

Fisher & Paykel Healthcare Structure Plan/Private Plan Change, Karaka Integrated Transport Assessment



19 June 2024

Ref: 310205559

PREPARED FOR:

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Revision Schedule

Revision No.	Date	Description	Prepared by	Quality Reviewer	Project Manager Final Approval
1	6 May 2024	Draft	AS	TLJ/DH	TLJ
2	19 June 2024	Final	AS	TLJ/DH	TLJ

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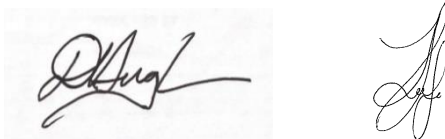


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Executive Summary

This Integrated Transportation Assessment (**ITA**) has been prepared by Stantec for Fisher & Paykel Healthcare Properties Limited (**FPHL**) to support a Structure Plan application for 105ha for a change to the anticipated land use as suitable for Business – Light Industry, as well as a Private Plan Change (**PPC**) application to rezone approximately 86.5ha hectares of the Structure Plan area from Future Urban Zone (**FUZ**) to Business – Light Industry zone, along Karaka Road, in Drury West.

The Structure Plan area (**the SP site**) encompasses the full FPHL landholding, which is bound by Karaka Road (also State Highway 22 (**SH22**)) to the north, the North Island Main Truck Railway Line (**NIMTRL**) to the south, Oira Creek to the west and a private landholding to the west. Being located 40km south of the Auckland Central Business District, 5km west of the Planned Drury Metropolitan Centre and 12km north of Pukekohe, the SP site is strategically located in an area of fringe urban growth where significant development is expected to occur. The SP site comprises approximately 105 Ha of predominantly FUZ land located inside the Rural Urban Boundary (**RUB**), with a triangle section in the Southwest currently zoned Rural – Mixed Rural Zone, and located outside the RUB.

The current (August 2019) Auckland Council Structure Plan for Drury – Opāheke includes the FUZ area of the SP site and anticipates residential development in the form of Mixed Housing Urban and Mixed Housing Suburban zones for this FUZ area, therefore this ITA assesses the suitability and transportation effects of instead providing for light industry employment activities on the SP site. This ITA also assesses the effect of the PPC request, to rezone the FUZ portion of the SP site, to Business – Light Industry zoning under the Auckland Unitary Plan (**AUP**).

The transportation aspects of the long-term development proposed by FPHL within the SP site have been assessed alongside other technical disciplines, such as land use planning, economics and urban design. The project's expert team understand how the SP site can be sustainably designed and delivered, and from a transport perspective, the following ITA demonstrates how the existing and planned infrastructure including enhanced public transport features can readily and efficiently contribute to the future employment and business outcomes for this area of South Auckland.

The SP site is strategically well-located approximately 300m from the proposed future Ngākōroa (Drury West) Train Station, alongside SH22, less than 3km from the State Highway 1 (**SH1**) motorway interchange, and in an area of Auckland where significant residential growth is projected. As such, the long-term development of the SP site provides opportunity to integrate with the planned future urban environment and provide significant local and regional employment opportunities while achieving strategic transport policy outcomes.

Residential subdivisions are currently being developed in Paerata, Pukekohe and Drury West, while a new metropolitan centre and transit-oriented development is planned for the Drury East area, east of SH1. The transport upgrades and provisions identified in this ITA in support of the PPC request, align and integrate with these wider developments and the planned transport upgrades.

Traffic modelling has established that, whilst the SP site will be well placed to take advantage of the excellent connections to public transport and active mode facilities, vehicular traffic volumes can also be accommodated by the proposed access intersections onto SH22 and the wider regional transport network. As such, from a transportation perspective, the proposed structure plan and PPC is acceptable and appropriate.



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Appendix A Crash Analysis System Outputs



1. Introduction

FPHL has engaged Stantec to provide an Integrated Transport Assessment to accompany the proposed Karaka Road Structure Plan and PPC requests to facilitate the relevant rezoning and development of its Karaka Road site.

The SP site is bound by SH22 to the north and the NIMTRL to the south. The SP site encompasses the properties at 300, 328, 350, 370 and 458 Karaka Road. The proposed SP site comprises approximately 105 Ha of FUZ and Rural – Mixed Rural Zoned land in Drury West. The FUZ portion of the land is sought to be rezoned to Business – Light Industry Zoning under the AUP, to allow for the development of FPHL's second New Zealand campus with a mix of office and industrial (research and development, warehousing, manufacturing and distribution) activities proposed. The SP site is envisaged to be an employment hub within the region providing employment opportunities for the local and wider Auckland area, as well as further afield.

The current (August 2019) Auckland Council Structure Plan for Drury – Opāheke includes the FUZ area of the SP site and anticipates residential development in the form of Mixed Housing Urban and Mixed Housing Suburban, therefore this ITA assesses the suitability and transportation effects of instead providing for employment activities on the SP site. Auckland Council's Future Development Strategy 2023-2053 (**FDS**) identifies the FUZ portion of the SP site as being scheduled for development from 2035+, however infrastructure prerequisites required to support development readiness and bring rezoning of FUZ land forward are specified in the FDS. This ITA also assesses the effect of the PPC application to rezone the FUZ section of land to Business – Light Industry Zoning under the AUP.

As such, the purpose of this ITA in support of the Structure Plan and PPC request, is to assess the land use / transportation implications of the proposed re-zoning and subsequent development of the site, and provide strategic direction for the transport network within the development and its interface with the surrounds, and recommend measures to avoid, remedy or mitigate adverse transportation effects. This report will:

- Describe the existing transportation environment in terms of road networks, traffic volumes, walking and cycling networks, and public transport services;
- Describe the future planned transport environment based on committed developments and established policy objectives;
- Describe the transportation characteristics of the indicative development and integration with the surrounding network;
- Predict trip generation of the indicative development during the peak hours by route, to and from the site;
- Assess the expected impact of the additional trips on the transport networks under 'with development' and 'future year' scenarios;
- Define the recommended transport upgrades required to support the development; and
- Conclude on the acceptability of the development and recommend measures with regard to transport planning and engineering.

By way of summary, the outcomes from the change in land-use aligns with the transport planning and policy objectives for the SP site, and the traffic generated by the development can be accommodated by the surrounding transport network. Accordingly, there are no transportation planning or traffic engineering reasons that would preclude the proposed PPC and Structure Plan proceeding.



2. Site Location

2.1 Structure Plan Site Location

The SP site comprises approximately 105 Ha of land located within the Drury West area, 40km south of the Auckland Central Business District, 5km west of the Planned Drury Metropolitan Centre and 12km north of Pukekohe.

The SP site is bound by Karaka Road (designated SH22) to the north and the NIMTRL to the south, with Oira Creek forming the western site boundary and a private landholding forming the eastern boundary. Karaka Road currently serves as the main access to the existing activities on the site and connects with Glenbrook Road and Paerata Road to the west. SH22 connects to the SH1 interchange and Great South Road to the east providing access to the wider Auckland region and Waikato, via SH1 and the arterial road network.

Figure 2-1 and **Figure 2-2** show the SP site in the context of the immediate and wider transport networks respectively.

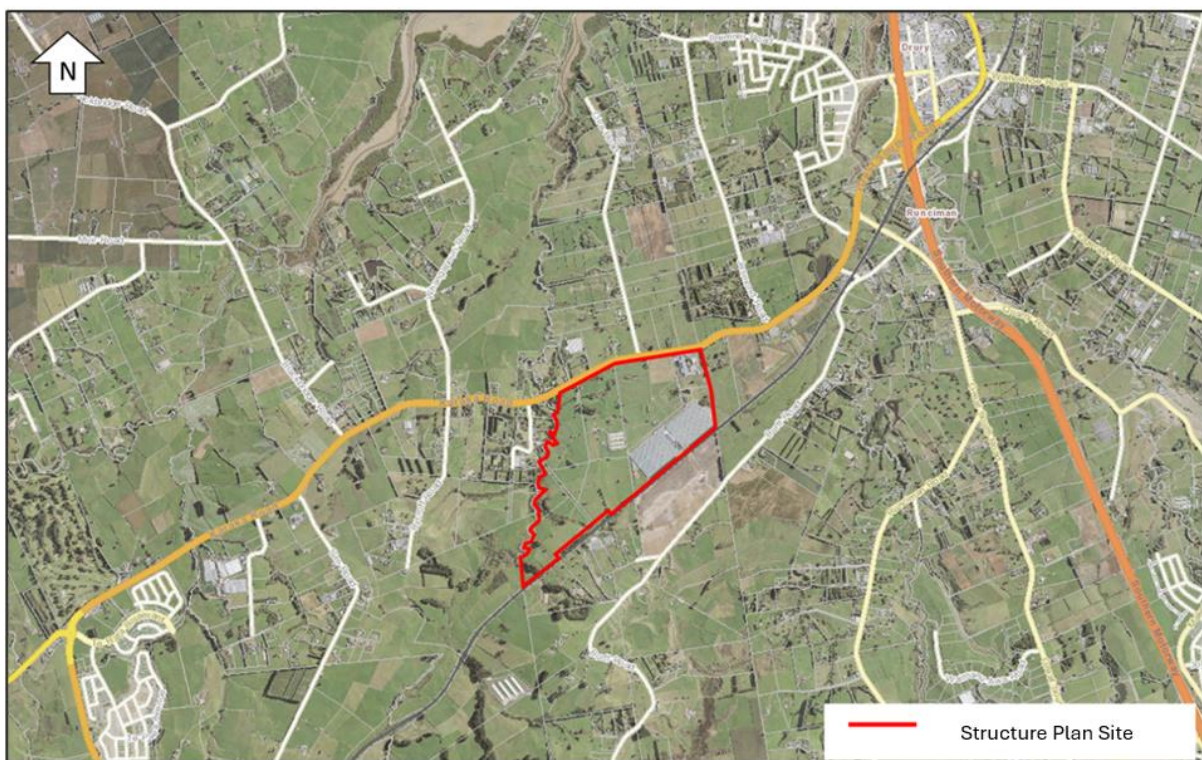


Figure 2-1: Aerial Photography¹ of site within its immediate network context

¹ Base image sourced from GeoMaps



Figure 2-2: Structure Plan site within its wider network context²

The current activity within the SP site is predominantly rural, with some business and transport/logistical activities currently operating at 300 Karaka Road. West of the site along Karaka Road, is the Paerata Rise residential subdivision which is currently being developed and seeks to establish approximately 4,500 homes by 2035. Drury East, West and South are also expected to undergo significant growth in coming years. The Waipupuke (approved PC61) subdivision immediately north of the site (across Karaka Road) is likely to also contribute an additional approx. 1,600 dwellings to the area, by 2031³.

The SP site is located in an area of Auckland that has experienced significant growth and urbanisation in recent years with several greenfield expansions scheduled for the near future. The wider Drury-Opāheke area, together with other developments in South Auckland, is expected to accommodate a significant proportion of the growth and greenfields expansion planned for Auckland.

² Base image sourced from GeoMaps

³ Commute Memo 28/03/2022 (updated Waipupuke development yields and modelling)



2.2 Existing Auckland Unitary Plan Context

The majority of the SP site is currently zoned FUZ and located inside the RUB, with a triangle in the southwest corner of the site zoned Rural - Mixed Rural under the AUP, as shown in **Figure 2-3** below.

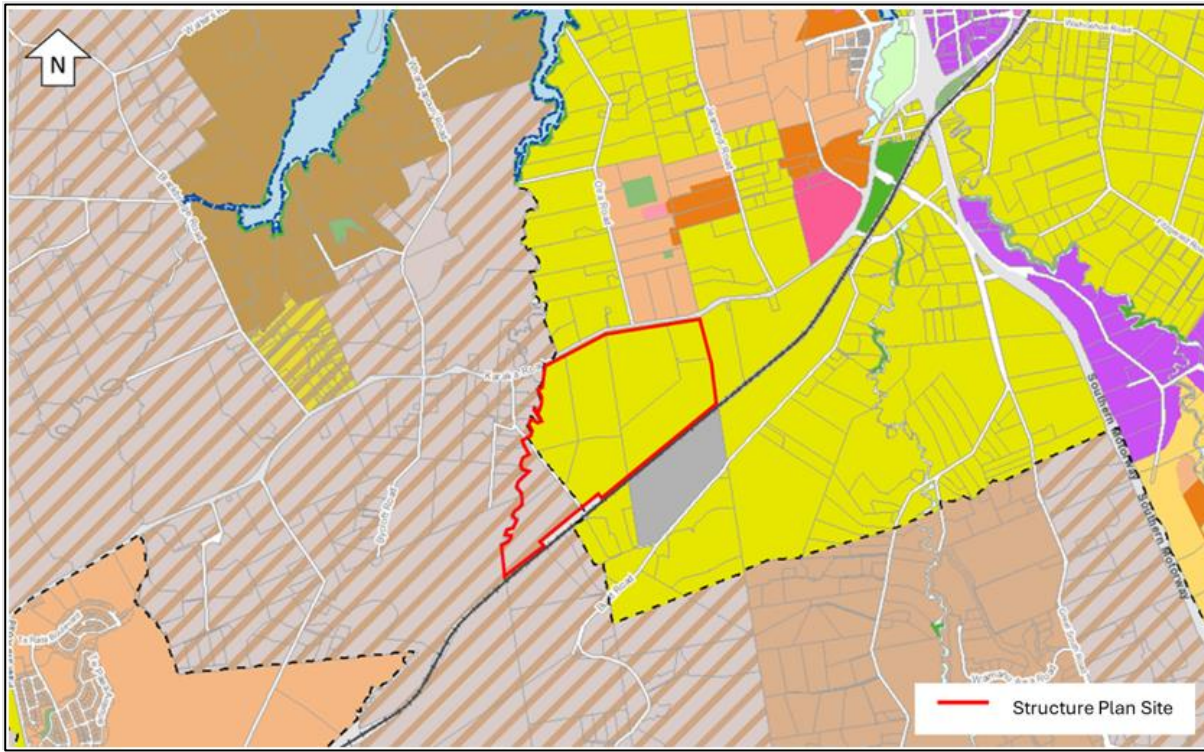


Figure 2-3: AUP Zoning for Drury West

Chapter H18 of the AUP for FUZ, describes the zone as follows:

“The Future Urban Zone is applied to greenfield land that has been identified as suitable for urbanisation. The Future Urban Zone is a transitional zone. Land may be used for a range of general rural activities but cannot be used for urban activities until the site is rezoned for urban purposes”.

The majority of the land to the north/east and east of the SP site is classified as FUZ under the AUP, with the exception of the Waipupuke Precinct, which was rezoned predominantly for residential use through the Residential – Mixed Housing Urban and Terraced Housing and Apartment Building zones under PC61 to the AUP. To the west, and within the southwest triangle for the SP site, the prevailing land use consists of Mixed Rural Zone, and the RUB runs between the portions of the SP site zoned FUZ and Rural – Mixed Rural.

2.3 Auckland Council Future Development Strategy 2023-2053

The Future Development Strategy (FDS) sets out Auckland Council’s vision for the timing and sequencing of land development over the next 30 years. It replaces the land use release timings provided in the Future Urban Land Supply Strategy (FULSS), published in July 2017. Figure 2-4 below shows the location of the SP site within the FDS timing figure⁴.

⁴ Figure 25 of the FDS.

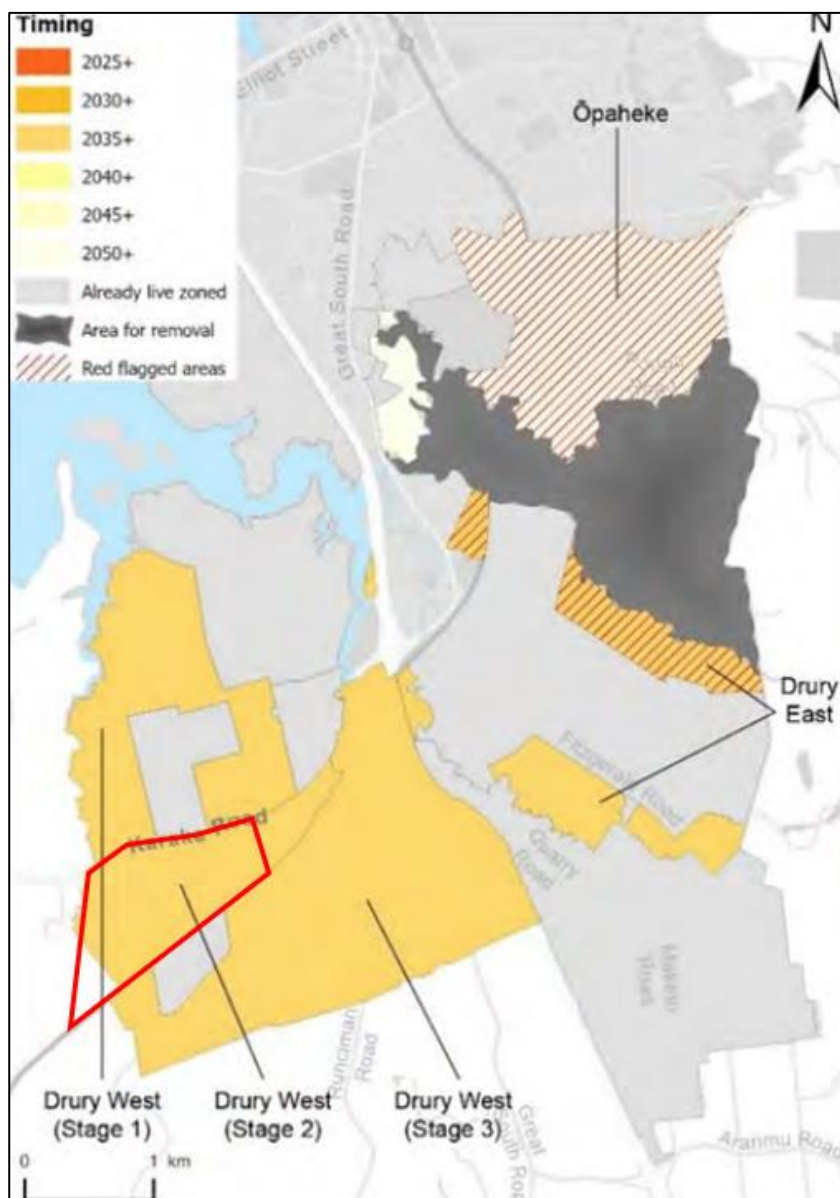


Figure 2-4: SP Site within the FDS Timing Vision

The FDS divides the Drury West area into three stages, with the SP site sitting entirely within Drury West Stage 2. Where the previous FULSS had the portion of the SP site within the FUZ being scheduled for development in the 2028-2033 time period, the FDS has now moved this expected timing into a 2035+ category. It is expected that the development within the SP site enabled by the Plan Change will be occupied in early the early 2030s, therefore this ITA assesses the effect of this out of sequence development on the FDS vision.

Appendix 6 of the FDS provides a list of infrastructure prerequisites for each of Auckland's future urban areas. **Table 2-1** below summarises the infrastructure prerequisites listed for each of the Drury West stages, and provides commentary on the funding and progress of each.

Table 2-1: Commentary on FDS Transport Upgrade Prerequisites

Drury West Stage	Transport Infrastructure Prerequisites	Comments
Stage 1	Drury Arterials	The prerequisite description is broad and is not defined within the FDS itself, however, the description within the Recommendation for the Notice of Requirement (NOR) for the Drury Arterial Network package⁵ suggests that the package represents five separate arterial upgrades. These are: 1. SH22 Upgrade (SH1 to Oira Road). This represents a duplication of the separate SH22 upgrade item. Its status is noted below. 2. Frequent Transit Network (FTN) upgrades of Jesmond Road, Norrie Road and Waihoehoe Road east. There is funding within the Roads of Regional Significance (RoRS) announced in May 2024 for the Waihoehoe Road east upgrade, but the other FTN links are not currently funded. Detailed design for the funded portion is currently being undertaken. Regardless, it is considered that the provision of FTN routes for these areas will not affect travel patterns to and from the SP site due to the distance between them and the SP site. 3. Widening of Waihoehoe Road to the east of Fitzgerald Road. It is understood that this upgrade will be provided by the Drury East Precinct developers as development progresses along Waihoehoe Road, and that detailed design for the initially required part of that upgrade is currently being undertaken. Regardless, it is considered that the provision of this upgrade will not affect travel patterns to and from the SP site due to the distance between the two. 4. The Opāheke North-South FTN Arterial between Hunua Road and Waihoehoe Road. Part of this road – minus the bus lanes but with space provided for future widening – through the Drury Waihoehoe Precinct is being provided by Waihoehoe Precinct developers, and detailed design is currently underway. Further, with the removal and red-flagging of the land areas to the north of the Waihoehoe Precinct within the FDS, the necessity and feasibility of this link is now in question. Regardless, it is considered that the provision of this upgrade will not affect travel patterns to and from the SP site due to the distance between the two. 5. Widening of Ponga Road from Opaheke Road to Jack Paterson Road to a two-lane urban arterial. The funding for this element is unknown and therefore assumed to be unfunded but it is considered that its provision will not affect travel patterns to and from the SP site due to the distance between the two.

⁵ <https://www.epa.govt.nz/assets/Uploads/Documents/Fast-track-consenting/Drury-Centre/Panel-correspondence/Attachment-B-Recommendation-on-Drury-Arterial-Network-NORS.pdf>



Drury West Stage	Transport Infrastructure Prerequisites	Comments
		In summary, some of the Drury Arterial network is funded and some is not, but it is considered that its provision is not necessary to support the development of the SP site.
	SH22 Upgrade	Up until the Government's RoRS announcement in May 2024, this upgrade was funded within the New Zealand Upgrade Programme (NZUP), and detailed design was underway. Following the RoRS announcement, it is understood that funding for this upgrade is not presently allocated, but it is expected that funding will be allocated in the near future. However, the effect of not providing this upgrade has been tested within Section 7 of this ITA, and it was found that it was not required to support the development of the SP Site.
	Papakura to Pukekohe Rail Electrification	This upgrade is fully funded within the New Zealand Upgrade Programme (NZUP), and construction works are underway,
	Ngākōroa Railway Station	This upgrade is fully funded within the New Zealand Upgrade Programme (NZUP), and detailed design is underway,
Stage 2	Drury Arterials SH22 Upgrade Ngākōroa Railway Station	As described above.
Stage 3	Drury Arterials SH22 Upgrade Ngākōroa Railway Station	As described above.
	SH1 Drury South Interchange, including connections to Drury West and Drury South	This is currently unfunded but was recently notified as an NOR. The effect of its construction has been modelled within Section 7 of this ITA.
	Great South Road Upgrade	This refers to the upgrade of the section of Great South Road on the western side of SH1, between SH22 and the proposed Drury South Interchange. It is not currently funded.

Overall, it is considered that the transport infrastructure prerequisites for the Drury West Stage 2 area within which the SP site lies are either fully funded or are not necessary to enable the development of the SP site. Accordingly, the fact that the development enabled by the Plan Change will be occupied prior to the FDS anticipated start date will not lead to any detrimental effects.

2.4 Auckland Council Drury – Opāheke Structure Plan (2019)

The current (2019) Auckland Council Drury – Opāheke Structure Plan establishes a high-level pattern of land-use and infrastructure prior to rezoning and is shown in **Figure 2-5** below. The Auckland Council Drury – Opāheke Structure Plan identifies the currently zoned FUZ area within the SP site as being rezoned to Mixed Housing Urban and Mixed Housing Suburban land uses. It also shows an indicative new collector road dissecting the structure plan site.



