Project Number: 4-27636.00

Bay of Islands Marina Plan Change

14 November 2022

CONFIDENTIAL

Transportation Assessment Report

wsp

150 YEARS IN AOTEAROA

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Document Details:

Date: 9th November 2022
Reference: 4-27636.00
Status:

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Document History and Status

Revision	Date	Author	Reviewed by	Approved by	Status
	9/11/2022	L Boyce	M Gregory	M Gregory	

Revision Details

Revision	Details

Contents

List of Figures

List of Tables

Disclaimers and Limitations

This report ('**Report**') has been prepared by WSP exclusively for Far North Holdings Ltd ('**Client**') in relation to a proposed change to the District Plan zoning for the Bay of Islands Marina development ('**Purpose**') and in accordance with the short form Agreement with the Client and scope of work/methodology dated 22nd September 2022. The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

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Executive Summary

WSP has been commissioned by Far North Holdings Limited to complete an Integrated Transportation Assessment report (ITA) for a Plan Change request to allow for development of the proposed Bay of Islands Marina Masterplan, which requires rezoning their land from its current "Industrial" zone to "Mixed Use" zone.

The proposed plan change site is located within Opua immediately adjacent to the Bay of Islands Marina and is occupied by industrial businesses, predominantly relating to marina activities. The applicant is seeking to rezone their land to "Mixed Use" to enable development that could potentially include residential, retail, accommodation, commercial and recreational activities, as well as the existing marina activity.

Access to the plan change site is available via several roads but most traffic is expected to use Franklin Street, which joins with SH11 and English Bay Rd approximately 800m west of the site. As such, the most significant potential for transport effect is expected to be on Franklin St and its intersections with SH11 (and English Bay Rd) and Baffin St, which joins the plan change site. The intersection of Franklin St and Baffin St will act as the main access to the plan change site and almost all traffic travelling to and from the marina area will use this intersection. Potential impacts on safety and level of service from the plan change traffic at this intersection can be mitigated through by controlling the site access with a roundabout, providing a balanced level of service between the site and the existing Okiato - Opua ferry. Notably, the ferry traffic would continue to enjoy right of way over traffic exiting the Marina site. For this reason, the main potential transport effect is the impact the plan change development will have on the SH11 / Franklin St intersection, and the potential to generate movement demands which exceed safe capacity.

The impact on the existing SH11/Franklin St/English Bay Rd intersection was assessed by estimating the level of traffic that could be generated by the proposed plan change development and modelling the increased traffic volumes using SIDRA micro simulation modelling software to determine the impact of this additional traffic on the intersection.

The level of traffic that could be generated by the proposed plan change was calculated based on three development scenarios, with these being 'Low' (21,200 m^2 Gross Floor Area (GFA)), 'mid' (42,400m^2 GFA) and 'High' (64,700m^2 GFA). These floor areas were then used to determine the expected peak hour traffic generation, during both the AM and PM peak periods, for each development scenario. The approximate traffic generation for the respective development scenarios were: 77 trips/hr, 153 trips/hr and 230 trips/hr in the AM peak and 283 trips/hr, 567 trips/hr and 850 trips/hr in the PM peak.

SIDRA analysis of the SH11/Franklin St/English Bay Rd intersection was carried out for the PM peak only, as the PM peak for SH11 will coincide with PM peak for the proposed plan change development, making this the critical assessment period. The SIDRA modelling of each development scenario suggests there is adequate capacity at the existing intersection. The worst performing movement forecast to be the right turn movements from Franklin St (on to SH11 and English Bay Rd) during the PM peak, which operates at Level of Service C ("acceptable"). For both the 'low' and 'mid' development (defined in section 5.2.2) the worst movement is forecast to operate at LOS B.

The Assessment of Environmental Effects (AEE) hinges on trip generation estimates from industrial standard sources; however, there are general challenges associated with predicting 'mixed use' development outcomes. This assessment manages this impact by summing trip generation of individual activities – not accounting for the expected reduction in overall trip rates resulting from users accessing more than one activity within the site in sequence. For a mixed-use development with residential, retail, accommodation, and commercial activities, as proposed for the Plan Change site, a high proportion of the total trips would be expected to remain internal to the site; therefore, our assessment is likely to be conservative.

The development enabled through the proposed plan change would likely comply with provisions in the operative FNDP, except for traffic intensity and parking. The traffic intensity would result in Resource Consent for a Discretionary Activity; however, we recommend that this assessment demonstrates likelihood of effects being less than minor, and further we have identified suitable instruments in the FNDP to manage these potential effects. With respect to parking, the District Plan parking requirements is considered higher than necessary for the proposed plan change site as it does not make allowance for mixed use. The final number of parking spaces will be confirmed as design progresses, but there is enough space available to provide sufficient parking meet the expected demand.

The overall transport effects anticipated from the proposal, including up to the 'high' level floor area can be considered less than minor.

1 Introduction

WSP has been commissioned by Far North Holdings Limited to complete a Transportation Assessment report for a proposed Plan Change to enable the development of the proposed Bay of Islands Marina Masterplan.

This report has been prepared in accordance with NZTA document *RR422 Integrated Transport Assessment Guidelines (Nov 2010)*

The proposal includes changing the zoning of a large block of land that is currently occupied by the Bay of Islands Marina and industrial activities. The land is currently zoned "Industrial", but the proposal is for the zoning to change to "Mixed Use" to enable the development of the site with a wider range of land use activities. The site will also be developed with associated landscaping, pathways, and parking areas.

This report describes the existing environment, details the proposal, and assesses the likely transportation related impacts of the proposal on surrounding road users.

2 Existing Land Data

2.1 Site location

The plan change site is located in Opua village, which is located approxiamtely 4km south of Paihia. The general location of the site within the wider area is shown in

Figure 2-1.

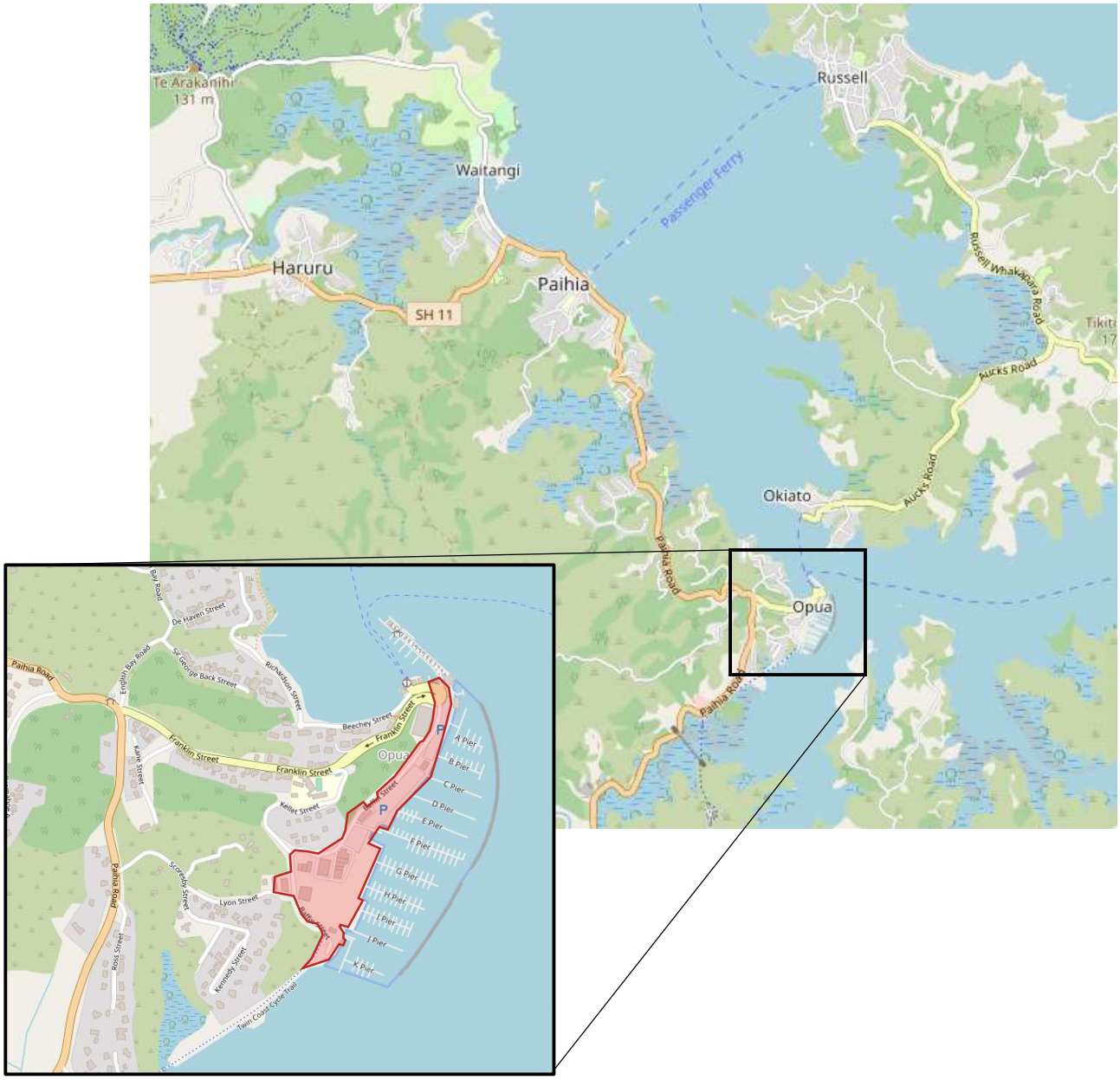

Figure 2-1 : General Location of the Plan

2.2 District Plan Zoning

The FNDC are in the process of carrying out a Plan Change review in which the rules, objectives, and policies of the Operative Far North District Plan (FNDP) are being reviewed and updated. The review process as resulted in development of the Proposed District Plan, which was released for notification in July 2022 and is open for submissions until 21st October 2022.

The Operative FNDP (2009) controls land use at the site however, given the District Plan review process is ongoing, the Proposed District Plan is also relevant. As such, both plans must be

regarded to when considering development at the site however no rules in the Proposed District Plan have legal effect with respect to the site, and the plan currently would carry little weight in any decision making.

2.2.1 Operative District plan

The Far North District Council's Operative District Plan (FNDP) shows the site is zoned as 'Industrial' and is identified as a Maritime Exemption Area. The District Plan defines a Maritime Exemption area as *"an area identified on the Plan maps exempt from the setback provisions to enable development that is functionally related to the coastal marine area. Maritime Exemption Areas are provided along parts of the coastal marine area where riparian margins are not required."*

The wider surround for the site is a mix of zoning, with 'Coastal Residential' predominantly surrounding the site, "General Coastal" located south of the site and a mix of "Coastal Living" and "Conservation" located west of the site.

Figure 2-2 shows the zoning for the site and its immediate surrounds.

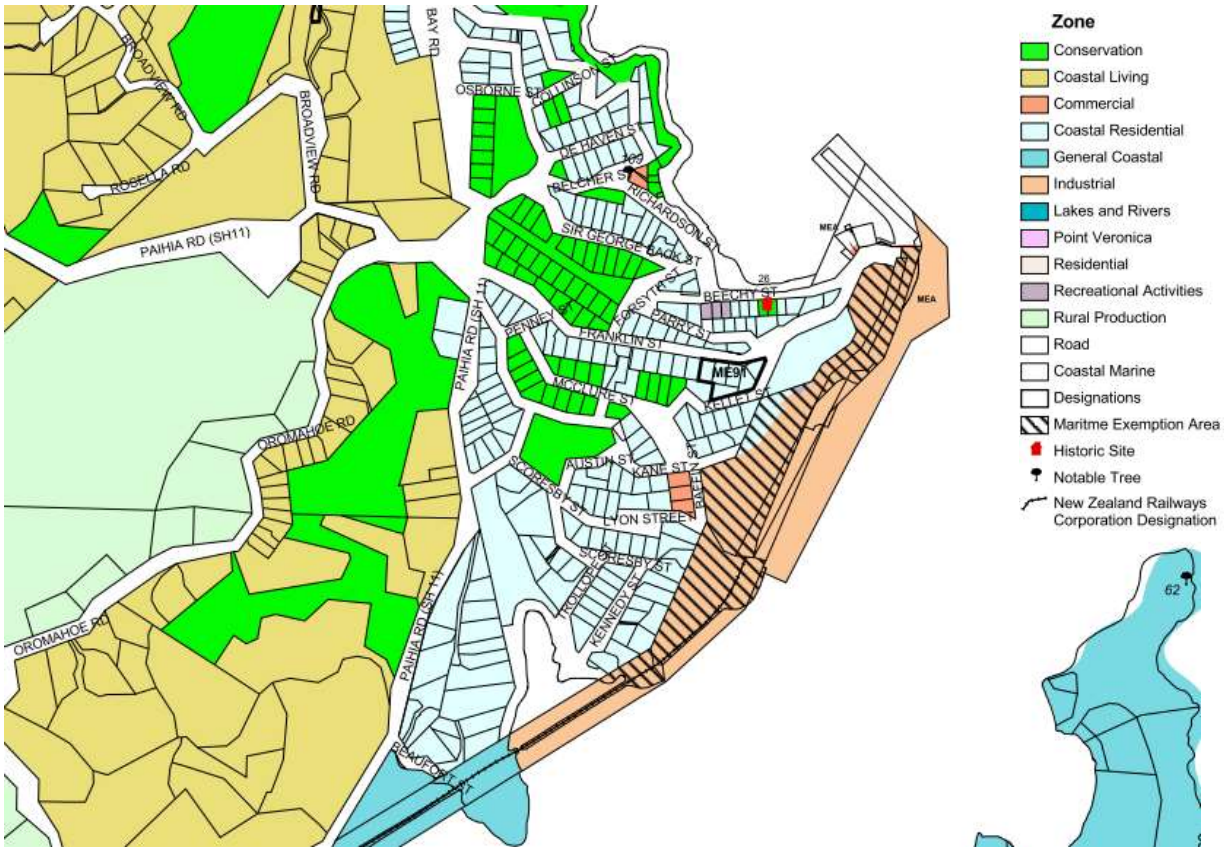

Figure 2-2 : Operative District Plan Zoning

2.2.2 Proposed District Plan

The FNDC's Proposed District Plan shows the site zoned as 'Light Industrial'. The land adjacent to the site is predominantly zoned "General Residential" whilst the wider surrounding land is zoned "Rural Production" (south of the site) and a mix of "Rural Lifestyle" and "Natural Open Space" west of the site.

