

Memorandum

To:	Auckland Council
From:	Supporting Growth
Date:	3 March 2023
CC:	
Subject:	Section 92: Request for further information (Transport Matters)
File/Ref No:	

The following transport planning information has been provided in response to requests for further information from Auckland Council's transport specialists. In particular more information has been requested in regard to following matters.

Strategic Package 078021

- Further information in relation to the network performance under a do minimum/do nothing scenario, i.e. the growth occurs without the proposed Notices of Requirement (NORs)/Projects in place
- Further information on the assessment against Auckland Unitary Plan (AUP) Policies – E27.2(3)(4)(5)(6)
- Further information in relation to the inter-dependencies of the NORs
- Further information in relation to staging and timing of construction.

Local Package

- Further information in relation to the network performance under a do minimum/do nothing scenario, i.e. the growth occurs without the proposed NORs/Projects in place
- Further information in relation to the inter-dependencies of the NORs.

HIF Package

- Further information in relation to the inter-dependencies of the NORs
- Further information on the interdependence between the four separate Redhills NORs
- Further information to understand the corridors in isolation.

This memorandum

covers these matters for the Assessments of Transport Effects for the NOR packages for North West Whenuapai Arterials, North West Redhills Riverhead Arterials, HIF Trig Road and HIF Redhills Arterials, and North West Strategic.

The matter of reasonable necessity was raised as part of the request for further information. Whether the designation is reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought has been addressed in the Assessment of Environmental Effects (AEE), accompanying each of the NOR packages, as required under Section 171(1)(c) of the Resource Management Act (RMA).

1 Overview

The approach to the North West NOR packages is founded on the development of an integrated network outcome that supports the full implementation of planned growth, as identified in the Auckland Unitary Plan and Future Urban Land Supply Strategy (FULSS). The subsequent transport infrastructure required to support this growth in a manner consistent with current policy direction has been identified and does this by nature of considering an integrated network, result in various inter-relationships and inter-dependencies.

The assessment of transport effects has been undertaken on a whole of network approach, and where available and appropriate, a quantified assessment of effects and interdependencies by corridor has been provided. This network approach has been undertaken within the context that the implementation of each project within the NoRs will be subject to future implementation analysis and decisions, including design and consenting. It is not considered practical, nor necessary to consider every possible combination of land use and project sequencing for this AEE, given the proposed use of future management plans, as discussed below.

There are both inter-dependencies and uncertainty in terms of delivery and staging of both the land use release and associated infrastructure, over the proposed lapse dates for the NOR packages. Therefore, by necessity there is a reliance on management plans to enable Projects to be provided in a manner that will be integrated with the surrounding transport network and land use present at the time of implementation. The key management plan proposed to support this is the Urban Design and Landscape Management Plan (Condition 10). The condition related to this plan is provided at the end of this memo.

This is supported by a statutory requirement both Auckland Transport and Waka Kotahi NZ Transport Agency (Waka Kotahi) have to contribute to *an effective, efficient, and safe (Auckland) land transport system in the public interest*.¹ This requirement will extend to the integration of the identified NORs/Projects with the surrounding transport network in the future environment context.

As such, whilst recognising there is uncertainty / risk with the long-term timeframe for some of the NORs / Projects, it is considered that the proposed conditions, statutory requirements and other internal processes (such as a future Implementation Business Case) that apply to Auckland Transport and Waka Kotahi will support the integration with the wider network and will manage the potential range of effects that have been identified in the assessments.

In addition to this, it is also noted that the designs currently used to inform the designation footprints are an indicative design, that can be further developed (within the context of the NoR Purpose and Conditions) in the future prior to implementation to enable the Projects to be integrated with the surrounding road network. This approach is also managed by the proposed Urban Design and Landscape Management Plan (Condition 10).

The use of this condition enables Auckland Transport and Waka Kotahi to respond to the land use and transport environment at the time of implementation and alter the design accordingly. This may also include changes that result from further work prior to implementation such as detailed design,

¹ <https://www.legislation.govt.nz/act/public/2003/0118/latest/DLM226236.html> and <https://www.legislation.govt.nz/act/public/2009/0032/latest/DLM2322355.html>

resource consent assessments, safety audits, and the exact operating strategy for the corridor (i.e. the need to provide prioritisation for certain modes, such as bus services).

Notwithstanding the above, further consideration has been provided on the inter-relationships between Projects in this memo, as requested. This primarily reiterates and supplements information already provided within the Assessments of Transport Effects for each of the NOR packages.

2 Existing Crash Records

Further information was requested on the existing crash environment within the North West growth area. This has been provided on a per corridor basis below. It is critical to note that while this information has been provided, it is considered that it provides little value within a future urban context due to:

- An objective of each of the NoRs is to support a safe transport network for all users. This is reflected in the interim design with proposed designation footprint sufficient to deliver this.
- The context of the surrounding land use in these areas. In particular the North West growth area for the five years assessed has been a mix of rural, transitioning rural to urban and urban. Accordingly, the roading network reflects these changes, with some roads changing from urban to rural within the time period, and others predicted to change in the future
- Speed limit bylaw changes. Several key corridors have been subject to speed reductions as part of rolling safety initiatives implemented by Auckland Transport and Waka Kotahi
- The time period that has been reviewed is 2015 to 2019. While not the most current data, this is considered an appropriate time period, as this does not include the series of rolling lockdowns due to COVID-19 in 2020 and 2021, and the associated disruption to travel patterns at that time and in the period that followed
- The crash records are reflective of the current transport demand on these corridors. In general, current active mode (walking and cycling) use of these corridors is very low (due to the lack of safe and attractive facilities).

Table 2-1: Total Crashes per Year by Corridor (all crash severity)

Road Corridor	Total Crashes per Year				
Redhills	2015	2016	2017	2018	2019
Fred Taylor Drive	11	18	7	6	8
Don Buck Road	5	11	9	11	9
Whenuapai					
Trig Road	2	1	2	0	4
Brigham Creek Road	16	17	21	11	15
Hobsonville Road	9	15	21	16	24
Kumeū /Riverhead					
Coatesville - Riverhead Highway	8	12	6	5	9
Access Road	2	3	2	1	2
Brigham Creek Interchange	10	10	7	7	7
SH16 - Old Railway Road to Foster Road	15	29	32	22	18

Table 2-2: Vulnerable Road User Crashes per Year and by Corridor

Road Corridor	Vulnerable Road User Crashes per year					
	2015	2016	2017	2018	2019	Total DSIs ²
Redhills						
Fred Taylor Drive	0	2	0	1	0	0
Don Buck Road	0	3	2	1	1	2
Whenuapai						
Trig Road	0	0	0	0	0	0
Brigham Creek Road	2	2	1	4	2	1
Hobsonville Road	3	2	2	3	4	2
Kumeū /Riverhead						
Coatesville - Riverhead Highway	0	3	1	0	1	1
Access Road	0	0	0	0	0	0
Brigham Creek Interchange	0	1	0	3	1	0
SH16 - Old Railway Road to Foster Road	1	2	4	4	1	4

As can be seen, vulnerable road user crashes are variable across the existing network. There are relatively high levels of Death and Serious Injury (DSI) crashes on SH16, reinforcing the current conflicts that are present within this corridor as a result of competing demands for through movements and town centre functionality.³ Hobsonville Road and Don Buck Road records also indicate higher levels of vulnerable road user crashes. Both of these corridors have increasing levels of urbanisation, and intermittent facilities for pedestrians and cyclists resulting in higher conflict levels and a higher risk of serious injuries occurring.

Table 2-3: Summary of Most Common Crash Types by Corridor (from total crashes)

Road Corridor	1	2	3
Redhills			
Fred Taylor Drive	Rear end/obstruction	Crossing/turning	Overtaking crashes
Don Buck Road	Rear end/obstruction	Crossing/turning	Straight road lost control/Head on
Whenuapai			
Trig Road	Bend - Lost control/Head on	Crossing/turning	Rear end/obstruction
Brigham Creek Road	Rear end/obstruction	Bend – Lost control/Head on	Crossing/turning
Hobsonville Road	Crossing/turning	Rear end/obstruction	Bend – Lost control/Head on
Kumeū /Riverhead			

² Total Deaths and Serious Injuries (DSIs) across the five-year period (2015 to 2019)

³ Noting the reported section of SH16 is largely within the existing urban area, which is not part of the separate SH16 Improvements Project

Road Corridor	1	2	3
Coatesville-Riverhead Highway	Rear end/obstruction	Crossing/turning	Bend – Lost control/Head on
Access Road	Bend – Lost control/Head on	Straight road lost control/Head on	Overtaking crashes
SH16 Kumeū -Huapai	Rear end/obstruction	Crossing/turning	Overtaking crashes

The crash records over the five years reported indicate the most common crash types on the existing road corridors are rear/end obstruction, crossing/turning crashes and loss of control. Within the context of the network, specifically rural roads experiencing increasing levels of congestion, and transitioning rural to urban corridors, these crash types are not unexpected. Without the provision of new and upgraded transport corridors, including safe and attractive facilities for active mode and micro-mobility users, these crash types are expected to be exacerbated with increasing pressure on the network. The design of the proposed designation identified for the NORs is consistent with design standards provided by the Auckland Transport Design Manual.

In addition, the designations for the NORs have considered the need to provide appropriate lane widths and, where necessary, medians to enable people to safely manoeuvre to and from the corridor. For example, within the urban sections of SH16 Main Road, where existing property access needs to be maintained, including for heavy vehicles.

3 Likely Future Transport Environment (without the Project)

Further information has been requested on the likely future transport network with and without the proposed Projects. The below tables provide additional information on a scenario where the projected growth in the North West was to occur, and the specific NoR project is not in place.

3.1 Road Safety

The following table provides an assessment of the road safety implications for each corridor should the NOR / Project not proceed.

The NORs for the Rapid Transit Corridor (RTC), and the associated Kumeū and Huapai RTC Stations, are not addressed in the table below. With regard to these NORs, as discussed in the Assessment of Transport Effects, the provision of rapid transit will shift trips from vehicles to public transport, reducing the potential for crashes associated with medium- to longer-distance trips for the Kumeū / Huapai growth area. Moreover, as discussed below, the provision of the RTC and associated stations will increase pedestrian, cycle and other micro-mobility demand to and along the SH16 Main Road corridor, necessitating provision of safe and attractive facilities.

