

APPENDIX 25

TRANSPORT ASSESSMENT

**Shipyard and Dry Dock
Facility at Marsden Point**

Integrated Transport
Assessment

August 2026

flow

TRANSPORTATION SPECIALISTS

Project: Shipyard and Dry Dock Facility at Marsden Point
Title: Integrated Transport Assessment
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EXECUTIVE SUMMARY

Flow Transportation Specialists Ltd (Flow) has been commissioned by the Ministry of Business, Innovation and Employment (MBIE) to identify and assess the transport planning and traffic engineering matters relating to a fast-track application for the shipyard and drydock facility at Marsden Point, Whangārei Harbour (“**the Site**”). The Site includes a reclamation, vessel haul-out system, and associated wharf structures, dredging, and supporting infrastructure.

This Integrated Transport Assessment (ITA) has been prepared for the Fast-track Approvals Act application. It accords with the Transport (TRA) Chapter of the Whangārei District Plan (District Plan). Our TA addresses the following matters:

- ♦ An overview of relevant District Plan matters
- ♦ A description of the site, the development, and new roads
- ♦ A description of the surrounding transport network
- ♦ An assessment of the potential transport effects of the construction and operation of the development
- ♦ A discussion of relevant District Plan provisions.

The Site is shown in Figure S1 and includes:

- ♦ reclamation of approximately 9.7ha
- ♦ a ‘cutout’ to the reclamation where a vessel haul out system is to be located, being a floating drydock or potentially shiplift or other lifting mechanism
- ♦ construction of a piled wharf structure to accommodate vessels either temporarily (before/after haul out), or for extended periods where works not requiring haul out can be undertaken
- ♦ dredging stage one: capital and maintenance dredging associated with construction and ongoing operation of the marine maintenance operations facility, including a berth pocket and a vessel turning basin to provide for safe navigation
- ♦ dredging stage two: capital dredging to ensure sufficient volume of dredge spoil is available to construct both the NDD and Northport’s Vision for Growth development.
- ♦ fixed plant and buildings to accommodate marine maintenance activities and materials
- ♦ sufficient working & laydown areas for marine maintenance operations, including the ability to transfer vessels to hardstand
- ♦ access to and around the marine maintenance operations facility, including a landside area for staff carparking
- ♦ public access around the edge of the reclamation to a public fishing platform

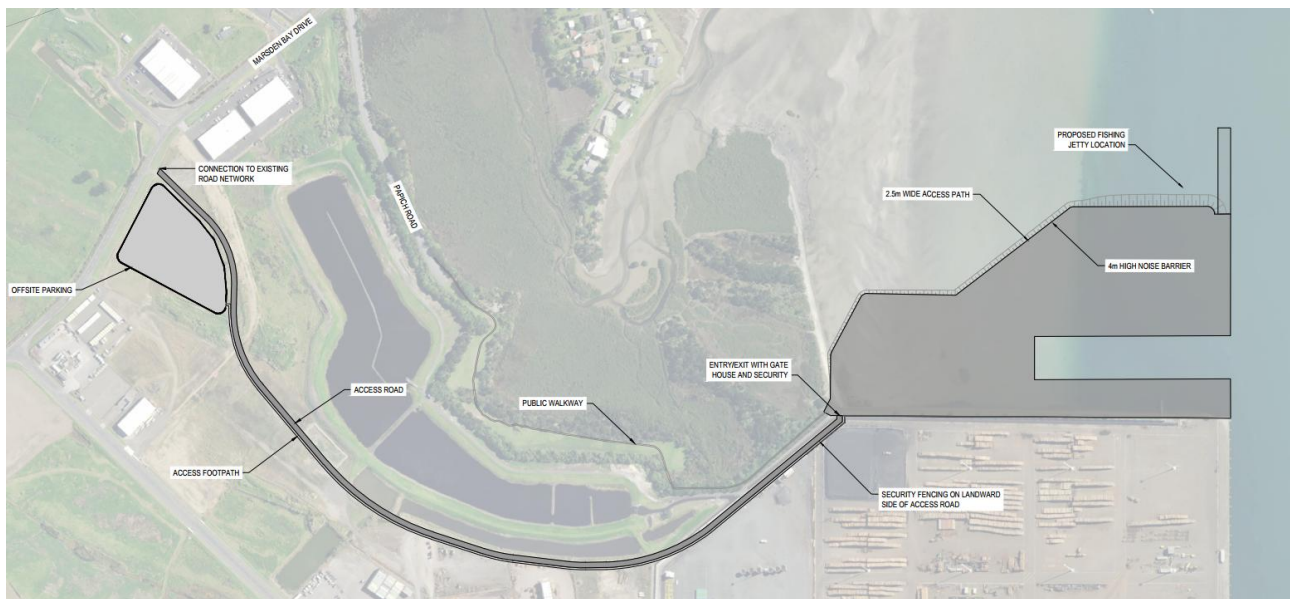
The marine maintenance operations facility is to provide vessel maintenance, repairs, and servicing, including but not limited to cleaning, painting, and repair of commercial and naval vessels, including Cook Strait ferries and Royal New Zealand Navy logistics vessels, along with other vessels such as international freight vessels and super yachts. The facility has design capacity to accommodate vessels

~50m to 230m in length with displacement between 500t and 28,000t. The facility will be based on normal working hours of 7am-6pm but the capacity to operate 24/7/365 where required, subject to appropriate restrictions on noise-generating activities.

The location of the facility has been carefully selected for functional and operational requirements, including the need for deep water access, sheltered harbour conditions, proximity to existing port services, sea and land transport links, and integration with established and proposed marine and land-based industrial infrastructure.

The project is listed in Schedule 2 of the Fast-track Approvals Act 2024 as having significant regional or national benefits.

Figure S1: Scheme plan of the Site produced by Beca¹



We conclude that there will be a negligible effect on the safe and efficient operation of the Site or the surrounding transport network.

In summary, we consider that there are no transport planning reasons to preclude resource consent being granted pursuant to the Fast-track Approvals Act.

¹ Drawing 3237966-SK-7000-B dated 22/05/2026

CONTENTS

1	INTRODUCTION	1
2	WHAT HAS BEEN CONSENTED AND WHAT IS BEING PROPOSED	3
2.1	What the Site includes	3
2.2	What has been consented	4
3	DESCRIPTION OF THE TRANSPORT NETWORK	6
3.1	Site location	6
3.2	The surrounding transport network	7
3.2.1	SH1	7
3.2.2	Port Marsden Highway	8
3.2.3	Marsden Bay Drive	9
3.3	Northport's existing vehicle access	10
3.4	Northport's existing car parking provisions	11
3.5	The Site's public transport accessibility	11
3.6	The Site's private vehicle accessibility	11
3.7	Road Safety	12
3.8	Adjacent Intersections	15
3.9	Existing traffic volumes	16
3.9.1	Marsden Bay Drive	16
3.9.2	Marsden Point Road	16
3.9.3	Port Marsden Highway	16
4	OUR CONSIDERATION OF RELEVANT TRANSPORT STRATEGIES	17
4.1	Marsden point – Ruakākā structure plan (2008)	17
4.2	Whangārei Future Development Strategy	19
5	VEHICLE ACCESS CONSIDERATIONS	20
5.1	Proposed intersection with Marsden Bay Drive	20
5.2	Proposed private access	21
5.3	Proposed vehicle access to the car park	22
6	CAR PARKING CONSIDERATIONS	22
6.1	Car parking requirements and provisions	22
6.2	Accessible parking	23
6.3	Parking layout	23
7	ACTIVE MODE CONSIDERATIONS	24
7.1	Pedestrian access	24
7.2	Bicycle parking and end of trip facility considerations	24
8	LOADING AND WASTE COLLECTION ARRANGEMENTS	25
9	OPERATIONAL TRAFFIC EFFECTS	25
9.1	Whangārei Transport Model (WTM)	25
9.2	Consented Developments – Port Expansions	26
9.3	Accounting for Traffic Growth	27
9.3.1	WTM base model flow comparison	27
9.3.2	Whangārei District Growth Strategy's Marsden Point/Ruakākā Development Model	

9.3.3	Adopted traffic growth.....	28
9.4	Modelled scenarios	28
9.5	Baseline traffic volumes for the opening year of 2030	29
9.6	How traffic will be distributed.....	29
9.7	Site generated traffic during the weekday morning shift and weekday afternoon shift changeover peak hours	30
9.8	Baseline traffic volumes in the opening year (2030) + site generated volumes.....	31
9.9	Baseline traffic volumes for the forecast year (2040) + site generated volumes	32
9.10	SIDRA Intersection modelling results.....	32
9.10.1	Baseline traffic volumes for the opening year (2030) without site generated traffic 33	
9.10.2	Baseline traffic volumes for the opening year (2030) + Site generated traffic volumes 33	
9.10.3	Baseline traffic volumes for the forecast year (2040) + Site generated traffic volumes 34	
9.11	Sensitivity tests.....	35
9.11.1	Operational Traffic Impacts to the SH1/Port Marsden Highway and Port Marsden Highway/One Tree Point Road Intersections.....	35
9.11.2	Baseline traffic volumes for the opening year (2030) without site generated traffic 39	
9.11.3	Baseline traffic volumes for the opening year (2030) + Site generated traffic volumes 40	
9.11.4	Baseline traffic volumes for the forecast year (2040) + Site generated traffic volumes 41	
9.11.5	Road Network Peak hours	42
9.11.6	Arrivals and departures	42
9.12	Summary of Operational Traffic Effects	42
10	ASSESSMENT OF CONSTRUCTION TRANSPORT EFFECTS	43
11	DISCUSSION OF RELEVANT PLANS AND POLICIES	44
11.1	Whangārei District Plan.....	44
11.2	Blue/Green Network Strategy for Whangārei City	48
11.3	Walking and Cycling Strategy	48
11.4	Whangārei City Transportation Network Strategy Programme Business Case	48
12	CONCLUSIONS	49

APPENDICES

- APPENDIX A DISTRICT PLAN TRANSPORT CHAPTER ASSESSMENT
- APPENDIX B VEHICLE TRACKING AND SIGHT DISTANCE PLAN
- APPENDIX C SIDRA OUTPUTS

1 INTRODUCTION

Flow Transportation Specialists Ltd (Flow) has been commissioned by the Ministry of Business, Innovation and Employment (MBIE) to identify and assess the transport planning and traffic engineering matters relating to a fast-track application for the development and operation of a shipyard and dry dock facility at Marsden Point, Whangārei Harbour (“the Site”). The Project is listed in Schedule 2 to the Fast-track Approvals Act 2024 (“FTAA”).

This integrated transport assessment (ITA) has been prepared in accordance with the requirements of the FTAA and in compliance with the Environment Court Practice Note 2023 (Code of Conduct for Expert Witnesses).

Consistent with the FTAA requirements, careful consideration has been given to the documents listed in Schedule 5 to the FTAA, including the Transport (TRA) Chapter of the Whangārei District Plan including the requirements of TRA-REQ2. Our ITA addresses the following matters:

- ♦ A description of the site, the proposed development and new roads
- ♦ A description of the surrounding transport network
- ♦ A discussion of relevant Plans and Policies
- ♦ An assessment of the potential transport effects of the proposed development
- ♦ An overview of relevant District Plan matters.

The following documents have been used to prepare this ITA:

- ♦ ITA prepared by WSP for the expansion of Northport (dated 31 August 2022)
- ♦ Civil drawings and report prepared by Beca to support the Substantive Application.

This report has been prepared in conjunction with an Operational Traffic Management Plan which has also been prepared by Flow which will also be submitted as part of the Substantive Application.

1.1 Activity status relevant to transport matters

We have assessed the Site against all relevant activities and standards of the Transport Chapter of the District Plan, refer to Table 13 in Appendix A.

While the Proposal does not technically trigger a Restricted Discretionary activity under this standard as it is not currently zoned under the Whangārei District Council District Plan, the relevant matters have nevertheless been assessed in this report:

- ♦ TRA-16 Integrated Transport Assessments
- ♦ The Site includes an overall Gross Floor Area (GFA) greater than 5,000 m².

The information required for an ITA is set out in TRA-REQ2, which is reproduced in Table 1 below, together with references to the relevant sections of this ITA that address each requirement.

Table 1: TRA-REQ2 information requirements

Information requirement	Reference in this report
A description of the site characteristics, existing development, existing traffic conditions and trip generation, surrounding land uses, proposed activity and its intensity, and future development potential of the site	Section 2 and 3
An assessment of the features of the existing transport network, including the following (where relevant to the proposal) i. Existing access arrangements, on-site car parking and crossing locations ii. Existing internal vehicle and pedestrian circulation iii. Existing walking and cycling networks iv. Existing public transport service routes and frequencies including bus stops and lanes. v. Hours of operation for non-residential activities vi. The adjacent transport network road hierarchy and the safety of the transport network in the vicinity including crash history if relevant vii. The location and type of any existing level crossings in the locality.	Section 2
A description of the estimated number of trips which will be generated by each transport mode (public transport, walking, cycling and private vehicles, including heavy vehicles).	Section 9
An assessment of the suitability of the proposal for all users within the development and connecting to the adjacent transport network. This shall include assessments of: i. The accessibility of the development for public transport and how the design of the development will encourage public transport use by considering the attractiveness, safety, distance and suitability of the walking routes to the nearest bus stop ii. The accessibility of the development for pedestrians and cyclists and how the design of the development will encourage walking and cycling, particularly to nearby destinations such as reserves, other public spaces and commercial or community facilities iii. Any safety implications that may detract from walking or cycling to/from the development iv. The accessibility of the development by private motor vehicles and the suitability of the proposed access and use of the site with respect to the safe, efficient and effective functioning of the transport network.	Section 5 to 10
An evaluation of the effects of the development on the surrounding transport network, including:	Section 9

i. Impacts on the operation of public transport infrastructure, and any vehicle and pedestrian/cyclist conflicts likely to arise from vehicle movements to and from the development ii. The impacts that any additional vehicle movements are likely to have on the capacity and operation of adjacent road and rail networks, including any intersections and level crossings iii. For heavy vehicle trips per day, whether there are any effects from these trips on roading infrastructure iv. Where the development will directly impact the state highway, a summary of consultation with the New Zealand Transport Agency v. The impacts of construction traffic where a development will require a significant amount of construction work vi. Where the development will directly impact the railway corridor, a summary of consultation with the railway operator.	
An assessment of how the transport network will be designed to accommodate infrastructure and services, stormwater, lighting, landscaping and street trees. For larger scale non-residential developments this shall include consideration of underground electrical supply system for electric vehicle charging stations.	Refer also to Civil plan and report prepared by Beca
Identification of any necessary mitigation measures that will be required to address any impacts on the transport network, including: i. Potential mitigation measures needed both within the proposed development and on the transport network surrounding the development including any improvements, upgrades, alterations or extensions to the transport network (including at level crossings) ii. Any mitigation required to achieve convenient and safe operation of access points and loading areas for all users iii. How the design and layout of the proposed activity maximise opportunities, to the extent practical, for travel other than by private car iv. Where appropriate, the use of Crime Prevention Through Environmental Design principles and techniques to mitigate any safety issues for pedestrians or cyclists v. A description of measures that will be put in place to mitigate against the effects of the construction process vi. A summary of the Integrated Transport Assessment including key findings and implications that the development will have for transport including any proposed mitigation measures.	Section 9
An overview of the transport implications of existing land uses and any land use characteristics that affect the proposal, including in the wider surrounding area those that will affect assessment of the proposal. This shall consider projected growth predictions and predicted annual average daily traffic.	Section 9

2 WHAT HAS BEEN CONSENTED AND WHAT IS BEING PROPOSED

2.1 What the Site includes

The Site includes the construction and operation of a marine maintenance operations facility abutting the western side of the existing Northport facility as shown Figure 1 and includes the following key transport planning, engineering elements and typical operations:

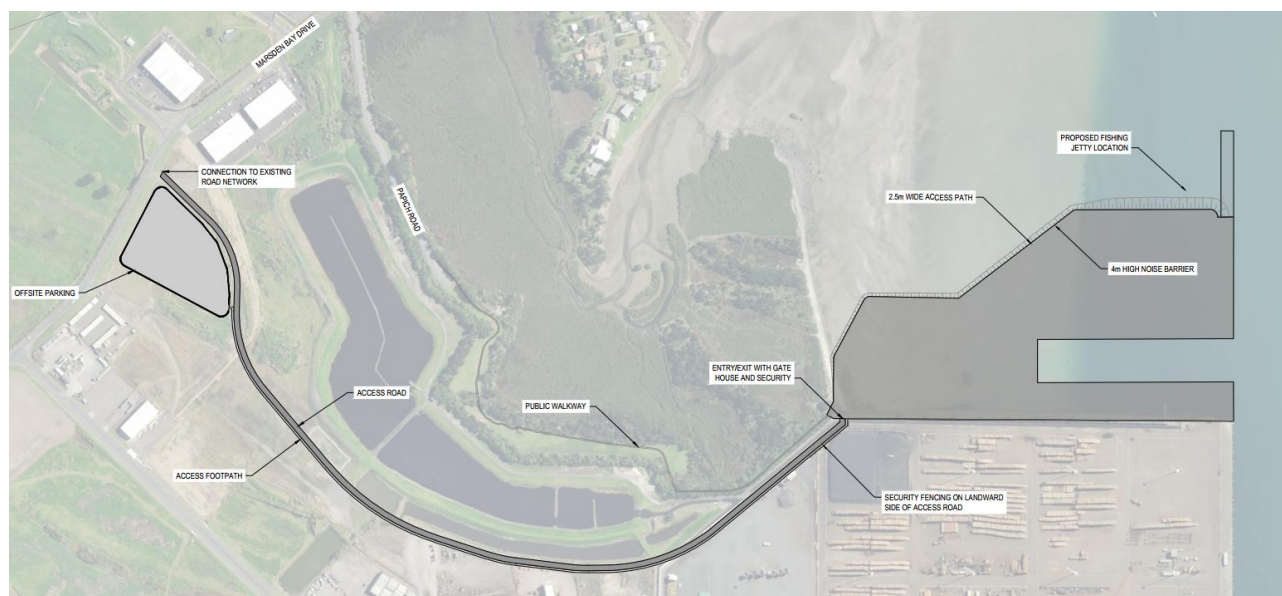
- ◆ reclamation of approximately 9.7ha
- ◆ a 'cutout' to the reclamation where a vessel haul out system is to be located, being a floating drydock or potentially shiplift or other lifting mechanism
- ◆ construction of a piled wharf structure to accommodate vessels either temporarily (before/after haul out), or for extended periods where works not requiring haul out can be undertaken
- ◆ dredging stage one: capital and maintenance dredging associated with construction and ongoing operation of the marine maintenance operations facility, including a berth pocket and a vessel turning basin to provide for safe navigation
- ◆ dredging stage two: capital dredging to ensure sufficient volume of dredge spoil is available to construct both the NDD and Northport's Vision for Growth development.
- ◆ fixed plant and buildings to accommodate marine maintenance activities and materials
- ◆ sufficient working & laydown areas for marine maintenance operations, including the ability to transfer vessels to hardstand
- ◆ access to and around the marine maintenance operations facility, including a landside area for staff carparking with capacity to provide for the expected demand of 450 car parking spaces and inclusion of a 20-30 spaces for loading/operations/waste collection within the new facility. Access will be via a new intersection with Marsden Bay Drive including a 10 m wide access road which will include a 7 m wide carriageway and a 2.5 m wide footpath. The access road will be the primary access to and from the Northland Shipyard and Dry Dock facility from the external road network
- ◆ public access around the edge of the reclamation to a public fishing platform

The marine maintenance operations facility is to provide vessel maintenance, repairs, and servicing, including but not limited to cleaning, painting, and repair of commercial and naval vessels, including Cook Strait ferries and Royal New Zealand Navy logistics vessels, along with other vessels such as international freight vessels and super yachts. The facility has design capacity to accommodate vessels ~50m to 230m in length with displacement between 500t and 28,000t. The facility will be based on normal working hours of 7am-6pm but the capacity to operate 24/7/365 where required, subject to appropriate restrictions on noise-generating activities.

The location of the facility has been carefully selected for functional and operational requirements, including the need for deep water access, sheltered harbour conditions, proximity to existing port services, sea and land transport links, and integration with established and proposed marine and land-based industrial infrastructure.

The project is listed in Schedule 2 of the Fast-track Approvals Act 2024 as having significant regional or national benefits.

Figure 1: Scheme plan of the Site produced by Beca²



The facility will be based on normal working hours of 7am to 6pm but the capacity to operate 24 hours a day/7 days a week/365 days a year where required, subject to appropriate restrictions on noise generating activities with capacity to cater for 500 full time equivalent staff (FTEs). The facility will operate with two staff rotations, with the first batch of staff arriving at 6:00am with a shift changeover occurring at 2:00pm.

A new private access road from Marsden Bay Drive is proposed. The existing access to Northport from Port Marsden Highway (SH15) will remain unchanged and will remain separate from the Northland Shipyard and Dry Dock facility.

2.2 What has been consented

Northport expansion

On 2 October 2025, consent was granted by the Environment Court for the expansion of Northport to include an additional berth. The consent also approved the construction of a public access area at the end of Ralph Trimmer Drive, including the provision of 20 car parking spaces.

The consented Northport operations include a total of five berths. Berths 1 to 3 are currently operational, while Berths 4 and 5 have been consented but are yet to be constructed. We note that the traffic generated by the previously consented development has already been accounted for in the Transport Assessment Report prepared by WSP, dated 31 August 2022.

The consented scheme is shown diagrammatically in Figure 2.

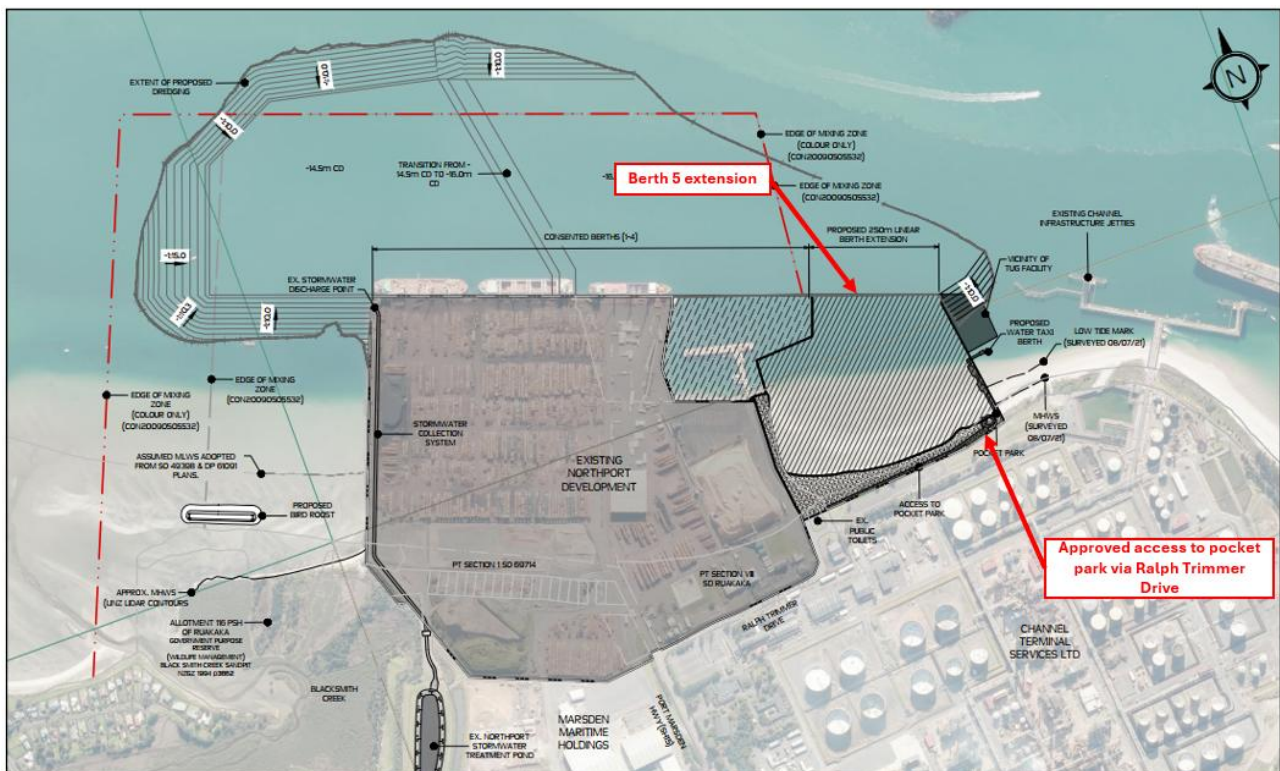
² Drawing 3237966-SK-7000-B dated 22/05/2026

KiwiRail spur line

Designations have been obtained by KiwiRail for a proposed rail line would branch off the existing North Auckland Line at Oakleigh, about 25 km south of Whangārei, and run roughly 16 km east to Marsden Point Port.

