

ALEPH

Captain Springs Road - Captain Springs Rd Parking Occupancy Survey May 2016



No of Parks	21		AO 7am to 12pm	79%
Average Occupancy	56%	12	AO 12pm to 3pm	81%
Average Peak Occupancy	82%	17	AO 3pm to 7pm	42%
			AO 7pm to 10pm	0%

	Tue 24th May	Sat 28th May
Average occupancy	54%	
Average peak occupancy	82%	
Approx length of stay	8 hr 6 min	
Approx t/over every hour	0.03	

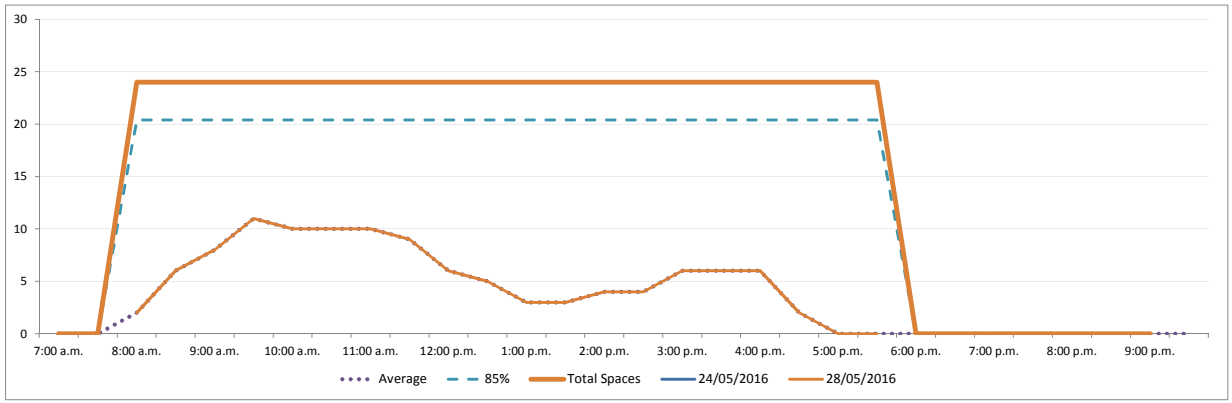
Length of Stay

0 to 30 mins	2	0
30 mins to 1hr	0	0
1 hr to 1hr 30 mins	0	0
1 hr 30 mins to 2 hrs	0	0
2 hrs to 2 hrs 30 mins	0	0
2 hrs 30 mins to 3 hrs	0	0
3 hrs to 3 hrs 30mins	0	0
3 hrs 30 mins to 4 hrs	0	0
4 hrs to 4 hrs 30 mins	2	0
4 hrs 30 mins to 5 hrs	0	0
5 hrs to 5 hrs 30 mins	0	0
5 hrs 30 mins to 6 hrs	0	0
6 hrs to 6 hrs 30 mins	0	0
6 hrs 30 mins to 7 hrs	0	0
7 hrs to 7 hrs 30 mins	1	0
7 hrs 30 mins to 8 hrs	0	0
8 hrs to 8 hrs 30 mins	0	0
8 hrs 30 mins to 9 hrs	0	0
9 hrs to 9 hrs 30 mins	1	0
9 hrs 30 mins to 10 hrs	9	0
10 hrs to 10 hrs 30 mins	3	
10 hrs 30 mins to 11 hrs	1	
11 hrs to 11 hrs 30 mins	0	
11 hrs 30 mins to 12 hrs	0	
Longer than 12 hours	0	

Approx average length of stay Tue 24th May	8 hr 6 min
Approx average length of stay Sat 28th May	

ALEPH

Captain Springs Road - Captain Springs Rd Parking Occupancy Survey May 2016



No of Parks	24		AO 7am to 12pm	34%
Average Occupancy	23%	6	AO 12pm to 3pm	17%
Average Peak Occupancy	43%	10	AO 3pm to 7pm	14%
			AO 7pm to 10pm	0%

	Tue 24th May	Sat 28th May
Average occupancy		23%
Average peak occupancy		43%
Approx length of stay		1 hr 42 min
Approx t/over every hour		0.06

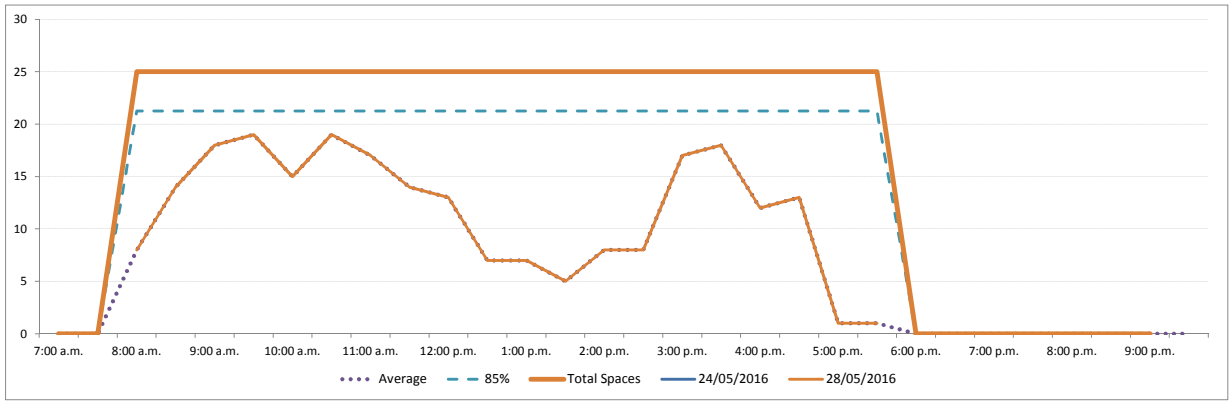
Length of Stay

0 to 30 mins	0	6
30 mins to 1hr	0	6
1 hr to 1hr 30 mins	0	3
1 hr 30 mins to 2 hrs	0	5
2 hrs to 2 hrs 30 mins	0	3
2 hrs 30 mins to 3 hrs	0	1
3 hrs to 3 hrs 30mins	0	1
3 hrs 30 mins to 4 hrs	0	0
4 hrs to 4 hrs 30 mins	0	0
4 hrs 30 mins to 5 hrs	0	0
5 hrs to 5 hrs 30 mins	0	0
5 hrs 30 mins to 6 hrs	0	3
6 hrs to 6 hrs 30 mins	0	0
6 hrs 30 mins to 7 hrs	0	0
7 hrs to 7 hrs 30 mins	0	0
7 hrs 30 mins to 8 hrs	0	0
8 hrs to 8 hrs 30 mins	0	0
8 hrs 30 mins to 9 hrs	0	0
9 hrs to 9 hrs 30 mins	0	0
9 hrs 30 mins to 10 hrs	0	0
10 hrs to 10 hrs 30 mins	0	
10 hrs 30 mins to 11 hrs	0	
11 hrs to 11 hrs 30 mins	0	
11 hrs 30 mins to 12 hrs	0	
Longer than 12 hours	0	

