Future Ferry Development

Programme Business Case

June 2021

Auckland Transport
An Auckland Council Organisation

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Contents

Abbreviations

AEP	Annual Exceedance Probability
AT	Auckland Transport
ATAP	Auckland Transport Alignment Project
AUP	Auckland Unitary Plan
CO	Carbon Monoxide
DTFT	Downtown Ferry Terminal
EPMF	Enterprise Project and Programme Management Framework
FGL	Fullers360 Group Ltd
GPS	Government Policy Statement
GPS	Government Policy Statement
ILM	Investment Logic Mapping
IPM	Investment Prioritisation Method
KPIs	Key Performance Indicators
MBCM	Monetised Benefits and Costs Manual
NLTF	National Land Transport Fund
NLTP	National Land Transport Programme
NOx	Nitrogen Oxides
NPS	National Policy Statement
PBC	Programme Business Case
PgCG	Programme Control Group
PM	Particulate Matter
RFP	Request for Proposal
RLTP	Regional Land Transport Plan
RPTP	Regional Public Transport Plan
SoI	Statement of Intent
SOx	Sulphur Oxides
SSBCs	Single Stage Business Cases
WEBs	Wider Economic Benefits
WK	Waka Kotahi

Glossary

Non-clock facing	A clock-facing schedule is a timetable system under which public transport services run at consistent intervals. Non-clock facing meant that the timetable would be driven by demand and has irregular headways.
Essential services	Ferry routes with no viable alternatives such as island communities within Hauraki Gulf (e.g. Waiheke Island)
Complementary services	Ferry routes that are faster than land-based alternatives (e.g. Pine Harbour and Devonport)
Optional services	Routes with equivalent land-based alternatives (e.g. Birkenhead)
Contracted/Exempt services	Contracted services are provided by private sector operators under contract to AT whilst and 'exempt' services are entirely funded and operated by private operators.
Integral/Non-integral services	All services are categorised as either 'integral' or 'non-integral' to the regional public transport network. Integral services are considered integral as they provide important public transport connections within the urban area and are integrated with other services in the network.

Executive Summary

Auckland's ferry network plays a key role within Auckland's transport system. It provides critical access to some parts of the region, and modal choice in others, in turn providing a direct and fast access option that delivers transport system capacity and resilience.

The current ferry network has an ageing and increasingly unreliable fleet that performs poorly from an environmental perspective. This is at odds with Auckland's commitment to reduce carbon emissions by 50 percent by 2030. More than half of the current fleet will reach end of life within the next decade.

The lack of investment in vessels, infrastucture and services has reduced the level of service and curbed patronage growth, resulting in a gradual loss of mode share. Patronage growth has occurred in some growth areas, such as Hobsonville Point and Gulf Harbour, but limited vessel capacity, availability, and reliability has resulted in poor customer outcomes.

The poor state of the ageing ferry fleet, combined with very limited investment in service improvements over the last decade, has meant that without further investment a period of managed decline will occur, with increasing breakdowns, reliability issues and limited capacity reducing customer confidence. The ferry network will also be unable to contribute meaningfully to the region's and nation's mode shift and climate change goals.

This Programme Business Case (PBC) presents the case for investment and a recommended way forward for improvements to Auckland's ferry network and operating model. It has been developed collaboratively by stakeholders, including Auckland Transport (AT) (the business case owner), and Waka Kotahi NZ Transport Agency (Waka Kotahi), in accordance with Waka Kotahi business case requirements.

Three key issues have been identified:

Problem 1

The ferry network and the existing fleet has insufficient capacity and poor customer levels of service meaning it is not effectively contributing to Auckland's transport system (50%).

Problem 2

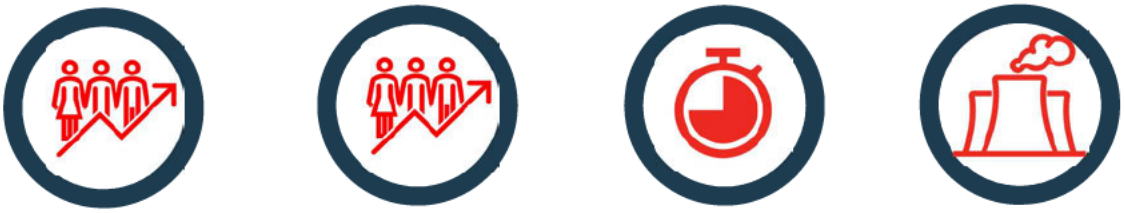
Current legislative settings, operating models and barriers to entry make it difficult to sustain or improve the ferry network in a value for money way (30%).

Problem 3

Older diesel vessels and lack of active mode faciities are resulting onhigh carbon emission (20%).

Figure 1: Problem Statements

Addressing these problems is expected to have the following benefits:



Benefit 1	Benefit 2	Benefit 3	Benefit 4
Improved customer experience leading to more people choosing to use ferries.	Improved access to opportunities from using ferry services.	Improved productivity and utilisation of the ferry network.	Reduced impacts on greenhouse gas emissions and marine quality.

Figure 2: Benefits

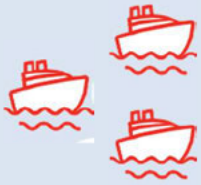
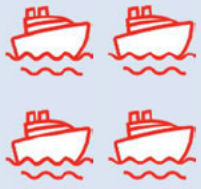
The investment partners identified a series of interventions that respond to the problems. These include:

- **Fleet Upgrades**: interventions that provide renewal and improvements to the vessel fleet
- **Ferry Service Improvements**: interventions that improve service frequency and span
- **Landside and Wharf Improvements**: interventions that improve ferry terminals, both on land and on the water
- **Public Transport Improvements**: interventions that provide better public trransport network integration
- **Active Mode Improvements**: interventions that improve walking, cycling and other active access to the ferry network.

Note, the interventions responding to problem 2 will also be addressed in the programme procurement strategy as part of a separate workstream.

The interventions identified above were grouped into five programmes as follows:

Table 1: Programme Descriptions

Level of Intervention required	Programme Description
	**Do Nothing programme** – the programme includes interventions with committed funding. This programme is not treated as a Do Minimum scenario as, due to the aging fleet with some vessels needing to be removed from operations, it would not maintain the current level of service.
	**Do Minimum programme** – this programme includes a set of interventions required to retain the service levels of the current network. These interventions include the extension of current contracts, purchase of second-hand vessels, and some minor ferry service adjustments
	**Programme III** – Network improvements to meet demand – the programme would build on Programme II interventions to meet the existing demand. It would include purchase of new vessels, provision of better frequencies for high demand routes such as Hobsonville – Downtown Ferry Terminal, better utilisation of assets during off-peak and weekends, provision of landside improvements and PT/active mode improvements.
	**Programme IV** – Network improvements to grow demand – the programme would build on Programme III interventions and would be focused on encouraging mode shift to ferries. It would include purchase of more new vessels, further enhancement to ferry service frequency and span during peak, off-peak and weekend periods, an introduction of Wynyard Quarter route, further landside and wharf improvements and better PT and active modes connections.
	**Programme V** – Long-term network development – the programme would build on Programme IV interventions and include a number of interventions focused on reducing the impact of the ferry network on the environment. This would include further frequency enhancements, renewal of the entire fleet, introduction of new technology to power vessels (e.g. hydrogen or more powerful electric ferries), extensive improvements to active mode connectivity and a number of interventions on Waiheke island to better integrate other travel modes.

The programmes were assessed qualitatively using multi-criteria analysis (MCA), and quantitatively using the cost benefit analysis against the 'Do Minimum' reference case, since this programme defines the minimum amount of investment required to retain the existing levels of ferry operations throughout 10-year period. MCA criteria included:

- Investment objectives: Customer satisfaction, ferry patronage, access to opportunities, cost efficiency and CO2 equivalents;

- Critical Success factors: Safety (water/land), RMA, Achievability (technical implementability), Cost (capital, operational and maintenance), supplier capacity and capability and alignment to national policies; and
- Opportunities and Impacts: Social, environmental effects and climate change mitigation, Climate change adaptation, impacts on Te Ao Māori and property impacts.

During the MCA assessment workshop, it was agreed a sixth option, a hybrid of all three programmes would be explored. The new programme, Programme VI, would be based on Programme III interventions and supplemented with additional interventions from other programmes based on their contribution to the investment objectives. The idea behind this new programme was to develop a set of interventions that are more cost efficient and provide better value for money than Programme IV and V. This was assessed using a similar combined MCA and economic evaluation framework to allow comparison with the other Programmes.

A summary of the outcome of this assessment is shown in the table below.

Table 2: Assessment Summary

Programme	MCA Ranking	Total patronage increase in 2031 compared to baseline in 2019	BCR	Midpoint Discounted Costs ($m NPV)
III	3	33%	1.9 - 2.1	350
IV	2	42%	1.2 - 1.4	710
V	1	54%	1.1 - 1.3	1090
VI	-	36%	1.8 – 2.0	390

The assessment of the programmes indicated:-

- Overall, MCA scoring of the programmes showed that all the Programmes identified offer options that meet the objectives of the scheme with Programmes V and VI having the best scores.
- The programmes would all generate increased patronage with the expansion of the range and quality of services provided with the most expensive IV and V having the greatest impact.
- While all the programmes have BCRs above 1 and therefore provide a minimum level of economic efficiency Programmes IV and V have relatively low BCRs and so would not represent good value for money.
- The costs of Programmes IV and V are high and these may not therefore be affordable
- While the BCR for Programme III is slightly higher than for Programme VI the difference is small with the ranges overlapping and with Programme VI having slightly higher overall benefits. Because of the better performance of Programme VI in other areas particularly the MCA scoring it was therefore chosen to be taken forward as the Recommended Programme

The recommended programme was further developed based on the outcome of the MCA and the benefit/cost analysis. Interventions in Programmes II, III, IV and V were reviewed to develop a recommended programme of interventions which scored well against the investment objectives whilst returning a higher BCR. See Figure 3: Interventions in the Recommended Programme

The core activities that are necessary to deliver the recommended programme are:

- The staged commissioning of 23 - 25 new vessels to standardised designs over the 10 year programme period to enable timely replacement of the aging fleet and the adoption of new technology and propulsion systems.
- Increasing ferry frequencies and operational spans through weekdays and weekends including peak, interpeak and evening service improvements
- Upgrades of wharf infrastructure to enable access to all wharves for new vessels.
- Landside terminal upgrades, such as shoreside charging infrastructure to enable electric ferry operations
- Construction of a new ferry terminal at Wynyard Quarter to enable a new route service, and construction of new Pine Harbour and Bayswater terminals that would be in AT ownership and allow the operation of bigger vessels. Improvements at all terminals in relation to wayfinding, accessibility and integration with other modes, including maintenance facilities.
- Bus service and active mode infrastructure upgrades to integrate with the ferry network and widen ferry terminal catchments.

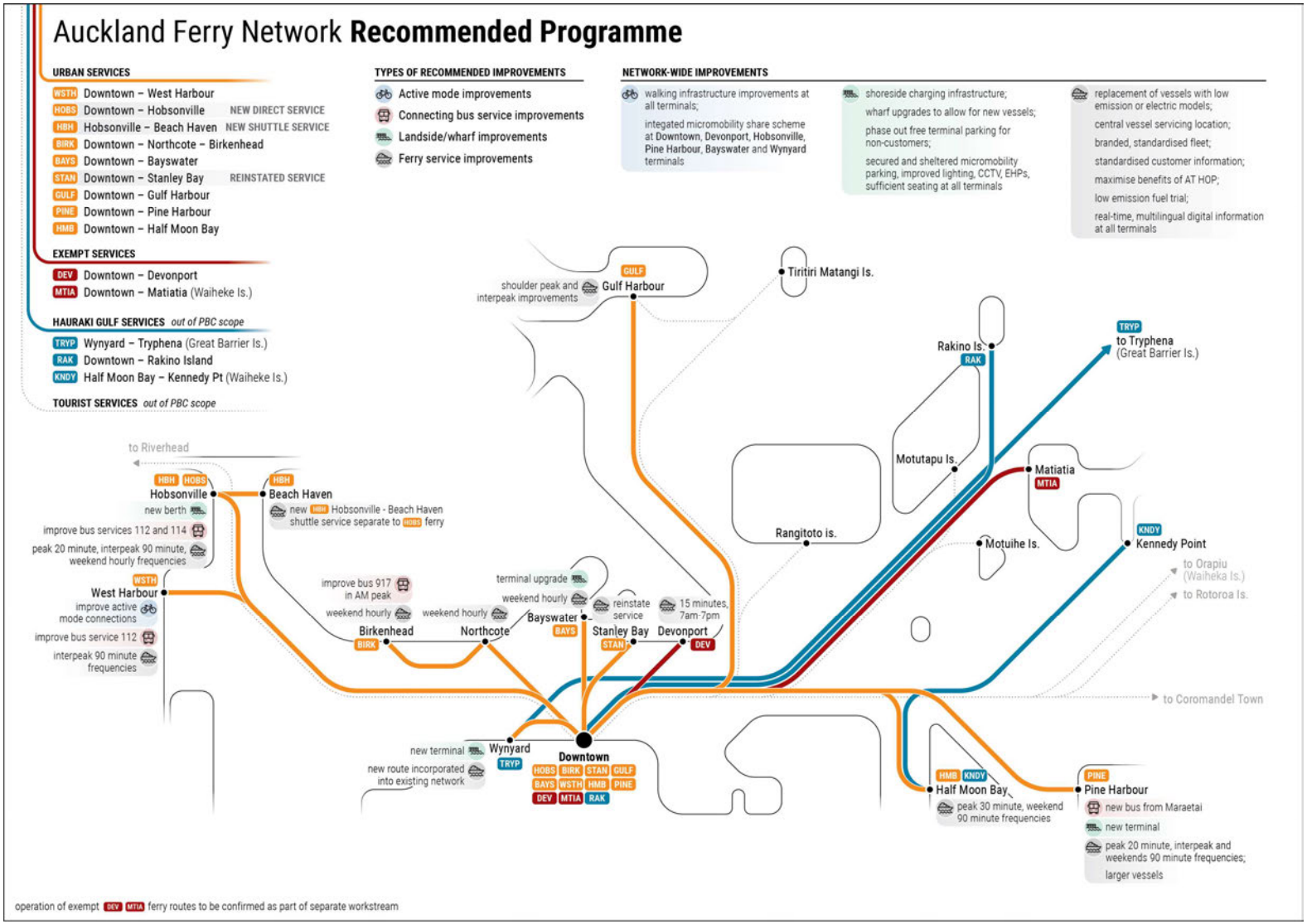


Figure 3: Interventions in the Recommended Programme

On the basis of a continuation of the current owner-operator procurement model, the total gross operating cost of the recommended programme over the three-year RLTP period from 2021/22 to 2023/24 is estimated to amount to approximately s7(2)(b)(ii) Prejudic which would be offset by revenues of about s7(2)(b)(ii) Pre. Over the ten-year period from 2021/22 to 2030/31 the gross operating costs would amount to about s7(2)(b)(ii) Prejud offset by revenues of s7(2)(b)(ii) Prejudice

In addition, the recommended programme is expected to require a capital investment for shore based infrastructure over 10 years of about s7(2)(b)(ii) Pre. Alternative procurement options with AT purchasing the vessels would require more substantial capital investment over the initial 10 year period, but would be offset by reductions in operating costs, particularly over the longer term.

The comparison of the estimated costs of the Programme VI with the availability of funding from the current RLTP suggests that the budget available for the initial three years of the programme is broadly in line with the estimated costs. Beyond this 3 year period, the RLTP budget is broadly based on a continuation of the position expected in 2023/24 and does not currently allow for the increases in capital and operational expenditure associated with Programme VI, however this position would be subject to review as the project is progressed. The mitigation of afforability risk will be a key focus of detailed business case processes going forward.

To deliver the recommended programme, Table 3 outlines the four-step process for arriving at the preferred commercial solution and the outputs that will be arrived at through the subsequent project business case or procurement strategy development process.

Table 3: Process for Arriving at Preferred Commercial

1. Route Options	2. Packaging Options	3. Ownership Options	4. Procurement Options
Currently Auckland's ferry services are made up of individually contracted routes and exempt routes. The route options analysis will determine AT's preferred approach to consolidating these routes into units, and the contracted and/or exempt status of each of these.	Packaging refers to the potential ways that different interventions in the Programme scope could be combined for procurement and delivery of each unit. Interventions will be delivered in an aggregated or disaggregated packaging approach, structured to best achieve AT's objectives.	The requirement for operators to supply vessels is seen as one of the major barriers to entry. AT's preference is long-term ownership or control of vessels to lie with AT by the end of the Programme. There are different models that could facilitate this, with the potential for different models to be applied across units.	Once AT has identified its preferred units, packaging options and ownership strategies, a preferred procurement model will need to be determined for each individual contract. While different procurement models exist for each intervention, these three factors will heavily guide the selection.
Output: Defined PTOM units to be tendered or negotiated, plus any routes that will remain exempt.	**Output:** Packaging solutions to deliver the required interventions across the defined PTOM units.	**Output:** A long-term ownership and control strategy for all vessels across the contracted units aimed to reduce the barriers to entry and by encouraging competition provide better value for money for AT.	**Output:** Preferred procurement methods for each of the defined packages and ownership strategy.

AT will commence a formal market engagement process in mid-2021, to consult with industry on its preferred packaging and procurement approaches. This will build on an initial phase of informal market engagement with incumbent operators, boat builders, designers and other relevant suppliers.

This PBC provides the justification for further investigations and detailed assessments of the recommended programme in the form of more detailed business cases relating to vessel purchases, service improvements (and associated infrastructure requirements) and other landside interventions. See Table 61

Replacing/ upgrading vessels is critical to enable ferry services keep running by providing resilience through significantly reducing the number of failures and service disruptions. The detailed assessment will determine which form of low-emission technology vessel is to be procured in the next three years to reduce CO_2 emissions and work towards achieving the targets set in the Climate Change plan. Replacing current vessels with larger vessels where needed, as well as improving service frequency, will address increasing demand so passengers do not get left behind or have to wait too long before the next service.

These business cases together will provide a basis for stage 1 of the decarbonisation of the Ferry Network, and maintaining and improving the efficiency of the network. Without this investment, the ferry network will carry on deteriorating, with more frequent breakdowns and limited capacity reducing the customer confidence which will lead to a gradual loss of mode share. The time to act is now as the window of opportunity to improve the network and operating model will be missed with the current ferry service contracts due to expire in 2023.

On this basis, it is recommended that Waka Kotahi approve the funding of these business cases.

Part A

1 Introduction

1.1 Overview

This **Future Ferry Development Programme Business Case** (PBC) presents the investment story for improving Auckland Transport's (AT) current ferry network and operating model and looks at a 10-year time frame.

The programme represents an opportunity to significantly improve an essential element of AT's public transport network and materially contribute towards achieving strategic objectives of improving the customer experience and prioritising rapid, high frequency, public transport.

The urgent need for investment is being driven by Auckland's significant urban growth, worsening traffic congestion issues, an aging fleet[1] and impending expiry of the current ferry contracts[2]. The ferry system will play a key role in responding to these transport challenges.

The PBC builds upon the *2018 Auckland Future Ferry Strategy*, which developed the strategic overview and framework that encompasses the wider picture of the ferry network. This strategy is currently operative and is intended to be progressed.

1.2 Project Extent

The project extent captures the entire Auckland ferry network, which is made up of the services shown within in Figure 4. It is noted that as this PBC only focuses on commuter/leisure ferry services, tourist services (e.g. Tiri Tiri Matangi, Rangitoto) have been excluded from the project extent.

1 Approximately 16 vessels are identified for retirement within the next 3 -5 years.
2 Fullers360 contracts expire in March 2023, with the remaining contracts expiring in July 2023

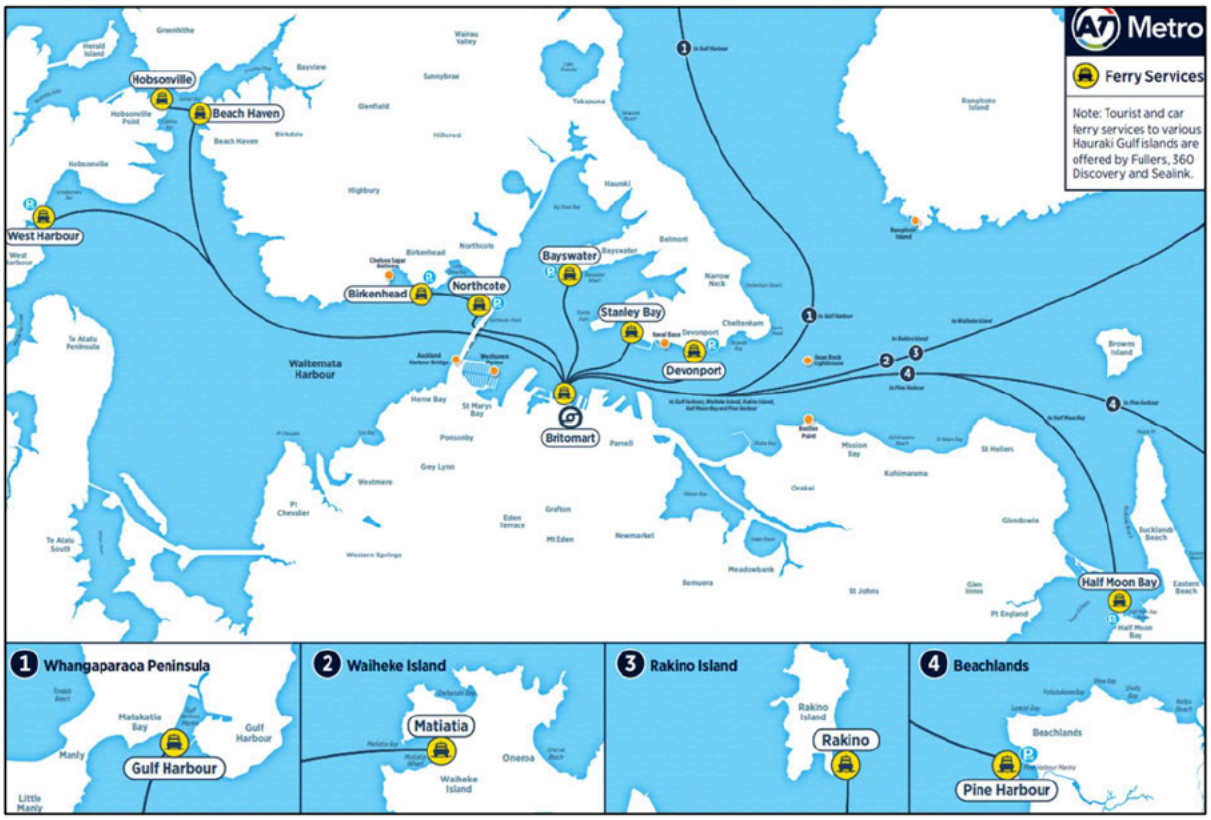


Figure 4: Auckland Ferry Services

1.3 Background

1.3.1 The Role of Ferries in Auckland

Auckland is seeing rapid population, employment, and tourism growth which is increasing the demand for space and placing pressure on existing transport infrastructure. Although the short-term outlook has been impacted by the Covid 19 pandemic, in the medium to long term there is a need to support this demand, but in a manner that supports high quality of life and prosperity.

There is limited opportunity to expand the road network, and indeed strategic desire to support more sustainable modes of travel. For Auckland to succeed, more space efficient transport modes need to be prioritised in order to foster mode share and make best use of finite transport system resources.

Ferries have an important role to play in offering an efficient mode of transport that can assist in reducing road traffic congestion and build resilience into the wider transport network. Furthermore, for some residents (e.g. those on Auckland Harbour islands), ferries provide the only method of public transport into the city centre. For others, particularly coastal communities, ferries provide a faster, more cost-efficient travel option directly into the city centre, freeing up the roads for other users.

1.3.2 History of Ferries in Auckland

Until the opening of the Auckland Harbour Bridge in 1959, Auckland had an extensive network of passenger and vehicular ferries which acted as the primary link between the North Shore and city centre. But with the opening the bridge, the ferry network was largely dismantled, leaving only the North Shore Ferries and Waiheke Shipping Company operated services – namely the Stanley Bay[3] launch, the Devonport and Waiheke ferries as well as visitor-oriented services to Hauraki Gulf Islands.

[3] Stanley Bay ferry service was suspended by AT on the 24th of December 2020, however, is proposed to be reinstated as part of this business case.

The explosive growth of the North Shore after the opening of the Harbour Bridge overwhelmed the capacity of the roading network and saw a renewed focus on ferry services as a congestion-free alternative to driving. In addition to the established passenger ferry services to Devonport and Waiheke Island (Matiatia), ferry services were subsequently established (or re-established) to:

- Birkenhead and Northcote Point - 1991
- Bayswater - 1997
- Gulf Harbour - 1997
- Half Moon Bay - 1999
- Pine Harbour - 2003
- West Harbour – 2004
- Beach Haven and Hobsonville Point - 2013.

Aside from minor service adjustments and the successful launch of weekend ferry services to Hobsonville Point, there has been little investment in additional ferry services over recent years. Service provision is limited in terms of weekend service provision and all day / late night service offering.

1.3.3 Ferry Operators

The current arrangement of the ferry network includes 'contracted' services which are provided by private sector operators under contract to AT, and 'exempt' services which are entirely funded and operated by private operators. *Fullers360* is the largest ferry operator carrying approximately 93% of total ferry patronage of the network (including Waiheke and Devonport exempt services). Belaire and SeaLink have lower market share of circa 3% percent respectively[4].

Exempt services[5] are fully commercial services and are not operated under a contractual arrangement with AT. Note that *Fullers360* operate both service models.

1.3.4 Ferry Patronage

Figure 5 shows the split of the public transport trips taken across Auckland between Jan 2019 – Dec 2019. 2019 has been used as a base year throughout this PBC as it represents the base level of patronage prior to impact on travel patterns caused by Covid 19.

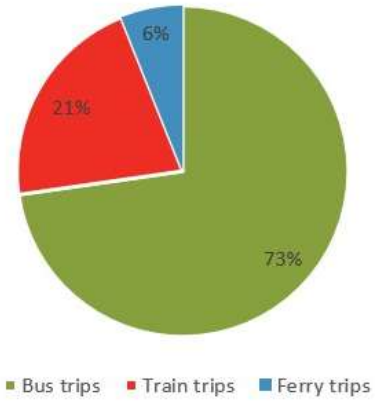


Figure 5: Public Transport Trips in Auckland

[4] Auckland Transport data 2019 year (pre Covid 19)
[5] Sections 130(2) and 153(2) of the Land Transport Management Act 2003

Of the total six million ferry trips recorded in 2019, 1.4 million occurred on contracted services whilst the remaining 4.6 million trips occurred on exempt services. These exempt services include the Devonport to Downtown Ferry Terminal, Waiheke services (both passenger and vehicular), and the car ferry and passenger services to Great Barrier Island.

Ferry trip patterns for services under contract to AT display significant on peak – off peak trends. During a typical weekday, there are an average of 162 trips during peak times and 90 trips during off peak times on contracted services. Weekends average 100 trips per day[6].

1.4 The Need for Investment

Recent population growth in Auckland (described in 2.3) and the projected continuation of growth across the wider region over the next 30 years mean that the provision of a well-connected, safe and integrated public transport network is vital for social and economic prosperity.

Critical factors that have led to an increasing need to upgrade Auckland's ferry network include[7]:

- Ageing vessels and infrastructure;
- Demand not being met at certain locations;
- Deteriorating levels of service for customers;
- Limited-service span and provision of service outside of peak times;
- Limited integration of ferry services into the wider public transport offering;
- The projected future population growth of Auckland;
- Opportunities created by expiry of all key operational contracts in 2023;
- Opportunities to introduce new types of transport such as electric ferries to achieve Auckland's commitment[8] to reduce carbon emissions by 50 percent by 2030 and achieve net zero emissions by 2050[9]. Specifically relating to public transport, transition of public transport fleets to low or zero emission vehicles is proposed as a means of achieving this[10];
- Increased demand for more sustainable and inclusive transport modes; and
- The transition to the New Network initiative[11] and its ability to better integrate effectively with the wider PT network.

Growth projections for areas served by ferries were determined using Auckland council's land use data which defines population and employment growth up to 2048. For further details, see 2.4.1 and 8.5.1.

1.5 Impact of COVID-19

New Zealand, as with the rest of the world, is currently experiencing a period of economic instability due to the ongoing impacts of the COVID-19 pandemic. Early COVID-19 impact analysis predicts an easing of growth in passenger transport demand over the short term due to slower population growth, increased working from home, reduced employment and discretionary trips. However, no significant changes are expected in the nature, scale and location of transport demand over the medium to long term.

[6] AT Strategic Case Future Ferry Development 2019
[7] These factors are discussed in detail within Section 4 of the report
[8] C40 Fossil-Fuel-Free Streets Declaration
[9] Te Tāruke-ā-Tāwhiri (Auckland's Climate Plan), Reducing our emissions.
[10] Te Tāruke-ā-Tāwhiri (Auckland's Climate Plan), Transport
[11] AT New Public Transport Network Page - https://at.govt.nz/projects-roadworks/new-public-transport-network/

The 10-year outlook remains unchanged, and the short-term COVID-19 period can be used as an opportunity to plan and implement an improved ferry network that would support economic recovery by providing better access to employment and education opportunities.

Following COVID-19 lockdowns, ferry services have recovered faster compared to other modes of public transport in Auckland reaching approximately 80 per cent of pre-COVID-19 patronage levels.[12]

[12] E.g. PT Weekly Update week commencing 15 March 2021 (81%) and week commencing 22 March 2021 (85%)

2 Programme Context

2.1 Existing Ferry Network

The geographical extent of the Auckland ferry network encompasses the Waitematā Harbour, Tāmaki Inlet, and other areas such as Rakino Island, Waiheke Island, Great Barrier Island and Gulf Harbour. As shown within Figure 4, these areas are all located within the Hauraki Gulf which covers approximately 1.2 million hectares of ocean[13].

2.1.1 Ferry Terminals

AT's ferry network consists of a total of 17 ferry terminals and is based around the Downtown Ferry Terminal from where most ferry services operate. This is currently the largest ferry terminal and provides 14 berths. Devonport and Matiatia ferry terminals are the next largest terminals whilst the remaining terminals are considerably smaller.

Most of the ferry terminals are located within areas of existing urban development with residential and commercial activities close by. The exceptions are the gulf islands where there is minimal development around the terminals or activity outside of ferry operating times.

2.1.2 Ferry Fleet

The current ferry fleet includes 29 vessels of varying sizes, speeds, fuel consumption, total capacity and ages. Of the 29 vessels, only 27 vessels are fully operational as Kea and Superflyte vessels are currently partially retired. Of the current vessel fleet, only 10 vessels are expected to be retained past the end of the programme period (2031) with 17 due to be retired before that time.

Fullers360 currently own and operate 21 vessels, whilst Belaire and SeaLink own and operate four vessels each.

A detailed list of the current vessels is provided within **Appendix C**.

2.1.3 Ferry Services

The integrated public transport network and services is specified in the Regional Public Transport Plan 2018 (RPTP). The RPTP ferry network comprises 16 service routes, nine of which are contracted by AT to external suppliers. The remaining seven services are exempt service routes operated independently of AT by private ferry services providers Fullers360 Group Ltd (FGL) and SeaLink.

All contracted ferry services are considered integral to the Auckland's public transport network[14]. In addition, exempt ferry services to Devonport, Waiheke, Great Barrier Island and Kawau Island are defined as integral to the regional public transport network within the RPTP.

A summary of current ferry services and their contracted/exempt status is provided within Table 4 and Table 5.

[13] Seachange.org.nz
[14] In line with the definition of 'integral' services, all contracted services are assumed to be

Table 4: Auckland's Contracted Ferry Services[15]

Ferry Services	Contracted / Exempt[16]	Servicing Ferry Terminal	Annual Patronage 2019 ('000s)	PBC In Scope / Out of Scope
West Harbour to Downtown	Contracted (Integral service)	Downtown, West Harbour	171,966	In scope
Birkenhead to Downtown via Northcote	Contracted (Integral service)	Downtown, Birkenhead, Northcote	170,136	In scope
Hobsonville Point to Downtown via Beach Haven	Contracted (Integral service)	Downtown, Hobsonville Point, Beach Haven	170,827	In scope
Bayswater to Downtown	Contracted (Integral service)	Downtown, Bayswater	218,052	In scope
Stanley Bay to Downtown[17]	Contracted (Integral service)	Downtown, Stanley Bay	63,277	In scope however currently not in operation
Gulf Harbour to Downtown	Contracted (Integral service)	Downtown, Gulf Harbour	182,204	In scope
Rakino to Downtown	Contracted (Integral service)	Downtown, Rakino	8,225	In scope
Pine Harbour to Downtown	Contracted (Integral service)	Downtown, Pine Harbour	195,537	In scope
Half Moon Bay to Downtown	Contracted (Integral service)	Downtown, Half Moon Bay	341,153	In scope

[15] Ferry services are based on RPTP 2018 and AT website
[16] Contracted services are provided by private sector operators under contract to AT whilst and 'exempt' services are entirely funded and operated by private operators. All services are categorised as either 'integral' or 'non-integral' to the regional public transport network. Integral services are considered integral as they provide important public transport connections within the urban area and are integrated with other services in the network.
[17] Stanley Bay ferry service was temporarily suspended by AT on the 24th of December 2020, however, is proposed to be reinstated as part of this business case.

Table 5: Auckland's Exempt Ferry Services[18]

Ferry Services	Contracted / Exempt[19]	Servicing Ferry Terminal	Annual Patronage 2019 ('000s)	PBC In Scope / Out of Scope
Devonport to Downtown	Exempt (Integral service)	Downtown, Devonport	1,870,896	In scope
Waiheke (Matiatia) to Downtown	Exempt (Integral service)	Downtown, Waiheke Island (Matiatia)	2,276,950	In scope
Waiheke (Kennedy Point) to Half Moon Bay (Vehicle with Passengers)	Exempt (Integral service)	Half Moon Bay, Waiheke Island (Kennedy Point)	453,613	Out of scope
Waiheke (Kennedy Point) to Wynyard Quarter (Vehicle with Passengers)	Exempt (Non-integral service)	Wynyard Quarter, Waiheke Island (Kennedy Point)	69,732	Out of scope
Great Barrier Island to Wynyard Quarter (Vehicle with Passengers)	Exempt (Integral and non-integral service)	Great Barrier Island, Wynyard Quarter	-	Out of scope
Kawau Island to Sandspit	Exempt (Integral service)	Kawau Island, Sandspit	-	Out of scope

As indicated above all contracted services and the exempt services from Downtown to Waiheke (Matiatia) and Devonport are included within the scope of this PBC. Existing vehicular ferry services to/from Waiheke (Kennedy Point) and Great Barrier Island as well as the Kawau Island to Sandspit services have been excluded from the scope as these do not serve commuter markets which are the primary focus of this PBC.

The exempt integral services outlined above are classified as exempt (commercial) services under section 153 (2) of the Land Transport Management Act (LTMA) but are all considered to provide important public transport connections. Should any of these services cease to be operated, the exempt service will be deregistered and the relevant route description for will then become a unit for the purposes of the LTMA, enabling Auckland Transport to put in place a replacement contracted service. Policy 6.6C of the current RPTP states that "If an exempt service is withdrawn, review the need for the service and where necessary take measures to ensure that cost-effective services are provided."

The predominant use of the services relates to commuters travelling to and from work during the week. Consequently, the peak direction of ferry travel during the morning peak is citybound, with these movements being reversed during the evening peak period.

During the weekends however, ferries are utilised mostly for leisure activities with trips being undertaken to destinations such as the city centre, Hobsonville Point, Devonport, and Waiheke Island.

[18] Ferry services are based on RPTP 2018 and AT website

[19] Contracted services are provided by private sector operators under contract to AT whilst and 'exempt' services are entirely funded and operated by private operators. All services are categorised as either 'integral' or 'non-integral' to the regional public transport network. Integral services are considered integral as they provide important public transport connections within the urban area and are integrated with other services in the network.

Ferry services are currently not as well integrated with the wider public transport network as they could be. Whilst most of the ferry terminals are serviced by at least one bus service, the timetables are not well integrated due to the non-clock face nature of ferry timetables, lack of fleet standardisation so they travel at different speeds, and frequency/pattern of service.

The current ferry routes, depending on their current status in the RPTP, pre-COVID 19 patronage and the estimated population and employment growth around each terminal, have been categorised into: very high, high, medium, and low priority routes.

The ferry route categories are shown in Figure 6 below.

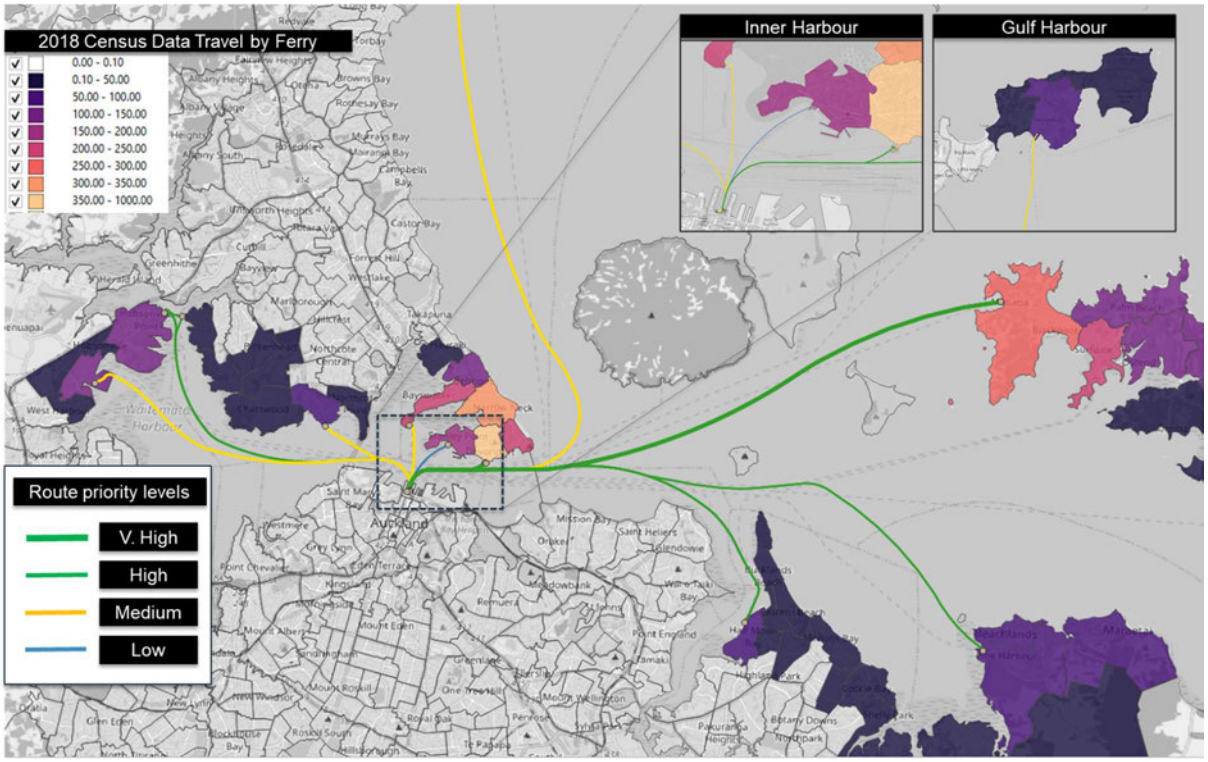


Figure 6: Ferry Route Priorities

2.2 Geographical and Environmental Context

2.2.1 Marine Conditions

There are varying marine conditions currently present within the Hauraki Gulf. The inner Hauraki Gulf is shallower (with depths of less than 40 metres) and not as exposed as the outer Gulf which is partially open to the Pacific Ocean with water depths of 50–100 metres north of Cape Rodney. These varying conditions affect the type of ferry vessels that can operate within Hauraki Gulf (e.g. for services such as Gulf Harbour, Waiheke, Pine Harbour) as larger vessels are required to operate in open waters, whilst smaller vessels can operate in shallower areas.

The varying marine conditions support a diverse marine ecosystem. The waters and islands of the Hauraki Gulf include many species of seabirds, mammals, fish, and a great diversity of invertebrates. Historically, marine mammals within Hauraki Gulf were at risk of being struck by vessels, however, this has been addressed through the implementation of voluntary speed reduction protocol in 2013 which required large vessel speeds to be at or below 10 knots.

High levels of metal contamination have been recorded within the Waitematā Harbour and Tāmaki Inlet because of the sediment and other discharges from development along the coast. Any future dredging of channels in these areas (i.e. to accommodate larger ferries) could further activate sediment. This is a potential constraint and will need to be further analysed in the detailed business case.

2.2.2 Commercial and Recreational Use

Aside from ferry services, Hauraki Gulf is used by several other commercial and recreational activities such as aquaculture, fishing, tourism, and shipping.