In June 2021, the New Zealand Upgrade Programme provided funding for the Oakleigh to Marsden Point Rail Link. The Government has recently confirmed that rail funding will be included in the National Land Transport Fund (NLTF).

Figure 2: Consented Scheme



3 DESCRIPTION OF THE TRANSPORT NETWORK

3.1 Site location

The location of the Site and the zoning map in the wider environment is shown in Figure 3 and Figure 4 , respectively.

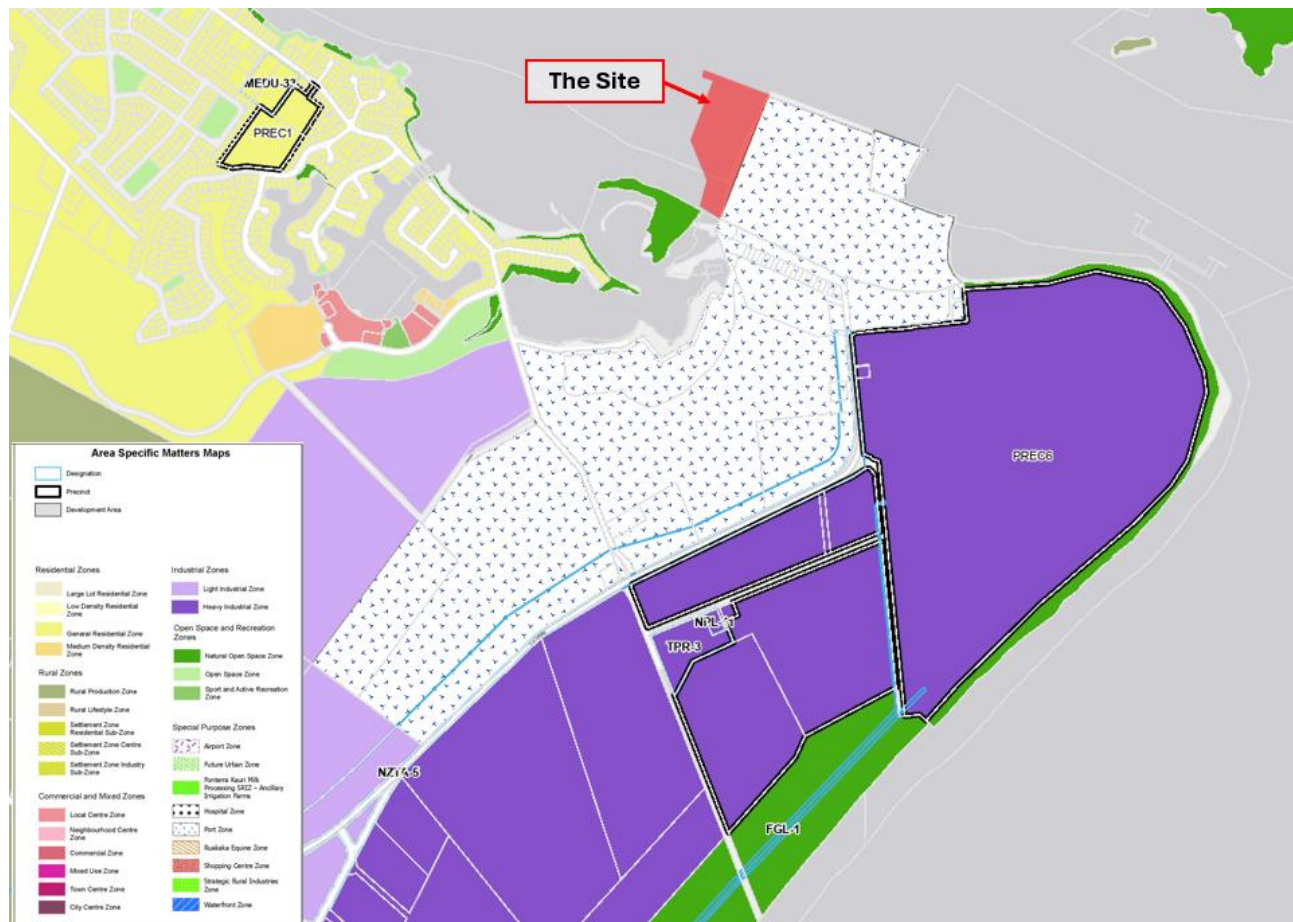
Northport is at the north-eastern corner of Marsden Point and is accessed via Port Marsden Highway (SH15). The Site sits within the Coastal Marine Area with the car parking and associated sitting within the Port Zone.

Figure 3: Aerial Image of the Site (source: Whangarei District Council GIS³)



³ <https://gismaps.wdc.govt.nz/GISMapsViewer/>

Figure 4: District Plan Zoning of the Site (source: Whangarei ePlan Home⁴)



3.2 The surrounding transport network

3.2.1 SH1

SH1 is the primary access to One Tree Point, Marsden Point and Ruakākā. SH1 runs in a north-south direction.

As shown in Figure 5, SH1 has the following characteristics:

- ♦ One traffic lane in each direction, separated by wire rope barriers with road shoulders on both sides of the road
- ♦ Parking is not permitted on either side of the road
- ♦ The road has a speed limit of 100 km/h
- ♦ Footpaths are not available in either side of the road.

⁴ <https://eplan.wdc.govt.nz/>

Figure 5: SH1 looking towards to SH1/Port Marsden Highway intersection (source: Google Street View October 2025)



3.2.2 Port Marsden Highway

Port Marsden Highway (SH15) is also the primary access to Northport and the immediate industrial uses.

As shown in Figure 6, Port Marsden Highway in the vicinity of the site has the following characteristics:

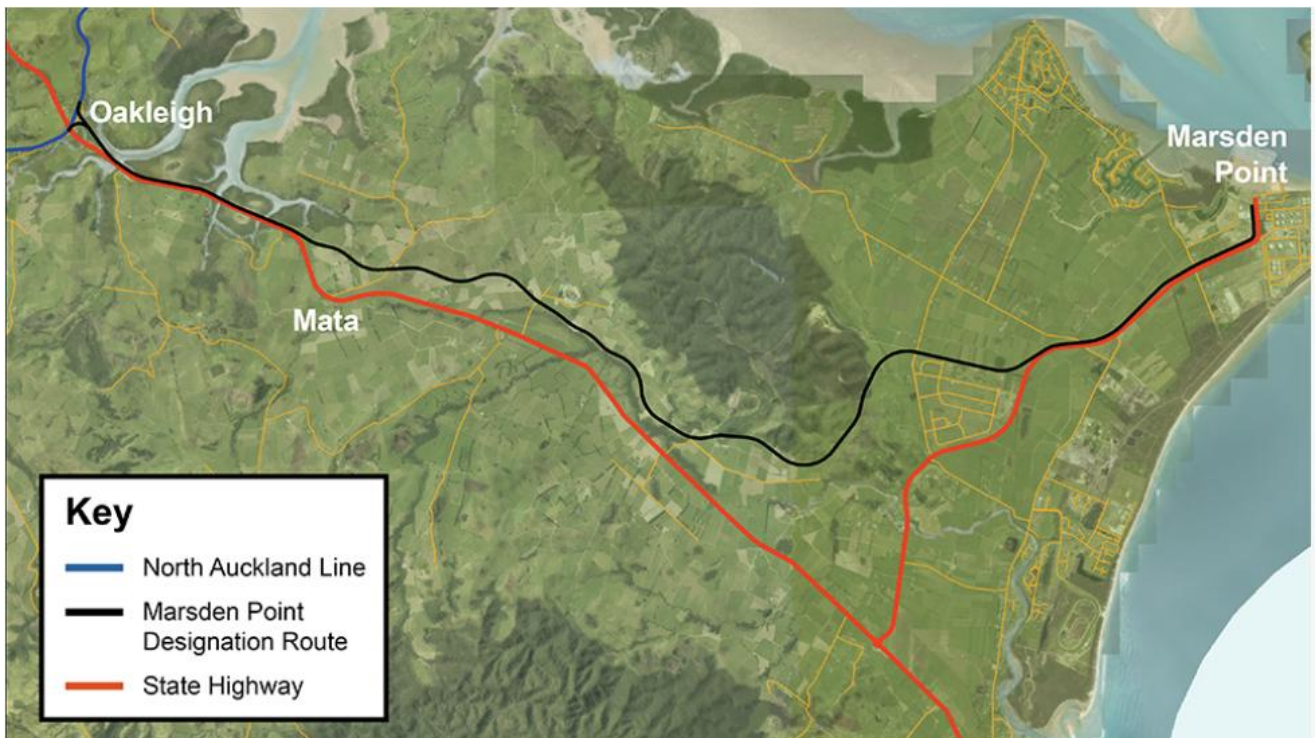
- ◆ One traffic lane in each direction with road shoulders on both sides of the road
- ◆ Parking is not permitted on either side of the road
- ◆ The road has a speed limit of 100 km/h
- ◆ Footpaths are not available on either side of the road.

A rail corridor designation is located adjacent to Port Marsden Highway to support the future development of the Marsden Point Rail Link, the extent of the designation is shown in Figure 7.

Figure 6: Port Marsden Highway looking north towards the existing port facility (source: Google Street View October 2025)



Figure 7: Port Marsden Highway rail designation (source: Kiwi Rail⁵)



3.2.3 Marsden Bay Drive

Marsden Bay Drive is classified as a Primary Collector Road and will be the primary access to the proposed Northland Shipyard and Dry Dock facility. Marsden Bay Drive runs in a north-south direction. It currently provides access to industrial land (including Port Zone land), Marsden Cove Marina commercial and residential uses, and the One Tree Point residential area.

As shown in Figure 8, Marsden Bay Drive in the vicinity of the site has the following characteristics:

- ♦ One traffic lane in each direction with road shoulders on both sides of the road
- ♦ Parking is not permitted on either side of the road
- ♦ The road has a speed limit of 60 km/h
- ♦ Footpaths are not available in either side of the road.

⁵ <https://www.kiwirail.co.nz/our-network/our-regions/northland-rail-rejuvenation/>

Figure 8: Marsden Bay Drive looking north (source: Google Streetview October 2025)



3.3 Northport's existing vehicle access

The existing port includes a single vehicle access which is controlled by boom gates, does not allow for public access and provides access to a dedicated on-site car parking area. The existing access to the port is shown in Figure 9 and will not be changed as part of this proposal. The proposed Northland Shipyard and Dry Dock facility will require new access as shown in Figure 2 via Marsden Bay Drive.

Figure 9: Existing vehicle access to Northport from Port Marsden Highway (source: Google Streetview October 2025)



3.4 Northport's existing car parking provisions

The existing port facility includes a car parking area with around 120 car spaces as shown in Figure 10.

Figure 10: Existing car parking area within Northport



3.5 The Site's public transport accessibility

There are no public transport options directly serving the Site at Marsden Point. The area is primarily accessed by private vehicle and freight transport.

3.6 The Site's private vehicle accessibility

The Site is well served by the existing road network. The Site has connectivity to SH1, One Tree Point Road, Marsden Bay Drive and Marsden Point Road via Port Marsden Highway as shown in Figure 11 and is described below:

- ◆ The Site is accessible to and from the north via Marsden Bay Drive via One Tree Point Road
- ◆ The Site is accessible to and from the south via SH1 and Marsden Point Road via Port Marsden Highway.

Figure 11: The Site connections to the wider road network (Source: Google Maps)



3.7 Road Safety

The New Zealand Transport Agency's Crash Analysis System (CAS) has been reviewed for any crashes recorded on key roads in the vicinity of the Site for the last five years between 2021 and 2026 (inclusive). A summary of the crash search area and the crashes near the Site are shown in Figure 12.

A summary of the crashes by intersection and midblock section along the study area is provided in Table 2.

Figure 12: CAS Diagram search area in blue and the Site in red (Source: <https://cas.nzta.govt.nz/>)



Table 2: Existing crash history near the Site

Location	Number of Crashes	Type of Crashes	Severity
Port Marsden Highway/Rama Road	1	Crossing turning (1)	Non-injury (1)
Port Marsden Highway/Marsden Bay Drive	1	Loss of control (1)	Non-injury (1)
Port Marsden Highway (between Marsden Bay Drive/Marsden Point Road)	1	Obstruction (1)	Non-injury (1)
Port Marsden Highway (between Marsden Point Road/One Tree Point Road)	1	Loss of control (1)	Non-injury (1)
Port Marsden Highway/One Tree Point Road	5	Crossing turning (5)	Non-injury (1) Minor (3) Fatal (1) – 1 motorcyclist
Port Marsden Highway/McCathie Road	1	Crossing turning (1)	Minor (1)
Port Marsden Highway (between McCathie Road Salle Road)	3	Other Manoeuvre (1) Obstruction (1) Loss of control (1)	Non-injury (2) Minor (1)

Port Marsden Highway (between Salle Road and SH1)	2	Loss of control (1) Rear end (1)	Non-injury (2)
Port Marsden Highway/SH1	6	Rear end (1) Crossing turning (2) Loss of control (1) Other overtaking (2)	Non-injury (5) Minor (1)
SH1/Marsden Point Road	5	Rear end (2) Crossing turning (3)	Non-injury (4) Minor (1)
Marsden Point Road/Ruakaka Beach Road	1	Loss of control (1)	Serious (1)
Marsden Point Road (between Miraka Road / Salle Road)	3	Collision with parked vehicle (1) Other manoeuvre (1) Off roadway to left (1)	Non-injury (2) Minor (1)
Marsden Point Road/Salle Road	1	Rear end (1)	Non-injury (1)
Marsden Point Road (Salle Road/Peter Snell Road)	2	Off roadway to left (2)	Non-injury (1) Minor (1)
Marsden Point Road/Peter Snell Road	1	Crossing turning (1)	Non-injury (1)
Marsden Point Road (between Peter Snell Road/Lakeside Park Road)	6	Obstruction (1) Crossing turning (2) Loss of control (3)	Non-injury (4) Minor (2)
Marsden Point Road/Lakeside Park Road	1	Loss of control (1)	Minor (1)
Marsden Bay Drive (along the Site's frontage)	1	Loss of control (1)	Non-injury (1)
Total	42	-	-

A total of 42 crashes were reported comprising 1 fatal crash, 1 serious injury crash, 12 minor injury crashes and the remaining crashes resulting in non-injuries.

The fatal crash involved a motorcycle colliding with a vehicle exiting One Tree Point Road onto Port Marsden Highway.

The serious crash involved a vehicle travelling eastbound on Marsden Point Road that lost control while descending toward the bridge near Bream Bay College and collided with the left side of the bridge.

All crashes were typical for the road environment. Specifically, we note that there has been one crash on Marsden Bay Drive. On this basis, we consider that it is unlikely that the Site will create a negative effect on the safety of road users.

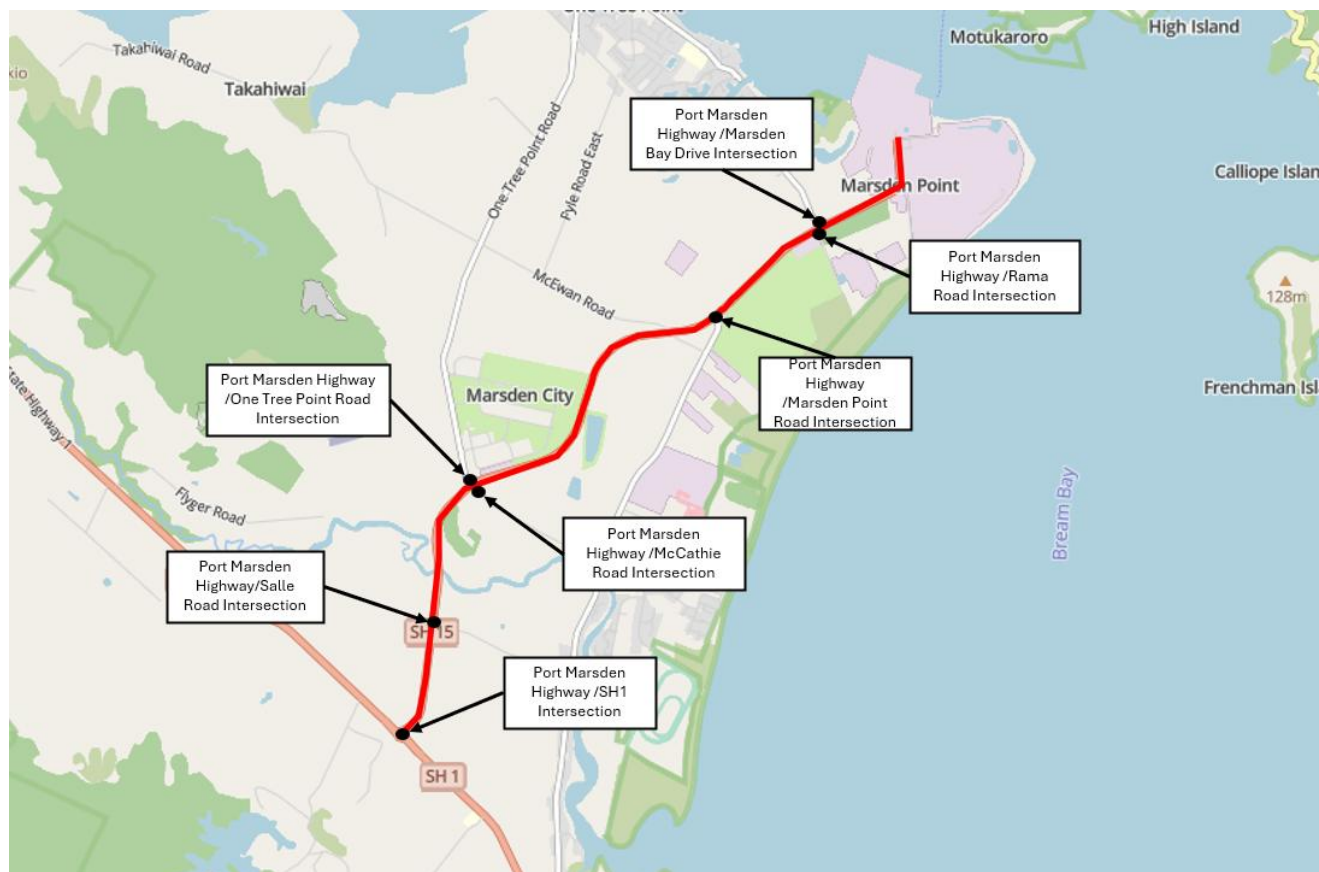
3.8 Adjacent Intersections

The existing intersections along Port Marsden Highway are shown in Figure 13 and described in Table 3.

Table 3: Existing intersections on Port Marsden Highway adjacent to the Site

Location	Intersection	Intersection Type	Intersection Control
1	Port Marsden Highway/Ralph Trimmer Drive	Unsignalised T	Stop
2	Port Marsden Highway/Mair Road	Unsignalised T	Give-way for left turn from Mair Road onto Port Marsden Highway Stop for right turn from Mair Road onto Port Marsden Highway
3	Port Marsden Highway/Rama Road	Unsignalised T	Stop
4	Port Marsden Highway/Marsden Bay Drive	Unsignalised T	Stop for right turn from Marsden Bay Drive onto Port Marsden Highway
5	Port Marsden Highway/Marsden Point Road	Unsignalised T	Stop
6	Port Marsden Highway/One Tree Point Road	Unsignalised T	Stop
7	Port Marsden Highway/McCathie Road	Unsignalised T	Stop
8	Port Marsden Highway/Salle Road	Unsignalised T	Give-Way
9	Port Marsden HighwaySH1	Four-leg roundabout	Stop

Figure 13: Intersections on Port Marsden Highway adjacent to the Site (source: Whangarei District Council GIS⁶)



3.9 Existing traffic volumes

The current traffic conditions on the nearby roads are described below.

3.9.1 Marsden Bay Drive

Traffic counts on Marsden Bay Drive were provided by Council. The Average Daily Traffic (ADT) in June 2025 was recorded to be 2,576 vehicles per day (vpd). A total of 96% of vehicles recorded were cars. No peak hour traffic data were provided.

3.9.2 Marsden Point Road

Traffic counts on Marsden Point Road were provided by Council. Between McEwen Road and Sime Road (where the Site is located), the Average Daily Traffic (ADT) in June 2021 was recorded to be 3,049 vpd. A total of 89% of vehicles recorded were cars. No peak hour traffic data was provided.

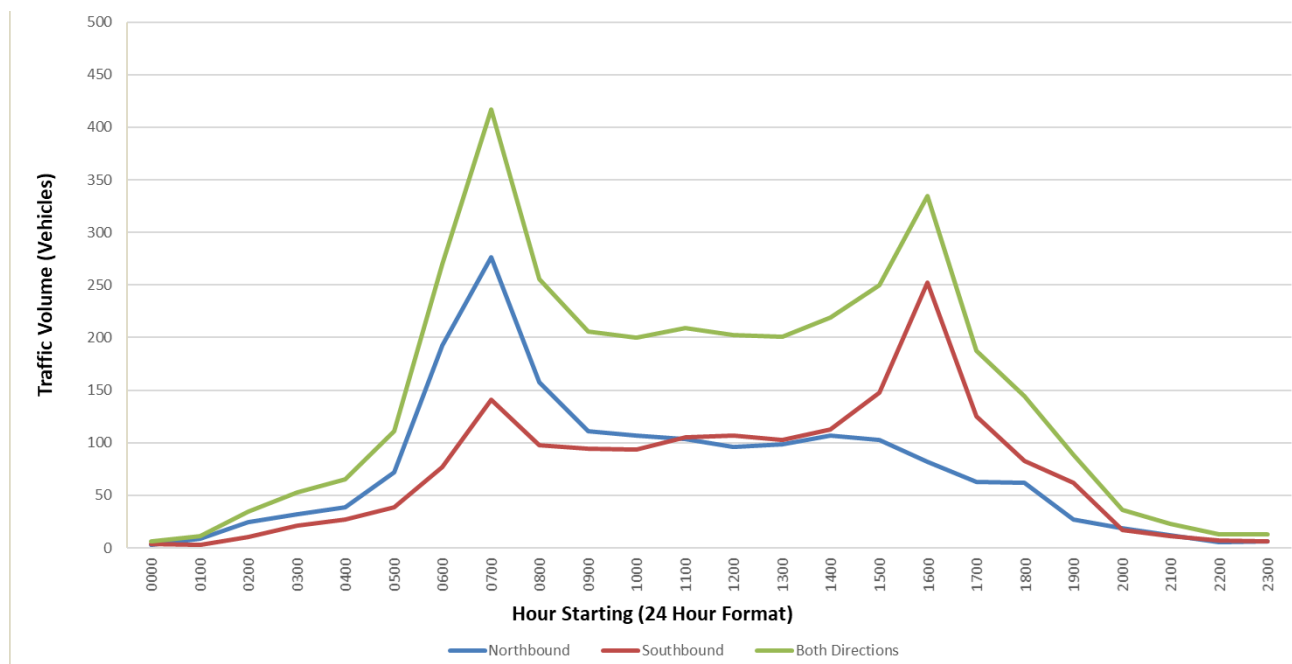
3.9.3 Port Marsden Highway

A peak hour traffic survey was done in March 2019 at the intersection of Marsden Point Road/Port Marsden Highway/One Tree Point Road. A full week count was also undertaken in April 2019 using a tube survey on Port Marsden Highway between One Tree Point Road and McEwan Road.

⁶ <https://gismaps.wdc.govt.nz/GISMapsViewer/>

The vehicle profile for a weekday average is shown in Figure 14, respectively below.