Approx average length of stay Tue 24th May	
Approx average length of stay Sat 28th May	1 hr 42 min

ALEPH

Captain Springs Road - Captain Springs Rd Parking Occupancy Survey May 2016



No of Parks	25		AO 7am to 12pm	62%
Average Occupancy	47%	12	AO 12pm to 3pm	32%
Average Peak Occupancy	74%	19	AO 3pm to 7pm	41%
			AO 7pm to 10pm	0%

	Tue 24th May	Sat 28th May
Average occupancy		47%
Average peak occupancy		74%
Approx length of stay		1 hr 48 min
Approx t/over every hour		0.12

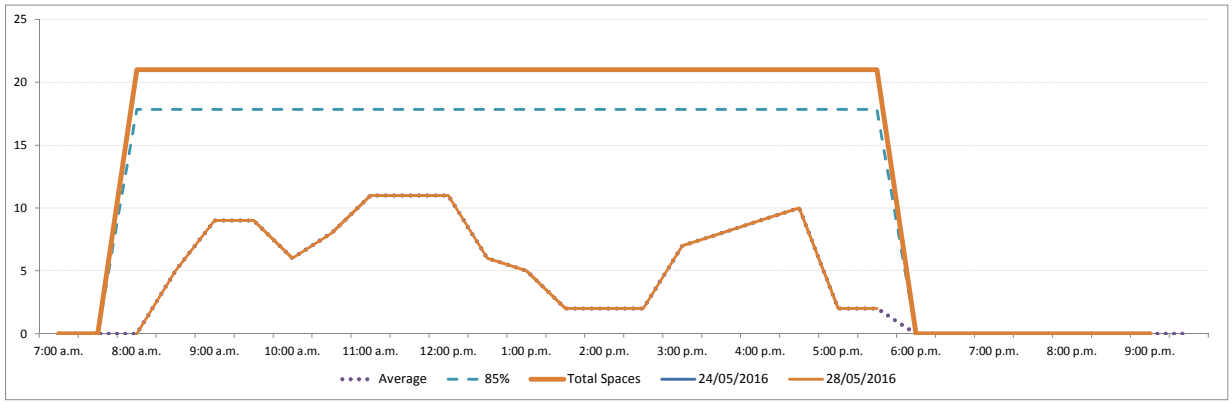
Length of Stay

0 to 30 mins	0	7
30 mins to 1hr	0	8
1 hr to 1hr 30 mins	0	12
1 hr 30 mins to 2 hrs	0	16
2 hrs to 2 hrs 30 mins	0	6
2 hrs 30 mins to 3 hrs	0	0
3 hrs to 3 hrs 30mins	0	0
3 hrs 30 mins to 4 hrs	0	0
4 hrs to 4 hrs 30 mins	0	1
4 hrs 30 mins to 5 hrs	0	2
5 hrs to 5 hrs 30 mins	0	1
5 hrs 30 mins to 6 hrs	0	1
6 hrs to 6 hrs 30 mins	0	1
6 hrs 30 mins to 7 hrs	0	1
7 hrs to 7 hrs 30 mins	0	0
7 hrs 30 mins to 8 hrs	0	0
8 hrs to 8 hrs 30 mins	0	0
8 hrs 30 mins to 9 hrs	0	0
9 hrs to 9 hrs 30 mins	0	0
9 hrs 30 mins to 10 hrs	0	0
10 hrs to 10 hrs 30 mins	0	
10 hrs 30 mins to 11 hrs	0	
11 hrs to 11 hrs 30 mins	0	
11 hrs 30 mins to 12 hrs	0	
Longer than 12 hours	0	

Approx average length of stay Tue 24th May	
Approx average length of stay Sat 28th May	1 hr 48 min

ALEPH

Captain Springs Road - Captain Springs Rd Parking Occupancy Survey May 2016



No of Parks	21		AO 7am to 12pm	35%
Average Occupancy	30%	6	AO 12pm to 3pm	22%
Average Peak Occupancy	51%	11	AO 3pm to 7pm	30%
			AO 7pm to 10pm	0%

	Tue 24th May	Sat 28th May
Average occupancy		30%
Average peak occupancy		51%
Approx length of stay		1 hr 36 min
Approx t/over every hour		0.08