A number of ferry terminals are currently located within or close to marinas (e.g. West Harbour, Bayswater, Half Moon Bay, Pine Harbour and Gulf Harbour) where recreational users share the same water space. These interactions impact on ferry timetables and service delivery because the water space is constrained which make it difficult for vessels to manoeuvre in and out of the marinas.

Ferry infrastructure located inside of marinas is also subject to complex ownership and/or lease options with varying levels of approval needed from marina owners and stakeholders when attempting change or introduce improvements. These restrictions compromise the supply chain and limits AT's options in implementing significant improvements in customer experience3 and amenity, and also with regards to the level of service offered. The narrow layout and shallow depth of some marinas also restricts the size and type of ferry that can operate within marinas. This limits capacity and frequency on some routes, with West Harbour and Pine Harbour particularly impacted by these limitations.

There are also several aquaculture areas around the Hauraki Gulf. Whilst the main existing ferry routes are not affected due to aquaculture being banned along Auckland's eastern coast, there are areas at Maraetai, eastern end of Waiheke, and around Great Barrier Island where there is a potential for more aquaculture areas to be established. Given aquaculture areas have an impact on the speed at which ferries can operate in these areas and the route the ferries take, new aquaculture areas could potentially affect the establishment of new ferry routes, particularly to/from the aforementioned areas of Hauraki Gulf.

2.3 Social Context

Auckland is expected to need to accommodate 55 per cent of the entire of New Zealand's population growth over the next 30 years. For the past 20 years, the population of the main urban area[20] in Auckland has grown at a higher rate than other main urban areas in New Zealand. This is demonstrated within the historic and projected growth of the three highest populated main urban areas in New Zealand between 2001 and ~2040 is shown in Figure 7.

[20] Statistics NZ describes 'main urban areas' as the most urbanised areas in New Zealand, which are very large and centred on a city or main urban centre with a minimum population of 30,000. Main urban areas in New Zealand include Whangārei, Auckland, Hamilton, Tauranga, Rotorua, Gisborne, Napier-Hastings, New Plymouth, Wanganui, Palmerston North, Kapiti, Wellington, Nelson, Christchurch, Dunedin and Invercargill.

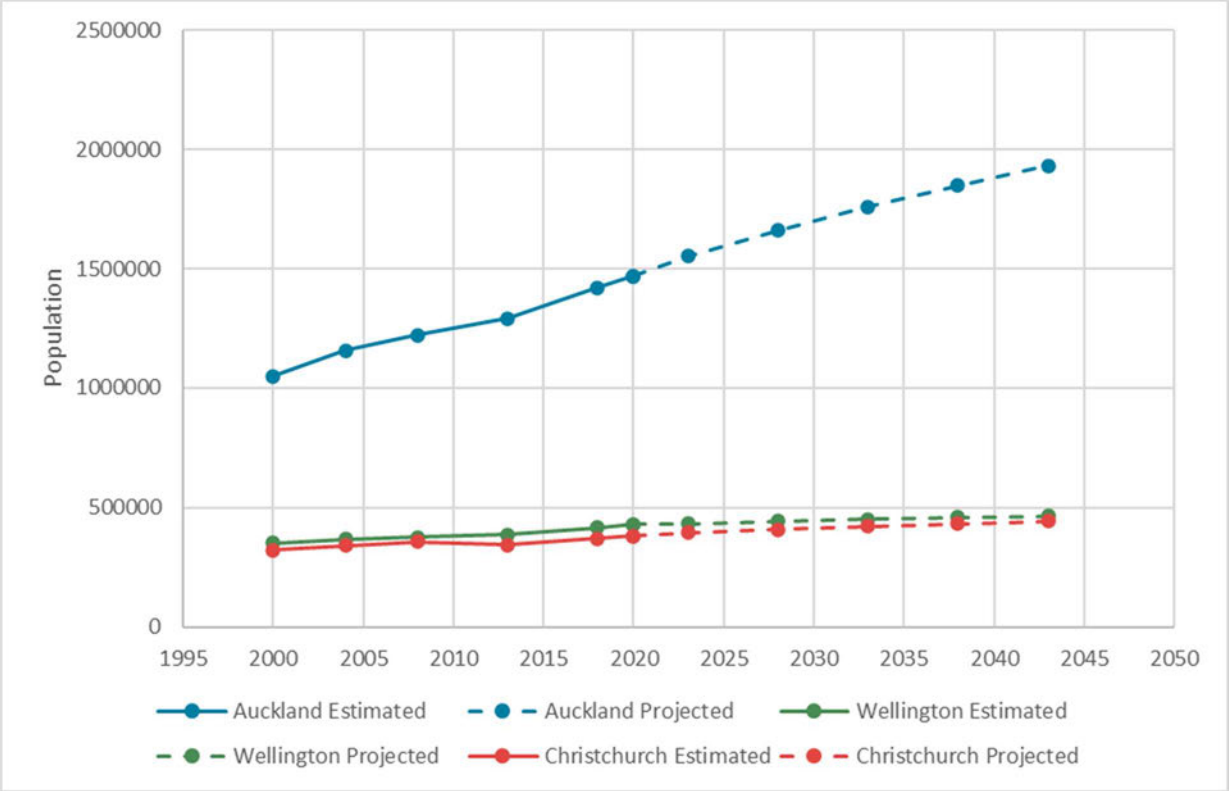


Figure 7: Population Growth in Main Urban Areas[21]

In recent times, the city has achieved substantial growth in both public transport patronage, carrying around 103 million passenger trips in the 12 months to February 2020, increasing from a low of around 35 million passenger trips in 1998. The sheer rate of expected population growth in Auckland, as illustrated in Figure 4, means that it is important to continue to develop the overall public transport system in order to keep pace with this growth.

New Zealand, as with the rest of the world, is currently experiencing a period of economic instability due to the ongoing impacts of the COVID-19 pandemic. While the economic instability brings uncertainty about the nation's future development, based on the general trend and previous global-scale recessions, it is highly likely that Auckland's population will continue to grow in the medium – longer term and with that, there will continue to be demand for travel to accommodate social and economic activities.

Over the long term, this strong population growth will generate a high level of additional travel demand which needs to be accommodated sustainably. Without improved ferry services, future travel demand is likely to shift to other transport modes, potentially further increasing the number of private vehicle trips. In addition to meeting the demands of growth, future ferry services need to accommodate expected shifts in sustainable transport uptake, including outside of commuting trips to also include leisure and recreational pursuits.

The motorway and arterial road network simply cannot cope with the ever-increasing number of private car trips, which will lead into unsustainable levels of congestion. This strongly points to a clear need for further investment in public transport services including ferry services and prioritise that investment to greatest need and deliver value for public sector investment.

2.3.1 Auckland's Māori population

[21] 2018 Census population and dwelling counts. http://archive.stats.govt.nz/browse_for_stats/Maps_and_geography/Geographic-areas/urban-rural-profile-update.aspx

The current transport network provides good access to ferry services for communities with proportionately large populations of Māori. Table 6 shows the relative size of Māori communities in the local board areas served by the current ferry network and the proportion of this Māori population with respect to the total population of Auckland[22].

Table 6 Māori populations served by current ferry network

Local board Māori	% local board population that are Māori	% total Auckland Māori population within local board
Albert - Eden	7.1	3.9
Kaipātiki	8.7	4.2
Waiheke	11.4	0.6
Devonport - Takapuna	5.5	1.8
Hibiscus and Bays	6.5	3.7
Waitematā	6.1	2.8
Howick	5.7	4.4
Upper Harbour	5.1	1.8
Great Barrier	20.5	0.1
Franklin	15	6.2

Improvements to public transport connectivity in and around the following facilities is likely to result in relatively more benefits for Auckland's Māori in the short-term:

- Downtown
- Beach Haven
- Northcote
- Waiheke
- Great Barrier Island.

Other facilities likely to attract proportionately higher numbers of Māori from adjoining local board areas include Halfmoon Bay (Howick Local Board), West Harbour (Upper Harbour Local Board) and Pine Harbour (Franklin Local Board). In future reviews of the network there may be opportunities to expand services beyond the current harbours to reach the large populations of Māori in Mangere-Ōtāhuhu and Manurewa Local Boards.

[22] Stats NZ 2018

2.4 Economic Context

2.4.1 Employment

The Auckland ferry network is focused on transporting people city centre and city fringe where there is a workforce of 200,000 (around 25% of Auckland's employment) and nearly 70,000[23] tertiary student places. Ferries also enable trips to the numerous retail, commercial and social businesses in the city centre which are not available in other smaller communities. Therefore, ferries not only support the economic activities within the city centre, but also increases the attractiveness of areas such as Hobsonville Point and Pine Harbour/Beachlands as places to live.

The number of jobs in the city centre per hectare in 2020 is 230, as shown in Figure 8, the employment within the city centre is expected to increase by more than 50 jobs per hectare by 2048 to 360 jobs per hectare which is a growth of 1.7% per annum over 28 years. This not only highlights the likely increase in workforce within the city centre, but also the likely increase in ferry patronage - as some of this workforce will originate from areas that are serviced by ferries. In addition to over 100,000 jobs in Auckland city centre, there are similar number of jobs within the inner Waitematā Local Board area which are just a short bus or train ride from the Downtown Ferry Terminal (at no extra cost to customers). This combined total means that around a quarter of Auckland's jobs are accessible by ferry.

In addition, for the more than 30,000 residents of the city centre, Waitematā Harbour and Hauraki Gulf ferries are a major recreational amenity and open up a readily accessible set of destinations outside of the city centre.

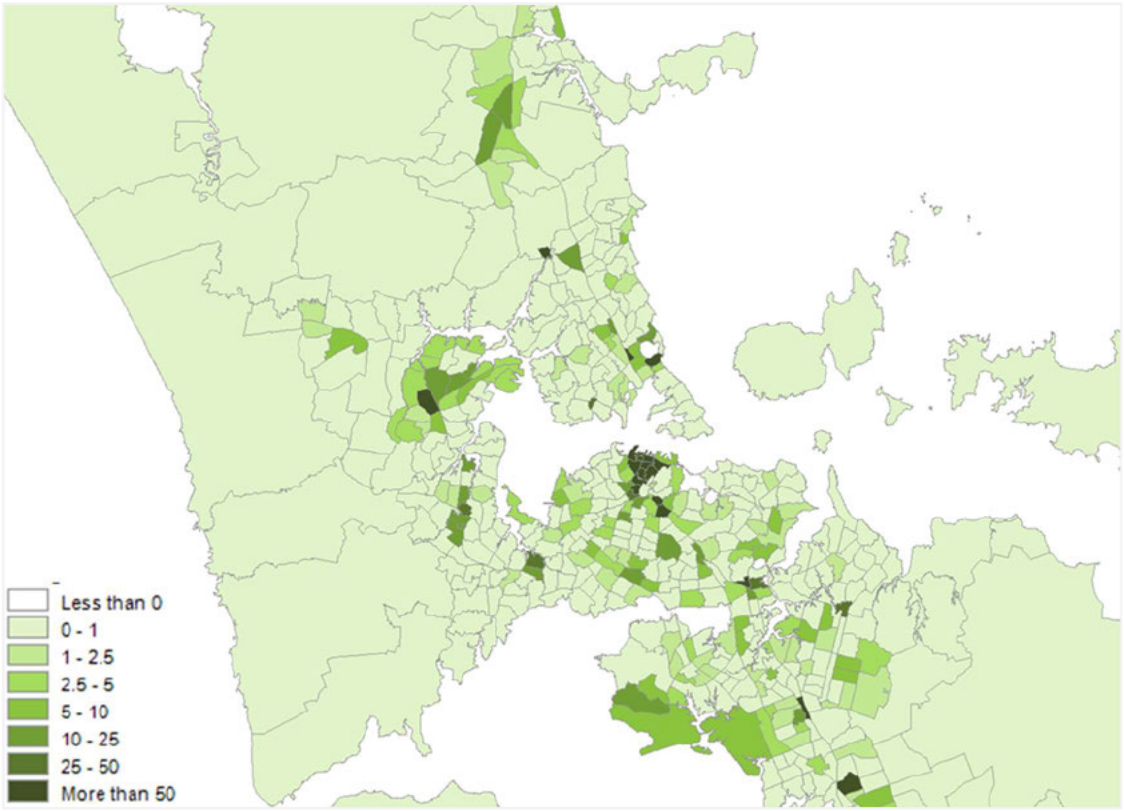


Figure 8: Expected Change in Employment Density 2016-2048 (jobs per hectare)[24]

[23] Based on the numbers enrolled at Auckland University, AUT and Unitec. This excludes students enrolled at other establishments including private training establishments. Source for provider-based enrolments https://www.educationcounts.govt.nz/statistics/tertiary-participation

[24] Developed based on Auckland Forecast Centre land use forecasts 11.5.

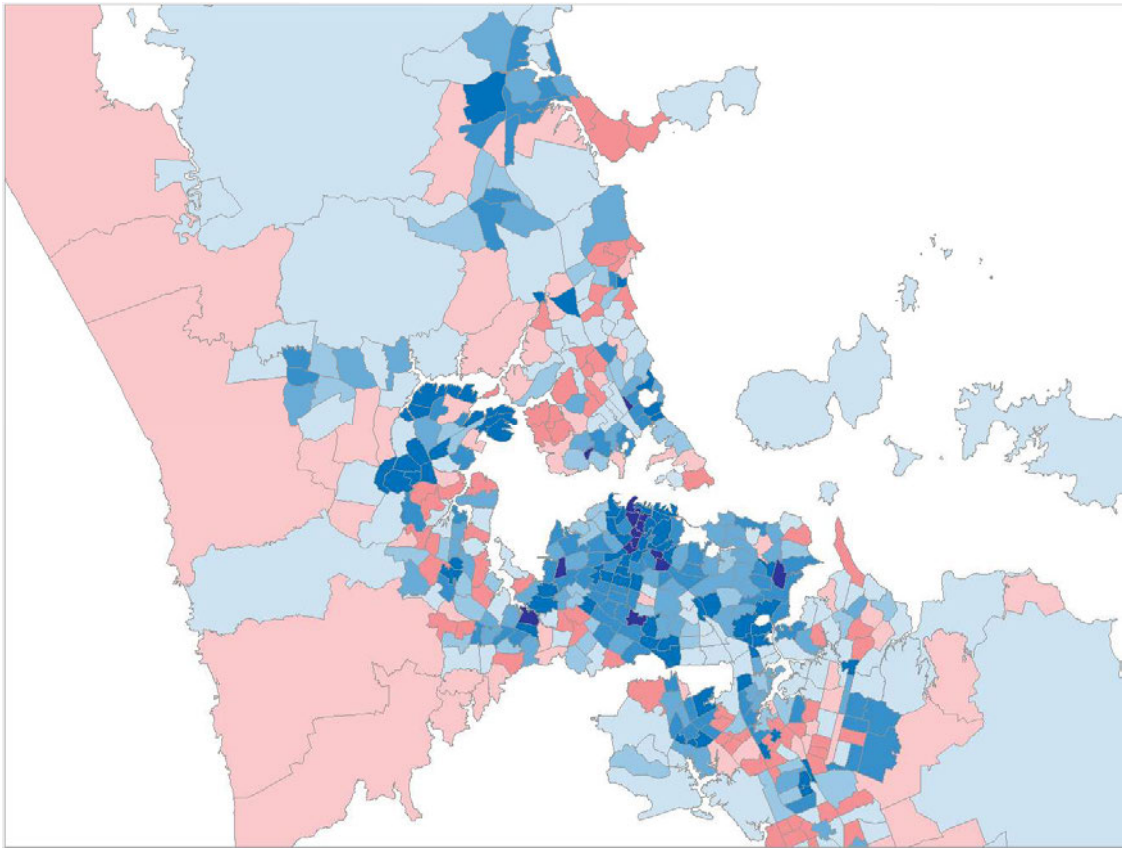


Figure 9: Expected Change in Population Density 2016-2048 (population per hectare)[25]

Arataki 2[26] outlines that by 2023 employment in Auckland is expected to return to pre-COVID 19 levels. This is in large part driven by internal migration and displaced workers from other parts of Auckland. There may be some dispersion of activity away from the main employment areas with 'a new normal' seeing an increase in working from home. This may result in pre-COVID 19 levels eventuating later than 2023.

2.4.2 Tourism

Ferries support several tourist attractions located within the Hauraki Gulf such as Waiheke Island and Great Barrier island. Furthermore, ferries are often a tourist attraction on their own right as taking a ferry out to the harbour may be considered an event or an outing.

Ferries therefore currently support tourist related economic activities in Auckland. Whilst this excludes the significant international tourist volumes at present due to COVID-19, it is expected the tourism industry will return to normal in the long-term, noting that in normal circumstances, the tourism industry is New Zealand's largest employer and largest generator of foreign exchange earnings. Ferries also have the potential to accommodate off-peak tourist trips, as capacity (in terms of available vessels) is there, but the current frequency is limited.

2.5 Strategic Alignment

The PBC strongly aligns with numerous national, regional, sector and organisational strategies and does not conflict with any objectives of these strategies. A summary of the alignment of the proposed investment in ferry services against the key policies and strategies is provided as Table 7.

[25] Developed based on Auckland Forecast Centre land use forecasts 11.5.

[26] Waka Kotahi's 10 year view of what is needed to deliver on the government's current priorities and long-term outcomes for the land transport system including impacts of COVID-19 and post-COVID-19 challenges and opportunities.

Table 7: Alignment of Ferry Investment vs Relevant Strategies

Strategy	Alignment to Investment in Ferry Infrastructure	
National		
Government Policy Statement (GPS), 2018 The GPS sets out the government's priorities from the national land transport fund. The revised GPS, which was released in March 2018, contains four strategic priorities for 2018-28.	The proposed investment in the ferry services directly contributes to each priority, and most strongly aligns to: a) Access: provides increased access to economic and social opportunities, enables transport choice and access and is resilient. b) Value for money delivers the right infrastructure and services to the right level at the best cost.	Strong
Government Policy Statement, 2021 Similar to the GPS 2018, the GPS 2021 contains four strategic priorities for 2021/22 – 2030/2031	Similar to the GPS 2018, the draft GPS 2021 contains four strategic priorities for 2021/22 – 2030/2031. The proposed investment in the ferry services contributes to each priority and most strongly aligns with: • Better Travel Options: Providing people with better transport options to access social and economic opportunities. • Climate change: Developing a low carbon transport system that supports emission reductions, while improving safety and inclusive access. Improving freight connections: Improving freight connections for economic development.	Strong
National Land Transport Programme 2018-2021 The National Land Transport Programme (NLTP) gives effect to the GPS through the allocation of funding to projects.	The NLTP notes that funding will typically be directed to: • Increase the frequency of services • Establish additional bus lanes • Improve the quality and accessibility of infrastructure • Improve connections with other modes • Expand networks. Apart from 'additional bus lanes', the proposed investment in the ferry services directly contributes all other four public transport improvement areas.	Strong
National Policy Statement (NPS) on Urban Development, 2020 The NPS has several objectives and policies related to decision making around urban environments and urban development.	The following objectives are relevant and captured by this PBC: • Objective 6: Local authority decisions on urban development that affect urban environments are a) integrated with infrastructure planning and funding decisions; b) strategic over the medium term and long term; and c) responsive, particularly in relation to proposals that would supply significant development capacity. Objective 8: New Zealand's urban environments. Supporting reductions in greenhouse gas emissions; and are resilient to the current and future effects of climate change	Strong
Arataki Version 2 Arataki presents Waka Kotahi's 10-year view of what is needed to deliver	The proposed investment in ferry services align with the following two step changes outlined within Arataki Version 2:	Strong

Strategy	Alignment to Investment in Ferry Infrastructure	
on the government's current priorities and long-term outcomes for the land transport system. It also considers the impacts of COVID-19.	• Improve urban form – enhance transport's role in creating land use and urban form that provide connections between people, product and places. • Transform urban mobility – shift from our reliance on single occupancy vehicles to more sustainable transport solutions for the movement of people and freight. Tackle climate change – support the transition to a low-emissions economy and enhance communities' long-term resilience to the impacts of climate change.	
Auckland Region		
Statement of Intent, 2019/20 – 2021/22	Investment in ferry services aligns strongly with all seven of the outlined strategic priorities: 1. Help people travel safely 2. Improve access to frequent and attractive public transport 3. Make the best use of existing transport networks 4. Support growth, urban redevelopment, and regeneration 5. Manage the impacts of the transport system on the environment 6. Ensure value for money 7. Encourage walking and cycling	Strong
The Auckland Plan 2050 The Plan establishes a long-term framework and vision for Auckland's growth and development. It describes the need to manage Auckland's transport as a single system, integrate transport planning with land use, prioritise and optimise investment across transport modes and implement new funding mechanisms.	The investment proposes to increase overall ferry capacity, allowing more people to utilise ferry services and provide more choice for moving around Auckland. This is directly aligned to the 'Transport and Access' objective in the Plan, and also links to the 'Home and Places' objective on accessibility by linking further away (and more affordable) communities with the city. There is also alignment to 'Environment and Cultural Heritage' objectives, as ferries provide a special opportunity to appreciate Auckland's coastal environment. Auckland Transport deliver outcomes for Māori consistent with the Auckland Plan working in partnership with mana whenua under the guidance of the Māori Responsiveness Framework	Strong
Auckland Transport Alignment Project (ATAP) 2021-31 ATAP sets out a s7(2)(b)(ii) Pre billion programme of significant transport infrastructure projects for Auckland over the next ten years. In addition to this it also outlines 'future priorities' for the following two decades.	ATAP states that ferries play an important role in the public transport system, 'particularly in serving locations where travel by seas is much shorter (or in the case of Waiheke the only option), than travel by land'[27]. It also identifies the upgrade of the downtown ferry terminal as the most critical component. ATAP also highlights the need to improve travel choice to support and enable greenfield growth. This travel choice could be taken up by ferries in some growth areas, specifically the north west. Decarbonising Auckland's transport system is one of the key challenges for Auckland and the 2021-31 ATAP investment programme reduces per capita and emissions over the period by 13%. Funding of 30miliion for ferry decarbonisation has been allocated	Medium

[27] Auckland Transport Alignment Project 2018, Page 35

Strategy	Alignment to Investment in Ferry Infrastructure	
Auckland Regional Land Transport Plan (RLTP) 2018 – 2028 The RLTP contains a 10-year programme which provides for significant improvements in public transport, including rapid transport, walking and cycling, network initiatives to help to address congestion, and support for greenfield and urban development.	The PBC aligns with the Auckland RLTP, in that it recognises and seeks to address the following challenges faced by Auckland: **Accessibility:** Increased congestion has resulted in longer travel times and reduced travel time reliability. This makes it more difficult to reach employment, education, healthcare, shopping, services, recreation and other activities. **Environment:** Transport is Auckland's largest contributor to greenhouse gas emissions at 40% (compared to 18% nationally) the majority of which comes from road transport. **Growth:** Accommodating Auckland's rapid population growth requires an acceleration of housing and business development and quality transport choices. Ferries were also identified as having a role in improving the resilience of the transport system. Investment in ferries will contribute towards achieving this.	Strong
Auckland Regional Public Transport Plan (RPTP), 2019 The RPTP is a 10-year plan which outlines the public transport network proposed by AT for Auckland.	The proposed investment in the ferry services most strongly aligns to the following desired outcomes of RPTP: • A continuously improving customer experience • Services that integrate with surrounding, and planned, land uses and contribute to placemaking • Affordable and equitable travel • An increasingly safe, secure and sustainable system • Improved monitoring and value for money. In addition, the proposed investment in ferry services directly contributes to the following RPTP objectives specific to ferries: • A zone-based integrated fare structure • Support the efficient provision of ferry services and infrastructure to serve the Hauraki Gulf Islands. Completed procurement of ferry PTOM units.	Strong
Better Travel Choices Better Travel Choices forms a part of overall national Mode Shift Plan "Keeping Cities Moving" developed by Waka Kotahi. Based on the three levers outlined within the Modal Shift Plan, Better Travel Choices provides identifies key focus areas for action over the next five years.	The proposed investment in the ferry services directly contributes to the following priorities underneath them: • Making shared and active modes more attractive: • Expand frequent networks and work towards frequent services having a 'every 10 minutes' definition. • Ensure service delivery is being optimised, with trade-offs being made in a clear and transparent way. • Focus network optimisation programmes on improving the efficiency of public transport services. • Improve access to high quality public transport through better walking/cycling facilities and partnering with the private sector. • Influencing travel demand and transport choices. Investigate targeted public transport fare changes, focused on improving travel affordability for those in the greatest need and on optimising existing service capacity.	Strong
Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan	The investment in ferry services aligns strongly with Auckland's Climate Plan objective of reducing Auckland's greenhouse gas emissions by 50 per cent by 2030 and achieve net zero emissions by 2050, as improvements proposed through this	Strong

Strategy	Alignment to Investment in Ferry Infrastructure	
Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan outlines Auckland Council's roadmap to zero-emissions and a resilient and healthier Auckland that is better connected to the environment and is able to thrive in the face of on-going change/disruption.	investment will look to replace highly polluting diesel vessels with low emission vessels (e.g. electric, hybrid). In addition, the investment in ferries will make some contribution to the following specific transport related targets set out in this plan. • Public transport mode share to increase from 7.8% to 24.5% and 35% in 2030 and 2050 respectively. The investment in ferries will contribute to this through improved ferry service frequencies and better integration with wider public transport network, which in turn will increase ferry patronage. • Cycling mode share to increase from 0.9% to 7% and 9% in 2030 and 2050 respectively. The investment in ferries will contribute to this through improved cycle facilities to/from terminals and cycle storage at terminals and within vessels. Walking mode share to increase from 4.1% to 6% in 2030/2050. The investment in ferries will contribute to this through improved walking facilities to/from terminals.	
Sea Change Hauraki Gulf Marine Spatial Plan 2017[28]	This document has called for development of a transport strategy that would provide for well-publicised and regular public transport options to the islands and to a range of locations throughout the Hauraki Gulf Marine Park. The proposed investment in the ferry services will contribute to achieving these changes.	Strong

Figure 10 shows how the regional and national strategies are all connected.

[28] https://www.seachange.org.nz/read-the-plan/

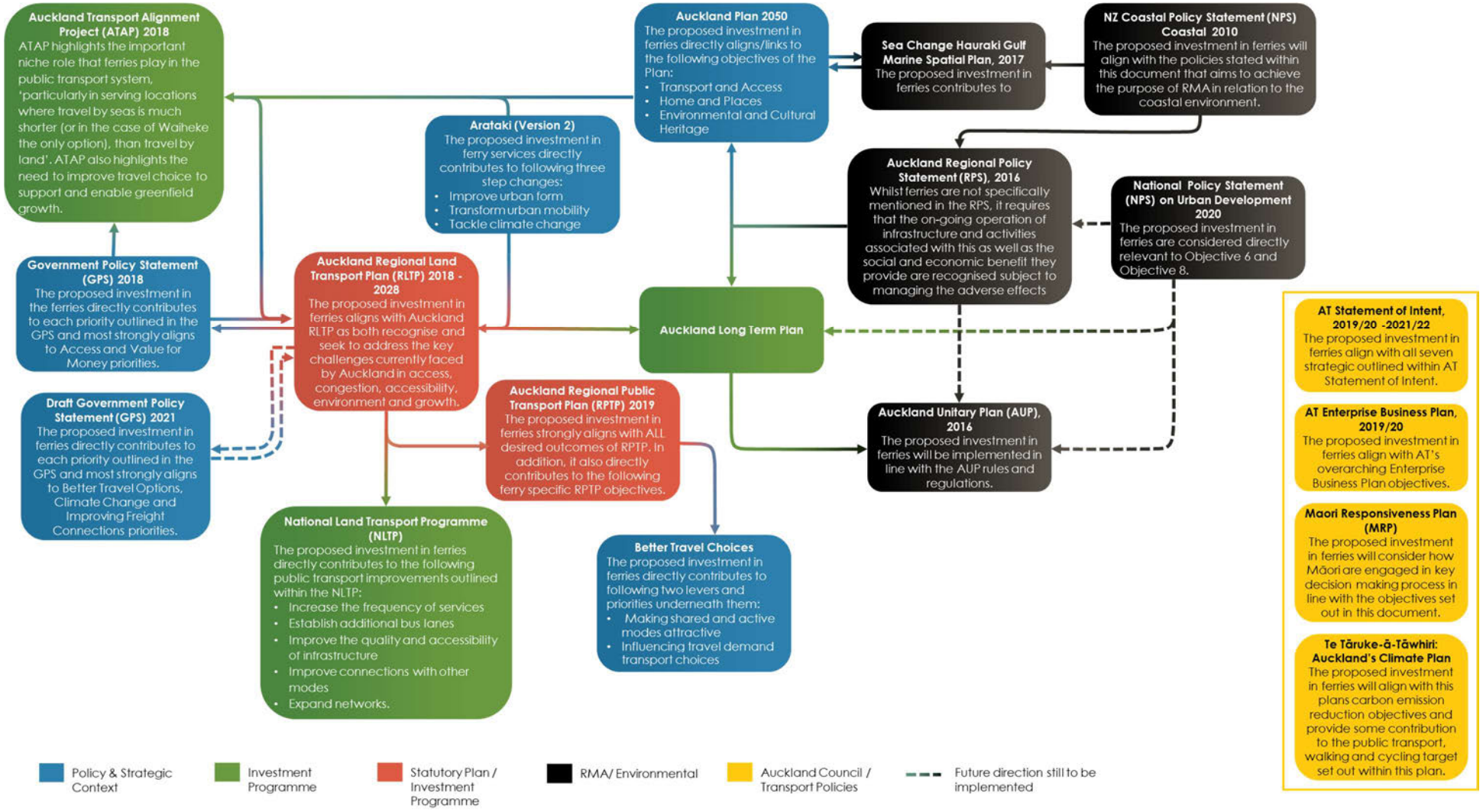


Figure 10: Strategic Alignment Summary

3 Partners and Key Stakeholders

3.1 Key Stakeholders

AT works with several organisations to deliver AT's transport requirements. The partners and key stakeholders have an interest in the expected outcomes or can influence the investment proposal and are described in Table 8.

Table 8: Partners and Stakeholders

Stakeholder	Role
Investment Partner	
Auckland Transport (AT)	AT is the local road controlling authority responsible for the planning, design and maintenance of the Auckland local transport network. AT is therefore responsible for delivering a ferry network and wider public transport system that meets the needs of the transport users. See also, Auckland Harbour Master below.
Waka Kotahi/NZ Transport Agency (Waka Kotahi)	Waka Kotahi is a New Zealand Crown entity tasked with promoting safe and functional transport by land. Waka Kotahi nominates a non-voting member to AT's Board of Directors to ensure transport decisions include a national perspective. In addition, based on the recent Land Transport Management Act changes, Waka Kotahi also oversee the planning, operation, implementation and delivery of public transport. The Waka Kotahi will assess this PBC for strategic fit and effectiveness against government priorities, in determining whether it will provide funding support.
Auckland Council	Auckland Council agrees a statement of intent with AT, which contains performance measures for transport. Council also sets the overall strategic direction and develops a Long-term Council Community Plan, which sets out transport funding.
Treaty Partner	
Mana Whenua	AT is committed to being more responsive to Māori and their role as kaitiaki of the harbour and land. There are 19 Iwi recognised with tribal boundaries in Auckland[29], All of these have interests across the Hauraki Gulf where existing ferry services are concentrated.
Engagement Partners	
Local boards	Local boards represent the people who live in their area. They make decisions on local matters, provide local leadership and build strong communities. There are 21 boards with 149 members operating across Auckland. AT works closely with local boards to deliver transport services throughout Auckland and boards have their say on the transport programme prepared by AT. All local boards will have an interest in the ferry network. However, of the 21 local boards, only the following nine boards have regular ferry services: • Waitematā • Devonport-Takapuna • Kaipātiki • Upper Harbour • Howick • Hibiscus and Bays • Franklin

[29] Auckland Plan 2050, The Hapū and Iwi of Tāmaki Makaurau

Stakeholder	Role
	• Waiheke • Great Barrier Island Residents and businesses of Waiheke, Rakino and Great Barrier are dependent on ferry services for goods, services and commuter transport beyond the islands.
Maritime New Zealand	Maritime NZ's role in New Zealand law is to ensure that all maritime activities are carried out safely, with minimal impact on the environment and on national security. Maritime NZ is the national regulatory, compliance and response agency for the safety, security and environmental protection of coastal and inland waterways.
Auckland Harbour Master	Under Maritime New Zealand law Auckland Council may appoint a harbour master to ensure maritime safety in relation to the ports, harbours, or waters for which he or she has been appointed. This function currently sits within AT. AT consults the Harbourmaster if issues related to navigation safety arise from ferry operations or proposals for new ferry services or terminals.
Ports of Auckland	Ports of Auckland is an Auckland Council owned organisation which provides container terminal handling, bulk cargo handling, freight hubs, cruise industry facilities, and other services and shares the harbour with ferry services.
Ferry Operators	AT currently contracts with three ferry operators across nine routes. Fullers360 is the largest ferry operator carrying approximately 77% of the total ferry patronage of the network[30]. Continual engagement occurs with existing ferry operators on operational matters and future network planning.
Ferry Users	Stakeholders in this category include commuters, tourists, and recreational users of ferry services.
Freight and courier services	Freight and courier services provide critical supply of goods and services to island communities. As a user of the ferry network they may have land-side infrastructure requirements that need to be considered in the development of new infrastructure.
Ferry terminal tenants	The Downtown Ferry Terminal, Birkenhead, Devonport and Matiatia terminals have several retail tenants that provide commercial amenity for ferry users. Any disruption or change to services is likely to impact these businesses.
Other	• Sustainable transport advocacy groups (e.g. Bike Auckland, Walk Auckland, Greater Auckland, Generation Zero and Women in Urbanism). • Local businesses which rely upon ferry customers Other harbour users – e.g. recreational users such as sailors who are affected by traffic in the harbour.

3.2 Meetings and Workshops

The following key project workshops and meetings have helped to shape this PBC. Meeting minutes are provided within in **Appendix A**.

- **Meeting No.1- Project Inception:** This workshop (16 July 2020) included representatives from the wider AT stakeholders and Waka Kotahi. The purpose of this workshop was to re-confirm the overarching problems and benefits associated with the current ferry network and services as well as identify potential options.
- **Workshop 1 - Investment Logic Mapping and Long List Development:** This workshop (16 July 2020) focused on re-confirming the problems and benefits as well as identifying a long list of potential interventions to address the problems.
- **Workshop 2 – Long List to Short List:** This workshop focused on the long list to short list process, the suitability of the short list and whether there are potential gaps

[30] Auckland Transport Ferry Fleet Funding and Ownership Options, Deloitte, 2018

or opportunities. Following this workshop, the short list was updated to reflect the feedback received.

- **Workshop 3 – Emerging Programme:** This workshop (12 November 2020) focused on packaging and assessment of various programmes of short-list options.

3.3 Mana Whenua Engagement

Improvements to ferry infrastructure and services has the potential to provide benefits for all communities, including for Māori. Likewise, the opportunities will come with challenges, especially with any development in the costal marine area of Auckland.

To support programme development, the following principles have been developed from previous engagement on other projects and have been used to guide discussion with mana whenua:

- Improving connectivity and therefore access to communities within the Waitematā Harbour and throughout the Hauraki Gulf, recognising that there are at times, conflicting accounts of iwi status in an area.
- Any development of ferry services and associated infrastructure will need to be planned, designed, and delivered in close collaboration with mana whenua, recognising their role as kaitiaki in the coastal marine area.
- For specific built interventions (e.g. a new pier), the project team will need to engage directly with the relevant hapū/iwi to understand the issues and opportunities as they are understood by local iwi. This will happen at an early stage so that opportunities for mana whenua to exercise their rangatiratanga are not lost or diluted by previous decisions.

The following iwi attended two hui (central and North/West) to learn about the programme and review the emerging programme to identify mana whenua values to support assessment of the options:

- Te Akitai Waiohua
- Ngāti Whanaunga
- Te Patukirikiri
- Ngāti Whātua o Ōrākei
- Ngāi Tai ki Tāmaki
- Ngāti Te Ata Waiohua
- Ngāti Whātua o Kaipara
- Ngāi Tai ki Tāmaki
- Ngāti Maru

Discussion about the emerging programme revealed support for investment objectives and resulted in the following values being identified:

- Improved environmental / sustainability outcomes – by improving management of issues, such as reducing CO2 emissions, air and water pollution, sullage, wake and wash issues;
- Improving access and the quality of services for communities; and
- Opportunities for celebrating Māori culture and pre-colonial history (vessel naming rights, opportunities to celebrate Māori culture and te reo Māori (e.g. bi-lingual passenger information systems etc).

The business case will commit investment partners to further collaboration with mana whenua and ensure effective resourcing.

3.4 Market Engagement

AT continues to engage with all existing operators as part of the Auckland Ferry Procurement Programme options for an interim transitional arrangement pending the recommended options of the PBC. Engagement has also been undertaken with naval architects/ vessel designers, shipyards and

other engineering specialists (e.g. electrical systems integrators and propulsion system engineers) during the development of the PBC.

The market engagement provides both a valuable source of information and acts as an important communication channel with the market.

Relevant AT staff from the procurement programme have been involved in the development and assessment of options for this PBC. This approach ensures that uncertainty and risk are appropriately managed whilst aligning the objectives across both programmes.

3.5 Engagement Plan

Figure 11 shows how and when different audiences have been engaged during the development of the PBC.

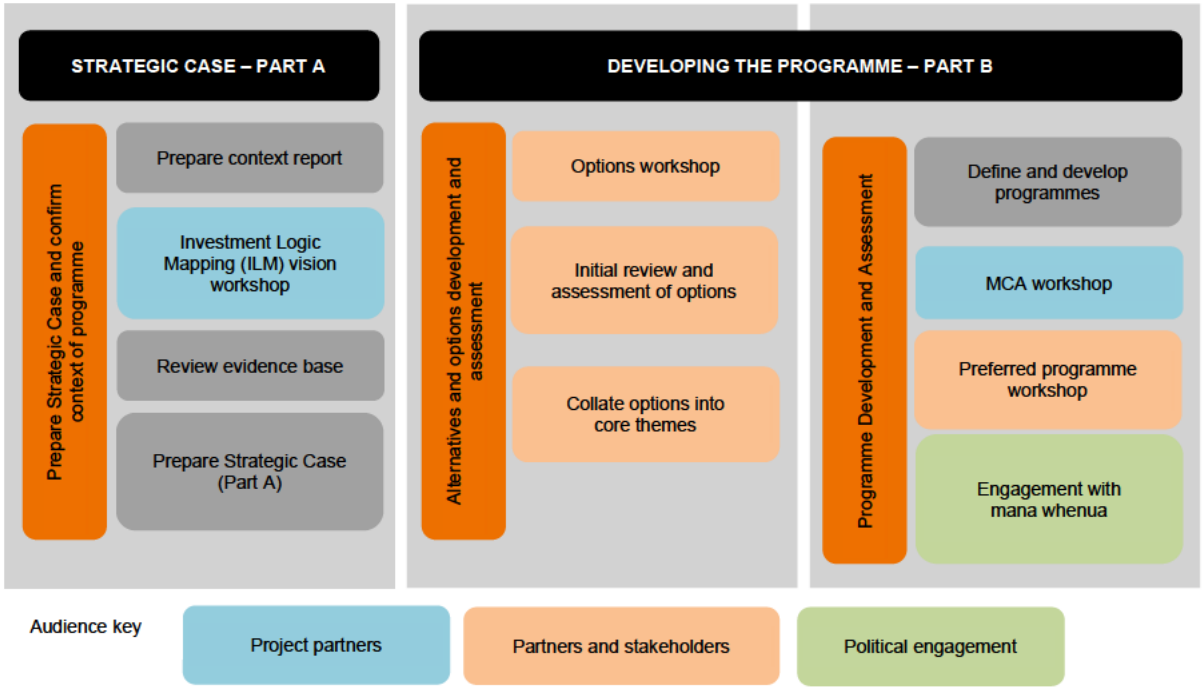


Figure 11: Engagement with Different Audiences in the Development of Preferred Programme

The objective of concentrated engagement with experts from within AT and Waka Kotahi is to identify an emerging preferred programme to support engagement with mana whenua and local boards as well as any potentially impacted stakeholders, to ensure effective communication and risk management and so that programme implementation engagement requirements can be mapped.

The timing of engagement on the emerging preferred programme with other stakeholders can be expected to commence upon approval of the PBC subject to the status of the market engagement strategy. It is critical that information about the preferred programme does not compromise AT's procurement strategy, for example by giving one party more information than others.