Figure 14: Port Marsden Highway Traffic Volume 5 day average (Monday 1 April to Friday 5 April 2019) – Two Way



As can be seen in the vehicle profiles above:

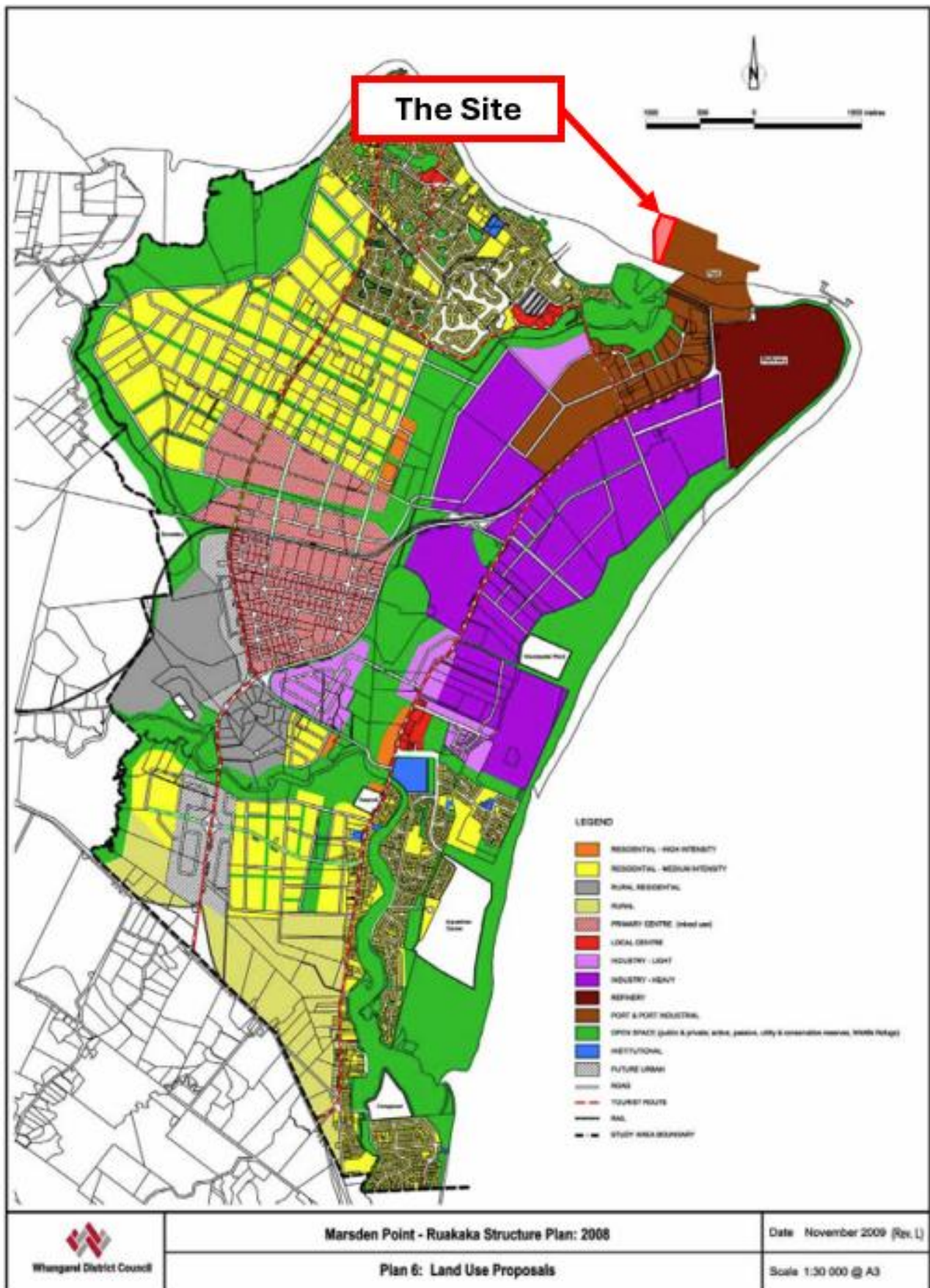
- ♦ in the weekday AM peak hour at 7:00am with around 400 veh/hr
- ♦ in the weekday PM peak hour at 4:00pm with around 330 veh/hr.

4 OUR CONSIDERATION OF RELEVANT TRANSPORT STRATEGIES

4.1 Marsden point – Ruakākā structure plan (2008)

The Marsden Point – Ruakākā Structure Plan has identified that a fully functional freight line between the port and Auckland is considered vital to future industrial growth in the area which is shown in Figure 15. The first stage of this project, the land acquisition and designation process for the 16km long rail corridor, is well underway (as discussed earlier).

Figure 15: Site with context of the Marsden Point – Ruakākā Structure Plan (2008)



4.2 Whangārei Future Development Strategy

The Whangārei Future Development Strategy sets out how the district will grow and change over the next 30 years. As a key centre in Northland, Whangārei's development and success will help support wider regional growth. The location of the site with context of the Whangārei Future Development Strategy is shown in Figure 16.

Figure 16: Site with context of the Whangārei Future Development Strategy



Several major projects referenced in the Future Development Strategy are planned to support Northport:

- ◆ Port and industry expansion: Increasing port capacity will allow more freight to be handled and moved through Northport
- ◆ Marsden Point Rail Link: Extending the rail network from the North Auckland Line to Northport would improve freight efficiency and reduce reliance on road transport.

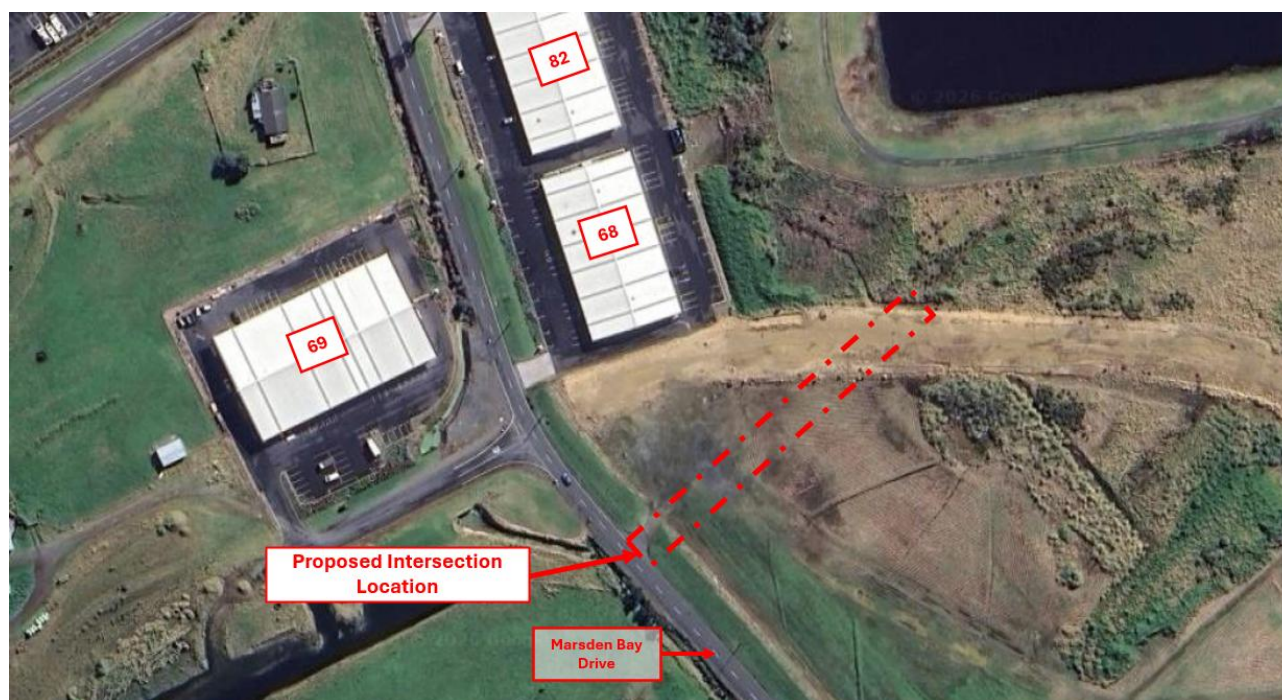
In addition to supporting Northport's ability to meet future freight demands for both Northland and New Zealand, these improvements are included in the Future Development Strategy as being expected to create new business and employment opportunities in the region. The proposed Northland Shipyard and Dry Dock facility aligns with, and is directly supported by, the expansion as outlined in the Whangārei Future Development Strategy.

5 VEHICLE ACCESS CONSIDERATIONS

5.1 Proposed intersection with Marsden Bay Drive

The design of the access is subject to further Engineering Design. For the purposes of this assessment, we have assumed that the proposed intersection to the Site will be situated by formalising the existing vehicle crossing (as shown in Figure 17) which is situated approximately 65 m south of the existing vehicle crossing at 68 Marsden Bay Drive.

Figure 17: Proposed intersection location on Marsden Bay Drive

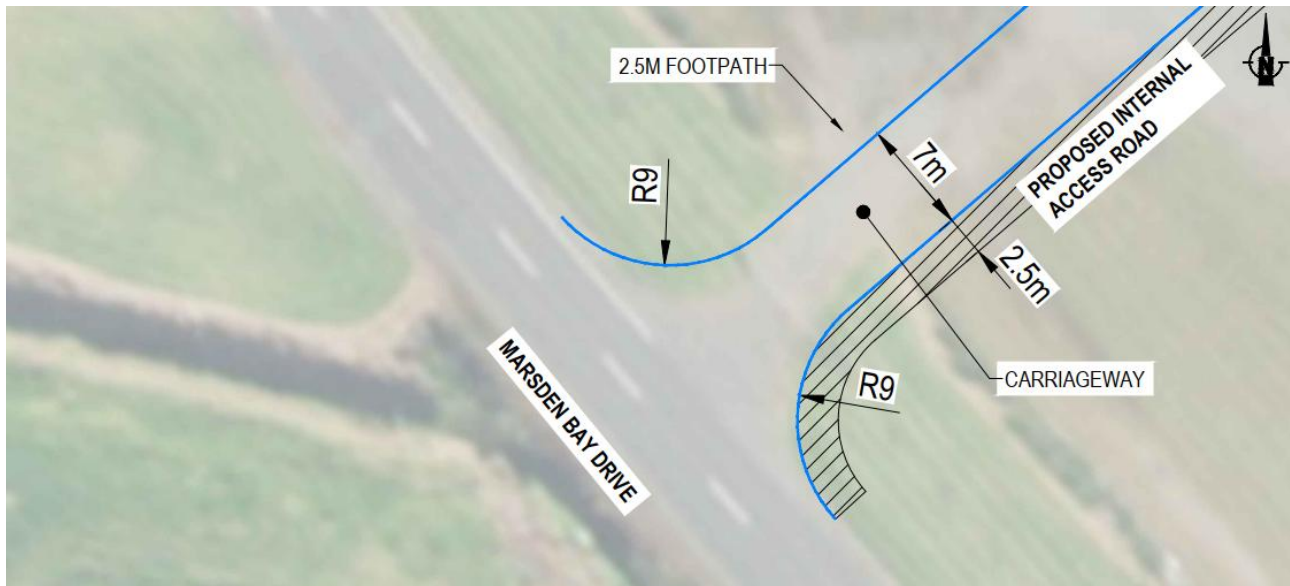


A priority controlled intersection is considered appropriate for the volume of traffic expected to use the access. The location of the intersection can achieve adequate visibility, with compliance demonstrated in Appendix B. The design meets the Safe Intersection Sight Distance (SISD) requirement of 120 m under the District Plan. This has been based on a design speed of 70 km/h (posted speed limit of 60 km/h plus 10 km/h) on both approaches and complies with the District Plan requirements for primary and secondary collector road frontages (Table TRA 8, Appendix 2C).

The intersection has been designed to allow an B99 design vehicle and an 8 m long Medium Rigid Vehicle (MRV) to pass simultaneously without crossing the centreline when turning onto Marsden Point Drive. This is the most likely scenario during typical operations of the Site.

An indicative design and location of the new intersection is shown in Figure 18 with vehicle tracking and the sight distance plan available in Appendix B.

Figure 18: Proposed design and location of the new intersection to Marsden Point Drive

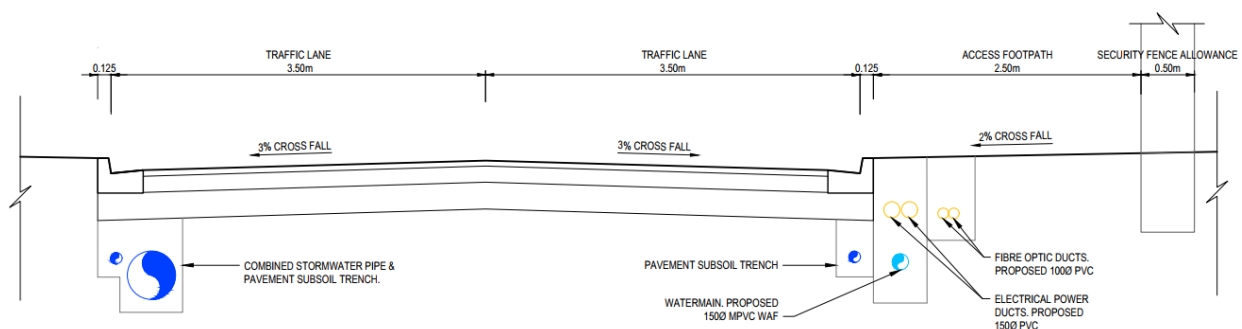


5.2 Proposed private access

The proposed private access has been designed within a 10 m legal width as shown in Figure 19 and described as follows:

- ◆ 2.5 m wide footpath on the eastern side of the road
- ◆ 7m wide carriageway (3.5 m wide traffic lanes), catering for two-way traffic movements.

Figure 19: Indicative cross section for the proposed access road



5.3 Proposed vehicle access to the car park

The vehicle crossing will be designed in accordance with Whangārei District Council Engineering Standard Drawings Sheet 19 (dated March 2018). The proposed vehicle access to the car park will be designed with either:

- ◆ Single width vehicle crossing – 3.5 m to 4 m (measured at the property boundary) if one-way access is used, or
- ◆ Double width vehicle crossing – 5.5 m to 6 m width (measured at the property).

6 CAR PARKING CONSIDERATIONS

6.1 Car parking requirements and provisions

The District Plan does not specify minimum or maximum parking requirements. As such, the proposed parking provision is not subject to quantitative compliance standards.

Based on an overall provision of 500 FTEs, presuming an occupancy rate of 1.1 persons per vehicle. The Site could generate a demand of around 450 car parking spaces.

The Site includes an indicative area of around 18,000 m² set aside for car parking adjacent to the new intersection with Marsden Bay Drive. The indicative area has capacity to cater for around 700 car parking spaces⁷. This is sufficient space for the anticipated parking demand. We recommend approximately 20-30 car parking spaces is provided for within or near the Northland Shipyard and Dry Dock facility to cater for a small proportion of staff and accessible users who may require direct access to the facility to cater for the parking demands of the Site. The car park will be publicly accessible from Marsden Bay Drive.

Pedestrian access will be provided from the main car parking area off Marsden Bay Drive to the proposed footpath at the access road to the Site. The indicative car parking area is shown in Figure 20.

⁷ This is based on standard car spaces requiring around 25 square metres which includes access and manoeuvring area.

Figure 20: Indicative location of the proposed car parking area to the Site



6.2 Accessible parking

Where parking is provided, the District Plan requires accessible parking to be supplied in accordance with NZS 4121:2004 (Design for Access and Mobility). The minimum requirements are as follows:

- ◆ Not less than one accessible parking space for 1-20 total spaces
- ◆ Not less than two accessible parking spaces for 21-50 total spaces
- ◆ Not less than one additional accessible parking space for every 50 spaces (or part thereof) thereafter.

Based on a total indicative car parking provision of around 450 car parking spaces, a minimum of 12 accessible parking spaces is required. The Site will include at least 12 accessible car parking spaces within the main car park and the smaller car park within the Northland Shipyard and Dry Dock facility.

The accessible parking spaces will be designed to be 2.4 m wide, 5.4 m long with a 1.1 m wide shared space. Accordingly, the accessible parking provision and layout complies with the NZS 4121:2004 (Design for Access and Mobility).

6.3 Parking layout

The District Plan specifies that parking spaces should be designed in accordance with TRA Appendix 1F – Minimum Car Parking Space Dimensions. Parking spaces will be designed with minimum dimensions of 2.4 m in width and 5.4 m in length, with a minimum aisle width of 6.2 m which is for User Class 1 (Employee and Commuter Parking). All car parking spaces will be designed to allow forward entry and exit of 90th percentile design vehicle (the nominated design vehicle in the District Plan).

On this basis, we are of the view the proposed car parking provisions and layout of the Site are acceptable and can meet the requirements of TRA Appendix 1F of the District Plan.

7 ACTIVE MODE CONSIDERATIONS

7.1 Pedestrian access

The Site will include the following active mode provisions:

- ♦ a 2.5 m wide footpath from the proposed car park to the Northland Shipyard and Dry Dock facility (not available for public use).
- ♦ A public footpath to a fishing platform, which will be via Papich Road and the existing Blacksmiths Creek walkway.

There are currently no footpaths on Marsden Bay Drive at the site access. However, it is understood that shared user paths are planned along Marsden Bay Drive and Port Marsden Highway, as indicated in red in Figure 21.

The Site's 2.5 m wide footpath (shown in green on the figure below) will be designed such that it can connect to this shared user path. The public access and footpath to the proposed public platform (shown in blue below) will be accessible via the existing footpath accessible from Papich Road (shown in orange below).

Figure 21: Indicative location of the existing footpaths and proposed shared user paths to the Site



7.2 Bicycle parking and end of trip facility considerations

Table TRA 1C of TRA Appendix 1A (Minimum On-site Bicycle Parking Requirements) of the District Plan indicates that industrial activities have a requirement for the Site to provide 1 bicycle parking space per

30 employees. Based on the provision of 500 employees, there is a requirement to provide 17. The Site will include provision of at least 17 bicycle parking spaces within the Northland Shipyard and Dry Dock facility.

TRA Appendix 1D of the District Plan indicates that if 5 to 50 long term bicycle parking spaces are provided, there is a requirement to provide a minimum of 2 showers/change rooms. The Site will be designed to include a minimum of 2 showers/change rooms within the Northland Shipyard and Dry Dock facility.

8 LOADING AND WASTE COLLECTION ARRANGEMENTS

The following operational conditions are assumed:

- ♦ loading and waste collection activities will typically be undertaken by 8 m long MRV or smaller vehicles
- ♦ loading and waste collection activities are expected to occur approximately 10-15 times per week.
- ♦ waste collection will be undertaken by a private contractor
- ♦ waste collection is expected to occur approximately 2-3 times per week.

Based on an overall GFA of 9,670 m², rule TRA-2 of the District Plan requires two loading spaces with minimum dimensions of 9 m length and 3.5 m width.

The Site includes space to accommodate at least two loading bays with dimensions of 9 m and 3.5 m width within the Northland Shipyard and Dry Dock facility and therefore will comply with the requirements of TRA Appendix 1C of the District Plan.

There is sufficient space for a typical waste collection vehicle to enter and exit the Site via the new internal access road and connection to Marsden Bay Drive.

On this basis, we consider the loading and waste collection arrangements of the Site are acceptable.

9 OPERATIONAL TRAFFIC EFFECTS

Typical operations of the Site will occur outside the commuter peak hours. For the purposes of this assessment, we only assessed the effects of traffic impacts associated with the proposed access road/Marsden Bay Drive intersection and the Port Marsden Highway/Marsden Bay Drive intersection. We consider the impacts to the wider road network, specifically on the intersections along Port Marsden Highway heading towards SH1 to be minimal during the commuter peak hours.

9.1 Whangārei Transport Model (WTM)

Stantec, on behalf of Whangārei District Council (WDC), developed a traffic demand model for 2024 and a “Do Nothing” 2054 scenario (with no road upgrades) using the WTM, which covers the wider district.

The 2054 scenario includes 1,200 new dwellings in the Northern Growth Corridor (Kauri and Kamo West). It was used to assess how this growth would affect an already limited road network. However,

the model does not appear to include additional future growth areas identified in the Whangārei Future Development Strategy (adopted May 2025), including western (Maunu/Three Mile Bush), southern (Otaika Valley), and eastern (Onerahi/Parua Bay/Whangārei Heads fringe) areas.

Staff will typically arrive and depart the Site outside the typical road peak hours; however, to assess the potential traffic impacts at the proposed intersection with Marsden Bay Drive and the intersection of Port Marsden Highway / Marsden Bay Drive, we have conservatively adopted the 2024 weekday AM and PM base model flows from the WTM, which are shown in Figure 22 and Figure 23.

Figure 22: 2024 base model flows – weekday AM peak hour

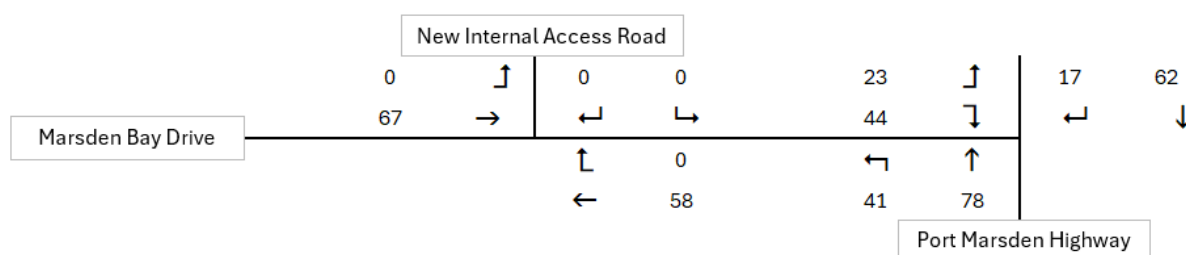
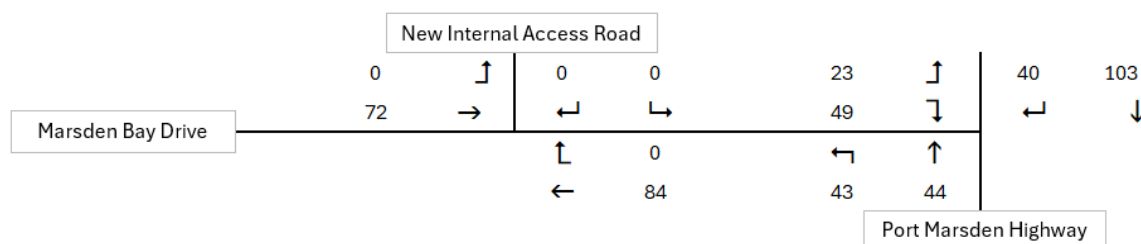


Figure 23: 2024 base model flows – weekday AM peak hour



The baseline traffic volumes adopted from the WTM are commuter peak volumes which will be higher than the traffic volumes during staff arrival and departure times, which will occur outside typical commuter peak times. The existing average traffic volume profile on Port Marsden Highway in Section 3.9.3 shows that at 6:00am and 2:00pm (staff arrival and departure times) traffic volumes on Port Marsden Highway are lower than the commuter peak hours. Therefore, we are of the view that the baseline traffic volumes adopted in this assessment are conservative.

9.2 Consented Developments – Port Expansions

The base model flows from the WTM do not account for traffic associated with the consented Northport expansion (discussed earlier). The transport assessment prepared for the expansion of Northport predicted a weekday AM and PM traffic generation of 150 vehicle movements and 154 vehicle movements, respectively. For the purposes of this assessment, we will presume that 20% of this traffic would be generated during the weekday shift peak and the weekday afternoon shift peak hours which is shown in Figure 24 and Figure 25. This assumption is considered appropriate, as the weekday peak hours at Northport currently occurs between 7:00am-8:00am and 6:00-7:00pm, as noted in Section

8.1.3.1 of the Integrated Transport Assessment prepared by WSP for the Northport Expansion (31 August 2022).