Table 3-1: Road Safety Effects without NOR by Corridor

NOR Corridor	Road Safety Effects without NOR Project
NoRS1: Alternative State Highway	<p>As a new corridor, the road safety implications without the Project are largely on the surrounding road network.</p> <p>The Project will provide a new route that removes strategic trips from other unsuitable parallel rural roads. Without the Project, increasing congestion along the existing state highway corridor (SH16 Main Road) is anticipated to result in increasing use of parallel rural routes by vehicles, including heavy vehicles.</p> <p>The business cases for the Project predicted a significant reduction of 30% (from around 4,750 to 3,350) in the number of daily vehicles (per kilometre) on rural roads within the North West area. This not only enables an increase in people in the North West using more suitable strategic routes or urban connections to undertake their travel, but will provide benefits to recreational users of these rural roads. This includes people who will use these roads for recreational cycling, horse riding or walking their dog.</p> <p>Without the provision of the Alternative State Highway, traffic volumes on the existing SH16 Main Road are expected to reach up to 40,100 vehicles per day to the west of Coatesville-Riverhead Highway and around 23,000 vehicles per day west of Old North Road. Noting that the current constraints on the corridor limit its ability to accommodate further traffic growth, with traffic spreading to parallel rural routes, as discussed above.</p> <p>The traffic demands on SH16 Main Road without the ASH will continue to place greater pressure on the corridor. There will be an increasing importance on the provision of safe, separated walking and cycling facilities on SH16 Main Road, as the surrounding area continues to urbanise and access is required to the town / local centres and proposed Rapid Transit Corridor (RTC) stations.</p>
NoRS2: SH16 Main Road	<p>Without this NoR, the nature of the crash record for vulnerable road users, as shown previously, is unlikely to change. With increasing demand for access, where vulnerable road users continue to use the limited provision of facilities, there is anticipated to be increasing numbers of DSIs.</p> <p>In addition to the ASH, the RTC enables buses to be provided on a separated facility that will support safe crossing facilities to and from the growth areas in Kumeū-Huapai. The NOR for the SH16 Main Road upgrade therefore enables the integration of walking and cycling and the future public transport provision. The SH16 Main Road upgrade includes new crossing facilities at Riverhead Road, Weza Lane, Matua Road, Station Road, Trigg Road, and Matua Road West. Without these crossing facilities, there is a significant safety risk for vulnerable road users crossing SH16 Main Road – even with the ASH and the RTC in place.</p>
NoRS4: Access Road	<p>The existing Access Road is not fit for purpose to support the planned future urban growth, due to the high-speed environment, narrow carriageway and significant increase in conflicts between through traffic, accessing/turning movements and vulnerable road users. These increases in conflicts will lead to increases in DSIs.</p> <p>The expected increase in safety issues is also likely to constrain the attractiveness of walking and cycling, further reinforcing use of vehicles with the resulting high-speed conflicts. Although the speed limit could be reduced, as a safety improvement measure, the existing Access Road will remain unsafe and be unable to safely accommodate future growth due to the type and number of conflicts expected.</p>
NoRW1: Trig Road North and NoR: HIF Trig Road	<p>The existing Trig Road is not fit for purpose to support the planned future urban growth, due to the high-speed environment, narrow carriageway and significant increase in conflicts between through traffic, accessing/turning movements and vulnerable road users. These increases in conflicts will lead to increases in DSI's.</p> <p>The expected increase in safety issues is also likely to constrain the attractiveness of walking and cycling, further reinforcing the use of vehicles with the resulting high-speed conflicts. Although the speed limits have recently been reduced as a safety improvement measure, the existing Trig Road will remain unsafe and be unable to safely accommodate future growth due to the type and number of conflicts expected.</p>

NOR Corridor	Road Safety Effects without NOR Project
	<p>It is also noted that a local primary school has recently been designated by the Ministry of Education further reinforcing the high-risk environment for vulnerable road users without appropriate facilities.</p>
<p>NoRW2: Māmari Road</p>	<p>Māmari Road is an extension to a small cul de sac creating a new corridor. From a road safety perspective, without the Project additional pressure will be placed on the existing network, in particular on Trig Road. As discussed above, Trig Road is not currently fit for purpose to accommodate future urban growth, and without Māmari Road this will place further pressure on Trig Road.</p>
<p>NoRW3: Brigham Creek Road</p>	<p>The existing Brigham Creek Road is not fit for purpose to support the planned future urban growth, due to the high-speed environment, narrow carriageway and significant increase in conflicts between through traffic, accessing/turning movements and vulnerable road users. These increases in conflicts will lead to increases in DSI's.</p> <p>The expected increase in safety issues is also likely to constrain the attractiveness of walking and cycling, further reinforcing use of vehicles with the resulting high-speed conflicts. Although the speed limits have recently been reduced in the town centre as a safety improvement measure, the existing Brigham Creek Road will remain unsafe and be unable to safely accommodate future growth due to the type and number of conflicts expected.</p> <p>It is also noted that the central town centre in Whenuapai will be a significant attractor and safe movement along the corridor by all modes will be increasingly important. Without the Project these movements will be limited, and in particular the safe movement of walking and cycling will be limited. These trips will then be likely undertaken via private vehicle – further reinforcing the conflict between vehicles and vulnerable road users.</p>
<p>NoRW4: Spedding Road</p>	<p>Spedding Road is an extension to a short extent of rural road creating a new corridor. From a road safety perspective, without the Project additional pressure will be placed on the existing network, in particular on Brigham Creek Road. As discussed above Brigham Creek is not currently fit for purpose to accommodate future urban growth, and without Spedding Road this will place further pressure on Brigham Creek Road.</p>
<p>NoRW5 Hobsonville Road NoR: HIF Trig Road</p>	<p>The existing Hobsonville Drive is not fit for purpose to support the planned future urban growth. There are expected to be increasing demands for walking and cycling and vehicle numbers along the corridor which will result in a significant increase in conflicts between through traffic, accessing/turning movements, and vulnerable road users. These increases in conflicts will lead to increases in DSI's.</p> <p>With the proximity of this corridor to Westgate Centre, Hobsonville Centre and West Harbour high crossing demands and demands to travel along the corridor are expected for pedestrians and cyclists. If appropriate facilities to enable crossing and travelling along the corridor are not provided, pedestrians and cyclists will either make high risk decisions or choose to travel by car. Hobsonville Road also has several legacy intersections, including Trig Road and Luckens Drive which are not considered safe for pedestrians to navigate. They also encourage higher speed turning movements which are not appropriate within an urban context.</p>
<p>NoR RE1: Don Buck Road FTN Upgrade</p>	<p>The existing Don Buck Road is not fit for purpose to support the planned future urban growth. There are expected to be increasing demands for walking and cycling and vehicle numbers along the corridor which will result in a significant increase in conflicts between through traffic, accessing/turning movements, and vulnerable road users. These increases in conflicts will lead to increases in DSI's.</p>
<p>NoR RE2: Fred Taylor Drive</p>	<p>The existing Fred Taylor Drive is not fit for purpose to support the planned future urban growth, due to the high-speed environment and significant increase in conflicts between through traffic, accessing/turning movements and vulnerable road users. These increases in conflicts will lead to increases in DSI's. With the proximity of this corridor to Westgate Centre and the Redhills intensive residential developments high crossing demands are expected for pedestrians and cyclists. If appropriate facilities to enable crossing and travelling along the corridor are not provided, pedestrians and cyclists will either make high risk decisions or choose to travel by car.</p>

NOR Corridor	Road Safety Effects without NOR Project
	<p>The expected increase in safety issues is also likely to constrain the attractiveness of walking and cycling, further reinforcing use of vehicles with the resulting high-speed conflicts. Although the speed limit could be reduced as a safety improvement measure, the existing Fred Taylor Drive will remain unsafe and will be unable to safely accommodate future growth due to the type and number of conflicts expected.</p>
<p>NoR R1 Coatesville Riverhead Highway</p>	<p>The existing Coatesville Riverhead Highway is not fit for purpose to support the planned future urban growth, due to the high-speed environment and significant increase in conflicts between through traffic, accessing/turning movements, and vulnerable road users. These increases in conflicts will lead to increases in DSI's.</p> <p>The Coatesville Riverhead corridor has several uncontrolled intersections, including Moontide Road and Old Railway Road, where intersection improvements are enabled through the NOR to poor visibility and narrow carriage way space for waiting vehicles. The five serious crashes on Coatesville Riverhead Highway were all in relation to turning movements at these intersections, including rear end collisions and poor turning decisions.</p> <p>With the Project not in place, crash records are expected to worsen on this corridor as a result of high through volumes making turning movements increasingly hazardous. This also includes waiting at a centre line to turn in a constrained carriageway. It is also noted that the vertical crest at Moontide Road presents a significant safety risk due to poor visibility.</p>
<p>NoR1: Redhills North-South Arterial Corridor</p>	<p>Redhills North South Arterial is a new corridor. From a road safety perspective, without the Project additional pressure will be placed on the existing network, in particular on Don Buck Road and Fred Taylor Drive. These corridors as identified above are already under increasing pressure to facilitate safe movements for all modes. Without this Project, the internal collector network will create a fragmented network that will encourage vehicle use, further increasing pressure on Don Buck Road and Fred Taylor Road in terms of access/turning movements, through movements and walking and cycling access.</p>
<p>NoR2a: Redhills East- West Arterial Corridor – Dunlop Road</p>	<p>Redhills East West Arterial Dunlop Road is a new corridor. From a road safety perspective, without the Project additional pressure will be placed on the existing network, in particular on Don Buck Road and Fred Taylor Drive. These corridors as identified above are already under increasing pressure to facilitate safe movements for all modes. Without this Project, the internal collector network will create a fragmented network that will encourage vehicle use, further increasing pressure on Don Buck Road and Fred Taylor Road in terms of access/turning movements, through movements and walking and cycling access.</p>
<p>NoR2b Redhills East – West Arterial Corridor -Baker Lane</p>	<p>Redhills East West Baker Lane Arterial is a new corridor. From a road safety perspective, without the Project additional pressure will be placed on the existing network, in particular on Don Buck Road and Fred Taylor Drive. These corridors as identified above are already under increasing pressure to facilitate safe movements for all modes. Without this Project, the internal collector network will create a fragmented network that will encourage vehicle use, further increasing pressure on Don Buck Road and Fred Taylor Road in terms of access/turning movements, through movements and walking and cycling access.</p>
<p>NoR2c Redhill East-West Arterial Corridor Nixon Road connection</p>	<p>Redhills East West Arterial Nixon Road is a new corridor. From a road safety perspective, without the Project additional pressure will be placed on the existing network, in particular on Don Buck Road and Fred Taylor Drive. These corridors as identified above are already under increasing pressure to facilitate safe movements for all modes. Without this Project, the internal collector network will create a fragmented network that will encourage vehicle use, further increasing pressure on Don Buck Road and Fred Taylor Road in terms of access/turning movements, through movements and walking and cycling access.</p>

3.2 General Traffic

The following table provides a summary of the expected traffic volumes on the transport network in 2048+ both without and with the Projects in place, together with an assessment of the outcomes expected to arise in the case that the NORs do not proceed. Particular commentary is provided where key interrelationships between projects exists.