Figure 2-3 shows the proposed District Plan zoning for the site and its immediate surrounds.

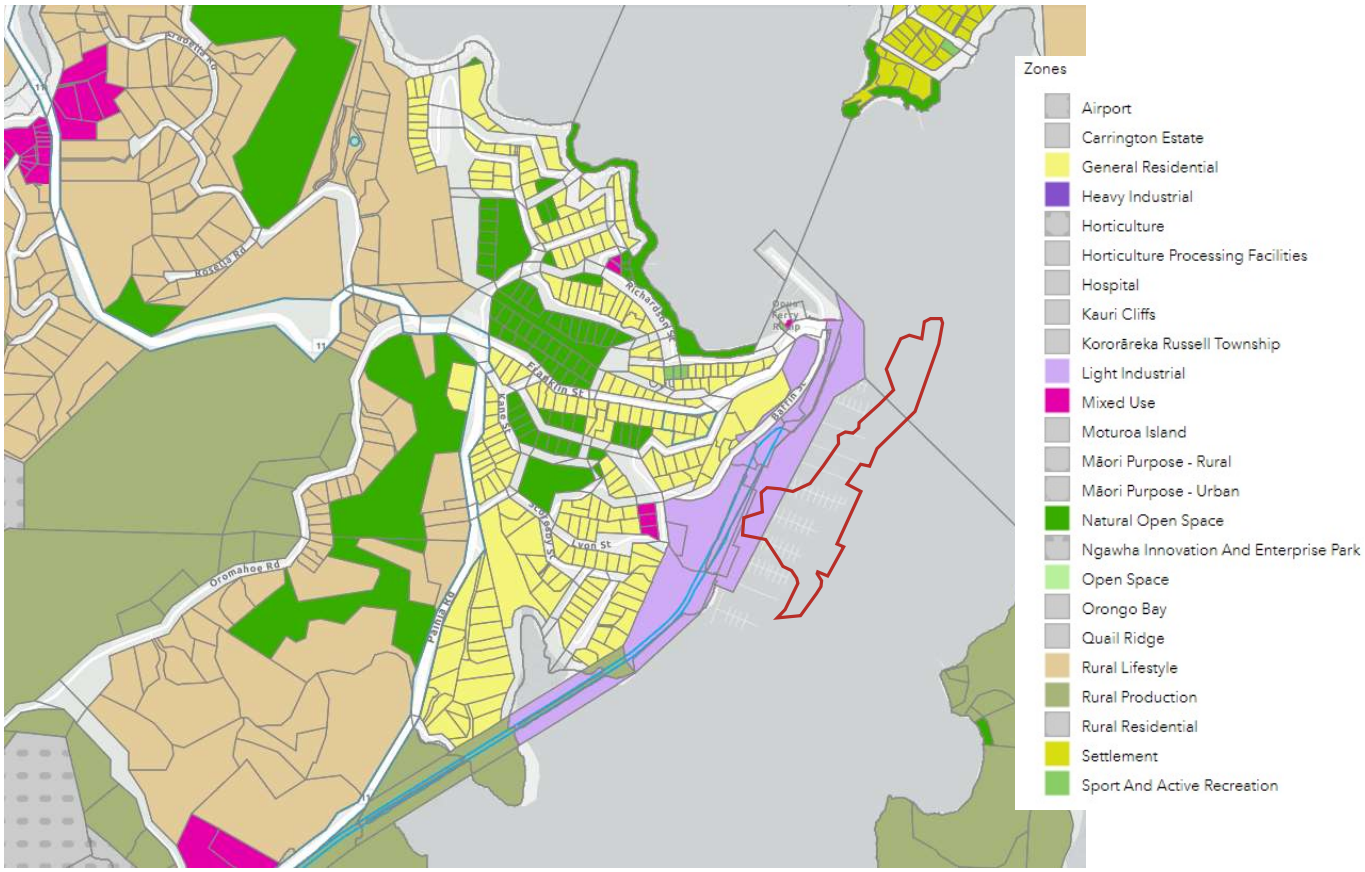

Figure 2-3 : Proposed District Plan Zoning

2.3 Existing land use

The largest activity within the plan change area is the Bay of Islands marina, which has berths for 400 boats. The marina recently underwent expansion (Consented March 2015), of an additional 150 berths provided (increased from 250 berths) along with new commercial, residential, and ancillary buildings.

Other land use within the plan change site is light industrial, primarily involving businesses supporting the local marina activities, and some commercial activity. The commercial activity includes the Port Opua building on Baffin Street, a restaurant/café, laundromat, lawyer, accountants, and shops including a café/general store and dining/takeaways business on Beechey St, north of the proposed plan change site.

Immediately north of the plan change site, near the Old Store block of shops on Beechey St, is an existing wharf from which the Opua and Okaito ferry currently runs from. This ferry service operates between the hours of 6:00am and 10:00pm daily, with departures approximately every 10 minutes, carrying up to 20 vehicles. The ferry can transport all vehicles including trucks, buses and campervans and takes foot passengers.

2.4 Surrounding Land Use

The wider area surrounding the plan change site is predominantly low-density residential housing and undeveloped land covered in trees and vegetation. Within the wider surrounds there is also the Opua Ferry terminal (as mentioned in Section 2.3) and Opua Primary School on Franklin St.

3 Existing Transport Network

3.1 Road frontages

Figure 3-1 shows the proposed plan change site location is relation to the existing road network, which indicates the proposed Plan Change site is generally fronted by Baffin Street to the west and by the marine environment to the east. A small section of the plan change area is fronted by Lyon Street, which joins with Baffin Street near the south of the site.

Figure 3-1 : Existing Road Network

3.1.1 Baffin Street

Baffin Street runs through the plan change site and will be the main route vehicles use when travelling to/from the area. It is a two-lane, two-way road with a total carriageway width of between approximately 6.8-9m for the section between Franklin Street and Lyon St. The section south of Lyon Street has a minimum total width of 6.5m but is unsealed and unmarked.

3.1.2 Franklin Street

Franklin Street is the main route from SH11 to Opua village. It operates as a two-lane, two-way road between SH11 to and a point approximately 60m east of Kellet St. East of this point Franklin Street operates with two eastbound lanes (to Opua) and one westbound lane. The provision of two eastbound traffic lanes allows the outer lane to operate as a queuing lane for vehicles waiting for ferry services, while the inside lane provides a through traffic lane for vehicles on Franklin St and Beechey St. The outer eastbound lane has “Ferry Lane” paint markings regularly placed, approximately every 60m, to ensure correct lane usage.

The two-lane, two-way section of Franklin St between SH11 and 60m east of Kellet St has a carriageway width that generally varies between 6.1 – 7.8m wide. The three-lane, two-way

section of Franklin St (from 60m east of Kellet St) has a carriageway width of approximately 10-10.5m.

3.1.3 Lyon Street

Lyon Street is a one-lane, one-way road with traffic travelling in an eastbound direction from Scoresby St to the plan change site. Operating speeds on Lyon St are estimated less than 30km/h[1].

Figure 3-2 : Typical view along Lyon St (looking west).

3.1.4 Kellet Street

Kellet Street connects from Franklin St to the plan change site and is a two-way, unmarked road. The typical carriageway width is between 3.5 and 4.5m. Operating speeds on Kellet St are estimated less than 30km/h[2].

Figure 3-3 : Typical view along Kellet St (looking east).

3.2 Intersections

The most significant potential transport effects are expected to include intersection efficiency, and the scope of assessment aims to capture intersections impacted by the additional traffic generated by the proposed site development. The intersections that are closest to the site are

[1] Data sourced from Waka Kotahi MegaMaps (see also Figure 3-16, p17)
[2] ibid

Baffin St/Franklin St/Beechey St, Baffin St/Kellet St and Baffin St/Lyon St, while the intersections that are further away but likely to be impacted by traffic generated from the site are SH11/Franklin St/English Bay Rd and SH11/Scoresby St.

3.2.1 Baffin St/Franklin St/Beechey St

This intersection is expected to be the main vehicle access to the site. Most of the traffic accessing the site will travel via Franklin St so the biggest increase in turning movements at this intersection will be vehicles turning left on to Franklin St from Baffin St or turning right from Franklin St on to Baffin St.

Vehicles waiting at Baffin St have approximately 55m sight distance available along Franklin St (to the west) and 45m along Beechey St; adequate given the estimated operating speed of less than 35km/h.

Figure 3-4 : Baffin St/Franklin St/Beechey St intersection

3.2.2 Baffin St/Kellet St

Kellet Street joins with Baffin Street as T-intersection with priority to Baffin St, although there is no road marking or sign posting to enforce it. The entrance to Kellet St is has a sign saying no “Heavy Trucks use Franklin St” and another sign saying, “No through traffic”.

Figure 3-5 : Baffin St/Kellet St intersection

3.2.3 Baffin St/Lyon St

Lyon Street joins Baffin St as a T-intersection with priority to Baffin Street traffic. The one-way operation of Lyon St and the narrow formation of the road means that few of the traffic movements generated by the proposed development will use Lyon St to access the site so the impact on this intersection will be minimal.

Figure 3-6 : Baffin St/Lyon St intersection

3.2.1 SH11/Franklin Street

The section of SH11 from Kawakawa to the southern edge of Paihia is a Limited Access Road (LAR). Franklin Street joins this LAR section of SH11 in the form of a T-intersection with priority to SH11 traffic. However, the intersection layout is complicated by the location of English Bay Road, which joins with Franklin Street very close to SH11, making the intersection appear more like a crossroad. The arrangement of this intersection is shown in Figure 3-7.

Figure 3-7 : SH11/Franklin Street/English Bay Road

There is an existing right turn bay on SH11 for vehicles turning in to Franklin Street. The available sight distance along SH11 from the Franklin St intersection is approximately 180m to the south and 90m to the north/west.

Most of the traffic generated by development on the plan change site will travel through this intersection, therefore the impact of additional traffic on this intersection is investigated in further in following sections of this report.

3.2.2 SH11/Scoresby St

Scoresby Street joins SH11 (LAR) in the form of a T-intersection with priority to SH11 traffic. It is expected that few vehicles will use this intersection to access the plan change site however the available sight distance from Scoresby Street along SH11 is approximately 110m to the south and 110m to the north. Because Lyon St (the connection from Scoresby St to the site) is one-way only, traffic generated by the plan change site can only use this intersection when travelling to the site.

The arrangement of this intersection is shown in Figure 3-8.

Figure 3-8 : SH11/Scoresby Street intersection

3.3 Traffic Volumes

Vehicle access to the site is available via either Franklin Street, Kellet Street or Lyon Street. Count data has been obtained from the Mobile Roads website. The estimated traffic volumes are shown in Figure 3-9.

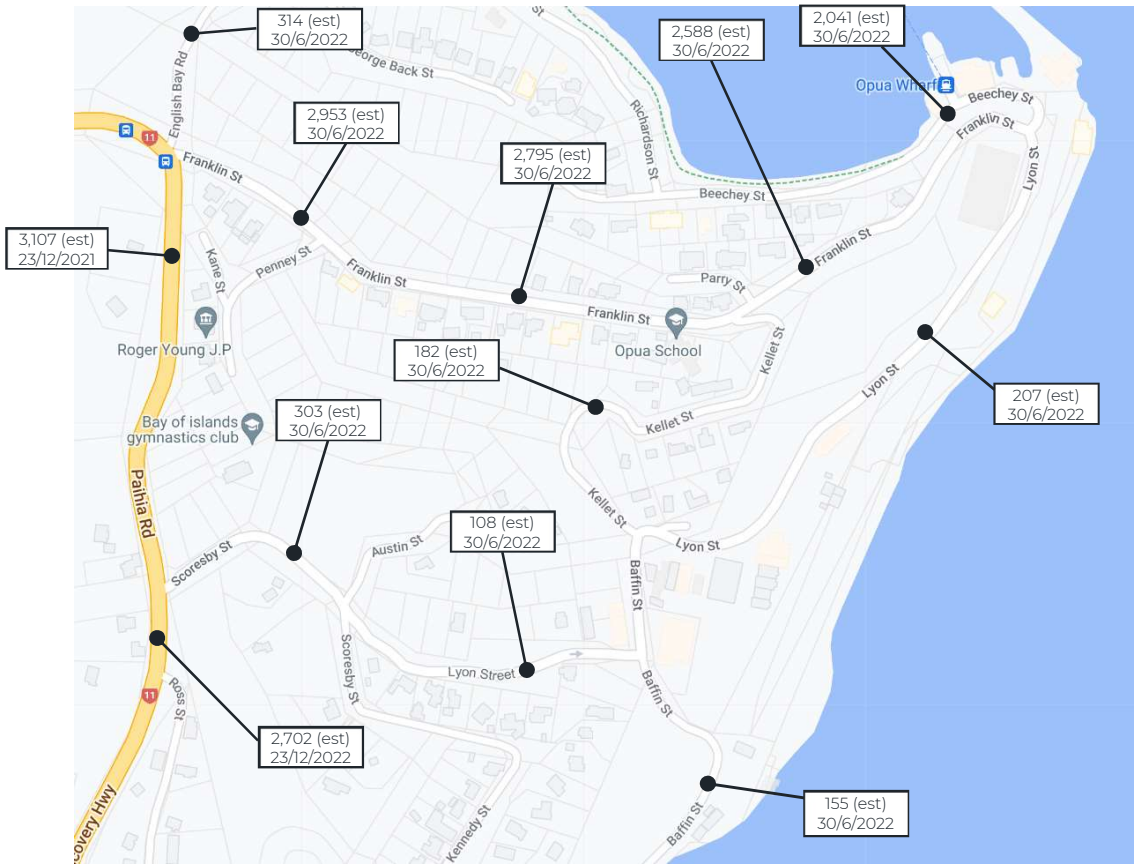

Figure 3-9 : Existing Traffic Volumes (Source: MobileRoads website)

3.3.1 SH 11

Traffic volumes obtained from Waka Kotahi's TMS database for the nearest telemetry site, which is located on SH11 approximately 1.5km northwest of Franklin Street.