Figure 24: Northport expansion traffic – weekday morning shift

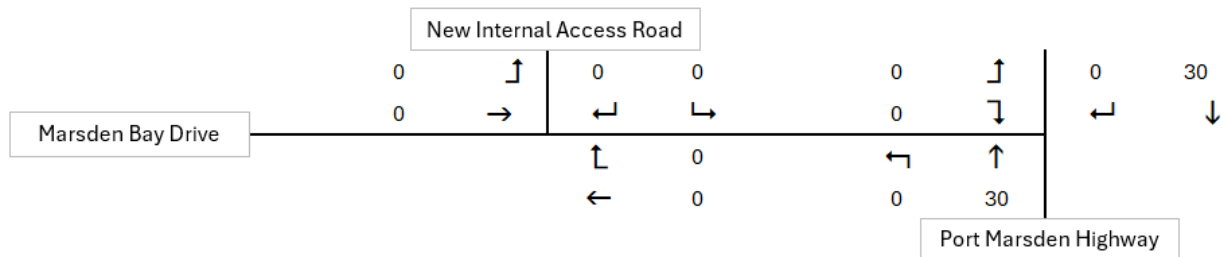
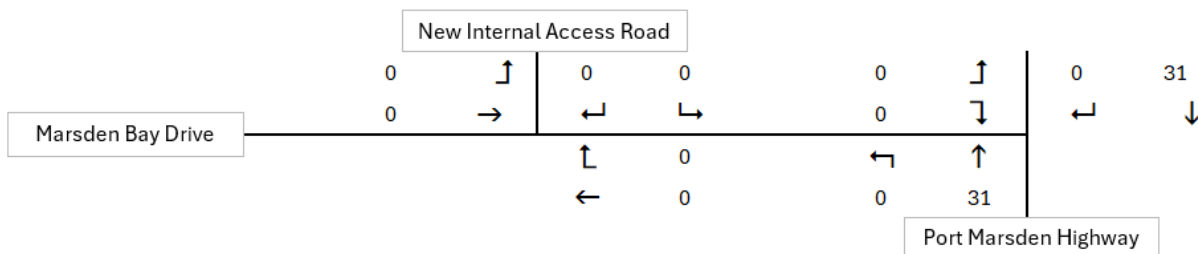


Figure 25: Northport expansion traffic – weekday afternoon shift changeover



9.3 Accounting for Traffic Growth

9.3.1 WTM base model flow comparison

The 2024 base model flows compared with the 2054 base model flows indicate a steady, linear growth rate of approximately 0.6-0.7% during both the weekday AM and PM peak periods.

9.3.2 Whangārei District Growth Strategy's Marsden Point/Ruakākā Development Model

Information from the Whangārei District Growth Strategy's Marsden Point/Ruakākā Development Model estimates the population growth at Marsden Point/Ruakākā out to 2041 which is shown in Table 4.

The population growth is based on:

- ◆ Expansion of Northport and industrial land
- ◆ Auckland spillover growth
- ◆ Improved freight and transport links Ruakākā and One Tree Point
- ◆ Satellite town development around Marsden Point.

Table 4: Projected population growth in Marsden Point/Ruakākā (source: Whangarei District Growth Strategy)⁸

Year	Population Forecast	Growth
2001	2829	+0.9%
2006	3108	+1.8%
2011	3713	+3.6%
2021	5280	+3.6%
2031	7509	+3.3%
2041	10378	

The data shows an expected population increase of around 3.6% per annum between 2021 and 2031 and 3.3% per annum between 2031 and 2041.

9.3.3 Adopted traffic growth

It is understood if Fast-track approvals are granted for the Project, it may be constructed and operational by as early as 2030. To ascertain any potential impacts on Port Marsden Highway, we have undertaken a 10-year post implementation scenario account for traffic growth.

For the purposes of this assessment, a 3% annual increase in traffic has been applied to the base traffic volumes, to determine the traffic volumes in the opening year and the forecast year. We have applied growth on Marsden Bay Drive and Port Marsden Highway.

9.4 Modelled scenarios

The following scenarios were modelled:

- ◆ Baseline traffic volumes for the opening year (2030) weekday morning shift peak hour
- ◆ Baseline traffic volumes for the forecast year (2030) weekday afternoon shift changeover peak hour
- ◆ Baseline traffic volumes for the opening year (2030) weekday morning shift peak hour + site generated traffic volumes
- ◆ Baseline traffic volumes for the forecast year (2030) weekday afternoon shift changeover peak hour + site generated traffic volumes
- ◆ Baseline traffic volumes for the opening year (2040) weekday morning shift peak hour + site generated traffic volumes
- ◆ Baseline traffic volumes for the forecast year (2040) weekday afternoon shift changeover peak hour + site generated traffic volumes.

⁸ <https://www.epa.govt.nz/assets/FileAPI/proposal/NSP000033/Hearings/f9bd4d5101/BoD-Volume-1-9-Whangarei-District-Growth-Strategy.pdf>

9.5 Baseline traffic volumes for the opening year of 2030

Figure 26 and Figure 27 shows the baseline traffic volumes in the opening year (2030) allowing for factoring the 2024 base model flows to align with TMS data on SH1 and Port Marsden Highway, traffic growth and the Northport expansion traffic volumes generated traffic volumes for the weekday morning shift and weekday afternoon shift changeover periods.

Figure 26: 2030 baseline traffic volumes – weekday morning shift

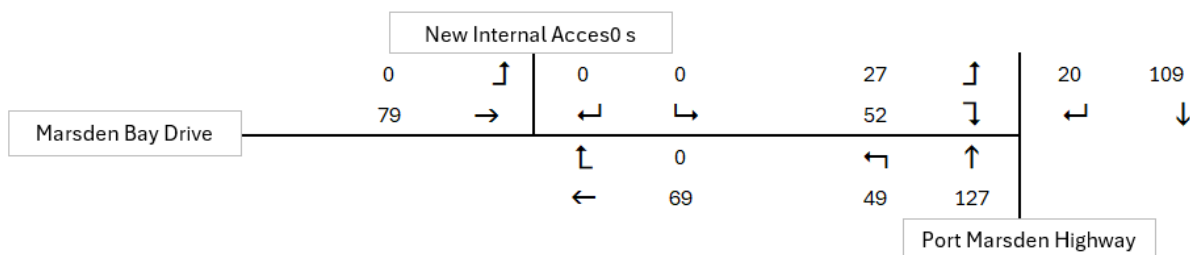
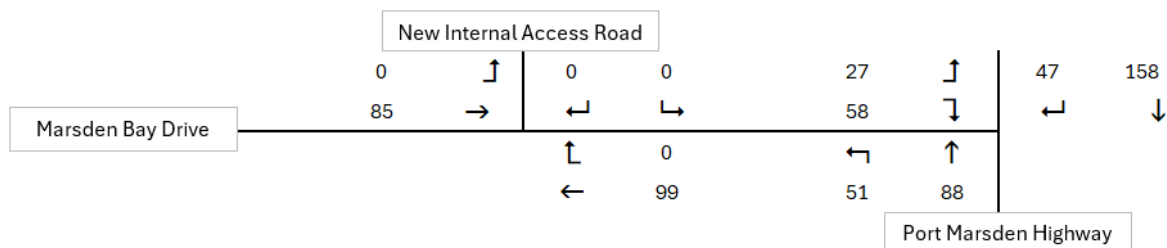


Figure 27: 2030 baseline traffic volumes – weekday afternoon shift changeover

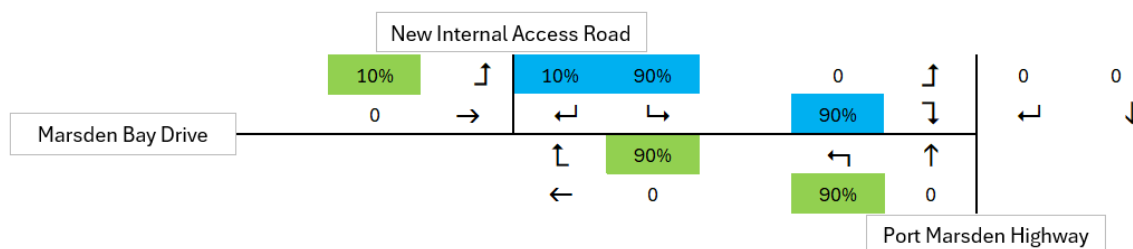


9.6 How traffic will be distributed

Based on existing traffic volumes on Marsden Bay Drive and Port Marsden Highway, and the surrounding residential catchment, it has been assumed that 90% of site related trips would enter and exit the site via the south, to and from Port Marsden Highway, while the remaining 10% would enter and exit via the north through the One Tree Point residential catchment.

The adopted traffic distributions for the weekday morning shift and weekday afternoon shift changeover peak hours are shown in Figure 28.

Figure 28: Adopted traffic distribution assumptions for the weekday morning shift and weekday afternoon shift changeover peak hours⁹



9.7 Site generated traffic during the weekday morning shift and weekday afternoon shift changeover peak hours

Operations at the proposed shipyard are expected to operate across two shifts. The first shift would commence with staff arrivals at 6:00 am, with a shift changeover occurring at 2:00 pm, outside of the commuter peak periods.

For the purposes of this assessment, a conservative assumption has been adopted whereby all staff arrival and departure movements are assumed to occur within the assessed shift arrival and shift changeover periods. During the weekday morning shift arrival period, it has been assumed that 90% of staff related vehicle movements would comprise inbound trips, with the remaining 10% comprising outbound trips. During the weekday afternoon shift changeover period, staff related vehicle movements have been assumed to be evenly split between inbound and outbound trips. A summary of the Site generated traffic during the weekday morning shift and the weekday afternoon shift changeover peak hours is shown in Table 5.

Table 5: Site generated traffic during the weekday morning shift and morning afternoon shift changeover peak hours

Period	Staff Arrivals/Departures	Occupancy	Total Movements
Weekday morning shift	250 FTEs	1.1 persons per vehicle	227 movements
Weekday afternoon shift changeover	500 FTEs	1.1 persons per vehicle	454 movements

Based on the above site traffic generation and the presumed distributions to and from the Site, Figure 29 and Figure 30 show the site generated traffic volumes for the weekday morning shift and weekday afternoon shift changeover periods, respectively.

⁹ Green denotes entry trip proportions and blue denotes exit trips proportion based on the surveyed traffic volumes.

Figure 29: Site generated traffic volumes – weekday morning shift

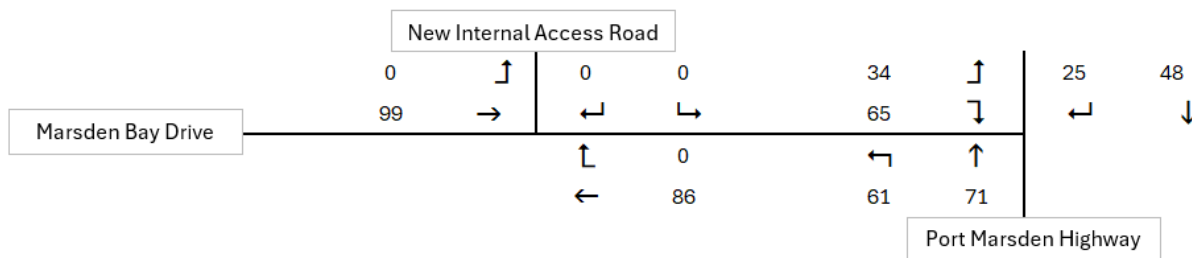
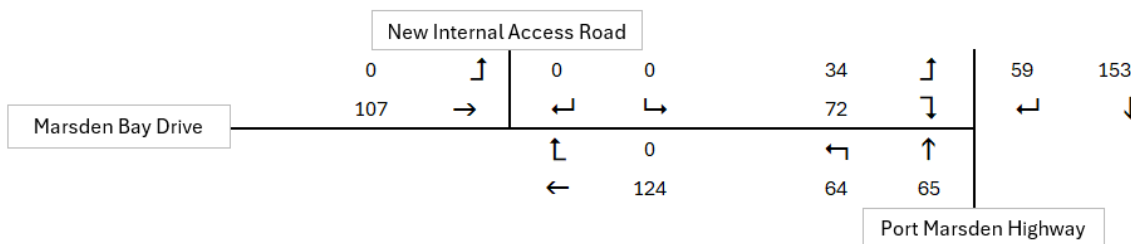


Figure 30: Site generated traffic volumes – weekday afternoon shift changeover



9.8 Baseline traffic volumes in the opening year (2030) + site generated volumes

Figure 31 and Figure 32 shows the baseline traffic volumes in the opening year (2030) allowing for traffic growth, superimposed with site generated traffic volumes for the weekday morning shift and weekday afternoon shift changeover periods.

Figure 31: 2030 opening year baseline traffic volumes + site generated traffic volumes – weekday morning shift

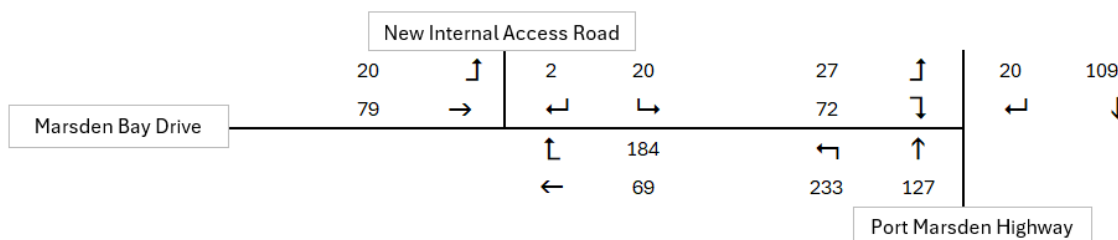
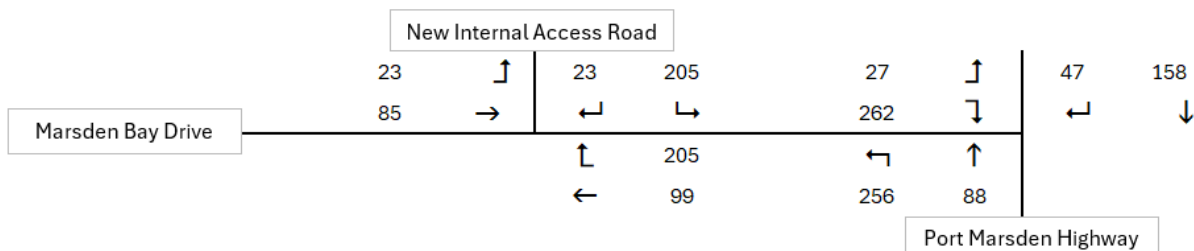


Figure 32: 2030 opening year baseline traffic volumes + site generated traffic volumes – weekday afternoon shift changeover



9.9 Baseline traffic volumes for the forecast year (2040) + site generated volumes

Figure 33 and Figure 34 shows the baseline traffic volumes for the forecast year (2040) allowing for traffic growth, superimposed with site generated traffic volumes for the weekday morning shift and weekday afternoon shift changeover periods.

Figure 33: 2040 forecast year + site generated traffic volumes – weekday morning shift

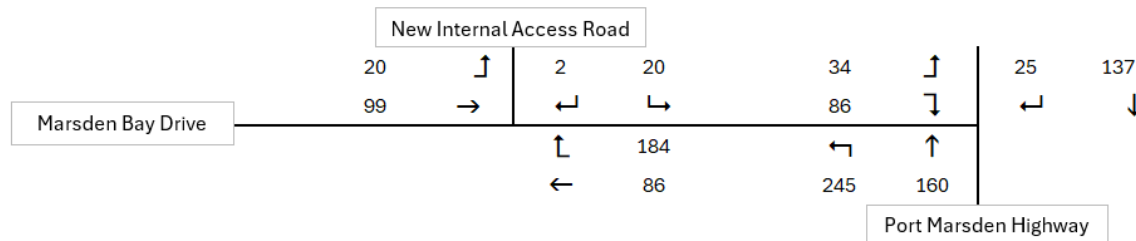
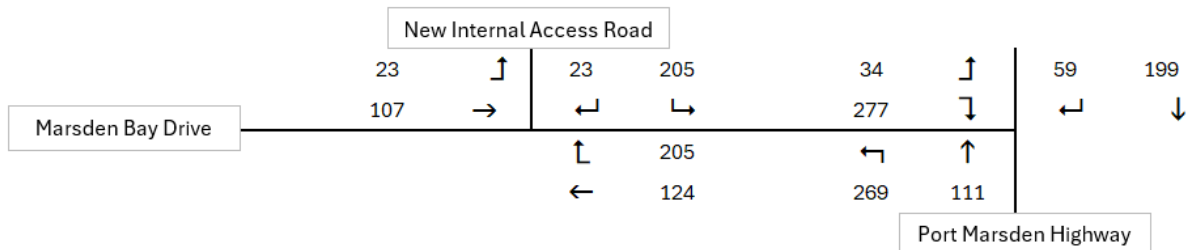


Figure 34: 2040 forecast year + site generated traffic volumes – weekday afternoon shift changeover



9.10 SIDRA Intersection modelling results

We undertook traffic modelling using SIDRA to understand the queue length, delay and level of service at the following locations:

- ◆ the proposed intersection of Marsden Bay Drive/Proposed Access Road
- ◆ The existing intersection of Port Marsden Highway / Marsden Bay Drive.

A summary of the results for the weekday morning shift and weekday afternoon shift changeover in the opening year (2030) and the forecast year (2040) for the forementioned intersections are summarised in Table 6 to Table 8. Detailed SIDRA outputs (including the modelled layout for each intersection) are available in Appendix C.

9.10.1 Baseline traffic volumes for the opening year (2030) without site generated traffic

Table 6: Weekday morning shift and weekday afternoon shift changeover, base with development in the opening year (2030) + site-generated traffic volumes at the Port Marsden Highway / Marsden Bay Drive intersection

Approach	Turns	Weekday morning shift				Weekday afternoon shift changeover			
		Volume over capacity	Delay (s)	Level of Service	95% Queue (m)	Volume over capacity	Delay (s)	Level of Service	95% Queue (m)
Port Marsden Highway / Marsden Bay Drive Intersection									
Port Marsden Highway (South)	Through	10%	6	A	0	8%	6	A	0
	Right Turn	10%	0	A	0	8%	0	A	0
Port Marsden Highway (North)	Left Turn	8%	0	A	0	13%	0	A	5
	Right Turn	8%	6	A	0	13%	6	A	5
Marsden Bay Drive (West)	Left Turn	9%	9	A	0	10%	9	A	5
	Through	9%	9	A	0	10%	10	A	5
Full Intersection	ALL	10%	3	A	0	13%	3	A	0

The results in the 2030 opening year indicate that:

- ♦ The existing intersection of Port Marsden Highway / Marsden Bay Drive is predicted to operate with acceptable queue lengths, average delays and capacity accounting for traffic growth and a portion of consented Northport traffic.

9.10.2 Baseline traffic volumes for the opening year (2030) + Site generated traffic volumes

Table 7: Weekday morning shift and weekday afternoon shift changeover, base with development in the opening year (2030) + site-generated traffic volumes at the Marsden Bay Drive / Proposed Private Access Road and Port Marsden Highway / Marsden Bay Drive intersections

Approach	Turns	Weekday morning shift				Weekday afternoon shift changeover			
		Volume over capacity	Delay (s)	Level of Service	95% Queue (m)	Volume over capacity	Delay (s)	Level of Service	95% Queue (m)
Marsden Bay Drive / Proposed Private Access Road Intersection									
Marsden Bay Drive (West)	Through	16%	0	A	5	19%	0	A	5
	Right Turn	16%	6	A	5	19%	6	A	5
Proposed Private Access Road (North)	Left Turn	2%	6	A	0	18%	6	A	5
	Right Turn	2%	7	A	0	18%	8	A	5
Marsden Bay Drive (West)	Left Turn	6%	6	A	0	6%	6	A	0
	Through	6%	0	A	0	6%	0	A	0
Full Intersection	ALL	16%	4	A	5	19%	4	A	5
Port Marsden Highway / Marsden Bay Drive Intersection									

Approach	Turns	Weekday morning shift				Weekday afternoon shift changeover			
		Volume over capacity	Delay (s)	Level of Service	95% Queue (m)	Volume over capacity	Delay (s)	Level of Service	95% Queue (m)
Port Marsden Highway (South)	Through	21%	6	A	0	20%	6	A	0
	Right Turn	21%	0	A	0	20%	0	A	0
Port Marsden Highway (North)	Left Turn	8%	0	A	0	14%	1	A	5
	Right Turn	8%	7	A	0	14%	7	A	5
Marsden Bay Drive (West)	Left Turn	13%	9	A	5	43%	10	A	15
	Through	13%	10	B	5	43%	12	B	15
Full Intersection	ALL	21%	4	A	5	43%	6	A	15

The results in the 2030 opening year indicate that:

- ♦ The existing intersection of Port Marsden Highway / Marsden Bay Drive is predicted to operate with minimal increases in queue lengths, average delays and capacity accounting for Site generated traffic, traffic growth and a portion of consented Northport expansion traffic.
- ♦ The proposed intersection of Marsden Bay Drive / Proposed Access Road is predicted to operate with acceptable queue lengths, average delays and capacity accounting for Site generated traffic, traffic growth and a portion of consented Northport expansion traffic.

9.10.3 Baseline traffic volumes for the forecast year (2040) + Site generated traffic volumes

Table 8: Weekday morning shift and weekday afternoon shift changeover, base with development in the forecast year (2040) + site-generated traffic volumes at the Marsden Bay Drive / Proposed Private Access Road and Port Marsden Highway / Marsden Bay Drive intersections

Approach	Turns	Weekday morning shift				Weekday afternoon shift changeover			
		Volume over capacity	Delay (s)	Level of Service	95% Queue (m)	Volume over capacity	Delay (s)	Level of Service	95% Queue (m)
Marsden Bay Drive / Proposed Private Access Road Intersection									
Marsden Bay Drive (West)	Through	19%	1	A	5	22%	6	A	0
	Right Turn	19%	7	A	5	22%	0	A	0
Proposed Private Access Road (North)	Left Turn	2%	6	A	0	17%	1	A	4
	Right Turn	2%	8	A	0	17%	7	A	4
Marsden Bay Drive (West)	Left Turn	14%	6	A	0	51%	11	B	24
	Through	14%	0	A	0	51%	14	B	24
Full Intersection	ALL	19%	4	A	5	51%	14	B	24
Port Marsden Highway / Marsden Bay Drive Intersection									
	Through	24%	6	A	0	22%	6	A	0

Port Marsden Highway (South)	Right Turn	24%	0	A	0	22%	0	A	0
Port Marsden Highway (North)	Left Turn	11%	1	A	0	17%	1	A	5
	Right Turn	11%	7	A	0	17%	7	A	5
Marsden Bay Drive (West)	Left Turn	17%	9	A	5	51%	11	B	25
	Through	17%	11	B	5	51%	14	B	25
Full Intersection	ALL	24%	4	A	5	51%	7	A	24

The results in the 2040 forecast year indicate that:

- ♦ The existing intersection of Port Marsden Highway / Marsden Bay Drive is predicted to operate with minimal increases in queue lengths, average delays and accounting for Site generated traffic, traffic growth and a portion of consented Northport expansion traffic
- ♦ The proposed intersection of Marsden Bay Drive / Proposed Access Road is predicted to operate with acceptable queue lengths, average delays and capacity accounting for Site generated traffic, traffic growth and a portion of consented Northport expansion traffic.

9.11 Sensitivity tests

9.11.1 Operational Traffic Impacts to the SH1/Port Marsden Highway and Port Marsden Highway/One Tree Point Road Intersections

This sensitivity test assesses the traffic impacts at the SH1/Port Marsden Highway and the Port Marsden Highway/One Tree Point Road intersections during the critical weekday afternoon shift changeover period. The weekday morning shift changeover has not been assessed, as traffic generated by the Site during this period is significantly lower than during the weekday afternoon shift changeover.

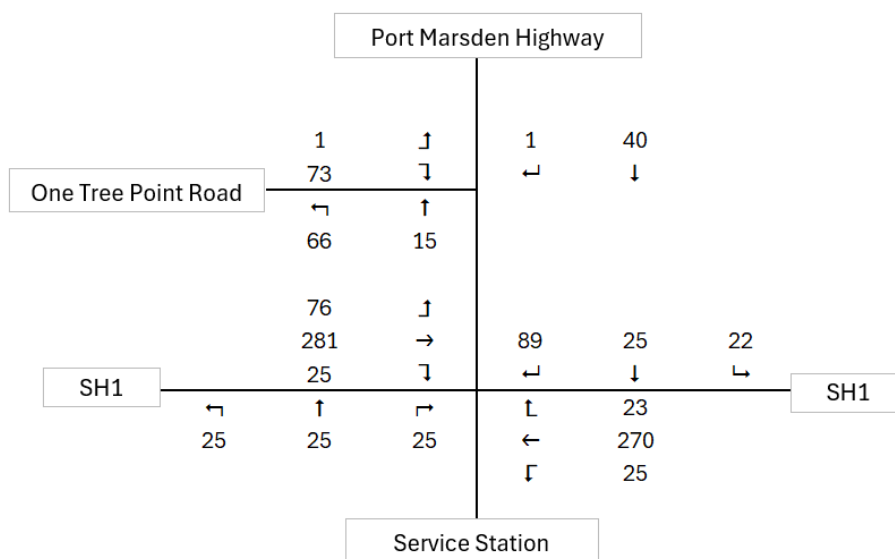
Adopted base model flows

We have adopted the 2024 weekday PM peak hour traffic flows from the WTM model and applied a 35% reduction to traffic volumes on Port Marsden Highway to align with the existing traffic profile on Port Marsden Highway at 2:00 pm during the weekday afternoon shift changeover period (refer to Section 3.9.3).