In the case of new corridors, the traffic effects of a new corridor not being implemented is largely on the existing road network.

At an area-level, each growth areas has been assessed to consider vehicle to capacity ratios. At a network-level, it can be seen that the overall transport effects for traffic are acceptable, with 5% or less of vehicle kilometres travelled being in peak congestion. These results are summarised in Table 3-23.2 below.

Table 3-2: Vehicle Capacity Ratios – Without NORs compared to With NORS / Projects in place

Growth Area	Without NORs – AM Peak Percentage of vehicles kilometre travelled in peak congestion (>90%)	With NORs in Place – AM Peak Percentage of vehicles kilometre travelled in peak congestion (>90%)
Whenuapai Package	5% in Do-min scenario	3% in Recommended Option
Redhills-Riverhead Package	13% in Do-min scenario	5% in Recommended Option
Kumeū -Huapai, Strategic Package	17% in Do-min scenario	0% in Recommended Option

For all intersections, including interchanges to the state highway network, Auckland Transport and Waka Kotahi will manage the network to achieve and balance a range of outcomes, including traffic efficiency, user safety (for all modes), and prioritising movement by more sustainable modes, such as public transport and active modes. This shift from a singular focus on traffic delay to broader outcomes and prioritisation of more sustainable movements is ongoing and driven by regional and national policy directives. This includes recent policy direction around reallocating road space to favour these broader outcomes, where practicable. Collectively, this requires a broader assessment of needs and priorities of the transport system than just localised vehicle delays at selected intersections.

Mode shift towards public transport is a key outcome of the overall North West network packages, and modal priorities are expected to change with less priority given to general traffic flow. In this regard, the future operating environment is anticipated to tolerate increased delay and queuing for general traffic, at certain intersections, at certain times.

The Transport Design Manual⁴ also reinforces that designing streets for two 30-minute peaks of each weekday leads to very wide streets with excess capacity for the rest of the day. The Manual states that:

“This has a very high spatial footprint and reduces the amenity of the street. This encourages high vehicle speeds during the remaining 23 hours of the day and makes pedestrian crossings difficult and/or dangerous. It may fail to provide a safe and attractive environment during the rest of the day. Vehicle capacity metrics should be established that seek to provide comfortable capacity during the typical hours of the day. Designing for peak hour vehicle capacity requires the construction and maintenance of costly infrastructure. By proactively setting vehicle capacity targets, traffic growth can be contained, while shifting to highly space-efficient modes. This enables a greater portion of space to be given to land use activity”.

The theoretical capacity of a single lane with uninterrupted flow conditions is generally within the range of 1,500 to 2,400 vehicles per hour⁵, noting these can be lower when considered at a corridor level due to various control features in the corridor (such as intersections, crossings etc). The peak period is generally accepted as 10% of the daily flow (vehicles per day (vpd)) of a corridor. The Transport Design Manual also provides indicative lane capacity for vehicles at 1,800 vehicles per hour. These considerations have been taken into account in the assessment provided below.

⁴ Auckland Transport: Transport Design Manual, <https://at.govt.nz/media/1989354/urban-street-and-road-design-guide-1-1-2022.pdf>

⁵ Austroads Guide to Traffic Management Part 3 Traffic Studies and Analysis

Table 3-3: Traffic Effects without NOR by Corridor

NOR Corridor	Without NORs (2048+)	With NORs (2048+)	Assessment of Outcomes without the NoR
NoRS1: Alternative State Highway	N/A	27,700vpd (east of Access Road) 13,900vpd (west of Access Road)	<p>Without NOR S1 in place, the reliance on the existing form of SH16 Main Road (the only east-west strategic traffic route through Kumeū to Helensville) will create increased congestion, stop-start conditions, and unpredictable and unreliable travel times on the SH16 Main Road route, as well as increased conflicting movements. This will compromise reliability, resilience, and safety for all road users.</p> <p>Based on the predicted daily traffic volumes, the existing SH16 Main Road corridor will not have enough capacity to cater for future growth, which will lead to strategic traffic re-routing to existing sub-standard rural roads (such as Old North Road, Old Railway Road). For example, the assessments have identified that the provision of the ASH would reduce 2048+ daily traffic demands from around 15,000 to 10,000vpd along Old North Road.</p> <p>As shown below, volumes of around 23,300vpd west of Old North Road well exceed the generally accepted capacity of a two lane urban road – also noting that the current corridor also serves as a town centre, with high levels of access and turning movements currently provided. With the ASH NOR in place, this daily traffic demand reduces substantially to around 8,000vpd. This includes a 71% reduction in freight traffic on SH16 Main Road.</p> <p>Moreover, the transport modelling for the NORs has predicted that the average travel time for vehicles travelling between Brigham Creek and Waimauku improves in each of the weekday peak periods. Without the NORs, the 2048+ travel times are predicted to be around 55 minutes, 20 and 30 minutes respectively in the weekday AM peak, inter peak, and PM peak. With the NOR, the travel time is predicted to reduce by around 46 minutes, 12 minutes and 22 minutes respectively, also becoming more reliable across the day.</p>
NoRS2: SH16 Main Road	10,800vpd west of Matua Road 23,300vpd west of Old North Road	8,400vpd west of Matua Road 8,000vpd west of Old North Road	<p>Without the NORs in place, the existing capacity along SH16 Main Road will exceed the volumes that could be accommodated by a two-lane urban road, particularly at the eastern end around Access Road, as is currently the case. These demands will be relieved by the implementation of the ASH NOR, the inter-dependencies of which have been discussed in the Assessment of Transport Effects, as well as below.</p>

NOR Corridor	Without NORs (2048+)	With NORs (2048+)	Assessment of Outcomes without the NoR
			<p>With the NORs in place, the proposed two lane arrangement along SH16 Main Road (with additional turning lanes at intersections), is considered to satisfactorily accommodate the predicted traffic demands. As noted previously, the designation along SH16 Main Road includes sufficient space for a median from where vehicles (including trucks) can turn to and from current driveways that are retained along the proposed corridor.</p>
<p>NoRS4: Access Road</p>	<p>15,000 to 18,000vpd (northern section)</p>	<p>9,400vpd (northern section) 21,100vpd (southern section)</p>	<p>The traffic volumes on Access Road range from 9,400vpd to 21,100vpd. The increased volumes on this corridor are largely as a result of access to the Alternative State Highway. Without the Access Road NOR, connections to the ASH will be constrained by the existing narrow two-lane rural carriageway. A four-lane corridor with limited access can efficiently accommodate up to 22,000 vehicles per day and therefore the proposed corridor design meets the forecasted needs.</p> <p>As discussed in section 8.5 of the Assessment of Transport Effects, there is some inter-dependency between the Access Road Upgrade and the implementation of the ASH. Whilst the long-term traffic demands on the northern section, with full implementation of the completed North West Strategic Package corridors are anticipated to be around or below 10,000 vehicles per day, the provision of four lanes has been identified.</p> <p>Typically, this threshold for four vehicle lanes would be in the order of 15,000 vehicles per day or a greater frequency of bus services. As can be seen, without the NORs, this level of demand could occur on the northern section of Access Road connecting with the current SH16 Main Road corridor, depending on the timing of the ASH implementation in relation to the future growth in Kumeū-Huapai. The proposed designation for four vehicles lanes, therefore provides some necessary flexibility to accommodate this outcome, acknowledging this inter-dependency with the ASH timing, particularly in relation to supporting the reliability of bus services in this interim period.</p>
<p>NoRW1: Trig Road North and NoR: HIF Trig Road</p>	<p>21,800vpd</p>	<p>13,800vpd</p>	<p>As shown the volumes on Trig Road are expected to decrease in future with the network in place. This is largely in response to the interrelationship with Māmari Road and Trig Road and the provision of an additional corridor to support strategic north south movements in Whenuapai. It is noted that no additional vehicle carrying capacity is proposed for Trig Road and that without the</p>

NOR Corridor	Without NORs (2048+)	With NORs (2048+)	Assessment of Outcomes without the NoR
			additional supporting network, Trig Road would have poor level of service for vehicles, public transport and freight movements.
NoRW2: Māmari Road	N/A	16,900vpd	Without the Māmari Road corridor, increased pressure will be placed on Trig Road and other surrounding roads. Traffic volumes on Trig Road as shown above are predicted to be in the region of 21,800 vehicles per day. The corridor as proposed provides two lanes of vehicle capacity and two bus lanes (discussed under PT below).
NoRW3: Brigham Creek Road	21,200 (central Section) 32,700 (east section) 35,200 (West section)	12,500 (central section) 26,600 (east section) 22,900 (west section)	<p>Brigham Creek Road is the main spine route travelling though Whenuapai. As shown the expected traffic volumes at each end of the corridor are relatively high, and without the corridor widening a proposed, significant delays and congestion would be expected in particular at the eastern and western extents of the corridor. This is generally due to this corridor connecting to SH16 and SH18 at its furthest extents.</p> <p>The Brigham Creek corridor is currently a two-lane road, and without the designation in place to increase vehicle capacity, efficient movement along the corridor will be compromised. As a key connection through to future business areas in Whenuapai, the corridor is expected to retain a freight function also. The volumes indicated without the NOR in place, include the scenario where Spedding Road is not in place to provide an indication of the traffic effects on Brigham Creek in a scenario of growth and no intervention. Volumes of 35,200 and 32,700 vehicles per day in a two-lane corridor will result in significant congestion on Brigham Creek Road. It is also noted that with the Spedding Road corridor in place, and carrying in the order of 18,400 vehicles per day, volumes on Brigham Creek still remain at over 22,000 vehicles per day. This further reinforces that without the provision for greater capacity on Brigham Creek Road, significant traffic effects can be expected, along with lower levels of amenity and liveability.</p> <p>Wider network assumptions include the SH16 to 18 connections. The provision of this motorway-to-motorway connection provides additional capacity on an east west movement for vehicles travelling from Kumeū to Albany. The connection enables the Brigham Creek corridor to operate as an arterial corridor, supporting local movements – rather than also providing strategic connections. This project also provides for south facing ramps on Northside Drive and an upgraded interchange at SH18. The project has been included within the do minimum modelling scenario given that a</p>