This count site is labelled as "*SH11, South of Waimangaro Rd between Paihia and Opua*". The traffic count data taken from this site showed the 2022 regressed AADT is 5,000 vehicles per day. The annual traffic volumes over the past 10 years have fluctuated somewhat and do not show a linear growth trend. The traffic volumes show significant growth between 2014 and 2015. This coincides with construction for the Stage 2 Bay of Islands Marina expansion project, which started in 2015 and finished in 2021, and the opening of the Twin Coast cycleway in 2017, so these activities may have contributed to this jump in traffic volumes. The rapid decline in trips from 2021 is likely to be due travel restrictions imposed during the Covid-19 pandemic. The traffic volumes used to calculate the traffic growth rate for 2022 includes the traffic volumes for 2021. If the 2021 traffic count is excluded the 2022 regressed AADT is 5,170 vehicles per day.

The traffic growth rate based on 20 years of data (including 2021) is 1.54% per year when including 2021 counts and 1.72% per year excluding 2021 counts. Historic traffic volumes and linear growth projections are shown on Figure 3-10 below.

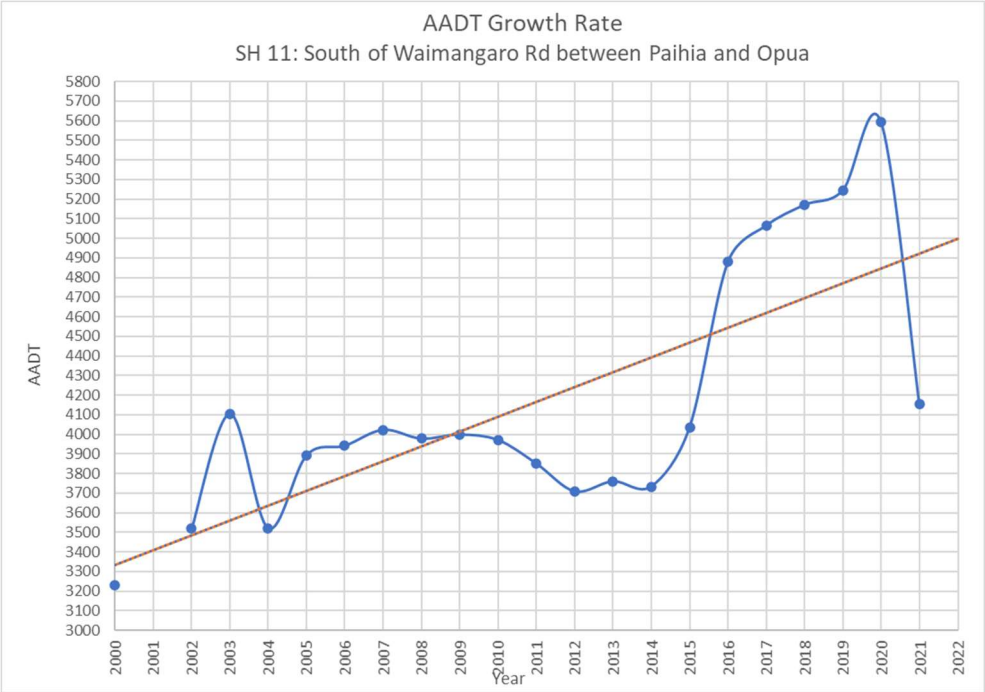

Figure 3-10 : Historic Traffic Data and linear regression (red line), incl. 2021 count.

Hourly traffic flow counts have also been obtained at this site for the most recently available count data, which covers the week of Sat 27th Nov – Friday 3rd Dec 2021, to determine the peak traffic periods for SH11. Figure 3-11 shows the hourly traffic flow profile obtained from the available count data.

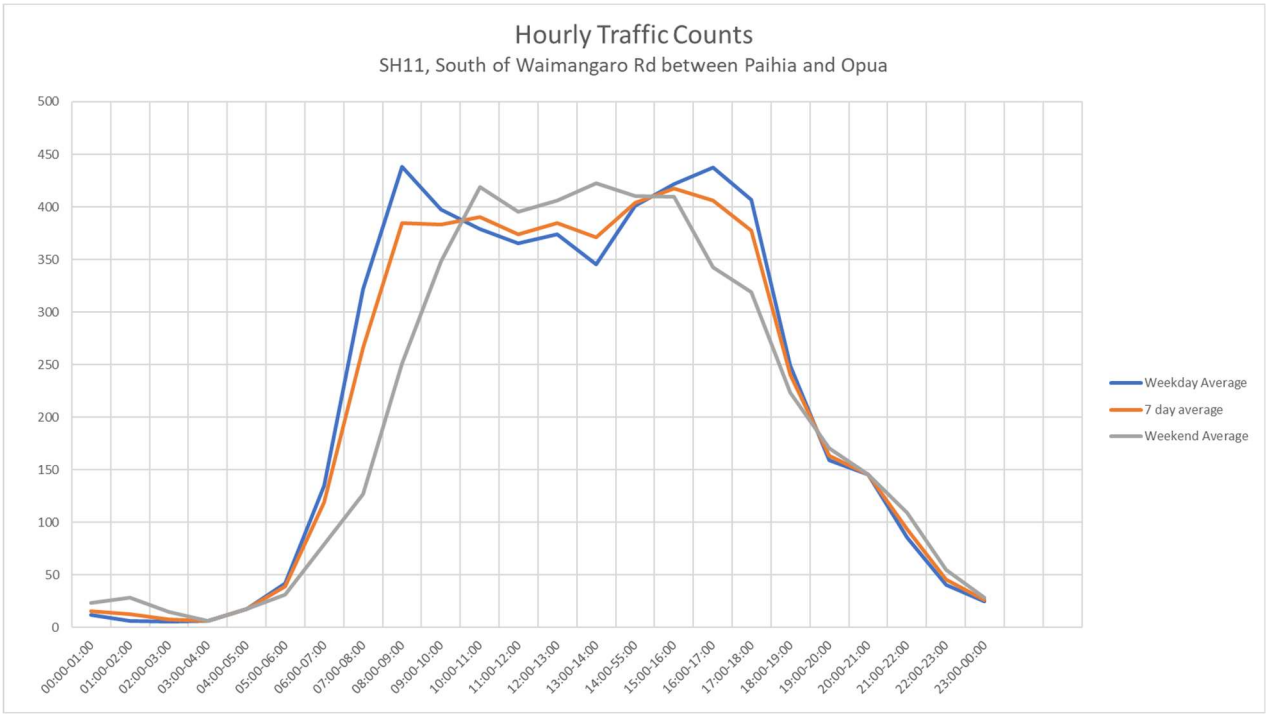

Figure 3-11 : Hourly Traffic Volumes (Source: Waka Kotahi's TMS database)

Figure 3-11 shows the highest traffic volumes typically occur on weekdays. The weekday AM peak has an hourly count of approximately 440vph and occurs between 8-9am, while the PM peak occurs between 4-5pm and has an hourly count volume of approximately 440vph.

3.4 Roading Hierarchy

The Far North District Plan does not specifically list a hierarchy for roads in the region however it specifies that FNDC adheres road classifications described in the Council's *"Engineering Standards and Guidelines" (June 2004 – Revised 2009)* and related documents. However, the "*Engineering Standards and Guidelines*" has been under review and a draft of the updated "Engineering Standards 2022" was released in February 2022 for public consultation, with review period ending in late March 2022. The District Plan has not yet been updated to reflect the updates in the "Engineering Standards 2022", but the document has been referred to for road classifications.

The 2022 *"Engineering Standards"* document states that "roads have been classified in terms of the "Waka Kotahi' One Network Road Classification" and provides a table that broadly defines the classifications used by the Council.

Classification	Average Daily Traffic (ADT)		Brief Descriptive
	Urban	Rural	
Access (Low Volume)	<200	<50	Access (Low Volume) are all other roads classed as low volume.
Access	<1,000	<200	Access includes all other roads. Significant numbers of pedestrians and cyclists. Low volume roads within this category will fall into the low volume subset above.
Secondary Collector	>1,000	>200	Roads that provide a secondary distributor/collector function, linking local areas of population and economic sites and may be the only route available to some places within the local area. Significant numbers of pedestrians and cyclists in urban areas.
Primary Collector	>3,000	>1,000	Roads that are locally important that provide a primary distributor/collector function, linking significant local economic areas or areas of population. In urban areas they may have moderate passenger transport movements and numbers of cyclists and pedestrians using the road.
Arterial	>5,000	>3,000	Roads that link regionally significant places, industries, ports or airports and may be the only route available to some places within the region. In urban areas they may have significant passenger transport movements and numbers of cyclists and pedestrians using the road.
Regional	>15,000	>10,000	Roads that connect regionally significant places, industries, ports or airports. They are also major connectors between regions.
National and National (High Volume)	>25,000 >35,000	>15,000 >20,000	Roads that connect major population centres, major ports or international airports and have high volumes of heavy commercial vehicles or general traffic.

Figure 3-12 : Road Classification from FNDC "Engineering Standards".

Based on the traffic volumes shown in section 3.3, Baffin Street is classified as an Access Road and Lyon Street is classified as an Access (Low Volume) Road.

It is worth noting that the One Network Road Classification has been replaced with the One Network Framework, which classifies roads through both a place and movement framework. It also separates classifications in to either rural or urban. The One Network Framework classification for the road network around the plan change site is shown in Figure 3-13.

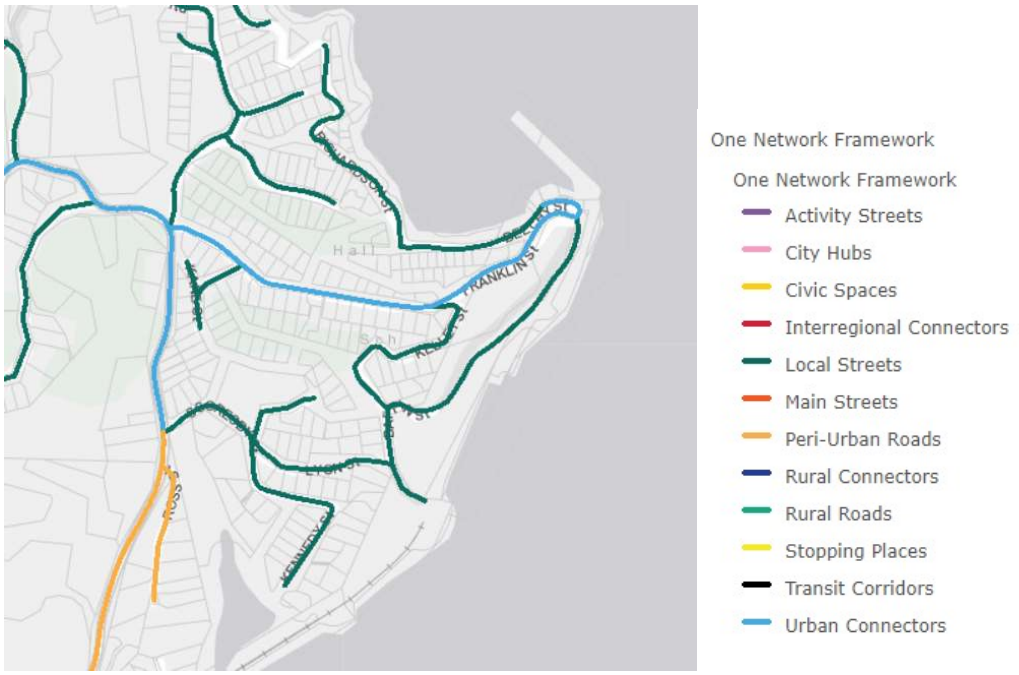

Figure 3-13 : Waka Kotahi's One Network Framework (ONF) classification

3.5 Parking

The existing site provides 426 car parking spaces, including 7 mobility spaces, and 20 long spaces for car and trailer parking. These parking spaces are provided in several locations around the site in dedicated at-grade carparks. The location of these carparks, and the number of spaces they each provide, are shown in Figure 3-14.