Auckland Council **Drury-Opāheke Structure Plan 2019** **Map**

Land Use Map

Scale @ A3
= 1:7,500

Date Printed:
18/07/2019

Legend:

- Drury Structure Plan Area**
 - Indicative Public Transport**
 - Potential New Neighbourhood Park (Size 0.5-1 ha) (Location may change)
 - Potential New Suburb Park (Size 3 - 5 ha) (Location may change)
 - Potential New Suburb Park (Size 5 - 10 ha or more) (Location may change)
 - Sloppy Creek Floodplain
 - Coastal Inundation 1 per cent ADP Peak 1% Contour
 - Present and Express (Bus) Rapid Rail (RTR)**
 - Rapid Rail (RTR) (Location may change)
 - New Motorway Interchange**
- Floodplains**
 - Potential New Neighbourhood Park (Size 0.5-1 ha) (Location may change)
 - Potential New Suburb Park (Size 3 - 5 ha) (Location may change)
 - Potential New Suburb Park (Size 5 - 10 ha or more) (Location may change)
 - Sloppy Creek Floodplain
 - Coastal Inundation 1 per cent ADP Peak 1% Contour
- Indicative Roads, Cycling & Walking Network**
 - Arterial Roads (Existing & Upgrades)
 - Recommended New Arterial Roads (Location may change)
 - Collector Roads (Existing)
 - Indicative New Collector Road (Location may change)
- Potential and Intendental Flow and 20m Riparian Margin (VRM) may change**
 - Floodplains
 - Greenfield
 - Heavy Industry
 - Light Industry
 - Township Housing and Apartment Buildings
 - Mixed Housing Urban
 - Mixed Housing Suburban

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Transport projects identified in these maps have been identified by indicative business cases and will require further tactical investigation, engagement with communities and stakeholders and statutory approvals before their final detail, location or land requirement is confirmed. They are also yet to be prioritised for funding for delivery over the next 10-20 years. Features and map notations (including zone boundaries, new parks etc) are indicative only and will be refined through later (more detailed) processes such as the Change or Notice of Requirements.

310205559 | Report
**Fisher & Paykel Healthcare Structure Plan/Private Plan Change,
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3. Existing Transportation Environment

3.1 Existing Road Network

The existing key transport links surrounding the SP site are described in the following sections of this report and shown in in **Figure 3-1** below.

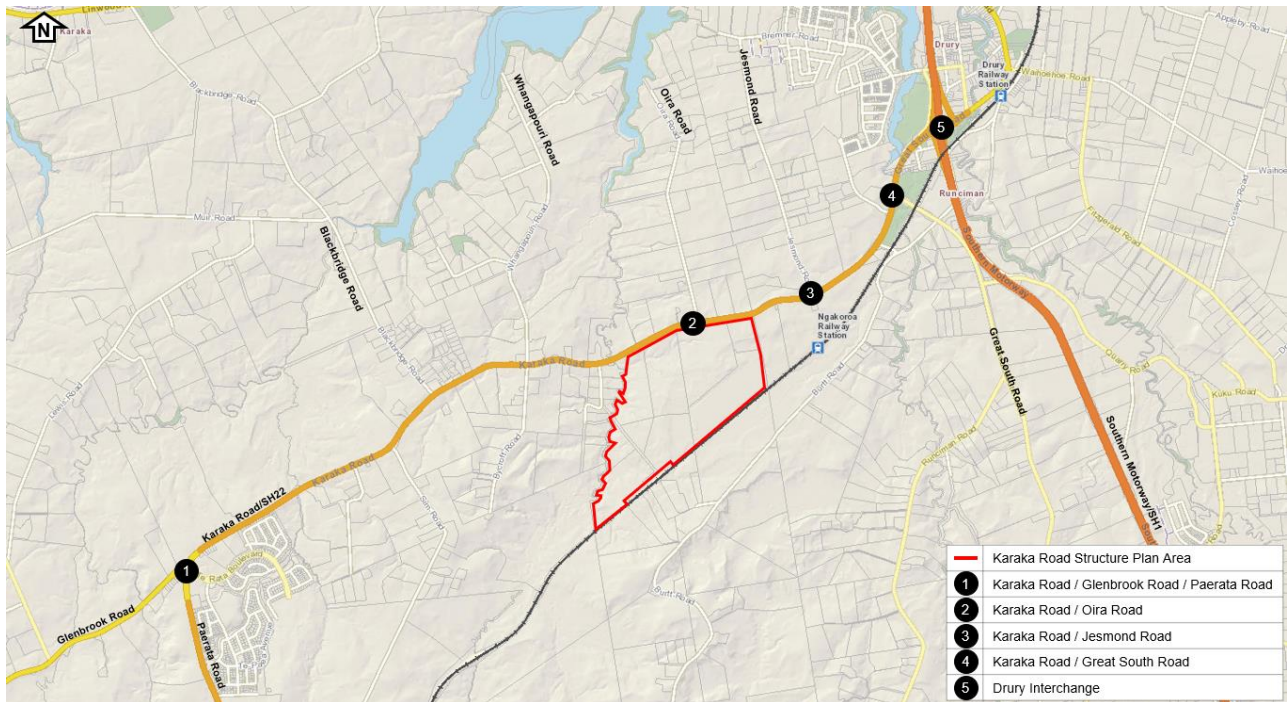


Figure 3-1: Surrounding Road Network and Key Intersection Locations

3.1.1 Karaka Road

Karaka Road (SH22) between Great South Road and Paerata Road forms part of the State Highway network and is therefore under the control of the Road Controlling Authority (**RCA**) NZTA. Karaka Road provides an east-west link between SH1 at the Drury Interchange and areas to the south/west including Pukekohe, Waiuku, Glenbrook and Patumahoe. Karaka Road forms the northern boundary of the SP site and will accommodate all vehicular traffic related to the development proposed. The AUP classifies Karaka Road as an arterial route where the function of such routes is to cater for through traffic movements with less emphasis on providing access to abutting properties. However, the urbanisation of the area over time anticipates an increase in the traffic generation and access to/from adjoining properties.

Karaka Road is a two-way two-lane road with sealed shoulders and a painted centreline. The posted speed limit on Karaka Road in the vicinity of the SP site is 80 km/h. Karaka Road does not currently feature any dedicated walking or cycling infrastructure.

3.1.2 Great South Road

Great South Road runs between the Drury Interchange at SH1 and Karaka Road (~800m) and forms part of the State Highway network. It is therefore under the control of NZTA and is classified as an arterial road under the AUP. From the Karaka Road / Great South Road intersection, the road alignment generally runs in a north-south orientation, parallel to SH1. To the northeast of that intersection, the road runs under the SH1 Drury interchange, then continues north through Drury and Papakura.

Great South Road is a two-way two-lane road with sealed shoulders and a painted centreline. The posted speed limit on Great South Road is 60 km/h and 100 km/h to the north and south of the Great South Road / Karaka Road intersection respectively. Great South Road does not currently feature any dedicated walking or cycling infrastructure.



3.1.3 Drury Interchange

The Drury Interchange comprises the north-south oriented SH1 overbridge (the SH1 motorway), and the at-grade SH22 – Great South Road alignment in the east-west direction. The interchange also comprises two signalised intersections (west and east) along Great South Road controlling access to the SH1 on-ramps and off-ramps. The Drury Interchange is likely to accommodate the majority of the vehicular traffic associated with development of the SP site as it allows for access to SH1 and the wider arterial road network. SH1, SH22 and the associated on/off-ramp links in the vicinity are all classified as arterial routes in the AUP where through traffic movements are to be prioritised.

The posted speed limit for SH22 and on/off ramp approaches to the interchange is 60 km/h. Within the interchange, footpaths are currently only provided on the northern side of SH22. There are also painted kerbside cycle lanes in both directions of SH22 within the interchange.

3.1.4 Glenbrook Road / SH22 Roundabout

The Glenbrook Road / SH22 / Te Rata Boulevard roundabout is located at the western extent of Karaka Road, at which point the SH22 designation applies to Paerata Road. Glenbrook Road, Karaka Road and Paerata Road are all classified as arterial routes within the AUP, with Te Rata Boulevard forming a local road access to the Paerata Rise residential subdivision. Glenbrook Road continues west and provides access to communities such as Patumahoe and Waiuku with access to the Arterial Road network. Paerata Road oriented along the north-south axis provides access to Pukekohe to the south, and the Paerata Rise development.

Both Glenbrook Road and Paerata Road are two-way two-lane roads with sealed shoulders and a painted centreline. The posted speed limits on Glenbrook Road and Paerata Road are 80 km/h. The roundabout features walking and cycling infrastructure on all approaches and pram crossing facilities with midblock refuge islands to allow vulnerable road users to safely navigate the intersection.

3.1.5 Oira Road

Oira Road is a rural two-way two-lane unmarked road with a posted speed limit of 60 km/h. Oira Road is aligned in a north-south direction, intersecting with Karaka Road along the northern boundary of the SP site via a stop-controlled T-intersection. The Oira Road / SH22 intersection is intended to be upgraded to a double-lane roundabout by PC61 Waipupuke Precinct.

3.1.6 Jesmond Road

Jesmond Road is a two-way two-lane road, with dashed centreline markings and a posted speed limit of 60 km/h. Jesmond Road is aligned along the north-south direction, intersecting with Karaka Road at its southern extents, approximately 500m east of the SP site, via a stop-controlled T-intersection. Jesmond Road is intended to be upgraded to a signalised intersection to provide access to the Ngākōroa Railway Station.

3.2 Existing Traffic Volumes

The most recent traffic counts for the surrounding road network have been obtained from the Auckland Transport (AT) and NZTA traffic count databases and are summarised below in **Table 3-1** and **Table 3-2** respectively.



Table 3-1: Traffic counts obtained from the AT traffic count database

Road	Location	Direction	5-day-AADT (vpd)	AM Peak (vph)	PM Peak (vph)	Survey Date
Jesmond Road	between SH22 and Bremner Road	Both	367	62	40	08/05/2021
Whangapouri Road	between SH22 and Manway Lane	Both	516	69	61	05/04/2021
Glenbrook Road	SH22 and Charles Road	Both	9575	849	923	03/02/2023

Table 3-2: Traffic counts obtained from the NZTA traffic count database

Location		Direction	5-day-AADT (vpd)	Survey Year
Drury Interchange	SH1, ID:01N20459	NB	36,358	2022
	SH1, ID:01N10459	SB	35,287	2022
	SH1 On-ramp, ID:01N50462	NB	12,330	2023
	SH1 Off-ramp, ID:01N40462	NB	3,340	2023
	SH1 Off-ramp, ID:01N60462	SB	12,736	2023
	SH1 On-ramp, ID:01N30462	SB	4,940	2023
SH22	between SH1 and Karaka Road, ID:2200001	Both	30,495	2023
	between Oira Road and Paerata Road, ID:2200003	Both	24,662	2023
	south of Glenbrook Road Roundabout, ID:2200008	Both	17,402	2023

As can be seen in the traffic count tables above, and as expected for a road of national significance, SH1 and the roadways comprising the Drury Interchange carry the greatest volumes of traffic in the vicinity of the site. SH22 also carries significant traffic volumes (between 17,000-30,000 vehicles per day (**vpd**)) with the on-road volumes decreasing to the west of SH1. In the vicinity of the SP site, the existing traffic volumes on SH22 are in the order of 25,000 vpd.

Glenbrook Road carries moderate traffic volumes (9,600 vpd), while the local roads are typically low volume roads (<1000 vpd) with volumes expected for roads of this nature and land-use. As such all existing volumes are within the carrying capacity of the individual roads.



3.3 Road Safety

A search was made of the NZTA's Crash Analysis System (**CAS**) for all reported crashes in the vicinity of the subject site for the full five-year period from 2019 to 2023 and all available results from 2024 as of 8 April 2024. The search area includes SH22 between the western intersection at Drury Interchange and the SH22/Glenbrook Road Roundabout, and the full extent of Oira Road.

The geographic extent of the CAS search area is shown in **Figure 3-2** below.

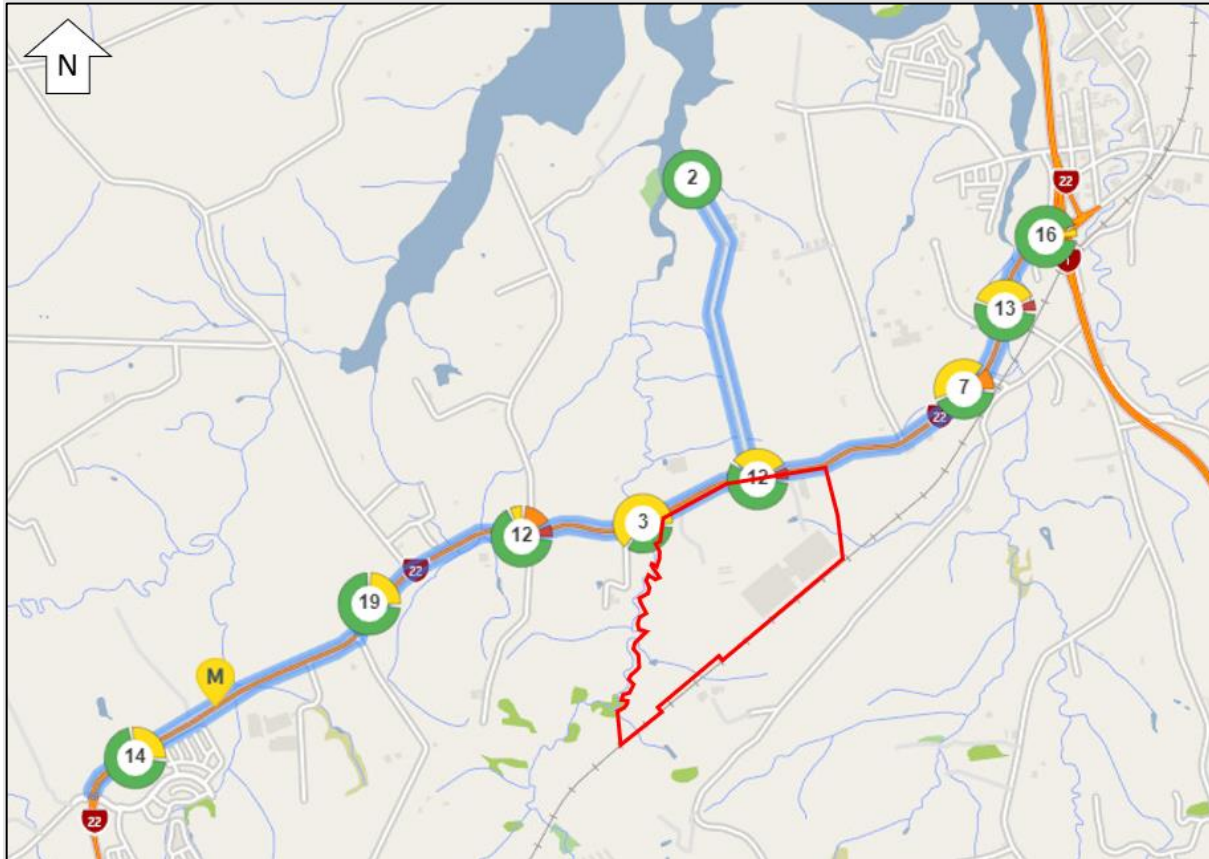


Figure 3-2: CAS search extents

A total of 99 crashes were recorded for the search extents and periods defined. Of these, three were fatal crashes, three were serious-injury crashes, 26 minor-injury crashes and 67 which did not result in injuries.

The reported crashes are summarised in **Table 3-3** below.

Table 3-3: Summary of crashes by type and location

Crash locations	Loss of Control	Rear-end	Crossing / Turning	Merging / Lane change	Head on	Overtaking	Pedestrian	Misc.	TOTALS
SH22 Midblock	10	10	3	1	3	1	1	1	30
SH22 Intersections	13	13	24	2	0	2	0	2	56
Drury Interchange	1	3	0	2	0	2	0	2	10
Local Roads	3	0	0	0	0	0	0	0	3
TOTALS	27	26	27	5	3	5	1	5	99

Appendix A provides a detailed analysis of the crashes reported within the search area.

Midblock crashes observed across the length of SH22 were primarily due to the driver losing control of the vehicle (33%) or rear end type crashes (33%) where the factors contributing to crashes included driver inattention, u-turning, following too closely, and medical issues which together form the bulk of crashes.

At the various intersections along SH22, crash types are primarily crossing/turning (43%), rear-end type crashes (23%), and loss of control (23%) in nature. Of the 24 crashes associated with crossing/turning at intersections, 19 are due to the driver failing to give way. Of the 13 rear-end type crashes, most were due to vehicles stopping on SH22 to undertake right turns and the drivers behind them being unable to stop in time as they were following too closely or being inattentive. The 13 loss of control crashes at these intersections occurred for similar driver-related reasons as in the midblock sections.

Crashes at the Drury Interchange are mainly rear-end crashes in queues or merging, which are typical of highly trafficked signalised areas such as this. Local roads, including Oira Road and Victoria Road represent a small number of crashes typical of roads with low traffic volumes.

It also noted that a number of speed limit changes were enacted in June 2020, identified below, which is assumed to contribute to a reduction in crashes since that time.

- Oira Road: from 80 km/h to 60 km/h
- Jesmond Road: from 80 km/h to 60 km/h
- SH22 Drury interchange up to 100m south of Burberry Road: from 70 km/h to 60 km/h
- SH22 Drury interchange to Paerata: from 100 km/h to 80 km/h

The yearly number of crashes recorded by severity within the search extents is shown in **Figure 3-3** below, noting the 2024 data set was retrieved as of 8 April 2024 and does not include a full year of crash data and the reduced traffic in 2022/2021 due to COVID-19. Nonetheless, it is clear that there has been a downward trend in crashes over the past five years, assumed to be due in part from safety and speed related improvements.



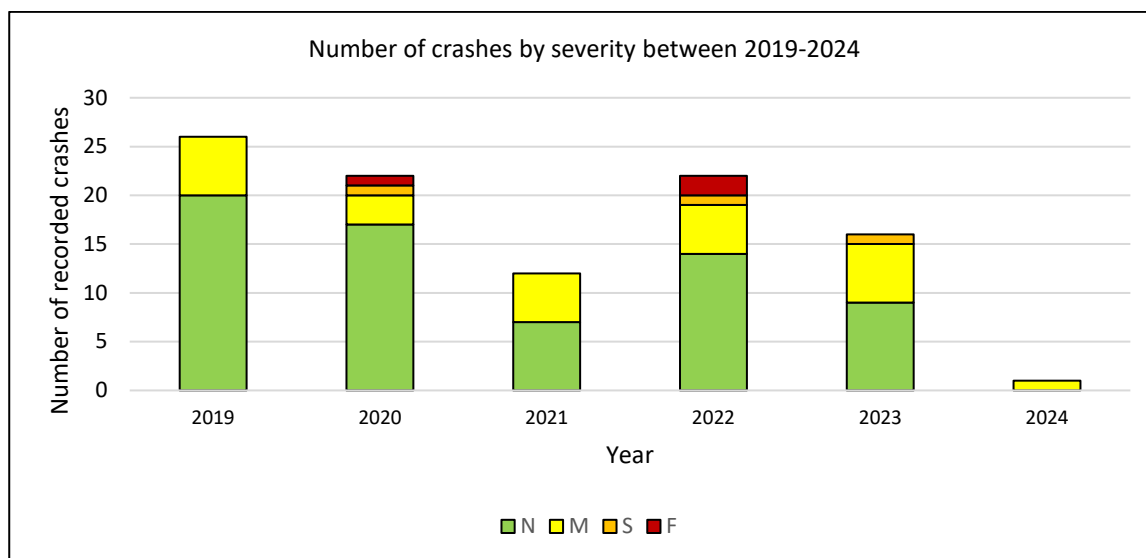


Figure 3-3: Total crashes by year (2019-2024)

Overall, the crash records associated with the surrounding area are typical of their current environments. Upgrades will be required at the proposed SP site access locations including the Oira Road/SH22 roundabout to accommodate the proposed developments, providing opportunity for significantly improved safety measures in addition to measures proposed as part of the SH22 upgrades by the Supporting Growth Alliance (SGA).

3.4 Existing Accessibility

3.4.1 Private Vehicles

The SP site will have private vehicle access and connectivity to the external road network directly off Karaka Road. From Karaka Road, private vehicles will be well connected to the regional arterial and wider state highway networks, via the Drury Interchange to the east and the Glenbrook Road/SH22 Roundabout to the west.

3.4.2 Public Transport

The existing public transport facilities in the vicinity of the SP site are shown on **Figure 3-4** below:



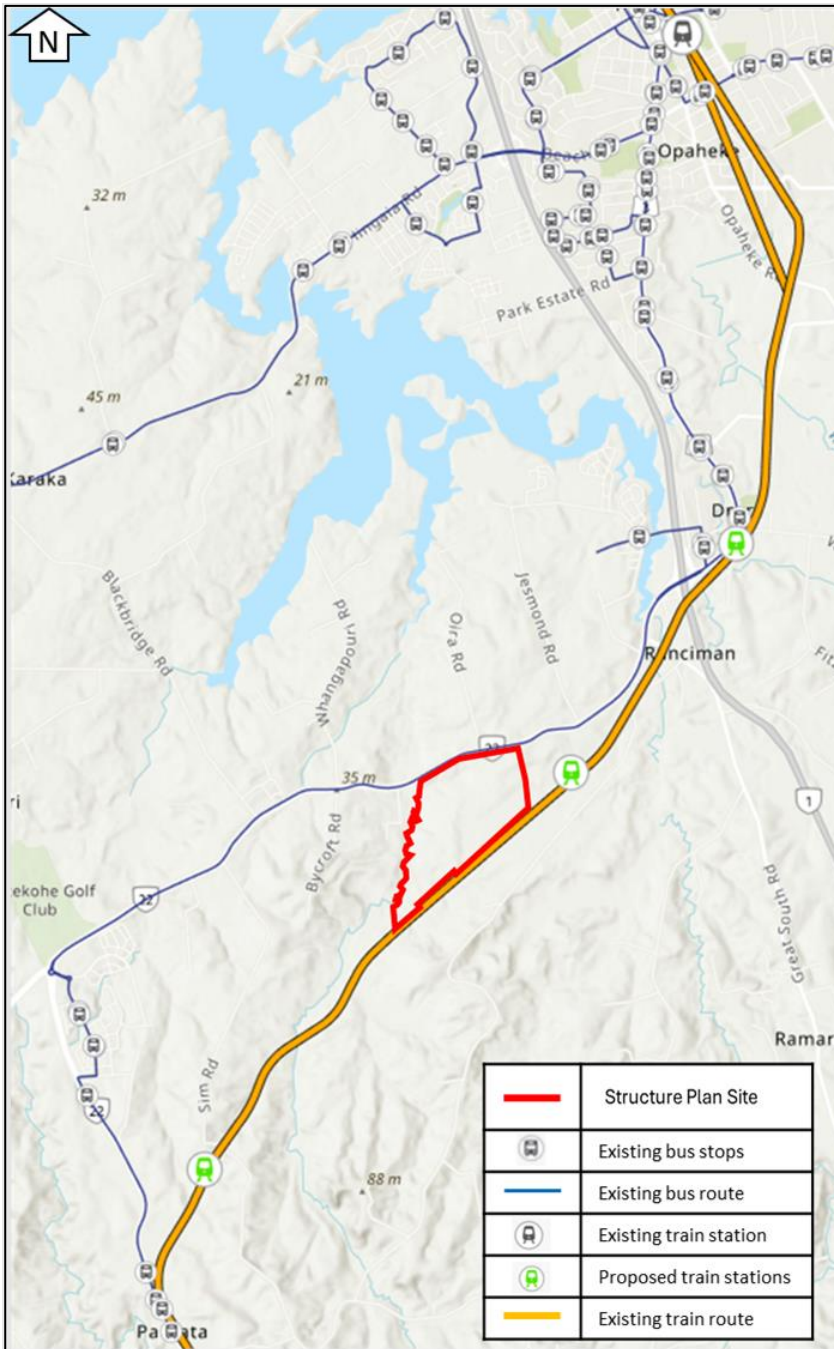


Figure 3-4: Existing / committed public transport infrastructure

Provision of public transport options and travel choice to and from the SP site in the future, will be critical for the sustainability and management of traffic associated with development of the SP site.

Currently, the public transport provisions in the vicinity of the SP site are limited, representing the existing low population and transitioning land use activity from rural to urban. There are however several public transport infrastructure upgrades and facilities planned for the area to accommodate the expected growth and urbanisation of the Drury-Opāheke area in accordance with the existing Structure Plan and the Auckland Future Development Strategy.

The nearest current bus stop to the SP site is located approximately 3km to the north-east in Drury, which serves the 376 route (Papakura to Auranga via Drury). The only bus route operating along Karaka Road is the



394 route (Pukekohe train Station to Papakura train Station), however there are currently no bus stops servicing this route between Paerata School and Papakura train Station. The 394 and 396 routes are classified as “Connector Services” under AT’s New Network and operate services at least every 30 minutes, 7am to 7pm, seven days a week. Currently, the nearest operational public transport interchange is Papakura Train Station located 8km to the north.