NOR Corridor	Without NORs (2048+)	With NORs (2048+)	Assessment of Outcomes without the NoR
			business case was completed and the project was identified as a key infrastructure element in the Whenuapai Structure Plan ITA. These infrastructure components reduce expected traffic volumes on Brigham Creek in particular, however it is noted that given the Brigham Creek Road is proposed to provide four lanes, this will provide the flexibility in the event that these larger scale projects are delayed.
NoRW4: Spedding Road	N/A	18,400vpd	The Spedding Road connection provides an important east west link across the Whenuapai growth area. Without this connection, greater volumes are expected on Brigham Creek Road, as discussed above.
NoRW5 Hobsonville Road	21,900vpd between SH16 and Luckens Road 18,200vpd between Luckens Road and Brigham Creek Road 17,300 East of Williams Road	20,200vpd between SH16 and Luckens Road 14,900 vpd between Luckens Road and Brigham Creek Road 16,500 vpd east of Williams Road	Hobsonville Road is predicted to be slightly less trafficked in the future, but, as can be seen from the estimated vpd, relatively consistent. The proposed alteration to the existing designation largely provides for the implementation of facilities to support walking and cycling and public transport use. Bus lanes at the western extent are proposed in response to the potential conflicts between relatively high bus services and high traffic volumes. The Spine Road running parallel to Hobsonville Road provides additional east-west capacity, and local access to the local industrial land. As shown, this results in a decrease in traffic volumes on Hobsonville Road in this central portion. The traffic effects without this NOR in place are minimal.
NoR RE1: Don Buck Road FTN Upgrade	24,600vpd	25,500 – 27,000vpd	Don Buck Road is a heavily trafficked route and will continue to be so in the future. As a key spine route in the North West, there are limited alternative routes running north south, aside from the SH16 corridor. Traffic volumes in the future are expected to increase, and Don Buck Road is also a key public transport route connecting to the Westgate. The proposed cross section for this corridor is currently shown as a four-lane arterial including bus priority lanes. Without this Project in place, there will be limited attractive alternative choices for those travelling by car, such as safe walking and cycling

NOR Corridor	Without NORs (2048+)	With NORs (2048+)	Assessment of Outcomes without the NoR
			<p>facilities, and reliable public transport links. This will continue to exacerbate the existing situation of low mode share.</p> <p>In general, the traffic environment is expected to be largely the same with and without the NOR in place. Congestion will be likely on this corridor; however, this is not a result of the NOR specifically. There is future opportunity for AT to consider operational measures to provide the most efficient use of the four-lane corridor. This could include reduced bus priority to enable transit lanes, or peak bus lanes only. These are matters that would be considered as part of standard network management undertaken by Auckland Transport.</p>
NoR RE2: Fred Taylor Drive	19,400 – 23,900vpd	15,000 to 22,000 vpd	<p>Fred Taylor Drive is an existing strategic north south route in Redhills. The corridor currently has two vehicle lanes. Traffic volumes are expected to be at the higher end of the carrying capacity of a two-lane corridor in sections. The provision of bus lanes along this corridor enables vehicles to move along the corridor with reduced friction from a high frequency of buses entering and exiting the traffic lane.</p> <p>The proposed cross section for this corridor is currently shown as a four-lane arterial including bus priority lanes. Without this Project in place, there will be limited attractive alternative choices for those travelling by car, such as safe walking and cycling facilities, and reliable public transport links. This will continue to exacerbate the existing situation of low mode share.</p> <p>In general, the traffic environment is expected to be largely the same with and without the NOR in place.</p>
NoR R1 Coatesville Riverhead Highway	10,000vpd	9,000vpd	<p>There is little effect from a general traffic outcome should the Project not proceed. Expected traffic volumes without the wider network projects in place and with the Project in place are similar and no additional capacity to that existing is proposed. Key projects assumed to be in place include the provision of a roundabout with SH16 and additional capacity between the intersection and SH16 Brigham Creek Interchange. These improvements are assumed to be in place in the do minimum scenario as these projects are funded and underway.</p>

NOR Corridor	Without NORs (2048+)	With NORs (2048+)	Assessment of Outcomes without the NoR
NoR1: Redhills North-South Arterial Corridor	N/A	8,500	<p>As growth increases in the area the current lack of an arterial network will reduce connectivity and result in a heavy reliance on the existing network around Redhills including Fred Taylor Drive and Don Buck Road. Without an arterial network, there will be an increasing reliance on the local and collector network. This will result in longer, less efficient bus networks, and safe cycle connections on desire lines would be limited. Without providing for through movement functions on arterials, there will likely be an increase in traffic utilising lower order corridors such as local and collector roads, with potential adverse effects on amenity and capacity.</p> <p>Specifically in regard to the NoR1 designation, should this not be present, traffic demands of 8,500 vehicles per day will reroute onto the other roads proposed within the Redhills Basin. Given that peak demand flows show high demands to/from the State Highway network, this will place significant pressure on Fred Taylor Drive intersections with Baker Lane, Don Buck Road and Fred Taylor Drive and Fred Taylor Drive through to SH16. By providing access for vehicles at Don Buck Road/Royal Road this provides attractive alternative routes for vehicles to access SH16 via Royal Road and Triangle Road – spreading these demands across the network.</p>
NoR2a: Redhills East-West Arterial Corridor – Dunlop Road	N/A	8,300	<p>As growth increases in the area the current lack of an arterial network will reduce connectivity and result in a heavy reliance on the existing network around Redhills including Fred Taylor Drive and Don Buck Road. Without an arterial network, there will be an increasing reliance on the local and collector network. This will result in longer, less efficient bus networks, and safe cycle connections on desire lines would be limited. Without providing for through movement functions on arterials, there will likely be an increase in traffic utilising lower order corridors such as local and collector roads, with potential adverse effects on amenity and capacity.</p> <p>The Dunlop Road corridor has been identified as a key public transport route that provides a direct linkage from the Redhills town centre to Westgate and RTN connections. Traffic volumes of 8,300 per day enable buses to be integrated within the two-lane corridor. However, if this corridor was not in place, a high proportion of traffic and buses would likely travel on NoR2b. This would result in some 22,700 vehicles within a two-lane corridor. This will result in a corridor that is at capacity, and provides poor levels of service for vehicles and public transport. The performance of the intersection of Baker Lane and Fred Taylor Drive would significantly worsen without provision of more capacity.</p>

NOR Corridor	Without NORs (2048+)	With NORs (2048+)	Assessment of Outcomes without the NoR
			<p>This is turn would have poor walking and cycling outcomes – which are particularly important given the proximity of the intersection to the Westgate centre.</p>
<p>NoR2b Redhills East – West Arterial Corridor - Baker Lane</p>	<p>N/A</p>	<p>14,400</p>	<p>As growth increases in the area the current lack of an arterial network will reduce connectivity and result in a heavy reliance on the existing network around Redhills including Fred Taylor Drive and Don Buck Road. Without an arterial network, there will be an increasing reliance on the local and collector network. This will result in longer, less efficient bus networks, and safe cycle connections on desire lines would be limited. Without providing for through movement functions on arterials, there will likely be an increase in traffic utilising lower order corridors such as local and collector roads, with potential adverse effects on amenity and capacity.</p> <p>The Baker Lane corridor provides a two-lane corridor connecting Fred Taylor Drive and the future Redhills town centre. Without this corridor in place, the predicted traffic volumes would be rerouted on to Dunlop Road. This would have a negative impact on bus movements along this corridor, and the performance of the Dunlop Road and Fred Taylor Drive intersection. The corridor would be at capacity, and the provision of frequent buses attempting to navigate in and out of traffic from stops would reduce corridor efficiencies as well.</p>
<p>NoR2c Redhill East- West Arterial Corridor Nixon Road connection</p>	<p>N/A</p>	<p>11,400</p>	<p>As growth increases in the area the current lack of an arterial network will reduce connectivity and result in a heavy reliance on the existing network around Redhills including Fred Taylor Drive and Don Buck Road. Without an arterial network, there will be an increasing reliance on the local and collector network. This will result in longer, less efficient bus networks, and safe cycle connections on desire lines would be limited. Without providing for through movement functions on arterials, there will likely be an increase in traffic utilising lower order corridors such as local and collector roads, with potential adverse effects on amenity and capacity.</p> <p>The NoR2c corridor through to Nixon Road provides an arterial connection through to Taupaki, and the western suburbs. The provision of this corridor means that vehicles that are travelling from the more western section of Redhills can access the existing arterial network from Nixon Road/Red Hills Road. Without this corridor, this will be rerouted to the North/South arterial. This intersection with</p>

NOR Corridor	Without NORs (2048+)	With NORs (2048+)	Assessment of Outcomes without the NoR
			<p>Royal Road is predicted to experience delays and congestion in the future, and as such opportunities for redistributing traffic across the network would provide in better network outcomes.</p> <p>Alternatively, a collector network would be implemented in a piecemeal fashion by progressive developers. This would result in multiple access points along Red Hills Road, which is proposed to remain predominately rural nature. This will increase conflict points along the corridor and potentially impact on wider network safety outcomes.</p>

3.3 Walking and Cycling

An assessment of walking and cycling outcomes has been provided below in Table 3-5. This assessment considers that the existing facilities form the basis of the do minimum network. In the case of new arterial connections, the assessment considers existing alternatives that are in place and the outcomes for walking and cycling should alternative corridors be utilised.