ZONE	NUMBER OF CARPARKS
A	44 (including 2 disability carparks)
B	10
C	19
D	137 (including 4 disability carparks)
E	62
F	**20 boat and trailer parks
G	5 carparks
H	25
I	51 (including 1 disability carpark)
J	73
Total	**426 (including 7 disability carparks)**
Additional	**20 boat and trailer carparks

Figure 3-14 : Existing on-site parking.

3.6 Vehicle access

The main access to the site is via the existing Baffin St/Beechey St/Franklins St intersection. Access is also available via Lyon Street and Kellet St.

3.7 Speed limits

The current speed limit on SH11 near Opua is 80km/h, as shown in Figure 3-15.

Figure 3-15 : Existing speed limits along SH11

The existing speed limit on all local roads within Opua is 50km/hr, however the cross-section and horizontal and vertical alignment of most roads within the village make it difficult to travel at this speed, so the operating speed is generally less than 50km/h.

Waka Kotahi's Mega Maps shows the mean operating speeds for roads adjacent to and surrounding the proposed plan change site, which are shown in Figure 3-16.

Figure 3-16 : Mean Operating Speeds (Source: Waka Kotahi's Mega Maps)

3.8 Pedestrians and Cyclists

3.8.1 Pedestrians

There are no dedicated pedestrian facilities available along Baffin Street adjacent to the proposed Plan Change site, although there is a pedestrian walkway available along the marina sea frontage, extending from the Opua General Store/Ferry Terminal to the Port Opua building.

Franklin Street has a pedestrian footpath available on the southern side of the road from SH11 to Kellett Street. The section of this footpath from SH11 to Penny Street is relatively narrow and overgrown but from Penny Street to Kellett Street is in good condition. The northern side of Franklin Street has a pedestrian footpath running from Opua School to Beechey St. This section of footpath is in good condition from Opua School to approximately 110m east of Kellett St, whilst the section from 110m east of Kellett St through to Beechey varies in condition. There is an existing zebra crossing on Franklin St, outside Opua School, providing a connection between the footpaths on each side of the road.

Within the wider context, Opua is situated on the Te Araroa Trail walkway. Within Opua the walkway starts at the ferry terminal (connecting with the trail at either Okiato or Waikare) and travels along the coast towards Paihia via Beechey St. The Te Araroa Trail route near Opua is shown in Figure 3-17.

Figure 3-17 : Te Araroa Trail route

3.8.1 Cyclists

There are no cycling facilities on either of the frontage roads, Baffin Street or Lyon Street, or any of the roads surrounding the plan change site. Due to the relatively rural nature of the site, and the local topography (leading to constrained road widths) the lack of cycling facilities is not unusual.

Whilst there are no specific cycling facilities available on roads surrounding the site, the Twin Coast Cycle Trail starts at the southern end of Baffin Street, adjoining the site. A map showing the cycle route is shown in Figure 3-18 and the cycle route start/end point in relation to the plan change site is shown in Figure 3-19.

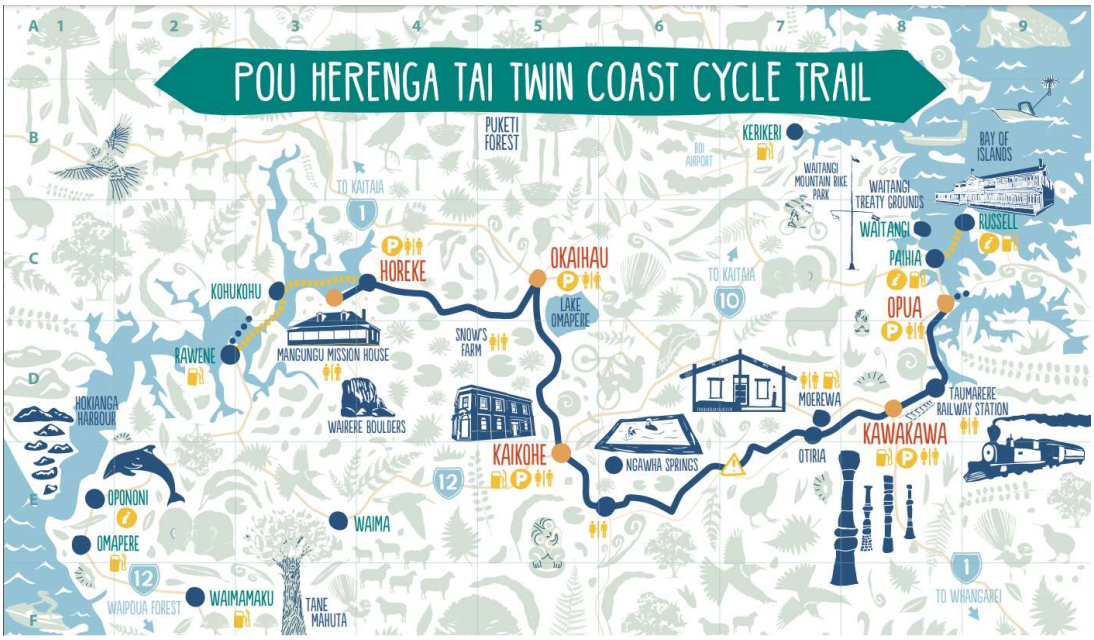

Figure 3-18 : Map of the Twin Coast Cycle Trail (Pou Herenga Tai)

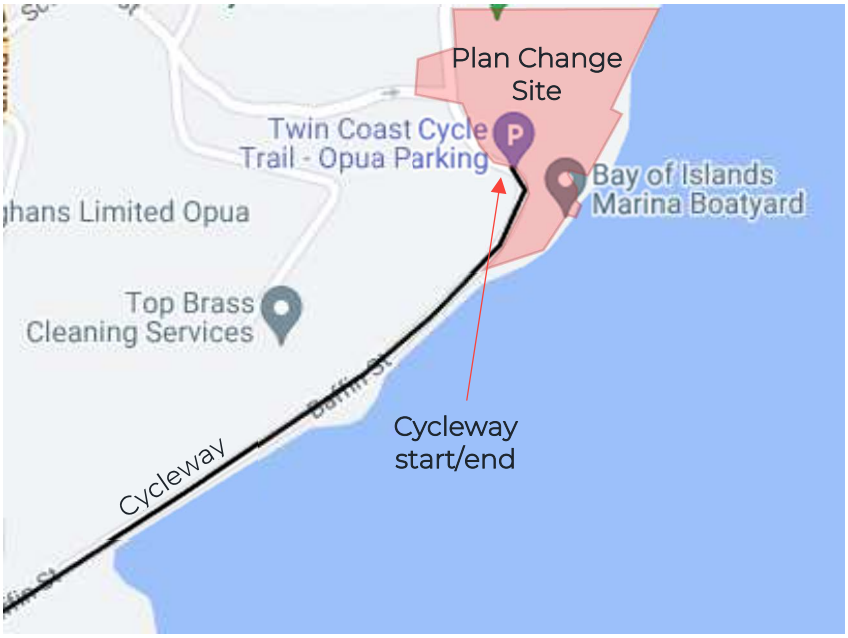

Figure 3-19 : Location of Twin Coast Cycle Trail in relation to Plan Change site

3.9 Public Transport

There is currently only one bus service to Opua which is the local “Mid North Link” bus service from Kaikohe to Waipapa via Waitangi, operated by the Kaikohe Bus Company. This service operates as one return trip every Tuesday and Thursday, with passengers being picked up or dropped off at the Opua General Store. The map and timetable for this service is shown in Figure 3-20.

Operator: Kaikohe Bus Company

SERVICE OPERATES TUESDAY, THURSDAY

MORNING

10.00am	Departs	**Kaikohe** Kaikohe Bus Company 3 Mangakahia Road **(Transfer from Hokianga Link here to Paihia and Waitangi)**
10.10am	Departs	**Ohaeawai** Te Corner
10.20am	Departs	**Moerewa** Town Centre **(between BP and shops)**
10.30am	Departs	**Kawakawa** Bus stop outside Community Link **(Hospital and InterCity stops by prior arrangement)**
10.50am	Departs	**Opua** Opua General Store
11.00am	Departs	**Paihia** Ferry Terminal Building Bus Bay
11.05am	Departs	**Waitangi** Waitangi Treaty Grounds **(PLEASE: No smoking on Treaty Grounds)**
11.45am	Departs	**Kerikeri** Cobham Road bus stop
12.00pm	Arrives	**Waipapa** Klinac Lane

AFTERNOON

1.45pm	Departs	**Waipapa** Klinac Lane
2.00pm	Departs	**Kerikeri** Cobham Road bus stop
2.30pm	Departs	**Waitangi** Waitangi Treaty Grounds **(PLEASE: No smoking on Treaty Grounds)**
2.35pm	Departs	**Paihia** Ferry Terminal Building
2.45pm	Departs	**Opua** Opua General Store
2.55pm	Departs	**Kawakawa** Bus stop opposite Community Link
3.05pm	Departs	**Moerewa** Town Centre, Plunket Street
3.15pm	Departs	**Ohaeawai** Te Corner
3.25pm	Arrives	**Kaikohe** Kaikohe Bus Company 3 Mangakahia Road

Figure 3-20 : Map and timetable for the Mid North Link bus route

Another bus route operating near the site is the Intercity service between Auckland and Kaitaia via Paihia and Kerikeri. This route travels along SH11 past Opua six times a day (3 northbound trips and 3 southbound trips) and can pick up and drop off passengers on Opua Hill. There is a bus shelter on the southbound side of SH11, located approximately 80m west of the SH11/Franklin St intersection. In the northbound direction, opposite the bus shelter, the road shoulder has been widened but there is no shelter or bus stop markings.

3.10 Crash History

A crash search was carried out for the area around the proposed site using the NZ Transport Agency Crash Analysis System (CAS) database for the complete five-year period of 2017 to 2021, as well as for the first part of 2022 that has been entered into the CAS database. The search includes all crashes within the area shown in Figure 3-21.

Figure 3-21 : Crash Search Area

The search showed there have been a total 12 crashes in the search area, with one crash recorded as resulting in serious injury, four recorded as resulting in minor injury and seven recorded as non-injury crashes. Four of these crashes listed alcohol as a contributing factor, including two of the minor injury crashes, and alcohol was listed as a suspected factor in the serious injury crash. No crashes involved cyclists or pedestrians.

A crash diagram showing the location of these crashes is presented in Figure 3-22 and details on these crashes are provided in Table 3-1. It is worth noting that some of the crash locations have been incorrectly recorded in the CAS database, so their locations on the crash diagram do not match the description in the crash report. The crash locations described in Table 3-1 provide the most accurate location.

KiwiRAP[3] includes a risk assessment covering all State Highways. SH11 is considered 'low-medium' risk for both collective, (crash frequency) and personal (crash outcome severity) risks.