However, three new train stations are planned for the southern Auckland area at Drury Centre, Ngākōroa (Drury West), and Paerata. The location of the Ngākōroa Station close to the SP site offers a key opportunity to integrate with the development of the SP site and provide better travel choices and allow for increased mode share for public transport and sustainable travel. Once the station is operational, employment centres in the vicinity will be able to provide direct walking and cycling access to activities onsite. Accordingly, the proposed Structure Plan includes provision for direct active mode access to Ngākōroa Station.

3.4.3 Active Modes

As with public transport, active mode amenities in the vicinity of the SP site are currently limited, due to the rural nature of the area. There are however several planned active modes infrastructure improvements for the area,

As noted above, there are currently no footpaths, cycle lanes, or secure crossings along Karaka Road between Drury Interchange and SH22 / Glenbrook Road roundabout. At the Drury Interchange, there are painted cycle lanes on both sides and a footpath along the northern side. The pedestrian crossings across the on/off ramps are a mix of signalised crossings and pram crossings. At the SH22 / Glenbrook Road roundabout, there are off-road shared paths on all sides, connecting to painted cycle lane and marked shoulders. There are currently no protected crossing facilities in the vicinity of the roundabout, however each arm of the roundabout features a central median refuge for pedestrians via pram crossings.

There are several planned active modes infrastructure improvements for the area, such as NZTA’s SH22 Drury upgrade which plans to establish improved walking and cycling paths for connectivity to the planned Ngākōroa Station. Together with the inclusion of active mode provisions within the SP site, a well-connected active modes network can be realised.

3.4.4 Summary

Overall, the Drury West area is currently suited for private vehicle accessibility due to the nature, location and land-use of the site and its surrounds. Significant infrastructure upgrades are planned for the area to provide improved travel choices for public transport and active modes as well as improved safety and efficiency of private vehicle travel and are discussed in more detail in the following section of this report.

The SP site will benefit from its proximity to the planned Ngākōroa Railway Station and connectivity to this station, including the integral bus interchange, is considered important for the development of the site. While no bus stops are currently located in the vicinity, the demand for travel between the activities within the SP site and local trip generators/attractors, as well as other planned future development of the surrounding area is expected to generate demand for AT to provide additional bus facilities, improved frequencies and additional routes.



4. Future / Planned Infrastructure Upgrades

The SP site will benefit from planned infrastructure upgrade projects in the immediate vicinity and the wider south Auckland area. Various infrastructure upgrade projects have been committed to in the current National Land Transport Programme (NLTP) and Auckland Regional Land Transport Plan (RLTP). The Indicative Strategic Transport Network for South Auckland, comprising these planned upgrades is illustrated in **Figure 4-1** below.

The upgrades of relevance to the SP site include:

- Electrification of the rail network and three new train stations including Ngākōroa at Drury West located approximately 300m from the site as well as in Paerata and Drury Central (discussed further in Section 4.1 below);
- Upgrades to the Drury West section of SH22 (Section 4.2);
- Safe Networks Programme: SH22 Drury to Paerata Upgrades (Section 4.3);
- Strategic walking and cycling corridor along the NIMTRL connecting the SP site to SH1;
- A new Pukekohe Arterial Network connecting Pukekohe to SH1;
- SH1 Papakura to Drury six-laning and subsequent Drury to Drury South six-laning incorporating a new interchange at Drury South;
- Mill Road, a new four-lane corridor connecting SH1 at Drury South to Papakura;
- Upgrades to Jesmond Road, Bremner Road and Waihoehoe Road as part of land development and urbanisation in those areas; and
- Safety improvements along several local roads adjoining SH22.

These projects are described in further detail in the following sections.



SOUTH INDICATIVE STRATEGIC TRANSPORT NETWORK

JULY 2019

Projects described in these maps have been identified by indicative business cases and will require further technical investigation, engagement with communities and landowners and statutory approvals before their final detail, location or land requirement is confirmed. They are also yet to be prioritised for funding for delivery over the next 10-30 years.

RAIL CORRIDOR UPGRADE

- 1 Rail upgrade from Papakura to Pukekohe
- 2 Closure of Manurewa Road and Spartan Road rail crossings to vehicles
- 3 New grade separated rail crossings at Taka Street and Walters Road
- 4 New train station – Drury Central
- 5 New train station – Drury West
- 6 New train station – Paerata

NEW OR IMPROVED PUBLIC TRANSPORT CORRIDOR

- 7 Frequent Transit Networks (FTNs) routes using SH1 and arterial roads to connect to town centres, and the major centres of Papakura, Drury and Manukau

NEW WALKING AND CYCLING CORRIDOR

- 8 Strategic walking and cycling corridor to connect to SH1 Strategic Cycleway

NEW OR IMPROVED TRANSPORT CORRIDOR

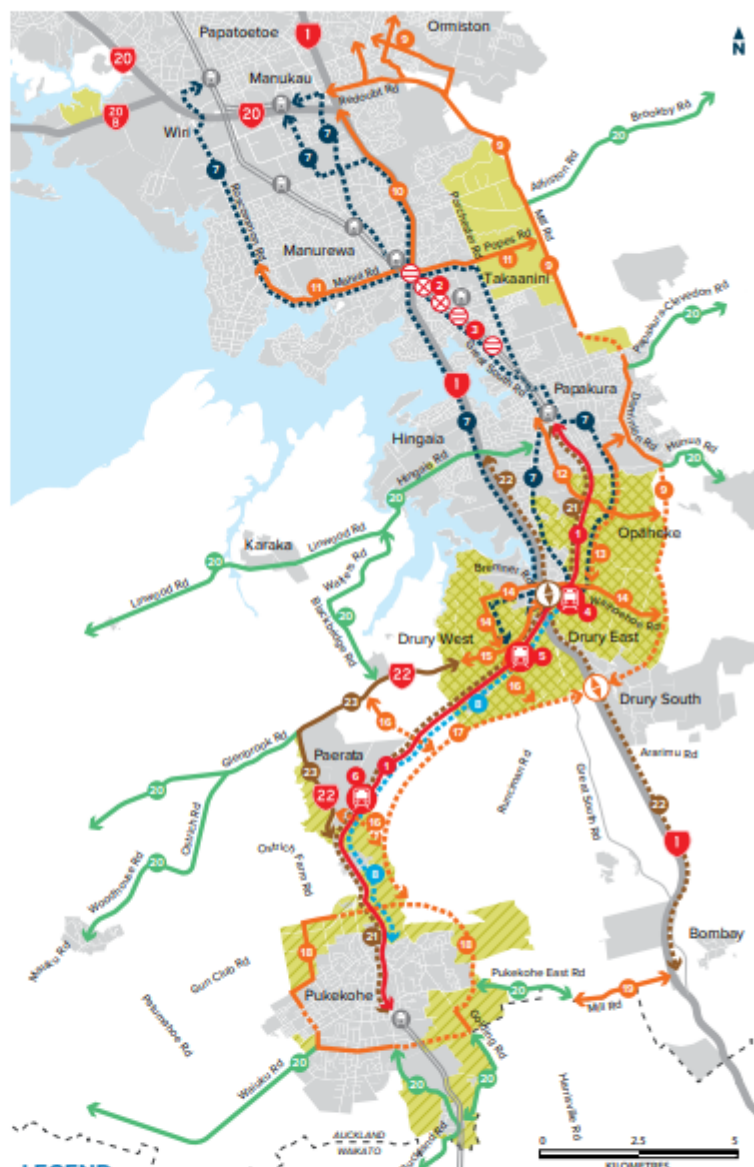
- 9 Mill Road Corridor including northern connections
- 10 Additional long term upgrades to SH1 between Manukau and Takaanini
- 11 Upgrade Mahia Road and Popes Road (including a new grade separated rail and SH1 crossing)
- 12 Upgrade Opaheke Road and Ponga Road
- 13 New arterial between Papakura Industrial area, to Waihoehoe Road
- 14 Upgrade Jesmond Road, Bremner Road and Waihoehoe Road
- 15 Upgrade Drury West section of SH22
- 16 Connections from SH22 to the Pukekohe Expressway
- 17 New Pukekohe Expressway connecting Pukekohe to SH1
- 18 Pukekohe Ring Road
- 19 Upgrade Mill Road between Harrisville Road intersection and the Bombay interchange

SAFETY IMPROVEMENTS

- 20 Safety improvements to Alliston Road, Brookby Road, Papakura-Clevedon Road, Hingala Road, Hunua Road, Linwood Road, Walters Road, Blackbridge Road, Glenbrook Road, Kingsseat Road, McKenzie Road, Ostrich/Woodhouse Road, Pukekohe East Road, Logan Road, Waiuku Road and Buckland Road.

OTHER PRIORITY PROJECTS

- 21 Rail electrification from Papakura to Pukekohe
- 22 SH1 Papakura to Bombay Project
- 23 Safe Networks Programme: SH22 Safety Improvements



LEGEND

- New growth area (Future Urban Zone)
- Drury – Opaheke structure plan area
- Pukekohe – Paerata structure plan area
- Existing urban area
- State Highway (SH)
- Auckland – Waikato Boundary
- New or upgraded interchange
- Existing rail corridor
- Existing train station
- Improved rail corridor
- Closure of rail level crossing
- Grade separation of rail level crossing
- New train station
- New public transport corridor
- Improved public transport corridor
- New walking and cycling corridor
- New transport corridor
- Improved transport corridor
- Safety improvements
- Other priority projects



New Zealand Government

Figure 4-1: Supporting Growth Southern Transport Network Upgrades



4.1 Rail Corridor Upgrades

The NIMTRL between Auckland and Wellington, passes through Papakura, Drury and Pukekohe. Electrification works on the route between central Auckland and Papakura have been completed, with the Early Rail Development Programme seeking to extend the electrification to Pukekohe.

The South Auckland package within the NZ Upgrade Programme (**NZUP**) has funding for:

- Electrification works across the 19km section of the southern line, including redevelopment of Pukekohe Station and level crossing improvements; and
- The three new train stations between Papakura and Pukekohe. It is understood that the train stations are expected to be completed in 2025 / 2026.

The major works for the electrification programme began in late 2021 and are expected to be rolled out over a three-year time frame – up to 2024.

The three new train stations are expected to be completed by 2025 /2026. Planning approval for Ngākōroa Station has been obtained. Each of these stations will include a bus interchange, park and ride facilities and walking and cycling paths, supporting the roadways. The Ngākōroa Station is expected to have up to 200 parking spaces while the Drury Centre and Paerata stations are expected to have 350 parking spaces each.

The electrification of the rail line along with the three new train stations in the area will enable planned growth in south Auckland by increasing passenger capacity, travel time reliability, achieve sustainability outcomes and allow for a direct service from Auckland's CBD through to Pukekohe.

The indicative (at that time) locations of the new train stations are included within the SGA ITA and Indicative Strategic Transport Network shown in Figure 4-1 above.

4.2 SH22 Drury Upgrade

The project extents include four-laning a 2km section of SH22 between Mercer Street and Jesmond Road intersections. NZUP plans to upgrade this part of SH22 to provide additional transport choice and connectivity to the planned Ngākōroa Railway Station thereby enabling greater travel choice, travel time reliability and safety to support planned growth in the area. Specifically, these upgrades will address existing safety issues, and provide facilities that make walking, cycling and public transport safer and more competitive to private vehicle travel.

The SH22 Drury West package currently has pre-implementation funding, allowing for preliminary design work. A date for the construction of the SH22 Drury Upgrade is currently unknown.

4.3 Safe Networks Programme: SH22/SH1 to Paerata

This programme seeks to address underlying road safety issues along SH22 with a number of safety related upgrades. The project is investigating options for flexible safety barriers, adding right turn bays, removing unsafe passing lanes, providing turn around locations and widening road shoulders. Some of these upgrades, including the SH22/Glenbrook Road intersection and speed limit changes are already operational.

These changes will help address some of the safety issues described for SH22 in **Section 0** of this report and will allow for improved safety outcomes for current and future operations within the area.

4.4 Other Projects

Additional infrastructure upgrades are proposed for the area as part of the SGA indicative transport network, including:

- Strategic walking and cycling corridor to connect to SH1 Strategic Cycleway. This corridor is expected to run parallel to the NIMTRL and will provide connectivity between Drury and Pukekohe via Drury West and Paerata. The connections to SH22 and the Drury West station with ongoing residential development in the area allows for improved transport choice for local travel and connectivity to the wider public transport network. The planning and design stage of this upgrade is currently unknown.
- Upgrades to Jesmond Road, Bremner Road and Waihoehoe Road for improved safety and efficiency outcomes will help improve the road safety record and address underlying issues with the roads. The



Waihoehoe Road element of this upgrade is fully funded and currently being detailed designed. Funding for the remaining elements is unknown.

- New Pukekohe Arterial Network connecting Pukekohe to SH1 and arterial road connections to SH22 at Jesmond Road and west of Blackridge Road. This strategic route will provide a more direct and alternative travel route between Drury South and Pukekohe. Additional travel options between the two centres and for access to and from SH1 means that SH22 will experience reduced traffic volumes and congestion. The arterial connectors will also allow for improved route choice for local travel. A Notice of Requirement (NOR) process for the Pukekohe Arterials is currently underway, with hearings carried out in February 2024, however a Decision has not yet been issued. **Figure 4-2** below shows each of the NOR packages.
- In terms of the Karaka Road Structure Plan, NOR 1 (Drury to Pukekohe Link) and NOR 2 (Drury West Arterial) appear to be of most relevance, whereas the other packages are more relevant to traffic movements around Pukekohe.



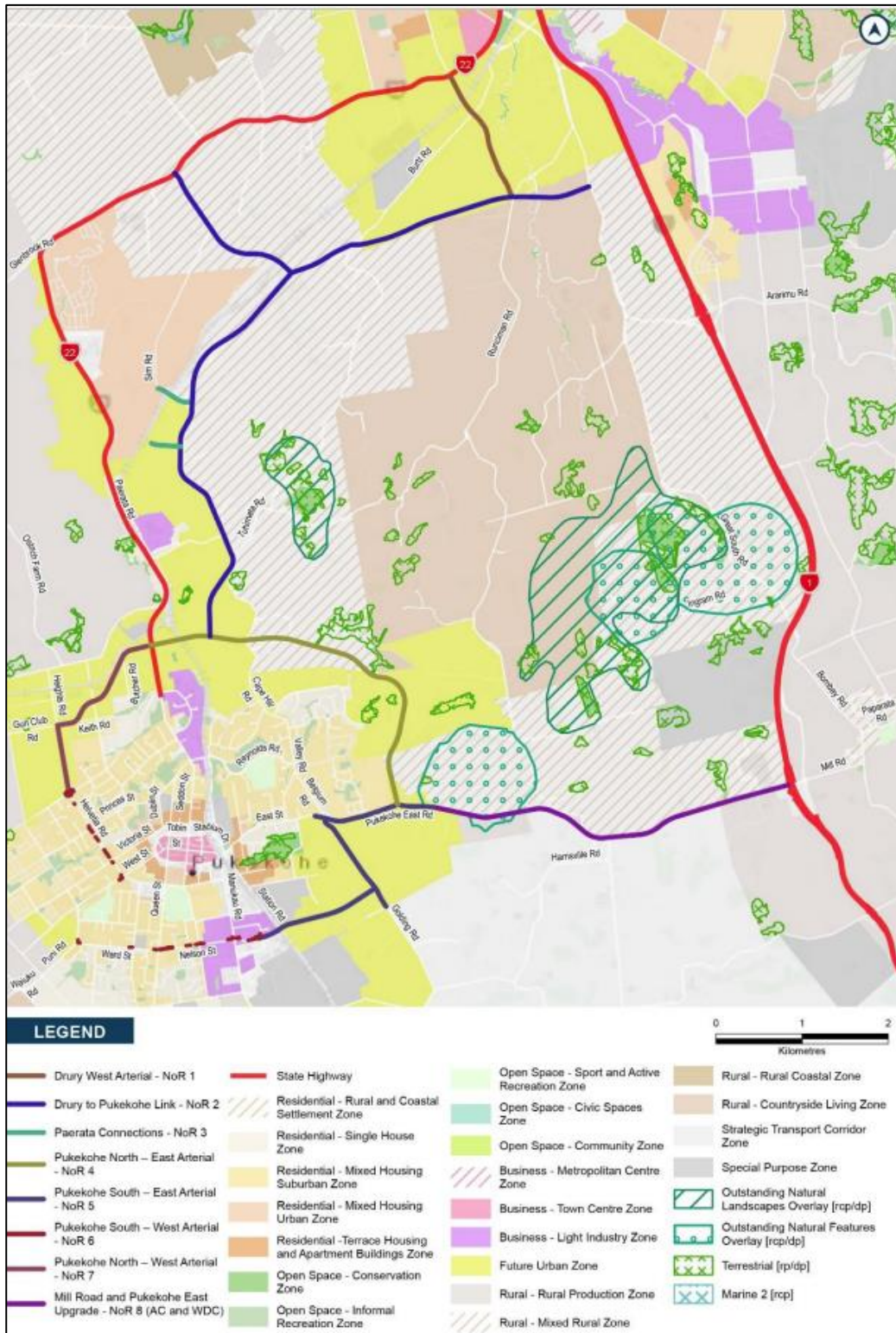


Figure 4-2: Pukekohe Arterial Network NOR Packages

- As discussed in Section 4.2 above, safety improvements along several local roads adjoining SH22 helping address underlying safety issues and reducing the risk of fatal and serious injury crashes in the area.



- SH1 six-laning between Papakura and Drury Interchange, including the upgrade of the Drury Interchange. This scheme is fully funded and consented, and construction is underway. The expected completion is understood to be 2025/ 2026.
- SH1 six-laning between Drury and Drury South, incorporating a new interchange at Drury South. This improvement is currently at an early NOR stage, with a hearing date not yet set, and with construction costs understood to not yet be funded.

Mill Road, a new four-lane corridor connecting SH1 at the future Drury South Interchange to Papakura. This connection remains within the Southern infrastructure strategy, but currently has no funding.



5. Future Land Developments

The Auckland Council's Drury – Opāheke Structure Plan 2019 land use scenario map is shown in Figure 2-5 above. As noted, while the updated Karaka Road Structure Plan proposes an alternative land use across the site to what had previously been identified through the Council's Structure Plan, the land-use map is useful for understanding the future urban context of the surrounding and wider area.

Auckland Council's Drury – Opāheke Structure Plan 2019 allows for substantial land development within the Drury West area with decreasing housing intensity radiating from the planned Ngākōroa Train Station and industrial activity planned west of SH1. A neighbourhood centre is also planned in the vicinity of Jesmond Road / SH22.

It is noted that a number of known residential developments are either currently under construction or have been approved within the Drury – Opāheke Structure Plan Area and therefore supersede parts of the Structure Plan. These developments are discussed in the following sections.

5.1 Waipupuke Precinct (PC61)

PC61 to the AUP – Waipupuke Precinct, has frontage on, and is bound by Oira Road to the west, Jesmond Road to the east, and SH22 to the south.

Waipupuke Precinct has a mix of Residential - Terrace Housing and Apartment Buildings (**THAB**), Mixed Housing Urban (**MHU**) and Business-Neighbourhood Centre (**NC**) and Open Space – Recreation zones applied to the area under the AUP. The anticipated development staging indicates the following yields⁶:

- 1,000 dwellings by 2028 and an additional 566 dwellings (totalling approximately 1,566 dwellings) by 2031; and
- A new local medical centre, retail and office activities comprising approximately 4,000sqm GFA by 2031.

It is also understood that the development of the Waipupuke Precinct requires upgrades to several transportation elements in the vicinity, including:

- Upgrades to Jesmond Road fronting Waipupuke Precinct including shared path (active modes) facilities.
- SH22 shared path (active modes) between Jesmond Road and Oira Road.
- Oira Road upgrade between SH22 and Waipupuke Precinct.
- New signalised intersection at Jesmond / Waipupuke Collector Road.
- New collector road internal to Waipupuke Precinct.
- A new double roundabout for Oira Road / SH22.

The Waipupuke future residential development's location adjacent to the north of the SP site will provide a substantial residential catchment.

5.2 Other Developments

Paerata Rise is a planned township development in the vicinity of the SH22 / Glenbrook Road roundabout. The residential development is envisaged to provide approximately 4,500 homes by 2035 along with supporting complementary activities in the vicinity of the planned Paerata train station.

The Drury Centre Precinct (PC48) is a recent re-zoning of 95 ha of land in Drury East, for Business – Metropolitan Centre and Business – Mixed Use development. Combined, the operative zones enable the development of the Drury Metropolitan Centre to be a high density, transit-orientated centre in south Auckland.

Each of these developments, and other areas of FUZ that have not yet progressed plan changes to live zone, have been assumed to be in place through the traffic modelling presented in **Section 7** of this ITA.

⁶ Commute Memo 28/03/2022 (updated Waipupuke development yields and modelling)

6. The Proposals

As outlined earlier, FPHL has prepared an updated Karaka Road Structure Plan and a PPC request. The PPC requests the rezoning of approximately 86.5ha of the Karaka Road site to Business – Light Industry zone, enabling FPHL to develop a second New Zealand Campus.

6.1 Updated Karaka Road Structure Plan

Auckland Council's Drury – Opāheke Structure Plan (2019) includes FUZ zoned areas of the SP site and anticipates residential development in the form of Mixed Housing Urban and Mixed Housing Suburban land uses. The updated Karaka Road Structure Plan identifies the entire FPHL landholding as suitable for future Business - Light Industry land use and development. The updated Karaka Road Structure Plan is shown in **Figure 6-1** below.

Of note, the new indicative collector road shown on Council's Drury – Opāheke Structure Plan (and highlighted in **Section 2.4** above), cannot be accommodated within the Structure Plan Site. This is because the FPHL business involves a major research and development component, and as such, public access to the SP site will be strictly prohibited. As an alternative, the updated Karaka Road Structure Plan shows this potential new collector road running along the eastern edge of the precinct. This is considered acceptable as it performs the same function as the alignment shown in Council's structure plan, and also presents an opportunity to enable another public transport / active mode link between the Ngākōroa Railway Station and SH22.

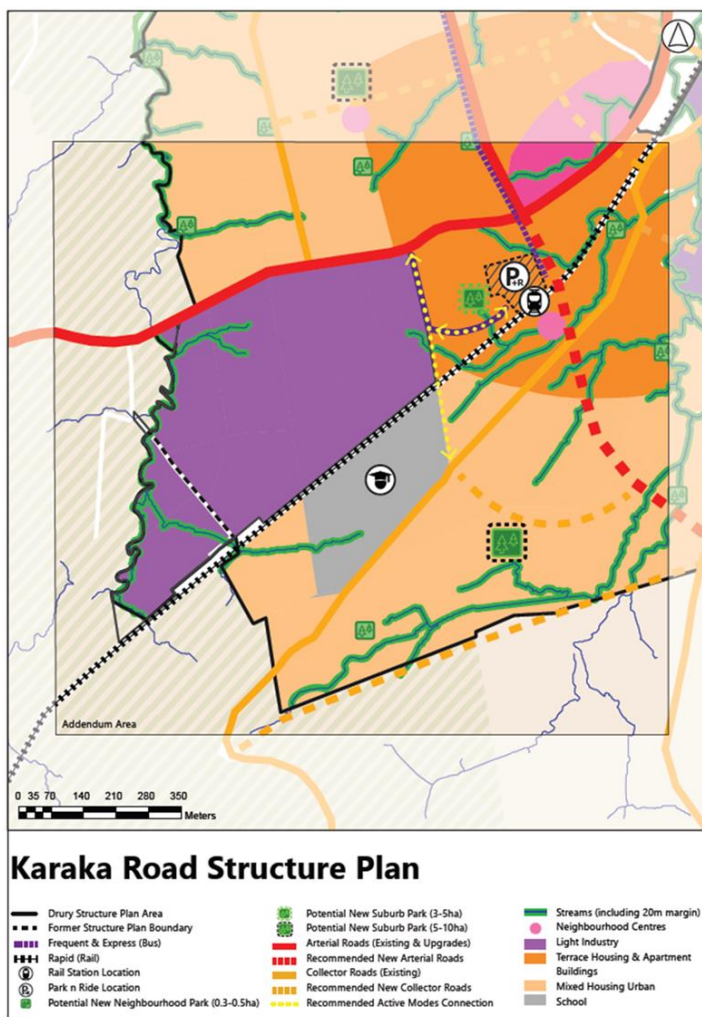


Figure 6-1: The updated Karaka Road Structure Plan



6.2 Plan Change Application

The PPC application seeks to rezone the portion of the SP site that is zoned FUZ and is located inside the RUB to Business – Light Industry zone under the AUP.