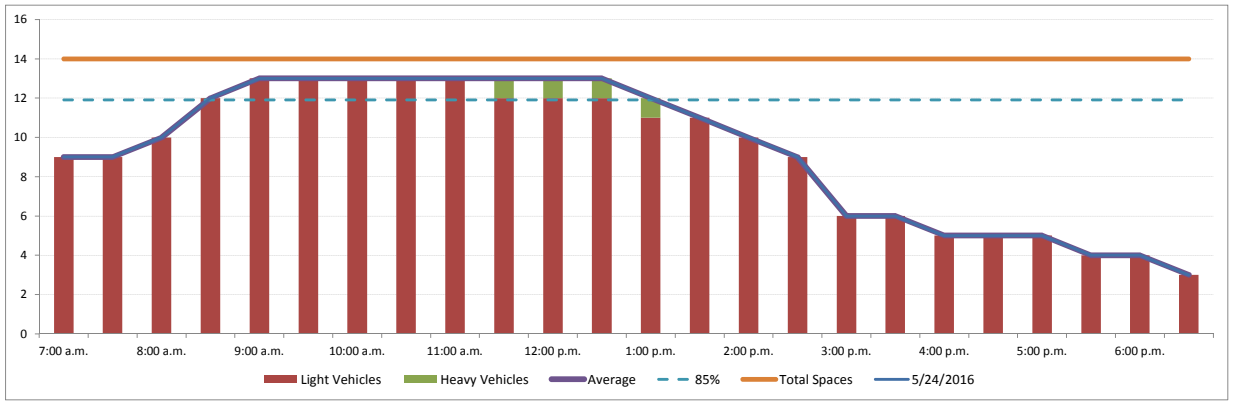
Length of Stay

0 to 30 mins	0	8
30 mins to 1hr	0	4
1 hr to 1hr 30 mins	0	4
1 hr 30 mins to 2 hrs	0	10
2 hrs to 2 hrs 30 mins	0	1
2 hrs 30 mins to 3 hrs	0	0
3 hrs to 3 hrs 30mins	0	0
3 hrs 30 mins to 4 hrs	0	3
4 hrs to 4 hrs 30 mins	0	2
4 hrs 30 mins to 5 hrs	0	1
5 hrs to 5 hrs 30 mins	0	0
5 hrs 30 mins to 6 hrs	0	0
6 hrs to 6 hrs 30 mins	0	0
6 hrs 30 mins to 7 hrs	0	0
7 hrs to 7 hrs 30 mins	0	0
7 hrs 30 mins to 8 hrs	0	0
8 hrs to 8 hrs 30 mins	0	0
8 hrs 30 mins to 9 hrs	0	0
9 hrs to 9 hrs 30 mins	0	0
9 hrs 30 mins to 10 hrs	0	0
10 hrs to 10 hrs 30 mins	0	
10 hrs 30 mins to 11 hrs	0	
11 hrs to 11 hrs 30 mins	0	
11 hrs 30 mins to 12 hrs	0	
Longer than 12 hours	0	

Approx average length of stay Tue 24th May	
Approx average length of stay Sat 28th May	1 hr 36 min

ALEPH

Hugo Johnston Drive - Hugo Johnston Dr Parking Occupancy Survey May 2016



No of Parks	14		AO 7am to 12pm	84%
Average Occupancy	67%	9	AO 12pm to 3pm	81%
Average Peak Occupancy	93%	13	AO 3pm to 7pm	34%

	Tue 24th May
Average occupancy	86%
Average peak occupancy	93%
Approx length of stay	7 hr 12 min
Approx t/over every hour	0.04

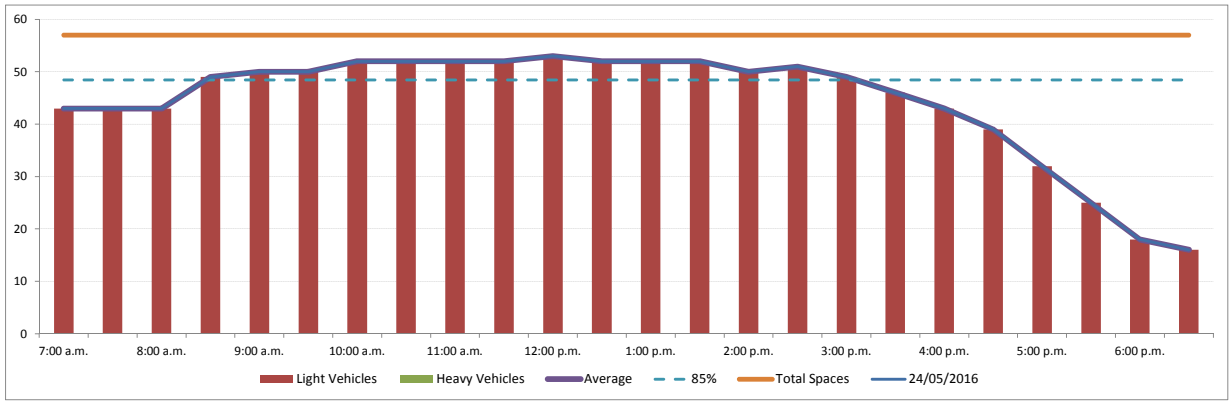
Length of Stay

0 to 30 mins	0
30 mins to 1hr	0
1 hr to 1hr 30 mins	0
1 hr 30 mins to 2 hrs	1
2 hrs to 2 hrs 30 mins	0
2 hrs 30 mins to 3 hrs	1
3 hrs to 3 hrs 30mins	0
3 hrs 30 mins to 4 hrs	1
4 hrs to 4 hrs 30 mins	0
4 hrs 30 mins to 5 hrs	0
5 hrs to 5 hrs 30 mins	1
5 hrs 30 mins to 6 hrs	1
6 hrs to 6 hrs 30 mins	0
6 hrs 30 mins to 7 hrs	1
7 hrs to 7 hrs 30 mins	1
7 hrs 30 mins to 8 hrs	4
8 hrs to 8 hrs 30 mins	0
8 hrs 30 mins to 9 hrs	1
9 hrs to 9 hrs 30 mins	0
9 hrs 30 mins to 10 hrs	0
10 hrs to 10 hrs 30 mins	0
10 hrs 30 mins to 11 hrs	0
11 hrs to 11 hrs 30 mins	0
11 hrs 30 mins to 12 hrs	3

Approx average length of stay Tue 24th May 7 hr 12 min

ALEPH

Hugo Johnston Drive - Hugo Johnston Dr Parking Occupancy Survey May 2016



No of Parks	57		AO 7am to 12pm	85%
Average Occupancy	78%	44	AO 12pm to 3pm	91%
Average Peak Occupancy	92%	52	AO 3pm to 7pm	59%

	Tue 24th May
Average occupancy	91%
Average peak occupancy	92%
Approx length of stay	7 hr 30 min
Approx t/over every hour	0.05