4 Problems

4.1 Defining the Problem

An Investment Logic Mapping (ILM) process has been undertaken with key investment partners to gain a better understanding of current issues. Based on the outcomes of this workshop, the following problem statements and associated priority weightings were identified:

- **Problem 1:** The ferry network and the existing fleet has insufficient capacity and poor customer levels of service meaning it is not effectively contributing to Auckland's transport system (50%).
- **Problem 2:** Current legislative settings, operating models and barriers to entry make it difficult to sustain or improve the ferry network in a value for money way (30%).
- **Problem 3:** Older diesel vessels and lack of active mode facilities are resulting in high carbon emission (20%).

A copy of the ILM is shown within Figure 12.

Investment Logic Mapping

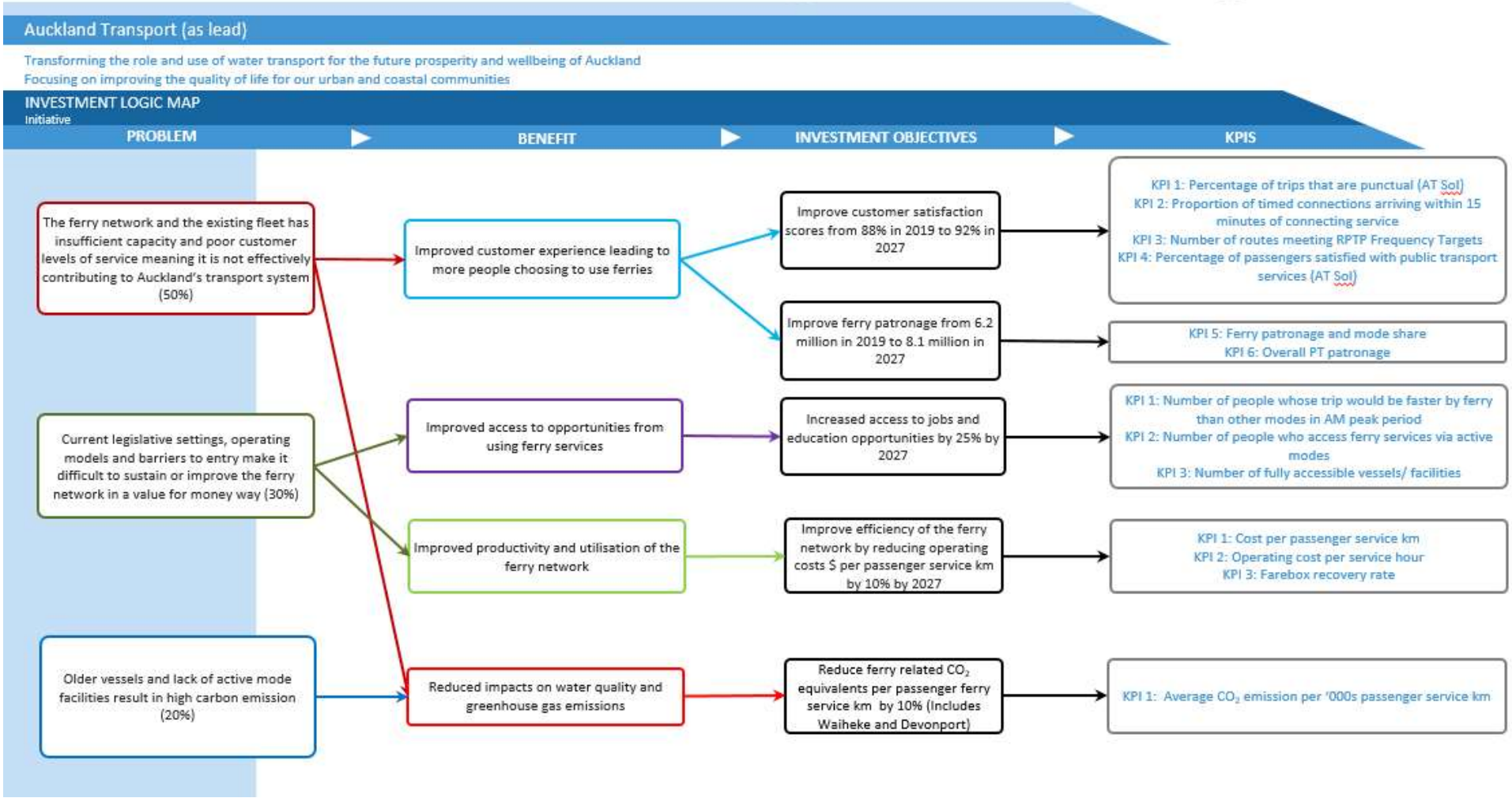


Figure 12: ILM

4.2 Problem 1 – Capacity & Customer LoS

This section provides the evidence base which substantiates Problem One (**50% weighting**).

A summary of the key causes, effects and consequences of this problem are provided within Table 9.

Table 9: Problem 1 – Key Causes, Consequences and Effects

The Ferry Network and the existing fleet has Insufficient Capacity and Poor Customer Levels of Service meaning it is not Effectively Contributing to Auckland's Transport System (50%)	
Cause	• Piecemeal and limited investment in ferries • Different user demands • Infrastructure constraints • Skill shortages • Old vessels – the current network has an ageing fleet with circa 16 vessels needing to be retired in the next 3 – 5 years.

Effects	• Poor customer LoS in the following attributes:
	  ○ Safety;
	  ○ Integration with Wider Public Transport Network;
	  ○ Poor active mode facilities;
	  ○ Vessel and Infrastructure Quality;
	  ○ Reliability;
	  ○ Timetabling (Hours of Operation, Frequency);
	  ○ Ticketing;
	  ○ Fares;
	  ○ Frequency; and
	  ○ Information.
	• Demand exceeding capacity on some routes

Consequences	○ Deteriorating customer LoS ○ Ferry passengers being left behind ○ Not attracting new customers
Evidence	• Overall customer satisfaction for ferries has reduced from 90.4% to 87.7% between 2013 – 2020, whilst overall satisfaction levels for buses and trains improved from 80.2% to 90.6% and 79% to 91.5% respectively. • Increasing trend in the number of passengers left behind on Pine Harbour and West Harbour services over the past three years, with known overcapacity issues on other services such as Hobsonville Point and Waiheke Island. • Flat ferry patronage growth since 2016 as per 4.2.3.3 indicating that ferries are failing to attract new passengers and losing some passengers. This is in contrast to significant gains in train and bus patronage.

4.2.1 Causes

4.2.1.1 Piecemeal and Limited Investment in Ferries

The ferry network has grown over the years in a piecemeal fashion without a long-term strategic vision. The lack of standards and a clearly defined roadmap has led to ad-hoc investment by ferry operators which has resulted in varying types of vessels and range of ownership of terminals. In addition, this has also resulted in some ferry terminals being located in privately owned marinas which poses challenges for efficient ferry operations, improving customer experience and a lack of space to allow for future growth.

The investment made by AT in ferries over the last 10 - 15 years has been limited due to a challenging financial environment both in terms of capital and operational budgets. The investment has been generally reactive, concentrated at hot spots or to address user disgruntlement. A new ferry services was last implemented in 2013 with only marginal improvement made to the ferry services and network since then.

The significant investment costs associated with ferries compared to other modes of public transport and walking and cycling has meant that limited funding and investment has been made in ferry network. Due to this, the capacity constraints in the ferry network have remained largely unaddressed and majority of the ferry fleet, wharves and other infrastructure has had no significant upgrades.[31]

4.2.1.2 Different User Demands

At present ferry services are required to cater for many different types of users. Although the majority of AT's contracted routes cater for commuters, a number of the exempt services also cater for tourists and recreational users. Ferry operators contracted to provide passenger services currently use the same vessels outside weekday peak periods to provide tourist services with cross-utilisation of vessels between commuter and tourist services. This suited the situation in the past where the commuter demand was limited to peak periods and off-peak services were mostly used by tourists. However, with the increased demand for off-peak and weekend services and the expansion of ferry services to cater for this demand has resulted in conflicts with the tourist demands. This creates a challenge to increasing off-peak and weekend ferry service frequency.

4.2.1.3 Infrastructure Constraints

Over the years ferry operators have commissioned bespoke vessels and have purchased or leased vessels based on what is available in the market at the time[32]. In addition, the varying characteristics of the Auckland waterways discussed within Section 2.2.1 has meant that vessels suitable for the open waters (e.g. Gulf Harbour, Waiheke Island and Pine Harbour services) are not suitable for shallower and narrow channels of the inner harbour. These factors have led to the highly varied fleet of ferries that currently service the Auckland ferry network. Whilst AT has specified vessel standards, the ability to implement these has been challenging due to historic/legacy and practical procurement reasons.

Simplistically due to the bespoke nature of the fleet, not all vessels can fit at all berths, not all marine crew are trained and qualified to operate all vessels and not all vessels can run all services due to speed, size and/or capacity. This not only poses a barrier to interoperability of existing fleet, but also any new vessels added to the fleet as the berthing and boarding profiles for these new vessels need to conform to the existing varying wharf layouts and infrastructure in order to operate across many different wharves. One such example is Pine Harbour ferry terminal where the current infrastructure can only service certain type of vessels due to being located in a marina.

[31] It is noted however that the creation of 6 new berths on the west side of Queen Wharf (as part of the recent Downtown Ferry Basin redevelopment) has been an important first step towards a consolidated ferry terminal for Auckland. The reinstatement of Northcote Wharf has also been a positive development.

[32] A list of the current ferry fleet and their varying characteristics is provided within Appendix C

4.2.1.4 Skill Shortages

At present the availability of suitably skilled and trained skippers and crew in New Zealand is limited with longer and difficult training process for skippers/crew due to regulatory requirements. In addition, as mentioned above, the lack of standardisation of vessels means that not all crew members are able to operate all vessels used for the AT ferry services. The combined effect of these reasons has resulted in a shortage of skilled staff in the ferry industry as indicated by industry/operator feedback, greater level of skipper/crew vacancies and increasing ferry cancellations arising from operational constraints[33]. This is one of the key barriers to increasing frequency on at or over capacity ferry routes. It also impacts service delivery reliability as this lack of skilled seafarers makes it difficult to cover unplanned leave or sickness resulting in operational constraints and service cancellations.

A summary of the ferry cancellations and delays due to operational constraints vessel issues in 2019 shown within Figure 13 below.

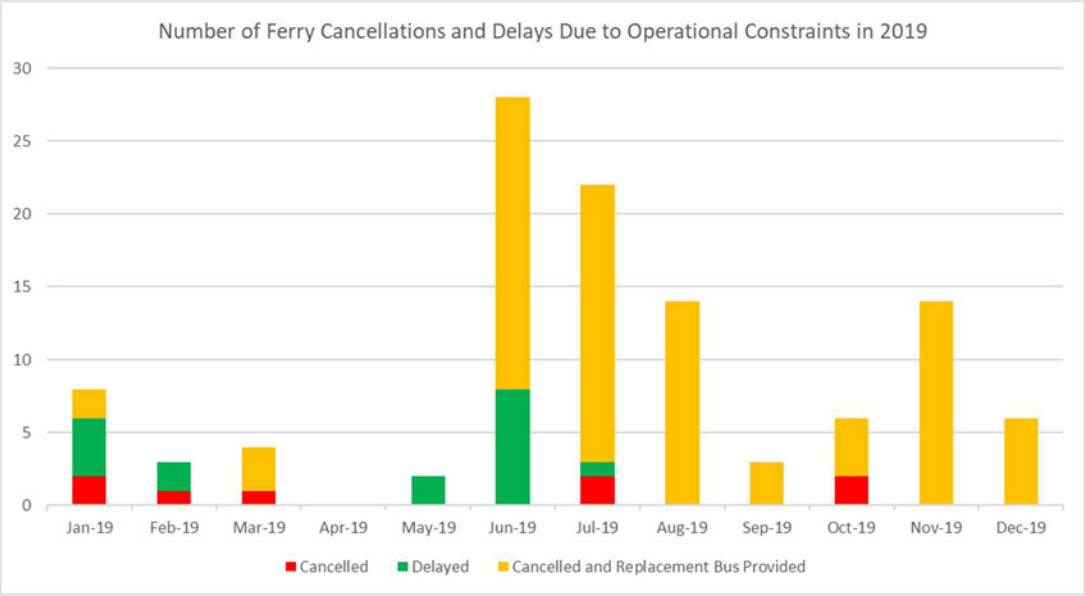


Figure 13: Number of Ferry Cancellations and Delays Due to Operational Constraints in 2019 [34]

4.2.1.5 Old Vessels

The existing ferry fleet consist of vessels which are of varying ages. Of the 29 vessels currently included within the Auckland ferry fleet (see Figure 14), 16 vessels were identified as being due for retirement in the immediate future and three vessels were identified as being due for retirement within the first 3 years of the new operational contract (by 2027). Whilst majority of these vessels are identified as being at the end of their life cycle based on their mechanical condition (i.e. unreliability and the cost of maintenance) and also readily available parts becoming obsolete, a few vessels are also due to be retired as a result of inadequate capacity. This highlights the varying age of the current fleet that contribute to the varying vessel quality. The periods of increased end of life/ reliability risk are show on a per vessel basis in figure 10.

[33] As per Industry feedback and AT SME input
[34] Based on data provided by AT and excludes weather related service cancellations and delays

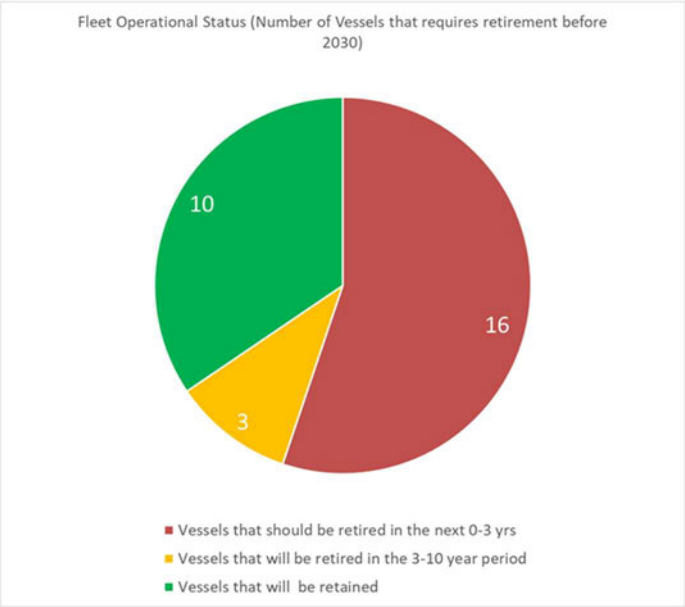


Figure 14: Fleet Operational Status

Figure 15 shows the period of service reliability risk associated with each vessel based on their age and condition.

Ferry Fleet Condition

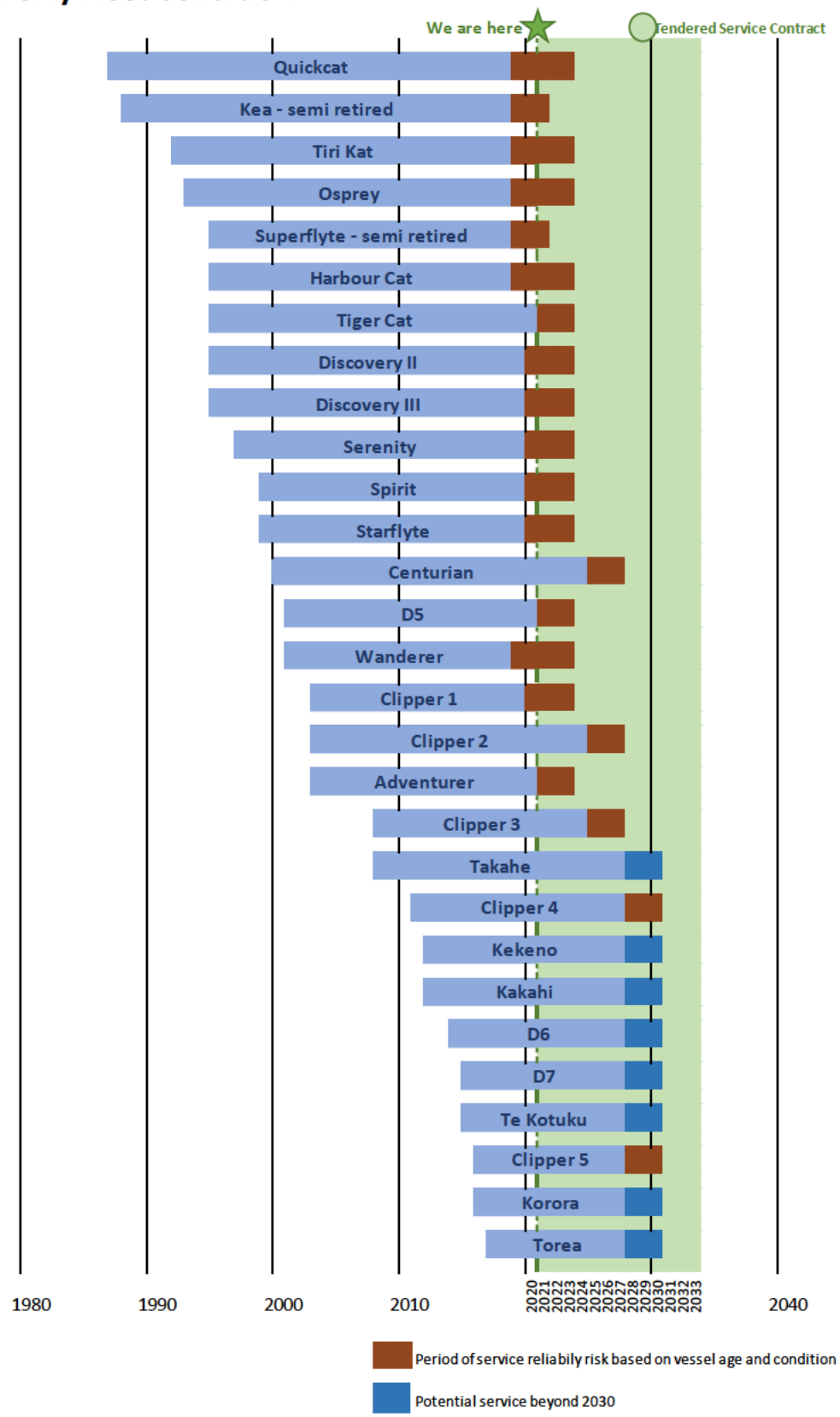


Figure 15: Vessel Retirement Dates[35]

[35] Provided by AT Ferry Team

Auckland Transport
An Auckland Council Organisation

4.2.2 Effects

4.2.2.1 Safety

The varying condition of vessels, wharves and ferry terminals has resulted in inconsistent level of service for ferry passengers in terms of safety. Safety relates to both the ferry terminal and the ferry journey. Some of the key issues with the current operation include infrastructure that is damaged or in an unsafe condition, mechanical failures of vessels and slips, trips and falls. This is indicated by the health and safety incidents recorded within the ferry network summarised in Table 10.

Table 10: Number of Health and Safety Incidents in Ferries[36]

	2018	2019	2020
Infrastructure that is damaged or in an unsafe condition	1	1	10
Slips, trips and falls	2	2	7
Operational ferry failure	0	1	5
Other ferry incidents occurring onboard e.g. oil leak, fire and ferry-ferry collision	0	4	2
Vessel colliding with infrastructure	1	3	3
Other	1	4	4
Total	**5**	**15**	**31**

4.2.2.2 Integration with Wider Public Transport Network

The ferry network is currently not fully integrated with the rest of the AT Metro public transport network, due to exempt services not being under the control of AT, and full fare parity with buses and trains has not been achieved due to the significantly higher cost structure of ferry services. For an example bus fares to travel between Downtown and outer harbour terminals such as Pine Harbour or Gulf Harbour are at least 40% cheaper than ferry fares, whilst the journey is longer than that of a ferry with having to travel via at least two bus services[37].

The ferries themselves, whether in exempt or contracted services, are not linked to the core AT Metro brand. This creates challenges for customers in viewing the entire public transport, including ferries, as a single seamless network. This is in contrast to trains and buses in Auckland which are presented to customers under a single integrated brand.

At present no bus services are provided to the West Harbour, and Pine Harbour ferry terminals. Although bus services are provided at all other ferry terminals, a number of ferry services are generally not well integrated with these bus services as bus services run on clockface timetables at the same time past the hour and ferries often run-on resource-driven timetables, driven by maximising the use of the ferry. For example, at Hobsonville Point there is no discernible common frequency pattern to ferry services while the route 112 and 114 buses which feed the ferry run on a fixed beat. To further complicate matters, in many cases the ferry timetable does not show bus connections and the bus timetable does not show ferry connections. The underutilisation of bus routes 112 and 114 highlighted by various media articles is an indication of poor ferry and bus connection currently present at Hobsonville[38].

[36] Summarised based on information supplied by AT
[37] Based on Adult HOP single trip ferry and bus fares published within AT website
[38] What's the point of buses if no-one uses them? | Stuff.co.nz

4.2.2.3 Poor Active and Sustainable Mode Facilities

Active modes and carpooling are sustainable modes for the first and last leg of ferry journeys.

At present, footpaths are provided on at least one side of most roads leading to the ferry terminals. However, with the exception of Downtown, Hobsonville Point, Stanley Bay[39], Devonport and Pine Harbour ferry terminals, all other ferry terminals in Auckland are not served by dedicated cycleway/cycle lanes.

In addition, bicycle parking is not provided at majority of the ferry terminals, with major issues around bike parking capacity identified at terminals such as Devonport where bike parking is provided. The key issues at Devonport terminal mainly relate to poor bicycle rack design and 'backwards' installation, in adequate weather protection and a step within the deck level that causes bicycles to roll out of the racks [40]. Lack of capacity for bicycles within vessels were also identified by various media articles and through discussions with Bike Auckland, with approximately 53 cyclists recorded to have been turned away from ferries operated by Fullers360 in May 2021[41] due to insufficient space for cyclists.

Existing cycle capacity issues on board ferries is shown in Figure 16 below.

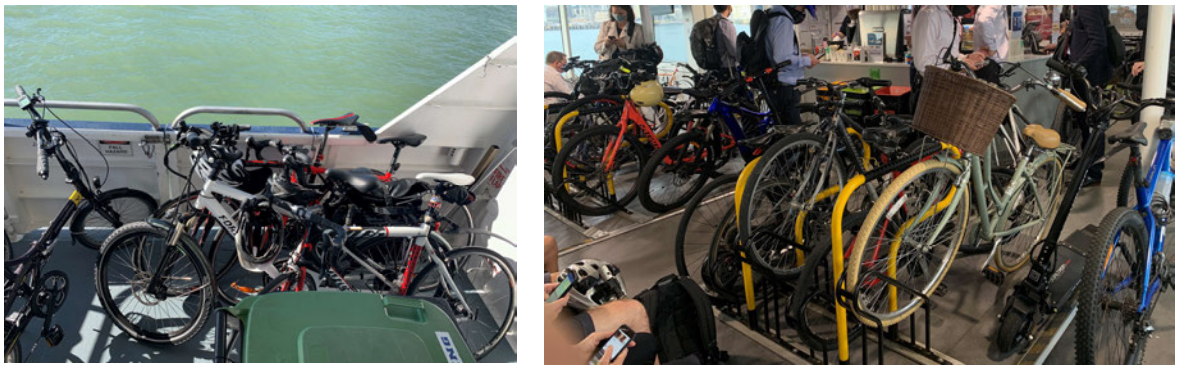


Figure 16: Photos of Existing Restricted Capacity Observed on Ferries

Carpooling and rideshare provides an efficient and sustainable means of transportation for people whom driving is the most practical mode of transportation. Whilst at present there are some rideshare mobile apps and services such as Smart Travel NZ and MyMobigo available in Auckland, dedicated carpooling and rideshare priority parking is rarely provided at ferry terminals. In addition, electric vehicle charging is only provided at Devonport.

Poor or lack of pedestrian, cycle and micro-mobility facilities and infrastructure as well as carpooling priority parking at ferry terminals discourages ferry passengers from utilising these sustainable modes of transport for first and last leg of their journeys, resulting in most people to rely on private vehicles for the first and last leg of their ferry trips. The decline in the customer scores on ferries being easy to get to via all modes indicated within Figure 20 may also be an indication of the effect of poor active and sustainable mode facilities currently provided at or leading to ferry terminals.

4.2.2.4 Vessel and Infrastructure Quality

As seen in **Appendix C**, the current ferry fleet has varying total capacity, travel speeds and number of seats. In addition, other facilities such as licensed cafes, Wi-Fi, power points, luggage racks and bicycle racks are also not provided consistently across all vessels in the ferry fleet. The varying quality of vessels impacts on the journey experience, and results in inconsistent levels of customer service.

The current condition of AT's wharves and ferry buildings is shown as a proportion of asset value, in Figure 17 and Figure 18. Ferry buildings are generally well maintained, consistent with the level of

[39] Stanley Bay ferry service was cancelled by AT on the 24th of December 2020, however, is proposed to be reinstated as part of this business case.

[40] Bike Auckland, November 2019

[41] Full Auckland ferries turn away 53 cyclists in four weeks | Stuff.co.nz

service required for rail stations and bus stations, whilst wharf assets are older. Although the majority of assets by value are in ‘very good’, ‘good’ or ‘moderate’ condition, it is a concern that 5 per cent of wharf assets are in ‘very poor’ condition.

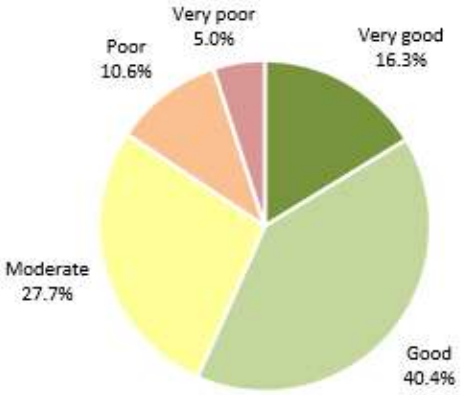


Figure 17: Condition profile for AT Owned Wharves[42]

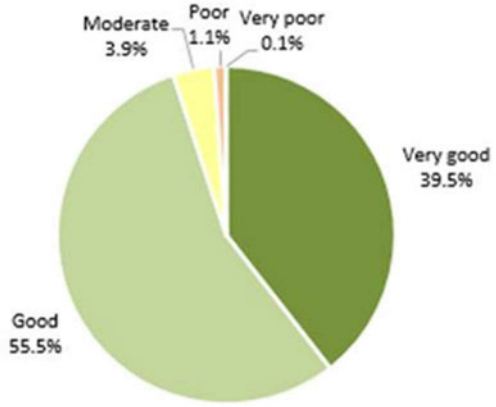


Figure 18: Condition profile for AT Owned Ferry Buildings[43]

A condition profile of the AT owned wharf assets at each ferry terminal is shown within Figure 19 below.

As can be seen from this graph, majority of the wharf assets currently in ‘very poor’ condition are located at Downtown, Birkenhead, Matiatia (Waiheke Island) and Northcote ferry terminals. These equate to approximately 79 percent of the total assets in ‘very poor’ condition.

[42] AT Asset Management Report on Wharf Condition December 2020
[43] AT Asset Management Report on Wharf Condition December 2020

Figure 19: Condition profile for AT Owned Wharf Assets (sorted by value)

One problem specific to wharves is that the assets in worst condition are likely to be under water, and the work required to return the wharf to acceptable condition would be better described as rebuilding the wharf as distinct from repairing it. The best recent example of this is Northcote wharf, where less than 20 per cent of the wharf's assets by value were found to be in very poor condition in 2018. This included the timber piles and bracing for the wharf. All of the pile assets located beneath the water, which are critical to supporting the wharf structure, were in 'moderate', 'poor' or 'very poor' condition. The wharf was closed to the public and the entire structure has now been replaced[44].

[44] Northcote Point wharf renewal (at.govt.nz)

As seen in Figure 20, an AT customer survey on ferry terminal facilities indicated that in general majority of the passengers surveyed are satisfied with the facilities provided at ferry terminals. However, the percentage of customers satisfied with the level of shelter from weather and seating provided at ferry terminals at present is noticeably lower, indicating perhaps these facilities may need some improvements[45].

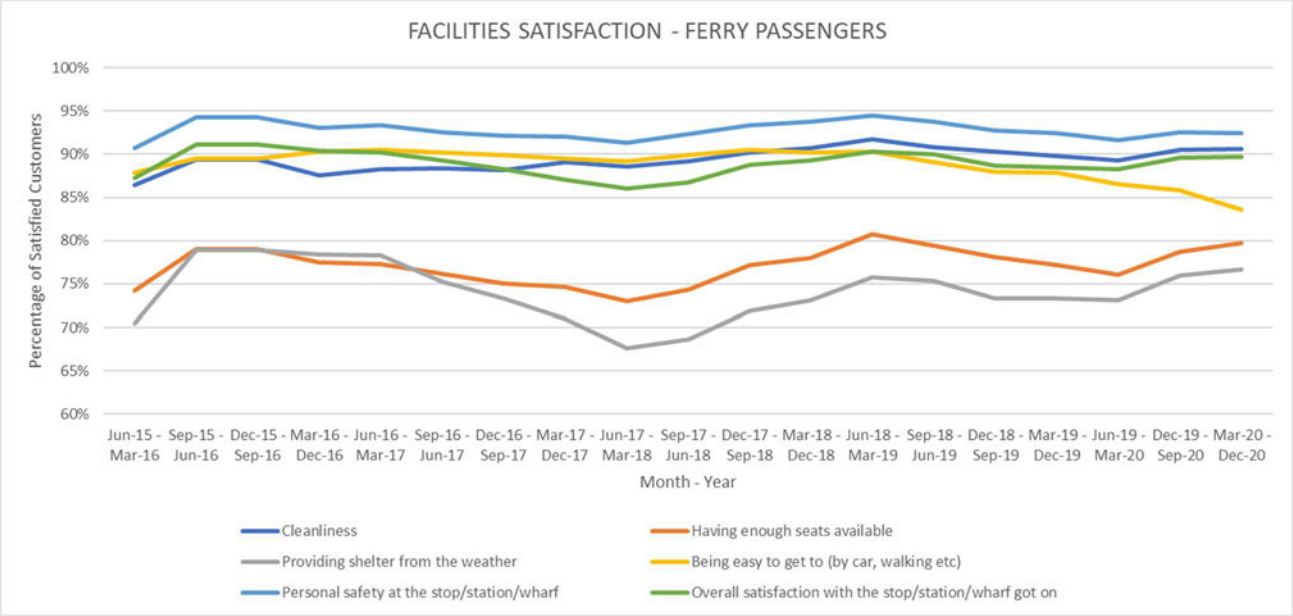


Figure 20: Ferry Facilities Customer Satisfaction Scores

4.2.2.5 Punctuality and Reliability

Ferry service reliability and punctuality are key attributes sought by customers as delayed and cancelled services reduce the attractiveness of ferries. Reliability and punctuality are impacted by weather conditions, tides and breakdowns. In addition, capacity constraints (due to the variances in vessels and infrastructure berths) at Downtown Ferry Terminal (DTFT) results in vessels regularly waiting to dock delaying customers.

A summary of the change in cancelled ferry sailings between 2018 and 2019 shown within Figure 21 indicates a significant increase in cancellation at Stanley Bay[46] and Northcote Point services.

[45] AT currently has no level of service relating to shelter and seating provisions at ferry facilities
[46] Stanley Bay ferry service was cancelled by AT on the 24th of December 2020, however, is proposed to be reinstated as part of this business case

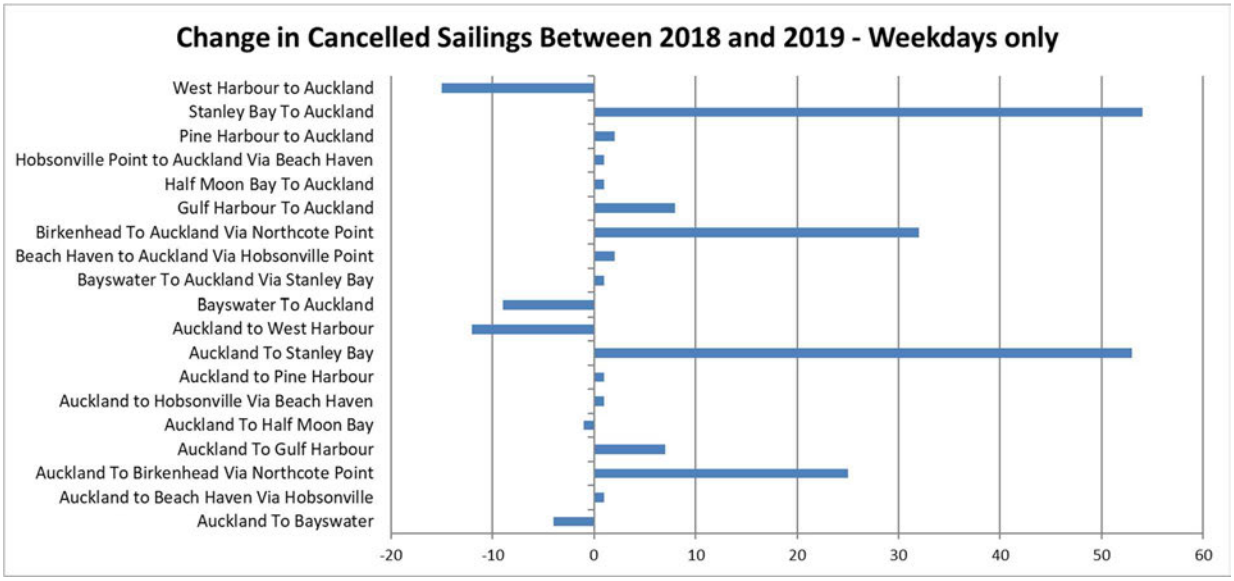


Figure 21: Change in Cancelled Ferry Sailings Between 2018 - 2019

Ferry service records indicate that the ferry cancellations are mostly due to vessel breakdowns and ferry service delays are due to various reasons such as weather effects, mechanical issues and vessel breakdowns.

A summary of the ferry cancellations and delays due to vessel issues in 2019 shown within Figure 22 below.

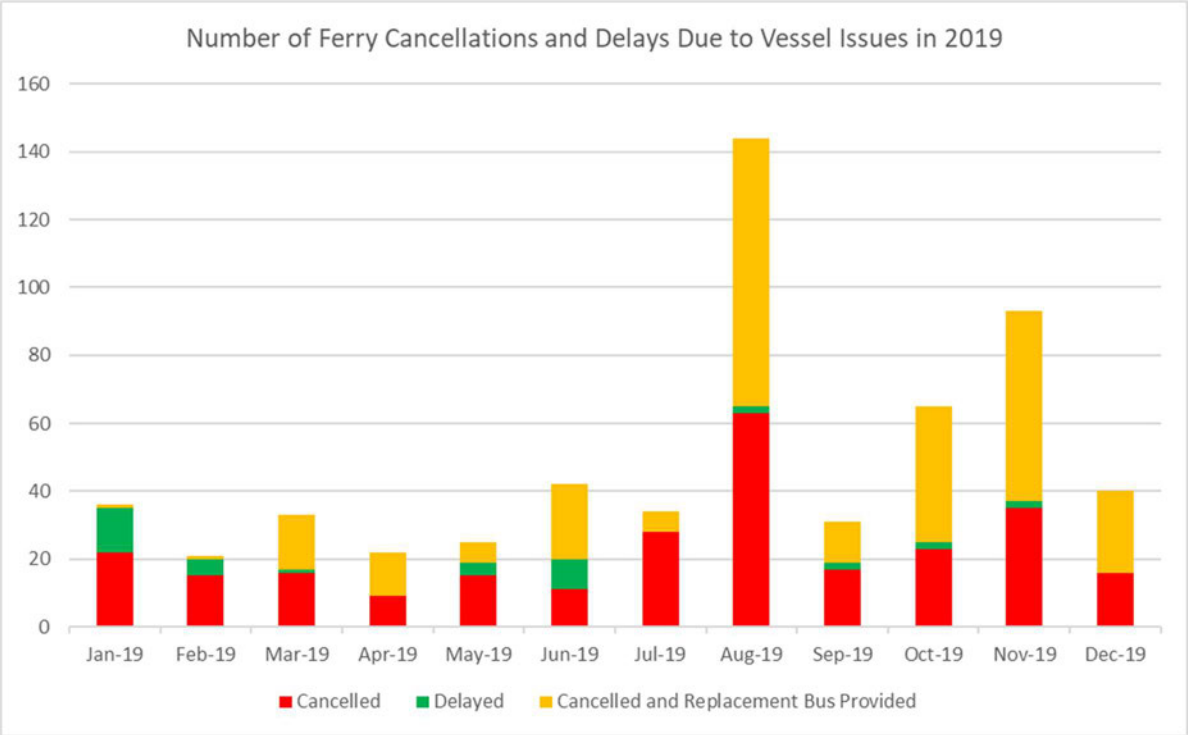


Figure 22 : Number of Ferry Cancellations and Delays Due to Vessel Issues 2019[47]

As indicated above, 276 services were cancelled with a bus replacement, 270 services were cancelled with no bus replacement provided and 40 services were delayed. Breakdown of vessels D2, D3 and Osprey were recorded to contribute to the most service cancellation with no bus replacements (approximately 15% - 22% each).

[47] Based on data provided by AT and excludes weather related service cancellations and delays

Currently, there is no consistent real-time tracking of ferry services or management of information to customers around service delays and interruption.

As indicated by the customer satisfaction scoring, punctuality is considered by ferry customers as an attribute of high importance that require improvement[48]. A moderate decline in punctuality for contracted services in recent years is shown below:

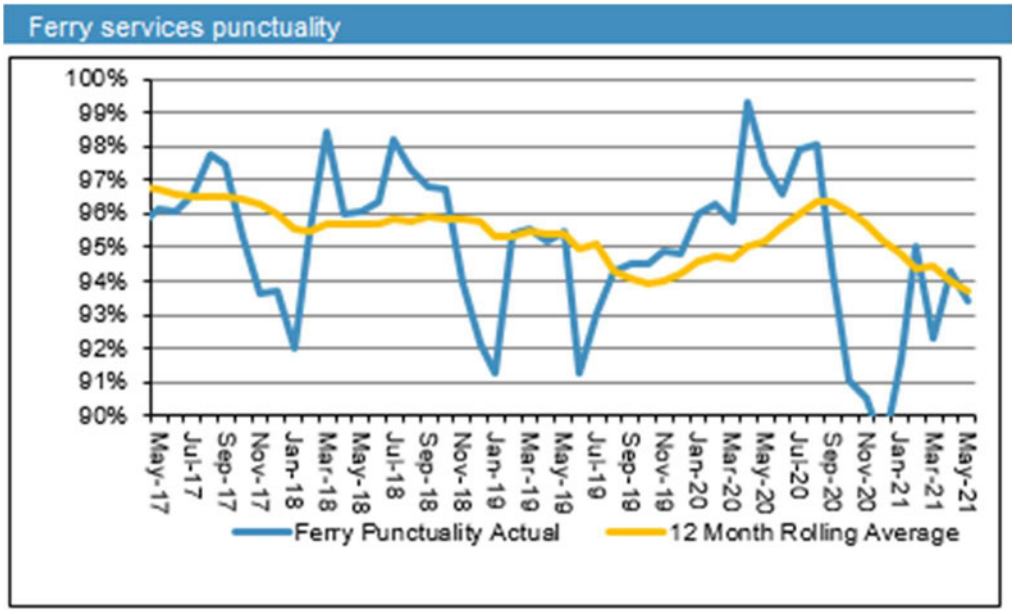


Figure 22A: Ferry Services Punctuality between May 2017 and May 2021

4.2.2.6 Timetabling, Ticketing and Fares

Ferry timetables are produced by each ferry operator with AT also producing timetables for contracted services. This creates inconsistencies in availability and production of timetables.

Although most ferry timetables are available through AT Metro app and AT website, this is not currently the case for tourist ferry services such as Tiri Matangi island, Rangitoto, Great Barrier Island and Kawau Island requiring customers to go into the ferry provider to obtain information.

At present, the peak ferry frequency ranges from 20 minutes to 45 minutes, whilst inter-peak frequency ranges from 30 minutes to three hours and 30 minutes. Only some services operate in evenings and weekends but very infrequently with instances of over three-hour gaps between services. A more consistent and understandable approach to the ferry timetables would be of significant benefit and would drive customer satisfaction and patronage.

Ticketing is another area where customers receive variable service. While contracted ferry services and the Devonport and Matiatia (Waiheke) ferry services accept the AT Hop card, there is no discount for AT Hop card use on these exempt services and the exempt service operators offer their own parallel ticketing products, often at cheaper rates. Other Hauraki Gulf Island services such as Rakino do not Include AT Hop as a ticketing option.

Recent improvements to the ferry fare structure mean that a single zone bus or train trip to or from the ferry terminal is now included within ferry fares for AT HOP card users, but this still does not provide a full fare integration as occurs on the bus and train network.

[48] AT Public Transport Customer Survey Results (Year to March 2020)

4.2.2.7 Inadequate Frequency and RPTP LoS Not Achieved

As outlined above, there are difficulties in adding ferry services due to challenges procuring additional vessels, terminal constraints and a skills shortage. See Table 11 below for current service frequencies of the ferry services included within the scope of this PBC.