FPHL has identified that the site will be developed into a research and development, manufacturing and office campus that will broadly comprise of office and light industrial (manufacturing) activities. Broadly, the scale of activity on the site, by employee numbers and equivalent building GFA for 2038 and 2048 has been shown in **Table 6-1** below.

Table 6-1: Proposed Employment (and Equivalent Building GFA) Forecasts

Employment type	2038 (Equivalent GFA)	2048 (Equivalent GFA)
Office (Salary) - EMP2	1,438	3,450
Manufacturing (Shift) - EMP1	490	1,225
Total Employees	1,928 (53,000sqm)	4,675 (128,900sqm)

On-site parking will be provided in accordance with the parking provisions and design requirements set out in Chapter E27 - Transport of the AUP for the proposed Business – Light Industry zone.

The proposed PPC area and zoning are shown in **Figure 6-2** below.

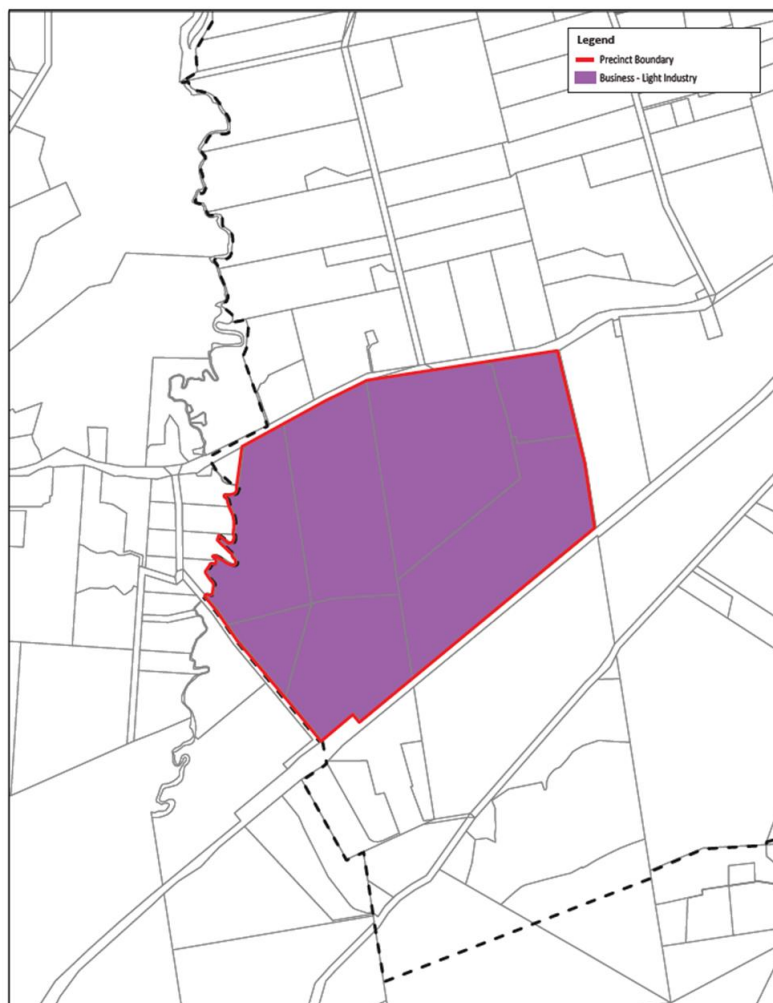


Figure 6-2: Proposed Plan Change area and Proposed zone



6.3 Proposed Transport Connections

Comprehensive site master planning has not yet been carried out within the site. However, it is expected that there will eventually be three road connections to SH22, as shown on **Figure 6-3** below. The future internal roading network will consist of private roads for the movement of employees throughout the site.

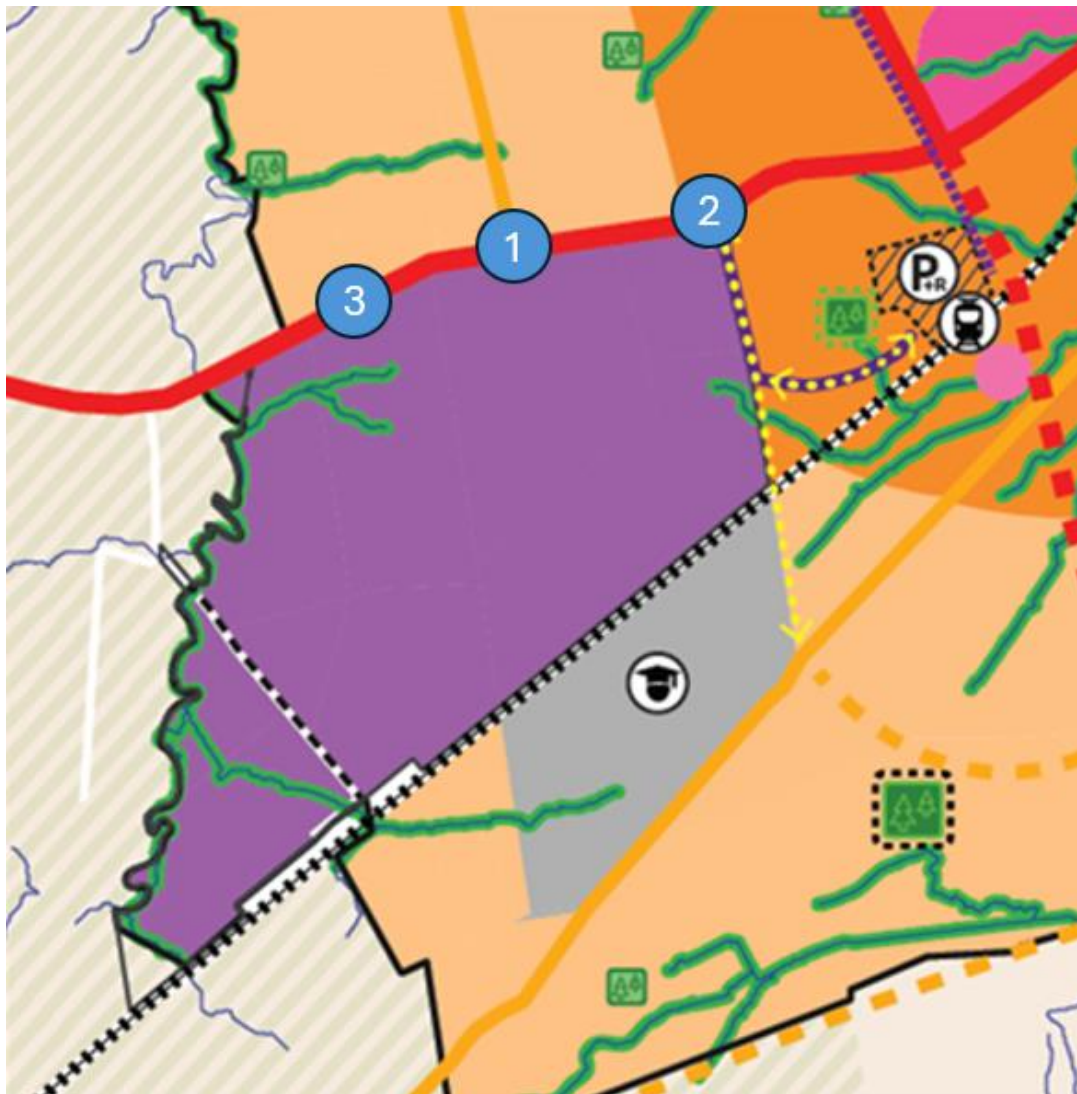


Figure 6-3: Potential Site Connections

All three access locations are intended to intersect with Karaka Road (SH22) at the northern boundary of the SP site and provide private vehicle and active mode access to the site.

The initial site connection is likely to be directly opposite Oira Road, forming the fourth arm of the Oira Road / SH22 intersection. A second access is anticipated on the eastern boundary of the site, with a third at the western end of the site's frontage to SH22.

Internal to the site, the roading network will be designed to accommodate the level of traffic and vehicle types expected for each access. The internal roading network will generally be consistent with what is expected for an urban location, including speed calming measures, separation between vehicular traffic, provision of active modes and integration with the external environment. It is proposed that all internal roads will remain privately owned and maintained and will not be vested with Auckland Transport.



6.4 Public Transport

The SP site is expected to benefit from several proposed public transport upgrades in the wider Drury-Opāheke area.

Employees arriving to the site via the proposed Ngākōroa Railway Station are envisaged to form the majority of public transport related trips to and from the site. The proximity of the Ngākōroa Railway Station, just east of the site, means that there is opportunity to maximise mode shift to sustainable travel choices. The design of the train station allows for a bus interchange, ensuring that bus travel, via connector bus services, will also become a realistic transport mode choice.

FPHL proposes to investigate the feasibility of providing private shuttles for future employees of the Site, potentially electric and automated in the future, between the Ngākōroa Railway Station and development within the Site. The internal transport network within the site will be designed to accommodate integration with any such private staff transport services. A future shuttle service could operate as means of transferring FPHL staff / visitors to the Site, at regular intervals during the peak hour periods (AM and PM). Public services will however not be able to access the interior of the Site itself.

Future development of the Ngākōroa Railway Station and the various future residential developments in the Drury-Opāheke FUZ area are likely to induce sufficient demand to justify the operation of new public transport routes and increased frequencies serving the Ngākōroa Railway Station and the surrounding growth areas. It is, however, AT's responsibility to provide services which utilise this infrastructure.



7. Traffic Modelling

7.1 Modelling Methodology

The traffic assessment which has been undertaken for the Structure Plan and PPC request has relied on a sequence of transportation modelling processes. The initial step involved a model run of the Auckland Forecasting Centre's (**AFC's**) Macro Strategic Model (**MSM**) which is a four-step (trip generation, trip distribution, mode choice and trip assignment) transportation model, incorporating land use data by way of households and employment for the entire Auckland Region. The MSM was run for two future forecast years (2038 and 2048) for a reference case land use (current land use projections for the SP site) combined with a reference transport network (committed and funded road infrastructure improvements). A separate model run for the 2038 forecast year, which included the SP site utilised for indicative unspecified employment purposes was also undertaken and this formed the basis of the trip distribution for the FPHL development for the two future forecast years.

The AFC also controls a SATURN model (the S3M SATURN Traffic Network Model) for the southern Auckland area, which forms a sub-regional portion of the MSM. Matrix demands from the MSM were exported to the SATURN model to create a sub-regional model for the purposes of modelling the effects of the SP site, albeit without specifically incorporating the FPHL trip generation of the site itself as the current SATURN model anticipates residential (not light industrial) activity as per the Council's Structure Plan for the forecast future years.

The anticipated trip generation of the FPHL site was derived from surveys carried out at the East Tāmaki FPHL Campus, which provides the example of what will be developed on the Karaka Road site. The trip generation methodology is described further in **Section 7.2** but by way of summary, the trip generation takes into consideration the number of employees, the type of employees (office or manufacturing) and shift work trip patterns, based on total area of buildings GFA. This trip generation was factored into the S3M SATURN traffic model and the trips assigned to the SATURN transport network. Several different scenarios were tested, including land use and infrastructure options, as part of the assessment, and these are summarised in **Section 7.3**. It is noted that the network peak defined in the Southern SATURN model is 7-8am and 5-6pm

Turning movements and delays were then extracted from the S3M SATURN model to determine the performance of the surrounding transport network. Further analyses with respect to the site access arrangements were undertaken using SIDRA⁷ version 9. SIDRA is an intersection micro-analytical evaluation software package which is in common usage by Transportation Engineers throughout New Zealand and the world to assess the performance of intersection and network performance.

The results of the modelling are summarised in **Section 7.4** further below.

7.2 Trip Generation

Development trip generation rates for this assessment were determined using a first principles approach and is based on the number of employees based in the SP site during the relevant future years.

7.2.1 Employee movement profiles

Table 7-1 below shows the projected employee numbers by employment type for 2038 and 2048. Office staff refers to the number of employed workers who are in professional services or supporting roles which are typically structured as an 8am-4.30pm workday with flexibility. Manufacturing staff refers to the number of employed workers who are in shift-based industrial activities on-site, with shift times being 7.30am-4pm, 4pm-12am, and 12am – 6.30pm.

⁷ SIDRA - Signalised & Unsignalised Intersection Design and Research Aid



Table 7-1: Projected number of employees

Employee Projections	2038	2048
Office - EMP2	1,438	3,450
Manufacturing - EMP1	490	1,225
Totals	1,928	4,675

One of the key inputs in determining trip generation for the site is a historic survey undertaken by FPHL at the East Tāmaki Campus which details the proportion of office and manufacturing staff arrivals and departures over the workday as a percentage of the total number of staff employed.

Table 7-2 and



Table 7-3 below summarises the data provided by FPHL obtained from the survey at the East Tāmaki site. As noted earlier, the network traffic peaks defined in the Southern SATURN model are 7-8am and 5-6pm. Those peak hours are shown in red boxes within the tables. The peak FPHL traffic flows are shown in bold.

Table 7-2: Surveyed percentages of staff arrival times

Arrival Time	Manufacturing %	Office %
5-6am	4.6%	0.1%
6-7am	51.2%	5.8%
7-7:30am		16.5%
7:30-8am		27.2%
8-8:30am		35.9%
8.30-9am		8.3%
9-10am		5.3%
10-12pm		0.9%
12-3pm	3.6%	
3-4pm	31.1%	
Total	90.6%	100.0%



Table 7-3: Surveyed percentages of staff departure times

Departure Time	Manufacturing %	Office %
6-7am	0.8%	
7-7.30am		
7.30-8am	9.1%	
8-8.30am		
8.30-9am		
9-10am		
10-12pm		
12-3pm	4.6%	6.6%
3-4pm		16.7%
4-4.30pm	51.2%	30.8%
4.30-5pm		21.6%
5-5.30pm		13.4%
5.30-6.00pm		10.9%
Total	66.0%	100.0%

The tables show that there are large spikes in arrivals and departures for Manufacturing staff during shift changes. These shift changes specifically avoid background traffic peak hours to enable staff to travel to and from the site during lighter traffic conditions. It is also noted that the majority of office staff leave during the 4-4:30PM period, again to avoid peak traffic conditions, and there is only a partial overlap between background morning peak and typical arrival times for office staff.

For the purposes of traffic modelling, and as agreed in pre-application meetings with Council's Consultant Traffic Engineer (Flow Transportation Engineers), the following peak hours were tested:

- For the SATURN testing of the wider transport network, the peak hours tested were 7:30-8:30 AM and 4:30-5:30 PM. This ensured a full overlap of the background and site peak hours in the morning peak, and a 50% overlap of background and staff peak hours in the evening peak. This represents a realistic worst-case assessment of coinciding traffic conditions, noting that shift changes and office attendance will always avoid the worst traffic conditions.
- For the sensitivity test at the site driveway(s), the PM peak hour tested was changed to 4-5pm, to ensure that the driveway access point(s) could accommodate the maximum possible afternoon traffic conditions, i.e. a 100% overlap between background and staff peaks.

7.2.2 Staff On-site

In addition to the above, the trip generation assumes that during any given day, only 90% of the total employed office staff are on-site due to factors such as leave, working from home and travelling for business or other off-site work. However, FPHL has provided information from the East Tāmaki Campus, where internal



data reveals that on average, a maximum of 77% of office staff are typically working within the site. As such, the assumed 90% proportion is considered to be a conservative assumption.

It should be noted that no such reduction has been applied to manufacturing staff, also reflecting a conservative approach.

7.2.3 Trip Distribution

In all tested scenarios, 100% of development related trips are expected to occur externally (i.e. with at least one of the trip ends being external to the SP site).

Inbound and outbound trip proportions have been determined using the rates specified in the Institute of Transportation Engineers (ITE)⁸ Trip Generation Manual (11th Edition) and are summarised in **Table 7-4** below, which apply to all scenarios in this assessment.

Table 7-4: Inbound and Outbound Trip Proportions

Peak	AM		PM	
Activity	Inbound	Outbound	Inbound	Outbound
Office	88%	12%	17%	83%
Manufacturing	76%	24%	31%	69%

These proportions were considered suitable for use in this assessment.

7.2.4 Mode share

Table 7-5 below shows the proportions of the trip modes assumed in this assessment.

Table 7-5: Mode share of the generated trips

	AM				PM			
Peak	2038		2048		2038		2048	
Activity	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Private Car	75%	85%	73%	84%	85%	75%	84%	73%
Carpool	7%	7%	7%	7%	7%	7%	7%	7%
Public Transport	15%	5%	16%	5%	5%	15%	5%	16%
Active Modes	3%	3%	4%	4%	3%	3%	4%	4%

Public transport mode share assumptions were based on a previous MSM run undertaken for the recent Drury East Plan Changes (48, 49 and 50). Those assumptions were produced by Supporting Growth Alliance (SGA) as part of its Drury Infrastructure Funding and Financing (DIFF) study, and were subsequently adopted by the PC48, 49 and 50 applicants to ensure consistency with the SGA approach. The MSM mode share assignment for Zone 554 (Drury East) was used as a reasonable basis for deriving mode share within the SP site due to the similarity in proximity a train station. On this basis, public transport mode-share proportions of 15% in 2038

⁸ ITE – Institute of Transportation Engineers

and 16% in 2048 were adopted for the dominant staff travel direction and 5% for the non-dominant staff travel direction.

Carpooling mode-share proportion was based on a Fisher & Paykel East Tāmaki Travel Survey conducted in 2021 which shows that 6% of employees always carpool, and 5% carpool “lots of the time” which equates to 11% of employees typically carpooling to and from site. On this basis, the 7% carpooling assumption used for trip generation purposes is considered to be a conservative assumption. This assumption considers an average two people per car, hence equating to a reduction of 7% of the private vehicle demand.

Similarly, the active modes proportion was based on the Fisher & Paykel East Tāmaki Travel Survey which shows that 2% of employees always walk/cycle, and 4% walk/cycle lots of the time which equates to 6% of employees typically walking/cycling to and from site. In 2038 and 2048 there are likely to be greater levels of active modes infrastructure within the SP site itself and in the wider area than facilities evident in and around the existing Fisher & Paykel East Tāmaki Campus, as well as significant local residential development adjacent to the SP site (PC61, Drury East and Paerata and several other future residential developments within the Future Urban Zones). Therefore, 3% in 2038 and 4% in 2048 has been assumed in this assessment. It is also noted that cycling and walking for travel to work shown in StatsNZ 2018 data⁹ for Auckland is approximately 5.3%, with cycling mode share trending upwards in recent years.

There is unlikely to be any notable heavy vehicle demand associated with FPHL staff traffic during the peak hours. However, a nominal 2% heavy vehicles proportion was assumed for the private vehicle demand in 2038 and 2048.

Overall, it is considered that each of the assumptions adopted in this assessment are realistic and generally conservative.

7.2.5 Total Trips

Given the above assumptions, the total number of trips generated by the FPHL development is shown below in **Table 7-6**.

Table 7-6: Total generated trips

Trips	AM				PM			
	2038		2048		2038		2048	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Office Staff vehicles	373	58	871	137	45	196	108	457
Manufacturing Staff vehicles	0	10	0	24	0	0	0	0
Light Vehicle Trips	366	66	854	158	45	192	106	448
Heavy Vehicle Trips	7	1	17	3	1	4	2	9
All Vehicle Trips	373	68	871	161	45	196	108	457
All trips	441		1,032		241		565	

As indicated above, some 240 to 440 vehicular trips are anticipated to be generated by the proposed activities within the SP site for the PM and AM peak hours respectively in 2038. In 2048, these trips increase to around 560 to 1,030 vehicles per hour for the PM and AM peak hours.

⁹ <https://www.stats.govt.nz/tools/2018-census-place-summaries/auckland-region#transport>



7.2.6 Turn Proportions

The turn proportions at the Oira Road / Site Access 1 / SH22 roundabout are based on the Saturn model demand flows for the 2038 and 2048 forecast years. These proportions are shown below in **Table 7-7** and **Table 7-8**.

Table 7-7: 2038 Saturn Turn Proportions

Light Vehicles (LV)					Heavy Vehicles (HV)			
2038	AM		PM		AM		PM	
Direction	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
West	39%	35%	33%	37%	25%	35%	33%	0%
North	2%	3%	2%	3%	0%	3%	2%	0%
East	59%	62%	64%	60%	75%	62%	64%	100%

Table 7-8: 2048 Saturn Turn Proportions

LV					HV			
2038	AM		PM		AM		PM	
Direction	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
West	41%	34%	36%	38%	28%	33%	0%	22%
North	3%	1%	2%	2%	0%	0%	0%	0%
East	57%	65%	62%	60%	72%	67%	100%	78%

Where Heavy Vehicle proportions were unavailable, the equivalent Light Vehicle proportions were used. Each of these assumptions are considered appropriate to use in this assessment.

7.3 Model Scenarios

As described earlier, AFC carried out the MSM runs which undertook network modelling incorporating land use data by way of households and employment for the entire Auckland Region. The MSM was run for two future forecast years (2038 and 2048) for a reference case land use (current land use projections, including for the SP site) combined with a reference transport network (according to the Indicative Strategic Transport Network South, as depicted in Figure 4-1).

In theory, all of the land use and infrastructure that is within the AFC 2038 and 2048 models are anticipated to be in place at those times. It is important to emphasise that the infrastructure assumed to be in place at those times enables the land use.

To understand the implications of a particular upgrade not being in place when it is expected within each of the future forecast years, key upgrades were removed from the models to observe traffic behaviour without those upgrades in place. However, it is very complex to also remove the corresponding land uses, therefore land use was assumed to remain the same (other than within the Drury East precincts (comprising Drury Centre Precinct, Drury East Precinct and Waihoehoe Precinct), explained further below). For example, the 2038 forecast year was tested without the Pukekohe Arterial network in place to see how the network would perform in 2038 without it, however, the land use increases in Pukekohe and Paerata that depend upon that new arterial network remained in the model. This represents a particularly conservative assumption.



The exception to this was the relationship between the collective Drury East precincts and Mill Road north. Model scenarios were run without Mill Road, but in that instance, it was straightforward to also remove the corresponding land uses from those precincts.

The timing and infrastructure scenarios adopted for the assessment are summarised below and presented in a clear format in **Table 7-9** on the following page. A total of seven key transportation infrastructure projects were identified, comprising:

- The Pukekohe Arterial Network (not funded, but expected by 2038). Section 4.4 describes the separate arterial packages included within the entire network, but in terms of this traffic modelling study, the Pukekohe Arterial Network refers only to NOR1 (Drury to Pukekohe Link) and NOR2 (Drury West Arterial), as these are relevant to local effects and the performance of SH22;
- SH22 four-laning between Jesmond Road and SH1 (not currently funded and expected by 2038);
- SH22 four-laning between Jesmond Road and Oira Road (not funded, expected by 2038);
- SH1 six-laning between Drury and Drury South, including a new Drury South interchange (not funded, expected by 2038);
- Mill Road north upgrade between SH1 Drury South Interchange and Papakura (not funded, expected by 2048);
- SH1 six-laning between Drury South and Bombay (not funded, expected by 2048); and
- The Opaheke Road upgrade from Waihoehoe Road to Papakura (not funded, expected by 2048).

The scenarios in Table 7-9 assess the effect of each of these upgrades not being in place when expected. It should be noted that 2048 scenarios 7 through 12 include a reduction to the collective Drury East precincts yield to recognise the cap on development without the Mill Road upgrade in place, with the full yield restored once Mill Road is in place. This has been taken into consideration in the analysis that has been undertaken.

For clarity, many of the projects listed in this report that have committed funding and are in the process of being delivered are assumed to be in place in all scenarios, including the rail electrification, three new rail stations and associated active mode facilities, SH1 six-laning from Papakura to Drury (incorporating the Drury Interchange), the Waihoehoe Road / Great South Road intersection, and Waihoehoe Road between Great South Road and Fitzgerald Road. Accordingly, all of these upgrades are assumed to be in place in all modelled scenarios.

Notes:

- Scenarios 1 and 7 consider the effect of the expected land uses in the southern area with no upgrades in place (other than those assumed to be in place in the paragraph above). These are the 'Do-Nothing' Scenarios.
- Scenarios 6 and 15 are the AFC expected scenarios, i.e. the networks in 2038 and 2048 that are expected to be in place in the southern growth area, and are used by NZTA and AT when planning growth in the southern area. These are the 'Do Minimum' Scenarios.