Overall, walking and cycling demands are expected to significantly increase as a result of the expected growth. A summary of the expected active mode demands derived from the Strategic Active Mode Model is summarised in Table 3-4. Given that finer grain networks, including collector and local roads, are still in development, assessment of these demands on an area basis is considered to be appropriate and can provide an indication of level of likely demands with the Projects in place.

Table 3-4: Active Mode Demands in 2048+

Growth Area	Predicted Daily Active Modes Demand on the Network by Area
Whenuapai Package	3,200 trips
Redhills-Riverhead Package	2,800 trips
Kumeū -Huapai, Strategic Package	1,500 trips on the local network 300 trips on the Regional Active Mode Corridor

Table 3-5: Walking and Cycling Effects by NOR without the Project in Place

NOR Corridor	Existing	Key Attractors	Assessment of Walking and Cycling Outcomes without the NOR
NoRS1: Alternative State Highway	New Corridor	Kumeū-Huapai urban growth area	<p>The ASH enables the reduction in traffic on SH16 Main Road, providing for additional walking and cycling infrastructure commensurate with an urban town centre arterial that also provides access to the Kumeū and Huapai RTC Stations. In addition to this, adjacent to the ASH is the Regional Active Mode Corridor, which enables unimpeded travel from Kumeū to the SH16 Cycleway in the long-term.</p> <p>Without the ASH, traffic volumes on SH16 Main Road are expected to be around 23,300 vpd. This provides a relatively inhospitable environment for walking and cycling. In addition to this, longer cycle trips through to Westgate and beyond will need to be on the urban corridor of SH16 Main Road. While separated facilities are proposed as part of NoRS2 – the facilities are more suited to the urban environment than longer distance trips, as they will be subject to existing vehicle crossings, intersections, and other activities. The overall journey for cyclists on this corridor would be less convenient and attractive for those longer distance trips than using the ASH and Regional Active Mode Corridor.</p>
NoRS2: SH16 Main Road	Range of facilities – on road bike lanes, footpaths, sections with no facilities, shoulder seal.	Kumeū Town Centre Huapai Local Centre Kumeū and Huapai RTC Stations Regional Active Mode Corridor	<p>In an environment without the SH16 Main Road upgrade, the cycling and walking outcomes will be very poor with no facilities in places, and intermittent walking facilities in others. This would result in poor integration with the proposed future wider walking and cycling network.</p> <p>With the SH16 Main Road NOR, there would be around 4.2km of additional cycling facilities along the corridor providing for local access to the Kumeū Town Centre, Huapai Local Centre, and Kumeū and Huapai RTC Stations, including by providing significantly improved and new, walking and cycling crossing facilities (crossing SH16 Main Road) at Riverhead Road, Weza Lane (connecting to RAMC), Matua Road, Station / Tapu Roads, Trigg Road, Matua Road (West).</p> <p>The ability to contribute to mode shift will be severely compromised if key walking and cycling facilities are not provided. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p>

NOR Corridor	Existing	Key Attractors	Assessment of Walking and Cycling Outcomes without the NOR
NoRS4: Access Road	<p>No facilities outside of existing urban area.</p> <p>Footpaths adjacent to current urban area</p>	<p>Kumeū-Huapai Town Centre</p> <p>Regional Active Mode Corridor</p>	<p>Without the upgrades to Access Road, access to employment and social amenities will be compromised, especially for immediately adjacent land uses. This will include access between residential and employment opportunities in Kumeū and in the indicative industrial activities on Access Road.</p> <p>In addition there will be poor integration with the proposed future wider walking and cycling network, including in particular providing access to the Regional Active Mode Corridor at the proposed interchange on Tawa Road. The ability to contribute to mode shift will be severely compromised if key walking and cycling facilities are not provided. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network. This will also significantly increase the crash exposure for vulnerable road users as demand increases.</p> <p>The lack of provision for sustainable travel choices will also lead to adverse environmental and health effects.</p>
NoRW1: Trig Road North	Footpath on one side of corridor	<p>Trig Road Primary School</p> <p>Connectivity to Whenuapai Local Centre</p>	<p>Without the upgrade to Trig Road access to employment and social amenities will be compromised, especially for immediately adjacent land uses. This will include access between residential and employment opportunities in Whenuapai to/from Hobsonville Road. Other key land uses include a proposed school on Trig Road.</p> <p>Poor integration with the proposed future wider walking and cycling network.</p> <p>The ability to contribute to mode shift will be severely compromised if key walking and cycling facilities are not provided. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p> <p>Significantly increase the crash exposure for vulnerable road users as demand increases</p> <p>Significantly increase the risk for DSI's for vulnerable users</p> <p>Lack of provision for sustainable travel choices will lead to adverse environmental and health effects.</p>

NOR Corridor	Existing	Key Attractors	Assessment of Walking and Cycling Outcomes without the NOR
NoRW2: Māmari Road	<p>Predominantly New Corridor</p> <p>No facilities outside of existing urban area.</p> <p>Footpaths adjacent to current urban area</p>	<p>Whenuapai Local Centre</p> <p>Westgate Metropolitan Centre</p> <p>Future RTN connections</p>	<p>The Māmari Road connection is an extension to a small cul de sac corridor. As such without the Project there will be limited north-south walking and cycling connectivity. Pedestrians and cyclists will need to travel via Trig Road. This is located some 750m (direct line) or from the northern section of Māmari Road – this will require a travel distance some 2.8km to reach Northside Drive via Trig Road compared to 1.6km. This is approximately a doubling of required travel distance, which has significant implications for walking and cycling attractiveness.</p> <p>Access to employment and social amenities will be compromised, especially for immediately adjacent land uses. This will include access between residential and employment opportunities in Westgate and Whenuapai. The Māmari Road corridor provides a central spine for walking and cycling connectivity – connecting via Northside Drive (Existing Designation) to the Metropolitan centre at Westgate.</p> <p>Poor integration with the proposed future wider walking and cycling network.</p> <p>The ability to contribute to mode shift will be severely compromised if key walking and cycling facilities are not provided. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network. .</p> <p>Lack of provision for sustainable travel choices leads to adverse environmental and health effects.</p>
NoRW3: Brigham Creek Road	<p>Intermittent facilities including shared path on eastern extent, no facilities on western extent and mixed on road bike lanes, buffered cycle lanes and</p>	<p>Whenuapai Local Centre</p> <p>Westgate Metropolitan Centre</p> <p>Future RTN connections</p>	<p>Access to employment and social amenities will be compromised, especially for immediately adjacent land uses. Brigham Creek Road provides a core east west spine through Whenuapai. This includes connections to the proposed Whenuapai town centre including employment opportunities and local amenities. The most eastern and western sections of Brigham Creek Road connect to employment opportunities at Hobsonville and Westgate.</p> <p>The Brigham Creek corridor provides intermittent facilities, with a range of level of service for pedestrians and cyclists. This includes shared paths, on road bike lanes and footpaths. This varying provision of facilities provides an inconsistent journey experience and is unlikely to encourage less experienced people to travel by bike or foot.</p>

NOR Corridor	Existing	Key Attractors	Assessment of Walking and Cycling Outcomes without the NOR
	<p>footpaths in local centre and recently developed areas.</p>		<p>Poor integration with the proposed future wider walking and cycling network.</p> <p>The ability to contribute to mode shift will be severely compromised if key walking and cycling facilities are not provided. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p> <p>Significantly increase the crash exposure for vulnerable road users as demand increases</p> <p>Significantly increase the risk for DSI's for vulnerable users</p> <p>Lack of provision for sustainable travel choices will lead to adverse environmental and health effects.</p>
<p>NoRW4: Spedding Road</p>	<p>Predominantly New Corridor</p> <p>No facilities outside of existing urban area.</p>	<p>Westgate Metropolitan Centre</p> <p>Hobsonville Industrial Area</p> <p>Future business parks</p>	<p>The Spedding Road connection is a new corridor. As such without the Project there will be limited east west walking and cycling connectivity. Pedestrians and cyclists will need to travel via Brigham Creek Road (750m north) or Hobsonville Road (1.5km south). Without NoR4, pedestrians utilising these corridors will need to cross SH18 and SH16 via the interchanges for these State Highways. This creates a significant conflict between vehicles and vulnerable road users at busy interchanges such as Brigham Creek Road where 75,900 vpd are expected to utilise this interchange in 2048+. Without Spedding Road in place this number would increase further by some 18,000vpd.</p> <p>Spedding Road provides a local road connection over SH16 and SH18 addressing severance for pedestrians and cyclists in Whenuapai. Without this connection severance will be a significant deterrent for pedestrians and cyclists.</p> <p>Access to employment and social amenities will be compromised, especially for immediately adjacent land uses. This will include access between residential and employment opportunities in Westgate, Whenuapai and Hobsonville.</p> <p>Poor integration with the proposed future wider walking and cycling network.</p> <p>The ability to contribute to mode shift will be severely compromised if key walking and cycling facilities are not provided. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p>

NOR Corridor	Existing	Key Attractors	Assessment of Walking and Cycling Outcomes without the NOR
			Lack of provision for sustainable travel choices will lead to adverse environmental and health effects.
NoRW5 Hobsonville Road	Intermittent facilities including shared paths, no facilities and mixed on road bike lanes, buffered cycle lanes and footpaths in local centre and recently developed areas.	Hobsonville Town Centre Westgate Metropolitan Centre Hobsonville Point Secondary School	<p>Access to employment and social amenities will be compromised, especially for immediately adjacent land uses. Hobsonville Road provides a core east west spine through Hobsonville and West Harbour. This includes connections to the Hobsonville town centre and Westgate Metropolitan centre including employment opportunities and local amenities.</p> <p>The Brigham Creek corridor provides intermittent facilities, with a range of level of service for pedestrians and cyclists. This includes shared paths, on road bike lanes and footpaths. This varying provision of facilities provides an inconsistent journey experience and is unlikely to encourage less experienced people to travel by bike or foot.</p> <p>Poor integration with the proposed future wider walking and cycling network.</p> <p>The ability to contribute to mode shift will be severely compromised if key walking and cycling facilities are not provided. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p> <p>Significantly increase the crash exposure for vulnerable road users as demand increases</p> <p>Significantly increase the risk for DSI's for vulnerable users</p>
NoR RE1: Don Buck Road FTN Upgrade	Intermittent facilities including shared paths, no facilities and mixed on road bike lanes, buffered cycle lanes and footpaths in local centre and	Westgate Metropolitan Centre Massey Local Centre Massey High School Massey Community centre	<p>Access to employment and social amenities will be compromised, especially for immediately adjacent land uses. Don Buck Road provides a north-west spine connecting Massey and Westgate.</p> <p>The Don Buck Road corridor provides intermittent facilities, with a range of level of service for pedestrians and cyclists. This includes shared paths, on road bike lanes and footpaths. This varying provision of facilities provides an inconsistent journey experience and is unlikely to encourage less experienced people to travel by bike or foot.</p> <p>Without the Project the ability to contribute to mode shift will be severely compromised. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p>