Table 11: Current Ferry Service Frequency[49]

Route Description	Service Type	Mon - Fri Morning Peak Headway	Mon-Fri Inter-peak Headway	Mon-Fri Evening Headway	Weekend day/evening Headway
West Harbour - Downtown	Contracted	20 – 30 mins	80 – 210 mins	30 – 40 mins	-
Birkenhead - Downtown via Northcote	Contracted	30 – 35 mins	60 mins	30 mins	150 – 180 mins
Hobsonville Point – Downtown	Contracted	20-55mins	75 – 435 mins	75 mins	120 – 150 mins
Beach Haven – Hobsonville	Contracted	80 mins	75 – 435 mins	75 mins	120 – 150 mins
Bayswater to Downtown	Contracted	30 mins	60 mins	30 mins	120 – 180 mins
Stanley Bay to Downtown[50]	Contracted	30 – 35 mins	-	30 mins	-
Gulf Harbour to Downtown	Contracted	30 mins	60 – 135 mins	30-60 mins	-
Rakino to Downtown	Contracted	-	3 per week	1	1-2 per weekend
Pine Harbour to Downtown	Contracted	20 mins	40 – 100 mins	20 – 40 mins	-
Half Moon Bay to Downtown	Contracted	45 – 60 mins	60 – 120 mins	45 - 60 mins	135 – 195 mins
Devonport to Downtown	Exempt	15 – 30 mins	30 mins	30 mins	30 – 45 mins
Waiheke (Matiatia) to Downtown	Exempt	30 mins	60 mins	30 – 60 mins	30 – 60 mins

As indicated above, whilst the majority of ferry services operate at least every 30 minutes during weekday peak periods, there are a number of services that still operate less frequently during the morning and evening peak period. During weekday inter-peak period, with the exception of Devonport service, all services operate at no more than an hourly frequency and often considerably less. During the weekend, no ferries operate to/from West Harbour, Gulf Harbour and Pine Harbour. The majority of the services that operate during the weekend are very infrequent. Whilst not all ferry services are expected to operate at the same frequency, to provide a better sense of ferry network operation and to ensure the timetables are easily understood, improving the consistency in the ferry timetables across the network is desirable.

Customer reception of the low ferry service frequencies on some routes is indicated by the scores obtained through the 2019 Customer Satisfaction Monitoring of Auckland Public Transport Services. This included a gap analysis to establish the relative importance of each service attribute and a

[49] Current ferry frequencies based on AT ferry schedule. Headway is based on peak direction ferry services.
[50] Stanley Bay ferry service was cancelled by AT on the 24th of December 2020, however, is proposed to be reinstated as part of this business case.

statistical technique to identify areas of importance for service improvement that will result in improved customer satisfaction.

The customer satisfaction scores indicated that the frequency of services was amongst the attributes with the lowest shares of positive ratings for ferry users (59.0%). When asked what is easy about public transport, only 13% of users scored the frequency of ferry services as a reason compared to the 16.1% of bus and 18.4% of train users. Service infrequency was the most common reason (25.3%) ferry service users felt the public transport is not easy (compared to 19.2% and 15.4% respectively for bus and train service users).

The RPTP currently specifies minimum ferry frequency targets for each contracted and exempt ferry service. A comparison of the RPTP LoS targets and the current frequencies of ferry services included within the scope of the PBC is provided within

Table 12 and Table 13.

Table 12: Summary of RPTP LoS Target of Contracted Services vs. Current Service Frequency[51]

Route Description	Year	Mon - Fri Peak Headway[52]		Mon-Fri All day Headway[53]		Mon-Fri Evening Headway		Weekend day/evening Headway	
		RPTP	Current	RPTP	Current	RPTP	Current	RPTP	Current
West Harbour - Downtown	2018	30	20 - 30	90/180	80 - 210	-	30 - 40	-	-
	2021	20		60*		60*		-	
Birkenhead - Downtown via Northcote	2018	30	30 - 35	60	60	60	30	150/180	150 - 180
	2021	30		60*		60*		150/180	
Hobsonville Point – Downtown	2018	60	25 - 55	-	75 - 435	-	75	-	120 - 150
	2021	30		60		60		120	
Beach Haven – Hobsonville Point (Herald Island)	2018	60*	20 - 60	-	75 - 435	-	75	-	120 - 150
	2021	30		60		60		120	
Bayswater to Downtown	2018	30	30	60	60	60	30	180	120 - 180
	2021	30		60		60		120	
Stanley Bay to Downtown[54]	2018	30	30 - 35	-	-	-	30	-	-
	2021	30		-		-		-	
Gulf Harbour to Downtown	2018	30/60	30	120	60 - 135	-	120	-	-
	2021	30		60		-		-	
Rakino to Downtown	2018	-	-	3 per week	4 - 6 per week	-	2 per week	-	4 per weekend
	2021	-		3 per week		-		-	
Pine Harbour to Downtown	2018	20	20	60	40 - 100	60*	20 - 40	-	-
	2021	20		60		60*		-	
Half Moon Bay to Downtown	2018*	30/60	45 - 60	120	60 - 120	120	5 - 45	120	135 - 195
	2021	30		60		120		120	

[51] Current ferry frequencies based on AT ferry schedule. Headway is based on peak direction ferry services.
[52] Weekday peak period was assumed to be between 7am – 9 am and 4 pm – 6 pm
[53] Weekday all day was assumed to be the inter-peak period between 9 am – 4 pm
[54] Stanley Bay ferry service was cancelled by AT on the 24th of December 2020, however, is proposed to be reinstated as part of this business case.

Table 13: Summary of RPTP LoS Target of Exempt Services vs. Current Service Frequency

Route Description	Integral /Non-Integral	Mon-Fri Peak Headway		Mon-Fri All Day Headway		Mon-Fri Evening Headway		Weekend day/evening Headway	
		RPTP	Current	RPTP	Current	RPTP	Current	RPTP	Current
Devonport to Downtown	Integral	15	15 - 30	30	30	30	30	30	30 - 45
Waiheke (Matiatia) to Downtown	Integral	30	30	60	60	60	30 - 60	30/60	30 - 60

As can be seen, several contracted services currently fall short of the minimum service levels specified in the RPTP whereas exempt ferry services, especially Devonport and Waiheke Island (Matiatia), sometimes provide better services than the levels specified in the RPTP. Contracted ferry services often lack off-peak and weekend services or operate limited span of hours, reducing the potential for increasing commuter and leisure demand. AT continues to experience pressure from local boards and community groups to improve and increase services span and weekend services[55].

4.2.2.8 Information

The 2019 Customer Satisfaction Monitoring of Auckland Public Transport Services report identified Information access as a high importance/low performance service attribute, meaning that investment in improving this service area is likely to result in improvements in customer satisfaction. Ferry user satisfaction about trip information has significantly declined in the last year, after three years of steady improvement.[56] This appears to be tied with the significant reduction in satisfaction across all public transport modes about the provision of information relating to delays and disruptions, down around 15 percentage points (from 75.2%, to 60.5%) for ferry users in just 12 months. In the same survey, 14.5% of ferry service users claimed that delays, cancellations and other disruptions to services made public transport difficult (compared with 11.8% and 22.5% for bus and train respectively).

When asked what makes public transport easy, ferry users scored timetable and route information (e.g. easy to use maps) at just 5.9% satisfied. This compares with 7.7 and 6.5% for bus and train respectively).

Customers experience a varied level of information and service, affecting their overall experience utilising ferry services. While real-time information is used extensively on bus and rail networks, they are not in operation at all ferry terminals. There is no consistent real-time tracking of ferry services or management of information to customers around service delays. In addition, much online content related to ferries, such as timetabling, must be downloaded in PDF format, impacting ease of access. Despite largely international visitors making up a significant portion of ferry patronage, ferry services only provide wayfinding in English at limited locations, and vary in design and level of information provided. In addition, tourist information and passes are not readily available on the AT website, which is more targeted at commuter usage.

The differing needs and expectations of ferry commuter customers and tourists will need to be explored further to understand how these can be brought into balance.

4.2.2.9 Demand Exceeding Capacity

While the patronage on inner harbour services has been stable, rapid growth in North West Auckland, Whenuapai, Pine Harbour / Beachlands and other areas, combined with limited increase in service provision, has meant that the current supply is now reaching capacity for several key ferry routes. However, difficulty to add more ferry services particularly during peak periods due to the causes

[55] AT advises that this is based on feedback from received from regular engagement by AT Operations Team.

[56] Gravitas Customer Satisfaction Survey, Year to March 2020 Survey Results (based on a 12 month rolling average results from the four most recent quarterly surveying waves, including 29th April to 31st May 2019, 22nd July to 21st August 2019, 4th November to 2nd December 2019 and 3rd February to 5th March 2020.

outlined above has resulted in the demand exceeding the current capacity on a number of ferry routes, requiring passengers to wait for the next service. This is most noticeable on Hobsonville, Pine Harbour, Gulf Harbour and West Harbour services which frequently operate above 85% capacity.

Evidence of overcapacity ferry services is indicated by the number of passengers left behind discussed in detail within Section 4.2.3.3 below.

4.2.3 Consequences

Poor customer level of service and lack of ferry capacity reduces the attractiveness of ferries as a viable mode of transport thereby limiting the role of ferries in Auckland's transport system. The evidence of this consequence is outlined below.

4.2.3.1 Deteriorating Customer Satisfaction and Value for Money

The customer satisfaction feedback provides a good indication of the level of service experienced and perceived by ferry passengers at present. The overall customer satisfaction scores of AT public transport moves are shown within Figure 23.

Figure 23: Overall Customer Satisfaction of Buses, Trains and Ferries[57]

Based on the scores shown within the figure above, a summary of the change in customer satisfaction scores between 2013 and 2020 is provided within Table 14 below.

[57] AT Public Transport Customer Summary Presentation Year to March 2020 Results

Table 14: Summary of the Change Overall Customer Satisfaction Score

Mode	Customer Satisfaction Score	Customer Satisfaction Score	Difference
	2013	2020	
Train	79%	91.50%	↑ 12.5%
Buses	80.20%	90.60%	↑ 10.40%
Ferries	90.50%	87.70%	↓ 2.80%

As can be seen above, ferry customers reported the highest level of customer satisfaction of any public transport mode in Auckland in 2013. However, within the past seven years, the customer satisfaction of ferries has deteriorated while bus and train customer satisfaction has improved. This places current customer satisfaction levels for ferries below that of train and bus, and indicate a growing issue relating to the decline in customer satisfaction.

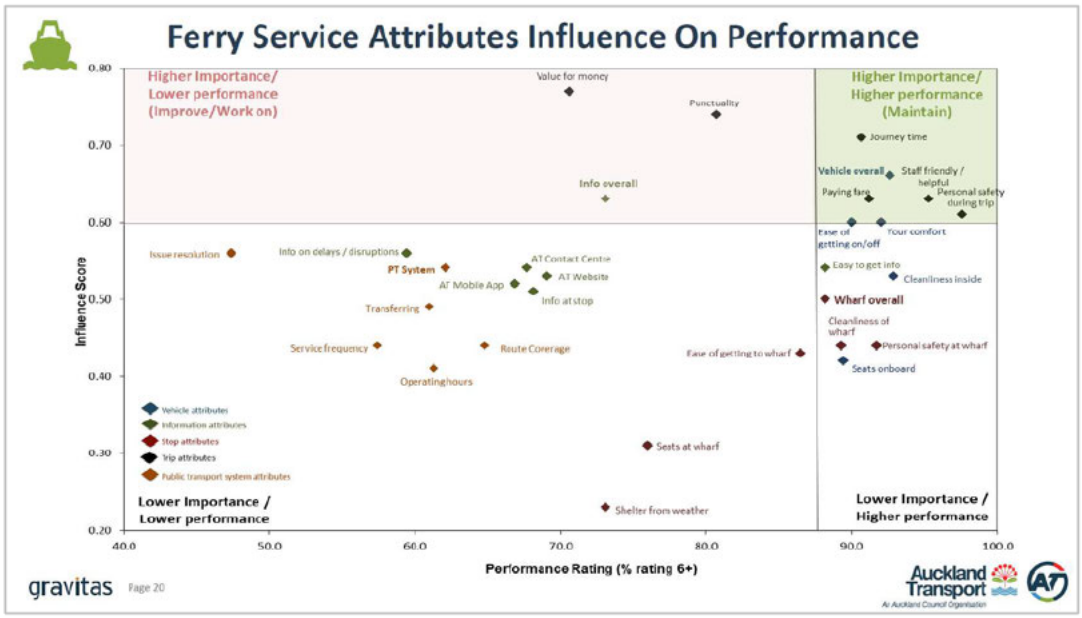


Figure 24: Ferry Service Attributes Influence on Performance[58]

Although ferry customers see the ferry network as special, as shown within Figure 24 they are most concerned with value for money, frequency, span and reliability of services, and quality of infrastructure which are currently scored as low performing. This is demonstrated within the ferry performance survey results shown in Figure 25 where satisfaction score of 71% and 81% was received for value for money and reliability, respectively.

[58] Gravitas, AT Public Transport Customer Summary Presentation Year to March 2020 Results

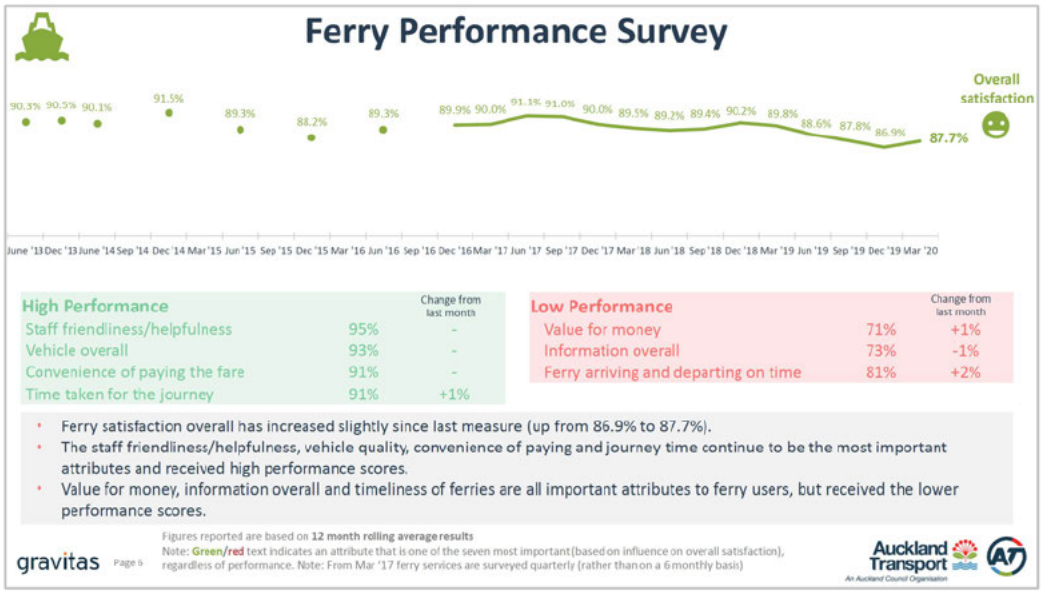


Figure 25: Ferry Performance Survey Results[59]

In 2019, compared to bus and train passengers, ferry passengers were more likely to say they would like to use public transport more. However, when compared with 2018 results, there was a significant decline in the share preferring to use it more (down from 38.1%, to 34.8%) and an increase in the share happy with their current level of use (up from 54.1%, to 57.1%)[60].

4.2.3.2 Passengers Being Left Behind

The limited capacity on routes and inadequate frequency has resulted on passengers being left behind on certain services. This is known to be an issue particularly on Pine Harbour, and West Harbour services and is demonstrated by Figure 26 below which shows the monthly reported passengers left behind over the last three years on these services.

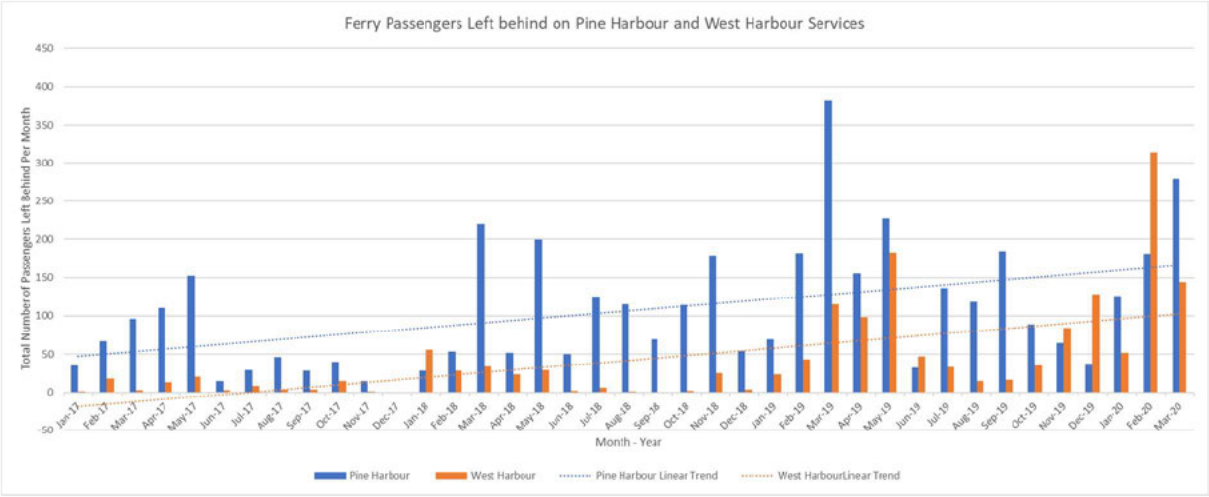


Figure 26: Passengers Being Left Behind[61]

As can be seen, there is an increasing trend in the number of passengers left behind on Pine Harbour and West Harbour services over the past three years indicating the ongoing capacity issues associated with this service. As indicated in Figure 26, the more recent figures indicate that a total of

[59] Gravitas, AT Public Transport Customer Summary Presentation Year to March 2020 Results
[60] Gravitas, Customer Satisfaction Monitoring of Auckland Public Transport Services, Main Report, Report for Year to December 2019
[61] Computed based on the ferry service provider records of the number of passengers left behind provided by AT.

279 passengers were left behind on the Pine Harbour ferry service in March 2020[62] and a total 314 passengers were left behind on the West Harbour ferry service in February 2020. Whilst no information is available on the time of day at which these incidents were recorded, it is expected this would be an occurrence during peak periods due to the high number of commuters.

Council's future land use estimates (version I11.5) indicate that whilst population in West Harbour is unlikely to grow in the future, continuous population growth is expected in Pine Harbour. This means without any ferry capacity improvements, more passengers are likely to be left behind in the future on this route.

It is noted that Fullers360 who operate the other six contracted routes do not report on the number of passengers that are left behind, as they are not required to do so as part of the services contract. However, recent media articles and public meetings have highlighted that passengers being left behind due to capacity issues is also an issue on Hobsonville[63] and Waiheke services[64] which are operated by Fullers360.

4.2.3.3 Not Attracting New Passengers

The patronage growth of the three key public transport modes in Auckland (bus, train and ferry) is a key indication of the attractiveness of these modes.

A comparison of the patronage number of each mode over the ten-year period between 2009 - 2018 is outlined within Table 15 and shown within Figure 27.

Table 15: AT Public Transport Patronage (2010 – 2019)[65]

Calendar Year	Patronage (000's)			
	Bus	Train	Ferry[66]	Total
2010	49,850	9,107	4,595	63,551
2019	75,028	21,887	6,240	103,155
10-year growth (%)	**50.51%**	**140.35%**	**35.80%**	**62.32%**

[62] Note however that PT passenger number peak in March with return of tertiary institutions, schools in term and lower numbers of people on leave etc.

[63] https://www.stuff.co.nz/auckland/119783510/march-madness-commuter-surge-leaves-ferry-passengers-stranded

[64] https://www.rnz.co.nz/news/national/390685/fullers-waiheke-service-to-be-examined-after-complaints

[65] Source: https://at.govt.nz/about-us/reports-publications/at-metro-patronage-report/

[66] Total ferry patronage of contracted and exempt services

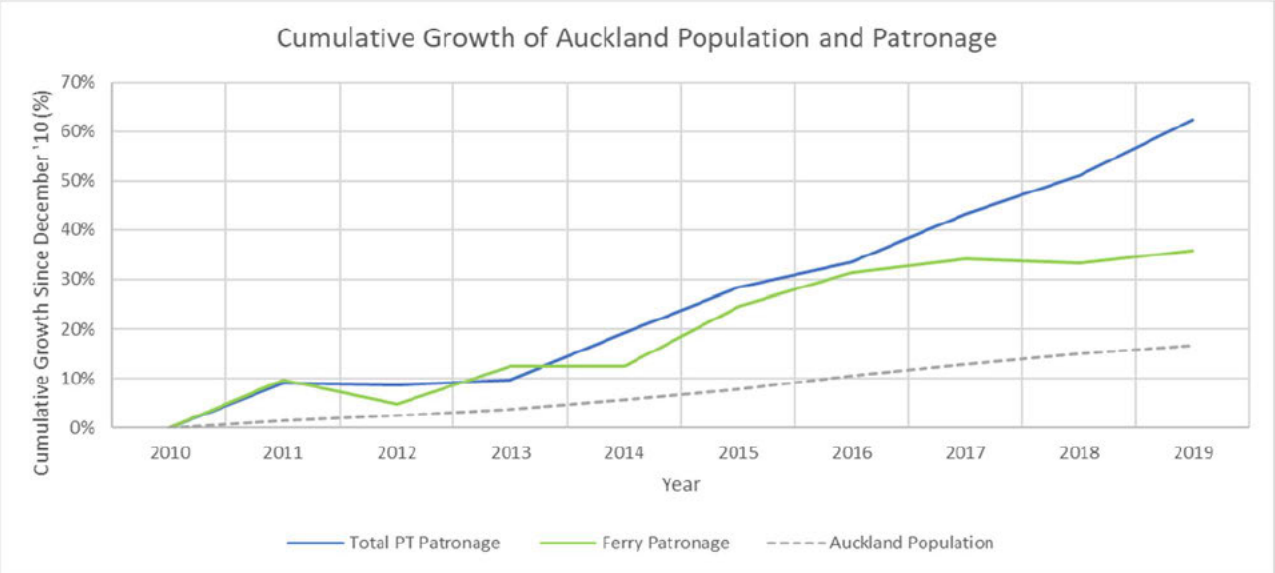


Figure 27: Auckland Patronage and Population – 10 Year Growth

As can be seen above, buses and trains have seen a higher overall patronage growth than ferries during the 10-year period between 2009 – 2019, with the train patronage numbers more than doubled towards the end of the decade. This is likely to reflect the effect of more investment, as the patronage growth appears to be more or less proportional to the capital invested.

Whilst the train and bus catchments may have been more mature, the investment made in these transport modes appear to have still attracted more passengers. Given the ferry catchment include growth catchments, this may mean that if investment was made in ferries, there may be more potential for growth in ferry patronage.

An indication of the investment in PT with respect to the population growth is provided in Figure 28. It is noted that this does not include the implementation of recent ferry improvements such as introduction of Hobsonville ferry services and DTFT improvements.

Figure 28: Public Transport Patronage and Key Investments 1968 - 2018[67]

[67] Sourced from Yearbook of New Zealand, AT Patronage Data

4.3 Problem 2 – Value for Money and Access

This section provides the evidence base which substantiates Problem Two (30% weighting).

4.3.1 Overview

A summary of the key causes, consequences and effects of this problem as identified by the wider stakeholder group is provided within Table 16.

Table 16: Problem 2 – Key Causes, Effects and Consequence

Problem two: Current legislative settings, operating models and barriers to entry make it difficult to sustain or improve the ferry network in a value for money way (30%)	
Cause	• Legislative constraints • Fragmented service model • Barrier to entry for new players
Effects	• Reduced flexibility and control for AT
Consequences	• Low value for money for funding partners and customer
Evidence	• Declining farebox recovery ratios of ferries • Poor VFM outcomes from previous tender round based on existing operational model

Note: The issues relating to procurement processes and fragmented service model will be further investigated and developed as part of the AT Ferry Procurement Strategy.

4.3.2 Causes

4.3.2.1 Legislative Constraints

As noted above, 'Exempt' services under the Land Transport Management Act 2003 are fully commercial services that are not provided under contract to AT[68]. While AT can describe exempt services in the RPTP and classify them as integral to the PT network, they may not make them subject to the RPTPs objectives and policies. Other ferry services such as Kennedy Point to Wynyard Quarter meet the LTMA criteria for exempt services, however, are not specified in the RPTP as integral to the network.

This means that AT does not have overall control of the services, frequency, vessels, fares or other elements for the entire ferry network. Given the two exempt services included within the scope (Devonport and Waiheke) carry approximately 4.1 million ferry users per year[69], this legislative constrains have a disproportionate impact on efficiency of the network[70].

There is a misalignment of objectives between AT and commercial operators. For example, while AT is focussed on meeting community demand by increasing the frequency and span of services (for example off-peak and weekends) to meet wider objectives, commercial operators are unlikely to do so unless there are clear financial rewards relative to the risk and size of investment.

This lack of alignment severely impacts AT's ability to meet transport objectives, with commercial operators slow or unwilling to respond to capacity pressures due to higher levels of risk and / or cost. Change is necessary to address these inefficiencies, lack of alignment and barriers impeding service level growth to meet demand.

[68] See part 5 of the LTMA.
[69] Based on the annual patronage figures recorded in 2019 as outlined within Table 1
[70] Note Orders in Council is a method that can be used by AT to implement decisions relating to exempt services that need legal force.

4.3.2.2 Fragmented Service Model

Most ferry services are provided by private operators through contracts with AT. As part of the contracts, all vessels are currently supplied, operated and maintained by the operators. A previous unsuccessful market procurement approach highlighted structural issues within the Auckland passenger ferry market including; cost of vessels relative to contract length of 12 years, small parcels (individual routes) and limited opportunity to establish premises. A large degree of inertia has settled into the industry, resulting in incumbency behaviour that has not had the customer at the centre.

The current operating environment is fragmented, reflecting that ~77% of passenger journeys on the network are run as exempt services[71]. The high number of trips on exempt services means that AT has a reduced ability to manage the delivery and management of the ferry network.

While this model may have worked in the past where demand was lower, and ferries were operating on a smaller scale focussed on serving tourists, it is now struggling to meet the growing demand of commuter and leisure customers, which is limiting AT's ability to provide an appropriate level and frequency of services. The lack of standardisation of infrastructure, vessels, and ownership is creating inefficiencies that cause barriers to entry and growth, resulting in significant cost implications. This is hindering AT's ability to optimise the network and respond to customer demand.

In addition, the short-term (typically 6, 9 or 12 years) contracts issued as part of the current procurement model and the on-going contract extensions have resulted in lack of certainty for ferry operators which creates a difficult environment to incentivise private investment as the industry is reluctant to invest due to the lack of surety of future contracts.

4.3.2.3 Barrier to Entry

The current owner operator model has meant high barriers to entry for potential new domestic or international ferry operators. The high capital, operational and maintenance costs of dedicated vessels required, uncertainty in future contracts/short contracts has reduced the attractiveness of ferry market for new player. Because vessels are specialised long-life assets (25-30 + years) and contracts are relatively short-term (6, 9 pr 12 years), the lack of meaningful price competition has resulted in incumbent operators recovering excess vessel capital across successive contracts under the status quo model. Some of these challenges were highlighted during AT's unsuccessful procurement of PTOM ferry contracts in 2015/16 as noted in the next section.

4.3.3 Effect

4.3.3.1 Reduced Flexibility and Control for AT

The current legislative arrangement of exempt and contracted services limits AT's ability to achieve consistency in terms of service span, frequency, fares and to integrate exempt services with the wider public transport network.

In addition, the lack of competition in the market has reduced flexibility for AT, which hinders AT from implementing necessary changes required to improve operation and capacity of ferry network. This was demonstrated by the 2016 unsuccessful PTOM tender where the 33% service level increase requested in the tender received a disproportionately increased cost level of 113% from the bidders. The key reason for this significant increase in cost was the need for dedicated vessels for each route on the basis that each route was its own unit, which results in poor crew utilisation and higher labour costs[72]. As a result, the procurement process was considered to not meet the value for money threshold.

Given no other viable option was available and no new ferry operators were available in the market, AT negotiated to move from net to gross[73] contracts for four of the five remaining contracts and extended these for four years allowing for a further procurement until 2023. This extension has resulted in significant additional expenditure.

[71] This figure excludes out of scope vehicular and tourist ferry services
[72] Section 2, Ferry Fleet Funding and Ownership Options, Deloitte, 2018
[73] Where AT pays operating costs and retain any revenue

In addition, the misalignment between vessel design life and term of operational contracts plays an important role. Vessels are specialised long-life assets (25-30 years), and contracts are relatively short-term (typically 6, 9 or 12 years). The absence of robust competition in market can result in the over-recovery of vessel capital charges across successive contracts by incumbent operators under the current owner operator model.

4.3.4 Consequences

4.3.4.1 Low Value for Money for Funding Partners

Farebox recovery ratio refers to the contribution made by the public transport passengers towards the operational cost of public transport services. This provides an indication of value for money for funding partners as the higher the farebox recovery rate, the more operational cost is recovered through public transport fares. Various farebox recovery rates can be calculated depending on the type of services included (e.g. contracted services only or all ferry services including exempt services).

Public transport farebox recovery ratio target of 46 – 50% has been set by the AT SoI for the year 2019/2020.

A summary of the actual farebox recovery ratio by mode from January 2017 to February 2020 is shown within Figure 29.

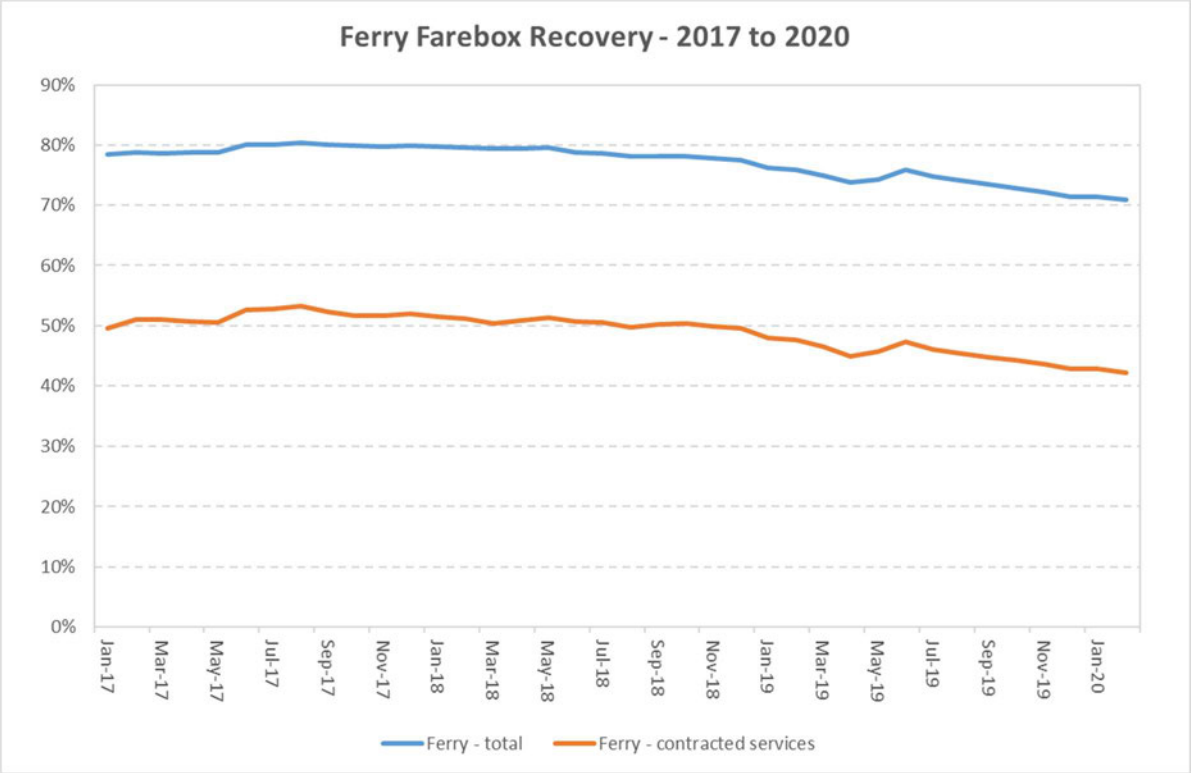


Figure 29: Ferry Farebox Recovery Ratios

The farebox recovery rate of ferry services has declined from mid-2018 onwards indicating declined revenue collection from farebox revenue, costing funding partners more to operate these services whilst maintaining the same level of service. It is noted that this could also be driven by increasing operating costs. FRR has declined from over 50% in 2017 to circa 42% in early 2020.

A separate look into the subsidy by passenger revealed a similar issue. As shown in Figure 30 and Figure 31, the subsidy for individual passenger and the distance they travelled were both trending upwards, increasing by 40% to 60% in the three-year analysis period. This further confirmed the increase of costs for the funding partners for contracted and exempted services.

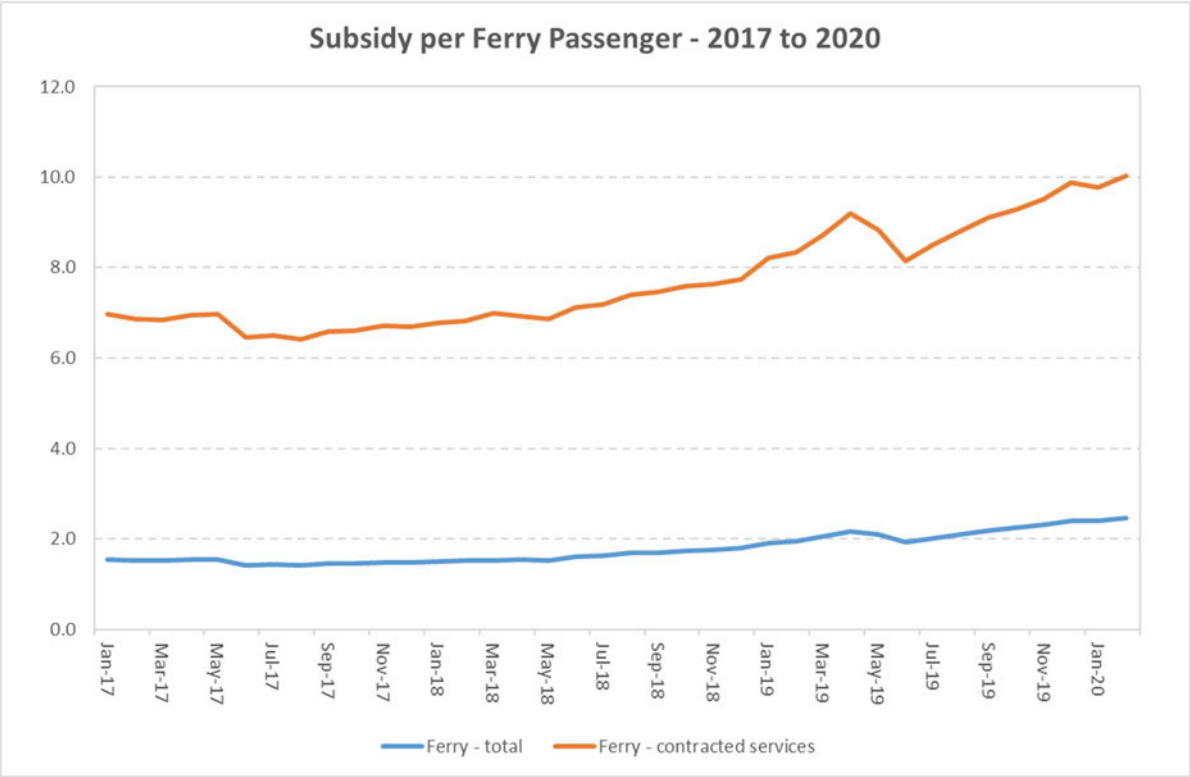


Figure 30: Ferry Subsidy per Passenger

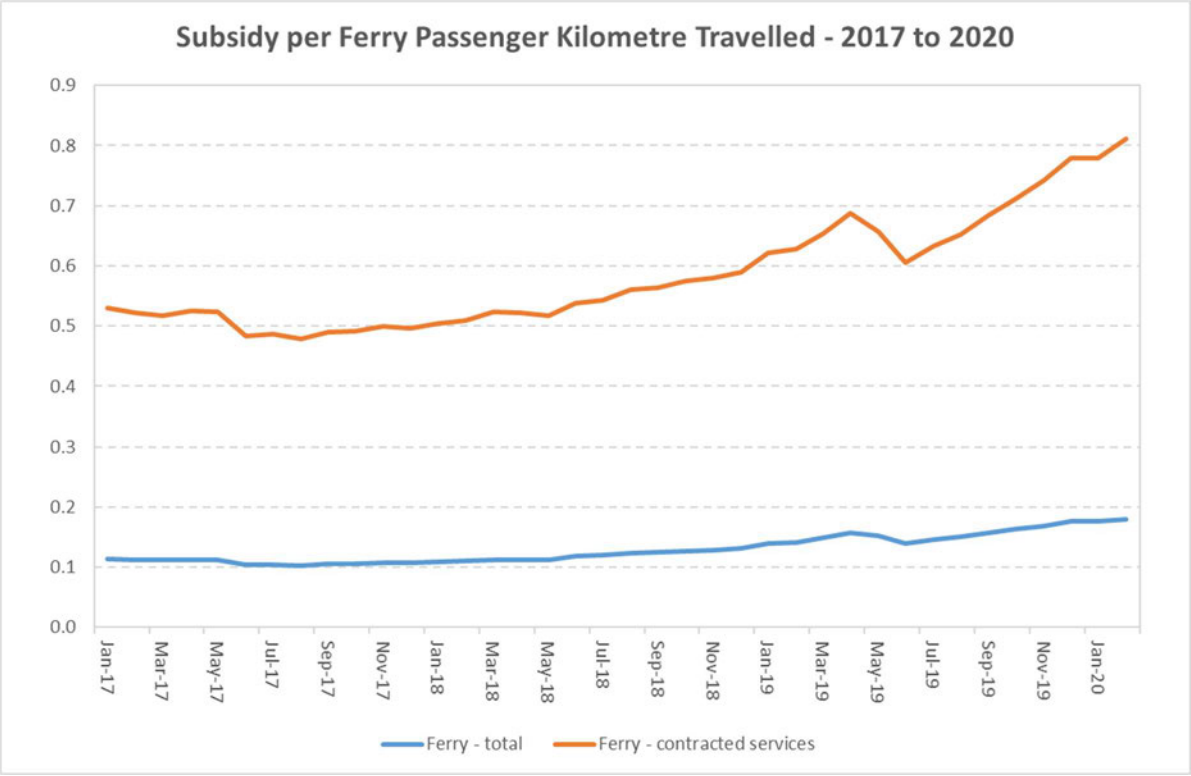


Figure 31: Ferry Subsidy per Passenger Kilometre Travelled

4.4 Problem 3 – Environmental Impacts

This section provides the evidence base which substantiates Problem Three (20% weighting).

4.4.1 Overview

A summary of the key causes, effects and consequences of this problem, as identified by the wider stakeholder group is provided within Table 17.

Table 17: Problem Three – Key Causes, Consequences and Effects

Problem Three: Older diesel vessels and Lack of Active Mode Facilities are Resulting in High Carbon Emission (20%)	
Cause	• Limited investment in new ferries • Lack of active mode facilities
Effects	• Older diesel vessels that are fuel inefficient, air polluting, water polluting have increased carbon emissions, are noisy and have poor hull design for wake wash. • Low active mode usage
Consequences	• Adverse environmental impacts on climate change, air pollution, and marine environment • Health impacts
Evidence	• High carbon dioxide emissions produced by the current non-environmentally friendly ferry fleet in Auckland. Whilst the Auckland ferry fleet only consists of 29 ferries, the carbon dioxide emissions associated with this fleet in 2020 financial year was 26,171 tonnes[74], approximately 20.4%[75] of AT's greenhouse gas emissions from public transport.

4.4.2 Causes

4.4.2.1 Limited Investment in New Ferries

As discussed within the previous sections, due to limited investment, the fragmented service model and the high cost associated with upgrading/buying new vessels, no significant upgrades have been made to the ferry fleet (including limited investment in new ferries), reducing the opportunity to introduce lower emission vessels as they are developed.

Technology transition to hybrid or battery electric for high-speed urban commuter ferries has also lagged behind the larger vehicular vessels, which typically have slower speeds and longer turn times enabling recharging. Generally, transition for marine transport has also lagged behind other transport modes. It is noted that feasibility of fully electric for shorter/ high frequency commuter services is not yet fully established and will require detailed testing as part of the programme implementation.