Table 7-9: Model Scenarios

Year	Scenario No.	Scenario Name	Pukekohe Arterial Network	SH22 Four-Laning SH1 to Jesmond	SH22 Four-Laning Jesmond to Oira	SH1 Six-Laning Drury to Drury South	Mill Road North of Fitzgerald / Waihoehoe	SH1 Six-Laning Drury South to Bombay	Opaheke Road
2038	1	Existing Network	No	No	No	No	No	No	No
2038	2	S1 + SH22 to Jesmond	No	Yes	No	No	No	No	No
2038	3	S2 + SH22 to Oira	No	Yes	Yes	No	No	No	No
2038	4	S3 + Puke Arterials	Yes	Yes	Yes	No	No	No	No
2038	5	S3 + SH1 Drury to Drury S	No	Yes	Yes	Yes	No	No	No
2038	6	AFC Devt Scenario	Yes	Yes	Yes	Yes	No	No	No
2048	7	Existing Network	No	No	No	No	No	No	No
2048	8	S1 + SH22 to Jesmond	No	Yes	No	No	No	No	No
2048	9	S8 + SH22 to Oira	No	Yes	Yes	No	No	No	No
2048	10	S9 + Puke Arterials	Yes	Yes	Yes	No	No	No	No
2048	11	S9 + SH1 Drury to Drury S	No	Yes	Yes	Yes	No	No	No
2048	12	S9 + SH1 Drury to Drury S + Puke Arterials	Yes	Yes	Yes	Yes	No	No	No
2048	13	S12 + Mill Road N	Yes	Yes	Yes	Yes	Yes	No	No
2048	14	S12 + Mill Road N + SH1 Drury S to Bombay	Yes	Yes	Yes	Yes	Yes	Yes	No
2048	15	AFC Devt Scenario	Yes	Yes	Yes	Yes	Yes	Yes	Yes



Three comparative land use options for the SP site were assessed:

- No development at all;
- Development as per the Council Structure Plan (medium density residential, as provided by AFC); and
- FPHL development (business land use - employment) scenario.
- The results of the modelling are provided in the following section of this report.

7.4 Modelling Results

Modelling of the scenarios was undertaken using the SATURN model and the key intersections analysed were as follows:

- Intersection 1: SH22 / Glenbrook Road (existing roundabout)
- Intersection 2: SH22 / Oira Road (proposed double roundabout)
- Intersection 3: SH22 / Jesmond Road (proposed traffic signals)
- Intersection 4: Great South Road / SH 22 (proposed traffic signals)
- Intersection 5: SH1 / SH22 Drury interchange – West (existing traffic signals)
- Intersection 6: SH1 / SH22 Drury interchange – East (existing traffic signals)
- Intersection 7: Great South Road / Waihoehoe Road (proposed traffic signals)

The average intersection delays predicted by the model was used as a key performance indicator (**KPI**) for the operation of the intersections. When the average delay exceeds a certain threshold, such as 100 seconds per vehicle (sec/veh), it suggests potential capacity issues at the intersection. This could mean that the intersection is experiencing congestion, leading to longer wait times for vehicles passing through.

Modelling and analyses were undertaken for the AM (7:30-8:30) and PM (4:30-5:30) peak hours and the results are summarised in the following sections of this report for the two future forecast years and the three land use options for the site. The operational performance (on the basis of overall intersection delay in sec/veh) of the seven key intersections and for each of the scenarios listed in table 7-9 above are provided within the sections below. Any intersections with an average delay of 100 seconds or more are flagged blue to easily identify where congestion occurs.

7.4.1 2038 Results – AM peak hour

The operational performance (on the basis of overall intersection delay in sec/veh) of the seven key intersections assuming the SP site is undeveloped (No Development Scenario) for the AM peak hour is provided in **Table 7-10**.

Table 7-10: Intersection Performance for the 2038 scenarios (No Development) – AM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
1	11	6	30	50	18	21	90
2	12	6	30	41	14	21	113
3	12	6	29	33	12	22	121
4	11	6	34	23	18	20	127
5	12	6	29	35	17	29	124
6	11	6	34	22	17	22	115

A similar analysis for the situation where the SP site is developed as per the Council's Drury-Opāheke Structure Plan is shown in **Table 7-11**.



Table 7-11: Intersection Performance for the 2038 scenarios (Council SP) – AM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
1	11	6	30	51	17	21	89
2	11	6	30	33	13	23	116
3	11	6	31	35	12	22	109
4	11	6	34	23	18	20	129
5	12	6	31	35	16	29	126
6	11	6	34	22	18	21	124

The results for the SP site developed for FPHL purposes (Business – Light Industry use) is shown in **Table 7-12** below.

Table 7-12: Intersection Performance for the 2038 scenarios (FPHL) – AM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
1	11	7	27	53	18	22	105
2	12	7	30	44	14	23	120
3	12	7	31	42	14	22	122
4	11	6	33	24	17	20	136
5	12	7	31	33	15	23	139
6	11	6	33	23	20	20	132

Overall, for the AM peak hour, apart from the Great South Road / Waihoehoe intersection, the transport network is likely to operate reasonably well in 2038 for all land use and infrastructure scenarios. This is despite all of the 2038 land use scenarios being in place in all scenarios. Comparing the Auckland Council Drury-Opaheke Structure Plan scenario (residential land use) with the FPHL scenario (Business – Light Industry land use), the difference in level of operation at the Great South Road / Waihoehoe intersection varies between 0 and 17 sec/veh. This is not considered significant for the AM peak hour.

7.4.2 2038 Results – PM peak hour

The operational performance of the seven key intersections for the situation where the underlying land within the SP site is undeveloped for the PM peak hour is provided in **Table 7-13**.



Table 7-13: Intersection Performance for the 2038 scenarios (no Development) – PM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
1	10	7	39	65	16	25	73
2	11	8	42	58	13	26	74
3	11	8	38	60	14	27	82
4	10	6	36	25	15	24	82
5	10	10	37	165	16	26	69
6	10	6	35	26	13	25	53

A similar analysis for the situation where the SP site is developed as per the Auckland Council Drury-Opāheke Structure Plan is shown in **Table 7-14**.

Table 7-14: Intersection Performance for the 2038 scenarios (Council SP) – PM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
1	11	8	39	65	15	25	77
2	10	7	37	114	13	25	49
3	11	14	38	58	14	27	89
4	10	6	35	25	15	24	85
5	10	6	27	32	12	26	85
6	10	6	34	26	13	25	57

The results for the SP site developed for FPHL purposes (Business – Light Industry land use) is shown in **Table 7-15** below.

Table 7-15: Intersection Performance for the 2038 scenarios (FPHL) – PM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
1	11	9	38	74	16	25	84
2	11	11	39	66	15	27	90
3	11	12	33	63	15	27	91
4	10	7	35	25	14	24	82
5	10	13	33	48	15	26	75
6	10	7	35	24	13	25	63

Overall, for the PM peak hour, the transport network is likely to operate reasonably well in 2038 for all land use and infrastructure scenarios. An issue is noted for Scenario 5 under the No-development land use and for Scenario 2 under the Council Structure Plan land use at the Great South Road / SH 22 intersection, but this constraint is not observed for the FPHL scenario.



Based on the modelling which has been undertaken the effect of the FPHL development on the surrounding transportation network in 2038 is not considered significant, or at least not substantially more than what would be expected than the baseline (or Structure Plan) scenario. The network operates well in most scenarios even with no upgrades but fully assumed land uses.

7.4.3 2048 Results – AM peak hour

The operational performance of the seven key intersections for the situation where the underlying land within the SP site is undeveloped for the 2048 AM peak hour is provided in **Table 7-17**.

Table 7-16: Intersection Performance for the 2048 scenarios (no Development) – AM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
7	57	7	62	85	39	22	246
8	73	7	51	142	52	25	288
9	71	8	82	138	49	26	283
10	74	7	71	36	61	87	281
11	69	8	83	134	41	25	284
12	62	6	72	36	63	75	281
13	12	7	68	30	9	17	136
14	12	7	66	29	11	16	138
15	13	7	42	32	9	18	38

The results for when the SP site is developed as per the Council Structure Plan is shown in **Table 7-17**.

Table 7-17: Intersection Performance for the 2048 scenarios (Council SP) – AM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
7	56	8	59	88	31	22	258
8	73	8	49	140	53	26	283
9	73	9	60	142	35	24	290
10	75	7	83	38	74	101	292
11	67	9	71	135	41	25	285
12	61	7	80	32	72	81	286
13	12	9	67	29	12	16	129
14	12	8	67	28	12	17	138
15	13	8	64	31	9	17	37

The results for the SP site developed for FPHL purposes is shown in **Table 7-18** below.



Table 7-18: Intersection Performance for the 2048 scenarios (FPHL) – AM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
7	69	131	82	76	26	23	221
8	79	103	84	86	43	26	272
9	72	89	86	87	30	25	288
10	105	32	69	41	59	102	280
11	72	106	93	96	26	24	311
12	97	38	73	37	73	70	304
13	15	58	68	34	11	17	128
14	15	54	74	33	11	17	136
15	19	53	77	36	11	18	38

As is evident from the results of the modelling, the Great South Road / Waihoehoe Road intersection is likely to come under significant pressure in 2048 during the AM peak hour with the currently envisaged design. It is only when all seven key transportation projects are included in the modelling (Scenario 15, the expected, Do-Minimum scenario) that the overall intersection delay drops to around 40 sec/veh.

The SH 22 / Oira intersection, which will also be the main access point for the SP site (via a southern leg), is forecast to experience high delays for Scenarios 7, 8 and 11, generally when the Pukekohe arterial network is not provided. As such, it is likely that additional accesses would be required by 2048 if the Pukekohe Arterial network is not operational at that juncture.

Relatively high delays are anticipated at the SH22 / Great South Road intersection even without the SP site land being developed and when the land is developed in accordance with the Council Structure Plan. In this respect the modelling indicates that the Pukekohe arterial network needs to be included in 2048 just to cater for normal traffic growth in the surrounding region.

There is a notable drop in congestion once Mill Road is provided, despite the higher land use yield that it enables.

7.4.4 2048 Results – PM peak hour

The operational performance of the seven key intersections for the situation where the underlying land within the SP site is undeveloped for the 2048 PM peak hour is provided in **Table 7-19**.



Table 7-19: Intersection Performance for the 2048 scenarios (no Development) – PM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
7	13	11	42	99	15	27	108
8	14	60	51	112	14	27	181
9	14	54	44	113	14	27	155
10	11	6	75	52	13	24	122
11	12	98	51	112	15	28	102
12	10	7	67	41	16	23	121
13	10	9	62	34	13	25	53
14	10	8	61	32	13	25	46
15	10	11	68	33	12	27	30

The modelling results for the Structure Plan scenario is summarised in **Table 7-20**.

Table 7-20: Intersection Performance for the 2048 scenarios (Council SP) – PM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
7	13	32	46	97	14	27	135
8	14	73	52	110	13	27	183
9	14	90	50	115	13	28	137
10	11	7	79	56	14	25	119
11	12	100	55	108	74	57	120
12	10	7	66	39	15	24	113
13	10	17	63	36	11	25	51
14	10	11	62	32	13	25	47
15	10	16	68	32	13	27	30

The results for the FPHL scenario are summarised in **Table 7-21**.



Table 7-21: Intersection Performance for the 2048 scenarios (FPHL) – PM Peak

Scenario	Int 1	Int 2	Int 3	Int 4	Int 5	Int 6	Int 7
7	13	275	46	101	14	29	127
8	13	287	42	107	9	25	113
9	14	527	47	104	12	28	177
10	11	14	72	48	15	25	120
11	12	598	52	114	14	29	107
12	11	36	66	42	17	24	101
13	10	224	61	36	11	26	52
14	10	233	57	33	12	25	48
15	10	299	63	41	14	25	32

As with the AM peak, in the PM peak the Great South Road / Waihoehoe Road intersection is forecast to come under pressure for the majority of the scenarios. However, once the Mill Road improvements are included, the performance of the intersection improves significantly despite the higher Drury East land use that it enables.

The SH22 / Great South Road intersection also comes under pressure until the Pukekohe Arterial network is constructed. However, even though the FPHL development may exert some pressure on the intersection, it seems that its impact isn't significantly different from other two land use scenarios tested, namely the No-development scenario and the Council Structure Plan scenario.

The one intersection that does stand out from the rest is the SH22 / Oira Road roundabout, which provides the main access point for the SP site. As indicated, with a single point of access off the roundabout, the double roundabout cannot cope with anticipated FPHL traffic volumes in the PM peak hour for the 2048 forecast year. This is consistent with the findings for the AM Peak. As such, it is likely that more than one access will be required if the Pukekohe arterial network is not constructed. The access is assessed further in the following section.

7.4.5 Site Access

As indicated earlier, at 2038 the FPHL development proposal can be supported by a single access point off the SH22 / Oira Road roundabout.

In 2048, the modelling indicates that one access will not be sufficient to accommodate the traffic associated with the expected FPHL development at that time. As discussed earlier, it should be noted that the fully anticipated household growth in Paerata and Pukekohe remains in the model despite the Pukekohe Arterial network that enables it not being present, meaning that this result is particularly conservative. However, if an additional site access is provided, likely via a new set of traffic signals at the eastern site boundary (Access Road 2), this would ease the pressure on the SH22 / Oira Road roundabout.

The access options were tested using SIDRA to provide a more detailed assessment of the operation of the accesses. The assessment assumes a worst-case scenario where no external improvements to the transportation network are provided (that is, scenario 7 for the 2048 forecast year).

The indicative intersection layout adopted for the assessment is shown in **Figure 7-1** below.



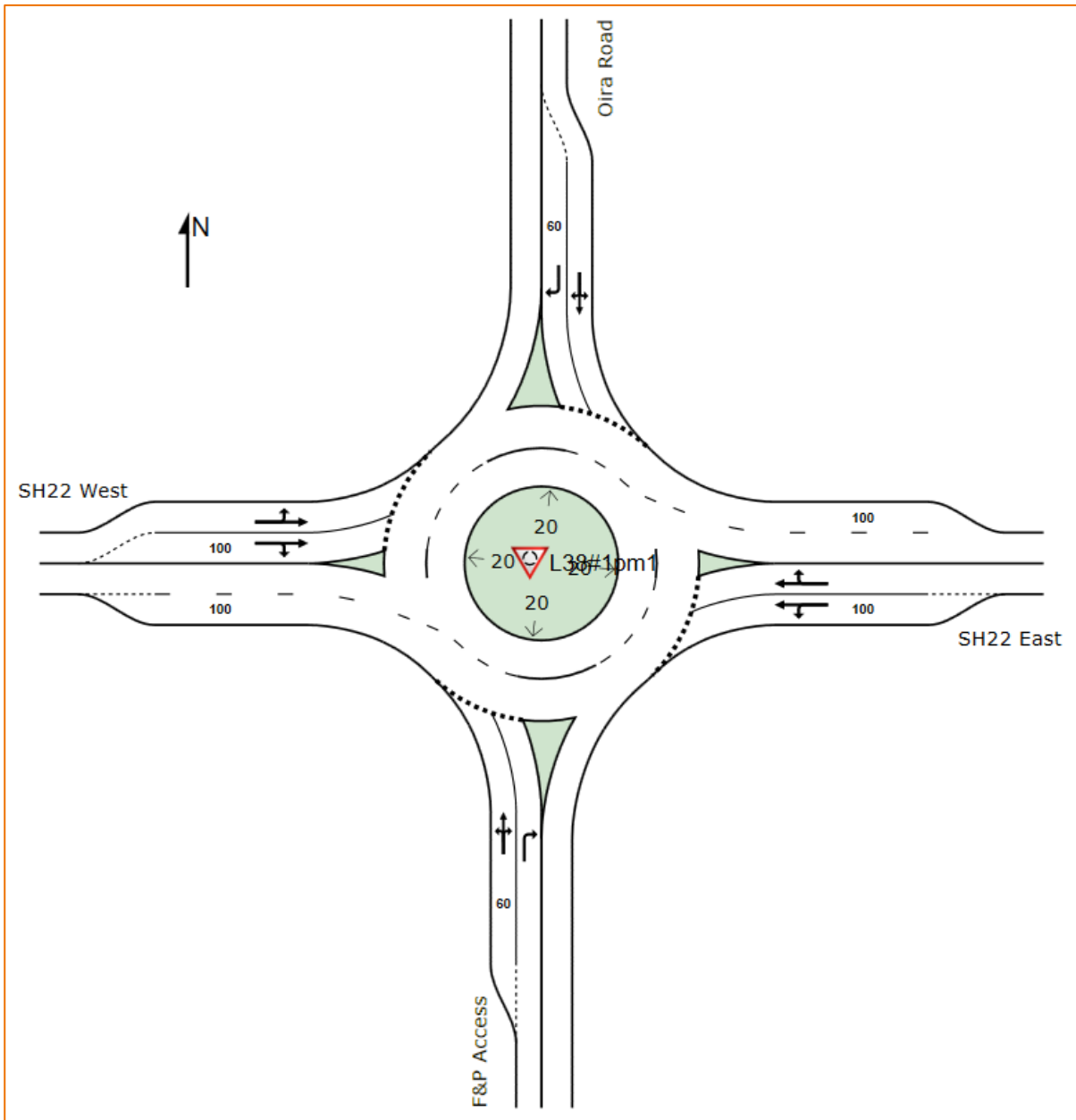


Figure 7-1: SH22 / Oira Road / FPHL access Intersection Indicative Layout

The performance of the intersection for the AM and PM peak hours for this layout as the sole access point to the site is summarised in **Table 7-22** and

Table 7-23 respectively, where Flow = approach flow in vehicles per hour; DoS = Degree of Saturation (the ratio of Flow vs Capacity); Delay = average Delay in seconds; LOS = Level of Service (a measure of delay); and 95% Q = the 95th percentile queue in metres.



Table 7-22: Intersection Performance (SH22 / Oira / Site Access) – AM Peak

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	89	0.14	9.5	A	5
	Through	3	0.14	7.8	A	5
	Right	128	0.16	12.0	B	6
	Approach	220	0.16	10.9	B	6
East (SH22)	Left	566	0.84	21.6	C	76
	Through	307	0.64	16.7	B	35
	Right	1	0.64	20.5	C	35
	Approach	874	0.84	19.9	B	76
North (Oira)	Left	35	0.64	18.6	B	39
	Through	67	0.64	18.6	B	39
	Right	480	0.64	26.3	C	39
	Approach	582	0.64	25.0	C	39
West (SH22)	Left	85	0.45	5.1	A	22
	Through	717	0.69	5.2	A	49
	Right	656	0.69	9.7	A	49
	Approach	1,458	0.69	7.3	A	49
Intersection		3,134	0.84	14.3	B	76



Table 7-23: Intersection Performance (SH22 / Oira / Site Access) – PM Peak

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	269	1.01	210.5	F	145
	Through	14	1.01	117.7	F	145
	Right	401	0.98	84.1	F	143
	Approach	684	1.01	134.5	F	145
East (SH22)	Left	107	0.83	9.5	A	79
	Through	1,221	0.83	71.4	F	79
	Right	273	0.83	14.9	B	78
	Approach	1,748	0.83	54.2	E	79
North (Oira)	Left	1	0.43	19.0	B	23
	Through	4	0.43	17.1	B	23
	Right	312	0.43	75.8	F	23
	Approach	317	0.43	74.9	F	23
West (SH22)	Left	184	0.57	9.6	A	25
	Through	857	0.86	13.4	B	72
	Right	63	0.86	18.2	B	72
	Approach	1,104	0.86	13.0	B	72
Intersection		3,853	1.01	58.4	E	145

As indicated, whilst the intersection is predicted to work satisfactorily in the AM peak hour, higher delays are anticipated for the PM peak hour with some approaches deteriorating to a LOS of F.

This confirms the earlier results that a single access for the site is insufficient to cater for the anticipated demands.

Based on this, a second access is proposed to be in place by 2048, if the Pukekohe arterial network is not operational by that year. The second access is proposed to be located to the east of the SH22 / Oira Road intersection and an indicative layout is shown below in **Figure 7-2**.

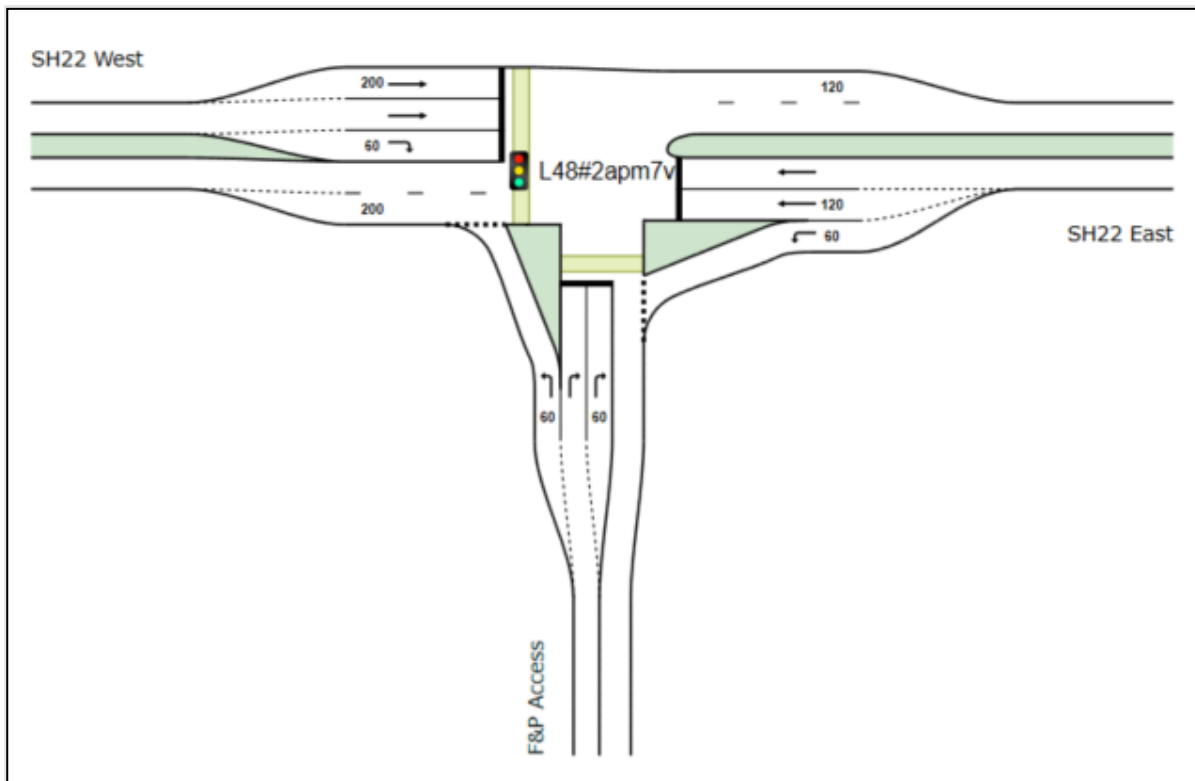


Figure 7-2: Second FPHL Site Access

With the second access in place, traffic will redistribute depending on their origins or destinations and expected delays at the intersection points. It has generally been assumed that if traffic is approaching from the east, then there would be a higher likelihood of these vehicles using the eastern access to enter the site and if traffic was approaching from the west, then there would be a higher likelihood of vehicles entering the site via the western access. A similar rationale has been adopted for vehicles leaving the site.

Given these assumptions, the SH22 / Oira Road roundabout has been reassessed and a separate analysis of the SH22 / eastern access has been undertaken for the AM and PM peak hours. The results are summarised in the following Tables.