[3] http://www.kiwirap.org.nz/pdf/KiwiRAP%202018%20compressed.pdf

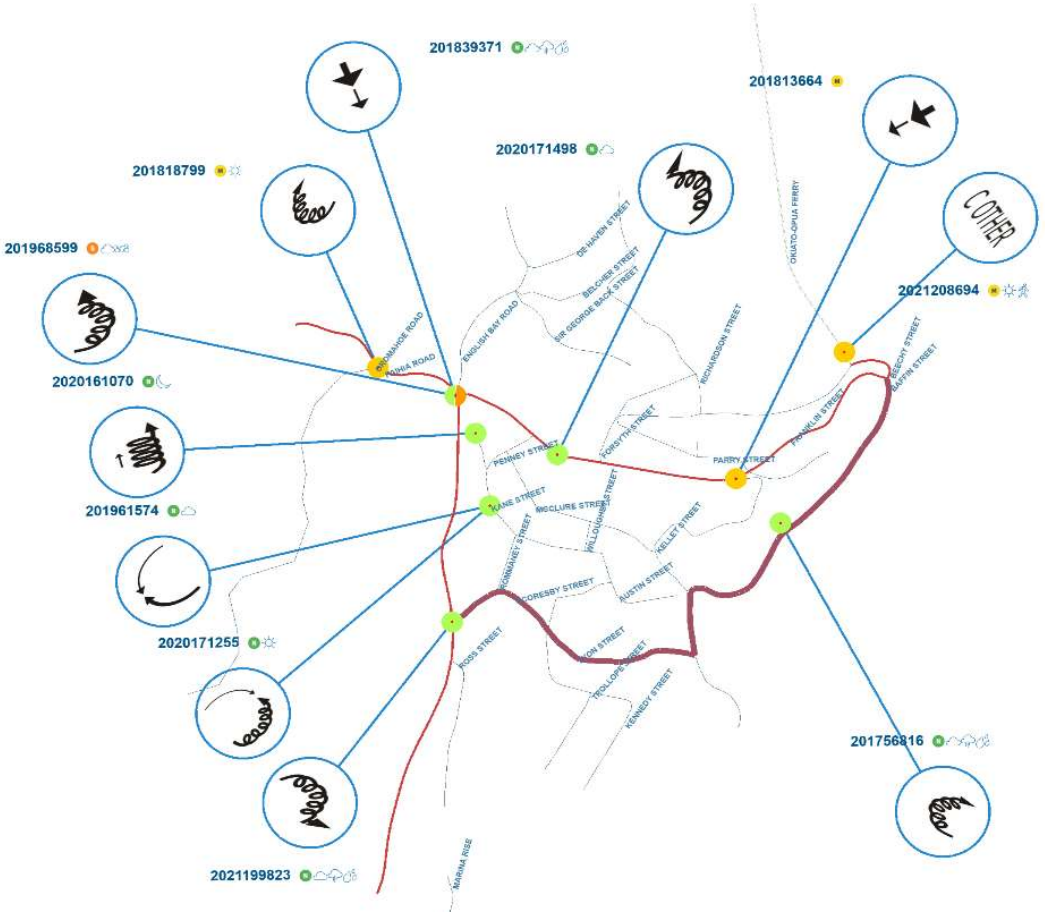

Figure 3-22 : Crash Diagram 2017 -2022

Table 3-1 : Crash Search Details

Crash Code	Location	Date	Severity	Cause
201756816	Lyon St, 220m east of Baffin St	Tue 12 Dec 2017	Non-injury	Vehicle travelling north on Lyon St lost control on minor right-hand bend and collided with a parked car. Vehicle then spun and collided with another parked car. Road condition was wet.
201813664	Franklin St, 25m west of Kellet St	Wed 25 April 2018	Minor	Westbound vehicle on Franklin St collided with the rear of another westbound vehicle on Franklin St. The driver of the rear vehicle recorded an excess breath alcohol reading.
201839371	SH11 (Paihia Rd), 50m west of English Bay Rd	Sun 29 April 2018	Non-injury	Eastbound vehicle on SH11 has collided with the rear of another eastbound vehicle on SH11 as it slowed to turn in to Franklin Rd. Following vehicle was too close.
201818799	SH11 (Paihia Rd), 40m east of Oromahoe Rd	Mon 22 Oct 2018	Minor	Northwest bound vehicle on SH11 left the roadway to the left and crashed on the side of the road, closely missing a power pole. Driver recorded an excess breath alcohol reading.
201961574	SH11 (Paihia Rd), 136m north of Scoresby St	Wed 13 April 2019	Non-injury	Vehicle travelling north on SH 11 was wishing to turn right on to Franklin Rd but turned on to Scoresby St. After doing a U-turn on Scoresby St they turned back on to SH 11, but they were on the wrong side of the road, resulting in a collision with a southbound vehicle on SH 11. Driver of northbound vehicle was a foreign visitor and unfamiliar with driving on the left-hand side of the road.
201968599	SH11 (Paihia Rd), at Franklin Rd intersection	Fri 30 Aug 2019	Serious	Northbound motorcyclist on SH11 lost control (possibly on loose metal) while negotiating left hand bend on SH11 and crashed on the roadway. Crash report states that alcohol was suspected.

2020161070	SH11 (Paihia Rd), 45m south of Franklin St	Fri 7 Aug 2020	Non-injury	Northbound vehicle on SH 11 overtook another northbound vehicle then lost control of their vehicle, exiting the roadway to the left and crashing into trees. Driver of overtaking vehicle recorded an excess breath alcohol reading.
2020167254	SH11 (Paihia Rd), 80m east of Broadview Rd	Wed 21 Oct 2020	Minor	Northwest bound vehicle on SH11 crossed the centreline and collided with a southeast bound vehicle. Crash occurred at 6:50am, driver of northwest bound vehicle stated sunstrike was a factor.
2020171255	SH11 (Paihia Rd), 170m south of Franklin Rd.	Sun 22 Nov 2020	Non-injury	Northbound vehicle on SH11 lost control of vehicle. Northbound vehicle veered left then pulled back to the right and crossed the centreline to collide with vehicle travelling south. Driver of northbound vehicle reported hearing a noise and suspecting tyre had blown out. Vehicle inspection showed a tyre had popped the rim, but this may have occurred due to crash.
2020171498	Franklin St, 54m west of Penney St	Tue 1 Dec 2020	Non-injury	Westbound vehicle on Franklin St lost control on a minor bend and left roadway - crossing the opposite lane and crashing down a bank. Driver recorded an excess breath alcohol reading.
2021199823	SH11 (Paihia Rd), at Scoresby Rd intersection	Tue 7 Sept 2021	Non-injury	Vehicle travelling south on SH11 lost control of vehicle and tried to over-correct, causing vehicle to cross the centreline, go up a bank and flip. Road conditions were wet. Loose gravel and/or excess speed were listed as possible contributing factors.
2021208694	Opua Ferry docking area	Thurs 23 Dec 2021	Minor	Vehicle towing a trailer collided with the ferry ticketing officer as it was disembarking the ferry. The ticket officer stood between the vehicle and trailer while the vehicle was stationery however the vehicle didn't see the ticket officer before disembarking so hit the officer, who got their leg caught in the trailer.

Of the eight crashes on SH11, seven are a type that may have been prevented through lower vehicle speeds (six loss of control crashes and one rear-end type crash) so lower travel speeds on SH11 may result in fewer crashes, or reduced severity of crashes. However, of the seven "loss of control" or "rea-end" type crashes, three listed alcohol as a contributing factor, indicating these crashes were likely caused through poor driving judgement due to alcohol impairment. The crash listed as having a suspected tyre blow out was likely due to a vehicle issue rather than a problem with the road.

The speed limit on SH11 is currently 80km/h however, due to the horizontal and vertical alignment, the safe operating speed near Opua is less than this. Whilst the crashes that have occurred do not appear to be caused through any inherent safety issues with the road network, an increase in crashes that could be attributed to high vehicle speeds could warrant installation of speed advisory signs to reduce vehicle speeds on this section of SH11.

4 Proposal

A detailed site layout plan is not currently available however it is understood that the applicant intends to develop the site with a mix of activities, which may include:

- residential housing,
- commercial and retail activities,
- recreational spaces
- event/entertainment spaces
- short stay accommodation
- light industrial activity
- ancillary activities (parking, public toilets, playgrounds)

To enable the type of development that is proposed the site will need to be rezoned to "Mixed Use" under the Operative District Plan or "Mixed Use" under the Proposed District Plan.

4.1 Parking

The development will provide various parking areas on site. While the details of the parking have not been provided, it is understood that some of the parking will be provided in the site's existing ground level parking areas and new parking areas will be provided within multi story parking buildings on the site.

4.2 Vehicle access

Access to the site will continue to be via Franklin Street, Lyon Street and Kellet Street. Franklin Street will be the main access point, with a roundabout control.

4.3 Pedestrians and cyclists

It is anticipated that subsequent development will incorporate appropriate pedestrian and cycle access and end of trip facilities throughout the site.

5 Trip Generation

5.1 Existing traffic volumes

The existing trip generation for the site includes trips related to activity for the existing marina and land use activities on the site. The existing traffic generated by the site can be estimated from traffic count or survey data for Franklin St and Baffin St.

A turning count survey was carried at the SH11/Franklin St/English Bay Road intersection out on 19th October 2022 during both the AM peak (8-9am) and PM peak (4-5pm). This survey collected the number of turning movements at the intersection but didn't include the through movements on SH11. The existing through movements on SH11 have been estimated using tube count data, obtained from Waka Kotahi's Traffic Management System (TMS), for the nearest telemetry site at "SH11, South of Waimangaro Rd between Paihia and Opua".

Because the available daily traffic volumes at this site were from 2021, they have been increased by a traffic growth factor 1.54% to estimate volumes for 2022. Additionally, as 2021 daily traffic volumes were affected by Covid related travel restrictions, a Covid factor was calculated using historic traffic volumes and applied to the estimated 2022 volumes.

Peak hour traffic volumes are typically 10% of daily traffic volumes so this was used to estimate the peak hour trips on SH11. This is considered a conservative estimate of peak hour flows, as traffic data for SH11 showed the typical peak hour volumes were around 8% of the average daily traffic count. The resulting peak hour traffic volumes are shown in Figure 5-1.

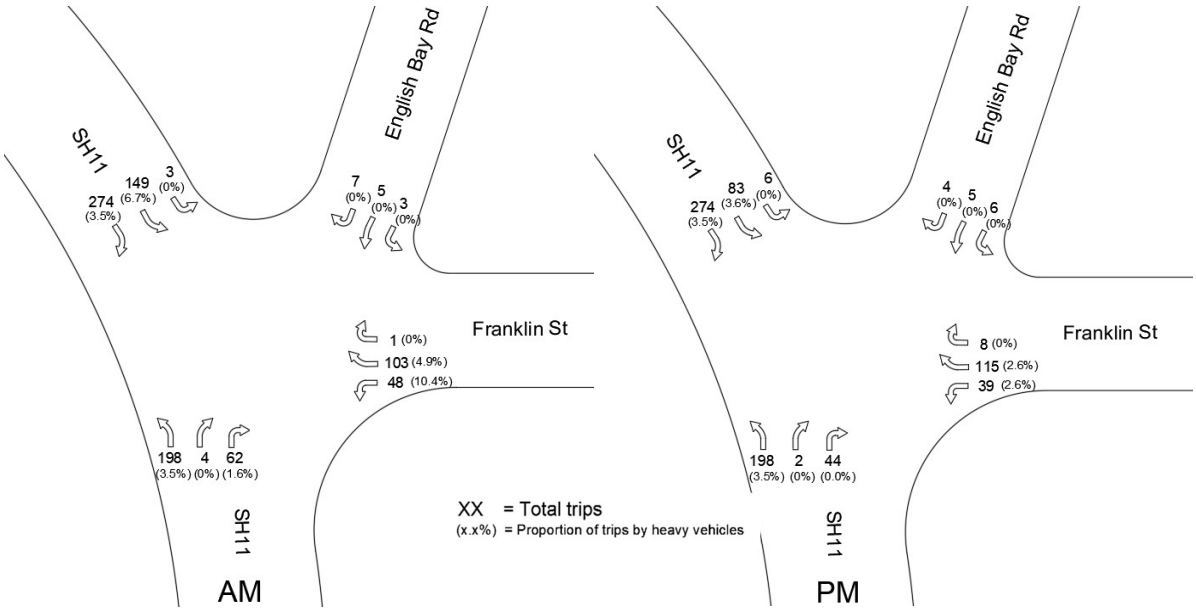

Figure 5-1 : Existing Traffic Volumes - SH11/Franklin St/English Bay Rd intersection

5.2 Trip Generation

This section investigates the existing traffic, estimates the number of trips that could be generated by the existing zoning (permitted baseline) and predicts the additional traffic that will be generated by the proposed plan change.

Trip generation for the permitted baseline and development under the proposed plan change do not include traffic generated by the existing marina (including the boat moorings and ramp), as no changes are proposed to the number of moorings or the boat ramp itself. This means that the

traffic generation calculated under the permitted baseline and proposed activity are additional to the existing trips generated by the site.

The peak hours for traffic on SH11 are 8-9am and 4-5pm on weekdays. Weekends have a slightly lower peak traffic flow, but the traffic profile is less peaky, with volumes building until 10am then staying fairly constant until 4pm before dropping away. The peak hour for trips generated by the proposed plan change is unlikely to be during the morning peak hour so the critical period for assessment was the weekday PM peak, when SH11 peak traffic volumes coincide with the peak site traffic.

The area of land proposed for development under the plan change is approximately 5.4ha. For our assessment, it is assumed all traffic movements to and from the site will be via Franklin Street.

5.2.1 Permitted Baseline

The permitted baseline trip generation for the site has been determined by estimating the level of development that could be carried out on the existing site under the existing "Industrial" zoning. This was done by taking the permitted level of development (Stage 2 Marina expansion) and determining the total remaining area of land available for development. A typical building coverage rate for "Industrial" sites was applied to this land area to determine potential Gross Floor Area (GFA) that could be developed.

The plan submitted for the Marina Stage 2 expansion shows further industrial development could be carried out near the south of the site, in the area shaded blue Figure 5-2. This area equates to approximately 10,600m².