For the purposes of this assessment, we have assumed 25 nominal vehicles for all movements entering and exiting the service station, which forms the south-west approach to the SH1 / Port Marsden Highway intersection.

The adopted base model flows are shown in Figure 35.

Figure 35: 2024 base model flows – weekday afternoon shift changeover

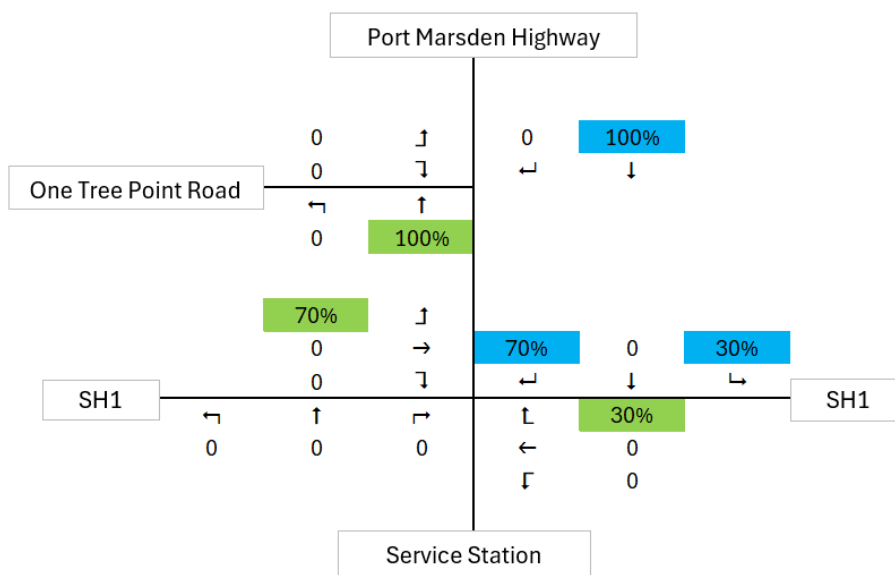


Adopted traffic distributions

Based on the existing traffic volumes on SH1 and Port Marsden Highway, together with the surrounding residential catchment, it has been assumed that 70% of site generated trips would enter and exit the Site from the north via SH1, while the remaining 30% would enter and exit from the south via SH1 from the SH1 / Port Marsden Highway intersection. The site generated trips would then travel through past the Port Marsden Highway / One Tree Point Road intersection.

The adopted traffic distribution for the weekday afternoon shift changeover peak hour is shown in Figure 36.

Figure 36: Adopted traffic distribution assumptions for the weekday afternoon shift changeover¹⁰

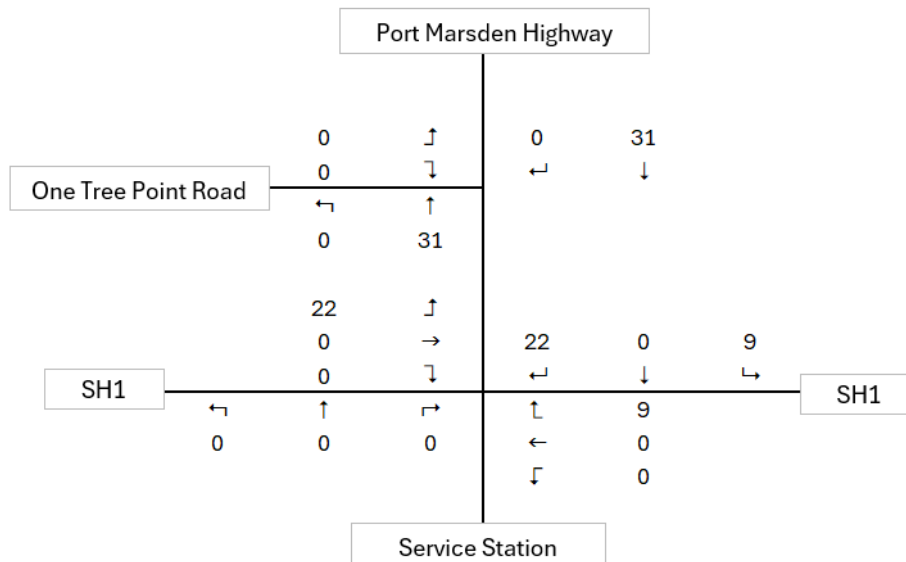


¹⁰ Green denotes entry trip proportions and blue denotes exit trips proportion based on the surveyed traffic volumes.

Consented Northport expansion traffic

Consistent with the assumptions adopted elsewhere in this report, it has been assumed that 20% of the consented port traffic would be generated during the weekday afternoon shift peak hour, with traffic distributed in accordance with the proportions outlined above is shown in Figure 37.

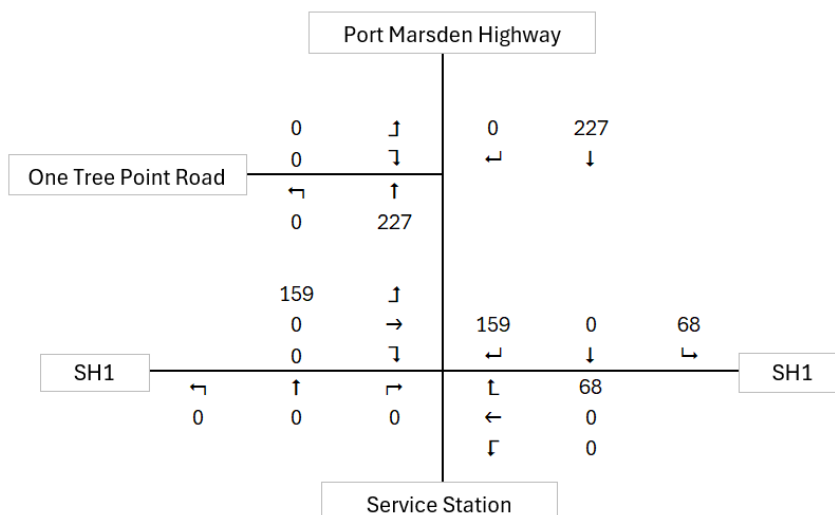
Figure 37: Northport expansion traffic – weekday afternoon shift changeover



Site generated traffic volumes

Based on the above site traffic generation and the presumed distributions to and from the Site, Figure 38 shows the site generated traffic volumes for the weekday afternoon shift changeover period at the SH1 / Port Marsden highway and Port Marsden Highway / One Tree Point Road intersections.

Figure 38: Site generated traffic volumes – weekday afternoon shift changeover

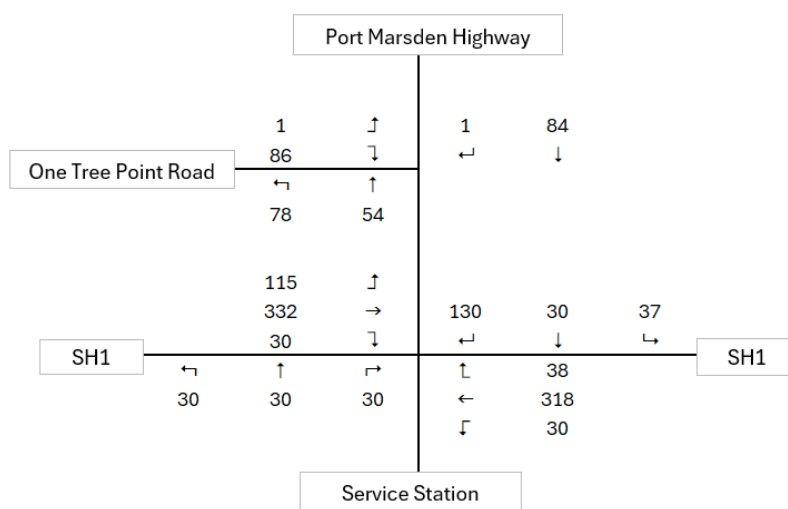


2030 opening year baseline traffic volumes

Consistent with the assumptions adopted elsewhere in this report, we have applied a 3% growth factor to all movements at the SH1 / Port Marsden Highway and the Port Marsden Highway / One Tree Point Road intersections.

Figure 39 shows the baseline traffic volumes in the opening year (2030) allowing for traffic growth, superimposed with site generated traffic volumes for the weekday afternoon shift changeover peak hour.

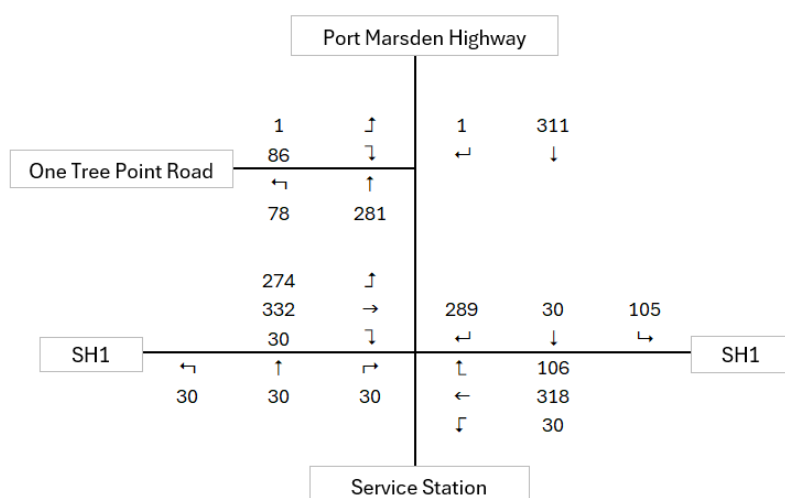
Figure 39: 2030 opening year baseline traffic volumes – weekday afternoon shift changeover



2030 opening year baseline traffic volumes + site generated traffic

Figure 40 shows the baseline traffic volumes in the opening year (2030) allowing for traffic growth, superimposed with site generated traffic volumes for the weekday afternoon shift changeover peak hour.

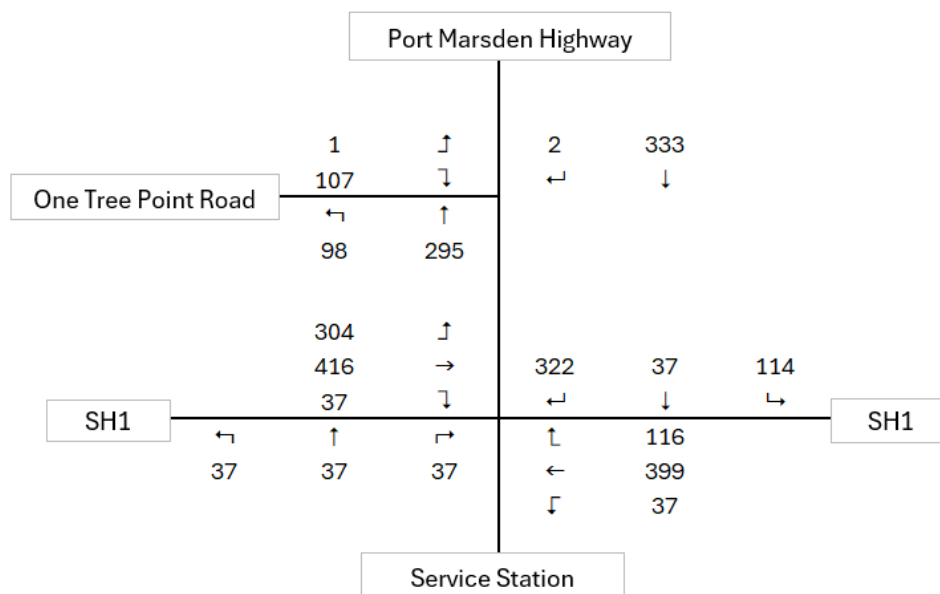
Figure 40: 2030 opening year baseline traffic volumes + site generated traffic volumes – weekday afternoon shift changeover



2040 forecast year baseline traffic volumes + site generated traffic

Figure 41 shows the baseline traffic volumes in the forecast year (2040) allowing for traffic growth, superimposed with site generated traffic volumes for the weekday afternoon shift changeover peak hour.

Figure 41: 2040 forecast year + site generated traffic volumes – weekday afternoon shift changeover



SIDRA Intersection modelling results

A summary of the results for the weekday morning shift and weekday afternoon shift changeover in the opening year (2030) and the forecast year (2040) for the forementioned intersections are summarised in Table 9 to Table 11. Detailed SIDRA outputs (including the modelled layout for each intersection) are available in Appendix C.

9.11.2 Baseline traffic volumes for the opening year (2030) without site generated traffic

Table 9: Weekday morning shift and weekday afternoon shift changeover, base with development in the opening year (2030) + site-generated traffic volumes at the Port Marsden Highway / SH1 intersection

Approach	Turns	Weekday afternoon shift changeover			
		Volume over capacity	Delay (s)	Level of Service	95% Queue (m)
SH1 / Port Marsden Highway Intersection					
Service Station (Southwest)	Left Turn	9%	5	A	5
	Through	9%	5	A	5
	Right	9%	12	B	5
SH1 (Southeast)	Left Turn	31%	3	A	15
	Through	31%	3	A	15
	Right	31%	11	B	15

Port Marsden Highway (Northeast)	Left Turn	19%	5	A	10
	Through	19%	4	A	10
	Right	19%	12	B	10
SH1 (Northwest)	Left Turn	35%	3	A	20
	Through	35%	3	A	20
	Right	35%	10	B	20
Full Intersection	ALL	35%	5	A	20

The results in the 2030 opening year indicate that:

- ♦ The existing intersection of SH1 / Port Marsden Highway is predicted to operate with acceptable queue lengths, average delays and capacity accounting for traffic growth and a proportion of consented Northport traffic.

9.11.3 Baseline traffic volumes for the opening year (2030) + Site generated traffic volumes

Table 10: Weekday afternoon shift changeover, base with development in the opening year (2030) + site-generated traffic volumes at the Port Marsden Highway / SH1 intersection and Port Marsden Highway / One Tree Point Road intersections

Approach	Turns	Weekday afternoon shift changeover			
		Volume over capacity	Delay (s)	Level of Service	95% Queue (m)
SH1 / Port Marsden Highway Intersection					
Service Station (Southwest)	Left Turn	11%	7	A	5
	Through	11%	7	A	5
	Right	11%	14	B	5
SH1 (Southeast)	Left Turn	44%	5	A	25
	Through	44%	5	A	25
	Right	44%	12	B	25
Port Marsden Highway (Northeast)	Left Turn	43%	5	A	25
	Through	43%	5	A	25
	Right	43%	12	B	25
SH1 (Northwest)	Left Turn	49%	4	A	30
	Through	49%	4	A	30
	Right	49%	11	B	30
Full Intersection	ALL	49%	7	A	30
Port Marsden Highway / One Tree Point Road Intersection					
SH15 (South)	Left Turn	21%	6	A	0
	Through	21%	0	A	0

SH15 (North)	Through	28%	2	A	10
	Right	28%	7	A	10
One Tree Point Road (West)	Left Turn	18%	10	A	5
	Right	18%	13	B	5
Full Intersection	ALL	28%	5	A	10

The results in the 2030 opening year indicate that:

- ♦ The existing intersection of SH1 / Port Marsden Highway is predicted to operate with minimal increases in queue lengths, average delays and capacity accounting for Site generated traffic, traffic growth and a portion of consented Northport expansion traffic
- ♦ The existing intersection of Port Marsden Highway / One Tree Point Road is predicted to operate with acceptable queue lengths, average delays and capacity accounting for Site generated traffic, traffic growth and a portion of consented Northport expansion traffic.

9.11.4 Baseline traffic volumes for the forecast year (2040) + Site generated traffic volumes

Table 11: Weekday afternoon shift changeover, base with development in the forecast year (2040) + site-generated traffic volumes at the Port Marsden Highway / SH1 intersection and Port Marsden Highway / One Tree Point Road intersections

Approach	Turns	Weekday afternoon shift changeover			
		Volume over capacity	Delay (s)	Level of Service	95% Queue (m)
SH1 / Port Marsden Highway Intersection					
Service Station (Southwest)	Left Turn	17%	8	A	10
	Through	17%	8	A	10
	Right	17%	16	B	10
SH1 (Southeast)	Left Turn	56%	6	A	40
	Through	56%	6	A	40
	Right	56%	13	B	40
Port Marsden Highway (Northeast)	Left Turn	53%	7	A	35
	Through	53%	7	A	35
	Right	53%	14	B	35
SH1 (Northwest)	Left Turn	60%	4	A	40
	Through	60%	4	A	40
	Right	60%	11	B	40
Full Intersection	ALL	60%	8	A	40
Port Marsden Highway / One Tree Point Road Intersection					
SH15 (South)	Left Turn	23%	6	A	0
	Through	23%	0	A	0

SH15 (North)	Through	20%	0	A	0
	Right	20%	6	A	0
One Tree Point Road (West)	Left Turn	25%	10	B	5
	Right	25%	14	B	5
Full Intersection	ALL	25%	3	A	5

The results in the 2040 forecast year indicate that:

- ♦ The existing intersection of SH1 / Port Marsden Highway is predicted to operate with minimal increases in queue lengths, average delays and capacity accounting for Site generated traffic, traffic growth and a portion of consented Northport expansion traffic
- ♦ The existing intersection of Port Marsden Highway / One Tree Point Road is predicted to operate with acceptable queue lengths, average delays and capacity accounting for Site generated traffic, traffic growth and a portion of consented Northport expansion traffic.

9.11.5 Road Network Peak hours

Site generated traffic is expected to occur outside of the road network peaks, however a proportion of site generated traffic may occur during road network peak hours.

Our assessment of the Port Marsden Highway/Marsden Bay Drive intersection conservatively assessed all staff arrivals and departures using traffic volumes for the weekday AM and PM peak hours. Any site trips occurring during the weekday AM and PM peak hours will be less than those assessed in the previous sections and therefore will have less of an effect than the staff arrival and departure assessment in the previous sections.

9.11.6 Arrivals and departures

Even if 100% of site generated traffic was modelled to enter and exit the Site via Port Marsden Highway, the Port Marsden Highway/Marsden Bay Drive intersection, rather than the 90% assessed, the Port Marsden Highway/Marsden Bay Drive intersection and the site access will still have ample capacity to accommodate the additional traffic flows.

9.12 Summary of Operational Traffic Effects

On this basis, we are of the view that:

- ♦ the traffic predicted to be generated by operational activities at the proposed Northland Shipyard and Dry Dock facility is expected to have negligible impacts on the surrounding road network, specifically on the operation of Marsden Bay Drive, the Port Marsden Highway/Marsden Bay Drive, SH1/Port Marsden Highway and Port Marsden Highway/One Tree Point Road intersections
- ♦ the traffic generated by operational activities at the proposed Northland Shipyard and Dry Dock facility will occur outside of the road network peak hours

- ♦ the cumulative traffic effects taking into account Northland Shipyard and Dry Dock and Northport expansion traffic undertaken above will not result in an exceedance of the triggers set by Northport's consents (granted in 2025) for the eastern expansion
- ♦ No upgrades to the adjacent intersections along Port Marsden Highway are required to mitigate any transport effects of operational activities at the proposed Northland Shipyard and Dry Dock facility.

10 ASSESSMENT OF CONSTRUCTION TRANSPORT EFFECTS

The effects of construction traffic on the environment will need to be managed to ensure that, from a transport perspective, the surrounding road network operates safely for all modes of travel. A detailed Construction Traffic Management Plan (CTMP) will be prepared closer to the commencement of the construction. We note that the CTMP will rely on the existing vehicle access to the port or a temporary vehicle access from Marsden Bay Drive for trucks to access the proposed Northland Shipyard and Dry Dock facility during the construction stage. Construction may also be undertaken using marine methodology, with materials, equipment, and components transported or installed via marine access from the existing port where appropriate.

A typical CTMP would include such matters as:

- ♦ A description of the construction site and a programme and scope of the works
- ♦ Routes to be used by construction traffic to access and egress the site, and the adoption of any measures on these routes to ensure a safe environment for all road users, including existing residents and pedestrians, to ensure that the surrounding road network will continue to operate in an efficient manner
- ♦ The amount of construction traffic expected during each phase of construction
- ♦ Access for construction vehicles onto the road network from the site and measures to be adopted at these access points to ensure a safe traffic environment for other road users, especially pedestrians
- ♦ Parking for contractor vehicles on the development site, thereby ensuring that the on-street parking effects as a result of the construction activity are minimised.

We recommend there is a consent condition requiring the preparation and implementation of a CTMP which addresses the above matters.

Overall, it is anticipated that the effects of construction traffic will be able to be safely managed through the preparation of a CTMP.

11 DISCUSSION OF RELEVANT PLANS AND POLICIES

TRA-REQ2 identifies local and regional transport plans and policies that should be considered for their relevance, including

- ♦ Whangārei District Plan
- ♦ Blue/Green Network Strategy for Whangārei City
- ♦ Walking and Cycling Strategy
- ♦ Whangārei City Transportation Network Strategy Programme Business Case.

We discuss these in further detail below, and in summary we consider that the Site is consistent with the transport related objectives and policies of these documents.

11.1 Whangārei District Plan

Commentary on objectives and policies of the Transport Chapter are provided in Table 12.

Table 12: TRA Chapter Objectives and Policies

Objective / Policy	Commentary
TRA-O1 Transport Network Provide and maintain a safe, efficient, accessible and sustainable transport network while avoiding, remedying or mitigating adverse effects on the environment, adjoining land uses and the surrounding amenity and character	This ITA demonstrates that the Proposal does not adversely affect the safe and efficient operation of the transport network, and that all new roads provide for safe and efficient access for all transport users.
TRA-O2 – Integrate Transport and Land Use Planning Integrate land use and transport planning to ensure that land use activities, development and subdivision maintain the safety and efficiency of the transport network	
TRA-O3 – Active and Public Transport Encourage and facilitate active transport and public transportation	There are currently no public transport services in the area, however the Site does not preclude future public transport services. There are currently no active transport facilities on Marsden Bay Drive near the Site, however the

	proposed private access incorporates active transport facilities.
TRA-04 – Safety and Efficiency Provide suitable and sufficient vehicle crossings, access, parking, loading and manoeuvring areas that minimise adverse effects on the safe, effective and efficient functioning of the transport network.	The Site will have access, parking and circulation and consider that can comply with District Plan rules.
TRA-05 – Urban Design Design and locate transport infrastructure in a manner that is consistent with the amenity and urban design outcomes anticipated for the zone.	The proposed private road is considered appropriate for the adjoining land uses.
TRA-06 – Future Growth Ensure that future growth can be supported by appropriate transport infrastructure.	We have assessed the Proposal against forecast 2040 traffic volumes and have demonstrated that the surrounding transport network can accommodate traffic generated by the Site.
TRA-P1 – Design, Construction and Maintenance To design, construct and maintain roads, cycleways, walkways, public transport infrastructure, car parks and pedestrian access in a manner that: 1. Provides a safe and efficient transport network. 2. Enables the efficient provision of network utility infrastructure while providing for suitable streetscape amenity including lighting and landscaping. 3. Has regard to the future capacity and growth of the transport network. 4. Is multi-modal and provides for the needs of all users, as appropriate for the surrounding environment and the function of the road within the transport network hierarchy. 5. Avoids no exit roads where through roads and connected networks can be designed, particularly in commercial and industrial areas. 6. Provides pedestrian and cyclist access to connect roads and public spaces where they would offer a shorter route. 7. Ensures access to multiple allotments is constructed to an acceptable standard and vested as a public road where appropriate. 8. Appropriately manages stormwater to ensure the risk of flooding is not increased and water quality is maintained.	The proposed private internal road provides a balanced provision for all road users to ensure safe and efficient operation of the transport network.