Table 7-24: Intersection Performance (SH22 / Oira / Site Access) – AM Peak (2 Site Accesses)

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	76	0.10	9.1	A	4
	Through	3	0.10	7.3	A	4
	Right	19	0.04	14.5	B	1
	Approach	98	0.10	10.1	B	4
East (SH22)	Left	85	0.25	8.7	A	8
	Through	320	0.37	8.8	A	15
	Right	1	0.37	12.6	B	15
	Approach	406	0.37	8.8	A	15
North (Oira)	Left	35	0.43	14.7	B	18
	Through	67	0.43	14.7	B	18
	Right	480	0.58	20.0	C	31
	Approach	582	0.58	19.1	B	31
West (SH22)	Left	85	0.38	4.4	A	19
	Through	815	0.58	4.5	A	39
	Right	558	0.58	8.9	A	39
	Approach	1,458	0.58	6.2	A	39
Intersection		2,544	0.58	9.7	A	39



Table 7-25: Intersection Performance (SH22 / Oira / Site Access) – PM Peak (2 Site Accesses)

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	179	0.47	52.7	E	21
	Through	14	0.47	14.7	B	21
	Right	61	0.24	19.6	B	8
	Approach	254	0.47	42.7	D	21
East (SH22)	Left	16	0.79	8.6	A	68
	Through	1,261	0.79	35.2	D	68
	Right	273	0.79	13.9	B	66
	U-Turn	147	0.79	16.1	B	66
	Approach	1,696	0.79	29.9	C	68
North (Oira)	Left	1	0.31	10.2	B	13
	Through	4	0.31	9.6	A	13
	Right	312	0.31	35.9	D	13
	Approach	317	0.31	35.4	D	13
West (SH22)	Left	184	0.48	7.5	A	22
	Through	866	0.73	9.2	A	57
	Right	54	0.73	13.9	B	57
	Approach	1,104	0.73	9.1	A	57
Intersection		3,371	0.79	24.6	C	68

As shown, the modelling indicates that with the redistribution of traffic across two site accesses, the SH22 / Oira Road roundabout is expected to operate well in both AM and PM peak hours (regardless of whether external transportation improvements are completed by 2048, but including the growth in Paerata and Pukekohe enabled by those upgrades).

The performance of the second site access intersection with SH22 is summarised in the following tables.

Table 7-26: Intersection Performance (SH22 / Second Site Access) – AM Peak

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	13	0.01	7.9	A	0
	Right	109	0.12	19.7	B	8
	Approach	122	0.12	18.4	B	8
East (SH22)	Left	481	0.34	7.1	A	19
	Through	392	0.47	19.4	B	33
	Approach	873	0.47	12.6	B	33
West (SH22)	Through	771	0.51	10.2	B	59
	Right	98	0.43	29.4	C	17
	Approach	869	0.51	12.4	B	59
Intersection		1,864	0.51	12.9	B	59

Table 7-27: Intersection Performance (SH22 / Second Site Access) – PM Peak

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	90	0.16	74.5	E	17
	Right	340	0.66	57.1	E	81
	Approach	430	0.66	60.8	E	81
East (SH22)	Left	91	0.05	13.5	B	2
	Through	1,656	0.70	48.9	D	226
	Approach	1,747	0.70	47.1	D	226
West (SH22)	Through	1,062	0.44	7.0	A	105
	Right	9	0.09	67.2	E	4
	Approach	1,071	0.44	7.5	A	105
Intersection		3,428	0.70	35.8	D	226

As shown, the second site access will operate acceptably for the AM and PM peak hours in 2048, even without the wider network transportation improvements being constructed and the assumed growth in Paerata and Pukekohe remaining. Despite some 95th percentile queueing of over 200m on SH22, this is considered acceptable queue distances in peak hour conditions.



7.4.6 ADDITIONAL SENSITIVITY TESTING

As discussed in section 7.2.1, as well as the 50% overlapping peak hours (staff and background), sensitivity tests were also undertaken of the absolute worst case at the site driveway(s), i.e. a 100% overlapping peak, to establish if the staff peak time that in practice avoids the background traffic peak can still be accommodated at the site driveway(s) if it were to coincide entirely with the background afternoon peak. The additional sensitivity testing focused on the PM peak period which was determined to be the critical period (having higher traffic volumes and resulting delays / queuing).

Intersection capacity of the proposed roundabout was tested for the 2038 forecast year for an employee yield of 1,928. The initial intersection layout test was the same as shown in Figure 7-1 above, with two approach lanes in each direction.

The results of the analysis are summarised in **Table 7-28**.

Table 7-28: Intersection Performance (SH22 / Oira / Site Access) – 2038 PM Peak (co-incident peaks)

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	214	0.60	29.4	C	29
	Through	16	0.60	20.0	C	29
	Right	318	0.63	22.3	C	36
	Approach	548	0.63	25.0	C	36
East (SH22)	Left	65	0.48	6.1	A	21
	Through	1,114	0.73	10.1	B	54
	Right	140	0.73	11.8	B	54
	Approach	1,748	0.73	10.1	B	54
North (Oira)	Left	1	0.18	10.0	B	7
	Through	2	0.18	9.7	A	7
	Right	272	0.24	17.3	B	10
	Approach	275	0.24	17.2	B	10
West (SH22)	Left	207	0.33	6.4	A	12
	Through	544	0.50	6.5	A	23
	Right	37	0.50	11.0	B	23
	Approach	788	0.50	6.7	A	23
Intersection		2,930	0.73	12.6	B	54

As indicated, the intersection is anticipated to work well in 2038, even if the peaks of the site and the surrounding road network were to coincide.

Further iterative testing was undertaken to establish the point at which the roundabout would need to be upgraded. In this respect the trip generation of the site was incrementally increased until the intersection showed signs of 'failing'. The tests indicated that where the employee numbers reached above 2,900, the



intersection would need to be upgraded. The results of the analysis for 2,900 employees are shown in **Table 7-29**.

Table 7-29: Intersection Performance (SH22 / Oira / Site Access) – 2038 PM Peak (2,900 employees)

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	321	0.93	89.6	F	98
	Through	24	0.93	60.2	E	98
	Right	477	0.97	76.4	F	166
	Approach	822	0.97	81.1	F	166
East (SH22)	Left	97	0.50	6.4	A	22
	Through	1,114	0.76	16.9	B	60
	Right	140	0.76	12.3	B	60
	Approach	1,352	0.76	15.7	B	60
North (Oira)	Left	1	0.22	12.4	B	9
	Through	3	0.22	11.7	B	9
	Right	272	0.29	26.2	C	13
	Approach	276	0.29	26.0	C	13
West (SH22)	Left	207	0.39	7.4	A	15
	Through	544	0.59	8.1	A	32
	Right	55	0.59	12.5	B	32
	Approach	807	0.59	8.2	A	32
Intersection		3,256	0.97	31.2	C	166

As indicated, whilst the overall intersection operates at an LOS of C, the southern approach (the FPHL access) has the greater delays and queues, although still considered acceptable for the peak hour. Beyond this level of development, the intersection failed, therefore beyond 2,900 employees, further mitigation for the access intersection would be required.

An additional upgrade was investigated, and the layout is as shown in **Figure 7-3** below, which provides an additional left turn lane at the roundabout for the southern approach.



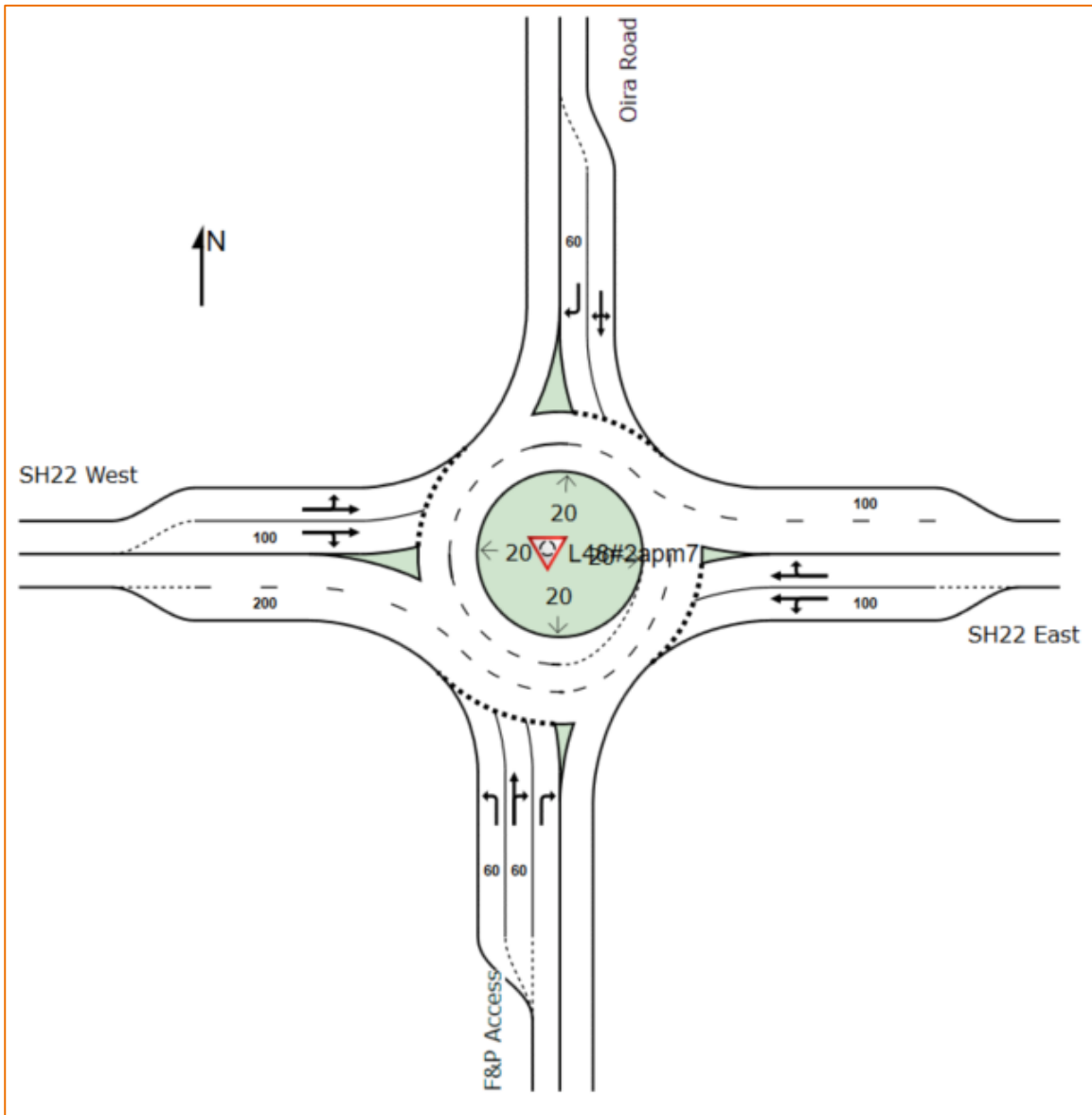


Figure 7-3: Second FPHL Site Access

Again, the test incrementally increased the number of employees until failure occurred. The analysis indicated that the updated layout would be sufficient to cater for 3,200 employees before failure occurred. The results of the 3,200 employee test are summarised in **Table 7-30**.

Table 7-30: Intersection Performance (SH22 / Oira / Site Access) – 2038 PM Peak (3,200 employees)

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	429	0.56	183.1	F	30
	Through	32	0.61	13.0	B	30
	Right	637	0.63	20.4	C	32
	Approach	1,098	0.63	83.8	F	32
East (SH22)	Left	106	0.49	4.9	A	21
	Through	1,103	0.64	68.3	E	37
	Right	131	0.64	11.3	B	37
	Approach	1,340	0.64	57.7	E	37
North (Oira)	Left	1	0.21	9.3	A	8
	Through	4	0.21	8.4	A	8
	Right	274	0.22	83.2	F	9
	Approach	279	0.22	81.8	F	9
West (SH22)	Left	209	0.39	6.3	A	15
	Through	540	0.51	6.0	A	25
	Right	63	0.51	12.3	B	25
	Approach	812	0.51	6.6	A	25
Intersection		3,529	0.64	55.9	E	37

As shown, the overall intersection performance drops to an LOS of E but anticipated queue lengths are not considered significant.

For the 2048 forecast year, sensitivity testing of the co-incident peaks was also undertaken to ensure the expected staff movements can be accommodated at the site driveways. Within the SATURN model it has been assumed that by 2048, all the transport infrastructure upgrades listed previously will have been constructed and would be operational, bearing in mind that all of these upgrades are required to support the growth throughout the surrounding region.

Also, as reported earlier in Section 7.4.5, two accesses will be required to support the 4,675 employees forecast by 2048. The results of the sensitivity analysis for 2048 are summarised in **Table 7-31** and



Table 7-32 for the roundabout (with three approach lanes from the site) and the signalised intersection.



Table 7-31: Intersection Performance (SH22 / Oira / Site Access) – 2048 PM Peak (co-incident peaks)

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	516	0.72	62	E	40
	Through	32	0.35	10	B	11
	Right	375	0.47	16	B	17
	Approach	923	0.72	41	D	40
East (SH22)	Left	24	0.57	6	A	29
	Through	1,032	0.57	37	D	29
	Right	233	0.57	11	B	29
	Approach	1,289	0.57	32	C	29
North (Oira)	Left	1	0.18	8	A	7
	Through	6	0.18	8	A	7
	Right	233	0.18	40	D	7
	Approach	240	0.18	39	D	7
West (SH22)	Left	139	0.35	7	A	12
	Through	566	0.53	7	A	25
	Right	73	0.53	12	B	25
	Approach	778	0.53	8	A	25
Intersection		3,230	0.72	29	C	40



Table 7-32: Intersection Performance (SH22 / Second Site Access) – PM Peak

Approach	Movement	Flow (veh/hr)	DoS (v/c)	Delay (sec/veh)	LOS	95% Q (m)
South (FPHL access)	Left	209	0.24	25.5	C	34
	Right	791	0.90	54.6	D	167
	Approach	1,000	0.90	48.6	D	167
East (SH22)	Left	133	0.08	16.9	B	3
	Through	1,425	0.88	45.1	D	250
	Approach	1,558	0.88	42.7	D	250
West (SH22)	Through	1,224	0.67	22.3	C	161
	Right	13	0.10	55.3	E	4
	Approach	1,237	0.67	22.6	C	161
Intersection		3,795	0.90	37.7	D	250

As indicated, even with the adoption of the conservative co-incident peak assumption, the two accesses are likely to operate reasonably well in 2048.

7.4.7 Summary

Overall, the modelling indicates that for the 2038 future forecast year, the surrounding transportation network is generally able to accommodate the traffic volumes associated with the FPHL development even if the expected external infrastructure upgrades are not provided, and even assuming a “worst-case” afternoon peak scenario. The Great South Road / Waihoehoe intersection is anticipated to experience some pressure, but this added pressure will occur even without the presence of the FPHL development.

For the 2048 future forecast year, the modelling indicates that the transportation network with the FPHL development is likely to perform no differently to the No-development and Council Structure Plan scenarios and it is noted that the Great South Road / Waihoehoe intersection will come under considerable pressure until the Mill Road improvement is incorporated. The one intersection which performs considerably worse when comparing the FPHL land use scenario with the other two land use scenarios is the SH22 / Oira Road roundabout, where the main access for the FPHL site connects to. However, if a secondary access is provided for the site (Access 2 in the eastern portion of the Site), the capacity issues are resolved.

Overall, the assessment indicates that the effects of the FPHL proposal on the surrounding transportation network are acceptable or can be effectively mitigated.

The iterative sensitivity testing that established the maximum employee yields that could be accommodated by the site driveway(s) can be summarised as follows:

- In 2038, a single site driveway consisting of a double roundabout with two approach lanes from each direction can accommodate up to 2,900 employees, which represents an equivalent 79,750sqm of commercial and industrial GFA.
- In 2038, with an additional approach lane from the site, up to 3,200 employees can be accommodated, which represents an equivalent 88,000sqm of commercial and industrial GFA.
- In 2048, the forecast employment yield of 4,675 employees can be accommodated, which represents an equivalent 128,900sqm of commercial and industrial GFA.

For the purposes of the proposed Private Plan Change, a table presenting the assumed Thresholds for Development is expected. Given the modelling results, this is provided in **Table 7-28** below:



Table 7-28: Thresholds for Development

Column 1		Column 2
Activities or development enabled by Transport infrastructure in column 2		Transport infrastructure required to enable activities or development in column 1
(a)	Prior to the occupation of any building and up to a maximum of 79,750m ² commercial and industrial gross floor area.	Provision of an interim upgraded intersection (roundabout with two approach lanes in each direction or equivalent interim traffic signals), including active mode facilities, located generally at the intersection of Karaka Road and Oira Road, as shown on Precinct Plan 1.
(b)	Occupied development greater than 79,750m ² and up to a maximum of 88,000m ² commercial and industrial gross floor area	Provision of an ultimate upgraded intersection (roundabout with three approach lanes from the Precinct or equivalent traffic signals), including active mode facilities, located generally at the intersection of Karaka Road and Oira Road, as shown on Precinct Plan 1.
(c)	Occupied development greater than 88,000m ² and up to a maximum of 128,900m ² commercial and industrial gross floor area.	Upgrades in (b) above; and Provision of a second site access, including active mode facilities, located generally at the locations shown on Precinct Plan 1.

8. Integration with Transport Planning and Policy

The following section provides a review of the established policy and plans in relation to the Updated Karaka Road Structure Plan. The following documents were reviewed:

- Government Policy Statement on Land Transport (**GPS**);
- Auckland Plan 2050;
- Auckland Unitary Plan (**AUP**);
- Auckland Transport Alignment Project (**ATAP**);
- Regional Land Transport Plan (**RLTP**);
- Regional Public Transport Plan (**RPTP**);
- Integrated Transport Programme (**ITP**); and
- Transport Emissions Reduction Pathway (**TERP**).

8.1 Government Policy Statement on Land Transport (GPS)

The Government Policy Statement (GPS) on Land Transport sets out the Government's desired outcomes and priorities for the land transport sector. It describes what Central Government expects to achieve through the National Land Transport Fund and the manner in which funding is allocated to upgrade and maintain the land transport network.

The Consultation Draft GPS was released in March 2024 and will take effect from 1 July 2024. The GPS provides strategic direction for a 10-year period until 2033/2034 to improve the performance of the land transport system.

The GPS has four outcomes to achieve, and summarises the objectives of these outcomes as follows:

- i. Economic growth and increased productivity
 - a. Reduced journey times and increased travel time reliability.
 - b. Less congestion and increased patronage on public transport.
 - c. Improved access to markets, employment and areas that contribute to economic growth.
 - d. More efficient supply chains for freight.
 - e. Unlocked access to greenfield land for housing development and supporting greater intensification.
- ii. Increased maintenance and resilience
 - a. More kilometres of the road network resealed and rehabilitated each year.
 - b. Fewer potholes.
 - c. A more resilient network.
- iii. Improved safety
 - a. Reduction in deaths and serious injuries.
 - b. Increased enforcement.
- iv. Value for money
 - a. Better use of existing capacity.
 - b. Less expenditure on temporary traffic management.

This Private Plan Change application seeks to rezone approximately 86.5ha of land in Drury West, from Future Urban to Business – Light Industry zone. The development enabled by this Plan Change will provide a new employment centre to the east of the Paerata Rise residential development. This allows integrated land use within the context of the complementary activities in the local Drury West area.



The location of the proposed light industrial / employment development reduces the need for commuters to make specific trips to other employment centres. This will reduce the number of people that have to travel towards the more central parts of the Auckland region, thereby reducing demand on the State Highway networks and reducing the overall time people spend travelling. The location also promotes alternative transport modes given its location to complementary residential activities as well as proximity to bus routes and the new Ngākōroa train station. This provides increased access to employment contributing to economic growth, as outlined in the GPS.

The PPC request aligns with the strategic priorities of the GPS by enabling active mode connections between areas of residential and employment activity which helps to improve accessibility and reduce greenhouse gas emissions. The updated Karaka Road Structure Plan helps reduce the safety risk to drivers by promoting access between complimentary land uses, and by reducing the number and length of vehicular trips on the road network. It is therefore considered that the updated Karaka Road Structure Plan and PPC to rezone the site for Business – Light Industry use integrate very well with the objectives outlined in the GPS.

8.2 Auckland Future Development Strategy (FDS)

The Auckland Future Development Strategy 2023-2053 (**FDS**) sets out how Auckland will grow and change over the next 30 years to support Auckland's population growth. This strategy aims to deal with this significant uncertainty and level of change in a land use sense. It replaces the existing Auckland Plan 2050 Development Strategy 2018 and the Future Urban Land Supply Strategy 2017. The rest of the Auckland Plan 2050 remains in place, including the six Auckland Plan outcomes. The Auckland Plan 2050 and the Future Development Strategy work together to set the high-level direction for Auckland over the long-term.

The Future Development Strategy Strategic Spatial Framework outlines the over-arching challenges for Auckland over the next 30 years:

- i. Climate change and its impacts;
- ii. Spatial planning in an uncertain and changing environment;
- iii. Halting the ongoing degradation of the natural environment;
- iv. Achieving equitable growth and change;
- v. Investing in infrastructure in a financially constrained environment.

The Future Development Strategy Strategic Spatial Framework also includes five principles for a quality compact approach to growth and change:

- i. Reduce greenhouse gas emissions;
- ii. Adapt to the impacts of climate change;
- iii. Make efficient and equitable infrastructure investments;
- iv. Protect and restore the natural environment;
- v. Development results in resilient built systems, natural environment, and communities.

Providing a significant employment hub in the vicinity of significant new residential areas reduces the need for people living in the residential area to travel to other areas of Auckland for employment, reducing travel time and subsequently reducing greenhouse gas emissions and VKTs.

The development will be centred around a train station, and other public transport and active modes infrastructure that is proposed to be upgraded or delivered in the foreseeable future. This will provide multiple transport options for both residents and employees in the area, aligning with multiple principles outlined above.

The FDS describes the area within which the SP site lies as Stage 2 of Drury West and anticipates land activation in 2035+. However, Section 2.3 of this report describes the transport infrastructure prerequisites to enable Stage 2 of Drury West to become operational. Overall, it is considered that the transport infrastructure prerequisites for the Drury West Stage 2 area within which the SP Site lies are either fully funded or are not necessary to enable the development of the SP site. Accordingly, the fact that the development enabled by the Plan Change will be occupied prior to the anticipated start date in the FDS will not lead to any detrimental effects. Auckland Unitary Plan (AUP)

The Auckland Unitary Plan, which has been operative in part since November 2016, has the following objectives with regards to transport infrastructure:



- i. Land use and all modes of transport are integrated in a manner that enables:
 - a. The benefits of an integrated transport network to be realised; and
 - b. The adverse effects of traffic generation on the transport network to be managed;
- ii. An integrated public transport, walking and cycling network is provided for;
- iii. Parking and loading support urban growth and the quality compact urban form;
- iv. The provision of safe and efficient parking, loading and access is commensurate with the character, scale and intensity of the zone;
- v. Pedestrian safety and amenity along public footpaths is priorities; and
- vi. Road / rail crossings operate safely with neighbouring land use and development.

The Updated Karaka Road Structure Plan will attract and generate a large number of vehicular trips. The assessment shows that the roading network will have sufficient capacity to accommodate these trips with the mitigation measures proposed to be incorporated in the PPC provisions.

Future network improvements to the roads, planned public transport hubs and walking and cycling connections will improve access to the Drury West area.

The subsequent employment opportunities in the area will reduce the effects on the wider road network by reducing the number and length of trips generated on the wider road network. The SP site will be located in proximity to several rapid transit routes, which will further encourage public transport integration. Infrastructure upgrades are anticipated as a result of this project, which will enhance the SP site's integration with various transport modes. This will ultimately provide the benefits of an integrated network by providing nearby residents and employees with transportation choices, thereby reducing the demand for private vehicle travel.

The construction of new infrastructure as well as upgrades to existing infrastructure enables the effects of the traffic generated by the development enabled by the PPC to be mitigated. There will be suitable access from the SP site to the wider road network via new access points onto SH22. The new road network and upgrades to existing roads in the surrounding area (including new dedicated footpaths and cycle lanes) will provide for safe travel for all modes.

The planned upgrades to the surrounding network, particularly to the Drury West section of SH22 and the proposed Pukekohe Arterial network, once operational, are expected to prevent severe congestion.

Preventing congestion improves journey reliability time and ensures that the capacity of the road network is realised. These roads, as well as the proposed private roads within the development, provide better access to the employment area and will, in turn, contribute to economic growth and productivity.

In summary the SP site is well placed to a variety of current and future transportation modes which means that the proposed development integrates well with both the objectives of the AUP and the existing and future transportation network.

8.3 Auckland Transport Alignment Project (ATAP)

Given the growth challenges that Auckland is facing, and the need for some big transport decisions to deal with this, the Government and Auckland Council have agreed on the need for a collaborative approach to improving alignment on a long-term strategic approach to transport in Auckland. A new edition of the Auckland Transport Alignment Project (ATAP) was released in March 2021 to provide a package to develop Auckland's transport system over the next 10 years. An important part of this work is to agree an indicative investment package that guides statutory funding plans like Auckland's Regional Land Transport Plan and the National Land Transport Programme. Over the past five years, ATAP has enabled significant progress on improving transport in Auckland. The ATAP focuses on three main investment areas; operational costs (including maintenance), asset renewals, and new infrastructure. Within new infrastructure, a great emphasis has been placed on rapid transit, road network, safety, walking and cycling, bus and ferry improvements, and more.