4.4.2.2 Lack of Active and Sustainable Mode Facilities

As discussed within Problem 1 (Section 4.2.2.3), at present most Auckland ferry terminals are not well catered by active mode facilities and vessels do not provide sufficient cycle storage capacity. In addition, whilst at present there are a number of rideshare mobile apps available in Auckland, carpooling and rideshare priority parking is rarely provided at ferry terminals.

[74] Our GHG emissions performance FY18 - FY20

[75] Contracted and exempt ferry services

Poor active and sustainable modes infrastructure at ferry terminals and within vessels discourages passengers from utilising these modes of transport for first and last leg of their ferry trips, resulting in usage of private cars that involve higher carbon emissions.

4.4.3 Effects

4.4.3.1 Non-Environmentally Friendly Vessels

The lack of investment in new ferries over the years has resulted in aging fleet of diesel ferries that are fuel inefficient, polluting, noisy and have poor hull design.

A breakdown of the typical diesel consumption and carbon dioxide production associated with each ferry service is provided within Table 18.

Table 18: Typical Diesel Consumption on AT Ferry Routes for contracted services[76]

Destination	Length (km)	Average diesel per trip (litres)	Annual trips	CO_2/annum (tonnes)
Stanley Bay[77]	2.25	10	4,750	130
Bayswater	2.23	10	11,962	321
Birkenhead	3.96	22.5	12,858	760
West Harbour	12.65	90	4,984	1,200
Hobsonville Marina	12.51	90	6,750	1,630
Half Moon Bay	15.31	120	7,910	2,545
Pine Harbour	22.00	180	10,208	5,027
Gulf Harbour	28.74	245	5,000	3,280

As indicated above, Pine Harbour services currently produce the most CO_2 per annum due to the boats being used on this service being powered by large engines with jet propulsion to achieve 28 knots for the service frequency. The (recently discontinued) Stanley Bay services produce the least CO_2 per annum due to having the shortest journey in both distance and time.

It is estimated that Auckland commuter ferries including exempt services emitted 28,400 tonnes[78] of carbon dioxide in 2018/19 the last full year before the effects of COVID-19. This fell slightly in the subsequent year with fewer services being run. This equates to 19.4 kilograms per service kilometre in both time periods.

While Auckland's ferry fleet only consists of 29 ferries, the carbon dioxide emissions associated with this ferry fleet is approximately 20.4% of AT's greenhouse gas emissions from public transport[79] whilst only carrying approximately 6% of the total public transport patronage. This indicates the adverse environmental impacts associated with the current diesel ferry fleet. We heard from mana whenua that sullage management was an issue with some vessels discharging into the harbour, albeit in compliance with maritime rules. They encouraged Auckland Transport to ensure improved monitoring of environmental performance on all contracted services and facilities

[76] Sourced from Greenhouse Gas Emission Reductions publication produced by EV Maritime Limited supplemented by information provided by AT on average diesel per trip
[77] Stanley Bay ferry service was cancelled by AT on the 24th of December 2020, however, is proposed to be reinstated as part of this business case.
[78] Provided by AT Sustainability Team
[79] Provided by AT Sustainability Team

4.4.3.2 **Low Active Mode Usage**

A customer survey completed by AT indicated that whilst approximately 44% of passengers in general currently walk to/from the ferry terminal, approximately 34% - 40% passengers currently travel to/from the ferry terminal by private vehicles. In addition, the cycle and micro-mobility use is noticeably low (less than 3%) indicating the effect of the poor cycle facilities provided at ferry terminals.

The general modal split associated with passengers travelling to and from the ferry terminals[80] is shown within Figure 32 and Figure 33.

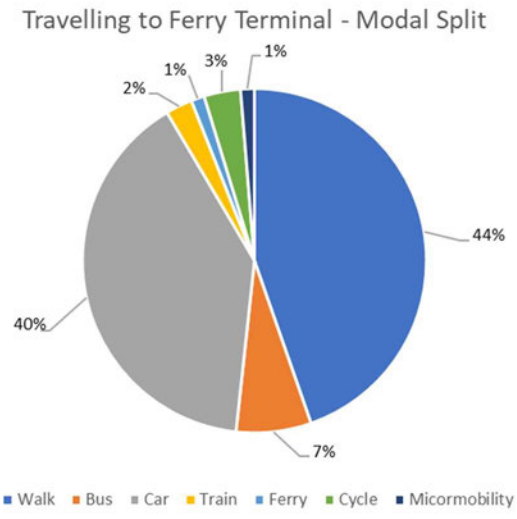


Figure 32: Travelling to Ferry Terminal - Modal Split[81]

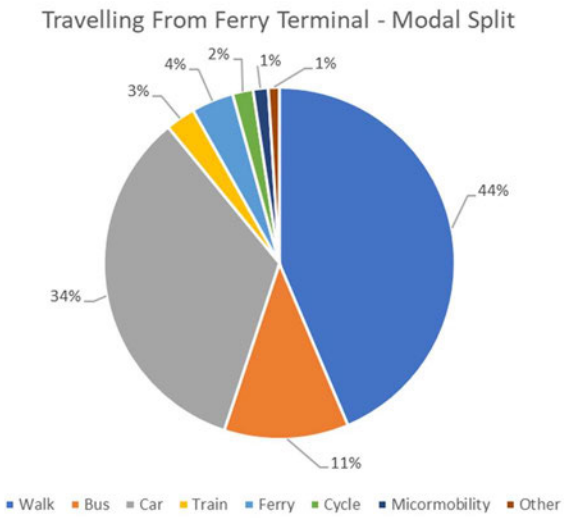


Figure 33: Travelling from Ferry Terminal - Modal Split[82]

As indicated within Figure 34 and Figure 35 below, the ferry terminal specific modal split information obtained from this survey indicated that over 50% of passengers travelling to or from Downtown and Stanley Bay ferry terminals currently walk or cycle. Over 50% of the passengers who travel to/from other ferry terminals currently use non-active modes with majority travelling by cars. The proportion of passengers travelling to and from these other ferry terminals using active modes are also noticeably low indicating the effect of limited facilities currently provided.

[80] All ferry terminals of in-scope ferry services with the exception of terminals at Northcote, Beach Haven and Rakino Island
[81] Based on the AT PT Customer Satisfaction Survey conducted by AT in December 2020
[82] Based on the AT PT Customer Satisfaction Survey conducted by AT in December 2020

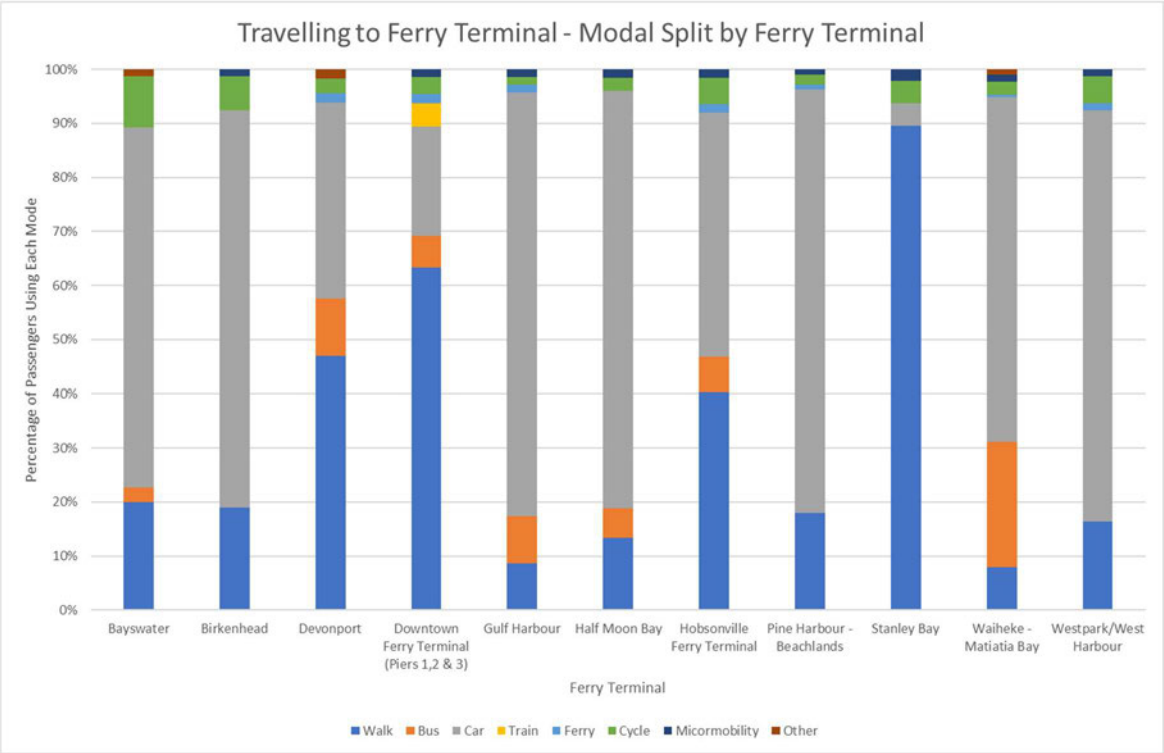


Figure 34: Travelling to Ferry Terminal – Modal Split by Ferry Terminal[83]

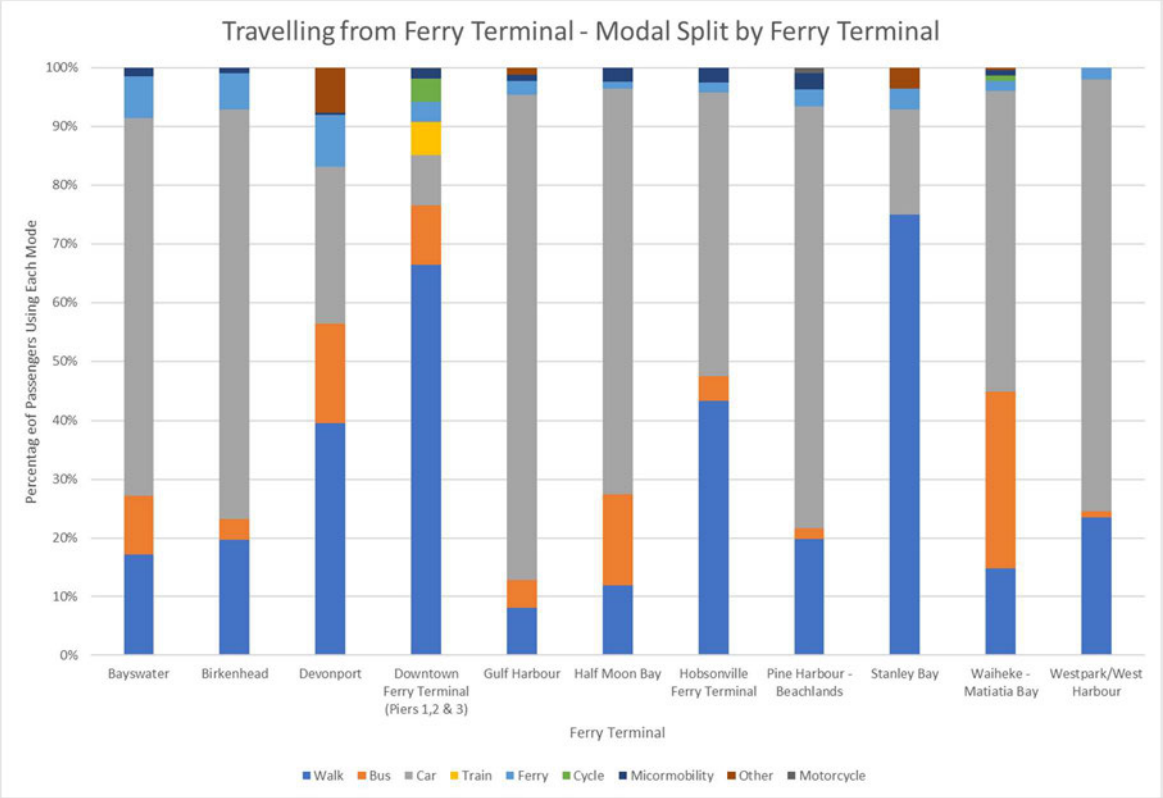


Figure 35: Travelling from Ferry Terminal – Modal Split by Ferry Terminal[84]

[83] Based on the AT PT Customer Satisfaction Survey conducted by AT in December 2020
[84] Based on the AT PT Customer Satisfaction Survey conducted by AT in December 2020

4.4.4 Consequence

4.4.4.1 Greenhouse Gas Emissions

As seen within Figure 36, at present transportation by sea in Auckland contributes towards 1.7% of Auckland's greenhouse gas emissions. Whilst this includes the coastal shipping and freight emissions, ferry related emissions are a significant contributor, as a large number of ferries operate on a daily basis. This figure is higher than the greenhouse gas contribution of largely electrified rail fleet (0.1%).

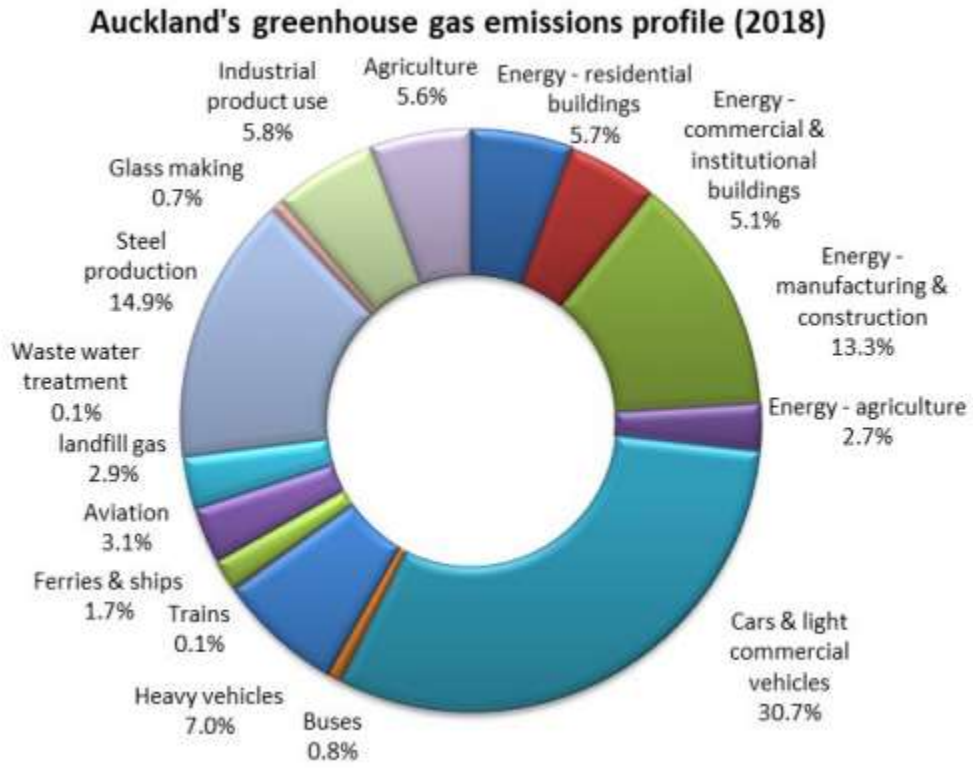


Figure 36: Auckland's Greenhouse Gas Emissions[85]

The current greenhouse gas emissions associated with transportation by sea is lower than that of a number of other major activities shown within Figure 36[86]. However, with the expected increase in population in Auckland and AT's vision to encourage ferry usage, necessary steps need to be taken to move towards a less carbon intensive ferry fleet and network to achieve AT's goal of halving carbon emission by 2030 and net zero emissions by 2050[87]. As noted, a high proportion of the fleet needs to be replaced due to asset condition, and as such, there is the opportunity to drive a solution that reduces the environmental impact of ferries including greenhouse gas emissions.

In addition to environmental impacts, the current ferry fleet also result in human health impacts such as noise and exposure to emissions on external decks (unlike in a train or a bus).

4.4.4.2 Health Impacts

Diesel engine exhaust gases contain nitrogen oxides (NO_x), sulphur dioxide (SO_2), hydrocarbons, carbon monoxide (CO), carbon dioxide (CO_2), and particulate matter (PM). Acute effects of diesel exhaust exposure can include irritation of the nose and eyes, lung function changes, respiratory changes, headache, fatigue and nausea. Chronic exposures are associated with cough, sputum

[85] Auckland's Greenhouse Gas Inventory to 2018
[86] However it is noted that it is more carbon intensive per km.
[87] Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan

production and lung function decrements. The gases can exacerbate allergies and contribute to asthma and bronchitis.

Concentrations of exhaust gases experienced at Auckland DTFT have exceeded World Health Organisation guidelines many times in light of both ferry and other marine vessel pollution, and cumulative impacts road transport pollution. Auckland Transport has a continuing responsibility to minimise pollution exposure for ferry patrons and the public.

Research has shown that maritime vessels have been found to emit a far greater concentration of hazardous air pollutants then compared to land based transport, which is generally attributed to poor quality fuel. Measurement of sulphur dioxide (SO2) concentrations, indicate that SO2 levels are at their highest closest to the waterfront areas of Auckland, up to four times higher than other areas. [88]

At a high level, recommendations to prevent, minimize, and control exhaust emissions from ships include[89]:

- Considering fuel efficiency and air emissions in ship design, including hull shape, propeller shape and interaction with the hull, primary and auxiliary engine design, and emission control systems; ·
- Compliance with national and international regulations and guidelines[90] regarding emissions of nitrogen oxides (NO_x) and sulphur oxides (SO_x) from ships, including limitations on the sulphur content of fuels; and
- Considering equipping vessels to enable connection to land-based electrical power, or use of land-based emission control units to collect and treat vessel emissions while in port.

Further information of health impacts of shipping activities can be found within 'A review of Research into the Effects of Shipping on Air Quality in Auckland 2006 – 2017' Technical

[88] N Talbot & N Reid, 'A review of Research into the Effects of Shipping on Air Quality in Auckland 2006 – 2017' , Auckland Council Technical Report 2017/005, March 17, p1

[89] Health effects of diesel exhaust emissions (European Respiratory Journal), Air quality guidelines global update 2005 (World Health Organisation), Environmental, Health and Safety Guidelines for Shipping (International Finance Cooperation and World Bank Group)

5 Benefits and Opportunities

5.1 Benefits

Based on the ILM developed through the workshop held on 16th July 2020, the potential benefits of investment were identified as follows:

- **Benefit 1:** Improved customer experience leading to more people choosing to use ferries.
- **Benefit 2:** Improved access to opportunities from using ferry services.
- **Benefit 3:** Improved productivity and utilisation of the ferry network.
- **Benefit 4:** Reduced impacts on greenhouse gas emissions and marine quality.

These benefits are discussed in detail below. The measures listed in Table 20 within Section 6 have been identified as suitable performance indicators in determining the extent of the benefits that can be achieved.

5.1.1 Benefit 1 – Improved Customer Experience

Purchasing new / more modern vessels and upgrades to ferry facilities, can significantly improve the customer experience.

Improvements to the frequency and hours of operation of ferry services as well as better value for money for public investment will address the issues frequently mentioned by ferry users in feedback on public transport use[91]

Ferry services will be more closely integrated with the wider public transport network, providing seamless connections between ferries, trains, and bus services. This could be enabled through integrated timetabling, ticketing, and fares. Ferries would provide a genuine travel choice for a healthy, vibrant and equitable Auckland.

Improved integration of ferry services with wider public transport network as well as consistent service offerings, facilities and infrastructure across the entire ferry network will elevate customer experience. In addition, addressing existing capacity issues will mean that the ferry network will be able to cater for the current and expected ferry demand, thereby reducing the likelihood of passengers being left behind. This will lead to improved customer experience which would lead to more passengers choosing to use ferries.

5.1.2 Benefit 2 – Improved Access to Opportunities from Ferry Services

An improved ferry network in terms of its coverage, number of services and service frequencies will improve access and travel choice particularly to parts of Auckland that are not easily reachable during peak periods via other modes of transport due to congestion and long travel times. Improved access to/from these areas will not only allow development of these areas[92], but also provide improved access to opportunities available within city centre and other more central locations within Auckland. This along with the improved travel choices ferries will provide also has the potential to result in modal shift from private cars to public transport.

5.1.3 Benefit 3 – Improved Productivity and Utilisation of the Ferry Network

Standardisation of existing vessels and infrastructure will improve interoperability of vessels and crew will assist in achieving economies of scale on asset management, vessel parts, training crew and route allocation. This will allow the utilisation of the existing and new ferry infrastructure and vessels to be maximised, the ferry network operation to be optimised leading to improved productivity. In

[91] Source 2019 Public Transport Customer Satisfaction: Main Report

[92] For example in Hobsonville, Gulf Harbour, Pine Harbour

addition, this will also allow for more resilient network operations, improving the ability to deal with planned and unplanned events (e.g. vessel breakdowns, additional ferry services during Auckland Half Marathon).

5.1.4 Benefit 4 – Reduced Impacts on Greenhouse Gas Emissions and Marine Quality

Investment in low emission vessels will reduce the greenhouse gas emission directly associated with the Auckland ferry network and impact on marine quality. In addition, improved walking, cycling and micro-mobility facilities will encourage more ferry passengers to choose more sustainable modes of transportation over private cars for the first and last leg or the entire trip, creating a mode shift from cars to ferries. This will contribute towards reducing greenhouse gas emissions indirectly associated with the ferry trips. As a result, both these measures will contribute towards achieving a more sustainable and environmentally friendly ferry operation in Auckland.

5.2 Opportunities

Opportunities are areas where it is possible achieve something else positive at the same time as addressing the identified problems. A detailed description of these opportunities is outlined in Table 19.

Table 19: Figure: Project Opportunities

Opportunity Category	Opportunity Identification
Urban Development Intensification	As outlined within the NPS, the new direction from Central Government requires the density and height of urban developments to be increased within areas of Auckland that are well served by existing or planned public transport. Whilst the level of urban development intensification is not defined within the NPS, all local governments are required to amend their regional policy statements and district plans within the next two-year period to ensure that this intensification will be achieved. As ferry services are included within the definition of public transport provided in the NPS, improvements at existing ferry terminals or implementation of new ferry terminals will present an opportunity to contribute towards achieving the NPS goal of intensification near ferry terminals.
AT ownership	Transitioning to a model where AT has control over vessels, infrastructure and network as a whole will provide AT more flexibility and control over the ferry network. It will also assist to remove existing barriers to entry and build a more sustainable market into the longer term.
Supporting a vibrant city	Ferries provide a relatively low-cost way for Aucklanders to connect with the water and to experience all that the ferry-served coastal communities such as Hobsonville Point, and Devonport have to offer. With the completion of the Northern Pathway, they will offer the opportunity to walk or cycle across the Waitematā Harbour in one direction and return by ferry in the other.
Supporting the visitor economy	As Auckland recovers from COVID-19, ferries provide a sought-after experience and a key attractor for both local and domestic visitors to explore the city, something that will apply to international visitors when travel is once again possible.
Māori responsiveness	Mana whenua have expressed interest in partnering with Auckland Transport and Waka Kotahi in the provision of commercial services or to follow other large capital investment programmes, such as the City Rail Link which have adopted a social procurement approach to identify employment opportunities for Māori and Pacific Island youth.

6 Investment Objectives

Investment objectives and a potential Key Performance Indicators (KPIs) were identified through stakeholder input. A summary of the investment objectives and examples of possible KPI's is provided in Table 20.

Table 20: Investment Objectives and KPIs

Investment Objectives	Measures	Baseline data
Improve customer satisfaction scores from 88% in 2019 to 92% in 2027	KPI 1: Percentage of trips that are punctual (AT SoI)	94.2%
	KPI 2: Proportion of timed connections arriving within 15 minutes of connecting service	40% timed connections
	KPI 3: Number of routes meeting RPTP Frequency Targets	Nine out of 11 services meet RPTP frequency targets
	KPI 4: Percentage of passengers satisfied with public transport services (AT SoI)	Overall customer satisfaction score of 87.7% for ferries[2]
Improve ferry patronage from 6.2m in 2019 to 8.1m in 2027.	KPI 5: Ferry patronage for contracted services	6.2 million (patronage)
	KPI 6: Overall PT patronage	103 million
Increased access to jobs and education opportunities by 25% by 2027	KPI 1: Number of people whose trip would be faster by ferry than other modes in AM peak period	Approximately 90,000 people living in Beachlands, Gulf Harbour, Devonport and partly in Hobsonville
	KPI 2: Number of people who access ferry services via active modes	44% Walk, 4%Cycle/micro mobility based on Data from Dec 2020
	KPI 3: Number of fully accessible vessels[93][3]	Five vessels[94]
Improve efficiency of the ferry network by	KPI 1: Cost per passenger service km	[redacted] per passenger service km (contracted services)

[2] AT Public Transport Customer Summary Presentation Year to March 2020 Results

[93] This is as a result of the previously mentioned bespoke development of vessels and infrastructure, plus the age of the fleet being one that did not consider accessibility factors when they were built

[94] Whilst all vessels in the ferry fleet except three vessels are accessible for mobility challenged customers in general, only the three new vessels used for Waiheke services and two jet powered vessels are considered fully accessible and designed with mobility challenged customers in mind. Only new berths currently under construction are considered fully accessible.

Investment Objectives	Measures	Baseline data
reducing operating costs $ per passenger service km by 10% by 2027	KPI 2: Operating cost per service hour	[redacted] per service hour (Contracted services)
	KPI 3: Farebox recovery rate	42.8% in 2019 for ferries Contracted services
Reduce ferry related CO_2 equivalents per passenger ferry service km by 10% (Includes Waiheke and Devonport)	KPI 1: Annual CO_2 emissions per 000 passenger service kms	21 tonnes per 000 passenger service kms

7 Constraints, Dependences and Assumptions

7.1 Issues and Constraints

Issues and constraints identified within the scope of the project area are outlined in Table 21.

Table 21: Project Issues and Constraints

Issue/ Constraint Category	Constraint Identification
Natural environment	Whilst the provisions of the Auckland Unitary Plan (AUP) require resource consent for works in the coastal marine area, AUP is largely supportive of ferry services. However, changes in the size of ferries may mean the following: • Navigational channels and areas around wharves may need to be dredged. All dredging works within existing navigational channels requires resource consent (either discretionary or restricted discretionary), whilst new channels or widening channels into areas identified as subject to Significant Ecological Area or with Outstanding Natural Features may trigger the need for a non-complying activity consent. • New structures required to increase the size of a wharf located within the General Coastal Marine zone requires a resource consent (coastal permit). • Disposal of dredged material containing contaminants will require resource consent (coastal permit) Implementation of new ferry terminals will require resource consents, and this would need to consider impact on the coastal and land environments. Although there are no outstanding natural features, significant natural features/landscapes or significant ecological areas at the existing terminals, visual impacts on the natural character or visual amenity of a coastal environment will need to be assessed when implementing any changes.
Natural Hazards	The AUP recognises the risk of sea level rise associated with climate change and has mapped the extent of coastal storm inundation above the 1 per cent annual exceedance probability (AEP) coastal storm inundation event including an additional sea level rise of 1m. The associated rule framework means that any new buildings and facilities or upgrade of existing facilities located in area subject to coastal inundation will need to be assessed in terms of risk, made resilient and need resource consent. Therefore, Sea level rise will need to be considered when proposing changes at ferry terminals or implementing new ferry terminals. Historically, the risk of coastal erosion due to the wake from ferries has been identified as an issue at Kennedy Point. This is related to the speed and size of the vessels using this terminal. With the rise in sea levels, this may be an issue which could also affect other ferry terminals.

7.2 Assumptions

A key assumption of this PBC is that post COVID-19, ferry usage and patronage levels will return to pre-COVID-19 levels in the medium – long-term. Whilst it is expected that working from home may still be attractive post pandemic with flexible working arrangements becoming more permanent, the organic growth of the ferry patronage over time will compensate for the reduced patronage associated with more people working from home.

Part B

8 Option Development and Assessment

The economic case outlines the process to develop a recommended programme. This began with an optioneering session with key stakeholders to generate initial ideas, moved on to developing alternative programmes and was completed by defining a recommended programme. Figure 37 shows the pathway from ILM to Recommended Programme.

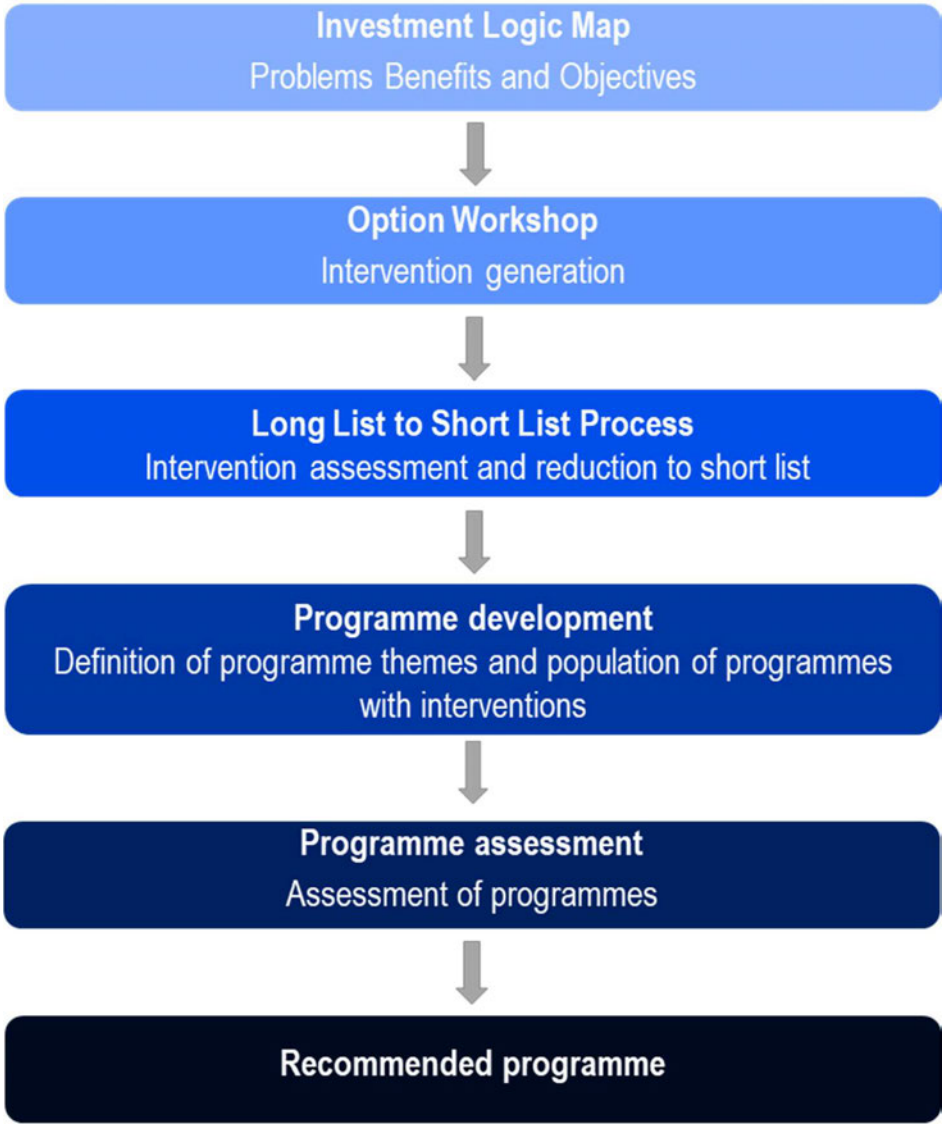


Figure 37: Process Flow Diagram

8.1 Option Identification

8.1.1 Identification of Interventions

A wide range of intervention ideas was generated by stakeholders at the options workshop held on 16th July 2020. These ideas were identified by asking participants to consider improvements in four main categories, which correspond to the problems identified in section 4 (as illustrated in Figure 38). The optioneering workshop outcome for these categories is as shown in the Table 22.

Table 22: Optioneering Workshop Outputs

Categories	Interventions Considered
AT Level of Service and Value for Money	A total of 36 ideas were proposed such as: a change to the fleet and infrastructure ownership model, development of a sustainable procurement model, development of tourism model and development of the network that offers better all-day service instead of peak focused service.
Customer Level of Service	52 ideas were generated for this category. These ideas included: boarding priority for vulnerable users, fare integrated E-scooter / e-bike scheme for first/last leg travel, ferry timetable integration with other PT modes, and better/safer terminal facilities.
Ferry Capacity	24 ideas were included in this category and these ideas related to: newer vessels, on-demand ferry services and better ferry designs that offer more efficient travel and faster boarding/alighting.
Environmental Impacts	A total of 40 ideas were included in this category such as: newer technology for vessel propulsion e.g. hydrogen and electric ferries, strategies and technology to manage oil spills, noise/wake level reduction ideas and development of more efficient wharves to achieve more efficient vessel manoeuvring.
Total number of potential interventions	**152 ideas and interventions**

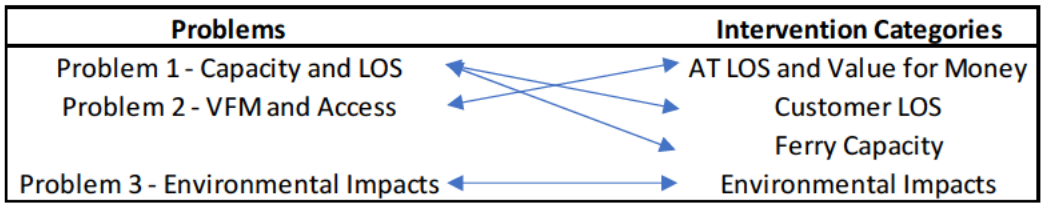


Figure 38: Mapping Problems to Intervention Categories

A full list of these interventions can be found in **Appendix D**. These ideas/interventions formed a long list of interventions.

8.1.2 Long List to Short List Process

Following the optioneering workshop, all documented ideas underwent a sifting process from Long List to Short List. The process is shown in Figure 39 and subsequently discussed in this section.

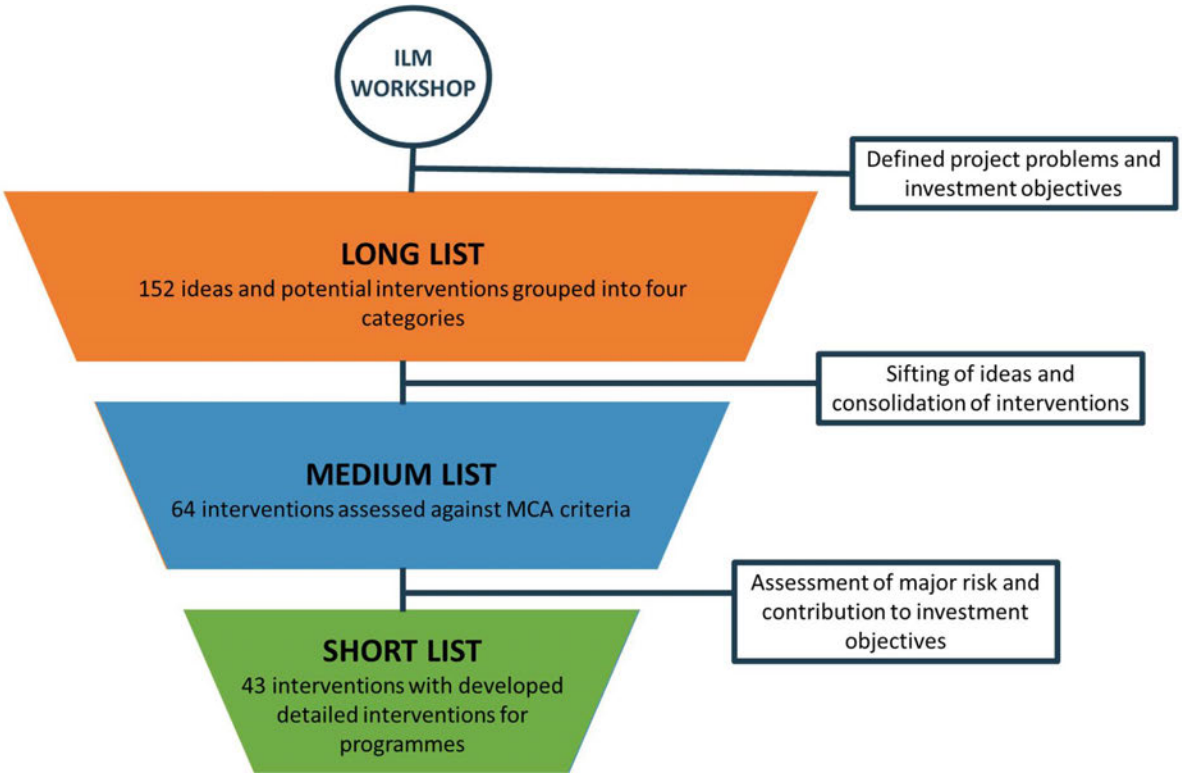


Figure 39: Long List to Short List Development

Long List to Short List Process:

1. **Long to Medium (Screening of Long List)** – screening and consolidation of proposed ideas was completed as part of this stage to delete duplications, consolidate ideas into interventions and remove ideas that defined a "Business as Usual" improvements such as retention of employees. After the refinement, review and consolidation of these ideas, 64 interventions were included in Medium List and taken to the next level of assessment.

2. **Medium to Short (Assessment of Medium List)** – the list of interventions was then assessed against the investment objectives and only those interventions that contributed to the investment objectives and did not have any high implementation risks were taken forward to the Short List assessment stage. In addition to above, any specific procurement related interventions were omitted (and have been carried forward for consideration into parallel procurement strategy development workstream).

   The detailed assessment for interventions that were assessed in this stage is documented and can be found in **Appendix E**.

A total of 43 interventions were included in the Short List and fell into five categories:

- **Fleet Upgrade** – interventions defining a number and type of vessels included in programmes;
- **Ferry Service Improvements** – interventions related to ferry frequency and span improvements;
- **Landside and Wharf Improvements** – interventions related to ferry terminal improvements both on land and water;
- **Public Transport Improvements** – PT improvements related to better network integration: and
- **Active Mode Improvements** – improvements related to walking, cycling and other means of active travel.

Before the development of the programmes, wider interventions like 'ferry service improvements', 'assessment of potential new routes' or 'improvements to ferry integration with other public transport modes' were split up into more detailed interventions on a route-by-route basis. This was required as each route has specific problems and more detailed interventions were needed.

For example, a detailed assessment of potential new routes was undertaken with AT staff members which identified opportunities and technical/planning challenges of expanding the ferry network. This assessment included potential 13 new ferry routes; however, after assessing viability, technical challenges and benefits, only two routes were taken forward to the programme development stage. The assessment of the 13 potential ferry routes is shown in **Appendix F**. The two routes that made it into the programmes are Wynyard Quarter and Kennedy Point passenger routes. The first one offers expansions of ferry network to Wynyard Quarter which is one of the key waterfront growth areas, and the later one could provide more resilience to Waiheke Island.

8.2 Programme Development

8.2.1 Programme Development Principles

The programme development followed three key principles:

1. **Alignment with Intervention Hierarchy** – The programmes present different levels of investment with due consideration of Waka Kotahi's intervention hierarchy to deliver proportional benefits for customers. Intervention diversity and alignment to the intervention hierarchy is discussed in 0;
2. **Targeted Interventions** - Programmes include interventions that are targeted to improve the key routes and have the highest contribution to the investment objectives. The current key routes were determined based on the levels of the existing patronage and the future key routes were added depending on the population / employment growth within the catchment area (see **Figure 46** in 0). Route priorities and future growth are discussed in Part A of this report.
3. **Gradual Investment** – This was the preferred approach by AT due to financial constraints with COVID impact. The programmes represent graduated investment levels to capture the benefits relevant to the increasing investment scale. Each of the subsequent programmes is built on interventions from the previous programme. This is discussed in Section 8.2.2.

Overall, these principles were developed to guide programme development process and develop programmes that achieve investment objectives and provide a positive investment return fitting within varying funding ranges.

Furthermore, to achieve the investment objectives, the developed programmes were constructed from short-listed interventions based on three conceptual steps:

Step 1 – Fill in Existing Gaps and Service Existing Demand by upgrading the ferry network to provide safe, reliable and sufficiently frequent ferry service. The ferry network has been underinvested for an extensive period of time resulting in an aging and polluting fleet. To achieve these goals the network requires an influx of newer vessels, improvements to landside and wharf infrastructure and more frequent and longer ferry services.

Step 2 – Grow Patronage and Expand Catchments by developing supporting active modes infrastructure and providing better ferry network integration with other public transport modes.

Step 3 – Introduce Environmentally Cleaner Fleet to support the growth of the city and contribute to goals set out in Climate Change Response (Zero Carbon) Amendment Act 2019[95].