TRA-P2 – Roads Allow new public roads or major roading upgrades to public roads where the location and design of the road: 1. Provides for the needs of all users, as appropriate for the surrounding environment and the function of the road within the transport network hierarchy. 2. Minimises adverse effects on surrounding sensitive activities, including severance effects and streetscape amenity. 3. Maintains or enhances the safety and efficiency of the transport network. 4. Does not compromise, and where possible provides, connections to surrounding areas, particularly for buses, pedestrians, and cyclists. 5. Provides sufficient area for landscaping and tree planting in appropriate areas while balancing the need to maintain safety and provide underground services and footpaths. 6. Contributes to positive urban design outcomes within the Urban Area	
TRA-P3 – Transport Network Capacity To manage the scale and design of subdivision and development by: 1. Ensuring that there is sufficient capacity within the transport network to cater for the proposal. 2. Requiring subdividers and developers to meet the costs of any upgrades and/or extensions to the transport network which are directly attributed to measurable impacts of the subdivision or development.	Our traffic modelling assessment demonstrates that the future demand can be accommodated by the surrounding transport network.
TRA-P4 – Integrated Transport Assessments To avoid remedy or mitigate adverse effects on the adjacent and wider transport network by requiring Integrated Transport Assessments for large scale developments and subdivisions.	This ITA has been prepared in accordance with TRA-R16 and TRA-REQ2.
TRA-P5 – Active Transport To promote active transport by facilitating cycle and pedestrian connectivity within new subdivisions and developments and, where appropriate, to existing developments, reserves and other public spaces	The proposed private internal road does preclude any future active mode connections to Marsden Bay Drive.
TRA-P6 – Dust Nuisances To avoid dust nuisances in the Urban Area and improve amenity and accessibility by implementing formation standards for access and parking whilst managing stormwater.	Not applicable.
TRA-P7 – Access and Intersections To ensure that access and intersections are designed and located so that:	

1. Good visibility is provided. 2. Vehicle manoeuvres and public and active transport modes are appropriately accommodated. 3. They are sufficiently separated so as not to adversely affect the free flow of traffic.	This ITA demonstrates that the proposed intersection on Marsden Bay Drive provides good visibility, accommodate the expected vehicle tracking, and are separated from other intersections. Vehicle crossings, car and bicycle parking, access, and manoeuvring areas will be designed in accordance with District Plan requirements.
TRA-P8 – Vehicle Crossings and Access To require vehicle crossings and associated access to be designed and located to ensure safe and efficient movement to and from sites for vehicles, pedestrians and cyclists by managing: 1. Separation distances between vehicle crossings. 2. Separation distances from intersections, railway crossings and pedestrian crossing facilities. 3. Vehicle crossing sight distances. 4. The number of vehicle crossings per site. 5. The design, formation and construction standards of crossings and access	
TRA-P9 – Parking and Loading To require parking and loading areas and access to be designed and located to ensure safe movement on-site and safe ingress and egress of vehicles, pedestrians and cyclists by managing: 1. Parking and loading space dimensions and gradient. 2. The location and identification of car parking and loading spaces. 3. Manoeuvring space within the site. 4. The formation and construction standards of parking areas. 5. The design and layout of parking areas.	
TRA-P10 – Bicycle Parking To provide safe and secure bicycle parking spaces and end-of-trip facilities for activities with high numbers of employees, students or residents.	
TRA-P11 – Charging Stations To reduce emissions and enhance the sustainability of Whangārei’s transport network by providing electric vehicle charging station parking spaces where high numbers of on-site car parking spaces are provided.	
TRA-P12 – Landscaping	Can be achieved as part of a Consent Condition.

To require landscape planting where uncovered on-site car parking is provided to improve visual amenity, navigability and stormwater management.	
TRA-P13 – Indicative Roads and Strategic Road Protection Areas To identify indicative roads and strategic road protection areas based on long term growth projections, and to require development and subdivision to have regard to effects on any indicative road or strategic road protection area.	Not applicable.
TRA-P14 – Transport Network Hierarchy To identify and apply a transport network hierarchy to ensure that the functions of transport network assets are recognised and protected in the management of land use and subdivision.	Not applicable.
TRA-P15 – Rail Infrastructure To support the safe, effective and efficient operation of the transport network by; 1. Discouraging new vehicle and new pedestrian rail level crossings. 2. Providing sufficient building setbacks from identified strategic railway line protection areas to ensure that buildings can be safely accessed and maintained.	Not applicable.

11.2 Blue/Green Network Strategy for Whangārei City

The Site is not within the scope of the Blue/Green Network Strategy document.

11.3 Walking and Cycling Strategy

The Site is not within the scope of the Walking and Cycling Strategy document.

11.4 Whangārei City Transportation Network Strategy Programme Business Case

The Site is not within the scope of the Whangārei City Transportation Network Strategy Programme Business Case.

12 CONCLUSIONS

We have assessed the Proposal to construct and operate a Northland Shipyard and Dry Dock facility. We have assessed the Proposal in the context of the relevant standards and policies of the District Plan, and note the following:

- ◆ the traffic predicted to be generated by operational activities at the proposed Northland Shipyard and Dry Dock facility is expected to have negligible impacts on the surrounding road network, specifically on the operation of Marsden Bay Drive, the Port Marsden Highway/Marsden Bay Drive, SH1/Port Marsden Highway and Port Marsden Highway/One Tree Point Road intersections
- ◆ the traffic generated by operational activities at the proposed Northland Shipyard and Dry Dock facility will occur outside of the road network peak hours
- ◆ the cumulative traffic effects taking into account Northland Shipyard and Dry Dock and Northport expansion traffic undertaken above will not result in an exceedance of the triggers set by Northport's consents (granted in 2025) for the eastern expansion
- ◆ No upgrades to the adjacent intersections along Port Marsden Highway are required to mitigate any transport effects of operational activities at the proposed Northland Shipyard and Dry Dock facility
- ◆ The Northland Shipyard and Dry Dock facility will include a new intersection at Marsden Bay Drive and a 10 m wide access road. The proposed location of the new intersection and the access road is considered to be acceptable and will be functional to support the traffic movements into and out of the proposed Northland Shipyard and Dry Dock facility
- ◆ There is no minimum or maximum on-site parking requirement under the District Plan. The Site has sufficient space for the anticipated parking demand of approximately 450 car parking spaces
- ◆ The proposed parking layout will comply with the requirements of the District Plan
- ◆ The Northland Shipyard and Dry Dock will include a safe walking connection from the indicative car parking area to the proposed main facility
- ◆ The proposed quantum and bicycle parking layout will comply with the requirement of the District Plan
- ◆ The proposed loading and waste collection arrangements will comply with the requirements of the District Plan.

Overall, the Site will achieve a safe and efficient transport outcome. Accordingly, there are no transportation planning or traffic engineering reasons that would preclude the development from proceeding subject to the preparation of:

- ◆ A Construction Traffic Management Plan (CTMP),
- ◆ An Operational Traffic Management Plan, and
- ◆ Engineering Plans of the access and parking layouts demonstrating they comply with all relevant engineering standards.

APPENDIX A District Plan Transport chapter assessment

Table 13: TRA Chapter assessment

TRANSPORT (TRA)			Assessment
TRA-R1 Any Activity Not Otherwise Listed in This Chapter			
All Zones and Port Nikau Development Area	Activity Status: Permitted Where: 1. Resource consent is not required under any rule of the District Plan. 2. The activity is not prohibited under any rule of the District Plan.		The Site is a permitted activity.
Parking			
TRA-R2 Required Spaces and Dimensions			
All Zones and Port Nikau Development Area	Activity Status: Permitted Where: 1. All off-street car parking spaces, loading spaces, bicycle parking spaces, end-of-trip facilities and associated manoeuvring areas are provided and constructed in accordance with TRA Appendix 1. Note: 1. <i>Lighting requirements for parking and loading spaces are contained within the LIGHT Chapter.</i>	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: 1. Location, size and design of parking and loading areas. 2. The number of parking and loading spaces. 3. Scale, management and operation of the activity as it relates to its demand for parking. 4. The safety and efficiency of the transport network for vehicles, pedestrians and cyclists	Can comply All off-street car parking spaces, loading spaces, bicycle parking spaces and associated manoeuvring areas will be designed in accordance with TRA Appendix 1.
TRA-R3 Location and Identification			
All Zones and Port Nikau Development Area	Activity Status: Permitted Where: 1. All car parking spaces and loading spaces are: a. Not located on any footpath, access, manoeuvring or outdoor living court area. b. Not located within any strategic road protection area. c. Permanently marked or delineated, except where they are: i. Associated with a residential unit which is not part of a multi-unit development. ii. Associated with the loading area for the fuel delivery vehicle or car parking spaces at a pump of a service station. iii. Located in the Rural Production Zone, Natural Open Space Zone or Open Space Zone.	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: 1. Location, size and design of parking and loading areas 2. The safety and efficiency of the transport network for vehicles, pedestrians and cyclists.	Can comply All off-street car parking spaces, loading spaces, bicycle parking spaces and associated manoeuvring areas have been located and designed to not be on a footpath, any strategic road protection area and will be permanently marked or delineated.
TRA-R4 Gradient			
All Zones and Port Nikau Development Area	Activity Status: Permitted Where: 1. All car parking spaces, loading spaces and associated manoeuvring areas do not have a gradient steeper than: a. 1 in 16 for surfaces at 900 to the angle of the parking. b. 1 in 20 for surfaces parallel to the angle of the parking.	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: 1. Location and design of parking, loading and manoeuvring areas. 2. The safety and efficiency of the transport network for vehicles, pedestrians and cyclists.	Can comply All car parking spaces will be designed to meet the relevant gradient requirements of the District Plan.

Vehicle Crossings and Access			
TRA-R5 Design and Location			
All Zones and Port Nikau Development Area	Activity Status: Permitted Where: - The vehicle crossing and access are provided and constructed in accordance with TRA Appendix 2. - A shared private access serves no more than 8 principle residential units. - The vehicle crossing is not fronting a state highway. - Any unused vehicle crossings are reinstated to match the existing footpath and kerbing. - The vehicle or pedestrian crossing is not over a railway corridor. <i>Note:</i> - A vehicle crossing permit may be required.	Activity Status when compliance not achieved with TRA-R5.1 – 4: Restricted Discretionary Matters of discretion: - Location, size and design of vehicle crossings and access. - The safety and efficiency of the transport network for vehicles, pedestrians and cyclists. - The extent to which the safety and efficiency of railway and road operations will be adversely affected. Activity Status when compliance not achieved with TRA-R5.5: Non-Complying	Can comply All vehicle crossings to the main car park off Marsden Bay Drive will be designed and construction in accordance with TRA Appendix 2.
TRA-R6 Setbacks			
All Zones and Port Nikau Development Area	Activity Status: Permitted Where: - The new vehicle crossing is located at least: 30m from a railway level crossing. 8m from a dedicated pedestrian crossing facility (including pedestrian crossing, midblock pedestrian signals, refuge islands and traffic signalled intersections). 2m from a separate vehicle crossing.	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: - Location, size and design of vehicle crossings and access. - The safety and efficiency of the transport network for vehicles, pedestrians and cyclists.	Can comply All vehicle crossing will be located at least 30 m from a railway level crossing, 8 m from a dedicated pedestrian crossing facilities and 2 m from any vehicle crossing.
Manoeuvring Space			
TRA-R7 Requirements for On-Site Manoeuvring Space			
All Zones and Port Nikau Development Area	Activity Status: Permitted Where: - All car parking, loading spaces and associated manoeuvring areas provide sufficient on-site manoeuvring space: - To ensure that no vehicle is required to reverse either onto or off the site, except for front sites where: - Access is gained from an Access or Low Volume Road; and - Less than 3 car parking spaces are provided on-site. - That enables vehicles occupying a car parking space or loading space to have ready access to the road at all times, without needing to move any other vehicles occupying other car parking spaces or loading spaces, except for: - Parking associated with an individual residential unit. - Staff parking areas associated with an individual activity; or	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: - Location, size and design of vehicle crossings, manoeuvring and access. - Location, size and design of parking and loading spaces. - The safety and efficiency of the transport network for vehicles, pedestrians and cyclists.	Can comply All car parking and loading spaces will be designed to meet the requirement of TRA-R7.

	iii. Parking for vehicles being serviced at a Repair and Maintenance Service or Rural Centre Service Activity. c. To ensure that vehicles using or waiting to use fuel dispensers, ticket vending machines, remote ordering facilities and devices, entrance control mechanisms, or other drive-through facilities do not queue into the adjoining road or obstruct entry to or exit from the site. d. For every car parking space, to accommodate the 90th percentile car tracking curves in Figure TRA 1 so that only one reverse manoeuvre is required to manoeuvre in or out of any car parking space. e. For every loading space, to comply with the tracking curves set out in the NZTA guidelines: RTS 18: NZ on-road tracking curves for heavy vehicles (2007) so that only one reverse manoeuvre is required to manoeuvre in or out of any loading space. Note: 1. <i>Acceptable means of compliance with access, parking and manoeuvring design can be found in the Whangārei District Council Engineering Standards</i>		
Sealing and Formation Standards			
TRA-R8 Crossings, Access and Parking Areas			
All Zones and Port Nikau Development Area	Activity Status: Permitted Where: 1. Vehicle crossings accessing a sealed road are sealed to a standard not less than that of the adjoining road surface. 2. On-site access and parking areas (including loading and manoeuvring areas) are formed, drained and sealed with a permanent all-weather surface in the following instances: a. Urban Zone sites. b. Rural (Urban Expansion) Zone sites with an area less than 2,000m2 . c. Rural Village Zone sites. d. Strategic Rural Industries Zone sites. e. Any accessway serving more than 5 principal residential units. f. Where the gradient exceeds 12.5%.	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: 1. Location, size and design of vehicle crossings, manoeuvring and access. 2. Location, size and design of parking and loading spaces. 3. The safety and efficiency of the transport network for vehicles, pedestrians and cyclists. 4. Dust nuisance. 5. Adverse effects on amenity. 6. Stormwater management.	Can comply All vehicle crossing and parking areas will be designed to meet the requirements of TRA-R8.
Strategic Road Protection Areas and Indicative Roads			
TRA-R9 Setbacks			
All Zones and Port Nikau Development Area	Activity Status: Permitted Where: 1. All buildings and major structures (excluding minor buildings) are set back at least 0.5m from a strategic road protection area as detailed in TRA Appendix 4. 2. Sensitive activities at ground floor are set back at least 2m from a strategic road protection area as detailed in TRA Appendix 4. 3. No buildings or major structures (excluding minor buildings) are located within 10m of an indicative road as shown on the Planning Maps.	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: 1. Location, size and design of buildings and activities. 2. The safety and efficiency of the transport network. 3. Effects on the future growth or expansion of the transport network. 4. Alternative routes to achieve the indicative road outcome.	Can comply All buildings and major structures will be designed to meet minimum offset requirements as set out in TRA-R9.

Activity Status when compliance not achieved: Restricted Discretionary

Matters of discretion:

1. Location, size and design of vehicle crossings, manoeuvring and access.

2. Location, size and design of parking and loading spaces.

3. The safety and efficiency of the transport network for vehicles, pedestrians and cyclists.

4. Dust nuisance.

5. Adverse effects on amenity.

6. Stormwater management.

Can comply

All vehicle crossing and parking areas will be designed to meet the requirements of TRA-R8.

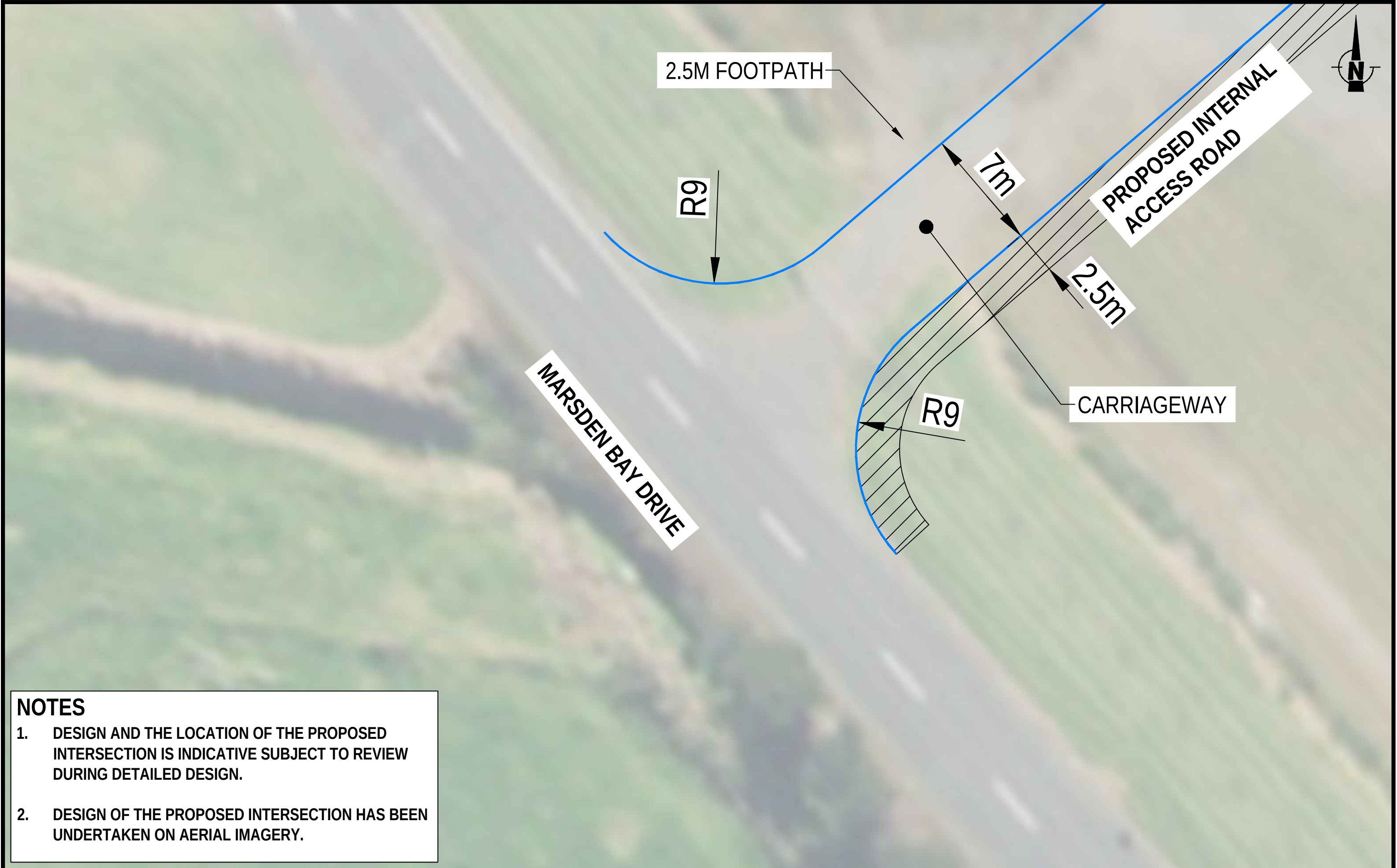
TRA-R10 New Buildings, Excluding Minor Buildings			
Residential Zones	Activity Status: Permitted Where: 1. All new buildings, excluding minor buildings, are set back at least 2m from the strategic railway line protection areas as shown on the Planning Maps.	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: 1. The location, size and design of the building as it relates to the ability to safely use, access and maintain buildings without requiring access on, above or over the rail corridor.	Can comply All buildings will be designed to meet the minimum offsets requirement as set out in TRA-R10.
All Zones Except Residential Zones	2. All new buildings, excluding minor buildings, are set back at least 2.5m from the strategic railway line protection areas as shown on the Planning Maps	Notification: Any restricted discretionary activity under TRA-9A shall not be notified or limited notified unless KiwiRail is determined to be an affected person in accordance with section 95B of the Resource Management Act 1991 or Council decides that special circumstances exist under section 94A (4) of the Resource Management Act 1991.	
Landscaping			
TRA-R11 Landscaping Within Parking Areas			
All Zones and Port Nikau Development Area except for the Heavy Industrial, Rural Production and Strategic Rural Industries Zones	Activity Status: Permitted Where: 1. All uncovered ground level car parking areas: a. Of 20 – 200 adjacent car parking spaces provide landscaping within or adjacent to the parking area to a minimum of 5% of the total parking area. b. Of more than 200 adjacent car parking spaces provide landscaping within or adjacent to the parking area to a minimum of 7.5% of the total parking area. Compliance Standard: 1. For the purpose of calculating total parking area, only the areas used for parking spaces and access aisles along parking spaces shall be included. Not included in the parking area calculation are service roads, pedestrian footpaths, loading/unloading areas, and perimeter landscape areas. Note: 1. Further guidance on best practice landscaping in car parks is contained in Whangārei’s Urban Design Guidelines.	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: 1. Location, size and design of parking and loading areas. 2. Safety and efficiency for vehicles, pedestrians and cyclists. 3. Amenity and character. 4. Stormwater management. 5. Navigability for pedestrians. 6. The number of parking spaces.	Can comply All car parking areas could be designed to meet the minimum landscaping requirements as set out in TRA-R11.
TRA-R12 Tree Planting Within Parking Areas			
All Zones and Port Nikau Development Area except for the Heavy Industrial, Rural Production and Strategic Rural Industries Zones	Activity Status: Permitted Where: 1. All uncovered ground level parking areas where at least 20 car parking spaces are provided, provide at least 1 tree for every 20 car parking spaces and each tree: a. Is planted within or adjacent to the parking area. b. Has a minimum height of 4m above ground level at maturity.	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: 1. Location, size and design of parking and loading areas. 2. Safety and efficiency for vehicles, pedestrians and cyclists. 3. Amenity and character. 4. Stormwater management.	Can comply All car parking areas could be designed to meet the minimum tree planting requirements as set out in TRA-R12.

	c. Has a minimum canopy shade coverage of 30m2 at maturity. Compliance Standard: 1. For the purpose of calculating total parking area, only the areas used for parking spaces and access aisles along parking spaces shall be included. Not included in the parking area calculation are service roads, pedestrian footpaths, loading/unloading areas, and perimeter landscape areas. Note: 1. Further guidance on best practice landscaping in car parks is contained in Whangārei’s Urban Design Guidelines.	5. Navigability for pedestrians. 6. The number of parking spaces.	
Electric Vehicle Charging Station Parking Spaces			
TRA-R13 Number Requirements			
All Zones and Port Nikau Development Area	Activity Status: Permitted Where: 1. All parking areas, except those associated with a residential activity, where 50 or more car parking spaces are provided sets aside space for at least 1 parking space for an electric vehicle charging station per every 50 car parking spaces provided. Note: 1. This rule does not require installation of electric vehicle charging infrastructure, rather, it requires the provision of sufficient space to accommodate electric vehicle charging infrastructure.	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion: 1. Location, size and design of parking and loading areas. 2. The number of parking spaces that can accommodate electric vehicle charging stations.	Can comply All car parking areas could be designed to meet the minimum electric vehicle charging station requirements as set out in TRA-R13.
Subdivision			
TRA-R14 Subdivision			
	Activity Status: Controlled Where:	Activity Status when compliance not achieved: Restricted Discretionary Matters of discretion:	Complies 1. The Site does not include an indicative road or strategic road protection area 2. The Site does not include any subdivision of sites 3. The Site does not include any subdivision of sites 4. The Site does not include ant shared accesses.
All Zones and Port Nikau Development Area	1. The site does not contain an indicative road or a strategic road protection area.	1. The matters of control listed in TRA-R14. 2. Location, size and design of vehicle crossings and access. 3. The safety and efficiency of the transport network for vehicles, pedestrians and cyclists. 4. Effects on the future growth or expansion of the transport network. 5. The extent to which the subdivision impacts on the future ability to form a road or access within an indicative road or strategic road protection area, and any mitigation to not preclude that future formation. 6. The adequacy of the access for the anticipated use. 7. The ability of the access to contain required services.	
All Zones and Port Nikau Development Area	2. Subdivision results in all sites having access and crossings which comply with TRA-R5 & R6.		
Rural (Urban Expansion) Zone	3. Subdivision results in: a. A shared access which serves no more than 3 allotments or 3 principal residential units. b. No more than 1 right of way being created.		
All Zones and Port Nikau Development Area except for the Rural (Urban Expansion) Zone	4. Subdivision results in a shared access which serves no more than 8 allotments or 8 principal residential units.		
	Matters of control:		

	1. Effects on the road network in the vicinity due to increased traffic from the subdivision. 2. The need for footpaths, kerb and channel on roads in the vicinity, including for stormwater management. 3. The adequacy of the access for the anticipated use. 4. The ability of the access to contain required services. 5. Traffic safety and visibility. 6. Type, frequency and timing of traffic. 7. Access design, and number and location of vehicle crossings. 8. Design and construction of any bridges or culverts. 9. The construction and maintenance of new vehicle crossings or alterations to existing vehicle crossings where proposed as part of the subdivision. 10. Where relevant, the provision, location, design, capacity, connection, upgrading, staging and integration of transport infrastructure. 11. Pedestrian and cycle connections to public roads from existing reserves and/or pedestrian accessways, especially where the connection will provide a significantly shorter distance. 12. Design of pedestrian and cycle connections to ensure ease of use, accessibility and safety. 13. In the Rural (Urban Expansion) Zone, the protection of land within the proposed allotments to allow access and linkages to adjacent allotments for future transport infrastructure. Notes: 1. Refer to Rules TRA-R15 – R16 for any Integrated Transport Assessment Requirements as part of a subdivision. 2. Acceptable means of compliance can be found in the Whangārei District Council Engineering Standards.		
Integrated Transport Assessments			
TRA-R16 Any Activity			
All Zones and Port Nikau Development Area except the Hospital Zone, and the Strategic Rural Industries Zone	Activity Status: Restricted Discretionary Where, with respect to Table TRA 16: 1. A new activity specified in Column A exceeds the Threshold Limit in Column B; or 2. A change to an existing activity specified in Column A exceeds the Threshold Limit in Column C; or 3. Any subdivision proposes more than 50 vacant allotments; or 4. Subdivision is proposed of an allotment that existed at 15 April 2021 and the area of the parent allotment is equal to or larger than: 1.5ha within the Medium Density Residential Zone. 2ha within the General Residential Zone or Rural Village Residential Zone. 8ha within the Low Density Residential Zone. Matters of discretion:		TRA-R16 does not technically apply as the Site is currently zoned as Coastal Marine Area. We do note that the Site has a GFA that exceeds 5,000 m ² and we have assessed the relevant matters in Section 11 of this ITA.