NOR Corridor	Existing	Key Attractors	Assessment of Walking and Cycling Outcomes without the NOR
	recently developed areas.		<p>Significantly increase the crash exposure for vulnerable road users as demand increases</p> <p>Significantly increase the risk for DSI's for vulnerable users</p>
NoR RE2: Fred Taylor Drive	Intermittent facilities including shared paths, no facilities and mixed on road bike lanes, buffered cycle lanes and footpaths in local centre and recently developed areas.	<p>Westgate Metropolitan centre</p> <p>Connections to future RTN</p>	<p>Access to employment and social amenities will be compromised, especially for immediately adjacent land uses. Fred Taylor Drove provides a north south spine connecting to Westgate.</p> <p>The Fred Taylor Drive corridor provides intermittent facilities, with a range of level of service for pedestrians and cyclists. This includes shared paths, on road bike lanes and footpaths, and a section of separated facilities. This varying provision of facilities provides an inconsistent journey experience and is unlikely to encourage less experienced people to travel by bike or foot.</p> <p>Without the Project the ability to contribute to mode shift will be severely compromised. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p> <p>Significantly increase the crash exposure for vulnerable road users as demand increases</p> <p>Significantly increase the risk for DSI's for vulnerable users</p>
NoR R1 Coatesville Riverhead Highway	No facilities	<p>Riverhead Local centre</p> <p>Connections to Regional Active Mode Corridor</p> <p>Westgate Metropolitan centre</p>	<p>Coatesville- Riverhead Highway currently has no walking cycling facilities in place. Without this NOR there will be limited options for connectivity between Riverhead and Westgate.</p> <p>This will result in the ability to contribute to mode shift being severely compromised. This will then lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p> <p>In addition, there will be a significant increase in the crash exposure for vulnerable road users as demand increases which will also significantly increase the risk for DSI's for vulnerable users. This is particularly critical for Coatesville Riverhead Highway as a large section of the corridor is proposed to be retained as rural land. This land use will result in a lower opportunity for a legible safer speed</p>

NOR Corridor	Existing	Key Attractors	Assessment of Walking and Cycling Outcomes without the NOR
			environment. Therefore, the provision of a dedicated separated facility for walking and cycling is critical on this corridor.
NoR1: Redhills North-South Arterial Corridor	New Corridor	New Redhills Local Centre Westgate Metropolitan centre	<p>Without this corridor increasing pressure will be placed on Don Buck Road and Fred Taylor Drive. Discussions on these corridors are summarised above.</p> <p>Without this corridor access to employment and social amenities will be compromised, especially for immediately adjacent land uses and connections through to Westgate and the existing local centre on Don Buck Road.</p> <p>Without the Project the ability to contribute to mode shift will be compromised. Without a direct and legible arterial network, the collector network will be relied upon to provide walking and cycling connections. These will be less direct and will have competing demands in terms of access and through movements. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p>
NoR2a: Redhills East- West Arterial Corridor – Dunlop Road	New Corridor	New Redhills Local Centre Westgate Metropolitan centre	<p>Without this corridor increasing pressure will be placed on Don Buck Road and Fred Taylor Drive. Discussions on these corridors are summarised above.</p> <p>Without this corridor access to employment and social amenities will be compromised, especially for immediately adjacent land uses and connections through to Westgate.</p> <p>Without the Project the ability to contribute to mode shift will be compromised. Without a direct and legible arterial network, the collector network will be relied upon to provide walking and cycling connections. These will be less direct and will have competing demands in terms of access and through movements. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p>
NoR2b Redhills East – West Arterial Corridor -Baker Lane	New Corridor	New Redhills Local Centre	Without this corridor increasing pressure will be placed on Don Buck Road and Fred Taylor Drive. Discussions on these corridors are summarised above.

NOR Corridor	Existing	Key Attractors	Assessment of Walking and Cycling Outcomes without the NOR
		Westgate Metropolitan centre	<p>Without this corridor access to employment and social amenities will be compromised, especially for immediately adjacent land uses and connections through to Westgate.</p> <p>Without the Project the ability to contribute to mode shift will be compromised. Without a direct and legible arterial network, the collector network will be relied upon to provide walking and cycling connections. These will be less direct and will have competing demands in terms of access and through movements. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p>
NoR2c Redhill East-West Arterial Corridor Nixon Road connection	New Corridor	New Redhills Local Centre Westgate Metropolitan centre	<p>Without this corridor increasing pressure will be placed on Don Buck Road and Fred Taylor Drive. Discussions on these corridors are summarised above.</p> <p>Without this corridor access to employment and social amenities will be compromised, especially for immediately adjacent land uses and connections through to Westgate.</p> <p>Without the Project the ability to contribute to mode shift will be compromised. Without a direct and legible arterial network, the collector network will be relied upon to provide walking and cycling connections. These will be less direct and will have competing demands in terms of access and through movements. This will lead to further reliance on low-occupancy vehicle use, further exacerbating congestion and safety issues both locally and on the wider network.</p>

3.4 Public Transport

In addition to the Rapid Transit Corridor Project, the North West packages also include four NORs for arterial corridor projects which propose the inclusion of public transport priority measures. These separate arterial corridors are:

- Don Buck Road
- Fred Taylor Drive
- Māmari Road
- Hobsonville Road

It is noted that exact operating strategies will be confirmed in the future prior to implementation, and opportunities for priority lanes that incorporate measures for other modes such as freight and transit lanes could also be considered. This will also consider operational timing requirements such as peak hours and shoulder times or all-day bus lanes.

An assessment of the public transport effects with, and without, each of these projects is set out below.

Table 3-6: Public Transport Effects by NOR without the Project in Place

NOR	Proposed PT Measures	Assessment of PT Priority Provision
NoRS3: Rapid Transit Corridor	<p>Dedicated rapid transit corridor from Brigham Creek to Huapai.</p> <p>A bus every two minutes</p>	<p>The Rapid Transit Corridor is designed to provide a reliable, high-capacity transit option to support the growth in the Kumeū-Huapai.</p> <p>The corridor as proposed will integrate the Rapid Transit Corridor along SH16 and will provide a journey time of 61 minutes from the Kumeū to the City Centre with the NOR in place, when compared to 78 minutes without the NOR. It is noted that the without NOR scenario assumes the SH16 Rapid Transit Corridor is in place. Therefore the travel time savings as noted here relate only to the proposed NOR corridor from Westgate to the Kumeū-Huapai.</p> <p>Without this Project, public transport is extremely poor and subject to congestion. Current conditions indicate that travel time can vary between 16 minutes and upwards of 40 minutes to reach Westgate from Huapai. With no dedicated bus priority, buses will continue to experience the same levels of delay and inconsistency in travel time as private vehicles, in conditions along SH16 that are expected to deteriorate without the Rapid Transit Corridor NOR.</p> <p>Page 85 and 86 of the Strategic Assessment of Transport Effects provides an overview of the expected public transport demands from the North West growth area. The expected demands indicate that a double decker bus every two minutes is necessary to accommodate demand.</p>

NOR	Proposed PT Measures	Assessment of PT Priority Provision
		<p>In order to provide reliable and efficient public transport services in this environment dedicated corridors and stations are required. Without the Rapid Transit Corridor and associated stations, patronage will not reach expected levels as service levels will be unattractive and commuters will continue to travel by private vehicle.</p>
<p>NoRW2: Māmari Road</p>	<p>Dedicated Bus Lanes</p> <p>A bus every five minutes in peak commuter period</p>	<p>The Māmari Road corridor is proposed to provide bus lanes in both directions. Traffic volumes on this corridor are in the order of 16,900 vehicles per day, or 1,690 vehicles in the commuter peak. Vehicle volumes of 1,690 per hour are in the upper region of a two-lane corridor, and without dedicated bus lanes buses will need to navigate traffic, turning movements and re-entering into the traffic at stops for boarding and alighting.</p> <p>This indicates a north-south demand on arterial roads of around 28,000 vehicles per day. Without the Māmari Road corridor, all vehicles and public transport would need to travel on Trig Road. A daily volume of 28,000 vehicles, far exceeds the capacity of Trig Road as a two-lane urban road. It is also noted that Trig Road provides north-south vehicle capacity and carries in the order of 13,800 vehicles per day.</p> <p>The provision of bus lanes on Māmari Road also provides reduced travel distance for buses linking Whenuapai to Westgate centre and connecting to the future RTN station at Westgate. In the longer-term buses will be able to access Westgate station via Northside Drive – providing a congestion free connection from Brigham Creek Road through to Westgate. Without Mamari Road, buses from Whenuapai town centre would need to travel via Brigham Creek interchange and Fred Taylor Drive – a distance of some 4.3km compared to the 2.9km along Māmari Road and Northside Drive.</p>
<p>NoRW5 Hobsonville Road</p>	<p>Intersection Improvements</p> <p>Bus lanes between SH16 and Luckens Road</p> <p>Bus every 10 to 12 mins in the peak commute period</p>	<p>Bus lanes have been proposed on Hobsonville Road between SH16 and Luckens Road to provide buses with additional capacity and reliability. Traffic volumes on the section of Hobsonville Road between Luckens Road and SH16 are expected to be some 2,000 vehicles an hour. Without the NOR in place buses would experience significant delays, as this exceeds the typical capacity of a two-lane road.</p> <p>Without the specific public transport interventions in NOW5, buses will need to navigate traffic and also re-enter traffic following boarding and alighting. These</p>