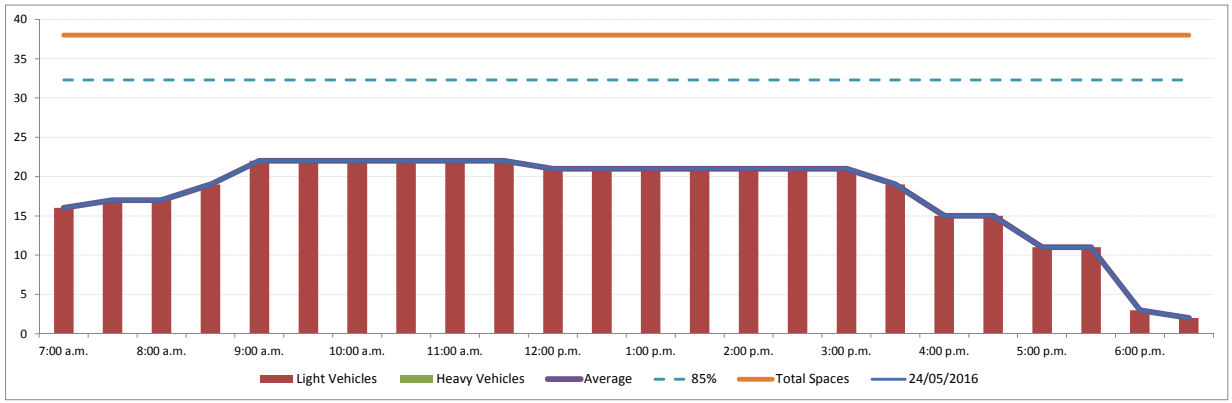
Length of Stay

0 to 30 mins	2
30 mins to 1hr	4
1 hr to 1hr 30 mins	0
1 hr 30 mins to 2 hrs	5
2 hrs to 2 hrs 30 mins	3
2 hrs 30 mins to 3 hrs	2
3 hrs to 3 hrs 30mins	0
3 hrs 30 mins to 4 hrs	1
4 hrs to 4 hrs 30 mins	3
4 hrs 30 mins to 5 hrs	1
5 hrs to 5 hrs 30 mins	1
5 hrs 30 mins to 6 hrs	2
6 hrs to 6 hrs 30 mins	0
6 hrs 30 mins to 7 hrs	0
7 hrs to 7 hrs 30 mins	0
7 hrs 30 mins to 8 hrs	6
8 hrs to 8 hrs 30 mins	4
8 hrs 30 mins to 9 hrs	3
9 hrs to 9 hrs 30 mins	0
9 hrs 30 mins to 10 hrs	7
10 hrs to 10 hrs 30 mins	4
10 hrs 30 mins to 11 hrs	8
11 hrs to 11 hrs 30 mins	3
11 hrs 30 mins to 12 hrs	10

Approx average length of stay Tue 24th May 7 hr 30 min

ALEPH

Hugo Johnston Drive - Hugo Johnston Dr Parking Occupancy Survey May 2016



No of Parks	38		AO 7am to 12pm	53%
Average Occupancy	46%	18	AO 12pm to 3pm	55%
Average Peak Occupancy	58%	22	AO 3pm to 7pm	32%

	Tue 24th May
Average occupancy	55%
Average peak occupancy	58%
Approx length of stay	8 hr 60 min
Approx t/over every hour	0.03

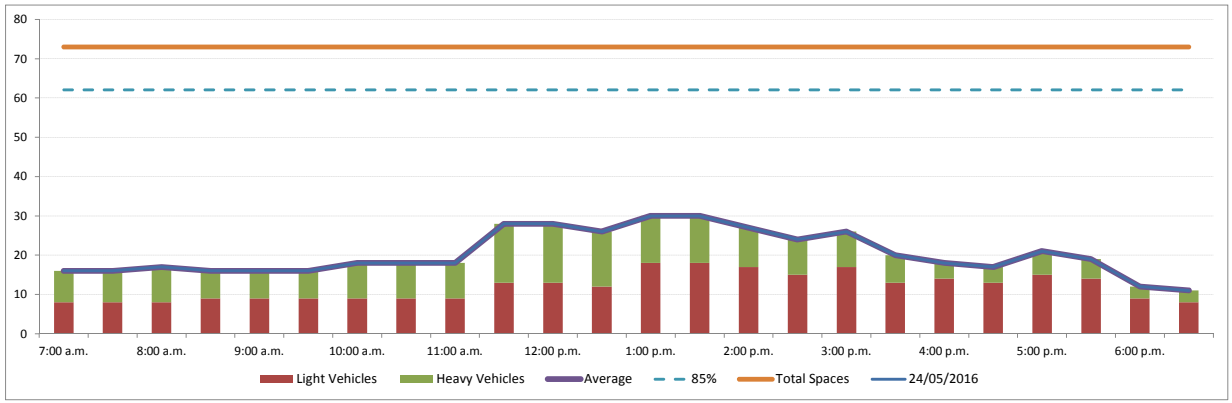
Length of Stay

0 to 30 mins	1
30 mins to 1hr	0
1 hr to 1hr 30 mins	0
1 hr 30 mins to 2 hrs	0
2 hrs to 2 hrs 30 mins	0
2 hrs 30 mins to 3 hrs	1
3 hrs to 3 hrs 30mins	0
3 hrs 30 mins to 4 hrs	0
4 hrs to 4 hrs 30 mins	0
4 hrs 30 mins to 5 hrs	0
5 hrs to 5 hrs 30 mins	0
5 hrs 30 mins to 6 hrs	0
6 hrs to 6 hrs 30 mins	0
6 hrs 30 mins to 7 hrs	1
7 hrs to 7 hrs 30 mins	1
7 hrs 30 mins to 8 hrs	1
8 hrs to 8 hrs 30 mins	1
8 hrs 30 mins to 9 hrs	4
9 hrs to 9 hrs 30 mins	2
9 hrs 30 mins to 10 hrs	1
10 hrs to 10 hrs 30 mins	0
10 hrs 30 mins to 11 hrs	7
11 hrs to 11 hrs 30 mins	1
11 hrs 30 mins to 12 hrs	2

Approx average length of stay Tue 24th May 8 hr 60 min

ALEPH

Hugo Johnston Drive - Hugo Johnston Dr Parking Occupancy Survey May 2016



No of Parks	73		AO 7am to 12pm	25%
Average Occupancy	28%	20	AO 12pm to 3pm	38%
Average Peak Occupancy	40%	29	AO 3pm to 7pm	25%

	Tue 24th May
Average occupancy	41%
Average peak occupancy	40%
Approx length of stay	4 hr 30 min
Approx t/over every hour	0.03