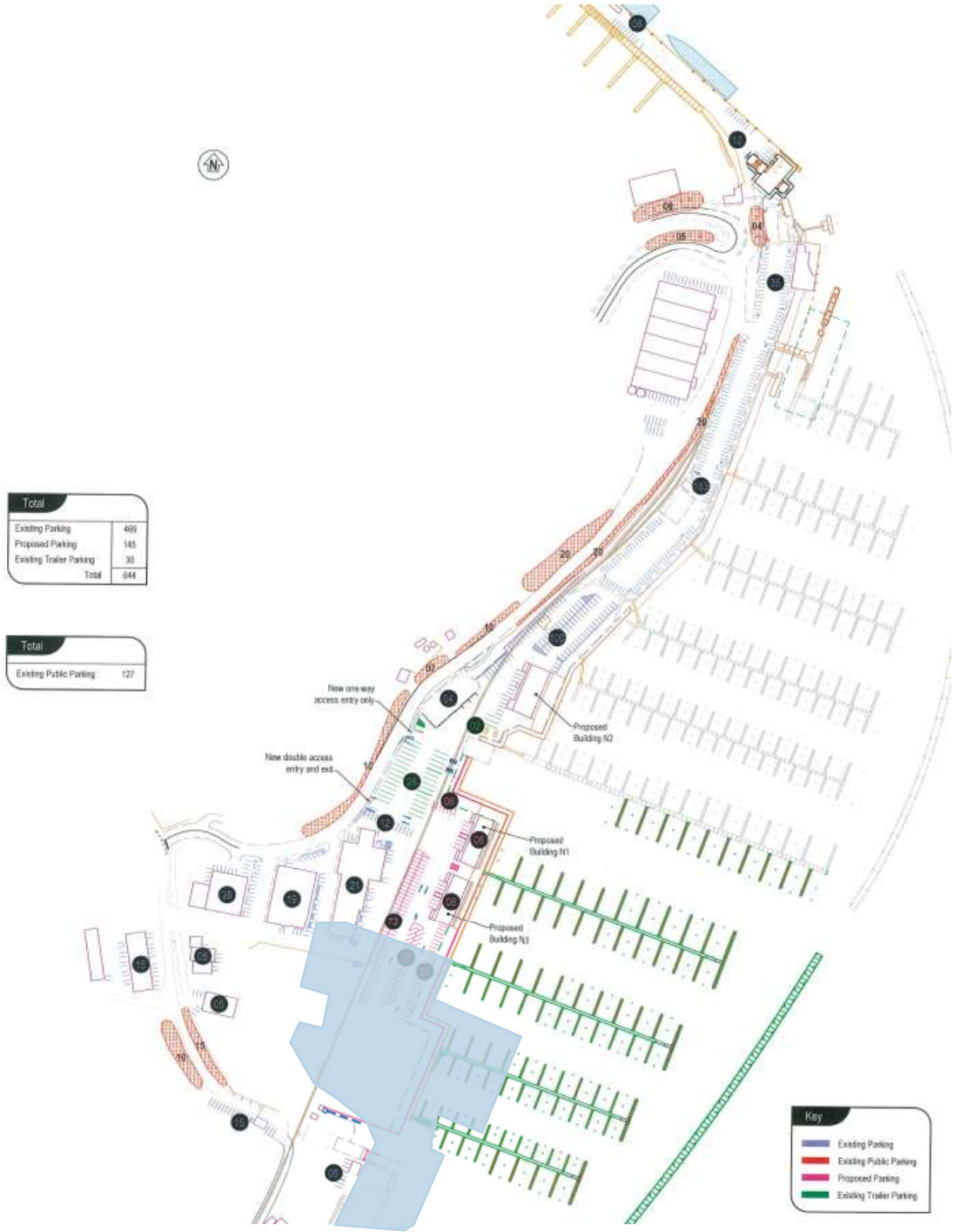

Figure 5-2 : Stage 2 Marina Plan, further development area

The District Plan doesn't provide site coverage rules for Industrial Zones however the typical maximum building coverage for a warehouse type facility is 50 - 60% to maintain suitable truck access, manoeuvrability, and on-site car parking. For manufacturing or contracting type activities the building coverage could be higher, with some District Plans allowing up to 85% site coverage as a permitted or controlled activity. For the purposes of our assessment, a building coverage of 65% the gross floor area was assumed, which equates to 6,900m^2 GFA.

This floor area assumes that all additional industrial development is of single-storey buildings. The District Plan allows a maximum building height of 12m (approx. 3 stories) in the Industrial Zone at Opua therefore the additional trips generated by an additional 6,900m^2 GFA are likely to be at the low end of what could be expected. If the site was developed with three storied buildings the total additional gross floor area could be 20,700m^2, which represents a high level of development. Therefore, our assessment for the

permitted baseline traffic generation looks at the following development floor areas scenarios to determine the potential range:

- **Low level of development (single story)**: 6,900 m^2 GFA
- **Medium level of development (two-stories):** 13,800 m^2 GFA
- **High level of development (three-stories):** 20,700 m^2 GFA

The FNDP requires a Traffic Intensity Factor (TIF) to be calculated for developments within the district to determine whether a site exceeds the allowable Traffic Intensity Threshold (in trips per day). Compliance (or non-compliance) with the Traffic Intensity Thresholds determines which District Plan classification a proposed development fits within and whether further assessment matters need to be considered.

In addition to assessing using the FNDP's Traffic Intensity Factors, further assessment has been carried out using typical "demand based" traffic generation rates to determine the level of traffic that could potentially be generated under the current zoning.

5.2.1.1 Traffic Intensity Factors

The FNDP lists Traffic Intensity Factors (TIF), based on either Gross Building Area (m^2 GBA) or Gross Floor Area (m^2 GFA), for buildings of various types of activity. The TIF is reported as the daily one-way vehicle movements for the activity.

Table 5-1 : Permitted Baseline – Traffic Intensity Factors

Activity	FNDC Traffic Intensity Factor	Gross Floor Area (GFA) m^2		TIF Daily Trip Rate
Industrial	10vpd/100m^2 GBA	Low	6,900m^2	**689** daily (one way) trips
		Medium	13,800m^2	**1,378** daily (one way) trips
		High	20,700m^2	**2,067** daily (one way) trips

The Traffic Intensity Thresholds provided in the FNDP are applied by site, rather than floor area, therefore assumptions have been made to estimate the number of industrial sites that can be developed within the available area.

For Commercial and Industrial activities, the Traffic Intensity Threshold categories are;

Up to 200 trips per day;	Permitted Activity
Between 201 – 500 trips per day:	Controlled activity
Exceeding 500 trips per day:	Restricted Discretionary

Using the assumed proportions of development provided in Table 5-3, the level of industrial and commercial development would exceed 500 trips per day therefore the permitted baseline development would be assessed as a Restricted Discretionary Activity.

5.2.1.2 Demand based assessment

Traffic generation rates for industrial type activities have been obtained using typical trip rates obtained from the TRICS database. These traffic generation rates are presented in vehicle trips per hour (vph) per 100m^2 GFA for both the AM and PM peak, and as vehicle trips per day (vpd) per 100m^2 GFA.

This resulted in the expected baseline traffic generation shown in Table 5-2.

Table 5-2 : Permitted Baseline - Trip Generation

Activity	Gross Floor Area (GFA) m²		Hourly Trip Rate (TRICS)		Total Hourly Trips		Daily Trip Rate (TRICS)	Total Trips Daily
			AM	PM	AM	PM		
Industrial	Low	6,900m²	0.579 vph/100m² GFA	0.545 vph/100m² GFA	40vph	38vph	10.623 vpd/100m² GFA	732 vpd
	Med	13,800 m²			80 vph	75 vph		1,464 vpd
	High	20,700m²			120 vph	113vph		2,196 vpd

Given its industrial zoning, a high proportion of these trips are expected be heavy vehicles which will have more negative network effects than light vehicles.

5.2.2 Proposed Plan Change Trip Generation

The actual level of development is not yet known however, as outlined in Section 4, it is proposed to include a mix of activities which may include;

- residential housing,
- commercial and retail activities (possibly including restaurants, local shops, general commercial spaces)
- recreational spaces (such as a gym, wellness centre, spa or similar)
- event/entertainment spaces
- short stay accommodation
- light industrial activity
- ancillary activities (public toilets, greenspace, playgrounds, parking buildings)

The trip generation is typically determined by applying a typical activity-based traffic generation rate to each of the respective on-site activities and adding up the trips generated by each activity to determine the total amount traffic generated by the site. However, as the area of each activity is currently unknown, our traffic generation assessment was carried out by estimating the total amount of land available for development, based on typical "maximum site coverage" values, and assuming various proportions for each of the potential land use activities.

The proposed plan change site has a total area of approximately **54.4ha**.

To determine the potential traffic generation for the site the building coverage had to be broken down into activity types so, because the proportion of activity types is not yet confirmed, the proportion of activity types has been estimated based on "best guess" assumptions on land use proportions. Table 5-3 shows the assumed proportions for each land use and the resulting land area for each activity.

Table 5-3 : Assumed Land Use Activity Coverage Areas

Activity	Assumed development proportions	Land Area m²
Residential	10%	5,400
Office/Commercial	10%	5,400
Retail	10%	5,400
Food/beverage	5%	2,700
Recreation	5%	2,700

Event/entertainment	5%	2,700
Short stay accommodation	10%	5,400
Industrial	10%	5,400
Ancillary (parking areas, public toilets, open space)	35%	18,900
	Total	54,000m²

The Gross Floor Area for each activity was calculated based on applying typical maximum building coverage rates to the available land area. The FNDP provides rules around permitted activity maximum site coverage for residential zones, which states:

> 7.6.5.1.17 Building Coverage:
>
> *Any new building or alteration/addition to an existing building is a permitted activity if the total Building Coverage of a site does not exceed 45% of the gross site area.*

The District Plan doesn't provide site coverage rules for Commercial or Industrial Zones but does provide maximum building heights, which in Opua are 10m (approximately 3 stories) for Commercial zone and 12m for Industrial Zone. As discussed in Section 5.2.1, industrial zones typically have a higher building coverage than residential areas so, to account for the varying activities within the plan change site, the building coverage for the proposed plan change site was assumed to be **60%**. Applying this rate to the total plan change site resulted in approximately 19,600m² of total building coverage.

However, our assessment will assume development outcomes of varying heights and aim to capture a range of potential effects through a range of possible development outcomes. We have used the variable of height, purely in proxy of a detailed plan. This will increase the overall GFA for the plan change area therefore further assessment was carried out assuming three development scenarios which are;

Low development: full single-story development
Medium development: full two-story development
High development: full three-story development

Table 5-4 : Development Scenarios - Gross Floor Areas

Activity	Land Area m²	Low Development (1-story) m²	Medium Development (2-stories) m²	High Development (3-stories) m²
Residential	5,440	3,240	6,480	9,720
Office/Commercial	5,440	3,240	6,480	9,720
Retail	5,440	3,240	6,480	9,720
Food/beverage	2,720	1,620	3,240	4,860
Recreation	2,720	1,620	3,240	4,860
Event/entertainment	2,720	1,620	3,240	4,860
Short stay accommodation	5,440	3,240	6,480	9,720
Industrial	5,440	3,240	6,480	9,720
Ancillary* (parking areas, public toilets, open space)	19,040	N/A	N/A	N/A
Totals	54,400m²	21,060m²	42,120m²	63,180m²

*Ancillary buildings don't generate traffic but support traffic generating activities on-site, therefore GFA is not required for traffic generation assessment.

5.2.3 Demand Based Assessment

The potential trip generation for each activity has been calculated using typical trips rates obtained from the TRICS database. These rates have been determined from vehicle count surveys for similar land use activities.

The TRICS data showed that the peak hour for trip generation occurs during the interpeak period (between the AM and PM peak periods) followed closely by the PM peak period. Given peak traffic volumes for the surrounding road network occur during the AM and PM peak periods, the critical period is the PM peak when high site traffic volumes coincide with the peak SH11 volumes, therefore our assessment focuses on the PM trip generation rates.

Traffic generation for the site is summarised in Table 5-5 below.

Table 5-5 : Proposed Plan Change – TRICS Demand based assessment

Activity	Low		Medium		High	
	PM Peak	Daily Trips	PM Peak	Daily Trips	PM Peak	Daily Trips
Residential	6	63	11	125	17	188
Office/Commercial	16	214	32	428	48	643
Retail	83	983	167	1,970	250	2949
Food/beverage	102	1,339	203	2,677	305	4016
Recreation	35	394	70	787	105	1181
Event/entertainment	3	20	6	40	8	60
Short stay accommodation	39	514	78	1,028	117	1542
Industrial	Not included in Plan Change Development traffic as existing traffic volumes already include industrial development. The industrial area for the plan change development is not expected to exceed area of existing industrial activity.					
Totals	283	3,526	567	7,052	850	10,578

5.2.4 Internal trip capture

The trip rates used to calculate the total trips for the site are based on external trips generated by the activity, so vehicles arrive to the activity from outside of the plan change site and depart the activity to leave the plan change site. However, mixed use sites are known to generate a proportion of internal trips, known as internal trip capture, which is the portion of trips generated by a mixed-use development that both begin and end within the development. As a result, a mixed-use development that generates a given number of total trips creates less demand on the external road system than single-use developments generating the same number of trips. Therefore, the likely trip generation outcomes would be lower, potentially significantly, than shown in Table 5-5.

For a development with residential, retail, accommodation, and commercial activities, as proposed for the Plan Change site, a high proportion of trips will typically remain internal to the subdivision. The Road and Traffic Authority's (RTA) *Guide to Traffic Generating Developments* (2002) report states that *"about 25% of trips are internal to the subdivision, involving local shopping, schools, and local social visits"*. As such, the actual number of trips generated by the site could be lower than calculated above, therefore the number of trips used in our assessment is a conservative assessment.

5.3 Trip Distribution

The distribution of traffic to and from the development has been determined based on a combination of the existing trip distribution obtained from the traffic survey carried out at the intersection of SH11/Franklin St/English Bay Rd, a gravity model and arrival/departure trip proportions obtained from the TRICS database.

The TRICS database presents hourly trip volumes with both arrival and departure trips for each activity type. The total hourly trip rate for an activity is obtained through combining the arriving and departing trips. The proportion of arrivals and departures derived from TRICS is shown in Table 5-6.

Table 5-6 : Trip Distribution (from TRICS) – Arrivals and Departures

	AM		PM	
	Arrivals	Departures	Arrivals	Departures
Permitted baseline	65%	35%	38%	62%
Plan Change Development	44%	56%	51%	49%

The gravity model results showed trips arriving and departing from the proposed plan change development will likely result in a directional split of **53%** of trips to/from the north (Paihia and surrounding communities) and **47%** to/from the south (Whangarei and other communities).

Using the distributions outlined above, the predicted trips to/from the site for the permitted baseline and proposed plan change development are shown in Table 5-7.

Table 5-7 : Trip Distribution for permitted baseline and plan change development.

			To/from north			To/from south		
			Low	Mid	High	Low	Mid	High
Permitted baseline	AM	Arriving	14	28	41	12	25	37
		Departing	7	15	22	6	13	19
	PM	Arriving	8	15	23	7	13	20
		Departing	12	25	37	11	22	33
Plan change	AM	Arriving	18	36	54	16	32	48
		Departing	23	45	68	20	40	61
	PM	Arriving	76	153	229	68	136	204
		Departing	73	147	220	65	131	196

The additional trips in Table 5-7 results in predicted traffic movements at the SH11/Franklin St/English Bay Rd intersection, for the permitted baseline and proposed plan change development, as shown in Figure 5-3 and Figure 5-4.