NOR	Proposed PT Measures	Assessment of PT Priority Provision
		<p>movements are difficult on a heavily trafficked route and will also impact on vehicle movements along the corridor.</p> <p>Within the remainder of the corridor, bus advance lanes have been allowed for within the footprint designs to enable buses to move quickly through signals – further increasing attractiveness of public transport travel.</p> <p>Reliable connectivity to the Westgate centre and the rapid transit network stations in the future provides an attractive transport choice for North West commuters. Without priority measures, commuters will find limited value in travelling by public transport.</p>
NoR RE1: Don Buck Road FTN Upgrade	Bus Lanes Bus every five minutes in the peak commuter period	<p>Don Buck Road is currently a heavily trafficked route, and will continue to carry high traffic volumes in the future. Traffic volumes are expected to be in the region of 25,000 vehicles per day. This hourly volume is approximately 2,500 vehicles per hour which exceeds the vehicle capacity of a two-lane road. .</p> <p>The provision of bus lanes will enable higher frequency public transport services to operate with a high degree of reliability. Without the NOR proposed bus lanes, public transport will be subject to congestion, unreliable journey times and poor levels of service.</p> <p>As noted above, there is future opportunity for Auckland Transport to consider operational measures to provide the most efficient use of the four-lane corridor. This could include reduced bus priority to enable transit lanes, or peak period bus lanes only. These are matters that would be considered as part of standard network management undertaken by Auckland Transport.</p>
NoR RE2: Fred Taylor Drive	Bus Lanes Bus every five minutes in the peak commuter period	<p>Bus lanes are proposed to be provided on Fred Taylor Drive. The provision of dedicated and reliable access for local services to the Westgate Metropolitan Centre and the proposed rapid transit network station is critical to support wider public transport objectives related to mode shift.</p> <p>Fred Taylor Drive is expected to carry between 15,000 and 22,000 vehicles per day. These daily volumes indicate peak volumes of between 1,500 and 2,200 vehicles per hour.</p> <p>Vehicle volumes of this magnitude are in the upper region of a two-lane corridor, and without the NOR in place, buses will need to navigate traffic, turning movements and re-entering into the traffic at stops for boarding and</p>

NOR	Proposed PT Measures	Assessment of PT Priority Provision
		alighting. This will have an impact on bus reliability and travel times.

4 Project Interdependencies and Relationships

Further information has been requested on the interdependencies of the Projects. As discussed above, it is noted that the approach to the North West NOR packages is founded on the development of an integrated network within the framework of full growth implementation. The subsequent transport infrastructure required to support this growth in a manner consistent with current policy direction has been identified and does by nature of considering an integrated network, result in various inter-relationships and inter-dependencies.

There are both inter-dependencies and the uncertainty in terms of delivery and staging, of both the land use release and associated infrastructure, over the proposed lapse dates for the NOR packages. Therefore, there is a degree of reliance on management plans to enable Projects to be provided in a manner that will be integrated with the surrounding transport network and land use present at the time of implementation.

This is overarched by the statutory requirements of both Auckland Transport and Waka Kotahi NZ Transport Agency (Waka Kotahi) to contribute to *an effective, efficient, and safe (Auckland) land transport system in the public interest*.⁶ This requirement will extend to the integration of the identified NORs/Projects with the surrounding transport network in the future environment context.

As such, whilst recognising there is this uncertainty / risk with the long-term timeframe for some of the NORs / Projects, it is considered that the proposed conditions and statutory requirements, supported by other internal processes (such as the requirement for an Implementation Business Case) that apply to Auckland Transport and Waka Kotahi will enable the effects to be further considered and addressed prior to implementation.

In addition to this, it is also noted that the designs currently used to inform the designation footprints are considered to be an indicative design, that can be altered to some degree in the future prior to implementation to enable the Projects to be integrated with the surrounding road network. This approach is managed by the proposed Urban Design and Landscape Management Plan condition (Refer to Section 7 below).

Specific details on the inter-dependencies of Projects by mode has been included in the above tables and also generally within the Assessment of Transport Effects for each of the NOR Packages. The table below provides details on how these inter-dependencies can be effectively managed.

⁶ <https://www.legislation.govt.nz/act/public/2003/0118/latest/DLM226236.html> and <https://www.legislation.govt.nz/act/public/2009/0032/latest/DLM2322355.html>

NOR Corridor	Inter-dependencies / relationships	Management of Interdependencies
NoRS1: Alternative State Highway	SH16 Main Road Rapid Transit Corridor (and Regional Active Modes Corridor) Access Road Upgrade SH16 to SH18 Connections Project	<p><u>Within NORs</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations to enable intersection upgrades to be implemented regardless of staging – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment – Access Road Upgrade designation extent provides for flexibility in relation to the implementation timing of the ASH, as discussed in the Assessment of Transport Effects. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport and Waka Kotahi statutory requirements – Implementation Business Case to confirm Project outcomes – One Network reassessment and Integration with the Network Operating Plan as per standard procedures by Auckland Transport and Waka Kotahi – Detailed Design commensurate with implementation works – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
No2S2: SH16 Main Road	Alternative State Highway Rapid Transit Corridor (and Regional Active Modes Corridor) (and NoRKS and NoRHS: the Kumeū and Huapai Stations) Access Road Upgrade	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations to enable intersection upgrades to be implemented regardless of staging – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport and Waka Kotahi statutory requirements – Implementation Business Case to confirm Project outcomes – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoRS3: Rapid Transit Corridor (and NoRKS and NoRHS: the	Alternative State Highway and SH16 Main Road Access Road	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations to enable intersection upgrades to be implemented regardless of staging

NOR Corridor	Inter-dependencies / relationships	Management of Interdependencies
Kumeū and Huapai Stations)	North West Rapid Transit Corridor Full Implementation (City Centre to Westgate)	<ul style="list-style-type: none"> – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Waka Kotahi statutory requirements – Implementation Business Case to confirm Project outcomes – Detailed Design commensurate with implementation works – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoRS4: Access Road	Alternative State Highway SH16 Main Road	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations to enable intersection upgrades to be implemented regardless of staging – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Implementation Business Case to confirm Project outcomes – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoRW1: Trig Road North and NoR: HIF Trig Road	Māmari Road Brigham Creek Road Hobsonville Road	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations at Trig Road/Brigham Creek Road to enable intersection upgrades to be implemented regardless of staging – Hobsonville Road/Trig Road intersection to be included as part of Trig Road works. Design tie ins to be provided at midblock locations – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice at Implementation</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Implementation Business Case to confirm Project outcomes – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport

NOR Corridor	Inter-dependencies / relationships	Management of Interdependencies
		<ul style="list-style-type: none"> – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoRW2: Māmari Road	Trig Road Brigham Creek Road SH16 to SH18 Connections Project	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations at Brigham Creek and Māmari Road to enable intersection upgrades to be implemented regardless of staging – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Implementation Business Case to confirm Project outcomes – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoRW3: Brigham Creek Road	Spedding Road SH16 to SH18 Connections Project	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations to enable intersection upgrades to be implemented regardless of staging. – Designation footprint sufficient to enable connection with SH18 interchange upgrades or enable Brigham Creek Upgrade and future interchange upgrades. – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. This is considered to be particularly relevant on this corridor as development pressure is current and ongoing. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Implementation Business Case to confirm Project outcomes – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.

NOR Corridor	Inter-dependencies / relationships	Management of Interdependencies
NoRW4: Spedding Road	Brigham Creek Road Hobsonville Road	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations at Fred Taylor Drive and Hobsonville Road to enable intersection upgrades to be implemented regardless of staging. – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. Elements of this corridor are proposed to be partially delivered by developers as part of PC69. There is also a section of the corridor between SH18 and Hobsonville Road that has been set aside by developers. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Implementation Business Case to confirm Project outcomes – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoRW5 Hobsonville Road NoR: HIF Trig Road	Spedding Road Trig Road	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations to enable intersection upgrades to be implemented regardless of staging. In the case of Hobsonville Road this means that should new intersections be made, appropriate tie ins can be provided. – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Implementation Business Case to confirm Project outcomes – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoR RE1: Don Buck Road FTN Upgrade	Fred Taylor Drive Intersection	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations to enable intersection upgrades to be implemented regardless of

NOR Corridor	Inter-dependencies / relationships	Management of Interdependencies
	North South Arterial Redhills	<p>staging. This includes the intersection of Don Buck Road with Fred Taylor Drive and with Royal Road.</p> <ul style="list-style-type: none"> – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Implementation Business Case to confirm Project outcomes – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoR RE2: Fred Taylor Drive	Spedding Road intersection East West Arterial Redhills (Baker Lane) East West Arterial Redhills (Dunlop Road)	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations to enable intersection upgrades to be implemented regardless of staging. This includes with Dunlop Road, Baker Lane, Spedding Road. – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Implementation Business Case to confirm Project outcomes – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoR R1 Coatesville Riverhead Highway	SH16 Brigham Creek to Waimauku Improvements Project	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Design completed to integrate with Waka Kotahi SH16 Brigham Creek to Waimauku Improvements Project. Overlapping designation not provided, as works on SH16 not within Project scope. – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. This will consider walking and cycling connectivity in the case that the intersection upgrades do not proceed the Project as expected.

NOR Corridor	Inter-dependencies / relationships	Management of Interdependencies
		<p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Implementation Business Case to confirm Project outcomes – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoR1: Redhills North-South Arterial Corridor	Don Buck Road East West Arterial Redhills (All sections)	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations to enable intersection upgrades to be implemented regardless of staging. This includes the intersection of Royal Road and Don Buck Road. – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoR2a: Redhills East- West Arterial Corridor – Dunlop Road	Fred Taylor Drive Don Buck Road	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> – Overlapping intersection designations at Fred Taylor Drive to enable intersection upgrades to be implemented regardless of staging. – Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> – Auckland Transport statutory requirements – Roads and Streets Framework and One Network reassessment to confirm modal priority – Integration with the Network Operating Plan as per standard procedures by Auckland Transport – Detailed Design commensurate with implementation works. – Road Safety Audits to ensure appropriate and safe tie ins for all modes.