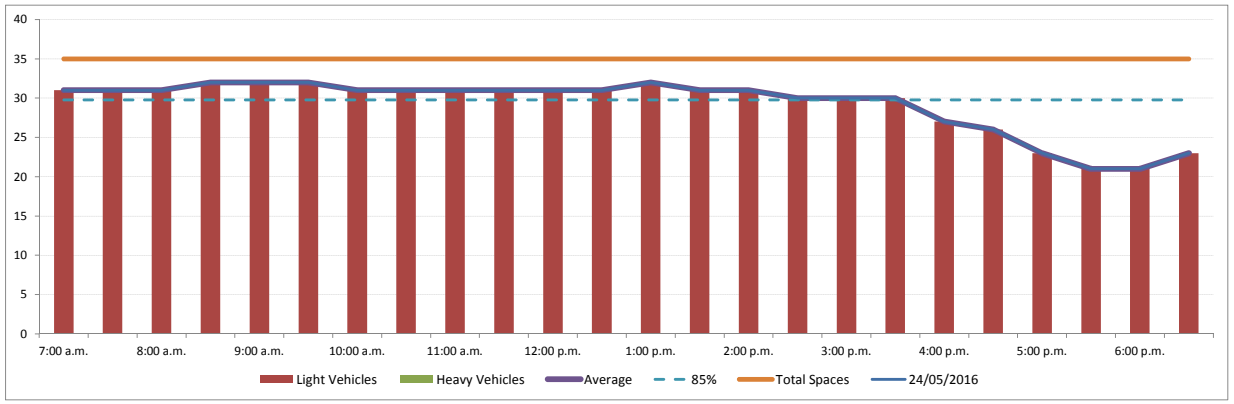
Length of Stay

0 to 30 mins	0
30 mins to 1hr	5
1 hr to 1hr 30 mins	10
1 hr 30 mins to 2 hrs	1
2 hrs to 2 hrs 30 mins	2
2 hrs 30 mins to 3 hrs	7
3 hrs to 3 hrs 30mins	2
3 hrs 30 mins to 4 hrs	0
4 hrs to 4 hrs 30 mins	1
4 hrs 30 mins to 5 hrs	3
5 hrs to 5 hrs 30 mins	0
5 hrs 30 mins to 6 hrs	0
6 hrs to 6 hrs 30 mins	0
6 hrs 30 mins to 7 hrs	0
7 hrs to 7 hrs 30 mins	2
7 hrs 30 mins to 8 hrs	1
8 hrs to 8 hrs 30 mins	1
8 hrs 30 mins to 9 hrs	0
9 hrs to 9 hrs 30 mins	1
9 hrs 30 mins to 10 hrs	3
10 hrs to 10 hrs 30 mins	1
10 hrs 30 mins to 11 hrs	1
11 hrs to 11 hrs 30 mins	2
11 hrs 30 mins to 12 hrs	2

Approx average length of stay Tue 24th May 4 hr 30 min

ALEPH

Autumn Place - Hugo Johnston Dr Parking Occupancy Survey May 2016



No of Parks	35		AO 7am to 12pm	89%
Average Occupancy	83%	29	AO 12pm to 3pm	89%
Average Peak Occupancy	91%	32	AO 3pm to 7pm	72%

	Tue 24th May
Average occupancy	91%
Average peak occupancy	91%
Approx length of stay	6 hr 24 min
Approx t/over every hour	0.06

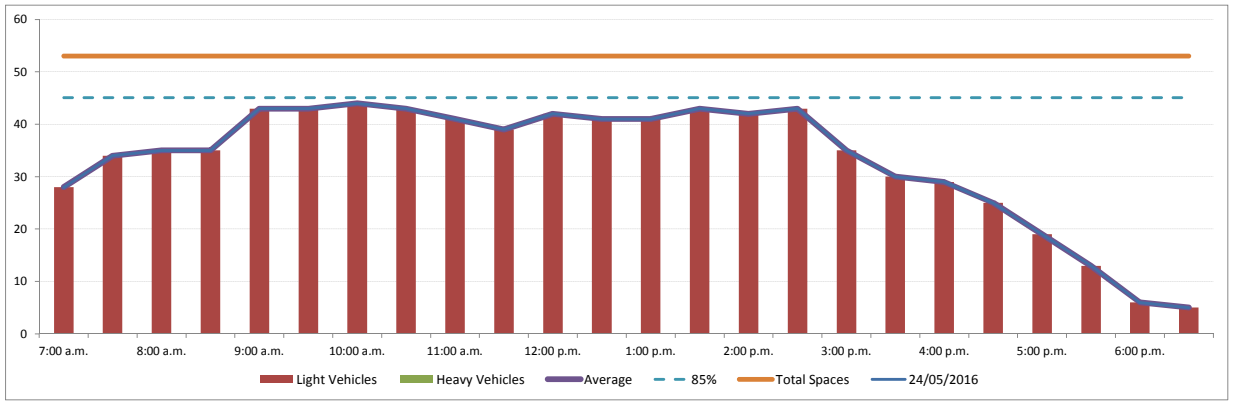
Length of Stay

0 to 30 mins	6
30 mins to 1hr	7
1 hr to 1hr 30 mins	1
1 hr 30 mins to 2 hrs	3
2 hrs to 2 hrs 30 mins	1
2 hrs 30 mins to 3 hrs	1
3 hrs to 3 hrs 30mins	1
3 hrs 30 mins to 4 hrs	2
4 hrs to 4 hrs 30 mins	0
4 hrs 30 mins to 5 hrs	0
5 hrs to 5 hrs 30 mins	0
5 hrs 30 mins to 6 hrs	1
6 hrs to 6 hrs 30 mins	1
6 hrs 30 mins to 7 hrs	0
7 hrs to 7 hrs 30 mins	2
7 hrs 30 mins to 8 hrs	0
8 hrs to 8 hrs 30 mins	0
8 hrs 30 mins to 9 hrs	3
9 hrs to 9 hrs 30 mins	2
9 hrs 30 mins to 10 hrs	3
10 hrs to 10 hrs 30 mins	2
10 hrs 30 mins to 11 hrs	0
11 hrs to 11 hrs 30 mins	2
11 hrs 30 mins to 12 hrs	13

Approx average length of stay Tue 24th May 6 hr 24 min

ALEPH

Southpark Place - Hugo Johnston Dr Parking Occupancy Survey May 2016



No of Parks	53		AO 7am to 12pm	73%
Average Occupancy	63%	33	AO 12pm to 3pm	79%
Average Peak Occupancy	82%	43	AO 3pm to 7pm	38%

	Tue 24th May
Average occupancy	77%
Average peak occupancy	82%
Approx length of stay	6 hr 0 min
Approx t/over every hour	0.05

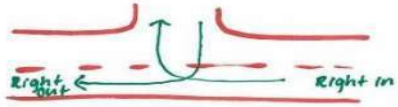
Length of Stay

0 to 30 mins	4
30 mins to 1hr	3
1 hr to 1hr 30 mins	4
1 hr 30 mins to 2 hrs	1
2 hrs to 2 hrs 30 mins	2
2 hrs 30 mins to 3 hrs	1
3 hrs to 3 hrs 30mins	1
3 hrs 30 mins to 4 hrs	1
4 hrs to 4 hrs 30 mins	3
4 hrs 30 mins to 5 hrs	1
5 hrs to 5 hrs 30 mins	2
5 hrs 30 mins to 6 hrs	2
6 hrs to 6 hrs 30 mins	4
6 hrs 30 mins to 7 hrs	1
7 hrs to 7 hrs 30 mins	6
7 hrs 30 mins to 8 hrs	7
8 hrs to 8 hrs 30 mins	2
8 hrs 30 mins to 9 hrs	3
9 hrs to 9 hrs 30 mins	7
9 hrs 30 mins to 10 hrs	6
10 hrs to 10 hrs 30 mins	2
10 hrs 30 mins to 11 hrs	0
11 hrs to 11 hrs 30 mins	0
11 hrs 30 mins to 12 hrs	0