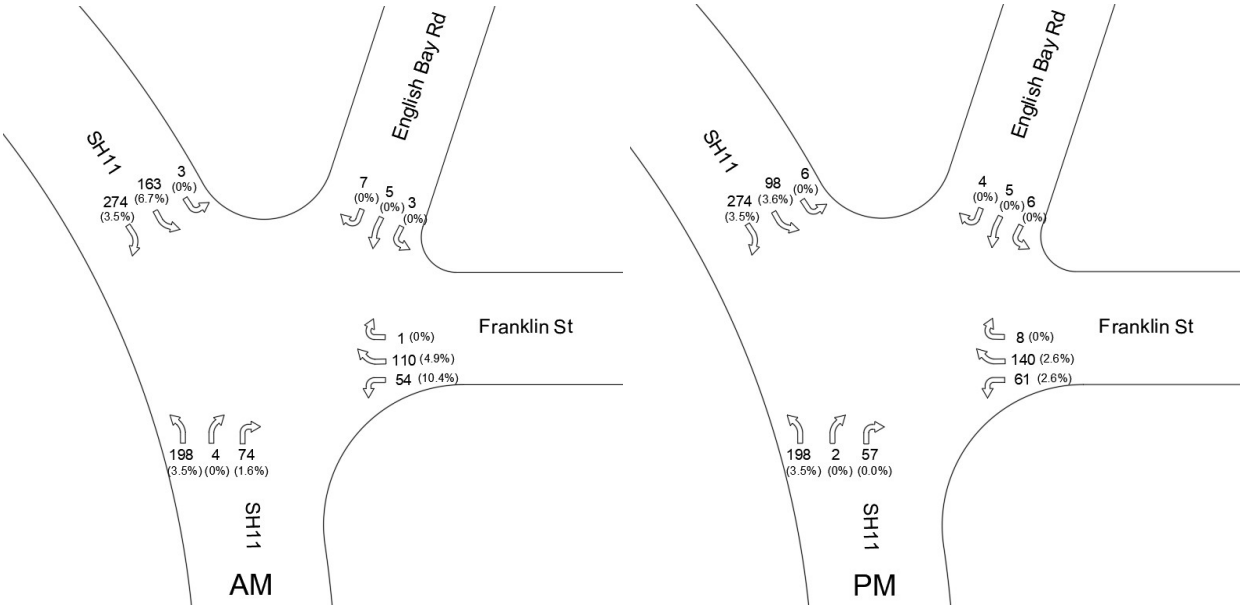

Figure 5-3 : SH11/Franklin St/English Bay Rd intersection: Traffic Volumes with permitted baseline development.

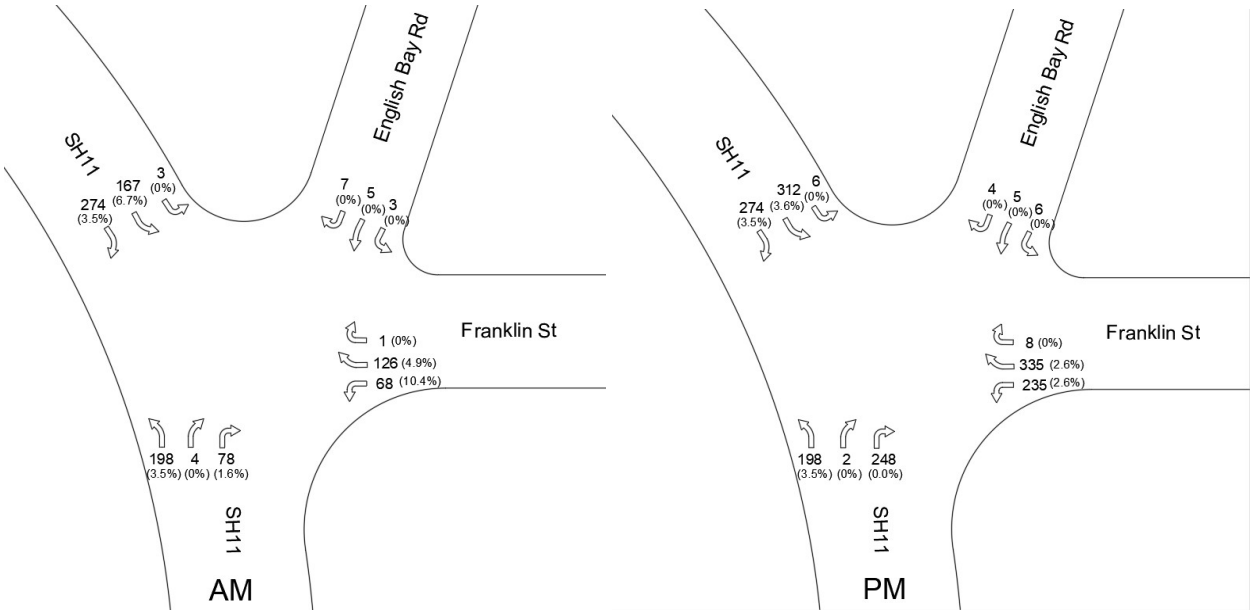

Figure 5-4 : SH11/Franklin St/English Bay Rd intersection: Traffic Volumes with plan change development.

6 Network effects

This section considers the impact the trip generation will have on the intersections near the site and any mitigation measures required.

Most of the traffic generated by the development proposal will utilise Franklin Street for travel to/from the site. Those that don't use Franklin Street will use Lyon St (via Scoresby St) however, given Lyon Street's narrow form and one-way operation, it is expected that almost all traffic will use Franklin St. As such, the intersections that will experience the greatest impact from the proposed plan change are the SH11/Franklin St intersection and Franklin St/Baffin St/Beechey St intersection. For our assessment, we have conservatively assumed that all traffic generated will travel through these intersections.

It is worth noting that the trip generation volumes estimated in Section 5 have been calculated assuming that all activities on-site will have their peak trip generation occurring at the same time. However, this is unlikely to be the case as the variety of activities provided are likely to experience their individual peak periods at different times. As such, our analysis provides a conservative estimate on the expected peak hour volumes and network impacts.

6.1 Network Impacts

6.1.1 SH11/Franklin St intersection

Intersection analysis has been undertaken using SIDRA intersection, a microscopic simulation software. AM and PM peaks have been modelled for the "high development" permitted baseline and for each plan change scenario ("low", "medium", "high").

The volumes shown in the results tables are the demand flows, which are automatically calculated in SIDRA based on the input volumes shown in Section 5.

Table 6-1: Forecast intersection operations, AM peak hour

Approach / Mvmt		Existing			Baseline			Including Plan Change activity outcomes								
								Low			Med			High		
		Veh/h	Ave. delay	LOS	Veh/h	Ave. delay	LOS	Veh/h	Ave. delay	LOS	Veh/h	Ave. delay	LOS	Veh/h	Ave. delay	LOS
South: SH11 (south)	Ahead	208	6	LOS A	208	6	LOS A	208	6	LOS A	208	6	LOS A	208	6	LOS A
	R1	4	5	LOS A	4	6	LOS A	4	5	LOS A	4	6	LOS A	4	6	LOS A
	R2	65	6	LOS A	104	7	LOS A	82	7	LOS A	99	7	LOS A	116	7	LOS A
Approach		278	6	NA	317	6	NA	295	6	NA	312	6	NA	328	6	NA
East: Franklin St	Left	51	9	LOS A	71	9	LOS A	72	9	LOS A	93	9	LOS A	115	9	LOS A
	R1	108	12	LOS B	132	13	LOS B	133	12	LOS B	156	13	LOS B	180	14	LOS B
	R3	1	8	LOS A	1	9	LOS A	1	9	LOS A	1	9	LOS A	1	10	LOS A
Approach		160	11	LOS B	203	12	LOS B	205	11	LOS B	249	11	LOS B	296	12	LOS B
NorthEast: English Bay Rd	L3	3	7	LOS A	3	7	LOS A	3	7	LOS A	3	7	LOS A	3	8	LOS A
	Ahead	5	9	LOS A	5	9	LOS A	5	9	LOS A	5	9	LOS A	5	9	LOS A
	R2	7	10	LOS A	7	11	LOS B	7	10	LOS B	7	10	LOS B	7	11	LOS B
Approach		16	9	LOS A	16	10	LOS A	16	9	LOS A	16	9	LOS A	16	10	LOS A
NorthWest: SH11 (north)	Left	3	6	LOS A	3	6	LOS A	3	6	LOS A	3	6	LOS A	3	6	LOS A
	Ahead	157	5	LOS A	200	5	LOS A	176	5	LOS A	195	5	LOS A	214	5	LOS A
	R1	288	5	LOS A	288	5	LOS A	288	5	LOS A	288	5	LOS A	288	5	LOS A
Approach		448	5	NA	492	5	NA	467	5	NA	486	5	NA	505	5	NA

Table 6-2: Forecast intersection operations, PM peak hour

Approach / Mvmt		Existing			Baseline			Including Plan Change activity outcomes								
								Low			Mid			High		
		Veh/ h	Ave. delay	LOS	Veh/ h	Ave. delay	LOS	Veh/ h	Ave. delay	LOS	Veh/ h	Ave. delay	LOS	Veh/ h	Ave. delay	LOS
South: SH11 (south)	Ahead	208	6	LOS A	208	6	LOS A	208	6	LOS A	208	6	LOS A	208	6	LOS A
	R1	2	5	LOS A	2	5	LOS A	2	5	LOS A	2	6	LOS A	2	6	LOS A
	R2	46	6	LOS A	60	7	LOS A	118	7	LOS A	189	7	LOS A	261	7	LOS A
Approach		257	6	NA	271	6	NA	328	6	NA	400	6	NA	472	7	NA
East: Franklin St	Left	41	9	LOS A	64	10	LOS A	109	9	LOS A	138	9	LOS A	247	9	LOS A
	R1	121	12	LOS B	147	15	LOS B	198	14	LOS B	155	14	LOS B	353	24	LOS C
	R3	8	8	LOS A	8	10	LOS A	8	10	LOS A	8	11	LOS B	8	21	LOS C
Approach		171	11	LOS B	220	13	LOS B	316	12	LOS B	301	11	LOS B	608	18	LOS C
NorthEast: English Bay Rd	L3	6	7	LOS A	6	7	LOS A	6	7	LOS A	6	8	LOS A	6	9	LOS A
	Ahead	5	8	LOS A	5	8	LOS A	5	9	LOS A	5	10	LOS B	5	12	LOS B
	R2	4	9	LOS A	4	9	LOS A	4	10	LOS B	4	11	LOS B	4	12	LOS B
Approach		16	8	LOS A	16	8	LOS A	16	9	LOS A	16	10	LOS A	16	11	LOS B
NorthWest: SH11 (north)	Left	6	6	LOS A	6	6	LOS A	6	6	LOS A	6	6	LOS A	6	6	LOS A
	Ahead	87	5	LOS A	103	5	LOS A	167	5	LOS A	248	5	LOS A	328	5	LOS A
	R1	288	5	LOS A	288	5	LOS A	288	5	LOS A	288	5	LOS A	288	5	LOS A
Approach		382	5	NA	398	5	NA	462	5	NA	543	5	NA	623	5	NA

The SIDRA modelling results in Table 6-1 and Table 6-2 show the intersection is expected to continue to operate at a good level of service (LOS) with the traffic from the proposed plan change development. Even with the highest level of development the worst LOS experienced is LOS C. This LOC allows for stable flow at or near free flow and the road remains below but efficiently close to capacity. This is generally considered the target LOS for some urban and most rural roads.

If required, the intersection can also be reconfigured to ensure the safe and efficient movement of vehicles, cyclists, and pedestrians to and from the Plan Change site and maintain the function of the State Highway and Franklin Street. The final layout for this has not been designed however it will be in the form of the existing give way system, which gives priority to traffic of SH11.

6.1.1 Franklin St/Baffin Street/Beechey Street intersection

SIDRA analysis was not carried out at this intersection as the performance of the SH11/Franklin St/English Bay Road intersection was considered the most critical to ensure the continued efficiency of the State Highway. The additional traffic generated from the proposed plan change will also travel through this intersection and potentially impact on traffic flow.

Any negative impacts arising from the increase in traffic volumes can be mitigated through reconfiguring the intersection layout to maintain the efficient movement of vehicles to and from the Ferry terminal and enable the safe and efficient movement of vehicles to and from the Plan Change site. Again, a final layout for this has not been designed however it could be in the form of a small roundabout.

A small roundabout in this location would allow vehicle movements between Franklin St and Beechy St (or Ferry Terminal) to maintain priority over traffic exiting the plan change site. Also, given most traffic movements leaving the plan change site will turn left on to Franklin St, development traffic is likely to have minimal impact on vehicles queuing on Franklin St for the ferry.

The client will work closely with FNDC and key stakeholders to provide an access to the plan change site that is safe and functional for all parties.

6.2 Access

It is intended to access to the proposed plan change using the existing roads and access locations to get to and from the site. While the final design layout for the access points is not known, the developer has indicated that improvements and modifications can be included at these accesses to mitigate any negative impacts resulting from development of the plan change site.

Any accesses provided within the plan change site can be designed to meet the access requirements of the District Plan.