NOR Corridor	Inter-dependencies / relationships	Management of Interdependencies
NoR2b Redhills East – West Arterial Corridor - Baker Lane	Fred Taylor Drive East – West Arterial (Dunlop Road) East- West Arterial Corridor (Nixon Road connection)	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> Overlapping intersection designations at Fred Taylor Drive to enable intersection upgrades to be implemented regardless of staging. Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> Auckland Transport statutory requirements Roads and Streets Framework and One Network reassessment to confirm modal priority Integration with the Network Operating Plan as per standard procedures by Auckland Transport Detailed Design commensurate with implementation works. Road Safety Audits to ensure appropriate and safe tie ins for all modes.
NoR2c Redhill East- West Arterial Corridor Nixon Road connection	Fred Taylor Drive East West Arterial (Baker Lane) East – West Arterial (Dunlop Road)	<p><u>Within NOR</u></p> <ul style="list-style-type: none"> Overlapping intersection designations not provided for this corridor. Condition 10: UDLMP covering integration of the Project with the transport and urban (future urban) environment. <p><u>Standard Practice</u></p> <ul style="list-style-type: none"> Auckland Transport statutory requirements Roads and Streets Framework and One Network reassessment to confirm modal priority Integration with the Network Operating Plan as per standard procedures by Auckland Transport Detailed Design commensurate with implementation works. Road Safety Audits to ensure appropriate and safe tie ins for all modes.

5 Auckland Unitary Plan Assessment

An assessment against the key Objectives and Policies of the AUP:OP has been provided in Section 29 of the NW Local Arterial Package, Section 28 of the NW Strategic Package and Appendix B to the AEEs for HIF Trig Road and HIF Redhills Arterials. We provide a further assessment to the specific Chapter E27 Objectives below, as requested.

AUP:OP Objective Ref.	Objective	Assessment
E27.2(3)	Parking and loading supports urban growth	The approach to parking on the arterial corridors will be considered at the detailed design stage. Parking provision will

AUP:OP Objective Ref.	Objective	Assessment
	and the quality compact urban form	be in line with the Auckland Transport Parking Strategy and Auckland Unitary Plan requirements at the time of implementation.
E27.2(4)	The provision of safe and efficient parking, loading and access is commensurate with the character, scale and intensity of the zone	The approach to parking will be considered at the detailed design stage and will be in line with the Auckland Transport Parking Strategy and Auckland Unitary Plan requirements at the time of implementation.
E27.2(5)	Pedestrian safety and amenity along public footpaths is prioritised.	An objective for all NoRs is to support a safe transport network for all users. All corridors provide active mode facilities which will meet Auckland Transport and Waka Kotahi design requirements at the time of implementation in accordance with the Urban and Landscape Design Management Plan condition.
E27.2(6)	Road/rail crossings operate safely with neighbouring land use and development.	There is sufficient footprint within the Rapid Transit Corridor designation to replace existing level crossings on Matua Rd West and Boord Crescent with bridges. Where the NoR crosses the North Auckland Line, level crossings are not proposed in the indicative design in order to support safety outcomes.

6 Construction Traffic Management

Further information was requested in relation to the effects of the staging and timing of construction of the Strategic Package.

The Construction Traffic Management Plans (CTMPs), required to be prepared for the construction phase, will consider the detailed mitigation measures to manage construction traffic. The CTMPs will extend over the full construction period of any of the proposed Projects and will be prepared and approved prior to construction. These CTMPs will identify any adverse effects and mitigation measures required for each stage with a greater level of detail. Most critically, the CTMPs will be based on the prevailing context during construction, including traffic patterns, bus services, adjacent land use changes, impacts of wider projects and policies and the specific construction methodology.

It is considered that preparing detailed mitigation measures now would be speculative and potentially inaccurate as we do not have sufficient certainty in regard to the construction methodology and future transport environment (during construction phase, i.e. approximately 15 years from now). It is noted that the proposed approach of confirming specific mitigations for each stage of works at the time of implementation has been utilised successfully in multiple large projects including Ara Tuhono – Puhoi to Warkworth, SH20 Waterview Tunnel and the Northern Corridor project.

Mitigation measures such as behavioural change mechanisms and travel planning measures are likely to be necessary and, if required, will be part of future CTMPs. Identifying mitigation measures

for the construction phase now could potentially limit other mitigation methods that may be considered / available in the future.

The Construction Traffic Management Plan condition (refer to Section 7 below) records these requirements, including a very clearly stated objective to avoid, remedy or mitigate, as far as is practical, the effects of construction. As such, we do not consider that additional analysis is required at this stage to understand how the construction effects would be managed via the Conditions.

7 Proposed Conditions

The following conditions have been proposed.

Condition 10: Urban and Landscape Design Management Plan (ULDMP)

- a) A ULDMP shall be prepared prior to the Start of Construction for a Stage of Work.
- b) Mana Whenua shall be invited to participate in the development of the ULDMP(s) to provide input into relevant cultural landscape and design matters including how desired outcomes for management of potential effects on cultural sites, landscapes and values identified and discussed in accordance with Condition 8(c) may be reflected in the ULDMP. The objective of the ULDMP(s) is to:
 - i. Integration of the Project's permanent works into the surrounding landscape and urban context; and
 - ii. Ensure that the Project manages potential adverse landscape and visual effects as far as practicable and contributes to a quality urban environment.
- c) The ULDMP shall be prepared in general accordance with:
 - i. Waka Kotahi Urban Design Guidelines: Bridging the Gap (2013) or any subsequent updated version;
 - ii. Waka Kotahi Landscape Guidelines (2013) or any subsequent updated version;
 - iii. Waka Kotahi P39 Standard Specification for Highway Landscape Treatments (2013) or any subsequent updated version; and
- d) To achieve the objective, the ULDMP(s) shall provide details of how the project:
 - i. Is designed to integrate with the adjacent urban (or proposed urban) and landscape context, including the surrounding existing or proposed topography, urban environment (i.e. centres and density of built form), natural environment, landscape character and open space zones (including Fred Taylor Park);
 - ii. Provides appropriate walking and cycling connectivity to, and interfaces with, existing or proposed adjacent land uses, public transport infrastructure and walking and cycling connections;
 - iii. Promotes inclusive access (where appropriate); and
 - iv. Promotes a sense of personal safety by aligning with best practice guidelines, such as:
 - a. Crime Prevention Through Environmental Design (CPTED) principles;
 - b. Safety in Design (SID) requirements; and
 - c. Maintenance in Design (MID) requirements and anti-vandalism / anti-graffiti measures.
- e) The ULDMP(s) shall include:

- i. a concept plan – which depicts the overall landscape and urban design concept, and explain the rationale for the landscape and urban design proposals;
 - ii. developed design concepts, including principles for walking and cycling facilities and public transport; and
 - iii. landscape and urban design details – that cover the following:
 - a. Road design – elements such as intersection form, carriageway gradient and associated earthworks contouring including cut and fill batters and the interface with adjacent land uses, benching, spoil disposal sites, median width and treatment, roadside width and treatment;
 - b. Roadside elements – such as lighting, fencing, wayfinding and signage;
 - c. Architectural and landscape treatment of all major structures, including bridges and retaining walls;
 - d. Architectural and landscape treatment of noise barriers;
 - e. Landscape treatment of permanent stormwater control wetlands and swales;
 - f. Integration of passenger transport;
 - g. Pedestrian and cycle facilities including paths, road crossings and dedicated pedestrian / cycle bridges or underpasses;
 - h. Historic heritage places with reference to the HHMP;
 - i. Reinstatement of construction and site compound areas, driveways, accessways and fences;
- f) The ULDMP shall also include the following planting details and maintenance requirements:
- i. planting design details including:
 - a. identification of existing trees and vegetation that will be retained with reference to the Tree Management Plan and Ecological Management Plan. Where practicable, mature trees and native vegetation should be retained;
 - b. street trees, shrubs and ground cover suitable for berms;
 - c. treatment of fill slopes to integrate with adjacent land use, streams, riparian margins and open space zones;
 - d. planting of stormwater wetlands;
 - e. identification of vegetation to be retained and any planting requirements under Conditions 23 and 24;
 - f. integration of any planting requirements required by conditions of any resource consents for the project; and
 - g. re-instatement planting of construction and site compound areas as appropriate.
 - ii. a planting programme including the staging of planting in relation to the construction programme which shall, as far as practicable, include provision for planting within each planting season following completion of works in each Stage of Work; and
 - iii. detailed specifications relating to the following:
 - a. weed control and clearance;
 - b. pest animal management (to support plant establishment);
 - c. ground preparation (top soiling and decompaction);
 - d. mulching; and
 - e. plant sourcing and planting, including hydroseeding and grassing, and use of eco-sourced species.

Condition 18: Construction Traffic Management Plan (CTMP)

- a) A CTMP shall be prepared prior to the Start of Construction for a Stage of Work.
- b) The objective of the CTMP is to avoid, remedy or mitigate, as far as practicable, adverse construction traffic effects. To achieve this objective, the CTMP shall include:
 - i. methods to manage the effects of temporary traffic management activities on traffic;
 - ii. measures to ensure the safety of all transport users;
 - iii. the estimated numbers, frequencies, routes and timing of traffic movements, including any specific non-working or non-movement hours to manage vehicular and pedestrian traffic near schools or to manage traffic congestion;
 - iv. site access routes and access points for heavy vehicles, the size and location of parking areas for plant, construction vehicles and the vehicles of workers and visitors;
 - v. identification of detour routes and other methods to ensure the safe management and maintenance of traffic flows, including pedestrians and cyclists, on existing roads;
 - vi. methods to maintain vehicle access to property and / or private roads where practicable, or to provide alternative access arrangements when it will not be;
 - vii. the management approach to loads on heavy vehicles, including covering loads of fine material, the use of wheel-wash facilities at site exit points and the timely removal of any material deposited or spilled on public roads; and
 - viii. methods that will be undertaken to communicate traffic management measures to affected road users (e.g. residents / public / stakeholders / emergency services).
 - ix. Auditing, monitoring and reporting requirements relating to traffic management activities shall be undertaken in accordance with the Waka Kotahi Code of Practice for Temporary Traffic Management.