Approx average length of stay Tue 24th May 6 hr 0 min

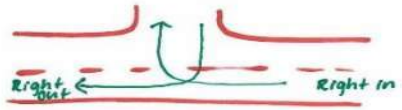
Snapshot Survey Tuesday 18th October 2016
20 Sylvia Park Road, Good weather conditions

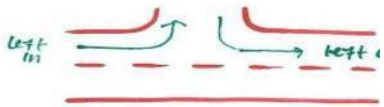
20 Sylvia Park Road													
Time Start	Time End	Driveway One				Driveway Two				Driveway Three			
		IN		OUT		IN		OUT		IN		OUT	
		Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
0800	0815	6	2	2	2	1	3	4	2	0	5	1	0
0815	0830	0	0	1	2	1	2	1	0	0	3	3	0
0830	0845	3	5	1	0	0	3	1	0	2	1	0	0
0845	0900	5	1	1	2	1	1	0	1	0	2	2	0
0900	0915	1	0	1	3	3	3	2	2	1	5	3	0
0915	0930	3	0	2	1	2	2	2	0	1	4	3	0
0930	0945	5	1	1	2	1	7	4	4	1	1	3	1
0945	1000	4	0	4	2	0	0	8	1	0	2	0	0
1200	1215	3	0	2	2	1	5	5	6	1	7	7	1
1215	1230	4	1	6	4	1	2	2	2	1	5	2	1
1230	1245	9	0	2	3	2	3	1	5	0	2	3	0
1245	1300	6	0	1	2	0	2	3	5	0	6	4	0
1500	1515	4	1	0	2	0	3	3	0	0	5	2	1
1515	1530	2	2	1	3	0	2	2	2	0	1	1	0
1530	1545	1	0	2	1	1	0	2	0	0	0	1	1



Snapshot Survey Tuesday 18th October 2016
8 Sylvia Park Road, Good weather conditions

8 Sylvia Park Road																	
Time Start	Time End	Driveway Four				Driveway Five				Driveway Six				Driveway Seven			
		IN		OUT		IN		OUT		IN		OUT		IN		OUT	
		Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
1300	1315	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
1315	1330	3	1	0	0	0	0	0	4	0	1	0	0	2	0	0	0
1330	1345	0	1	1	1	0	0	0	0	0	0	0	1	1	0	0	1
1345	1400	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
1600	1615	0	0	1	4	0	0	2	0	0	0	0	0	0	0	0	2
1615	1630	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1
1630	1645	2	0	4	0	0	0	2	0	0	1	0	0	0	0	0	3
1645	1700	0	0	0	2	0	0	0	0	0	0	0	2	3	0	0	2
1700	1715	0	0	9	2	0	0	9	0	0	0	0	0	0	1	0	2
1715	1730	1	0	1	2	0	0	1	1	0	1	1	0	0	0	0	0
1730	1745	1	0	0	0	0	0	0	0	0	1	0	1	0	2	0	1
1745	1800	1	0	1	2	0	0	3	0	0	1	0	0	0	0	0	1





Appendix C

Pedestrian and Cycle Usage

Estimate of Usage

Method of Estimation

Estimating likely usage of the proposed walking and cycling infrastructure as part of this Project is challenging as:

Walking and Cycling is highly variable, being sensitive to seasonal and weather conditions.

- Many people who currently would be dissuaded from walking and cycling in the area due to the sporadic provision of infrastructure for these modes may be attracted once more destinations are reachable by foot and bike;
- There is a lack of data on pedestrian usage of infrastructure after shared paths are complete so estimates are particularly difficult to make.
- Predicting pedestrian and cycle usage is very unreliable due to the many and varies behaviour for using such modes.

Given the above issues, the method for estimating future usage of the proposed walking and cycling infrastructure has involved the following:

- Starting with current day data on usage estimating the potential growth in usage without the Project
- Looking at comparable cycling infrastructure in Auckland (using Auckland Transport's Monthly Cycle Monitoring Report) to identify potential growth rates that could apply to the enhanced facility
- Applying these growth rates to the Without Project forecast from 2023 (potential project opening day) to get 5-year post-opening usage estimates
- The resulting flows were benchmarked against other locations in Auckland.

This exercise has only been completed for the main Waikaraka Cycleway.

Current Usage

Recent (winter) counts indicate some 190 cyclists on weekend and 55 on a weekday. 20% was added to the weekend data and 15% to weekdays to estimate seasonal averages. The weekday and weekend data was combined into an Annual Average flow (AADT), assuming 120 weekend days and 245 weekdays per year. This gave an estimated AADT of 117 cyclists, which is close to the 111 counted by Auckland Transport in 2015

Estimated Growth without Project

Simple assumptions of 10% growth per annum was used to estimate future usage without the Project. This growth is expected to be driven only by population growth and the general enhanced promotion and investment in cycling across the region.

Estimated Growth with the Project

For the purposes of forecasting the cycle growth in the future, previous similar cycleway projects were selected to compare their annual daily and monthly data. The selected cycling projects have similar infrastructure characteristics (shared path and/or separated facility) and have sufficient data for analysis.

Table 10-1 presents cycleway projects that have similar cycling infrastructure to the Project and have reliable data for analysis:

Table 10-1: Auckland Cycleway Projects used for estimating growth

Project	Daily Annual Data Period[15]	Monthly Data Period[16]
Beach Road shared path	Not Available	2014 to 2015
Grafton Gully shared path	Not Available	2014 to 2015
NW Cycleway (St Lukes)	2007 to 2015	Not available
NW Cycleway (Kingsland)	2007 to 2015	2010 to 2015
Waikaraka Cycleway	2008 to 2015	2010 to 2015
Tamaki Drive shared path	Not available	2012 to 2015
Upper Harbour Drive shared path	2007 to 2015	2010 to 2015

Two data sources are available from Auckland Transport's website – The annual daily data and the monthly daily data. Both sets of data were analysed for its reliability to predict estimated growth of cyclist in future years for the EWL.

The Auckland Transport Annual Cycle Monitoring Report (annual daily data) generates cyclist movements annually for each site from carrying out the data capture on the same day of each year and multiplying a factor to each annual number. The Monthly Cycle Monitoring data provides monthly movements for each site by capturing data consistently daily and sum it up. As a result, the data available for the annual monthly data is 'actual' cycle counts and are not dependent on factoring or other factors.