6.3 Safety

The internal layout of the development site will support a low-speed environment which will improve safety for vulnerable road users such as pedestrians and cyclists. The increase in traffic on Franklin Road, and at its intersections with SH11 and Baffin St, is not expected to have a significant negative impact on safety along these roads. Franklin St includes existing separated footpaths and a zebra crossing that will continue to provide a safe travel environment for pedestrians. Franklin St does not currently have a high number of cyclists due to the steep gradient of the road and the steep gradient and speed limit (50km/h) also restricts vehicle speeds on Franklin Rd, meaning the overall risk to cyclists will remain relatively low.

The increase in traffic at the SH11/Franklin Rd intersection is not expected to result in a significant reduction in safety in this location. The intersection layout provides good visibility for vehicles entering and exiting the intersection and the SIDRA analysis showed the intersection has capacity to comfortably accommodate the increased number of vehicles using the intersection, reducing the likelihood of vehicles making risky turning movements due to there being fewer gaps in the traffic.

6.4 Pedestrians and Cyclists

The proposed plan change is not expected to generate a substantial increase of cyclists to and from the site however cyclists will travel through the plan change site to access the Twin Coast Cycle Trail. There is expected to be an increase of pedestrian and cycle movements within the site as people travel between the various activities provided. It is expected that subsequent development will incorporate appropriate pedestrian and cycle connectivity.

6.5 Construction Related Traffic Impacts

Vehicle movements during the construction phases of the development has the potential to impact on the surrounding area and road network, however the impact of construction traffic can be minimised through the requirement for a traffic management plan to be prepared and approved prior to work commencing. A traffic management plan may require controls on the times of operation (e.g., avoiding peak periods), travel routes used, and other matters to minimise potential impact.

7 Parking Demand

7.1 Existing Parking

The existing site provides 446 parking spaces for the existing marina and industrial activities, of which 14 are disability parking spaces and 40 are car and trailer parking spaces. In addition to these parking spaces there is space available for on-street parking.

ZONE	NUMBER OF CARPARKS
A	44 (including 2 disability carparks)
B	10
C	19
D	137 (including 4 disability carparks)
E	62
F	20 boat and trailer parks
G	5 carparks
H	25
I	51 (including 1 disability carpark)
J	73
Total	**446 (including 7 disability carparks and 20 boat and trailer carparks)**

Figure 7-1 : Existing Parking

7.2 Consented Environment

The consented environment is for the parking consented for the Stage 2 Marina development, which allows for 644 parking spaces and 127 on-street parking spaces, giving a total of 771 parking spaces.

7.3 Proposed Plan Change

The proposed plan change will allow for mixed use development however there is limited available parking data for mixed use sites. Parking assessments are frequently carried out by assessing each activity individually and adding them together, however the mix of activities on-site will introduce internal trip capture, with many of these internal trips being by active mode (walking or cycling) rather than car. As such, the actual parking demand for mixed use sites is expected to be less than calculated through combining the parking for each activity so the parking provision for the proposed plan change has been calculated based on only the primary activities requiring parking, with all else being ancillary. For this development the primary activities are the marina and residential activities.

7.4 Potential parking provision

Due to a lack of local data, parking data obtained was from the TRICS database for marina developments in the UK. The TRICS data showed that a marina with 400 berths had a maximum parking occupancy of 135 spaces, with the peak occupancy period occurring between 12-1pm.

The parking demand for residential developments has been assessed based more on a first principles basis, which assumes that each residential dwelling requires 1 vehicle park. On this basis, the approximate parking demand for the proposed plan change could be as follows:

Low development: 168 spaces
Medium development: 200 spaces
High development: 233 spaces.

A possible approach to supporting development potential would be to accommodate some parking in buildings.

Hypothetically, two 50m x 50m parking buildings of 3 storeys would provide around 500 spaces, (assuming average allowance of 30m^2 per space, including access). If a further 250 surface spaces are assumed, this parking scenario would cover approximately 17% of the site area: a plausible outcome. If 127 on-street spaces ((subject of consent in 2015) are also available, this scenario gives a total potential number of **877** parking spaces.

The existing consent for the site for the Stage 2 Marina expansion allowed 601 parking spaces, therefore the number of parking spaces provided under this proposed plan change scenario could potentially include an additional 250 spaces.

8 District Plan Compliance

The Far North District Plan sets out transportation related rules and matters for developments under Chapter 15 Transportation. The proposed development has been assessed against the applicable objectives and rules in the Operative FNDP.

Notwithstanding the estimated AEE for the Plan Change proposal, the FNDP is found to include rules and instruments fit to assess AEE for subsequent Resource Consent applications, meaning that the potential environmental effects arising from this plan change will be appropriately managed.

8.1 Traffic

The proposed plan change development has been assessed against the traffic requirements of the Far North District Plan.

8.1.1 Traffic Intensity Factors

Rule 15.1.6A.1 of the FNDP give Traffic Intensity Thresholds (per site) for the types of activities proposed are as follows:

Industrial and Commercial
Permitted Activity: 200vpd
Controlled Activity: 201 – 500vpd
Restricted Discretionary Activity: More than 500vpd
Residential
Permitted Activity: 20vpd
Controlled Activity: N/A
Restricted Discretionary Activity: 21 -40vpd
Discretionary Activity: More than 40vpd
Recreation
Permitted Activity: 200vpd
Controlled Activity: N/A
Restricted Discretionary Activity: 201 -400vpd
Discretionary Activity: More than 40vpd

The FNDC also provides Traffic Intensity Factors for a variety of activities that can be used to determine what category the development will meet. Using the approximate Gross Floor Areas of each development activity proposed by under the plan change, as shown in Table 5-4, the traffic intensity for the plan change site is shown in Table 8-1.

Table 8-1 : Trip Generation – Traffic Intensity Factors

		Total Daily Trips		
Activity	Traffic Intensity Factor	Low	Medium	High
Residential	Residential: 10/per unit	320	650	980
Office/Commercial	Office/Commercial: 10/100m² GBA	320	650	980
Retail	Shops: 50/100m² GBA	1,620	3,260	4,900
Food/beverage	Restaurants/Bars/Cafes: 30/100m² GBA	490	980	1,470
Recreation	Gymnasium: 50/100m² GFA	810	1630	2,450
Event/entertainment	Places of entertainment: 2 per every person designed for	300	400	500
Short stay accommodation	Motel: 3 per unit	85	170	260
Industrial	Industry: 10/100m² GBA	320	650	980

Total	4,265	8,290	12,420

Proposed plan change TIF is based on the "worst complying" activity (Residential) with between 326 – 979 vpd: **Discretionary Activity**

8.2 Parking

The proposed plan change development has been assessed against the parking requirements of the Far North District Plan.

8.2.1 Parking numbers

The District Plan contains minimum car parking requirements categorised by land use activity and states *"where there is more than one activity on a site the parking requirement is calculated separately for each activity and then added together"*.

Given the proposed site will contain a mix of activities, the number of parking spaces required has been calculated based on the combined total of the parking required for each of the separate activities proposed within the plan change site. The Operative District Plan gives the minimum number of parking spaces for each of the separate activities as shown in Table 8-2.

Table 8-2 : Proposed plan change – District Plan Parking Requirement

Site Activity	District Plan Activity	District Plan parking rate	Total Car Parking		
			Low	Medium	High
Residential	Standard Residential Unit	2 per unit	57	114	171
Office/ Commercial	Office and Commercial	1 per 40m^2 Gross Business Area	82	163	245
Retail	Shops	1 per 25m^2 Gross Business Area	131	261	392
Food/beverage	Restaurants, bars, cafes	1 per 10m^2 GFA plus 1 per 15m^2 outdoor are or 1 space for every 4 persons that activity is designed to accommodate, whichever is greater.	163	326	490
Recreation/Gym/ Wellness	Recreation: gymnasiums	3 per 100m^2 GFA	49	98	147
Event/ entertainment	Recreation: places of entertainment	1 per every 4 persons designed to be accommodated.	38	50	63
Short stay accommodation	Accommodation - motel	1 per unit plus 1 per 2 employees	34	69	103
Industrial	Industrial	1 per 100m^2 Gross Business Area	33	65	98
Total			586	1,147	1,708

The District Plan parking requirements are likely to be higher than necessary for the proposed plan change site as it does not make allowance for mixed use. The mix of activities on-site will introduce internal trip capture, with many internal trips being by active mode (walking or cycling) rather than car, therefore reducing the number of parking spaces required.

As outlined in Section 7.3, a scenario of 877 spaces is identified. The Road and Traffic Authority's (RTA) *Guide to Traffic Generating Developments* (2002) report states that *"about 25% of trips are internal to the subdivision, involving local shopping, schools, and local social*

visits". On this basis, a Resource Consent Assessment outcome could conclude a less than minor effect by adjusting the parking rates accordingly, arriving at a rate of 860 spaces.

The final number of parking spaces will be confirmed as design progresses. We recommend a scenario which demonstrates ability to meet parking demands, and identify instruments in the FNDP suitable for managing potential effects at Resource Consent.

8.2.1.1 Mobility Parking

The Operative District Plan requires that mobility spaces be provided at the following rate:

- 21-50 car parking spaces: Two accessible parking spaces
- Every additional car 50 parking spaces where more than 50 spaces are provided: 1 additional accessible parking space.

This results in the following number of mobility spaces to be provided:

Low development:	approximately **13** mobility spaces
Medium development:	approximately **24** mobility spaces
High development	approximately **35** mobility spaces

As development plans for the site are not yet available it is unknown how many mobility spaces are intended however there is plenty of space to provide the number of mobility spaces required therefore the proposed carpark is expected to be able satisfy this requirement.

8.2.1.2 Loading Parking

The Operative District Plan requires loading parking be provided where activities are established within a Commercial or Industrial Zone at the following ratio:

Building Gross Floor Area	Number of Loading spaces required
No greater than 200m^2	No loading space
Between 200m^2 and 500m^2	One loading space
Between 500m^2 and 5,000m^2	Two loading spaces
Exceeding 5,000m^2	Three loading spaces

The number of loading parks will depend on the size of each of the commercial or industrial buildings developed however, proposed development could result in the following loading requirements:

Low development:	up to approx. **40** loading spaces
Medium development:	up to approx. **75** loading spaces
High development	up to approx. **110** loading spaces.

8.2.1.1 Cycle Parking

The Operative District Plan does not specify that any cycle parking spaces are required however it does allow for the number of on-site car parking spaces to be reduced in commercial areas if provision is made for on-site cycle facilities. The District Plan rules is as follows:

15.1.6B.2.1 Cycling Facilities

a) *A maximum of 50% of the car parking spaces required by Appendix 3C are substituted by bicycle parking; and*

b) *Each car parking space is substituted by adequate space to park at least two bicycles.*

At this stage it is unclear exactly how much commercial development will be provided within the plan change site however it is expected that cycle parking will be provided for commercial activities, which will permit a reduction in the parking space requirements.

8.2.2 Parking standards

The District Plan provides parking standards around the size of parking and manoeuvre spaces. No information is available at this stage on parking space dimensions, aisle widths and manoeuvring space however there is plenty of available space within the plan change site to provide parking that meets this rule.

8.3 Access

The access requirements of the of the District Plan relate to access standards regarding their location and form. The specific details of accessway locations within the plan change site are not available however they will be provided at the resource consent stage and will be designed in accordance with the District Plan, where possible.

9 Conclusions

Our assessment has been carried out based on three development scenarios, of 'Low' (21,200 m^2 Gross Floor Area (GFA)), 'mid' (42,400m^2 GFA) and 'High' (64,700m^2 GFA). These floor areas were then used to determine the expected peak hour traffic generation, during both the AM and PM peak periods, for each development scenario. They have been used in context of a parking provision scenario. Overall, we use these data to conclude sufficient capacity in the Transport environment to accommodate possible development outcomes from a mixed-use zone.

However, the assessment is broadly conservative. The expected traffic volumes were calculated by adding together the expected traffic that would be traffic by each land use activity, but mixed-use sites are known to generate a proportion of internal trips, of potentially 25% (see 5.2.4, p31). For a development with residential, retail, accommodation, and commercial activities, as proposed for the Plan Change site, a high proportion of the total trips will typically remain internal to the subdivision. Our assessment considers the effects of all trips being external to the site, and the coincidence of peak demand across all activities. Therefore, we recommend that resulting environmental effects will likely be less than those identified in this assessment, and that those effects identified would be considered less than minor. We have also identified appropriate instruments capable of ensuring management of traffic generation effects at Resource Consent stage.

The main potential transport environmental effect is safety impacts on the SH11 / Franklin St intersection, and the potential to generate movement demands which exceed safe capacity. The modelling of various scenarios at the intersection suggests adequate capacity. The worst performing movement forecast to be the right turn movements from Franklin St (on to SH11 and English Bay Rd) during the PM peak, which operates at Level of Service C ("acceptable"). For both the 'low' and 'mid' development (defined in section 5.2.2) the worst movement is forecast to operate at LOS B, which is good.

The applicant proposes to control the site access via Franklin / Lyons St with a roundabout, providing a balanced level of service between the site and the existing Okiato - Opua ferry. Notably, the ferry traffic would continue to enjoy right of way over traffic exiting the Marina site.

Section 8 identifies that the activity would likely comply with provisions in the operative FNDP, except for traffic intensity, which would require Resource Consent, and parking. With respect to parking, the District Plan parking requirements is considered higher than necessary for the proposed plan change site as it does not make allowance for mixed use. The final number of parking spaces will be confirmed as design progresses, but there is enough space available to provide sufficient parking meet the expected demand.

The overall transport effects anticipated from the proposal, including up to the 'high' level floor area can be considered less than minor, including of a scale which avoids environmental effects, in keeping with Part 2 of the Act.

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