Ultimately, ATAP aims to provide Auckland with a transport system that provides safe, reliable and sustainable access. It contains investment to be made in projects to assist growth over the next decade (2021 – 2031), while identifying future priorities beyond 2031. It recommends investment be made in short and medium-term projects to assist growth over the next decade, while working to protect routes for longer term projects. The priorities identified in the ATAP which affect the Drury West area include the following:



- Waihoehoe Road west construction.
- State Highway 22 intersection upgrades at Great South Road and Jesmond Road.
- Collector road extension of Jesmond Road to Drury West station.
- Route protection for future rail corridor and station improvements.
- Property acquisition for Jesmond Road and Bremner Road upgrades.

The projects outlined in ATAP will greatly enhance the accessibility of Drury West to all modes. While private vehicles currently have a high level of access due to the proximity of SH22, the emphasis of rail in ATAP will enable increased utilisation of public transport. The projects included in the ATAP throughout the region are intended to improve the safety and efficiency of the transport network which will therefore integrate positively with the proposed Structure Plan.

8.4 Regional Land Transport Plan (RLTP)

The Regional Land Transport Plan (RLTP), prepared by Auckland Transport with Waka Kotahi and KiwiRail, identifies the priority of several key region-wide transport projects over a ten-year period. The current RLTP was adopted in 2021 and covers the period 2021-2031, while the 2024-2034 draft RLTP is out for public consultation. Projects outlined in the existing RLTP are outlined in ATAP, although the ATAP has not yet been updated to reflect the draft 2024 RLTP.

The key themes of the RLTP are prioritising high frequency public transport, improving the customer experience, and optimising the existing network. The SP site integrates well with the RLTP by aligning well these strategic themes. The integration of different land uses allows active modes and public transport to be prioritised as a transport mode. Furthermore, the variety of feasible modes in addition to the expected infrastructure upgrades in Drury West will allow network optimising by providing a variety of alternative routes. This enhances the resilience of the area and better manages congestion.

8.5 Regional Public Transport Plan (RPTP)

The Auckland Regional Public Transport Plan (RPTP) seeks to deliver an improved public transport network in Auckland by increasing public transport frequency along key transport corridors and simplifying ticketing to improve user experience.

The vision of the RPTP is to deliver “*An integrated, efficient and effective public transport network that offers a wider range of trips and valued by Aucklanders*”. To achieve this vision, Auckland’s public transport system needs to deliver:

- Services that align with future land use patterns;
- Services that meet customer needs;
- Increased passenger numbers;
- Increased public transport mode share; and
- Improved value for money.

The SP site is not currently well served by the public transport network, with only one bus route in the area, but with the imminent arrival of the Ngākōroa Railway Station with integral bus interchange adjacent to the SP site, it will become very well connected. Further, the increased activity within Drury West due to these developments will improve the economic viability of providing additional bus routes to serve both residents and employees in the Drury West area. The proposed development does not hinder Auckland Council and Auckland Transport from achieving the deliverables mentioned in the RPTP.

8.6 Integrated Transport Programme (ITP)

The AT Integrated Transport Programme (ITP) 2012-2041 sets out the 30-year investment programme to meet the transport priorities outlined in the Auckland Plan across travel modes covering the responsibilities of all transport agencies. The ITP provides a consolidated transport investment programme across the transport system over the next 30 years. The programme covers footpaths, cycle facilities, public transport, state highways and locations roads, intermodal transport facilities and supporting facilities such as parking and park-and-ride sites.



In particular, the ITP:

- i. Guides transport agencies in their detailed planning activities for maintaining, operating, renewing and developing their transport networks.
- ii. Directs transport asset management, corridor and network development, transport service levels and the transport capital portfolio for each of the 10 year periods to 2041.
- iii. Informs the detailed programming of activities in the Regional Land Transport Programme (RLTP).

Projects relevant to the Structure Plan identified in the ITP include the following:

- i. New Ngākōroa Station with integrated bus interchange.
- ii. Upgrades to Great South Road from Manukau Central to Drury.
- iii. Upgrades to Karaka Road (SH22) from SH1 to Glenbrook.

Projects identified in the ITP are largely addressed by ATAP, the RLTP and the RPTP, which are all detailed previously in this report. The proposed development does not preclude any of these projects from being completed.

8.7 Transport Emissions Reduction Pathway (TERP)

Auckland Council's TERP provides a high-level framework to respond to Government's Emissions Reduction Pathway. By signing the 2016 Paris Agreement, the New Zealand Government has committed to becoming net zero in carbon emissions by 2050 and to reduce carbon emissions by 50% by 2030. With transport representing over 40% of Auckland's carbon emissions, the TERP targets a 64% reduction in transport emissions by 2030.

The TERP sets out six transformations that will be required to enable Aucklanders to walk, cycle and use public transport more, with the remaining transformations relating to adopting low-emission vehicles. These six transformations are outlined below, along with our commentary on how the proposed PPC gives effect to each:

- i. **Supercharge walking and cycling.** The site will enable and encourage the use of all active modes, both within the site and externally. Internally, protected active mode pathways will be provided to facilitate safe and efficient flows of people. Showers and cycle storage facilities will be provided. Connections will be made to external active mode routes, such as along SH22 and along the NIMTRL.
- ii. **Use public transport much more.** A key transport philosophy of the SP site is to capitalise on the proximity of the nearby Ngākōroa Station with integral bus interchange. It is anticipated that a significant proportion of staff (~15%) will arrive via public transport.
- iii. **Prioritise and resource sustainable transport.** Although this is more of an Auckland Council / Auckland Transport focussed transformation, the SP site will support this through its focus on active mode design and accessibility to the rail and bus station, which over time will become increasingly sustainable.
- iv. **Reduce travel where possible and appropriate.** By encouraging and enabling active mode and public transport trips, the proposed PPC will reduce the need to travel using private car.
- v. **Make neighbourhoods safer with less traffic.** As described earlier, the SP site itself will be designed to be a completely safe and easily accessible precinct, which in turn will reduce the need to use private vehicles to move around internally within the campus.
- vi. **Put things closer to where people live.** Adjacent to a significant residential growth area, the SP site will capitalise on the growing local population and the local road upgrades will enable shorter trips, particularly those by active modes, to be easier and safer. The site location is perfectly located to achieve this objective.

In summary, the SP site will contribute to and support all six of the required transformations outlined in the TERP and therefore will give effect to the policy and its purpose.



8.8 Summary

It has been demonstrated that the future development that would be enabled by the updated Karaka Road Structure Plan and PPC has excellent alignment with the various transport-related policy documents relevant to this proposal. Given the proximity of the proposed light industrial activity to future residential and commercial developments, the project aligns with the Auckland Plan, the GPS and the AUP by providing employment opportunities close to high-density development maximising the use of rapid transit and reduced and shorter trips. The proximity of the new Ngākōroa Railway Station and its integrated bus interchange will ensure future employees in the area will be well integrated with a high frequency public transport system.

Further, the nature, scale and location of the development potential will positively influence the viability of and confidence in the public and active transport infrastructure investments that have already occurred and are planned in the area.

Other policy documents such as ATAP and ITP also outline funded and future priority projects which will further enhance the SP site's high level of accessibility to multiple transportation modes and the increased efficiency of the transport network.



9. Conclusions

An assessment of the transportation effects of an updated Karaka Road Structure Plan and PPC request to rezone approximately 86.5ha of FUZ land in Drury West to Business – Light Industry has been undertaken.

The updated Karaka Road Structure Plan provides an opportunity to deliver employment opportunities which will support the residential growth in Auckland, particularly in the southern region.

The internal private road network within the site will feature on and off-road walking and cycling paths for safe and efficient movement of employees throughout the site. There are potentially three new access points required onto Karaka Road to enable full development of the site, and each intersection will be upgraded to provide safe and efficient movement of traffic and active modes provisions as the need arises. Additionally, the site will be designed to facilitate active modes and private transport services between the planned Ngākōroa Railway Station and internal to the Site for future employees of the FPHL site.

Intersection network modelling has been undertaken to assess the likely effects of the development from a transportation perspective. The modelling has relied on outputs from the SGA's Southern model, local development information and staging combined with expected activities and employee numbers for the development to assess the likely effects on the transportation network.

Local access improvements into and out of the site are recommended to ensure that the performance of the surrounding road network remains within acceptable levels for an urban environment. Otherwise, the development will have no or negligible detrimental effect on the surrounding road network when compared to both the Auckland Council Drury-Opāheke Structure Plan assumed medium density housing land use, or no development at all.

The relevant high-level policy documents directing transportation planning and delivery throughout Auckland have been reviewed and it has been found that the development is consistent with the policies and objectives in the various documents. On this basis it is considered that Auckland Council can confidently accept the proposal as a positive step forward for providing economic opportunities for the increasing Auckland population and additional local employment opportunities for the growing population.

The FDS transport infrastructure prerequisites for the Drury West Stage 2 area within which the SP Site lies are either fully funded or are not necessary to enable the development of the SP site. Accordingly, the fact that the development enabled by the Plan Change will be occupied prior to the anticipated start date in the FDS will not lead to any detrimental effects. Accordingly, if the recommendations above are adopted, there are no transport planning or engineering reasons to preclude approval of this Structure Plan or PPC request.





Appendices

Appendix A Crash Analysis System Outputs



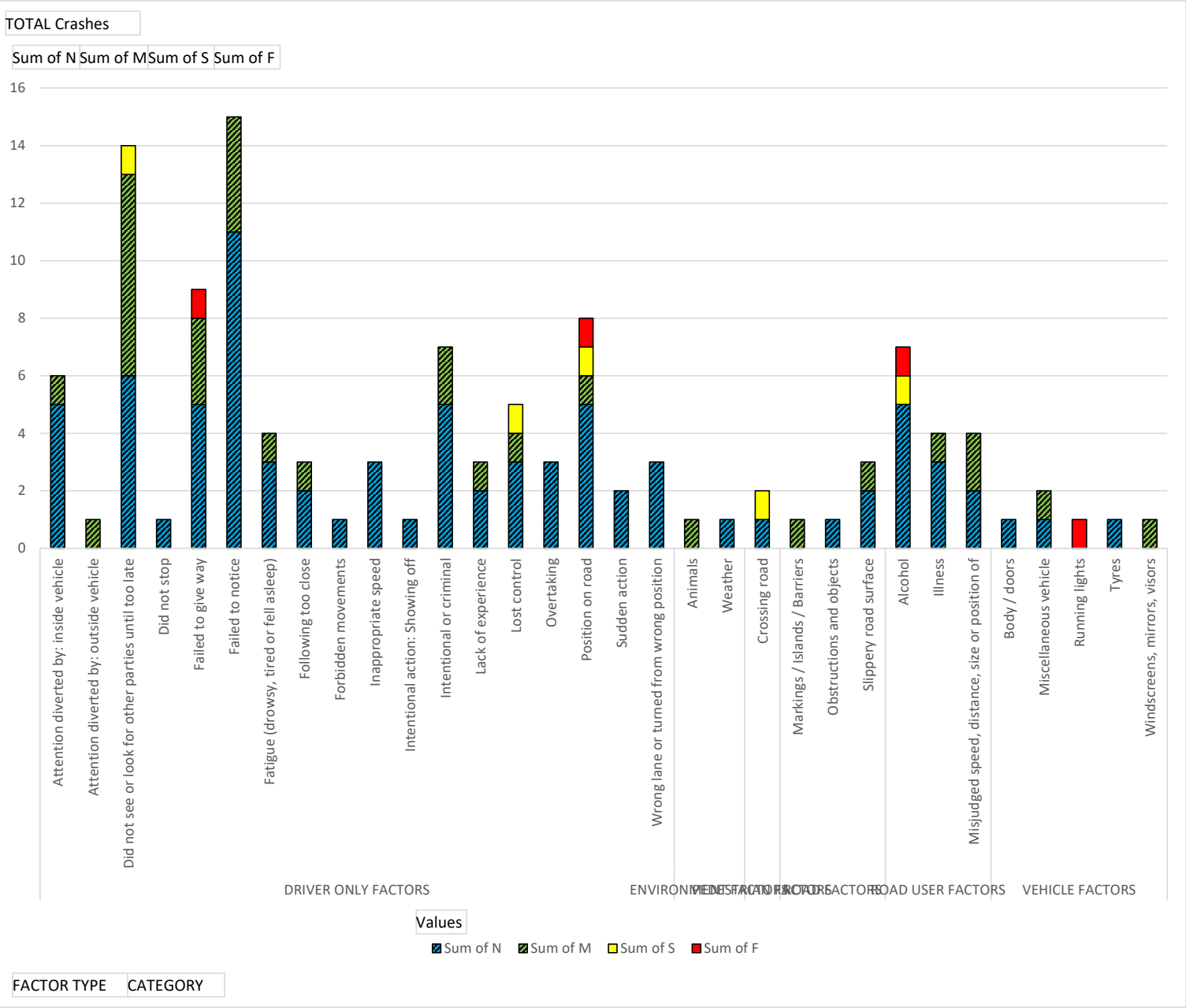


	Coded Crash ID	Roadname	Distance	Direction	Side Road	Reference	Date	Weekday	Time	Description	Causes	Location	Crash Type	Reason	Junction	Control	Fatal	Severe	Minor	Social Cost (\$m)	Reference	Route Position	Intersection	Time	Orig	Alt	Alcohol suspect	Alcohol above	Alcohol Below	Alcohol Unknown	Drugs suspect	Fatigue	Overtaking	Failed to Give Way	Speed on straight	Speed on curve	Speeding
0																							1	1458	1	0	0	0	1	0	0	0	0	0	0	0	
1	1375148	KARAKA ROAD	222	E	OIRA ROAD	2024278608	23/01/2024	Tue	0.624	Van1 EDB on KARAKA ROAD hit rear of Car/Wagon2 VAN1, alcohol test below limit, attention diverted by navig	SH22 Karaka		Rear-end	Distraction / Inattention	Nil (Default)	Unknown	0	0	0	0.05				1458	1	0	0	0	1	0	0	0	0	0	0	0	
2	1365907	GREAT SOUTH ROAD		I	KARAKA ROAD	2023271819	29/10/2023	Sun	0.517	SUV1 WDB on GREAT SOUTH ROAD turning right hit SUV2, alcohol test below limit SUV1, failed to give way at	SH22 GSR / Karaka		Crossing / Turning	Failure to give way	Nil (Default)	Unknown	0	0	0	0.05			1224	1	0	0	0	1	0	0	0	0	0	0	0		
3	1360600	KARAKA ROAD		I	GREAT SOUTH ROAD	2023268175	11/09/2023	Mon	0.5	Ute1 SDB on KARAKA ROAD hit Truck2 turning right TRUCK2, alcohol test below limit, other inattentive, other	SH22 GSR / Karaka		Crossing / Turning	Failure to give way	Nil (Default)	Unknown	0	0	0	0.05			1200	1	0	0	0	1	0	0	0	0	0	0	1		
4	1381728	GREAT SOUTH ROAD		I	KARAKA ROAD	2023268299	10/09/2023	Sun	0.336	Other1 SDB on GREAT SOUTH ROAD hit Car/Wagon: CAR/WAGON2, alcohol test below limit OTHER1, alcohol b	SH22 GSR / Karaka		Crossing / Turning	Failure to give way	Nil (Default)	Unknown	0	0	1	0.31			804	1	0	0	0	1	0	0	0	0	0	0	0		
5	1372477	KARAKA ROAD		I	BLACKBRIDGE ROAD	2023260903	1/07/2023	Sat	0.403	SUV1 NDB on KARAKA ROAD hit SUV2 turning right SUV1, alcohol test below limit SUV2, alcohol test below lin	SH22 Karaka / Blackbridge		Crossing / Turning	Failure to give way	Nil (Default)	Unknown	0	0	1	0.31			940	1	0	0	0	1	0	0	0	0	0	0	0		
6	1372007	KARAKA ROAD		I	BLACKBRIDGE ROAD	2023260580	28/06/2023	Wed	0.717	Car/Wagon1 EDB on KARAKA ROAD hit Car/Wagon2 CAR/WAGON1, alcohol test below limit CAR/WAGON2, al	SH22 Karaka / Blackbridge		Crossing / Turning	Failure to give way	Nil (Default)	Unknown	0	0	1	0.31			1713	1	0	0	0	1	0	0	0	0	0	0	0		
7	1371296	GREAT SOUTH ROAD		I	GREAT SOUTH ROAD	2023260002	22/06/2023	Thu	0.59	Car/Wagon1 SDB on GREAT SOUTH ROAD hit Ute2 UTE4, alcohol test below limit CAR/WAGON1, alcohol test	SH22 GSR / Karaka		Crossing / Turning	Failure to give way	Nil (Default)	Unknown	0	0	1	0.31			1410	1	0	0	0	1	0	0	0	0	0	0	0		
8	1350554	KARAKA ROAD	106	S	MCPHERSON ROAD	2023260035	20/06/2023	Thu	0.667	Car/Wagon1 SDB on KARAKA ROAD hit Car/Wagon2 CAR/WAGON2, alcohol suspected, did not check/notice an	SH22 Karaka		Crossing / Turning	Failure to give way	Nil (Default)	Unknown	0	0	0	0.05			1600	1	0	0	0	1	0	0	0	0	0	0	0		
9	1371966	KARAKA ROAD	190	E	JESMOND ROAD	2023260549	17/06/2023	Sat	0.51	Car/Wagon1 EDB on KARAKA ROAD hit Car/Wagon2 CAR/WAGON2, alcohol test below limit, did not check/not	SH22 Karaka		Crossing / Turning	Failure to give way - U-turn	T Junction	Give way	0	0	0	0.05			1214	1	0	0	0	1	0	0	0	0	0	0	0		
10	1369151	KARAKA ROAD	359	W	WOODYLN DRIVE	2023258112	26/05/2023	Fri	0.341	Car/Wagon1 EDB on KARAKA ROAD hit rear end of 1CAR/WAGON1, alcohol test below limit, other inattentive	SH22 Karaka		Rear-end	Unknown	T Junction	Give way	0	0	0	0.05			811	1	0	0	0	1	0	0	0	0	0	0	0		
11	1346292	KARAKA ROAD		I	WHANGAPOURI ROAD	2023257295	23/05/2023	Thu	0.778	Car/Wagon1 EDB on KARAKA ROAD hit Car/Wagon2 CAR/WAGON2, did not check/notice another party from	SH22 Karaka / Whangapouri		Crossing / Turning	Failure to give way	T Junction	Give way	0	0	0	0.05			1840	1	0	0	0	1	0	0	0	0	0	0	0		
12	1338020	GREAT SOUTH ROAD		I	GREAT SOUTH ROAD	2023250683	6/03/2023	Mon	0.667	Motorcycle1 NDB on GREAT SOUTH ROAD hit Car/Wagon2 CAR/WAGON2, alcohol test below limit, did not check/not	SH22 GSR / Karaka		Crossing / Turning	Illegal manoeuvre	T Junction	Give way	0	0	1	0.31			1600	1	0	0	0	1	0	0	0	0	0	0	0		
13	1334658	KARAKA ROAD		I	BLACKBRIDGE ROAD	2023247208	2/02/2023	Thu	0.403	Car/Wagon1 NDB on KARAKA ROAD hit Ute2 turning CAR/WAGON1, alcohol test below limit UTE2, alcohol test	SH22 Karaka / Blackbridge		Crossing / Turning	Failure to give way	T Junction	Nil	0	0	1	0.31			940	1	0	0	0	1	0	0	0	0	0	0	0		
14	1357391	KARAKA ROAD	187	W	GELLERT ROAD	2023246887	29/01/2023	Sun	0.601	Car/Wagon1 EDB on KARAKA ROAD hit rear end of CAR/WAGON1, alcohol test below limit, inappropriate spe	SH22 Karaka		Loss of Control	Environmental	T Junction	Give way	0	0	0	0.05			1425	1	0	0	0	1	0	0	0	0	0	0	1		
15	1356794	KARAKA ROAD	500	W	GELLERT ROAD	2023246436	24/01/2023	Thu	0.954	Car/Wagon1 SDB on KARAKA ROAD hit rear end of 1CAR/WAGON2, alcohol test below limit CAR/WAGON1, al	SH22 Karaka		Rear-end	Distraction / Inattention	Crossroads	Traffic Signals	0	0	0	0.05			2254	1	0	0	0	1	0	0	0	0	0	0	0		
16	1333680	KARAKA ROAD	265	W	WHANGAPOURI ROAD	2023246414	24/01/2023	Thu	0.62	Ute1 WDB on KARAKA ROAD swinging wide hit Van2 VAN2, alcohol suspected UTE1, alcohol suspected, swung	SH22 Karaka		Head on	Unknown	T Junction	Nil	0	0	0	0.05			1453	1	0	0	0	1	0	0	0	0	0	0	0		
17	1356244	KARAKA ROAD	96	N	MCPHERSON ROAD	2023245783	13/01/2023	Fri	0.986	Car/Wagon1 NDB on KARAKA ROAD lost control turn CAR/WAGON1, alcohol test below limit, lost control - vehi	SH22 Karaka		Loss of Control	Vehicle issue	T Junction	Nil	0	0	0	0.05			2340	1	0	0	0	1	0	0	0	0	0	0	0	0	
18	1334694	GREAT SOUTH ROAD		I	KARAKA ROAD	2023243892	22/12/2022	Thu	0.792	Car/Wagon1 SDB on BLACKBRIDGE ROAD lost control CAR/WAGON1, alcohol test below limit, new driver/under	SH22 Karaka / Blackbridge		Loss of Control	Inexperienced driver	Crossroads	Traffic Signals	0	0	1	0.31			1500	1	0	0	0	1	0	0	0	0	0	0	0		
19	1331488	KARAKA ROAD	458	N	GLENBROOK ROAD	2023243544	14/12/2022	Wed	0.472	Car/Wagon1 WDB on KARAKA ROAD hit rear of Car/Wagon1, alcohol test below limit, failed to notice ca	SH22 Karaka		Rear-end	Distraction / Inattention	T Junction	Give way	0	0	0	0.05			1320	1	0	0	0	1	0	0	0	0	0	0	0		
20	1330081	KARAKA ROAD	316	W	BYCROFT ROAD	2022242458	8/12/2022	Thu	0.607	Car/Wagon1 WDB on KARAKA ROAD swinging wide CAR/WAGON2, alcohol test below limit CAR/WAGON1, al	SH22 Karaka		Head on	Medical issue	Nil (Default)	Nil	0	0	0	0.05			1434	1	0	0	0	1	0	0	0	0	0	0	0		
21	1348641	KARAKA ROAD		I	GLENBROOK ROAD	2022239523	1/11/2022	Thu	0.33	Ute1 SDB on KARAKA ROAD hit Car/Wagon2 crosstion UTE1, failed to notice car slowing, stopping/stationary	SH22 Karaka / Glenbrook		Rear-end	Distraction / Inattention	T Junction	Traffic Signals	0	0	0	0.05			755	1	0	0	0	1	0	0	0	0	0	0	0		
22	1347022	GREAT SOUTH ROAD ON RAMP		I	GREAT SOUTH ROAD	2022238758	27/10/2022	Thu	0.95	Car/Wagon1 SDB on GREAT SOUTH ROAD ON RAMP CAR/WAGON1, alcohol test below limit, non-compliance v	Drury Interchange		Misc.	Illegal manoeuvre	T Junction	Give way	0	0	0	0.05			2248	1	0	0	0	1	0	0	0	0	0	0	1		
23	1347702	KARAKA ROAD	30	N	TE RATA BOULEVARD	2022239695	26/10/2022	Wed	0.229	Car/Wagon1 SDB on KARAKA ROAD changing lanes 1CAR/WAGON1, alcohol test below limit, overtaking on left	SH22 Karaka / Glenbrook		Overtaking	Following too closely	T Junction	Give way	0	0	0	0.05			530	1	0	0	0	1	0	0	0	0	0	0	0		
24	1346419	GREAT SOUTH ROAD	32	N	VICTORIA STREET	2022241346	14/10/2022	Thu	0.132	Car/Wagon1 WDB on GREAT SOUTH ROAD overtake CAR/WAGON1, incorrect merging/diverging manoeuvre	Drury Interchange		Overtaking	Failure to give way	T Junction	Give way	0	0	0	0.05			310	1	0	0	0	1	0	0	0	0	0	0	0		
25	1342428	KARAKA ROAD	170	N	TE RATA BOULEVARD	2022235618	20/09/2022	Tue	0.296	Car/Wagon1 WDB on KARAKA ROAD hit rear end of CAR/WAGON1, alcohol test below limit CAR/WAGON1, al	SH22 Karaka		Misc.	Failure to give way - U-turn	T Junction	Give way	0	0	1	0.31			706	1	0	0	0	1	0	0	0	0	0	0	0		
26	1342416	KARAKA ROAD		I	MCPHERSON ROAD	2022235575	19/09/2022	Mon	0.335	SUV1 NDB on KARAKA ROAD lost control turning rig CAR/WAGON2, alcohol test below limit SUV1, alcohol test	SH22 Karaka / McPherson		Crossing / Turning	Loss of Control	Nil (Default)	Nil	0	0	0	0.05			802	1	0	0	0	1	0	0	0	0	0	0	0		
27	1320814	KARAKA ROAD		I	BLACKBRIDGE ROAD	2022234578	8/09/2022	Thu	0.314	Car/Wagon1 NDB on KARAKA ROAD hit Car/Wagon: CAR/WAGON2, alcohol test below limit CAR/WAGON2, al	SH22 Karaka / Blackbridge		Crossing / Turning	Failure to give way	T Junction	Give way	0	0	0	0.05			732	1	0	0	0	1	0	0	0	0	0	0	0		
28	1337500	GREAT SOUTH ROAD		I	KARAKA ROAD	2022233015	8/08/2022	Mon	0.709	Car/Wagon1 WDB on GREAT SOUTH ROAD hit rear of CAR/WAGON1, alcohol test above limit or test refused, fai	SH22 Karaka		Loss of Control	Medical issue	Nil (Default)	Nil	0	0	0	0.05			1701	1	0	0	0	1	0	0	0	0	0	0	0		
29	1334835	KARAKA ROAD		I	BLACKBRIDGE ROAD	2022233032	3/08/2022	Wed	0.597	Car/Wagon1 WDB on GREAT SOUTH ROAD turning r CAR/WAGON1, alcohol test below limit, evading enforcem	Drury Interchange		Rear-end	Failure to give way	T Junction	Give way	0	0	0	0.05			1557	1	0	0	0	1	0	0	0	0	0	0	0		
30	1314915	KARAKA ROAD	45	W	JESMOND ROAD	2022228932	9/07/2022	Sat	0.624	Ute1 WDB on Karaka Road lost control turning right UTE1, medical illness (not sudden), too far left	SH22 Karaka / Blackbridge		Crossing / Turning	Failure to give way	Crossroads	Give way	0	0	0	0.05			1458	1	0	0	0	1	0	0	0	0	0	0	0		
31	1329581	KARAKA ROAD	263	W	GELLERT ROAD	2022228404	1/07/2022	Fri	0.465	Car/Wagon1 WDB on KARAKA ROAD changing lanes CAR/WAGON1, alcohol test below limit, emotionally upset	SH22 Karaka / Blackbridge		Loss of Control	Medical issue	T Junction	Traffic Signals	0	0	0	0.05			1110	1	0	0	0	1	0	0	0	0	0	0	0		
32	1323733	GREAT SOUTH ROAD OFF RAMP		I	GREAT SOUTH ROAD	202223164	19/05/2022	Thu	0.726	Car/Wagon1 NDB on GREAT SOUTH ROAD hit rear of CAR/WAGON1, following too closely	SH22 Karaka / Woodylyn		Loss of Control	Unknown	Crossroads	Traffic Signals	0	0	0	0.05			1725	1	0	0	0	1	0	0	0	0	0	0	0		
33	1306139	KARAKA ROAD		I	BLACKBRIDGE ROAD	2022219599	2/05/2022	Mon	0.36	Car/Wagon1 NDB on KARAKA ROAD hit Van2 turning CAR/WAGON1, alcohol test below limit VAN2, alcohol test	SH22 Karaka		Loss of Control	Unknown	T Junction	Nil	0	0	0	0.05			838	1	0	0	0	1	0	0	0	0	0	0	0		
34	1321862	KARAKA ROAD	331	E	BLACKBRIDGE ROAD	2022220287	28/04/2022	Thu	0.017	Car/Wagon1 WDB on KARAKA ROAD lost control; we CAR/WAGON1, sudden illness, too far left	SH22 GSR / Karaka		Crossing / Turning	Illegal manoeuvre	T Junction	Give way	0	0	1	0.31			25	1	0	0	0	1	0	0	0	0	0	0	0		
35	1303536	KARAKA ROAD		I	WOODYLN DRIVE	2022220151	26/04/2022	Tue	0.743	Car/Wagon1 EDB on KARAKA ROAD lost control on CAR/WAGON1, other lost control	Drury Interchange		Rear-end	Distraction / Inattention	Nil (Default)	Nil	0	0	0	0.05			1750	1	0	0	0	1	0	0	0	0	0	0	0		
36	132018	KARAKA ROAD	278	N	SIM ROAD	2022220391	9/04/2022	Sat	0.163	Car/Wagon1 SDB on KARAKA ROAD lost control; we CAR/WAGON1, other lost control	SH22 GSR / Karaka		Crossing / Turning	Failure to give way	T Junction	Give way	0	0	0	0.05			355	1	0	0	0	1	0	0	0	0	0	0	0		
37	1297202	KARAKA ROAD		I	GREAT SOUTH ROAD	2022215707	9/03/2022	Wed	0.504	Van1 SDB on KARAKA ROAD hit SUV2 turning right SUV2, alcohol suspected, failed to give way at priority traff	SH22 GSR / Victoria		Crossing / Turning	Failure to give way	T Junction	Give way	0	0	1	0.31			1206	1	0	0	0	1	0	0	0	0	0	0	0		
38	1293409	GREAT SOUTH ROAD		I	GREAT SOUTH ROAD OFF RAN	2022213525	16/02/2022	Wed	0.243	Car/Wagon1 EDB on GREAT SOUTH ROAD hit rear of CAR/WAGON1, failed to notice car slowing, stopping/stat	SH22 GSR / Karaka		Crossing / Turning	Failure to give way	T Junction	Give way	0	0	2	0.31			550	1	0	0	0	1	0	0	0	0	0	0	0		
39	1312780	GREAT SOUTH ROAD		I	KARAKA ROAD	2022213040	4/02/2022	Fri	0.048	Car/Wagon1 EDB on KARAKA ROAD overtaking Car / CAR/WAGON2, alcohol test below limit, emergency vehic	SH22 Karaka / Driveway		Crossing / Turning	Failure to give way	Nil (Default)	Unknown	0	0	0	0.05			1557	1	0	0	0	1	0	0	0	0	0	0	0		
40	1304881	GREAT SOUTH ROAD		I	VICTORIA STREET	2022208623	16/12/2022	Thu	0.556	Truck2 turning right hit by oncoming Car/Wagon1 N TRUCK2, failed to give way turning to non-turning traffi	SH22 Karaka / Blackbridge		Crossing / Turning	Failure to give way	T Junction	Give way	0	0	0	0.05			1320	1	0	0	0	1	0	0	0	0	0	0	0		
41	1304709	GREAT SOUTH ROAD		I	KARAKA ROAD	2022120867	15/12/2022	Wed	0.57	Truck1 SDB on GREAT SOUTH ROAD hit Truck2 turni TRUCK2, alcohol test below limit, failed to give way at prio	Drury Interchange		Loss of Control	Evasion	Nil (Default)	Nil	0	0	0	0.05			1341	1	0	0</											