	1. Effects on the sustainability, safety, efficiency, effectiveness and accessibility of the affected transport network, including cumulative effects from incremental changes to the activity on the site or sites. 2. Required improvements, alterations or extensions to the affected transport network to mitigate adverse effects (including at level crossings). 3. The need for pedestrian and cyclist connections to nearby destinations. 4. Adverse effects on streetscape and amenity. 5. The location, design, scale and intensity of the proposed activity in relation to its effects on the affected transport network. 6. Demonstrated characteristics of the activity or proposal which result in low traffic generation relative to size or scale of the activity. 7. Recommendations and proposed mitigation measures of the Integrated Transport Assessment and any further information provided through the consent process. Compliance Standard: 1. TRA-R16.1 does not apply for any activity where consent has previously been granted for the activity under TRA-R16.1. 2. In TRA-R16.2 “change” means a change of activity or a change in intensity, or scale of the activity. 3. The thresholds for a change under TRA-R16.2 shall be measured based on: a. The size or scale of the activity as constructed or consented at 15 April 2021 where the activity does not have consent under TRA-R15 or TRA-R16; or b. The resource consent where one has previously been granted under TRAR15 or TRA-R16. Notes: 1. Applications shall comply with information requirement TRA-REQ2. Table TRA 16 is located in TRA Appendix 5.	
TRA-R17 Construction of Any New Public Road or Service Lane		
All Zones and Port Nikau Development Area	Activity Status: Restricted Discretionary Matters of discretion: 1. The provision, design and construction of the road or service lane. 2. Effects on the sustainability, safety, efficiency, effectiveness and accessibility of the transport network. 3. Streetscape, urban design and amenity effects of the transport infrastructure. 4. Provision and encouragement of active and public modes of transport. 5. Integration with surrounding land uses and transport infrastructure. 6. Recommendations and proposed mitigation measures of the Integrated Transport Assessment and any further information provided through the consent process. Notes: 1. Any application shall comply with information requirement TRA-REQ3. 2. Acceptable means of compliance for the provision, design and construction of infrastructure is contained within the Whangārei District Council Engineering Standards.	TRA-R17 does not apply.

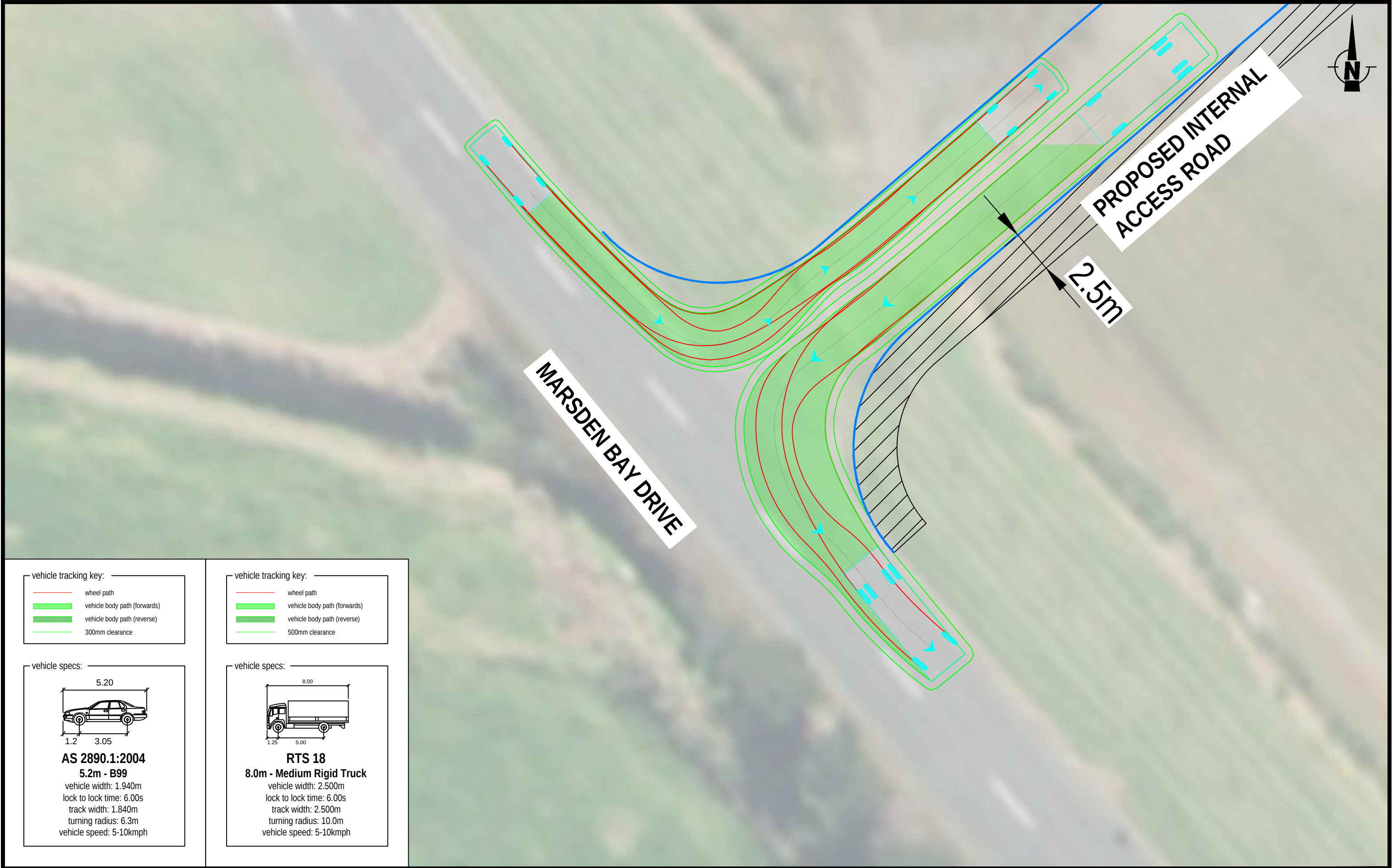
APPENDIX B Vehicle tracking and sight distance plan



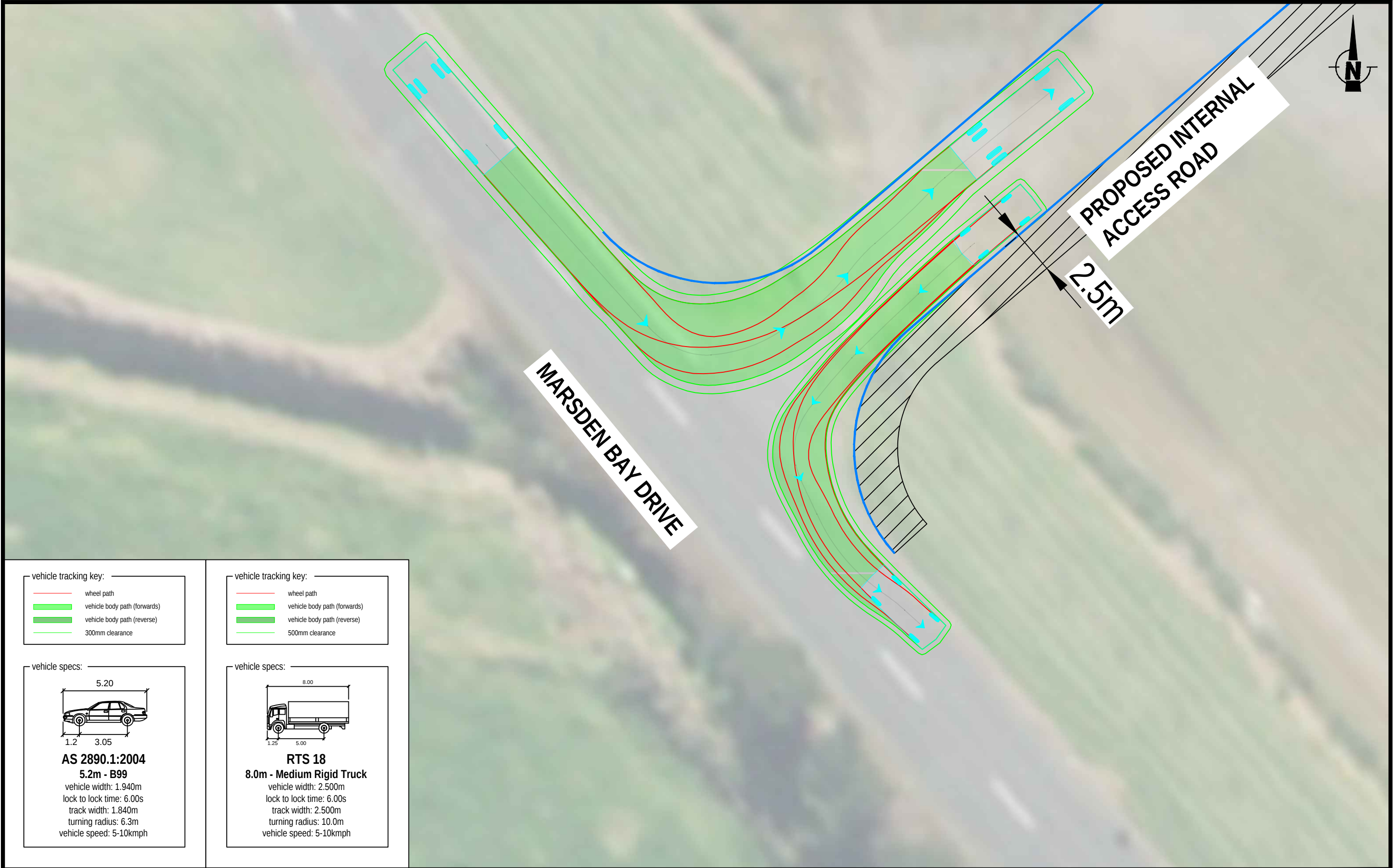
NOTES

1. DESIGN AND THE LOCATION OF THE PROPOSED INTERSECTION IS INDICATIVE SUBJECT TO REVIEW DURING DETAILED DESIGN.
2. DESIGN OF THE PROPOSED INTERSECTION HAS BEEN UNDERTAKEN ON AERIAL IMAGERY.

REV	AMENDMENT	DATE OF ISSUE	DESIGN: KG	DRAWN: KG	CLIENT: MBIE	SHEET TITLE: PROPOSED INTERSECTION CONCEPT DESIGN	SHEET: 01 of 04	flow TRANSPORTATION SPECIALISTS Level 1, 11 Blake Street, Ponsonby, Auckland PO Box 47497 Ponsonby p 09 970 3820 f 09 970 3890 www.flownz.com
A	First Issue	21/05/2026	CHECKED: CR	DATE: 21/05/2026	PROJECT: SHIPYARD AND DRYDOCK FACILITY			
			SCALE: 0 8m		LOCATION: 21 RALPH TRIMMER DRIVE, MARSDEN POINT			
			1:200 @ A3		CONCEPT DESIGN	DRAWING NUMBER: MBIE001-NDD-DW0	REV: A	



REV	AMENDMENT	DATE OF ISSUE	DESIGN: KG	DRAWN: KG	CLIENT: MBIE	SHEET TITLE: PROPOSED INTERSECTION VEHICLE TRACKING 1	SHEET: 02 of 04	flow TRANSPORTATION SPECIALISTS Level 1, 11 Blake Street, Ponsonby, Auckland PO Box 47497 Ponsonby p 09 970 3820 f 09 970 3890 www.flownz.com
A	First Issue	21/05/2026	CHECKED: CR	DATE: 21/05/2026	PROJECT: SHIPYARD AND DRYDOCK FACILITY			
			SCALE: 0 8m		LOCATION: 21 RALPH TRIMMER DRIVE, MARSDEN POINT			
			1:200 @ A3		CONCEPT DESIGN	DRAWING NUMBER: MBIE001-NDD-DW0	REV: A	



vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:

AS 2890.1:2004
5.2m - B99
vehicle width: 1.940m
lock to lock time: 6.00s
track width: 1.840m
turning radius: 6.3m
vehicle speed: 5-10kmph

vehicle tracking key:

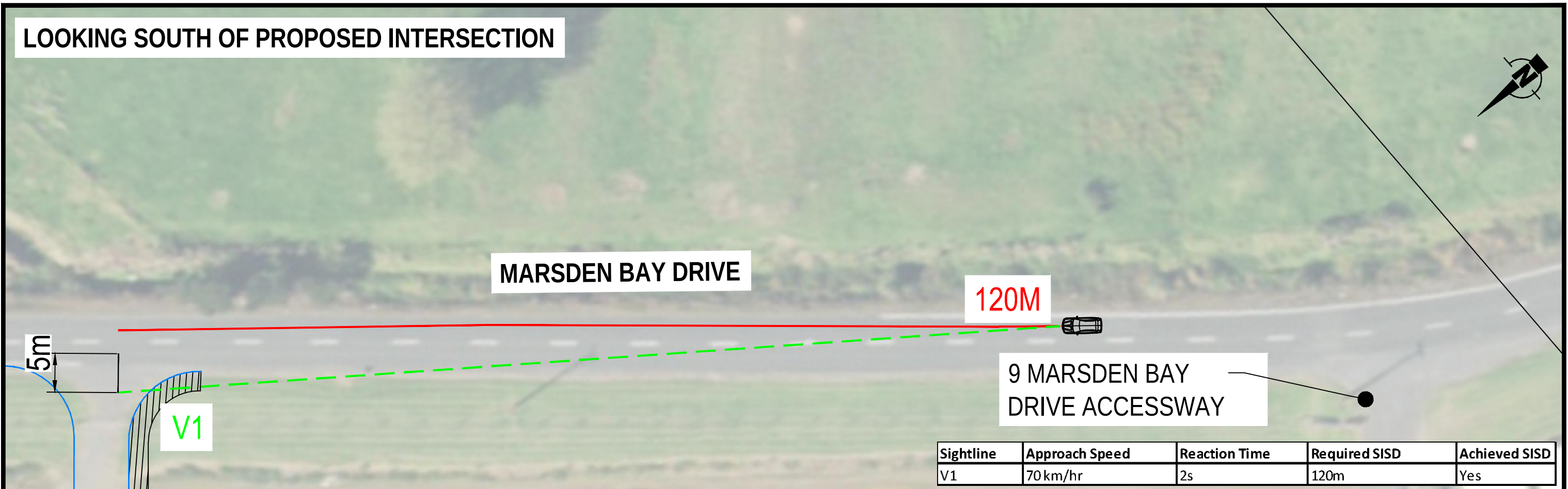
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:

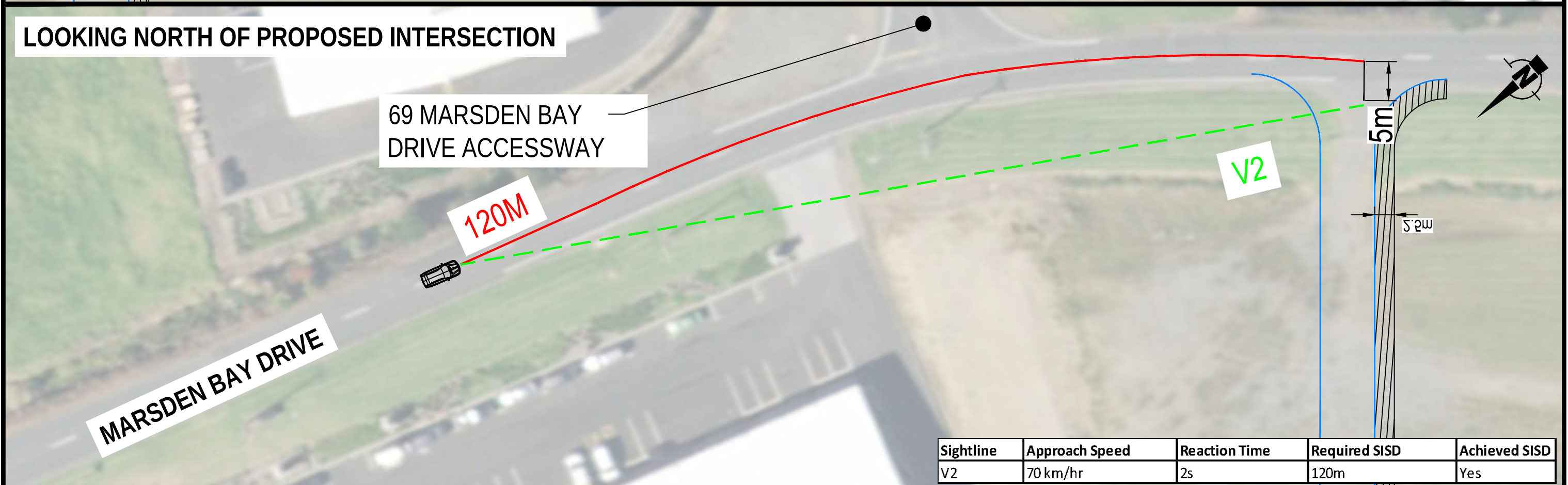
RTS 18
8.0m - Medium Rigid Truck
vehicle width: 2.500m
lock to lock time: 6.00s
track width: 2.500m
turning radius: 10.0m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE	DESIGN: KG	DRAWN: KG	CLIENT: MBIE	SHEET TITLE: PROPOSED INTERSECTION VEHICLE TRACKING 2	SHEET: 03 of 04	flow TRANSPORTATION SPECIALISTS Level 1, 11 Blake Street, Ponsonby, Auckland PO Box 47497 Ponsonby p 09 970 3820 f 09 970 3890 www.flownz.com
A	First Issue	21/05/2026	CHECKED: CR	DATE: 21/05/2026	PROJECT: SHIPYARD AND DRYDOCK FACILITY			
			SCALE: 0 8m		LOCATION: 21 RALPH TRIMMER DRIVE, MARSDEN POINT			
			1:200 @ A3		CONCEPT DESIGN	DRAWING NUMBER: MBIE001-NDD-DW0	REV: A	

LOOKING SOUTH OF PROPOSED INTERSECTION



LOOKING NORTH OF PROPOSED INTERSECTION



APPENDIX C

SIDRA Outputs

Figure C 1: Weekday Morning Shift Peak Hour (2030 Base) – Port Marsden Highway/Marsden Bay Drive Intersection Movement Summary**MOVEMENT SUMMARY**

 Site: [1 (5)] PMH/Mardens Bay Drive - 2030 Weekday AM Peak (2030 - Base)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh. Dist]		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Port Marsden Highway (South)															
1	L2	All MCs	52	5.0	52	5.0	0.104	5.6	LOS A	0.0	0.0	0.00	0.17	0.00	55.7
2	T1	All MCs	134	16.0	134	16.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	58.3
Approach			185	12.9	185	12.9	0.104	1.6	NA	0.0	0.0	0.00	0.17	0.00	57.6
North: Port Marsden Highway (North)															
8	T1	All MCs	115	16.0	115	16.0	0.079	0.2	LOS A	0.1	1.1	0.11	0.14	0.11	58.6
9	R2	All MCs	21	5.0	21	5.0	0.079	6.2	LOS A	0.1	1.1	0.11	0.14	0.11	55.7
Approach			136	14.3	136	14.3	0.079	1.1	NA	0.1	1.1	0.11	0.14	0.11	58.2
West: Marsden Bay Drive															
10	L2	All MCs	28	5.0	28	5.0	0.090	8.8	LOS A	0.3	2.3	0.33	0.89	0.33	50.6
12	R2	All MCs	55	5.0	55	5.0	0.090	9.4	LOS A	0.3	2.3	0.33	0.89	0.33	50.4
Approach			83	5.0	83	5.0	0.090	9.2	LOS A	0.3	2.3	0.33	0.89	0.33	50.4
All Vehicles			404	11.8	404	11.8	0.104	3.0	NA	0.3	2.3	0.10	0.31	0.10	56.1

Figure C 2: Weekday Afternoon Shift Changeover Peak Hour (2030 Base) – Port Marsden Highway/Marsden Bay Drive Intersection Movement Summary**MOVEMENT SUMMARY**

 Site: [1 (6)] PMH/Mardens Bay Drive - 2030 Weekday PM Peak (2030 - Base)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Port Marsden Highway (South)															
1	L2	All MCs	54	5.0	54	5.0	0.082	5.6	LOS A	0.0	0.0	0.00	0.22	0.00	55.3
2	T1	All MCs	93	16.0	93	16.0	0.082	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	57.9
Approach			146	12.0	146	12.0	0.082	2.1	NA	0.0	0.0	0.00	0.22	0.00	56.9
North: Port Marsden Highway (North)															
8	T1	All MCs	166	16.0	166	16.0	0.126	0.2	LOS A	0.3	2.6	0.14	0.18	0.14	58.1
9	R2	All MCs	49	5.0	49	5.0	0.126	6.1	LOS A	0.3	2.6	0.14	0.18	0.14	55.2
Approach			216	13.5	216	13.5	0.126	1.5	NA	0.3	2.6	0.14	0.18	0.14	57.4
West: Marsden Bay Drive															
10	L2	All MCs	28	5.0	28	5.0	0.101	8.6	LOS A	0.4	2.6	0.32	0.89	0.32	50.5
12	R2	All MCs	61	5.0	61	5.0	0.101	9.7	LOS A	0.4	2.6	0.32	0.89	0.32	50.2
Approach			89	5.0	89	5.0	0.101	9.4	LOS A	0.4	2.6	0.32	0.89	0.32	50.3
All Vehicles			452	11.3	452	11.3	0.126	3.3	NA	0.4	2.6	0.13	0.33	0.13	55.7

Figure C 3: Weekday Morning Shift Peak Hour (2030 Base + Site Generation Traffic) – Marsden Bay Drive/Proposed Access Road Intersection Movement Summary**MOVEMENT SUMMARY**

 Site: [2] Marsden Bay Drive/New Access Road - 2030 Weekday AM Peak (2030)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			Total	HV	Total	HV				Veh.	Dist				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Marsden Bay Drive (East)															
5	T1	All MCs	73	5.0	73	5.0	0.161	0.4	LOS A	0.8	6.0	0.23	0.44	0.23	55.6
6	R2	All MCs	194	5.0	194	5.0	0.161	5.9	LOS A	0.8	6.0	0.23	0.44	0.23	52.9
Approach			266	5.0	266	5.0	0.161	4.4	NA	0.8	6.0	0.23	0.44	0.23	53.6
North: Proposed Access Road															
7	L2	All MCs	21	5.0	21	5.0	0.017	5.8	LOS A	0.1	0.5	0.18	0.54	0.18	52.1
9	R2	All MCs	2	5.0	2	5.0	0.017	7.0	LOS A	0.1	0.5	0.18	0.54	0.18	51.9
Approach			23	5.0	23	5.0	0.017	5.9	LOS A	0.1	0.5	0.18	0.54	0.18	52.1
West: Marsden Bay Drive (West)															
10	L2	All MCs	21	5.0	21	5.0	0.056	5.6	LOS A	0.0	0.0	0.00	0.12	0.00	56.2
11	T1	All MCs	83	5.0	83	5.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	58.9
Approach			104	5.0	104	5.0	0.056	1.1	NA	0.0	0.0	0.00	0.12	0.00	58.3
All Vehicles			394	5.0	394	5.0	0.161	3.6	NA	0.8	6.0	0.17	0.36	0.17	54.7