8.2.2 Initial Programmes

The project team, together with AT and key stakeholders, through the process of meetings and workshops developed a series of ferry network development programmes. The programmes built on interventions defined in the short-list process and Table 23 below shows the level that each intervention is included in each programme (light green shows partial implementation and dark green shows full implementation of an intervention, empty cell indicates no intervention)

[95] http://www.legislation.govt.nz/act/public/2019/0061/latest/LMS183736.html

Table 23: Interventions from Short-list to Programmes

		Programmes --->	Programme I	Programme II	Programme III	Programme I	Programme V
Code	Short Listed interventions	Programme Interventions	Do Nothing	Do Minimum	Meet Demand	Grow Demand IV	Future Proofing
V1	Improve Safety and Security – Vessel and gangway lighting.	New Vessels					
V2	Provide free on-board working space – Wi-Fi.	New Vessels					
V3	Provide better and standardised cycling storage facilities on board with sufficient capacity and manoeuvring space	New Vessels					
V4	Retro-fit technology as an interim solution to achieve better environment outcomes	Existing fleet/ Second hand/ Leased vessels					
V5	Standardise gangway widths for faster boarding and alighting and boarding ramps to provide easier, safer, access for all;	New Vessels					
V6	More efficient and faster ferries - better hull design/semi-foiling results in faster travel, use of propellers or kites	New Vessels					
V7	Vessel design that provides reliable access to upper harbour or estuary wharves	New Vessels					
V8	Replace diesel ferries with - hydrogen, hybrid, electric ferries	New Vessels					
V9	Develop a more sustainable vessel design - reduce wake/wash	New Vessels					
V10	Decommission existing old/most polluting diesel fleet	New Vessels					
V11	Develop carbon offset strategy (e.g. install solar panels)	New Vessels					
V12	Manage oil/refuelling spills	New Vessels and Central Vessel Servicing Location					
V13	Branded and Standardised Fleet	New Vessels/ Procurement Model					
V14	Provide outside seating to improve customer experience	New Vessels					
V15	Fully accessible vessels	New Vessels					
NET1	Develop network design that serves throughout the day and not just peak hours (incl. weekend services) to optimise the ferry routes. Redesign network for interpeak and weekends for interlinked services	Better interpeak, evening and weekend frequencies. Longer operational span.					
NET2	Develop response strategy to service reduction on exempt services e.g. Devonport service reductions.						
NET3	Subsidise exempt ferry services						
NET4	Standardise and improve the fleet and infrastructure. Develop a ferry network hierarchy (key, connector and minor routes) and standardise ferry types based on the route category	Vessel design, network operation.					
NET5	Improved peak frequencies for key routes	Better peak frequencies					
NET6	Improved operational span by increasing the span on key routes to operate from 6am to late evenings or midnight	Longer operational span					
NET7	Implement new routes - provide more destinations / better coverage.	New routes. E.g. Wynyard Quarter					
NET8	Develop better Marine / harbour info and interaction	Better on-board terminal service information					
NET9	Consider on demand ferry	On-demand ferry service for less populous areas					
NET10	Investigate central vessel service locations to support the growing fleet	Implementation of central vessel servicing location					

		Programmes --->	Programme I	Programme II	Programme III	Programme I	Programme V
Code	Short Listed interventions	Programme Interventions	Do Nothing	Do Minimum	Meet Demand	Grow Demand IV	Future Proofing
NET11	Explore the efficiency of "networked" or "point to point" routes	Network improvement					
LW1	Develop Property Optimisation / Transport Orientated Design strategies around wharves (incl. partnering opportunities with private developers and communication with local boards)	Larger ferry terminal catchments					
LW2	Replace marina terminals with AT-owned wharves	New ferry terminals					
LW3	Car parking to ferry (implement park and rides at appropriate locations where there are no bus/rail services - i.e. at remote locations). Manage access to park and ride	Access to and management of park and rides at ferry terminals					
LW4	Provide better transfer facilities: safer terminals with retail that has cafes/food, good toilet facilities and sheltered waiting areas	Improved terminal facilities					
LW5	Develop better wharf designs to reduce dwell times and improve ferry repositioning.	Improved wharf infrastructure					
LW6	Improve infrastructure around wharves - better bus, train, walking and cycling connections.	Improved access to terminals					
LW7	Provide better and standardised cycling/scooter parking facilities at ferry terminals - secure and sheltered parking	Improved terminal facilities					
LW8	Improved Wayfinding – real time info, including other languages.	Improved terminal facilities and wayfinding					
LW9	Fully accessible terminals	Improved terminal facilities					
LW10	Dynamic Berth Allocation	Better operation at terminals					
PT1	Integrate ferry timetable with other PT.	Integrated timetable for ferries and buses					
PT2	Full fare integration for ferries with other PT	Fare integration beyond one zone					
PT3	On-demand shuttles to ferry terminals	Expansion of ferry catchment areas					
PT4	Improve bus connectivity to ferry terminals	Better bus frequencies to ferry terminals					
AM1	Integrated E-scooter / e-bike scheme for first/last leg with fare included in the ferry ticket	Better ferry and active mode integration					
AM2	Sufficient active modes parking capacity on-board and shoreside	Better active modes facilities					
AM3	Improve active modes connectivity to ferry terminals	Expansion of ferry catchment areas, safe and protected infrastructure, vision zero design					

The programme scenarios developed are listed and discussed below:

1. **Programme I – Do Nothing (Existing network with secured investment only)** – this programme has minor operational improvements such as additional sailings to extend peak hours at West Harbour and Pine Harbour – low-cost improvements attempting to partly address existing operational gaps. This scenario also assumes the closure of Stanley Bay route and a relocation of a legacy Stanley Bay vessel to operate on the Hobsonville route (which has already occurred). The programme does not include any infrastructure or vessel upgrades and as a result, due to aging fleet and infrastructure that requires regular maintenance, this programme will not be able to ensure the current levels of ferry services for the entire 10-year investment period. It is expected that the network will gradually deteriorate with more likely service cancelations and vessel breakdowns.

2. **Programme II – Do Minimum (Ferry network with minimal investment)** – this programme includes a set of interventions required to retain the minimum operational levels of the current network. These interventions include purchase/lease of 14 second-hand vessels to replace aging fleet and introduction of two new vessels to operate on the Pine Harbour route. For ferry service improvements, this scenario includes minor improvements to the West Harbour and Hobsonville routes and more substantial improvements for Pine Harbour, including an introduction of weekend services. This programme does not include Stanley Bay ferry service (as per AT's PT January 2021 changes). Overall, this is a scenario with minimal investment to maintain current levels of network operations over the next 10 years. All interventions included in this programme are shown in Figure 40.

3. **Programme III – Network improvements to meet demand** – the programme is built on Programme II interventions and includes additional improvement to focus on meeting the existing patronage demand. It includes purchase of new vessels (second-hand vessels from Programme II plus 11 new vessels, including electric ferries), provision of better ferry frequencies for high demand routes such as Hobsonville and Devonport, better utilisation of assets during off-peak and weekends on Birkenhead and Bayswater routes, reinstatement of Stanley Point route, construction of new terminals at Pine Harbour and Bayswater and public transport/active mode improvements. Note procurement strategy is covered by a separate workstream by AT. Overall, this programme will offer moderate improvements to overall ferry operations, resulting in the overall network upgrade which will enable filling in the gaps in the network, meeting the existing ferry patronage demand and slightly reducing the negative impact on environment. This programme partly achieves step 1, 2 and 3 mentioned in section 8.2.1. All interventions included in this programme are shown in Figure 41.

4. **Programme IV – Network improvements to grow demand –** the programme builds on Programme III interventions and includes additional interventions that are focused on enabling mode shift to ferries. It includes purchase of more new vessels to replace remaining old vessels in the fleet (i.e. a total of 21 new vessels in addition to 14 second-hand vessels), further enhancement to ferry service frequencies and spans throughout the network during peak hours, off-peak and weekend periods, an introduction of Wynyard Quarter route, further landside and wharf improvements and further improvements to public transport and active mode connections. As a result, this programme will offer moderate to significant improvements to ferry network, enabling expansion of the network, more efficient and cleaner operations and the network that is targeted to address population growth in the key areas of Tāmaki Makaurau, Auckland. This programme achieves step 1 and 2, and partly achieves step 3 mentioned in section 8.2.1. All interventions included in this programme are shown in Figure 42.

5. **Programme V[96] – Long-term network development –** the programme includes interventions from Programme IV and adds a number of interventions focused on further reducing impact of the ferry network on environment and significant improvements to increase ferry catchments. The programme includes further frequency enhancements across the network, renewal of the entire fleet (second-hand vessels which are part of Programme II are replaced with new vessels), more vessels with new propulsion technologies (e.g. hydrogen or more efficient electric ferries), extensive improvements to active mode network and connectivity and a number of interventions on Waiheke Island to better integrate other travel modes including the Kennedy Point terminal improvements. This is the programme that is targeted at developing nearly maximum potential of the ferry network when it comes to increasing patronage, improving customer levels or service and decreasing impacts on environment. This programme achieves all three steps mentioned in section 8.2.1. All interventions included in this programme are shown in Figure 43 and Figure 44.

As mentioned above, each subsequent programme builds upon the interventions included in the previous programmes unless a new intervention in the new programme offers an overriding improvement. For example, a new bus service from Maraetai to Pine Harbour included in Programme II is also part of Programme III, IV and V but second-hand vessels included in Programme II are not part of Programme V as these are replaced with the same number of new vessels.

The development of the above programmes was completed in conjunction with AT and Waka Kotahi over a series of meetings.

96 Programme V is the only programme beyond 10-year period. Other programmes are designed for 2021-2031 investment period

Programme II – Do Minimum

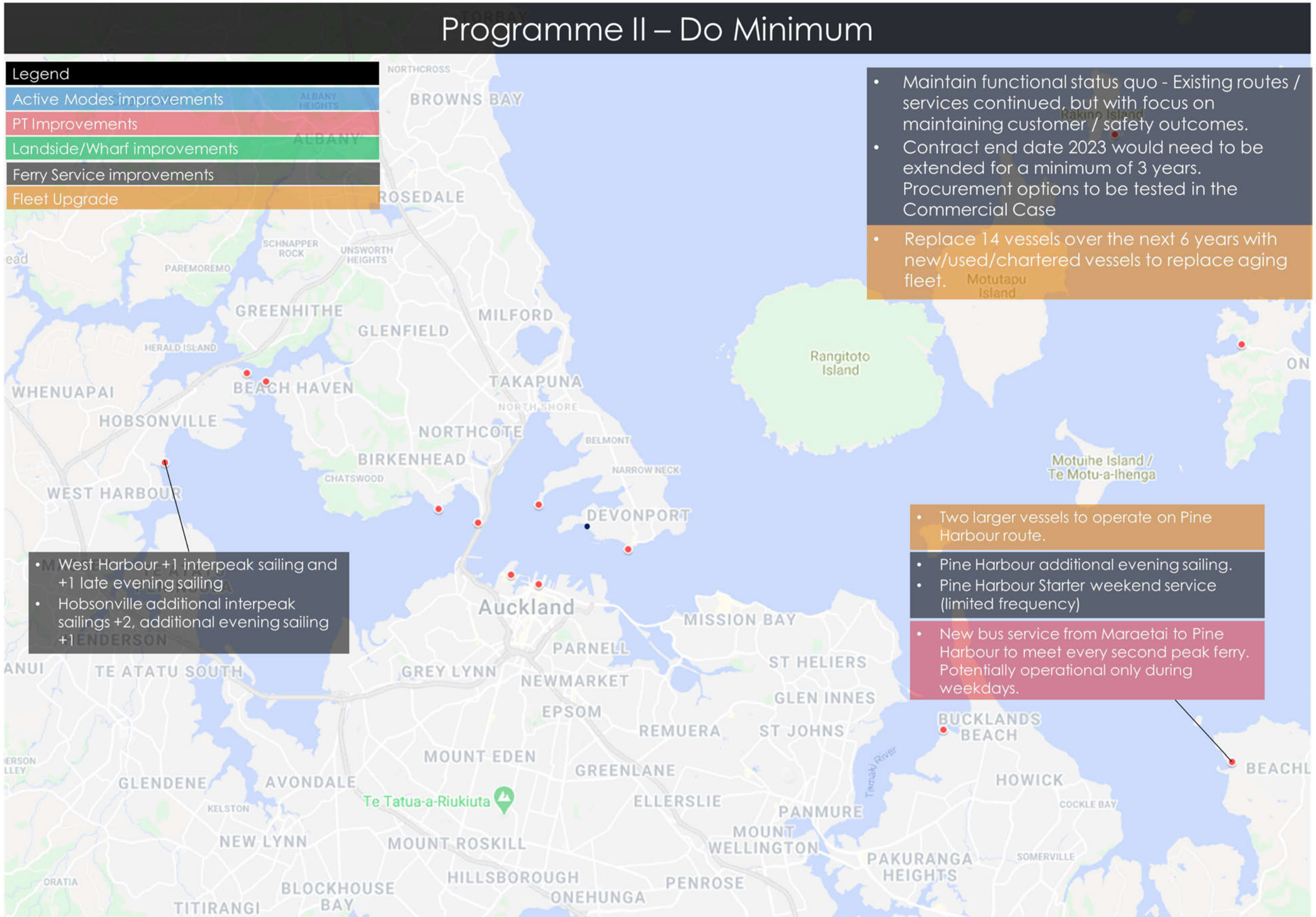


Figure 40: Programme II - Do Minimum

Programme III - Network and Fleet improvements to meet patronage demand

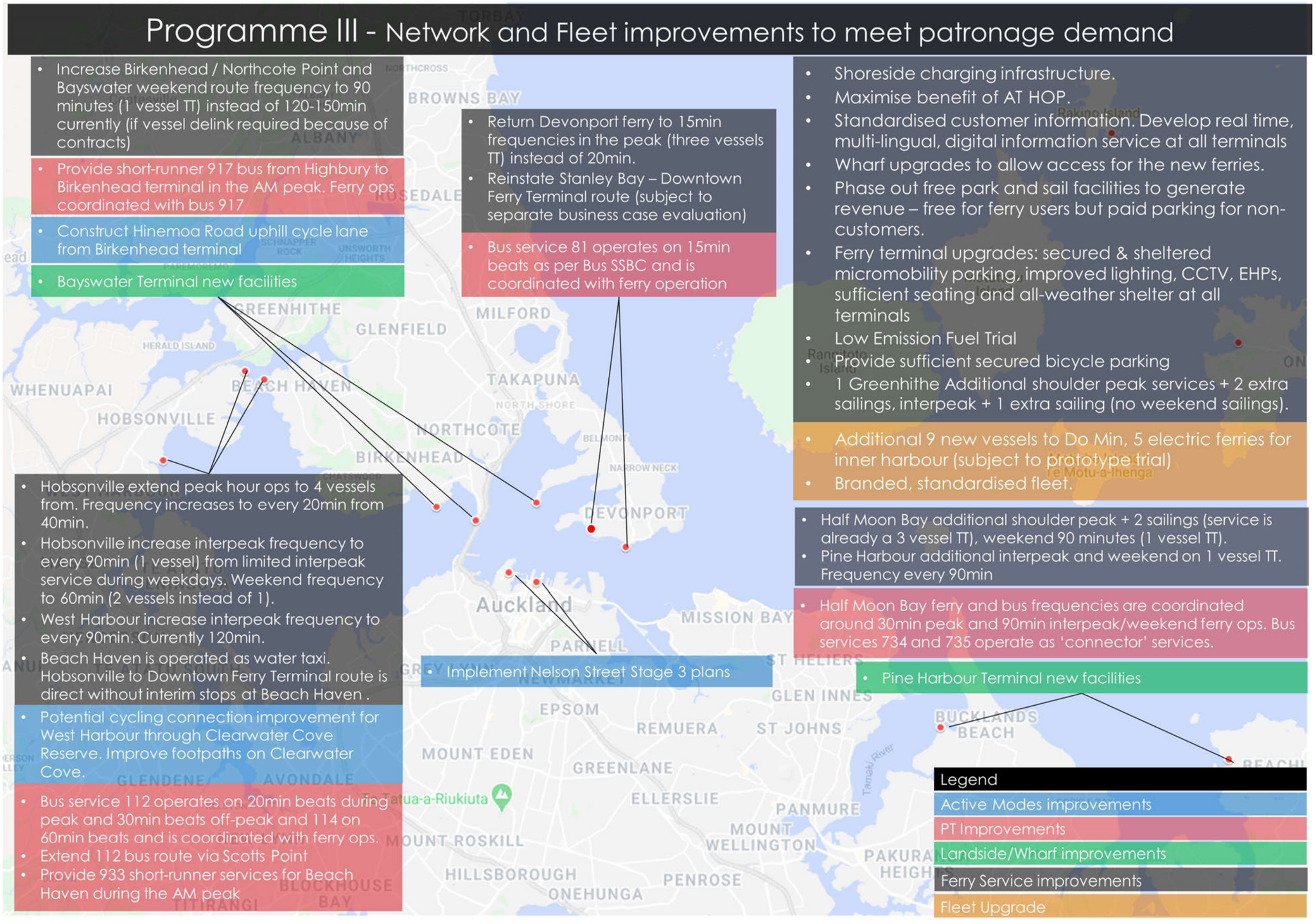


Figure 41: Programme III - Meet Demand

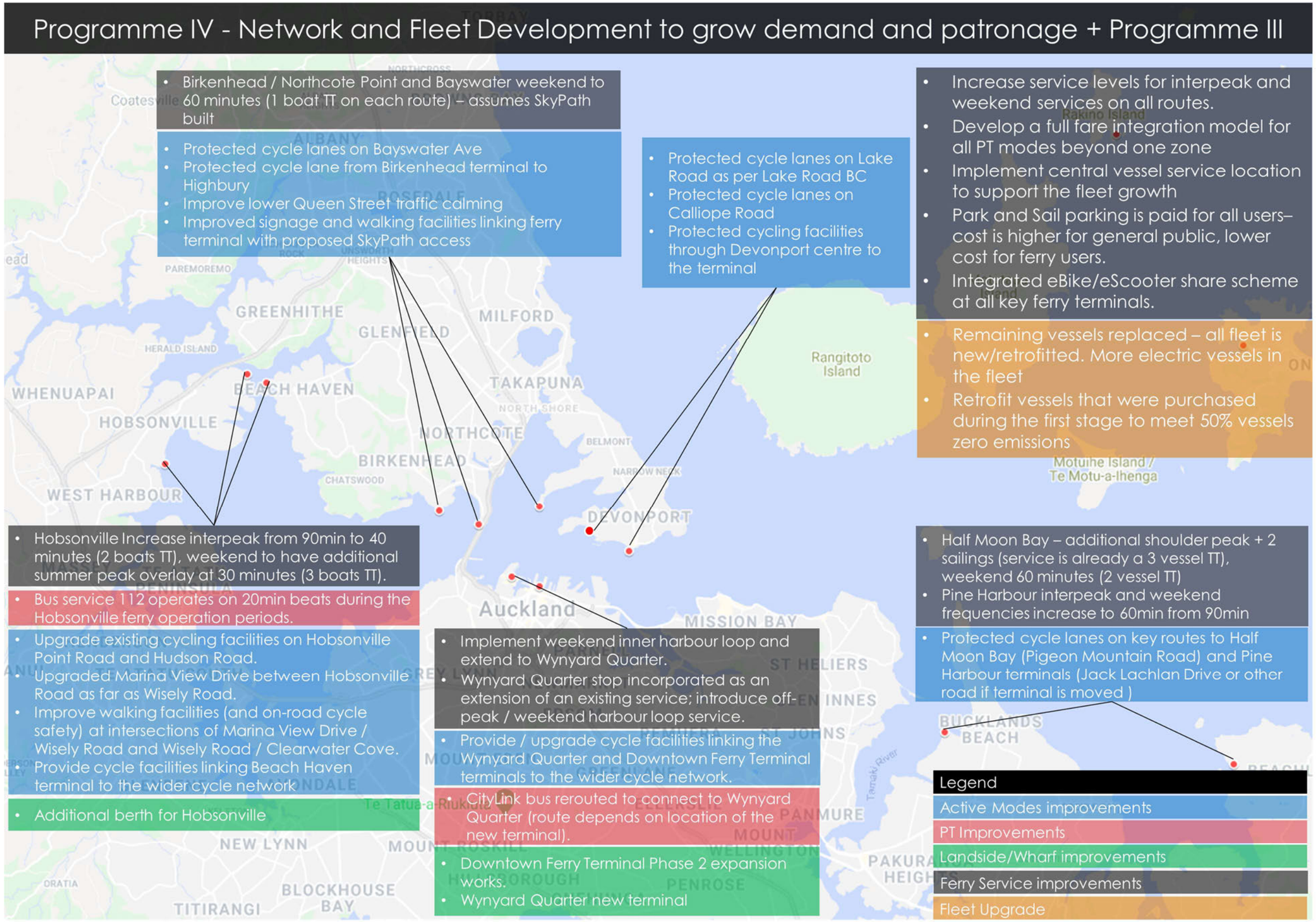


Figure 42: Programme IV - Grow Demand

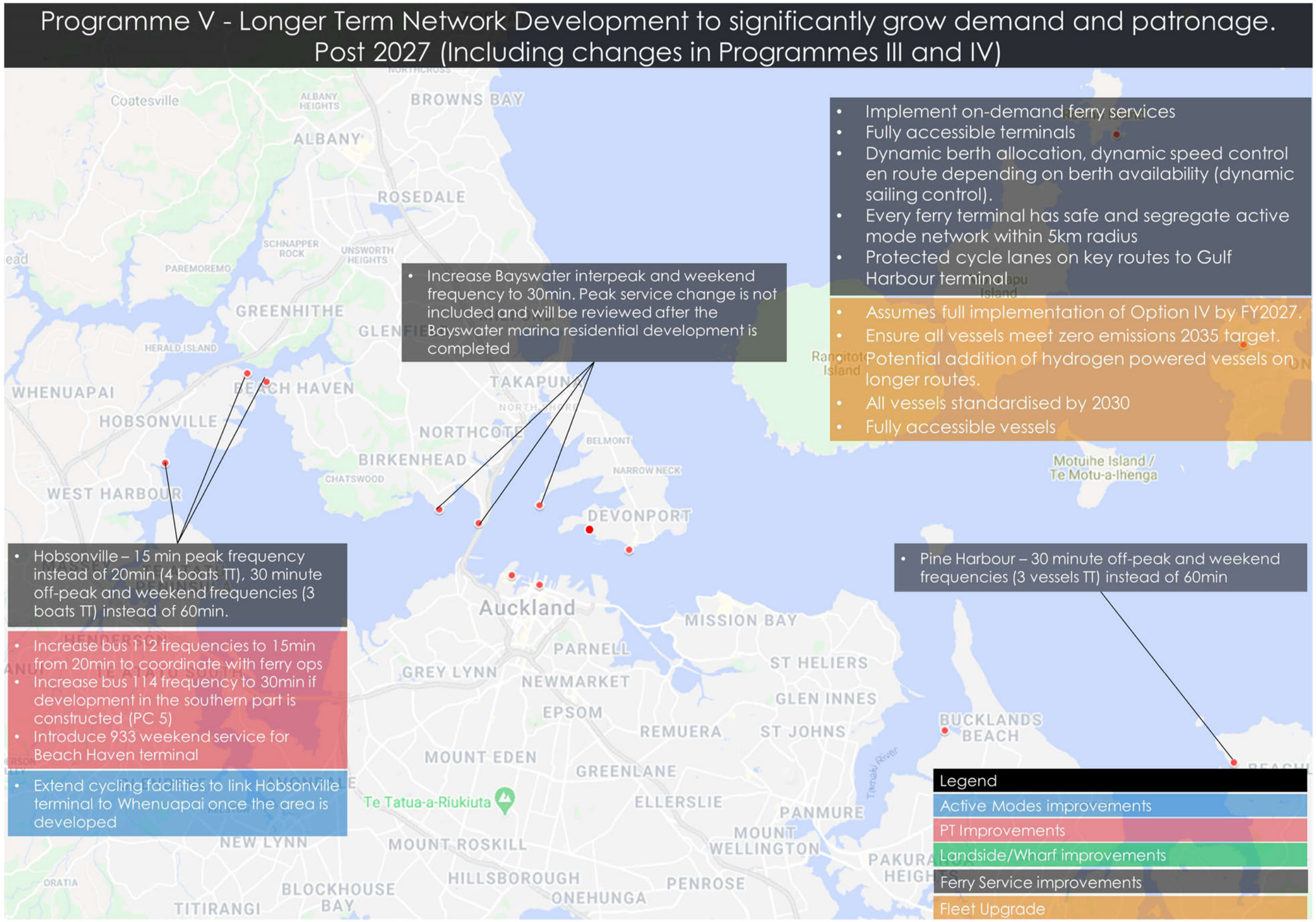


Figure 43: Programme V - Long-term Improvements

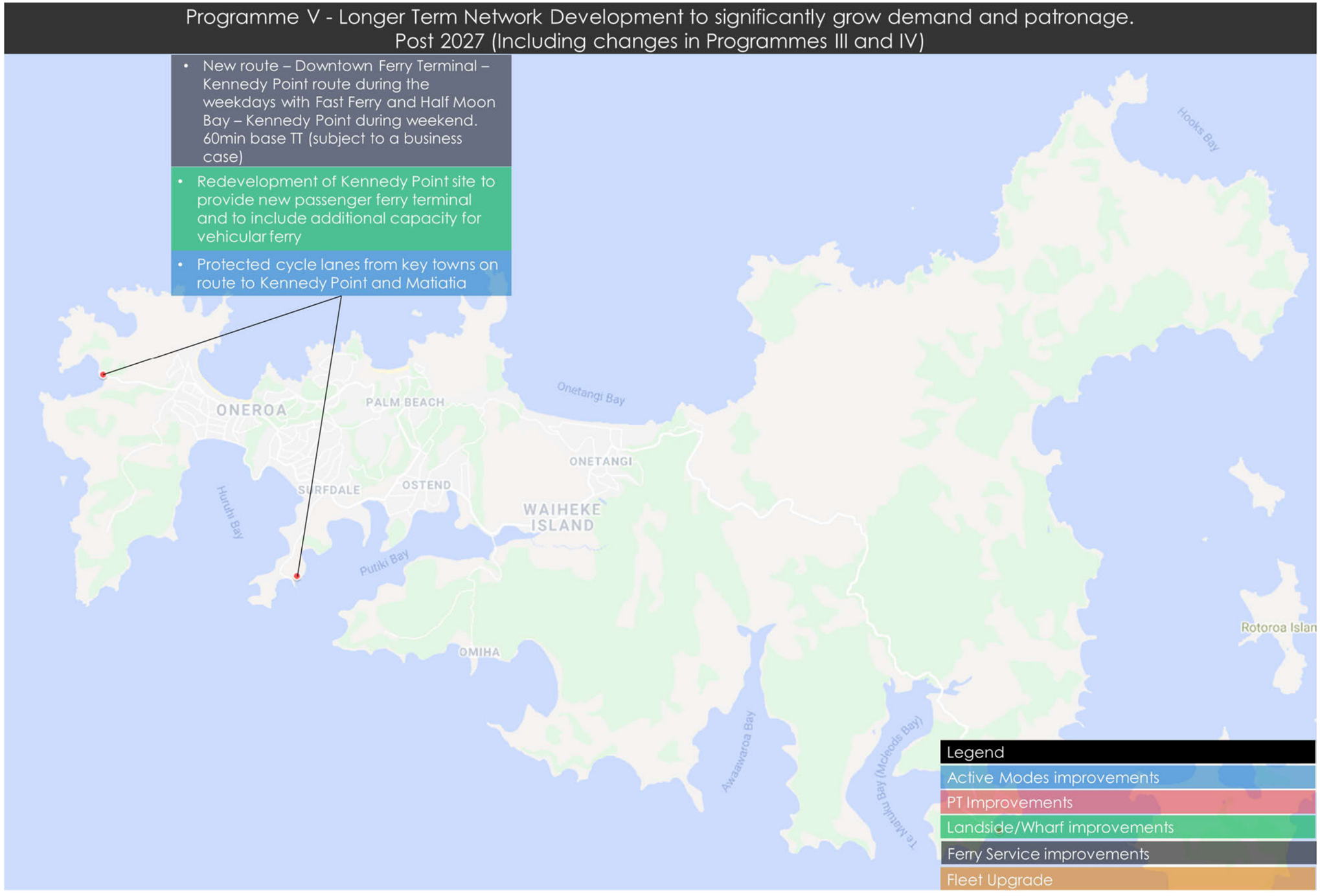


Figure 44: Programme V - Long-term Improvements (Waiheke)

The fleet upgrade throughout the programme is illustrated below.

Table 24: Fleet Upgrade in Programmes

Fleet Upgrade	Programme				
	I	II	III	IV	V
Existing vessels	27	13	10	0	0
Retired vessels	2	16	19	29	29
Second-hand vessels		14	14	14	
New vessels		2	11	21	37
Total Fleet Size at the end of the Programme	27	29	35	35	37

8.2.3 Programme Alignment with Intervention Hierarchy

The development of the programmes responds to Waka Kotahi's intervention hierarchy, especially in relation to the better use of the existing network (prioritisation and re-allocation of existing services) to achieve the objectives set out in the ILM. The Intervention Hierarchy is illustrated below in Figure 45 and formed a framework when developing the programmes meaning that all of the programmes have some elements of the investment hierarchy, but the cost and scale of interventions included in the earlier programmes is lower than that of interventions included in Programmes IV and V.

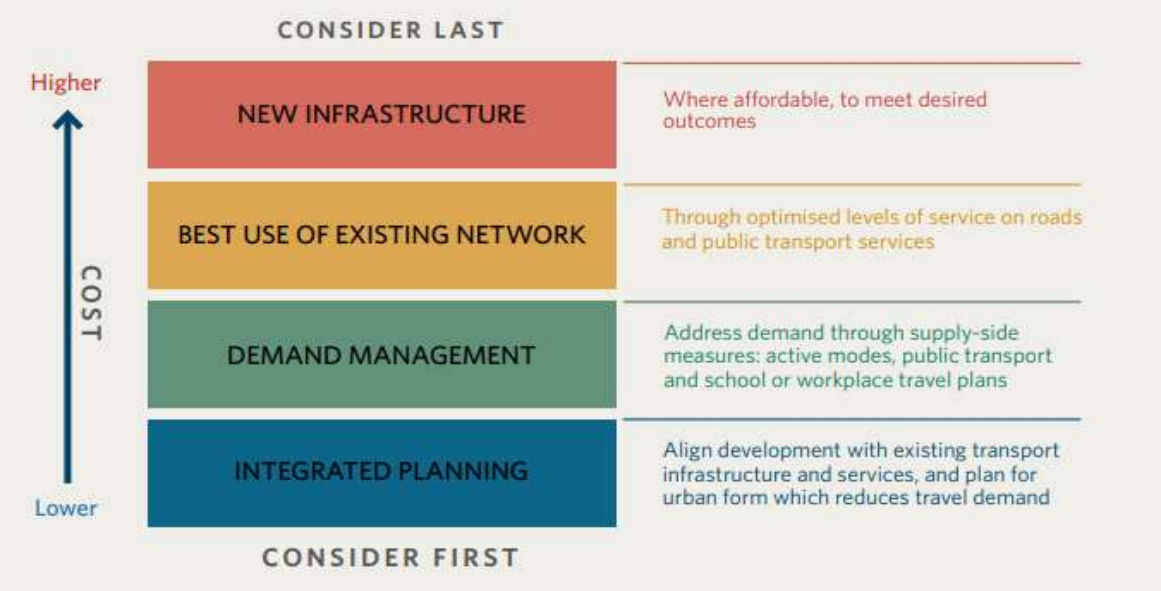


Figure 45: Waka Kotahi Intervention Hierarchy for Investments

Taking each of the interventions in turn:

1. **Integrated Planning**: to address the growth across the region, an integrated PT network will be the key in successful development of competitive and attractive public transport in Auckland. Most of the growth around the current ferry routes is planned to occur in Hobsonville and the City Centre. In Hobsonville Point alone there will ultimately be 4,500 homes and a population of about 11,000, with the wider Hobsonville area being home to a total of 20,000 people in the next 10 years. The integrated

walking, cycling, bus and ferry network will play an important role to offer these residents a good alternative to private vehicle travel as supported by National Policy Statement - Urban Design.

Furthermore, in the next 10 years City Centre is projected to offer approximately 17,000 more jobs and will be home to 11,000 more people. With more jobs around the downtown ferry terminal, the central area will result in an even stronger travel demand pull on the existing areas connected by the ferry network as ferries offer the most direct connection from each of the ferry terminals to City Centre.

From potential new ferry routes, the largest growth area is expected in Wynyard Quarter. When the development of Wynyard Quarter is fully completed, it will become home to about 3,000 residents and 25,000 workers. The figure showing the projected changes in employment and population is shown in Figure 46.

Beachlands and Maraetai are the areas around Pine Harbour terminal that could experience more growth than what is recorded in I11.5 Council's land use data, however, at this stage additional growth to what is shown in Figure 46 is unlikely due to Whitford-Maraetai Road and intersections on this route operating near its capacity limits.

Therefore, when developing the programmes, the interventions were introduced in a gradual manner to first increase PT and active mode network integration and overall infrastructure upgrades at these growth areas.

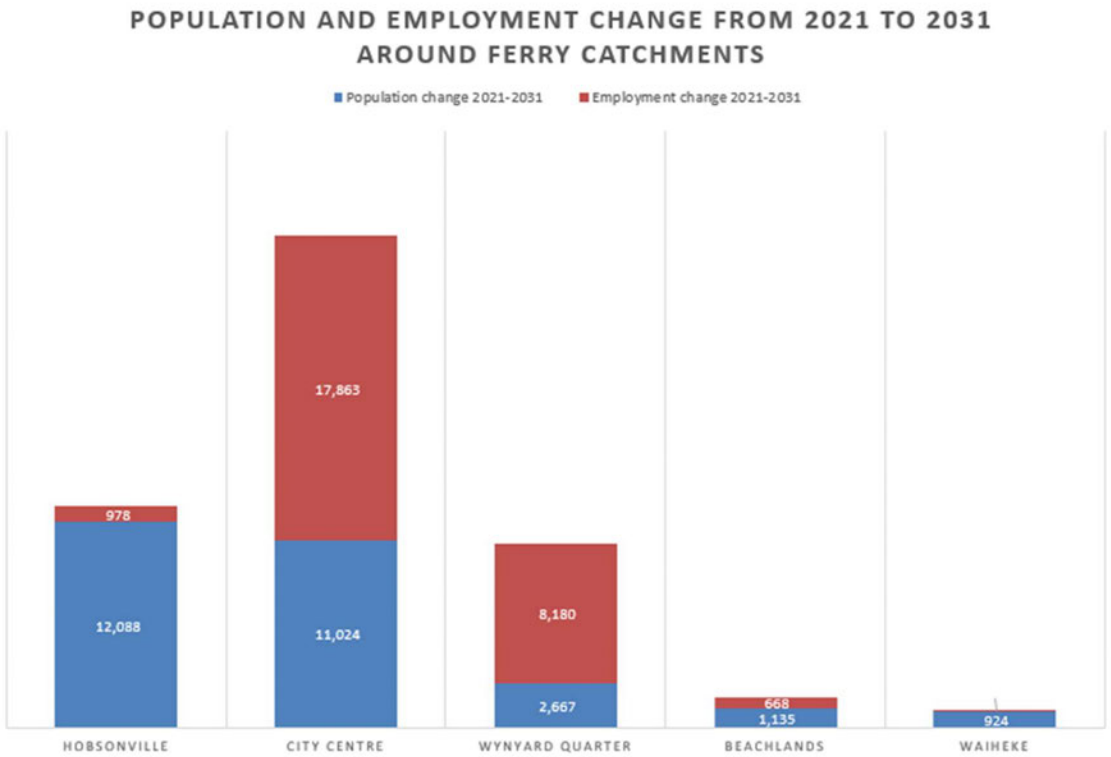


Figure 46: Projected Population and Employment Growth in Auckland between 2021- 2031[97]

2. **Demand Management:** many demand management techniques are expected to drive an increase in public transport. AT have trialled a number of TDM measures across Auckland including "give it a go" free HOP cards for businesses and communities, incentivising active and public transport modes and

[97] I11.5 Auckland Council Housing and Employment Data – values interpolated based on available data

route specific promotions. Demand management generally drives a shift from private transport to public transport and active modes, increasing PT patronage and helping Auckland get to its target of 150 million PT journeys by 2028. The developed programmes offer a range of demand management interventions such as full fare integration, parking charges for parking activities not related to park and sail travel, more frequent services and cycling/scootering share schemes which mostly relate to improved attractiveness, competitiveness and integration of active modes and public transport.

3. **Best use of existing network:** this is an area that AT have spent a lot of time and resource in 2020, as part of emergency budget discussions post COVID-19.

   It is noted that during the COVID-19 recovery period, AT have assessed ways in which to save $10m from the public transport network[98]. As part of this budget saving exercise, the Stanley Bay route has been temporary suspended with reallocation of the vessel to enable better service for the faster growing Hobsonville area. Due to the suspension of this route, the commute for approximately 160 people a day from Stanley Bay has been altered. As such the reinstatement of Stanley Bay to a Downtown (DTFT) route is included in Programme III.

   Further to that, when exploring potential programmes, some analysis was undertaken to understand if the existing network's use is maximised and if it requires any upgrades. The analysis included the following steps:

   - Review current frequency and span of the routes and how the operation of existing network aligns with RPTP future targets;
   - Review routes that had a consistent pattern of passengers being left behind such as Pine Harbour and West Harbour;
   - Review future growth areas;
   - Analyse daily patronage profiles;
   - Assess ferry timetable integration with the other PT modes in ferry catchment areas.

   Once these analyses were completed, routes that could be better utilised were identified and minor but essential improvements such as extension of peak periods with additional sailings or provision of larger vessels to tackle an issue of passengers being left behind were included in the early intervention programmes to ensure that the existing network is used to its full potential. For routes that are not 'lifeline' routes or do not carry a substantial number of passengers, e.g. Beach Haven link, an option of amending the service was explored.

   It is noted that for ferry routes such as Birkenhead / Northcote Point, while there appears to be more frequent bus services alternative to ferry; the catchments these bus routes served are quite different from that for the ferry service. For Birkenhead, the ferry terminal's closest competing city bound bus service is almost half an hour walk away and the in-vehicle travel time for ferry is significantly less comparing to that on bus during peak time. Ferry is also more accommodating for travellers cycling the first and last mile of their journey, allowing them to carry their bikes on the vessel. Moreover, ferry tends to have a high mode attractiveness comparing to bus, attracting loyal customers who would otherwise drive to work, therefore expanding the size of public transport market. Lastly, more detailed financial assessment will be carried out in the next phase to confirm wider economic and social benefits of routes such as Birkenhead / Northcote Point.

   Better use of bus network was also included in the programmes. Such interventions that help integrate bus and train services with ferry services were explored and adjustment to the existing service frequencies or extension of operating hours (e.g. starting bus service earlier to provide connectivity to ferry service) were put forward.

[98] https://at.govt.nz/about-us/news-events/changes-to-public-transport-services/ (last published on 18 September 2020)

4. **New infrastructure:** Any new infrastructure required to enable proposed changes such as the reconstruction of wharves to enable new vessel operation, construction of new ferry terminals in Bayswater and Pine Harbour and further enhancements to DTFT were gradually introduced in each of the programmes.

   Programmes I and II focus mostly on the best use of the existing vessels and network, with minimal new infrastructure. Later programmes consist of a mix of all intervention levels from the intervention hierarchy. All programmes have sufficient interventions to function independently and have a diverse set of interventions as discussed in 8.1.

8.2.4 Consideration of Other Transport Infrastructure

Other transport infrastructure that may offer significant travel improvements for alternative modes to current ferry routes were considered when developing the programmes. These include the Northwest Busway along SH16, Penlink with NX 2 Bus connections from Gulf Harbour and AMETI (Eastern Busway). Note, these do not form part of the programmes developed in this PBC as they are covered in separate business cases.

The key infrastructure that is planned to be completed in the next 10 years is listed below:

- **Northwest Rapid Transit along SH 16** – bus infrastructure and service upgrades along northwest corridor are expected to offer improved travel times from Northwest Auckland and potentially reduce the attractiveness of ferries from the West Harbour terminal. The interim implementation of Northwest Busway is planned for 2024, with bus priority lanes planned at the end of 10-year period;
- **Penlink with NX 2 bus connection from Gulf Harbour** – a new link providing better connectivity for Gulf Harbour. This public transport upgrade could impact Gulf Harbour ferry patronage and offer competitive land travel times but only if the bus route is completely segregated throughout Penlink and within Gulf Harbour. Planned completion late 2020s.
- **AMETI** (Eastern Busway) – the Stage 1 construction will offer a separated bus connection from Panmure to Pakuranga (estimated completion mid-2021) with later stages connecting to Botany via Ti Rakau Drive and link to Pakuranga Road (completion in 2025). AMETI will offer better bus connections from the east but since it passes through the southern side of Half Moon Bay it is unlikely to affect the Half Moon Bay ferry patronage significantly.
- **Northern Pathway (Skypath and Seapath)** – The Northern Pathway project will provide a seamless dedicated walking and cycling link between Auckland's City Centre and the North Shore which will connect with existing local paths to extend the region's walking and cycling network. This infrastructure may impact ferry patronage at Northcote Point and Birkenhead routes, potentially reducing ferry patronage on the weekdays.
- **Other Business Cases** – such as Public Transport Improvements SSBC (October 2020), Lake Road business case, Cycling business case and other business cases.