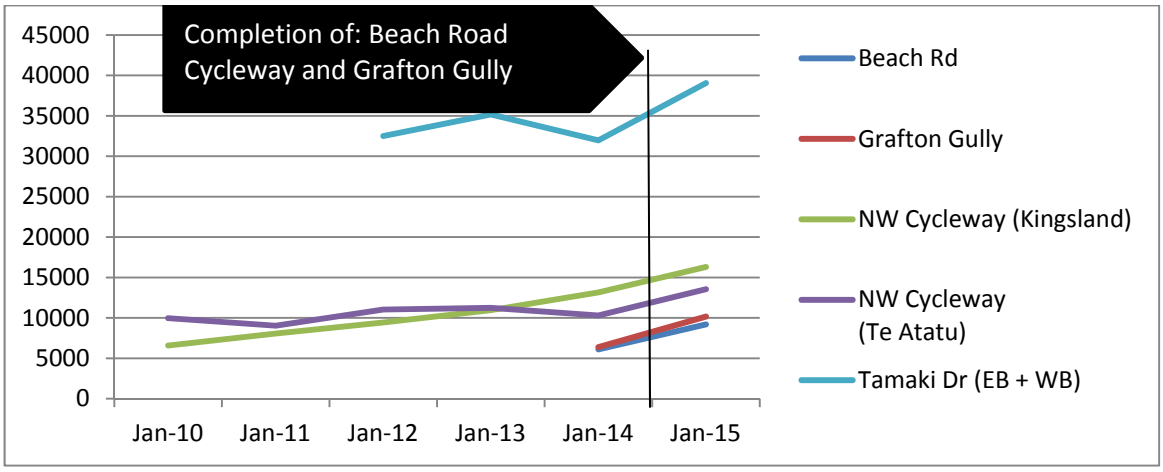
For the annual daily data, given its methodology, the cycling numbers are inconsistent, which could be due to a number of factors such as weather, seasonal affects, school holidays etc. This unpredictability is not an accurate representation of growth in cycle numbers and is considered inappropriate to use for growth prediction. The findings revealed that percentage increase for each year for a site could range from -44% to 292%. Due to the unpredictability of such data, the Monthly Cycle Monitoring data is deemed more reliable in predicting growth as the data captures 'actual' cycling numbers.

Figure 10-1 below shows the annual monthly cycle counts for the sites that have readily available data for comparison.

[15] Data from the Auckland Regional Cycling Monitor Report, from https://at.govt.nz/cycling-walking/cycling-walking-monitoring/annual-cycle-monitoring-report/

[16] Data from AT's Monthly Cycle Monitoring Report, from https://at.govt.nz/cycling-walking/cycling-walking-monitoring/monthly-cycle-monitoring-report/

Figure 10-1: Annual monthly cycle counts, Comparable Auckland Cycleway Projects



It is considered inappropriate to use a whole year's data to predict cycle growth given cycling numbers vary considerably at different times of the year. For example, including data from the winter months will likely to bring down the actual growth given cycling is desired at wetter months. As a result, only the summer months (November, December and January) were selected to predict the cycle growth for the EWL. It is assumed that cycle numbers during these three months are likely to be the most consistent given they have longer daylight hours and are least sensitive to wet weather.

Three sites (Beach Road shared path, Grafton Gully shared path and the Tamaki Drive shared path) were removed from the analysis because there is not enough data available to work out determine the correlation.

Table 10-2 summarises the average change in the number of cyclists (as a percentage) for the remaining three sites: NW Cycleway (Kingsland), NW Cycleway (Te Atatu) and Upper Harbour Cycleway.

Table 10-2: Annual cyclist growth for the summer months (Nov to Jan)

Month	NW Cycleway (Kingsland)	NW Cycleway (Te Atatu)	Upper Harbour Cycleway	Average percentage increases for each year
2010 to 2011	26%	-5%	19%	13%
2011 to 2012	20%	11%	21%	21%
2012 to 2013	16%	5%	10%	10%
2013 to 2014	10%	-11%	-1%	-1%
2014 to 2015	21%	21%	16%	16%
Average growth of the summer months for the three sites				12%

The data reveals that the average percentage growth ranges from -1% to 21%, with a 12% average expected growth.

From the results and analysis, low, medium and high growth rates were assumed to estimate extra growth as a result of the Project.

Weekends:

- Low growth: 10%
- Medium growth: 15%
- High growth: 20%

Weekdays:

- Low growth: 20%
- Medium growth: 25%
- High growth: 30%

The weekday growth was assumed to be very high as this would relate to commuter travel, and the Project provides substantially increased connectivity to the east. The growth for the weekends was more modest, as this is already a popular recreational route, so the enhanced facilities would have lower relative improvement.

Appendix D

Crash History

Section 1: Neilson Street (between SH20 Off-Ramp and Church St)

The section of Neilson Street investigated extends from the SH20 off-ramp to the Church Street intersection. There were 174 reported crashes during the study period from 2011 to 2015. Of these, one was a fatal crash, five were serious and 168 were minor and non-injury crashes. This resulted in a five-year crash total of seven injury crashes.

Table 1 shows the proportion of injury and non-injury crashes and their severity between 2011 and 2015 along Neilson Street. It shows that the most common movement types involving Fatal Serious Injury (FSI) and non-injury crashes were rear end/obstruction (30%), overtaking (29%) and crossing/turning (25%) respectively. The high percentage of rear end crashes may be due to high congestions levels at peak periods. The high occurrence of overtaking crashes may be attributable due to the majority of Neilson Street being a two lane dual carriageway in both directions with a relatively straight alignment, which may encourage speeding. Injury and non-injury crashes were spread relatively evenly along the route, however there were slightly more crashes occurring within a 50m radius of intersections along Neilson Street.

Table 10-3: Crash History along Neilson Street including areas within 50m radius of all intersections (2011-2015)

	Movement category	2011	2012	2013	2014	2015	Total
Fatal	Bend-lost control/Head on	-	1	-	-	-	1
Serious	Bend-lost control/Head on	-	-	1	1	-	2
	Crossing/Turning	-	-	-	1	1	2
	Rear end/obstruction	1	-	-	-	-	1
Minor	Bend-lost control/Head on	2	-	-	-	-	2
	Crossing/Turning	4	4	3	3	1	15
	Overtaking	-	-	-	4	1	5
	Pedestrian vs Vehicle	-	1	-	-	-	1
	Rear end/obstruction	1	-	1	2	1	5
	Straight-loss of control/Head on	-	-	-	-	1	1
Non-injury	Bend-lost control/Head on	-	4	3	2	4	13
	Crossing/Turning	6	8	2	7	4	27
	Overtaking	9	8	5	15	9	46
	Rear end/obstruction	7	9	14	10	8	48
	Straight-loss of control/Head on	-	1	-	-	4	5
Total Injury		**1**	**1**	**1**	**2**	**2**	**-**
Total Injury and Non-injury		**30**	**36**	**29**	**45**	**34**	**174**
Five-Year Total Injury Crashes		**7**					

The crash data shows that 28% of the reported injury and non-injury crashes in the five year period between 2011 and 2015 occurred during wet conditions. These included 1 fatal, 1 serious and 12 minor crashes. The data does not suggest an increase in severity due to wet conditions.