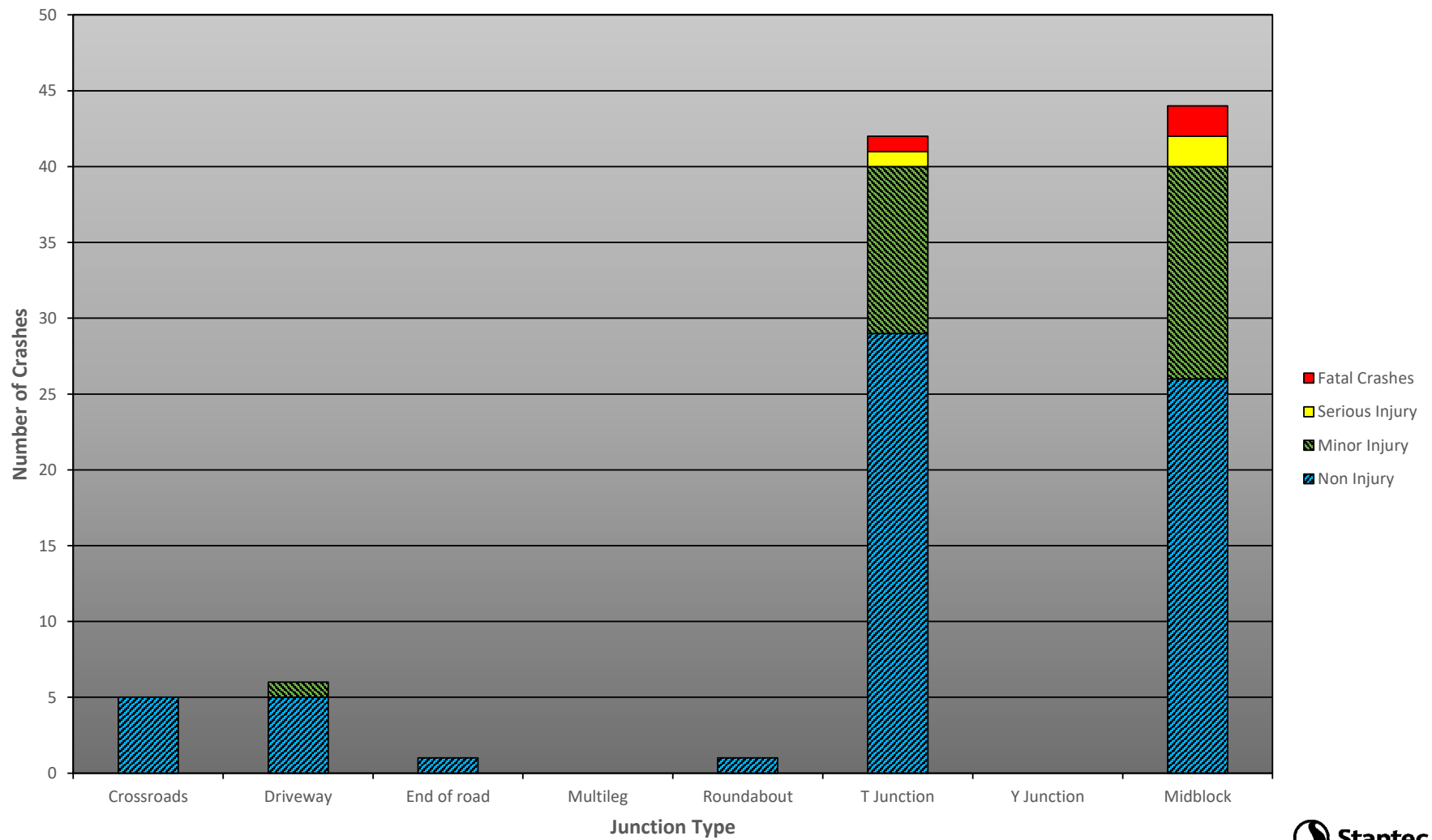
TOTAL Crashes (Multiple Items)

NOTE: There are 0-10 causation codes per crash

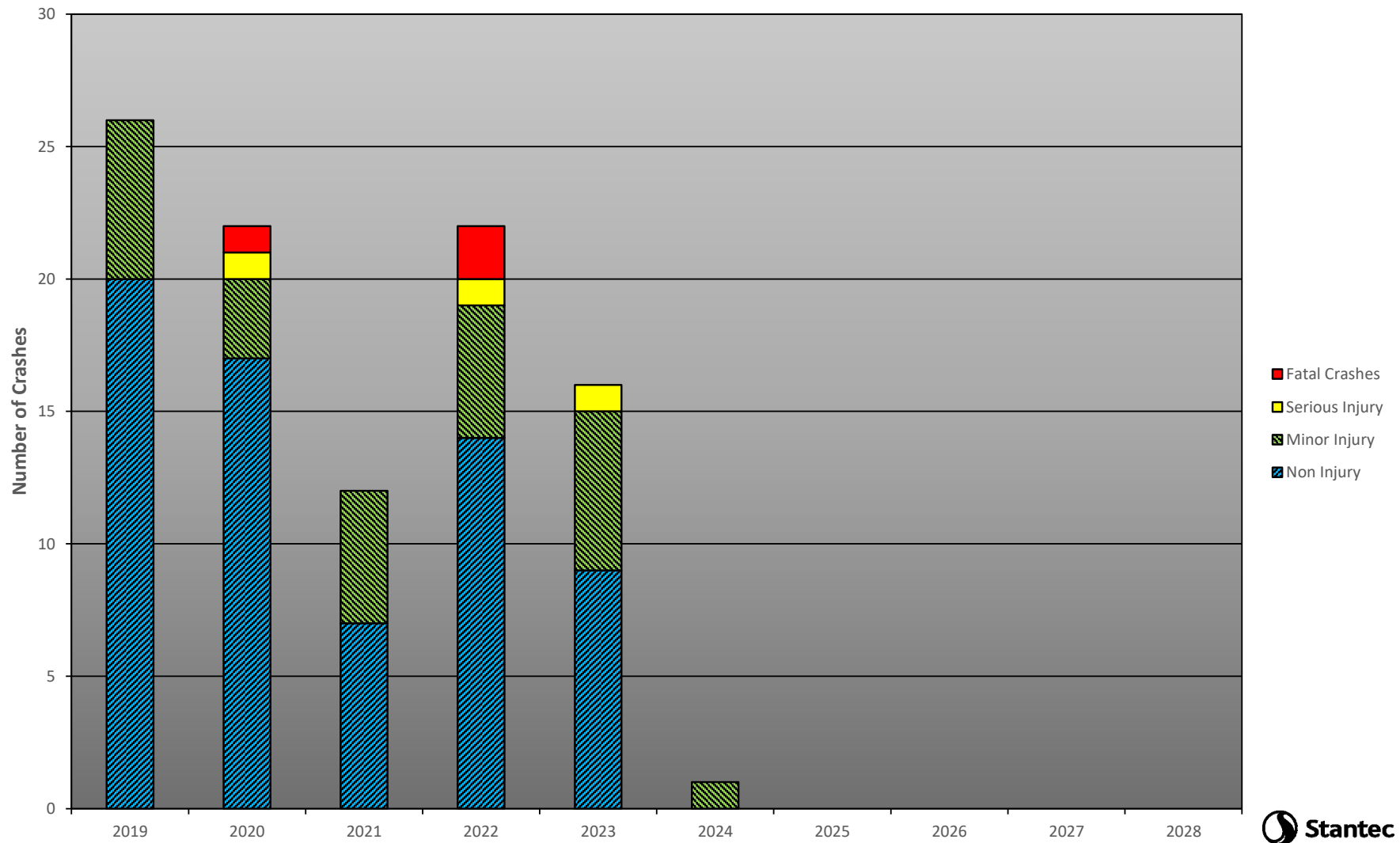
Row Labels	Sum of N	Sum of M	Sum of S	Sum of F
DRIVER ONLY FACTORS	61	23	3	2
Attention diverted by: inside vehicle	5	1	0	0
Attention diverted by: outside vehicle	0	1	0	0
Did not see or look for other parties until too late	6	7	1	0
Did not stop	1	0	0	0
Failed to give way	5	3	0	1
Failed to notice	11	4	0	0
Fatigue (drowsy, tired or fell asleep)	3	1	0	0
Following too close	2	1	0	0
Forbidden movements	1	0	0	0
Inappropriate speed	3	0	0	0
Intentional action: Showing off	1	0	0	0
Intentional or criminal	5	2	0	0
Lack of experience	2	1	0	0
Lost control	3	1	1	0
Overtaking	3	0	0	0
Position on road	5	1	1	1
Sudden action	2	0	0	0
Wrong lane or turned from wrong position	3	0	0	0
ENVIRONMENT FACTORS	1	1	0	0
Animals	0	1	0	0
Weather	1	0	0	0
PEDESTRIAN FACTORS	1	0	1	0
Crossing road	1	0	1	0
ROAD FACTORS	3	2	0	0
Markings / Islands / Barriers	0	1	0	0
Obstructions and objects	1	0	0	0
Slippery road surface	2	1	0	0
ROAD USER FACTORS	10	3	1	1
Alcohol	5	0	1	1
Illness	3	1	0	0
Misjudged speed, distance, size or position of	2	2	0	0
VEHICLE FACTORS	3	2	0	1
Body / doors	1	0	0	0
Miscellaneous vehicle	1	1	0	0
Running lights	0	0	0	1
Tyres	1	0	0	0
Windscreens, mirrors, visors	0	1	0	0
Grand Total	79	31	5	4



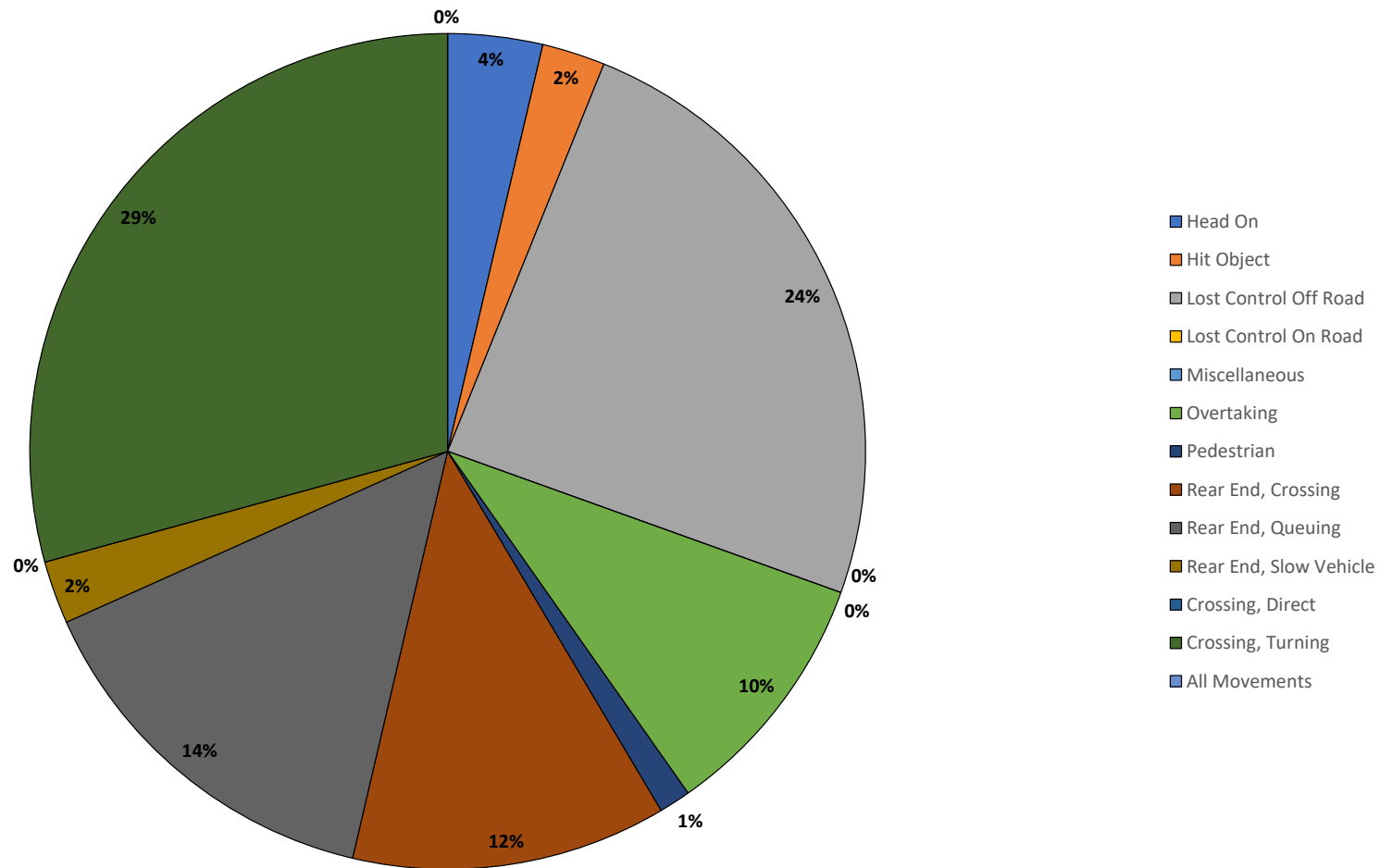
Junction Type



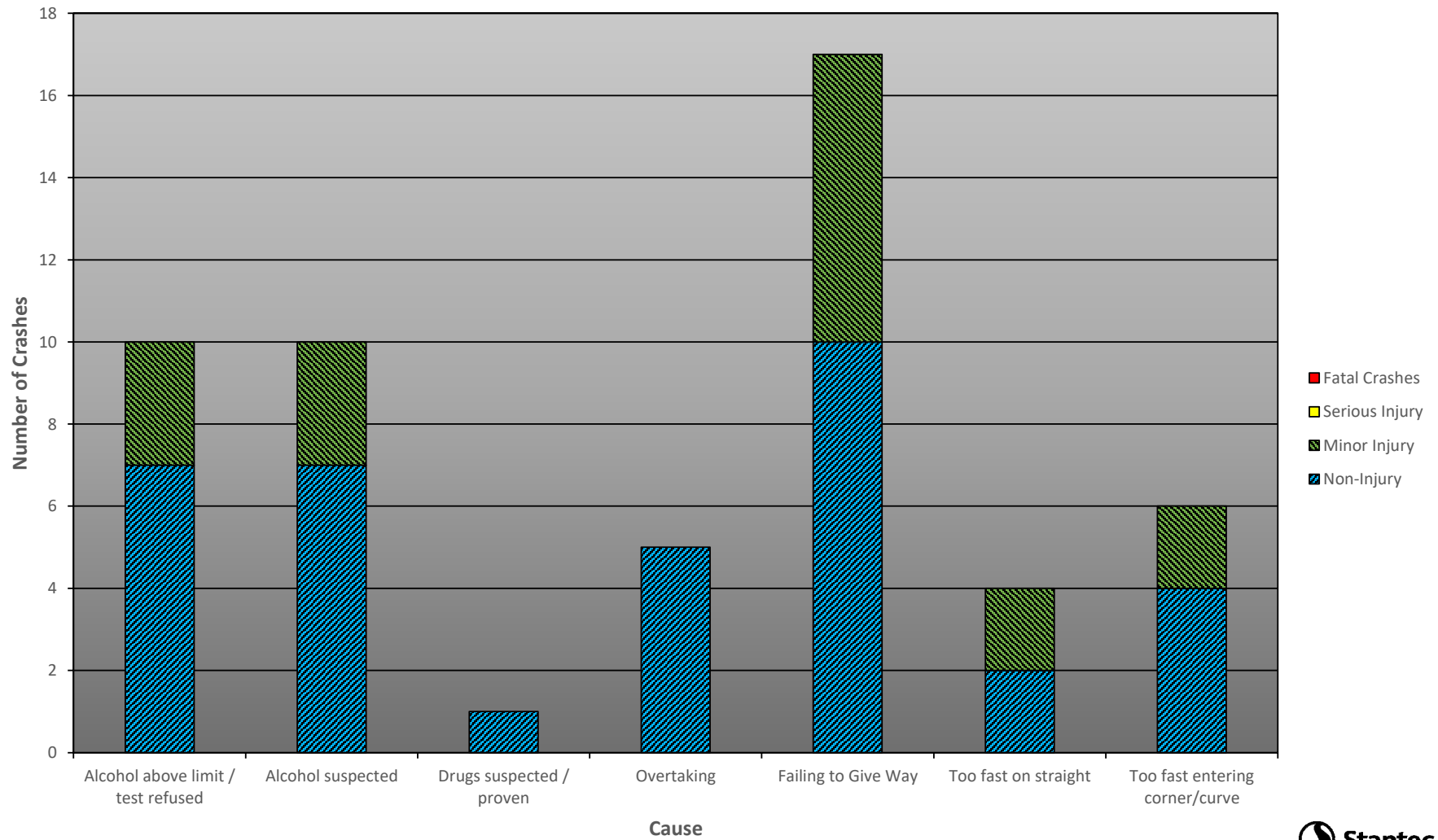
Annual Severity



Crash by Movement Code



Crash Causes



NOTE: There may be >1 cause per crash

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