These projects were considered when assessing the initial programmes and identifying the recommended programme. From this assessment, ferry routes that may have planned improvements in the future to competing alternative travel modes, were given less weighting when forming the recommended programme. These routes were Gulf Harbour affected by the construction of Penlink and West Harbour affected by Northwest rapid transit. However, if the improvements are not completed, investment in these ferry routes should be considered.

8.3 Initial Programme Assessment

A series of meetings, online calls and a multi-criteria assessment workshop have been completed in the process of assessing the programmes.

The investment objectives, the critical success factors and the opportunities/impacts were identified, refined and agreed with AT and Waka Kotahi. These assessment criteria with associated KPIs and other factors are listed in Table 25.

Table 25: MCA Criteria with Associated KPI

Criteria	Description
Customer Satisfaction	KPI 1: Percentage of trips that are punctual (AT SoI) KPI 2: Proportion of timed connections arriving within 15 minutes of connecting service KPI 3: Number of routes meeting RPTP Frequency targets KPI 4: Percentage of passengers satisfied with public transport services (AT SoI)
Ferry Patronage	KPI 1: Ferry patronage and mode share KPI 2: Overall PT patronage and mode share
Access to Opportunities	KPI 1: Number of people whose trip would be faster by ferry than other modes in peak times KPI 2: Number of people who access ferry services via active modes KPI 3: Number of fully accessible vessels/ facilities
Cost Efficiency	KPI 1: Cost per passenger service km KPI 2: Operating cost per service hour KPI 3: Farebox recovery rate
CO2 Equivalents	KPI 1: Average CO2 equivalents emission per ferry km
Safety (Water/Land)	What is the impact of the proposed programmes on Health and Safety on landside and seaside?
RMA	What is the level of consenting complexity/difficulty?
Achievability (technical implementability)	What are the technical or practical considerations that may prevent a programme from achieving the investment objectives? What are the technical risks involved in developing or implementing this option?
Cost (Operational, Capital and Maintenance)	What are the capital/operational/maintenance costs?
Supplier Capacity and Capability	Any external vessel supply challenges? Timeframes to procure/build new vessels. Local supplier availability? Is technology sufficiently advanced?
Alignment to regional and national policies	Alignment with policies in RLTP, RPTP, Auckland Plan, Uni Plan, NPS and others

Criteria	Description
Social/Environmental effects/Climate Mitigation	What environmental effects are associated with this programme? Environmental effects could include those related to ecology, water quality, stormwater, noise and vibration and etc.
Climate change adaptation	Is the programme exposed to climate change risk or other natural hazards over time?
Impacts on Te Ao Māori	What, if any, impacts are there on Te Ao Māori? This includes areas of significance for Māori, Māori land and Kaitiakitanga.
Property impacts	How does the programme impacts on property? Can the necessary property be obtained?

While cost benefit analysis was considered to weigh the programmes, it quickly became apparent that a multi-criteria analysis would be more suitable for the assessment. This is especially the case given the complexity and uncertainty in some of the criterion such as costs for future fleet options. This was raised in the workshop and following the agreement of the MCA criteria, the development of the programmes and refinement of interventions was completed in close liaison with AT.

The initial MCA scores were developed by the project team and then refined with AT on 6th November 2020. Final programme assessment and an MCA scoring workshop was held on the 12th November 2020 and included wider AT stakeholders and Waka Kotahi. All programmes were assessed using a seven-point scale described in Table 26.

Table 26: Scoring System for MCA Criteria

Score	Description
-3	Significant negative effects, high risks or significant challenges
-2	Moderate negative effects, medium risks or moderate challenges
-1	Minor negative effects, slight risks or some challenges
0	Same or similar to the reference programme
1	Slight positive effects or minor improvements
2	Moderate positive effects or moderate improvements
3	Significant positive effects or significant improvements

The Do Minimum programme was chosen as the reference case programme, since this programme defines the minimum amount of investment required to retain the existing levels of ferry operations throughout 10-year period. The impact of the proposed programmes is therefore measured against the Do Minimum. The Do Minimum scores for all criteria were consequently set to zero.

During the initial MCA scoring, it was agreed with AT that a comparison of the proposed programmes to the current 2020 network (rather than the Do Minimum) would enable an assessment of how Programme I - Do Nothing would perform, enabling the assessment of service level deterioration. This was completed in a separate exercise, as an MCA sensitivity test, and results can be found in **Appendix G**.

Not all criteria were considered equal in terms of the impact they should have on investment decisions. Accordingly, several different weighting scenarios were developed to help in understanding impacts of different sensitivity scenarios.

MCA weightings for each assessment criterion were agreed during the MCA workshop with stakeholders. These values were used to weigh each of the MCA scores to derive a weighted average for each of the programmes. The workshop weighting values are shown in Table 27 and described further in relation to sensitivity testing in Section 8.4.3.

Table 27: Workshop Weighting of Criteria

Criterion Description	Workshop Weighting
Customer Satisfaction	5
Ferry Patronage	5
Access to Opportunities	5
Cost Efficiency	5
CO2 Equivalents	4
Safety	3
RMA	3

Criterion Description	Workshop Weighting
Achievability	5
Cost	5
Supplier Capacity and Capability	3
Policy Alignment	1
Social/Environment/Climate Mitigation	1
Climate Adaptation[99]	Risk
Impacts on Te Ao Maori	5
Property Impacts	3

8.3.1 MCA Scores of Initial Programmes

Overall, MCA scoring of the programmes showed that the interventions included in Programme III onwards (the programme which is aimed at meeting the existing demand) are offering improvements that meet objectives. The high-level rationale of the MCA scores is summarised below with a more detailed rationale covered in **Appendix H**. The complete MCA scores are shown in

- Further engagement at more detailed stages of BCs will be undertaken on these issues.

[99] During the workshop it was agreed not to factor in this criterion in MCA assessment due to uncertainties and instead it was included in the Risk section of the report

Table 28

Programme III - Meet Demand Scenario, MCA results:

The programme results show that it starts to align well with the investment objectives as four out of five scores show that interventions in this programme will bring minor to moderate improvements. Customer Satisfaction and Ferry Patronage is expected to increase due to newer fleet and more frequent services on the key routes such as Hobsonville, Devonport and Pine Harbour, improvements to public transport integration and active modes will result in minor contributions to improving Access to Opportunities and decreasing CO2 Equivalents. New terminal facilities will also contribute to these investment objectives and as a result will have a moderate positive impact on other criteria such Safety, Alignment with Policies and Social/Environmental effects/Climate Mitigation.

Due to larger costs and consenting challenges around the development of the new terminals, RMA, Achievability, Cost and Property Impacts are expected to result in medium risks or moderate challenges.

Programme IV - Grow Demand Scenario, MCA results:

This programme adds further ferry service frequency improvements throughout the day, includes replacement of remaining old vessels with new vessels and introduction of Wynyard Quarter route. This programme also includes significant walking and cycling improvements across Auckland and new landside/wharf improvements at Hobsonville and Downtown Ferry Terminal.

It was considered that these interventions would result in improvements across all investment objectives, significantly increasing customer satisfaction and ferry patronage and improving cost efficiency. However, this programme is also expected to result in larger achievability and property risks including larger costs for running the network and purchasing new vessels.

Programme V - Network Future Proofing Scenario, MCA results:

Network Future Proofing Scenario includes completely renewed ferry fleet, including more ferries with cleaner and more efficient propulsion technology such as more powerful electric vessels, hydrogen powered vessels and hydrofoiling technology. The programme also includes further ferry service improvements to the ones included in previous programmes at Hobsonville, Pine Harbour and Bayswater, better active modes facilities/infrastructure on Waiheke Island, West Auckland and Gulf Harbour plus minor improvements to bus frequencies for services that connect to ferry terminals.

The MCA scores for this scenario show that further improvements are expected across all investment objectives with moderate to significant level of improvements when comparing to Do Minimum. This programme also has further increase in risks and challenges related to costs, property, RMA and achievability.

Assessment of programmes against mana whenua values

The values identified through engagement with mana whenua included

- Improved environmental / sustainability outcomes
- Improving access and the quality of services for communities;
- Opportunities for celebrating Māori culture in the landscape

Improving environmental outcomes and improved access are already covered by other assessment criteria with the same weighting. To avoid double counting the benefits they are not assessed under Te Ao Māori criteria.

Opportunities for celebrating Māori culture in the landscape have been assessed on the scale of investment represented in each programme, with specific interventions influencing scores, these include:

- Wayfinding opportunities to celebrate Māori culture and te reo Māori (e.g. bi-lingual passenger information systems etc)
- new fleet purchases presenting opportunities for vessel naming; and
- Facilities development for incorporating Māori Design elements.

Further engagement at more detailed stages of BCs will be undertaken on these issues.

Table 28 Assessment of Initial Programmes and MCA Scores

	Programmes --->	Programme II	Programme III	Programme IV	Programme V
	Criteria	Do Minimum	Meet Demand	Grow Demand	Future Proofing
Investment Objectives	Customer Satisfaction	0	2	3	3
	Ferry Patronage	0	2	3	3
	Access to Opportunities	0	1	2	3
	Cost Efficiency	0	0	1	2
	CO2 Equivalents	0	1	2	3
Critical Success Factors	Safety (Water/Land)	0	2	2	2
	RMA	0	-2	-2	-2
	Achievability (technical implementability)	0	-1	-2	-2
	Cost (Operational, Capital and Maintenance)	0	-1	-2	-3
	Supplier Capacity and Capability	0	0	-1	-2
	Alignment to regional and national policies	0	2	3	3
Opportunities and Impacts	Social/Environmental effects/Climate Mitigation	0	2	3	3
	Climate change adaptation	0	0	-1	-1
	Impacts on Te Ao Māori	0	1	2	2
	Property impacts	0	-2	-3	-3
	Weighted Average[100]	0	0.4	0.6	0.8

[100] Weighted average which does not include Climate Change Adaptation scores within the average and considers this value as a risk indicator. Impact on Te Ao Maōri are to be confirmed through stakeholder engagement process.

The weighted MCA workshop results show that all three programmes contribute to investment objectives, however, the costs and risks also increase with subsequent programmes. Programme III has a fair average score of 0.4 compared to the Do Minimum and Programmes IV and V have good scores of 0. 6 and 0.8 respectively compared to the Do Minimum. These scores are relevant but show that all programmes have interventions that contribute to a positive change regarding investment returns.

In the stakeholder workshop, as a result of MCA assessment, it was decided to explore an option which would be a hybrid of all three programmes. The new programme, Programme VI, would be based on Programme III interventions and supplemented with additional interventions from other programmes based on their contribution to the investment objectives. The idea behind this new programme was to develop a set of interventions that are more cost efficient and provide better value for money than Programme IV and V. The development, MCA score, sensitivity tests and economic assessment of new and initial programmes to identify the recommended programme is discussed below. For more details on programme costs, please refer to section 10.

8.4 Development of Programme VI

8.4.1 Programme VI Interventions

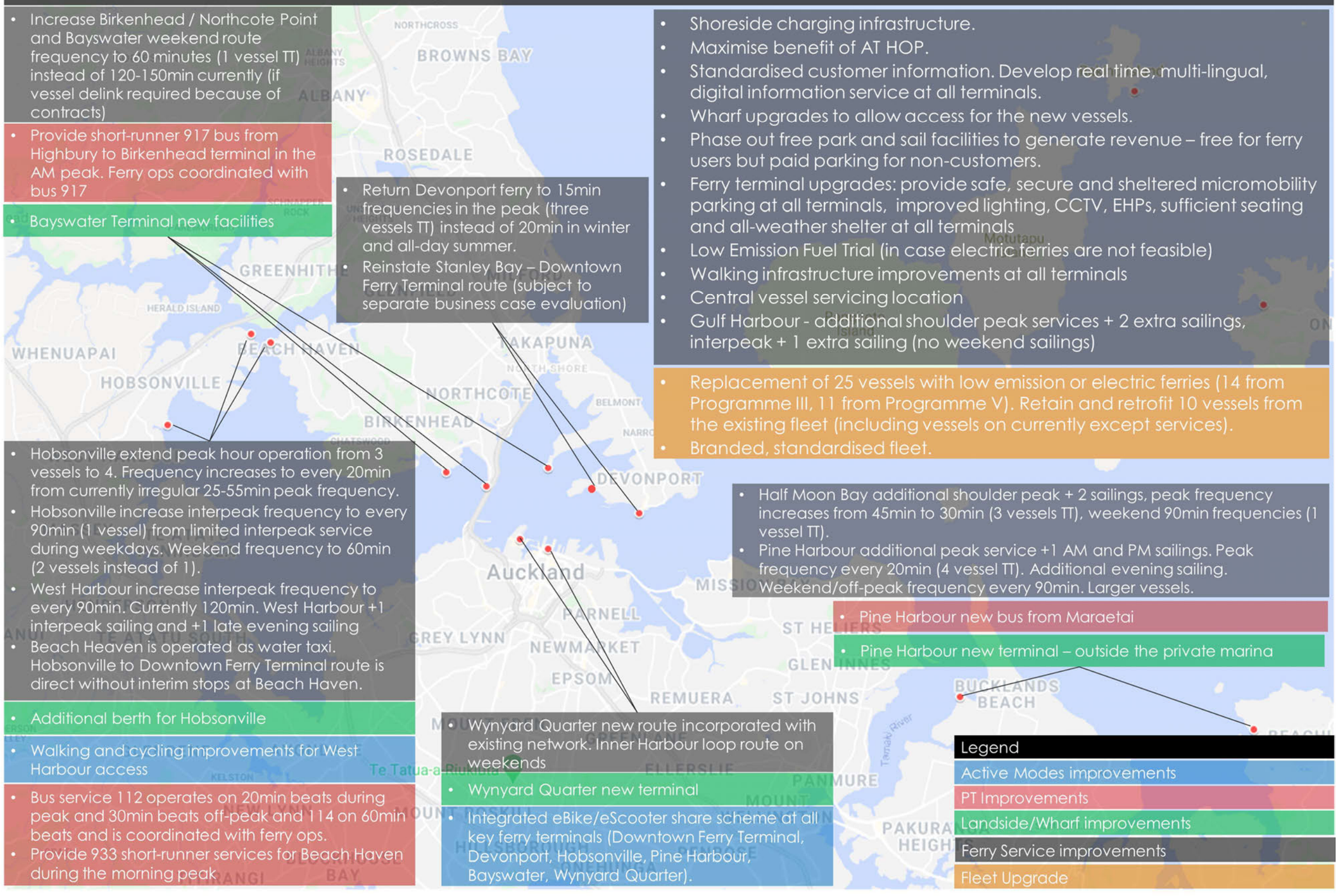
The mix of interventions included in Programme VI is outlined in the matrix in Table 30, which shows the proposed interventions and their original programme, and describes why particular interventions were included in the new programme. The table below shows the fleet upgrade for programme VI compared against all the other programmes.

Table 29 Fleet Upgrade for Programme VI

Fleet Upgrade	Programme					
	I	II	III	IV	V	VI
Existing vessels	27	13	10	0	0	10
Retired vessels	2	16	19	29	29	19
Second-hand vessels		14	14	14		
New vessels		2	11	21	37	25
Total Fleet Size at the end of the Programme	27	29	35	35	37	35

A map showing Programme VI interventions by location is shown in Figure 47

Programme VI - Balanced Investment



- Increase Birkenhead / Northcote Point and Bayswater weekend route frequency to 60 minutes (1 vessel TT) instead of 120-150min currently (if vessel delink required because of contracts)
- Provide short-runner 917 bus from Highbury to Birkenhead terminal in the AM peak. Ferry ops coordinated with bus 917
- Bayswater Terminal new facilities
- Return Devonport ferry to 15min frequencies in the peak (three vessels TT) instead of 20min in winter and all-day summer.
- Reinstate Stanley Bay – Downtown Ferry Terminal route (subject to separate business case evaluation)
- Shoreside charging infrastructure.
- Maximise benefit of AT HOP.
- Standardised customer information. Develop real time, multi-lingual, digital information service at all terminals.
- Wharf upgrades to allow access for the new vessels.
- Phase out free park and sail facilities to generate revenue – free for ferry users but paid parking for non-customers.
- Ferry terminal upgrades: provide safe, secure and sheltered micromobility parking at all terminals, improved lighting, CCTV, EHPs, sufficient seating and all-weather shelter at all terminals
- Low Emission Fuel Trial (in case electric ferries are not feasible)
- Walking infrastructure improvements at all terminals
- Central vessel servicing location
- Gulf Harbour - additional shoulder peak services + 2 extra sailings, interpeak + 1 extra sailing (no weekend sailings)
- Replacement of 25 vessels with low emission or electric ferries (14 from Programme III, 11 from Programme V). Retain and retrofit 10 vessels from the existing fleet (including vessels on currently except services).
- Branded, standardised fleet.
- Hobsonville extend peak hour operation from 3 vessels to 4. Frequency increases to every 20min from currently irregular 25-55min peak frequency.
- Hobsonville increase interpeak frequency to every 90min (1 vessel) from limited interpeak service during weekdays. Weekend frequency to 60min (2 vessels instead of 1).
- West Harbour increase interpeak frequency to every 90min. Currently 120min. West Harbour +1 interpeak sailing and +1 late evening sailing
- Beach Heaven is operated as water taxi. Hobsonville to Downtown Ferry Terminal route is direct without interim stops at Beach Haven.
- Additional berth for Hobsonville
- Walking and cycling improvements for West Harbour access
- Bus service 112 operates on 20min beats during peak and 30min beats off-peak and 114 on 60min beats and is coordinated with ferry ops.
- Provide 933 short-runner services for Beach Haven during the morning peak
- Half Moon Bay additional shoulder peak + 2 sailings, peak frequency increases from 45min to 30min (3 vessels TT), weekend 90min frequencies (1 vessel TT).
- Pine Harbour additional peak service +1 AM and PM sailings. Peak frequency every 20min (4 vessel TT). Additional evening sailing. Weekend/off-peak frequency every 90min. Larger vessels.
- Pine Harbour new bus from Maraetai
- Pine Harbour new terminal – outside the private marina
- Wynyard Quarter new route incorporated with existing network. Inner Harbour loop route on weekends
- Wynyard Quarter new terminal
- Integrated eBike/eScooter share scheme at all key ferry terminals (Downtown Ferry Terminal, Devonport, Hobsonville, Pine Harbour, Bayswater, Wynyard Quarter).

Figure 47: Programme VI – Balanced Investment

Table 30: Development of Programme VI

Programme VI - Balanced Investment – List of Interventions Included in the Programme						
Programme VI Source	**Vessels**	**Ferry Services**	**Landside/Wharf Infrastructure**	**Public Transport**	**Active Modes**	**Justification**
Do Minimum	None	Additional peak, interpeak and evening sailings for Pine Harbour, West Harbour and Hobsonville routes	None	New bus service from Maraetai	None	Minor service improvement included in the programme from the Do Minimum are the ones that attempt to fill in the existing peak capacity gaps and address gaps during interpeak and evening periods. These are the basic improvements that are carried forward to Programme VI.
Programme III	14 new vessels, including electric vessels. Moving towards branded and standardised fleet. Retrofit and refurbishment of 10 vessels. No second-hand vessels	**Peak services** Significant peak hour frequency improvements on Hobsonville route, moderate improvements at Devonport, reintroduction of Stanley Point route. Point-to-point Hobsonville operation during weekdays, Beach Haven operated as water taxi. Peak period extension on Gulf Harbour route **Interpeak/Evening services** Frequency improvements on Half Moon Bay, Gulf Harbour, Pine Harbour and West Harbour routes **Weekend services** An introduction of Pine Harbour weekend service. Significant improvements to Hobsonville weekend service	**New Terminals:** Pine Harbour and Bayswater new terminals **Wharf Improvements:** Shoreside charging infrastructure, wharf upgrades to enable new ferry access and docking. **Other:** Integrate Park and Sail facilities with HOP card and introduce parking charges for non PT users. Improved bicycle parking facilities, improved safety and security measures and digital travel information at terminals.	Bus service improvements for more integrated connections at Hobsonville, Beach Haven and Birkenhead.	Improve footpaths on Clearwater Cove leading to West Harbour terminal	Around 70% (by number of improvements and approximate value) of Programme VI improvements come from Programme III. These relate to upgrade of the fleet with new vessels, ferry service improvements at Hobsonville (the key growth area on the waterfront) and significant all-day service improvements to enable better access at other key locations such as Pine Harbour. The programme also includes significant landside improvements at Pine Harbour to enable larger vessel access, Bayswater to enable development of accessible AT owned terminal that is separate from private marina and minor bus improvements to improve overall public transport integration.
Programme IV	11 new vessels with some vessels powered by new propulsion technology. Most of the fleet is branded and standardised. No second-hand vessels	**Peak services** Moderate improvements to Half Moon Bay route frequencies. Introduction of Wynyard Quarter route. **Interpeak/Evening services** No additional improvements **Weekend services** Better frequencies on Birkenhead, Northcote Point and Bayswater routes as part of the Wynyard Quarter weekend service loop	**New Terminals:** Wynyard Quarter new terminal **Wharf Improvements:** Construction of additional berth at Hobsonville. Explore more efficient docking technologies **Other:** All terminals comply with accessibility standards. Central vessel servicing location.	None	Improve walking infrastructure at all terminals Sufficient parking spaces on board for bikes and scooters. Integrated eBike/eScooter share scheme at all key ferry terminals (DTFT, Devonport, Hobsonville, Pine Harbour, Bayswater, Wynyard Quarter).	The remaining approximately 30% of improvements within Programme VI come from Programme IV and relate mostly to future network development, patronage growth and safer and improved active mode access. Wynyard Quarter was included in the programme as it is one of the largest development areas in the city, which will serve both as a trip origin and destination due to its mixed-use type of development. Improvements at Half Moon Bay are included as these will enable better travel options from the east and enable timetable integration with buses. Half Moon Bay, due to its poor timetable frequency is considered one of the biggest ferry network gaps. When considering vessel design, sufficient bike/scooter parking on board should be allowed for. As per our observations of Devonport, this should be at least 30 parking spaces for bikes/scooters. As demand is expected to increase, integrated active mode share schemes should be introduced. Lastly, walking infrastructure improvements around all terminals are included to ensure safe access and shared active mode schemes to enable better first leg/last leg connection from/to the key terminals will provide travel options for commuters to leave cars at home.
Programme V	Explore and trial new propulsion technologies	None	Develop vessel real-time tracking and berth allocation system	None	None	New propulsion technology trial to explore evolving innovations in the market were included in Programme VI to reduce an impact on environment. A better tracking and navigation system is also included to allow more efficient and less energy wasteful ferry travel. Other interventions from this programme, such as improvements to active mode network around all terminals to increase ferry catchments or Downtown Ferry Terminal expansion works are desirable items in case there is available funding.

Elements that were not included in Programme VI are high-cost interventions such as:

- Active mode improvements such as development of new connections in Beachlands, connecting Whenuapai area to Hobsonville or extensive active mode improvements on Waiheke.
- Further frequency improvements at Hobsonville from proposed ferry services every 20min during the peak to 15min frequency.
- Further frequency improvements to off-peak/weekend services on the Bayswater and Beachlands routes, increasing ferry service frequencies from 60min to 30min;
- Expensive landside infrastructure development such as Downtown Ferry Terminal Phase 2 project and the new Kennedy Point terminal; and
- Further upgrade to the ferry fleet to achieve complete fleet renewal.

The abovementioned interventions are considered to be important and (as discussed in sections below) these interventions should be reassessed if additional funding is made available.

8.4.2 Programme VI Multi-Criteria Assessment

Programme VI, Balanced Investment, MCA results:

The programme results, shown in Table 31, show that Programme VI aligns well with the investment objectives and offers moderate improvements across all investment objectives. Customer Satisfaction and Ferry Patronage is expected to return between moderate to significant improvements. This programme scores higher on Cost Efficiency compared to Programme IV. The main reason for this is that Programme IV builds on Do-Minimum Programme and includes second-hand vessels, whereas Programme VI does not include second-hand vessels and considers an introduction of new vessels (70% of the fleet) and retention of 30% of the existing fleet. Access to Opportunities and CO2 Equivalents will improve to similar levels of those in Programme IV.

Programme VI is expected cost more and will have its technical, planning and property challenges when compared to Programme III, however, these risks and challenges are expected to be lower or equal to those challenges identified in Programmes IV or V.

Overall, Programme V aligns best with the investment objectives, but carries the largest cost and risk factors. Programme IV shows similar weighted average score to Programme VI. However, Programme VI results in lower risks and costs.

Table 31: MCA Scores for All Programmes

	Programmes --->	Programme II	Programme III	Programme IV	Programme V	Programme VI
	Criteria	Do Minimum	Meet Demand	Grow Demand	Future Proofing	Balanced Investment
Investment Objectives	Customer Satisfaction	0	2	3	3	2
	Ferry Patronage	0	2	3	3	2
	Access to Opportunities	0	1	2	3	2
	Cost Efficiency	0	0	1	2	2
	CO2 Equivalents	0	1	2	3	2
Critical Success Factors	Safety (Water/Land)	0	2	2	2	2
	RMA	0	-2	-2	-2	-2
	Achievability (technical implementability)	0	-1	-2	-2	-2
	Cost (Operational, Capital and Maintenance)	0	-1	-2	-3	-2
	Supplier Capacity and Capability	0	0	-1	-2	-1
	Alignment to regional and national policies	0	2	3	3	3
Opportunities and Impacts	Social/Environmental effects/Climate Mitigation	0	2	3	3	2
	Climate change adaptation	0	0	-1	-1	0
	Impacts on Te Ao Māori	0	1	2	4	3
	Property impacts	0	-2	-3	-3	-2
	Weighted Average[101]	**0**	**0.4**	**0.6**	**0.8**	**0.6**

[101] Weighted average which does not include Climate Change Adaptation scores within the average and considers this value as a risk indicator.

8.4.3 Scenario and Sensitivity Testing

Not all criteria were considered equal in terms of the impact they should have on investment decisions. Accordingly, a number of different weighting scenarios were developed to help in understanding impacts of different sensitivity settings. Seven scenarios were developed, including the workshop weighting scenario that was developed with investors and AT during the MCA scoring meeting as discussed in Section 8.3. This and the other weighting scenarios are:

1. **Workshop Weighting** – assessing MCA scores based on the importance/weighting of each criterion defined in the workshop with investors and AT.
2. **Investment Objectives** – assessing the scores of the programmes primarily against the weighted investment objectives.
3. **RMA** – assessing the scores of the programmes primarily against the weighted RMA criteria such as RMA, CO_2 Equivalents and Impacts on Te Ao Maori.
4. **Social** – assessing the scores of the programmes primarily against the weighted social criteria such as Access to Opportunities, Customer Satisfaction and Safety.
5. **Environmental** – assessing the scores of the programmes primarily against the weighted environmental criteria such as CO_2 equivalents and policy alignment.
6. **Cultural** - assessing the scores of the programmes primarily against the weighted cultural criteria such as mana whenua values.
7. **Economic** - assessing the scores of the programmes primarily against the weighted cost criteria such as cost efficiency, costs and property impact.

The sensitivity tests for the scenarios listed above were completed using the five-point weighting scale described below. This scale identified five weighting levels:

- 5 – high priority;
- 4 – medium/high priority;
- 3 – medium priority;
- 2 – low/medium priority; and
- 1 – low priority.

The weighting of each element for each scenario is shown in Table 32.

Table 32: Criterion Weighting per Scenario

Criterion Description	Workshop Weighting	Investment Objectives	RMA	Social	Environ-mental	Cultural	Economic
Customer Satisfaction	5	5	0	4	0	0	0
Ferry Patronage	5	5	0	1	0	0	0
Access to Opportunities	5	5	0	5	0	5	0
Cost Efficiency	5	5	0	0	0	0	5
CO2 Equivalents	4	5	3	3	5	0	0
Safety	3	0	0	5	0	0	0
RMA	3	0	5	0	0	0	0
Achievability	5	0	3	0	0	0	3
Cost	5	0	0	0	0	0	5
Supplier Capacity and Capability	3	0	0	0	0	0	3
Policy Alignment	1	0	5	0	5	0	0
Social/Environment/Climate Mitigation	1	0	3	5	5	5	0
Climate Adaptation	Risk	Risk	Risk	Risk	Risk	Risk	Risk
Impacts on Te Ao Maori	5	0	5	5	3	5	0
Property Impacts	3	0	0	0	0	0	3

The summary of the results is shown in Figure 48.

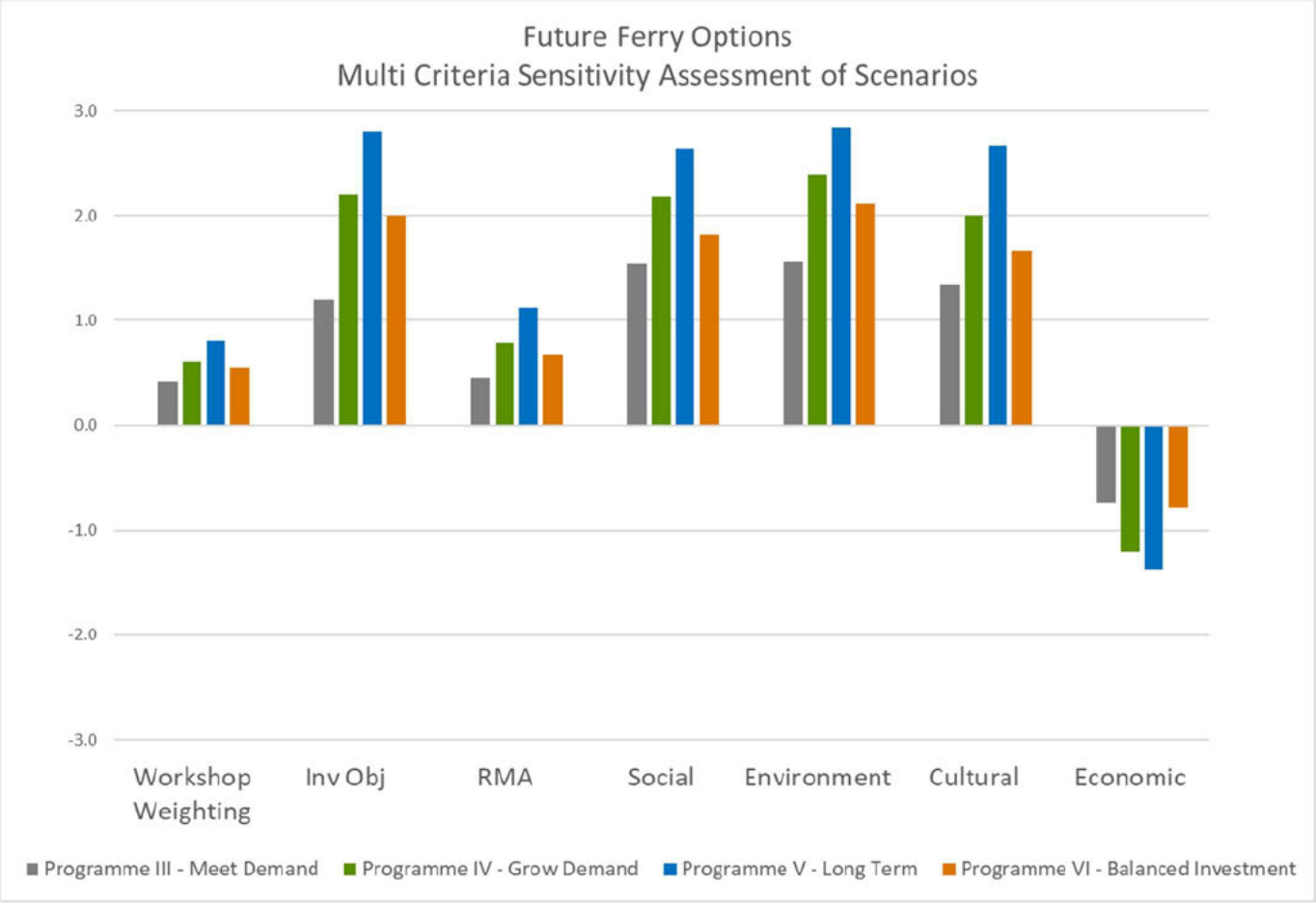


Figure 48: Sensitivity Testing Results

The results depicted in the figure above are also shown in Table 33 below.

Table 33: Scenario Sensitivity Testing Results

Option	Work-shop	Invest Object	RMA	Social	Environ	Cultural	Econ
Programme II - Do Minimum	0.00	0.0	0.0	0.0	0.0	0.0	0.0
Programme III - Meet Demand	0.4	1.2	0.5	1.5	1.6	1.3	-0.7
Programme IV - Grow Demand	0.6	2.2	0.8	2.2	2.4	2.0	-1.2
Programme V - Long Term	0.8	2.8	1.1	2.6	2.8	2.7	-1.4
Programme VI - Balanced Investment	0.6	2.0	0.7	1.8	2.1	1.7	-0.8

Overall, all weighting scenarios show increasing preference for higher levels of investment, apart from the Economic scenario, where increased cost and a reduction in levels of service have greater impact. The results reinforce the MCA workshop outcomes and show that Programme V aligns best with the investment objectives across all sensitivity tests except the Economic scenario.

Programme VI achieves a more balanced outcome between alignment with investment objectives and projected investment amount to achieve the improvements included in the programme. Programme VI aligns closely with programme IV, but the gap starts to widen between the two, when looking at social and environmental factors, where programme IV shows better alignment. Despite that, when assessing economical sensitivity test, programme VI shows a noticeable reduction in costs.

8.5 Option Economics

8.5.1 Patronage

Table 34 shows the projected patronage impact of each programme, indicating increases between around 2% under the Do Minimum and more than 35% under Programme V. Programme VI patronage is projected to be slightly higher than Programme III (9.4m passengers per annum in 2048 compared to 9.2m passengers), reflecting the increases in the levels of service provided.

Table 34: Project Patronage by Programme (Million Passengers Per Annum)[102]

Year	Programme					
	Do Nothing	Do Minimum	III	IV	V	VI
2022	6.5	6.5	6.5	6.5	6.5	6.5
2031	7.1	7.2	8.4	8.9	9.7	8.5
2048	7.9	8.0	9.2	9.8	10.7	9.4

8.5.2 Economic Assessment

The benefits and costs associated with each of the programmes have been assessed at a high level compared to the Do Minimum. The headline economic appraisal parameters and results are set out in Table 35, which shows that the levels of benefit increase with the scale of the services included in each programme. All programmes have a BCR in excess of 1, indicating that they provide a positive return on investment.

Table 35: Economic Appraisal Parameters and Results by Programme

Programmes	Midpoint Discounted Costs ($m NPV)	Midpoint Discounted Benefits ($m NPV)	BCR Range
III	350	720	1.9 - 2.1
IV	710	920	1.2 - 1.4
V	1090	1310	1.1 - 1.3
VI	390	750	1.8 – 2.0

Programme III and Programme VI have the highest BCRs, of 1.9-2.1 and 1.8-2.0 respectively. While the BCR for Programme III is slightly higher than for Programme VI the difference is small with the ranges overlapping and with Programme VI having slightly higher overall benefits. All other programmes have significantly lower incremental BCRs and are consequently considered to be less desirable from an economic perspective.

More detail on the parameters is provided in Section 9.4, and, for the assessment as a whole, in the separate supporting Economic Evaluation paper.

[102] To allow comparisons over time, the figures in this table include passengers on the services operated by Sealink to Waiheke and Great Barrier

8.6 Option Assessment Against Investment Objectives

Table 36: Assessment of Programmes against Investment Objectives

Benefits	Performance Measure	Baseline Data	Do Nothing (I)	Do Minimum (II)	Network Improvements to Meet Demand (III)	Network Improvements to Grow Demand (IV)	Long-term Network Development (V)	Balanced Investment (VI)
Improved customer experience leading to more people choosing ferries	KPI 1: Percentage of trips that are punctual (AT SoI)	94.2% Dec 19 Rolling average	92%	94.2%	95%	95-97%	96% -98%	95-97%
	KPI 2: Proportion of timed connections arriving within 15 minutes of connecting service	23%	20%	23%	50% to 60%	60% to 75%	>75%	55% to 70%
	KPI 3: Number of routes meeting RPTP Frequency Targets	Nine out of 11 services meet RPTP frequency targets	8	9	10	All RPTP targets met	All RPTP targets met	All RPTP targets met
	KPI 4: Percentage of passengers satisfied with public transport services (AT SoI)	Overall customer satisfaction score of 87.7% for ferries[103]	85%	90%	92%	95%	95% to 97%	94 to 95%
	KPI 5: Ferry patronage	6.2m	6.8m	6.9m	8.0m	8.5m	9.3m	8.2m
	KPI 6: Overall PT patronage	103m	Because of uncertainties generated by Covid, no reliable estimates	Plus 0.7m from ferries Minimal other PT growth related to programme improvements	Plus 1.8m from ferries 0.2m to 0.6m from other PT improvements	Plus 2.4m from ferries 0.5m to 1.2m from other PT improvements	Plus 3.1m from ferries 0.8m to 1.5m from other PT improvements	Plus 2.0m from ferries 0.5m to 1.0m from other PT improvements
Improved access to opportunities from using ferries	KPI 1: Number of people whose trip would be faster by ferry than other modes in peak times	90,000	70,000 - 80,000	90,000	100,000 – 110,000	150,000	180,000	130,000
	KPI 2: Number of people who access ferry services via active modes	47%	46%	47%-48%	48%	50%-55%	55%-60%	49%-52%
	KPI 3: Number of fully accessible vessels	5 (fully accessible)	3	3	14	20	35	24-26 vessels
Improved productivity and utilisation of the ferry network	KPI 1: Cost per passenger service km (contracted services & Devonport)	[redacted] per km contract services & Devonport	-	-	-	-	-	[redacted]
	KPI 2: Operating cost per service hour	[redacted] per hour contract services & Devonport	-	-	-	-	-	[redacted]
	KPI 3: Farebox recovery rate[104]	50% in 2019 for contract services & Devonport	-	-	-	-	-	29%
Reduced impacts on greenhouse gas emissions and marine quality	KPI 1: Average CO2 equivalent emission per ferry service km annum[105]	21 tonnes	-	-	-	-	-	12-27 tonnes

Key

Reduction in KPI	Minor to moderate improvements to KPI
No or minor improvements to KPI	Moderate to significant improvements to KPI

[103] AT Public Transport Customer Summary Presentation Year to March 2020 Results
[104] To be reviewed with AT
[105] To be reviewed with AT

8.7 Option Assessment Conclusions

The MCA results, economic assessment, and sensitivity testing show that investment over and above the Do Minimum is needed to achieve the investment objectives. Programme V would perform best from an MCA perspective and best meets the investment objectives; however it is considered to be unaffordable and performs less effectively from an economic perspective compared to the other programmes. Programmes IV and VI perform similarly and were next ranked through the MCA process, but Programme VI significantly outperforms Programme IV from an economic perspective. Programme VI performs comparably with Programme III economically, but much better than that programme from an MCA perspective. Programme VI is consequently considered to be the programme that provides the best balance of outcomes and affordability, and it is therefore taken forward as the recommended programme.

The recommended programme, Programme VI, is further assessed in more detail and discussed in the following section.

9 Recommended Programme

9.1 Programme Elements

In this section the programme is discussed covering its core activities, desirable requirements and optional requirements are discussed.

9.1.1 Core Activities

The core activities or the essential elements that need to be delivered for successful programme implementation are discussed in high-level in Table 37 and are listed previously in this report in Figure 47.

Table 37: Core Activities per Intervention Types

Intervention type	Description
Vessels	The commissioning of 25 new vessels, allowing sufficient time to construct these vessels and to enable timely replacement of the aging fleet and the adoption of new technology and propulsion systems.
Ferry Service Improvements	Increasing ferry frequencies and operational spans through weekday and weekend including peak, interpeak and evening service improvements as per interventions listed in Figure 31.
Wharf and Landside Infrastructure Improvements	Upgrade of wharf infrastructure to enable access to all wharves for new vessels.
	Landside terminal upgrades, such as shoreside charging infrastructure to enable electric ferry operations Construction of the new ferry terminals at Wynyard Quarter to enable new route service and construction of the Pine Harbour and Bayswater terminals to allow the operation of bigger vessels and AT's control of standardising terminal features such as wayfinding, accessibility and integration with other modes (currently existing terminals are located within the private marinas).
Bus and Active mode improvements	Bus service and active mode infrastructure upgrades to integrate with the proposed interventions and widen ferry terminal catchments (as per Figure 39) including ferry design to provide good bicycle/scooter parking facilities.