The crash data shows that 24% of the reported injury and non-injury crashes in the five year period between 2011 and 2015 occurred during dark or twilight conditions. These included one fatal, two serious and eight minor crashes. The data does not suggest an increase in severity due to dark conditions.

It is important to note the truck/bus related crashes due to the highly industrial and commercial land use of the area. For the study period between 2011 and 2015, 69 crashes involved trucks or buses which represents 40% of the total crashes along Neilson Street. Of these, only two were minor crashes and no fatal or serious injury crashes were reported.

1 cyclist serious injury crash where the car failed to give way to a turning cyclist and 1 fatal cyclist crash the other due to an opened car door in path of the cyclist.

No pedestrian related crashes were reported injury and non-injury crashes during the study period 2011 to 2015.

Section 2: Church Street between Neilson Street and Great South Road

The section of Church Road investigated extends from Neilson Street to Great South Road. There were 82 reported injury and non-injury crashes during the study period 2011 to 2015. Of these 1 was a serious crash, 17 were minor crashes and 64 were non-injury crashes. No fatal crashes were reported within the study period. This resulted in a five year crash total of 18 injury crashes.

The most common types (involving FSI and non-injury crashes) were rear end/obstruction (38%), overtaking (21%), and crossing/turning (24%).

The crash data shows that 17% of the reported injury and non-injury crashes in the five year period between 2011 and 2015 occurred during wet conditions. The number of wet crashes were reasonably consistent with an average of three wet crashes per year over the study period. The crash data shows 24% of the reported injury and non-injury crashes in the five year period between 2011 and 2015 occurred during dark or twilight conditions. The data suggests a slight increase in dark crashes in 2015 (8 crashes) while the previous years had an average of three crashes per year. This suggests that wet and dark conditions are not a significant factor for causing crashes.

For the study period between 2011 and 2015, 27 crashes involved trucks or buses which represents 32% of the total crashes along Church Street. However, the majority of these were non-injury crashes with only one serious truck related crash in 2014 and five minor injury crashes that occurred in 2015.

For the study period between 2011 and 2015, one cyclist related non-injury crash occurred in 2011. The crash occurred when a truck attempted to overtake a cyclist which the driver didn't see due to the mirror blind spot. The weather was dry, bright and fine so these factors were unlikely to have contributed to the crash.

Section 3: Great South Road (between Church Street and Sylvia Park Road)

The section of Great South Road that extends from Church Street to Sylvia Park Road has 65 reported injury and non-injury crashes during the study period 2011 to 2015. Of these one was a serious crash, 13 were minor crashes and 51 were non-injury crashes. No fatal crashes were reported within the study period. This resulted in a five year crash total of 14 injury crashes.

The most common types involving FSI and non-injury crashes were rear end/obstruction (35%), crossing/turning (35%) and overtaking (20%). These crashes are mainly due to lack of driver attentiveness, which is characteristic of traffic congestion.

The crash data shows that 29% of the reported injury and non-injury crashes in the five year period between 2011 and 2015 occurred during wet conditions. The crash data shows 26% of the reported injury and non-injury crashes in the five year period between 2011 and 2015 occurred during dark or twilight conditions. This suggests that wet and dark conditions are not a significant factor for causing crashes.

For the study period between 2011 and 2015, no reported crashes involved trucks or buses. Three crashes involved cyclist/motorcyclists, where two of these were minor injury crashes and the other was a serious crash.

No pedestrian related crashes were reported during the study period.

Section 4: Princes Street and Frank Grey Place (SH1 south and north ramp intersections)

The three intersections investigated in this section include the SH1 northbound off-ramp and Princes Street, SH1 southbound off-ramp with Frank Grey Place, and SH1 southbound on-ramp and Frank Grey Place. 10 crashes were reported in this section of the study area between the study period 2011 and 2015. Majority of these crashes occurred due to rear end/obstruction movements (60%) which is characteristic in high traffic congestion. This resulted in a five year crash total of one injury crashes.

The Princes Street and SH1 northbound off-ramp intersection reported one minor injury crashes resulting from crossing/turning movements. The SH1 southbound on-ramp and Frank Grey Place intersection reported no fatal, serious or minor injury crashes, however two non-injury crashes were reported at this intersection between the study period 2011 and 2015. The SH1 southbound off-ramp and Frank Grey Place intersection had 1 non-injury crashes due to crossing/turning movement. Two truck related crashes (20%) were reported at the SH1 southbound on-ramp and Frank Grey Place intersection.

One non-injury crash was reported to have occurred during wet conditions at the Princes Street and SH1 northbound on-ramp intersection during study period between 2011 and 2015 and another at the Frank grey Place intersection. Three non-injury crash was reported to have occurred in dark conditions during the study period. From this data, dark and wet conditions are not a significant cause of crashes at all the three SH1 intersections identified for this study.

No pedestrian or cyclist related crashes were reported during the study period at any of the identified intersections.

Section 5: Panama Road (Hillside Road and McLennan Road intersections only)

The section investigated includes the intersections of Panama Road with Hillside Road and McLennan Road. 11 injury and non-injury crashes were reported during the study period 2011 to 2015. Of these, four were minor crashes which all occurred at the McLennan intersection and seven were non-injury crashes evenly distributed between the Hillside and McLennan intersections. No fatal or serious crashes were reported within the study period. This resulted in a five-year crash total of four injury crashes.

The most common movement types involving FSI and non-injury crashes were crossing/turning (55%) and rear end/obstruction (27%) respectively. These crashes were due to a variety of factors including drivers travelling the wrong way, failure to give way, illness and alcohol consumption.

No truck related crashes were reported at either of the Panama Road (Hillside Road and McLennan Road) intersections between 2011 and 2015.

No crashes occurred during wet or dark conditions at Panama Road – Hillside Road intersection between 2011 and 2015. However, two non-injury crashes were reported to have occurred in wet conditions at the Panama Road and McLennan Road intersection. Of these two wet related crashes one also occurred in dark conditions. From this data, dry and wet conditions are not a significant cause of crashes at both Panama Road (Hillside Road and McLennan Road) intersections.

No pedestrian or cyclist related crashes were reported during the study period at any of the identified intersections.