Figure C 4: Weekday Morning Shift Peak Hour (2030 Base + Site Generation Traffic) – Port Marsden Highway/Marsden Bay Drive Intersection Movement Summary

MOVEMENT SUMMARY

 **Site: [1] PMH/Mardens Bay Drive - 2030 Weekday AM Peak (2030)**
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh. Dist]		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			veh/h	%	veh/h	%				v/c	sec				
South: Port Marsden Highway (South)															
1	L2	All MCs	245	5.0	245	5.0	0.212	5.7	LOS A	0.0	0.0	0.00	0.38	0.00	54.0
2	T1	All MCs	134	16.0	134	16.0	0.212	0.1	LOS A	0.0	0.0	0.00	0.38	0.00	56.4
Approach			379	8.9	379	8.9	0.212	3.7	NA	0.0	0.0	0.00	0.38	0.00	54.8
North: Port Marsden Highway (North)															
8	T1	All MCs	115	16.0	115	16.0	0.083	0.4	LOS A	0.2	1.4	0.17	0.20	0.17	58.4
9	R2	All MCs	21	5.0	21	5.0	0.083	7.1	LOS A	0.2	1.4	0.17	0.20	0.17	55.5
Approach			136	14.3	136	14.3	0.083	1.4	NA	0.2	1.4	0.17	0.20	0.17	57.9
West: Marsden Bay Drive															
10	L2	All MCs	28	5.0	28	5.0	0.128	8.9	LOS A	0.5	3.3	0.39	0.90	0.39	50.2
12	R2	All MCs	76	5.0	76	5.0	0.128	10.2	LOS B	0.5	3.3	0.39	0.90	0.39	50.0
Approach			104	5.0	104	5.0	0.128	9.8	LOS A	0.5	3.3	0.39	0.90	0.39	50.1
All Vehicles			619	9.4	619	9.4	0.212	4.2	NA	0.5	3.3	0.10	0.43	0.10	54.6

Figure C 5: Weekday Afternoon Shift Changeover Peak Hour (2030 Base + Site Generation Traffic) – Marsden Bay Drive/Proposed Access Road Intersection

MOVEMENT SUMMARY

 **Site: [2 (2)] Marsden Bay Drive/New Access Road - 2030 Weekday PM Peak (2030)**
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh. Dist]		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Marsden Bay Drive (East)															
5	T1	All MCs	104	5.0	104	5.0	0.194	0.4	LOS A	1.0	7.4	0.25	0.42	0.25	55.8
6	R2	All MCs	216	5.0	216	5.0	0.194	5.9	LOS A	1.0	7.4	0.25	0.42	0.25	53.1
Approach			320	5.0	320	5.0	0.194	4.1	NA	1.0	7.4	0.25	0.42	0.25	53.9
North: Proposed Access Road															
7	L2	All MCs	216	5.0	216	5.0	0.176	5.9	LOS A	0.8	5.6	0.22	0.55	0.22	52.0
9	R2	All MCs	24	5.0	24	5.0	0.176	7.8	LOS A	0.8	5.6	0.22	0.55	0.22	51.7
Approach			240	5.0	240	5.0	0.176	6.1	LOS A	0.8	5.6	0.22	0.55	0.22	52.0
West: Marsden Bay Drive (West)															
10	L2	All MCs	24	5.0	24	5.0	0.061	5.6	LOS A	0.0	0.0	0.00	0.13	0.00	56.2
11	T1	All MCs	89	5.0	89	5.0	0.061	0.0	LOS A	0.0	0.0	0.00	0.13	0.00	58.8
Approach			114	5.0	114	5.0	0.061	1.2	NA	0.0	0.0	0.00	0.13	0.00	58.2
All Vehicles			674	5.0	674	5.0	0.194	4.4	NA	1.0	7.4	0.20	0.42	0.20	53.9

Figure C 6: Weekday Afternoon Shift Changeover Peak Hour (2030 Base + Site Generation Traffic) – Port Marsden Highway/Marsden Bay Drive Intersection

MOVEMENT SUMMARY

 **Site: [1 (2)] PMH/Mardens Bay Drive - 2030 Weekday PM Peak (2030)**
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh. Dist]		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Port Marsden Highway (South)															
1	L2	All MCs	269	5.0	269	5.0	0.203	5.6	LOS A	0.0	0.0	0.00	0.43	0.00	53.6
2	T1	All MCs	93	16.0	93	16.0	0.203	0.1	LOS A	0.0	0.0	0.00	0.43	0.00	56.0
Approach			362	7.8	362	7.8	0.203	4.2	NA	0.0	0.0	0.00	0.43	0.00	54.2
North: Port Marsden Highway (North)															
8	T1	All MCs	166	16.0	166	16.0	0.135	0.6	LOS A	0.4	3.2	0.23	0.28	0.23	57.8
9	R2	All MCs	49	5.0	49	5.0	0.135	7.1	LOS A	0.4	3.2	0.23	0.28	0.23	54.9
Approach			216	13.5	216	13.5	0.135	2.1	NA	0.4	3.2	0.23	0.28	0.23	57.1
West: Marsden Bay Drive															
10	L2	All MCs	28	5.0	28	5.0	0.426	9.6	LOS A	2.4	17.3	0.55	0.97	0.72	48.9
12	R2	All MCs	276	5.0	276	5.0	0.426	12.3	LOS B	2.4	17.3	0.55	0.97	0.72	48.7
Approach			304	5.0	304	5.0	0.426	12.1	LOS B	2.4	17.3	0.55	0.97	0.72	48.7
All Vehicles			882	8.2	882	8.2	0.426	6.4	NA	2.4	17.3	0.25	0.58	0.30	52.8

Figure C 7: Weekday Morning Shift Peak Hour (2040 Forecast Year + Site Generation Traffic) – Marsden Bay Drive/Proposed Access Road Intersection Movement Summary**MOVEMENT SUMMARY**

Site: [2 (3)] Marsden Bay Drive/New Access Road - 2040 Weekday AM Peak (2040)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh. Dist]		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Marsden Bay Drive (East)															
5	T1	All MCs	91	5.0	91	5.0	0.192	1.0	LOS A	1.0	7.2	0.39	0.50	0.39	55.3
6	R2	All MCs	194	5.0	194	5.0	0.192	6.6	LOS A	1.0	7.2	0.39	0.50	0.39	52.6
Approach			284	5.0	284	5.0	0.192	4.8	NA	1.0	7.2	0.39	0.50	0.39	53.4
North: Proposed Access Road															
7	L2	All MCs	21	5.0	21	5.0	0.018	6.1	LOS A	0.1	0.5	0.26	0.55	0.26	51.9
9	R2	All MCs	2	5.0	2	5.0	0.018	7.8	LOS A	0.1	0.5	0.26	0.55	0.26	51.6
Approach			23	5.0	23	5.0	0.018	6.2	LOS A	0.1	0.5	0.26	0.55	0.26	51.9
West: Marsden Bay Drive (West)															
10	L2	All MCs	104	5.0	104	5.0	0.141	5.6	LOS A	0.0	0.0	0.00	0.24	0.00	55.3
11	T1	All MCs	157	5.0	157	5.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.24	0.00	57.8
Approach			261	5.0	261	5.0	0.141	2.3	NA	0.0	0.0	0.00	0.24	0.00	56.8
All Vehicles			568	5.0	568	5.0	0.192	3.7	NA	1.0	7.2	0.21	0.38	0.21	54.9

Figure C 8: Weekday Morning Shift Peak Hour (2040 Forecast Year + Site Generation Traffic) – Port Marsden Highway/Marsden Bay Drive Intersection Movement Summary**MOVEMENT SUMMARY**

Site: [1 (3)] PMH/Mardens Bay Drive - 2040 Weekday AM Peak (2040)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				
South: Port Marsden Highway (South)															
1	L2	All MCs	258	5.0	258	5.0	0.239	5.7	LOS A	0.0	0.0	0.00	0.36	0.00	54.2
2	T1	All MCs	168	16.0	168	16.0	0.239	0.1	LOS A	0.0	0.0	0.00	0.36	0.00	56.6
Approach			426	9.3	426	9.3	0.239	3.5	NA	0.0	0.0	0.00	0.36	0.00	55.1
North: Port Marsden Highway (North)															
8	T1	All MCs	144	16.0	144	16.0	0.105	0.5	LOS A	0.2	1.9	0.18	0.22	0.18	58.3
9	R2	All MCs	26	5.0	26	5.0	0.105	7.4	LOS A	0.2	1.9	0.18	0.22	0.18	55.4
Approach			171	14.3	171	14.3	0.105	1.5	NA	0.2	1.9	0.18	0.22	0.18	57.9
West: Marsden Bay Drive															
10	L2	All MCs	36	5.0	36	5.0	0.169	9.1	LOS A	0.6	4.4	0.45	0.91	0.45	49.9
12	R2	All MCs	91	5.0	91	5.0	0.169	11.0	LOS B	0.6	4.4	0.45	0.91	0.45	49.6
Approach			126	5.0	126	5.0	0.169	10.5	LOS B	0.6	4.4	0.45	0.91	0.45	49.7
All Vehicles			723	9.8	723	9.8	0.239	4.2	NA	0.6	4.4	0.12	0.42	0.12	54.7

Figure C 9: Weekday Afternoon Shift Changeover Peak Hour (2040 Forecast Year + Site Generation Traffic) – Marsden Bay Drive/Proposed Access Road Intersection**MOVEMENT SUMMARY**

Site: [1 (3)] PMH/Mardens Bay Drive - 2040 Weekday AM Peak (2040)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				
South: Port Marsden Highway (South)															
1	L2	All MCs	258	5.0	258	5.0	0.239	5.7	LOS A	0.0	0.0	0.00	0.36	0.00	54.2
2	T1	All MCs	168	16.0	168	16.0	0.239	0.1	LOS A	0.0	0.0	0.00	0.36	0.00	56.6
Approach			426	9.3	426	9.3	0.239	3.5	NA	0.0	0.0	0.00	0.36	0.00	55.1
North: Port Marsden Highway (North)															
8	T1	All MCs	144	16.0	144	16.0	0.105	0.5	LOS A	0.2	1.9	0.18	0.22	0.18	58.3
9	R2	All MCs	26	5.0	26	5.0	0.105	7.4	LOS A	0.2	1.9	0.18	0.22	0.18	55.4
Approach			171	14.3	171	14.3	0.105	1.5	NA	0.2	1.9	0.18	0.22	0.18	57.9
West: Marsden Bay Drive															
10	L2	All MCs	36	5.0	36	5.0	0.169	9.1	LOS A	0.6	4.4	0.45	0.91	0.45	49.9
12	R2	All MCs	91	5.0	91	5.0	0.169	11.0	LOS B	0.6	4.4	0.45	0.91	0.45	49.6
Approach			126	5.0	126	5.0	0.169	10.5	LOS B	0.6	4.4	0.45	0.91	0.45	49.7
All Vehicles			723	9.8	723	9.8	0.239	4.2	NA	0.6	4.4	0.12	0.42	0.12	54.7

Figure C 10: Weekday Afternoon Shift Changeover Peak Hour (2040 Forecast Year + Site Generation Traffic) – Port Marsden Highway/Marsden Bay Drive Intersection

MOVEMENT SUMMARY

Site: [1 (4)] PMH/Marsden Bay Drive - 2040 Weekday PM Peak (2040)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Port Marsden Highway (South)															
1	L2	All MCs	283	5.0	283	5.0	0.224	5.7	LOS A	0.0	0.0	0.00	0.41	0.00	53.7
2	T1	All MCs	117	16.0	117	16.0	0.224	0.1	LOS A	0.0	0.0	0.00	0.41	0.00	56.1
Approach			400	8.2	400	8.2	0.224	4.0	NA	0.0	0.0	0.00	0.41	0.00	54.4
North: Port Marsden Highway (North)															
8	T1	All MCs	209	16.0	209	16.0	0.172	0.7	LOS A	0.5	4.3	0.25	0.30	0.25	57.7
9	R2	All MCs	62	5.0	62	5.0	0.172	7.3	LOS A	0.5	4.3	0.25	0.30	0.25	54.8
Approach			272	13.5	272	13.5	0.172	2.2	NA	0.5	4.3	0.25	0.30	0.25	57.0
West: Marsden Bay Drive															
10	L2	All MCs	36	5.0	36	5.0	0.509	10.5	LOS B	3.2	23.5	0.63	1.04	0.95	47.8
12	R2	All MCs	292	5.0	292	5.0	0.509	14.4	LOS B	3.2	23.5	0.63	1.04	0.95	47.5
Approach			327	5.0	327	5.0	0.509	14.0	LOS B	3.2	23.5	0.63	1.04	0.95	47.6
All Vehicles			999	8.6	999	8.6	0.509	6.8	NA	3.2	23.5	0.28	0.59	0.38	52.6

Figure C 11: Weekday Afternoon Shift Changeover Peak Hour (2030 Base) – SH1/Port Marsden Highway Intersection

MOVEMENT SUMMARY

Site: [4] SH1/PMH - 2030 Weekday PM Peak (2030 Post Opening Year Base)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Service Station (South)															
1	L2	All MCs	32	5.0	32	5.0	0.091	4.7	LOS A	0.5	3.9	0.60	0.57	0.60	49.4
2	T1	All MCs	32	5.0	32	5.0	0.091	4.6	LOS A	0.5	3.9	0.60	0.57	0.60	49.7
3	R2	All MCs	32	5.0	32	5.0	0.091	12.0	LOS B	0.5	3.9	0.60	0.57	0.60	48.5
Approach			95	5.0	95	5.0	0.091	7.1	LOS A	0.5	3.9	0.60	0.57	0.60	49.2
East: SH1 (East)															
4	L2	All MCs	32	5.0	32	5.0	0.314	3.4	LOS A	2.1	15.8	0.46	0.38	0.46	51.3
5	T1	All MCs	335	10.0	335	10.0	0.314	3.4	LOS A	2.1	15.8	0.46	0.38	0.46	54.5
6	R2	All MCs	40	10.0	40	10.0	0.314	10.8	LOS B	2.1	15.8	0.46	0.38	0.46	53.5
Approach			406	9.6	406	9.6	0.314	4.1	LOS A	2.1	15.8	0.46	0.38	0.46	54.2
North: Port Marsden Highway (North)															
7	L2	All MCs	39	16.0	39	16.0	0.194	4.6	LOS A	1.1	8.9	0.56	0.60	0.56	51.6
8	T1	All MCs	32	5.0	32	5.0	0.194	4.3	LOS A	1.1	8.9	0.56	0.60	0.56	48.6
9	R2	All MCs	137	16.0	137	16.0	0.194	11.9	LOS B	1.1	8.9	0.56	0.60	0.56	50.9
Approach			207	14.3	207	14.3	0.194	9.4	LOS A	1.1	8.9	0.56	0.60	0.56	50.8
West: SH1 (West)															
10	L2	All MCs	121	10.0	121	10.0	0.345	2.9	LOS A	2.4	17.9	0.33	0.32	0.33	55.1
11	T1	All MCs	349	10.0	349	10.0	0.345	2.9	LOS A	2.4	17.9	0.33	0.32	0.33	55.4
12	R2	All MCs	32	5.0	32	5.0	0.345	10.2	LOS B	2.4	17.9	0.33	0.32	0.33	51.7
Approach			502	9.7	502	9.7	0.345	3.3	LOS A	2.4	17.9	0.33	0.32	0.33	55.2
All Vehicles			1211	10.1	1211	10.1	0.345	4.9	LOS A	2.4	17.9	0.43	0.41	0.43	53.7

Figure C 12: Weekday Afternoon Shift Changeover Peak Hour (2030 Opening Year + Site Generated Traffic) – SH1/Port Marsden Highway Intersection

MOVEMENT SUMMARY

Site: [8] SH1/PMH - 2030 Weekday PM Peak (2030 Post Opening Year Post Development)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Service Station (South)															
1	L2	All MCs	32	5.0	32	5.0	0.114	6.6	LOS A	0.8	5.6	0.76	0.67	0.76	48.0
2	T1	All MCs	32	5.0	32	5.0	0.114	6.6	LOS A	0.8	5.6	0.76	0.67	0.76	48.3
3	R2	All MCs	32	5.0	32	5.0	0.114	13.9	LOS B	0.8	5.6	0.76	0.67	0.76	47.1
Approach			95	5.0	95	5.0	0.114	9.0	LOS A	0.8	5.6	0.76	0.67	0.76	47.8
East: SH1 (East)															
4	L2	All MCs	32	5.0	32	5.0	0.436	4.6	LOS A	3.3	24.8	0.68	0.53	0.68	49.1
5	T1	All MCs	335	10.0	335	10.0	0.436	4.6	LOS A	3.3	24.8	0.68	0.53	0.68	52.9
6	R2	All MCs	112	10.0	112	10.0	0.436	12.0	LOS B	3.3	24.8	0.68	0.53	0.68	51.9
Approach			478	9.7	478	9.7	0.436	6.4	LOS A	3.3	24.8	0.68	0.53	0.68	52.5
North: Port Marsden Highway (North)															
7	L2	All MCs	111	16.0	111	16.0	0.428	5.1	LOS A	3.1	24.2	0.69	0.64	0.69	51.1
8	T1	All MCs	32	5.0	32	5.0	0.428	4.7	LOS A	3.1	24.2	0.69	0.64	0.69	47.9
9	R2	All MCs	304	16.0	304	16.0	0.428	12.4	LOS B	3.1	24.2	0.69	0.64	0.69	50.4
Approach			446	15.2	446	15.2	0.428	10.1	LOS B	3.1	24.2	0.69	0.64	0.69	50.5
West: SH1 (West)															
10	L2	All MCs	288	10.0	288	10.0	0.494	3.5	LOS A	4.0	30.2	0.50	0.40	0.50	54.4
11	T1	All MCs	349	10.0	349	10.0	0.494	3.5	LOS A	4.0	30.2	0.50	0.40	0.50	54.6
12	R2	All MCs	32	5.0	32	5.0	0.494	10.8	LOS B	4.0	30.2	0.50	0.40	0.50	50.6
Approach			669	9.8	669	9.8	0.494	3.8	LOS A	4.0	30.2	0.50	0.40	0.50	54.4
All Vehicles			1688	10.9	1688	10.9	0.494	6.5	LOS A	4.0	30.2	0.62	0.51	0.62	52.4

Figure C 13: Weekday Afternoon Shift Changeover Peak Hour (2030 Opening Year) – Port Marsden Highway/One Tree Point Road Intersection

MOVEMENT SUMMARY

Site: [3] PMH/One Tree Point Road- 2030 Weekday PM Peak (2030 Post Opening Year Post Development)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Port Marsden Highway (South)															
1	L2	All MCs	82	5.0	82	5.0	0.213	5.7	LOS A	0.0	0.0	0.00	0.13	0.00	56.0
2	T1	All MCs	296	16.0	296	16.0	0.213	0.1	LOS A	0.0	0.0	0.00	0.13	0.00	58.6
Approach			378	13.6	378	13.6	0.213	1.3	NA	0.0	0.0	0.00	0.13	0.00	58.0
North: Port Marsden Highway (North)															
8	T1	All MCs	1	16.0	1	16.0	0.282	1.9	LOS A	1.4	10.1	0.52	0.70	0.52	53.5
9	R2	All MCs	327	5.0	327	5.0	0.282	7.4	LOS A	1.4	10.1	0.52	0.70	0.52	51.0
Approach			328	5.0	328	5.0	0.282	7.4	NA	1.4	10.1	0.52	0.70	0.52	51.0
West: One Tree Point Road															
10	L2	All MCs	1	5.0	1	5.0	0.181	9.8	LOS A	0.6	4.3	0.59	1.00	0.59	48.4
12	R2	All MCs	91	5.0	91	5.0	0.181	13.0	LOS B	0.6	4.3	0.59	1.00	0.59	48.1
Approach			92	5.0	92	5.0	0.181	12.9	LOS B	0.6	4.3	0.59	1.00	0.59	48.1
All Vehicles			798	9.1	798	9.1	0.282	5.1	NA	1.4	10.1	0.28	0.46	0.28	53.7

Figure C 14: Weekday Afternoon Shift Changeover Peak Hour (2040 Forecast Year + Site Generation Traffic) – SH1/Port Marsden Highway Intersection

MOVEMENT SUMMARY

 **Site: [12] SH1/PMH - 2040 Weekday PM Peak** (2040 Forecast Year Post Development)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Service Station (South)															
1	L2	All MCs	39	5.0	39	5.0	0.169	8.2	LOS A	1.2	9.0	0.87	0.72	0.87	46.8
2	T1	All MCs	39	5.0	39	5.0	0.169	8.2	LOS A	1.2	9.0	0.87	0.72	0.87	47.0
3	R2	All MCs	39	5.0	39	5.0	0.169	15.6	LOS B	1.2	9.0	0.87	0.72	0.87	45.9
Approach			117	5.0	117	5.0	0.169	10.7	LOS B	1.2	9.0	0.87	0.72	0.87	46.6
East: SH1 (East)															
4	L2	All MCs	39	5.0	39	5.0	0.562	5.8	LOS A	5.2	39.6	0.81	0.65	0.87	47.8
5	T1	All MCs	420	10.0	420	10.0	0.562	5.9	LOS A	5.2	39.6	0.81	0.65	0.87	51.9
6	R2	All MCs	122	10.0	122	10.0	0.562	13.3	LOS B	5.2	39.6	0.81	0.65	0.87	51.0
Approach			581	9.7	581	9.7	0.562	7.5	LOS A	5.2	39.6	0.81	0.65	0.87	51.5
North: Port Marsden Highway (North)															
7	L2	All MCs	120	16.0	120	16.0	0.530	6.9	LOS A	4.6	36.6	0.82	0.74	0.90	50.2
8	T1	All MCs	39	5.0	39	5.0	0.530	6.5	LOS A	4.6	36.6	0.82	0.74	0.90	46.6
9	R2	All MCs	339	16.0	339	16.0	0.530	14.2	LOS B	4.6	36.6	0.82	0.74	0.90	49.5
Approach			498	15.1	498	15.1	0.530	11.8	LOS B	4.6	36.6	0.82	0.74	0.90	49.5
West: SH1 (West)															
10	L2	All MCs	320	10.0	320	10.0	0.601	3.9	LOS A	5.6	42.1	0.61	0.44	0.61	53.8
11	T1	All MCs	438	10.0	438	10.0	0.601	3.9	LOS A	5.6	42.1	0.61	0.44	0.61	54.1
12	R2	All MCs	39	5.0	39	5.0	0.601	11.1	LOS B	5.6	42.1	0.61	0.44	0.61	49.8
Approach			797	9.8	797	9.8	0.601	4.2	LOS A	5.6	42.1	0.61	0.44	0.61	53.8
All Vehicles			1993	10.8	1993	10.8	0.601	7.5	LOS A	5.6	42.1	0.74	0.59	0.77	51.7

Figure C 15: Weekday Afternoon Shift Changeover Peak Hour (2040 Forecast Year + Site Generation Traffic) – Port Marsden Highway/One Tree Point Road Intersection

MOVEMENT SUMMARY

 **Site: [11] PMH/Mardens Bay Drive - 2040 Weekday PM Peak** (2040 Forecast Year Post Development)
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Port Marsden Highway (South)															
1	L2	All MCs	103	5.0	103	5.0	0.233	5.7	LOS A	0.0	0.0	0.00	0.15	0.00	55.8
2	T1	All MCs	311	16.0	311	16.0	0.233	0.1	LOS A	0.0	0.0	0.00	0.15	0.00	58.4
Approach			414	13.3	414	13.3	0.233	1.5	NA	0.0	0.0	0.00	0.15	0.00	57.7
North: Port Marsden Highway (North)															
8	T1	All MCs	351	16.0	351	16.0	0.200	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.9
9	R2	All MCs	2	5.0	2	5.0	0.200	6.1	LOS A	0.0	0.2	0.01	0.01	0.01	56.8
Approach			353	15.9	353	15.9	0.200	0.0	NA	0.0	0.2	0.01	0.01	0.01	59.9
West: One Tree Point Road															
10	L2	All MCs	1	5.0	1	5.0	0.249	10.3	LOS B	0.9	6.4	0.65	1.02	0.73	47.5
12	R2	All MCs	113	5.0	113	5.0	0.249	14.4	LOS B	0.9	6.4	0.65	1.02	0.73	47.3
Approach			114	5.0	114	5.0	0.249	14.4	LOS B	0.9	6.4	0.65	1.02	0.73	47.3
All Vehicles			880	13.3	880	13.3	0.249	2.6	NA	0.9	6.4	0.09	0.20	0.10	56.9