Desirable Elements

There are a number of additional interventions from Programme IV and V which are not included in the recommended programme but would add value to the overall outcomes. These are discussed Table 38 below and, during the next development stage of the ferry network improvement business case (single stage business case), should be added to the programme if a more detailed appraisal shows good investment returns and an alignment with project objectives.

Table 38: Desirable Activities per Intervention Types

Intervention Type	Description
Vessels	Replacement of remaining 10 current vessels in the fleet with new vessels.
Ferry Service Improvements	Further frequency improvements at Hobsonville, Pine Harbour and Bayswater.
Wharf and Landside Infrastructure Improvements	Redevelopment of Kennedy Point site to provide new passenger ferry terminal and to include additional capacity for vehicular ferry; Downtown Ferry Terminal Phase 2 construction works. (Works TBC)
Bus and Active mode improvements	Bus service improvements to accompany ferry service improvements at Hobsonville Point, Pine Harbour and Bayswater. Extensive active modes improvements at a number of key locations such as Hobsonville, Beachlands connection to Pine Harbour, Half Moon Bay and Devonport to provide safe active mode infrastructure at all terminals within 5 kilometres radius. Better train timetable integration with Downtown Ferry Terminal services.

Other improvements that would provide additional benefits relate mostly to further improving ferry service frequencies, investing in more environmentally friendly vessels and retrofitting the earlier purchased vessels to reduce environmental pollution. These interventions are included in Programme IV and V and would add further value to project objectives if funding is made available. Looking beyond the 10-year period, low or zero emission vessels, specifically ferries with currently evolving technology such as electric or hydrogen powered vessels, will play an important role in helping to achieve zero emissions target by 2035. However, a separate roadmap to achieving this should be prepared in a subsequent stages of ferry network development business cases.

Further improvements to active modes and bus/rail network – interventions that would further increase ferry terminal catchment areas, would also have a significantly positive impact on overall transport network resilience, accessibility and travel mode choice for waterfront communities and beyond. However, at this stage it is understood that the cost of implementing these interventions is outside of the realistic investment envelope.

Other desirable improvements that would add value to the overall network integration are detailed in other business cases relating to active mode improvements e.g. Lake Road Business Case, Downtown SSBC, the recently completed Public Transport Improvements SSBC for 2021 – 2024 investment period and future PT Ferry Services Improvements BC for the 2021- 2024 investment period for bus and ferry network development, respectively.

9.1.2 Optional Activities

Optional improvements should be considered when improving ferry network such as:

- Marketing campaigns promoting special fares on weekends for example kids go free;
- Travel demand strategies encouraging carpooling and enabling parking priority for high-occupancy vehicles at park and sail sites.
- Developing electric vehicle charging infrastructure at ferry terminal park and rides.
- Enabling more retail/commercial opportunities at ferry terminals.

9.2 Programme Assessment

9.2.1 Programme Outcomes

The recommended programme focuses on improvements in the areas that can provide high investment returns. The areas that are considered to have good investment returns and contribute significantly to investment objectives are the fleet upgrades, improvements to areas with high growth projection (Hobsonville, Wynyard Quarter and Pine Harbour) and interventions helping to achieve a more integrated ferry network with other travel modes. Table 39 provides a summary of how interventions included in the recommended programme contribute to the investment objectives.

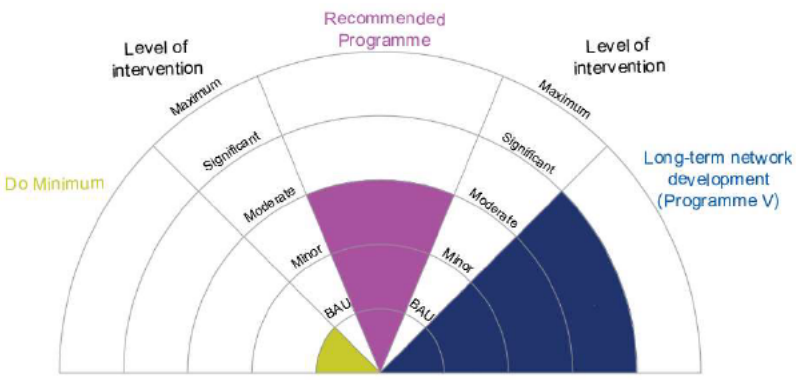
Table 39: Assessment of Recommended Programme Against Investment Objectives

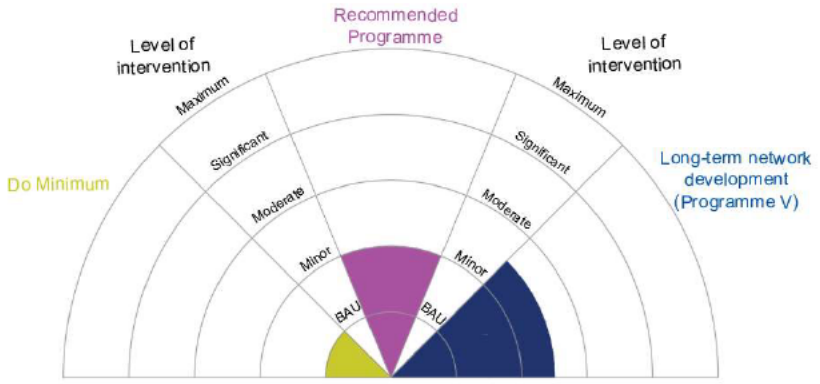
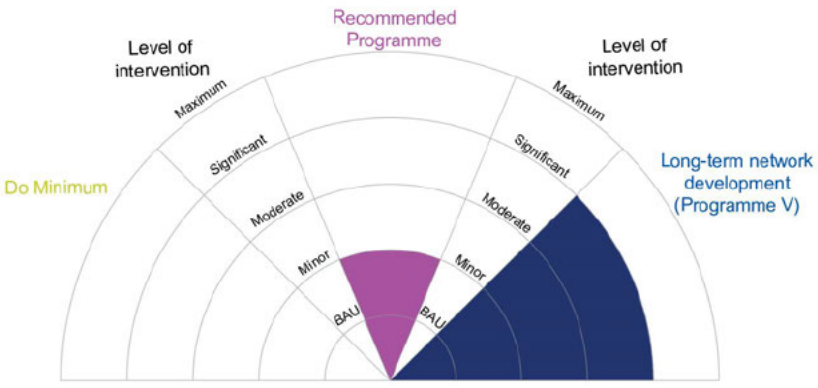
Benefits	Performance Measure	Baseline Data	Recommended Programme
Improved customer experience leading to more people choosing ferries	KPI 1: Percentage of trips that are punctual (AT SoI)	94.2% Dec 19 Rolling average	95-97%
	KPI 2: Proportion of timed connections arriving within 15 minutes of connecting service	23%	55% to 70%
	KPI 3: Number of routes meeting RPTP Frequency Targets	Nine out of 11 services meet RPTP frequency targets	All RPTP targets met
	KPI 4: Percentage of passengers satisfied with public transport services (AT SoI)	Overall customer satisfaction score of 87.7% for ferries[106]	94 to 95%
	KPI 5: Ferry patronage and PT mode share	6.2m, 6%	8.2m
	KPI 6: Overall PT patronage	103m	Plus 2.0m from ferries 0.5m to 1.0m from other PT improvements
Improved access to opportunities from using ferries	KPI 1: Number of people whose trip would be faster by ferry than other modes in peak times	90,000	130,000
	KPI 2: Number of people who access ferry services via active	43%	49%-52%
	KPI 3: Number of fully accessible vessels/ facilities	5 (fully accessible)	24-26 vessels
Improved productivity and utilisation of the ferry network	KPI 1: Cost per passenger service km	[redacted] per km contract services & Devonport	[redacted]
	KPI 2: Operating cost per service hour	[redacted] per hour contract services & Devonport	[redacted]
	KPI 3: Farebox recovery rate	50% in 2019 for contract services & Devonport	29%
Reduced impacts on greenhouse gas emissions and marine quality	KPI 1: Average CO2 equivalent emission per 000service kms	21 tonnes	12-27 tonnes

[106] AT Public Transport Customer Summary Presentation Year to March 2020 Results

As mentioned earlier, all the interventions are split into five key intervention types as discussed in Table 40. The investment distribution across these intervention areas together with the level of improvements included in the recommended programme and its comparison to Do Minimum (the programme with minimum funding required to maintain the existing level of service) and Programme V (the most expensive programme) is shown in Table 40 below.

Table 40: Assessment of Level of Intervention in Recommended Programme compared to Do Minimum and Programme V

Intervention Type	Details	Recommended Programme vs Do Min vs Programme V
Vessels	**Summary:** Purchase of 23-25 new vessels is included in the recommended programme which results in a renewal of 70% of the fleet. This number is derived based on the number of vessels in the current fleet available to operate within the entire 10-year period, which is 10 vessels. In total a fleet of approximately 33 vessels is required to provide sufficient number of vessels to operate during peak hours and allow for spare vessels to enable the maintenance of the fleet. As such, 10 newest vessels from the existing fleet will be retained and retrofitted to extend their lifespan and reduce emissions. **Comparison to other programmes:** Do Minimum – 14 second-hand vessels plus two new vessels results outcome with an intervention level that is slightly above BAU; Programme V – 41 new vessels to cover the existing network operation and expand the ferry network results in a full fleet upgrade with low emission vessels.	
Network and Ferry Services	**Summary:** The recommended programme includes significant ferry service improvements for Hobsonville, Devonport and Pine Harbour. Moderate improvements for Half Moon Bay, Birkenhead and Bayswater. Minor service improvements to West Harbour and Gulf Harbour. Reinstatement of Stanley Bay route and the addition of the Wynyard Quarter stop to the network. **Comparison to other programmes:** Do Minimum: minimal network improvements - BAU. Programme V – significant network improvements building on top of the improvements included in the recommended programme and offering further frequency and span improvements.	
Landside and Wharf improvements	**Summary:** The recommended programme includes the construction of new terminals at: Pine Harbour, Wynyard Quarter, Bayswater. Other wharf / terminal upgrades, shoreside charging infrastructure, secured and sheltered bicycle parking **Comparison to other programmes:** Do Minimum: includes only upgrades to maintain the existing operations - BAU. Programme V – includes significant improvements in addition to those included in the recommended programme. The additional improvements include DTFT Phase 2 and Kennedy Point passenger terminals construction.	

Intervention Type	Details	Recommended Programme vs Do Min vs Programme V
Bus Improvements	**Summary:** The recommended programme includes a new bus service – connecting Maraetai to Pine Harbour. Improvements to bus frequencies at Hobsonville and short runner services to the Birkenhead and Beach Haven terminals. Bus improvements to Devonport and HMB are also supported but these form parts of other business cases e.g. PT Improvements SSBC and as such, these improvements are treated as potential improvements and benefits of these improvements are not included in this business case. **Comparison to other programmes:** Do Minimum: includes only new bus service from Maraetai to Pine Harbour - BAU. Programme V – includes additional bus frequency improvements for buses connecting Hobsonville Point and Gulf Harbour.	
Active Mode Improvements	**Summary:** The recommended programme includes walking infrastructure improvements around each terminal. Integrated eBike/eScooter share scheme at all key ferry terminals (DTFT, Devonport, Hobsonville, Pine Harbour, Bayswater, Wynyard Quarter). Improvements to walking facilities (and on-road cycle safety) at intersections of Marina View Drive / Wisely Road and Wisely Road / Clearwater Cove. Improve footpaths on Clearwater Cove. In addition, this business case supports other active modes improvements as part of other business cases such as Lake Road BC. Same as with bus improvements from other business cases, the benefits of these improvements are not included in this assessment. **Comparison to other programmes:** Do Minimum: no walking and cycling interventions below BAU. Programme V: – significant improvement that include segregated cycle lanes in a number of locations around ferry terminals	

The summary of this comparison is shown in **Figure 49**.

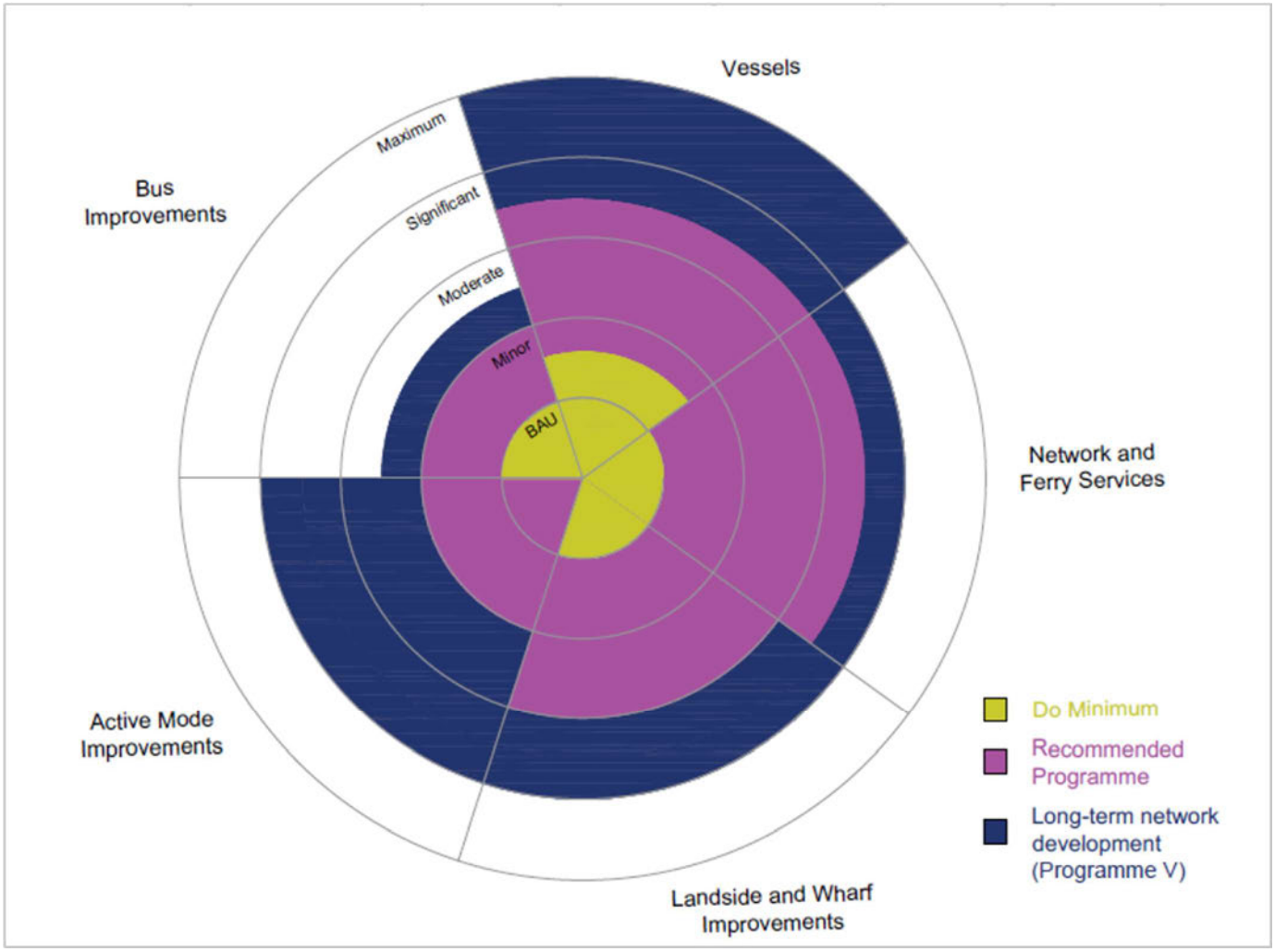


Figure 49: Summary of Interventions Impacts - Do Minimum vs Recommended Programme vs Programme V

Overall, the assessment of different intervention types shows that the focus of investment is to upgrade the ferry fleet and improve ferry service frequencies/span. A significant proportion of funding is also required to upgrade ferry landside and waterside infrastructure such as improvements of ferry terminals such as bicycle parking or digital, multi-lingual information and wharves to enable access for new vessels. Some minor funding is also allocated to improve PT integration with ferry services and improvements to walking and cycling infrastructure at the ferry terminals.

9.3 Programme Schedule

The timeline of the proposed programme is shown in Figure 50 below and it is broken down into three RLTP periods.

The timeline and the logic behind this programme is discussed year-by-year below:

- During the first year RLTP period (from 2021/22 – 2024/25) the flowing changes are proposed:
  - Commissioning and construction of new vessels, so that the first new vessels could start operating by mid-2024, is planned to start in 2022. At least two new vessels could join the fleet during this investment period – these could potentially be electric vessels (but this needs to be subject to a separate business case). If electric or hybrid technology is used shoreside charging infrastructure would also be required to be constructed;

- Fixing relatively easy minor gaps in the network operation such as extending peak hours and improving interpeak frequencies. First stage of Hobsonville service improvements is proposed to start during this stage. Peak improvements at Half Moon Bay to provide better service and integrate ferry network with other public transport are proposed. Potential reintroduction of Stanley Bay route following review of patronage before and after the second RLTP (2024 - 2027) and low emissions vessel trial is also planned in this period.
- Minor landside and wharf improvements are proposed to be undertaken, including planning process and other works to prepare for construction new terminals at Bayswater and Pine Harbour. Integration of park and sail carparks with public transport travel via HOP card is introduced which would result in paid parking for non-PT users.
- Minor bus and walking and active modes improvements such as integrating buses with new ferry frequencies and filling in the most problematic walking infrastructure gaps.

- The second RLTP investment period (2024 - 2027):
  - Commissioning, construction and deployment of approximately 12 - 17 new vessels to replace aging fleet and accommodate proposed ferry network improvements are proposed in this period. Refurbishment of the existing fleet is also expected to take place.
  - Second tranche of ferry service improvements is proposed to start 2024 onwards with substantial improvements across the whole network to address remaining network gaps and provide additional capacity at such locations like Hobsonville, Pine Harbour and Devonport.
  - Substantial ferry landside and wharf infrastructure works are timed to be completed in this period. The most notable are Pine Harbour and Bayswater ferry terminals to enable larger vessel access and address Pine Harbour vessel capacity issues. Planning works for implementing Wynyard Quarter are expected to start during this investment stage to enable construction in the next period.
  - Further important improvements for active modes and walking are planned to be achieved during this period – completing walking infrastructure upgrades around all terminals and introducing eBike/eScooter shared scheme integrated with HOP card. This would enable larger shift from private vehicles to active mode travel to cover the firs/last leg travel. Further bus integration improvements are at Hobsonville to integrate bus and ferry connections.
- The third RLTP investment period and above (2027 - onwards):
  - Commissioning, construction and deployment of approximately 5 - 10 new vessels to replace aging fleet and accommodate proposed ferry network improvements are proposed in this period. Refurbishment of the existing fleet is also expected to take place.
  - Third tranche of ferry service improvements is proposed from 2027. The most notable change is the introduction of new stop at Wynyard Quarter.
  - Wynyard Quarter terminal completion and accessibility improvements to meet accessibility standards are planned at all terminals.
  - Other Desirable improvements could be completed during this investment period, or even earlier, if required funding is available such as Kennedy Point passenger terminal, further active modes improvements and Downtown ferry terminal phase 2 construction.

	SHORT TERM		MEDIUM TERM			LONG TERM		
	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029 onwards
Vessels		Deployment of 2 new vessels	Deployment of 12 to 17 new vessels			Deployment of 5 to 10 new vessels		
	Retrofit and refurbishment of existing fleet							
Network and Operations	Pine Harbour additional peak service (+1 AM and PM), +1 evening sailing	Pine Harbour additional interpeak service and introduction of weekend services	Hobsonville 60min interpeak/weekend frequencies	Beach Haven is operated as water taxi. HOB to DTFT route is direct without interim stops at BH.	Hobsonville extend peak hours, frequency at 20min	Wynyard Quarter stop incorporated as an extension of existing service		New Route – DTFT – Kennedy Point route + KP Terminal
	Hobsonville 30min peak and 90min interpeak/weekend frequency	Trial Low Emission / New Technology Ferries	Birkenhead / Northcote Point and Bayswater - increase weekend frequency to 60min	Return Devonport ferry to 15 min frequencies in peak		Implement weekend inner harbour loop and extend to Wynyard Quarter		
	Half Moon Bay additional shoulder peak sailings and 90min interpeak frequency	Half Moon Bay – Peak service at 30min frequencies and weekend at 90min	West Harbour interpeak frequency at 90min					
	West Harbour additional interpeak and late evening sailings		Two larger vessels to operate on Pine Harbour					
	Gulf Harbour additional shoulder peak and interpeak		Reinstate Stanley Bay – Downtown Ferry Terminal route					
Landslide and Wharf Improvements	Provide HOP Card dispensers/top-up machines at all terminals	Shoreside charging infrastructure	BW Terminal new facilities	Additional berth for Hobsonville	Develop real time, multi-lingual, digital info service at all terminals	Wynyard Quarter new terminal		Downtown Ferry Terminal Phase 2 expansion works
		Secure, safe and sufficient all-weather bicycle parking facilities	Implement central vessel service location to support the fleet growth		Real time tracking, real time berth allocation	Ensure compliance with accessibility standards at all terminals		Re-development of Kennedy Point site
		Integrated park and sail facilities with ferry travel	Pine Harbour Terminal new facilities			Shoreside *rapid* charging infrastructure		
	Minor ferry terminal upgrades, e.g. installation of CCTVs		Wharf upgrades to allow access for the new ferries					
Bus Improvements	Bus improvements at Maraetai, Birkenhead, Beach Haven and Hobsonville				Further bus improvements in Hobsonville			
Active Mode Improvements	Improve walking infrastructure in the vicinity of all terminals – filling in gaps		Fully accessible walking infrastructure around all terminals			Other active modes infrastructure improvements as part of Desirable Improvements		
			Integrated eBike/eScooter share scheme at all key terminals					

Figure 50: Recommended Programme Timeline

9.4 Programme Economics

9.4.1 Patronage

The patronage projections are primarily based on an elasticity approach, which reflects the response of potential users to changes in the generalised journey costs associated with the use of the ferries. The journey costs associated with ferry use combine:

- Access to the ferry;
- Waiting time for ferry, based on service frequency;
- Interchange penalties;
- The valuation of the time spent travelling on the ferries, including an allowance for improvements in the quality of the service;
- Fares; and
- Time from CBD ferry terminal to a typical destination in the CBD.

The effects of generalised cost changes have been assessed for three main time periods: morning peak (taken as representative of all peak periods); interpeak (taken as also being representative of weekday early morning and evening services), and weekends. The demand response to improvements is based on a conservative long run generalised cost elasticity of -2.0, with associated period elasticities, in line with guidance provided in Section 4.4 of the Waka Kotahi Monetised Benefits and Costs Manual (MBCM). New service demand has been estimated by comparing the relationship between relevant flows on existing services and routes.

Table 41 shows the resulting patronage projections for each route under the recommended programme.

Table 41: Annual Patronage Projections by Routes (Million Passengers Per Annum) [107]

Route	2019 Observed	2022 Do Minimum	Recommended Programme	
			2031	2048
Devonport	1.87	1.78	2.28	2.31
Waiheke	2.32	2.35	2.85	3.17
Half Moon Bay	0.34	0.34	0.42	0.43
Pine Harbour	0.20	0.38	0.53	0.60
Gulf Harbour	0.18	0.15	0.17	0.16
Bayswater	0.22	0.21	0.24	0.25
Stanley Point	0.06	0.00	0.07	0.07
Hobsonville	0.17	0.30	0.67	1.05
Northcote/Birkenhead	0.17	0.17	0.23	0.26
West Harbour	0.17	0.21	0.28	0.30
Total	**5.71**	**5.90**	**7.76**	**8.61**

[107] Note the figures in this table do not include passengers on the services operated by Sealink to Waiheke and Great Barrier as in Table 34

Further detail on patronage forecasting is provided in the separate supporting Economic Evaluation paper.

9.4.2 Benefits

Benefits have been assessed in four main categories, reflecting guidance in the MBCM:

- Benefits to existing and new ferry users;
- Benefits to road users with the switch of traffic away from the road network, particularly at peak periods. In principle these include emissions and safety benefits as well as changes in travel costs but the required data to break down the total is not available;
- Wider economic benefits (WEBs) in the form of agglomeration benefits; and
- Environmental benefits from the switch to a low emission fleet.

Of the total discounted benefits, direct benefits to ferry and road users account for about 60%, environmental impacts for about one third, and WEBs for about 6 per cent.

The following sections provide further description of these elements. Additional detail on the benefits is provided in the separate supporting Economic Evaluation paper.

9.4.2.1 User Benefits

User benefits are generated in terms of savings in the generalised costs for the journey as a whole, considering the various components described in Section 9.4.1. These savings have been valued at the commuting value of time, which accounts for a large part of the travel on ferries in peak periods and is broadly reflective of the split of patronage in other periods, being similar to the value of "other" time and much lower than the value for working time. An allowance has been made for passengers able to work during travel.

9.4.2.2 Congestion Relief

With the increase in ferry traffic there is likely to be some diversion from road transport and a subsequent reduction in congestion costs. These effects have been estimated using the values set out in MBCM Table 43, giving a benefit to road users of $14.5 per trip in 2019 values. As indicated above these would include some crash and emission cost savings but these have not been identified separately.

9.4.2.3 Agglomeration Benefits

Agglomeration benefits are based on the changes in the generalised costs of public transport for the main movements using the ferries, typically based on the movements between the zones containing the ferry terminals to a range of zones in the CBD. The analysis has been based on an average agglomeration elasticity of 0.074 for the area as a whole, which is consistent with the values set out in Table 38 of the MBCM.

The benefits have been estimated for 2018 and in line with the approach set out in the MBCM have been assumed to grow by 2 per cent per year in real terms. This reflects increases in productivity estimated at 1.2 per cent per annum and an allowance for employment growth in the central area.

No assessment has been made of other WEB benefits, in particular labour supply impacts, but these are expected to be only small.

9.4.2.4 Environmental benefits

An examination of the emissions produced by the current vessel fleets and possible future fleets has recently been undertaken by Incat Crowther for Auckland Transport. The draft finding from this report indicates the levels of emissions likely to be generated by IMO Tier i and Tier iii diesel vessels and by electric vessels for two selected routes and these have been valued at the costs set out in the MBCM updated to current 2019 prices.

Emissions rates and costs have been identified for four different elements: NOx, SOx, CO_2, and PM. For all except SOx, these have been valued at the rates set out in the MBCM. For SOx for which no cost is provided in the MBCM, research from overseas[108] has suggested that this typically has a value similar to that for NOx and

[108] CE Delft et al External Costs of Transport in Europe Table 7

the same figure has therefore been used. Air quality and greenhouse gas effects have been reported separately.

9.4.3 Total benefits

The benefits by type and time period estimated for the recommended programme are set out in Table 42 and the breakdown by type is illustrated in Figure 51.

Table 42: Benefits by Type and Year – Recommended Option ($m)

Forecast year	Peak		Inter-peak	Week-end	Agglom-eration	Air quality	GHG	Total
	Ferry Users	Congest reduction						
2022	6.4	3.6	4.7	4.5	1.7	12.8	-0.8	32.9
2031	7.1	3.9	4.7	5.0	2.0	12.8	-0.8	34.8
2048	7.8	4.3	5.2	5.7	2.9	12.8	-0.8	37.9

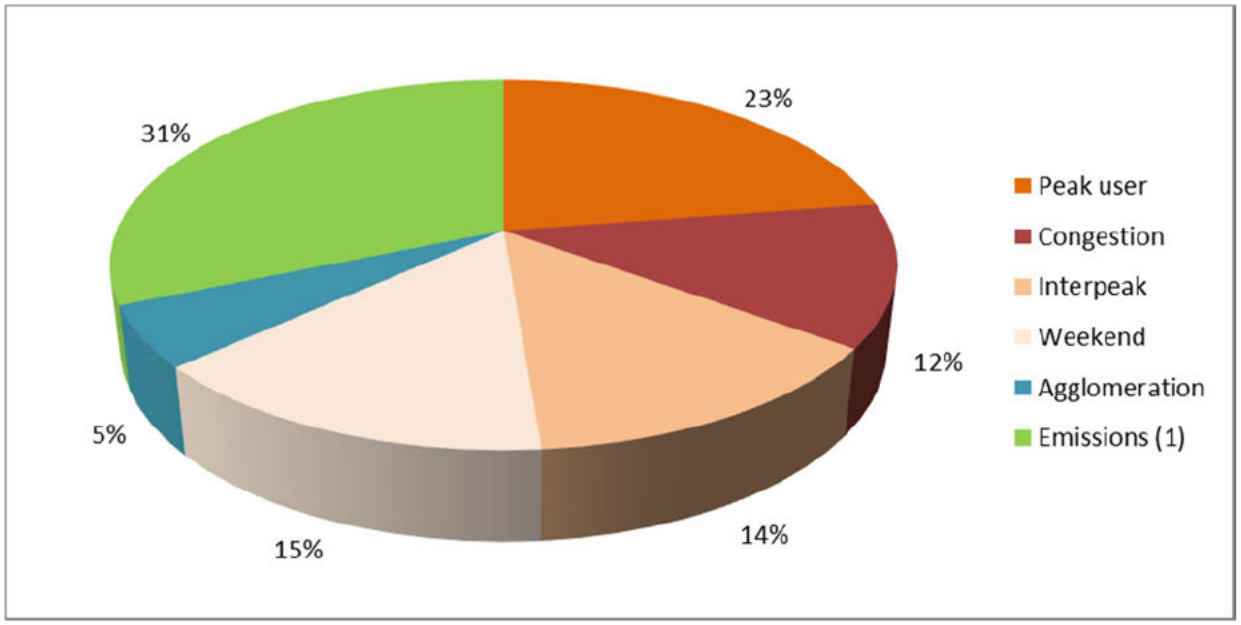


Figure 51: Breakdown of Recommended Programme Benefits by Type (2031) [109]

Of the total benefits in 2031:

- About half accrue directly to ferry users with just over 10 per cent reflecting the benefits to road users from the relief of congestion;
- A further third represents the environmental benefits from switching to lower emission vessels;
- The benefits from the relief of congestion amount to about a third of the benefits directly attributed to peak periods and peak; and
- Agglomeration benefits at just under 10 per cent are relatively small although this may reflect the conservative approach used to assess these.

[109] Emissions covers both air quality and GHG effects

9.4.4 Costs

9.4.4.1 Ferry Costs

The costs of ferry operation for the different strategies have been estimated based on a high-level model developed by Auckland Transport and developed further for this study. This takes into account the number and size of ferries being operated and the number of hours over which these are operated including allowances for spares and out of service operation. A key feature of this model is that it assumes the capital costs of the ferries are converted to annual costs and thus represents an extension of the current procurement position. An alternative approach which is being considered by Auckland Transport is to purchase the vessels directly and then provide these to the operators for each of the services. This would involve a slightly different cost profile, and the effects of this are considered in the financial analysis. The model has been used to estimate the costs of operation for 2027, a date by which it is assumed that almost all the fleet currently operating will have had to have been replaced.

A simplified cost structure has been applied covering the Do Minimum case and the alternative programmes. For the Do Minimum it has been assumed that that the current fleet would be mainly replaced by used vessels acquired from overseas. Because of their age, they may have somewhat lower capital costs, which would be balanced by higher operating and maintenance costs and also higher rates of depreciation associated with the use of the older vessels. For this stage in the analysis the costs for all the proposed scenarios, both capital and operating, assume that all vessels are diesel powered although recognising that all new vessels will have low emission engines.[110]

Based on the Auckland Transport model, and assuming that the capital costs are recovered through annual charges, the total annual costs of ferry operation in 2027 for the Do Minimum and recommended programme are set out in Table 43. It should be noted that the Auckland Transport model does not directly calculate the costs of the Waiheke services, so these have been estimated assuming the parameters set out in the model.

Table 43: Estimated Costs of Ferry Operation 2027

Parameter	Value
s7(2)(b)(ii) Prejudice to commercial position	

[110] It is noted that costings for electric and hybrid commuter vessels are highly uncertain with very few comparable benchmarks. Technology solutions are also being developed rapidly and will be subject to change.

Parameter	Value
[redacted]	

9.4.4.2 Other Costs

In addition to the ferry operating costs, costs will be incurred for a number of supporting activities. These include the capital costs associated with ferry terminal and land-side facilities and the annual costs of improved public transport services enhancing the access to the terminals. The costs for the scenarios are set out in Table 44.

Table 44: Other Capital and Operating Costs by Scenario

Parameter	Cost at current prices ($m)
Terminals	67.45
Land side upgrades	1.80
Total capital costs excl. ferries	69.25
New bus services (annual op.)	0.56

The profile of the other capital cost expenditure is set out in Table 45.

Table 45: Proposed Investment in Terminals and Other Land Side Facilities

Year	Annual Expenditure at current prices ($m)
2024	33.5
2025	3.5
2026	15
2027	17.25
Total proposed	69.25

9.4.5 Economic Assessment

The results of the economic assessment of the recommended programme compares the costs and benefits in relation to the Do Minimum are presented in Table 46. The assessment uses a 40-year appraisal period and 4% discount rate, as per MBCM guidance for public transport assessments. Costs and benefits have been discounted to 2021.

Overall, the Recommended Programme achieves a BCR of 1.8 or 1.9 including WEBs. This would give it a **Low** rating.

Table 46: Economic Appraisal Parameters and Results

Parameter	Midpoint Value ($m NPV)

9.4.6 Economic Sensitivity Testing

A range of sensitivity tests has been undertaken to assess the robustness of the key findings and the extent to which they would be affected by changes in some of the key assumptions considering both single changes and the effects of combined changes. The single tests comprise:

- **Changes to demand assumptions**
  - Alternative responses to changes in the generalised costs of travel with higher and lower elasticities
  - The assumption of no growth in flows between 2019 and a post Covid 2022
  - Alternative assumptions about the relationship between population growth and ferry demand for the period after 2022. The base assumption assumes that base case ferry demand will grow by a multiple of 1.5 times population growth in the ferry catchment areas, based on a continuation of recent trends but alternative factors of 1 and 2 have been examined.
- **Changes to benefit growth assumptions**
  - Benefits over time remaining constant after 2031
  - Shorter evaluation period of just 20 years
  - Ramp up of costs and benefits over a 20-year period
- **Changes in cost assumptions**
  - Costs less 20 per cent

- Costs less 50 per cent
- Costs less 75 per cent

- **Changes to emission benefits:**
  - Emission benefits being 50 per cent lower than assumed. This would be in line with constraining the emission benefits to the time when the vessel was moored at the berth and would ignore any additional benefits en route. The estimates of the value of CO2 savings would not be changed.
  - Emission benefits increased by 11 per cent to reflect the use of a single electric ferry serving inner harbour routes. This would represent the first step of the complete conversion of routes to electric or hybrid operation.
- **Alternative discount rates**
  - 3 per cent and 6 per cent as suggested in the MBCM

The results of this testing are set out in Table 47 and Figure 52.

Table 47: Recommended Programme Sensitivity Testing

Ref	Scheme description	BCR
Base		1.8
ST1	Base including WEBs	1.9
Demand changes		
	Changes in demands in response to changes in generalised costs	
ST2	• High responsiveness - elasticity of -2.5	1.9
ST3	• Low responsiveness - elasticity of -1.5	1.7
	Changes in demand growth over time	
ST4	• No growth in demand between 2019 and 2022	1.7
ST5	• Growth in demand after 2022 in line with population growth	1.8
ST6	• Growth in demand after 2022 in twice population growth in line with observed pattern before 2019	1.8
Alternative benefit growth		
ST7	• 20-year evaluation period	1.8
ST8	• No benefit growth after 2031	1.7
ST9	• Ramp up of costs and benefits over 20 years	1.7
Emission benefits		
ST10	• Emission benefits reduced by 50 per cent	1.5
ST11	• Emission benefits increased by 11 per cent	1.9

Ref	Scheme description	BCR
Cost sensitivity		
ST12	• Costs - 20 per cent	2.3
ST13	• Costs plus 50 per cent	1.2
ST14	• Costs plus 75 per cent	1.0
Changes in discount rates		
ST15	• Discount rate of 3 per cent	1.9
ST16	• Discount rate of 6 per cent	1.7
Covid effects		Included in Base BCR

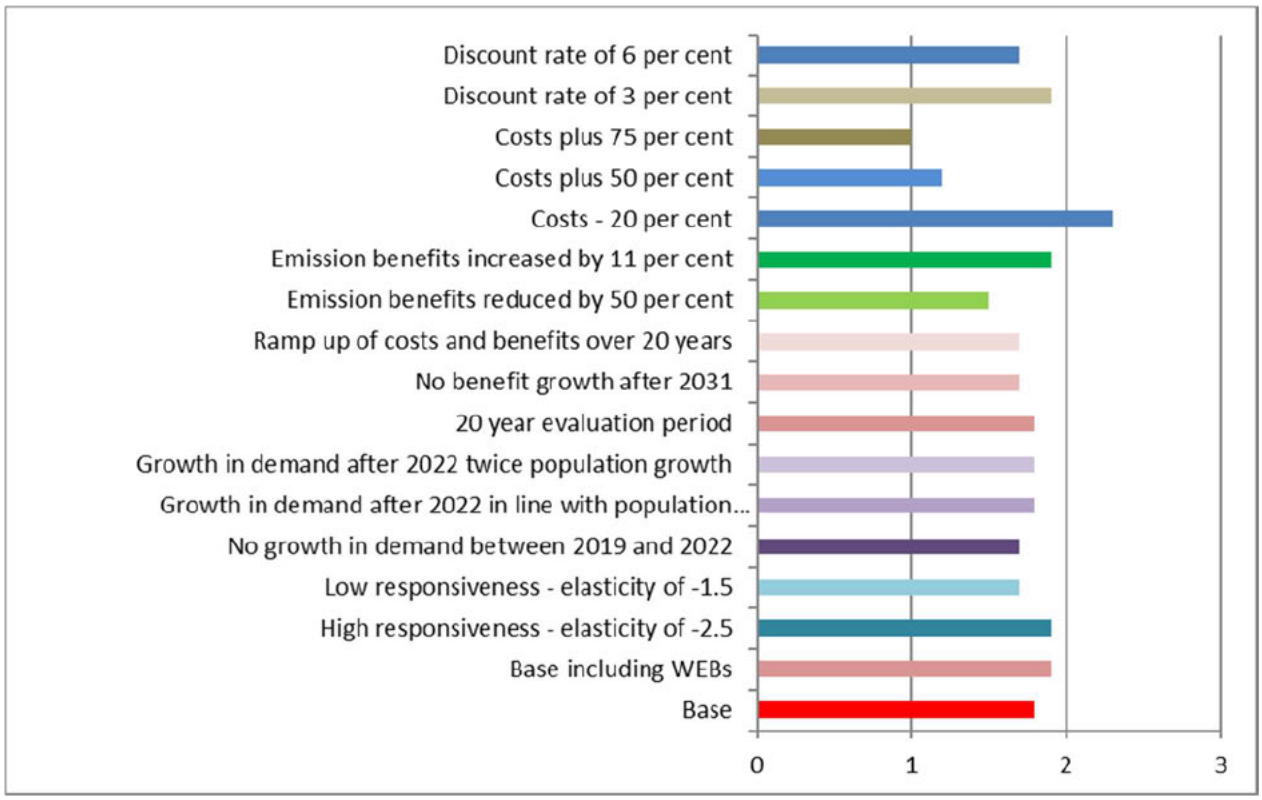


Figure 52: Results of Sensitivity Testing

The key points from the sensitivity testing include:

- Changes to the level of demand either from changes in the underlying levels of demand or responsiveness to changes in the generalised costs of travel give only a limited range of BCRs in the range from 1.7 to 1.9
- The results are more sensitive to assumptions about the environmental benefits where reducing the assumed impacts of air quality improvements round the ferry terminals reduces the BCR to 1.5 and increasing the benefits to reflect the introduction of an electric vessel raises the BCR to 1.9.
- The results are sensitive to changes in the estimated costs of operation, and increasing these by 75 per cent would give a BCR of 1.

- The effects of different discount rates are also very limited, reflecting the structure of the costs with high annual operating costs and low capital costs. This means that the discounted values of the costs and benefits tend to move in line limiting any impact on the BCR.

On the basis of this testing the central case BCR can be considered to lie in the range 1.7 - 1.9. A series of combined tests have also been undertaken and the results of these are set out in the following table.

Table 48: Growth scenario testing results

Growth scenarios	Cost assumptions		
	Base cost	Base cost plus 50 per cent	Base costs plus 75 per cent
Base case growth scenario for the Recommended Option	1.8	1.2	1.0
Pessimistic scenarios			
No change in demand 2019-2022 - subsequent demand growing in line with population	1.7	1.1	1.0
No change in demand 2019-2022 - demand growing at 150 per cent of population to 2031 and 100 per cent subsequently	1.7	1.1	1.0
More optimistic scenarios			
Growth Scenario	**Base cost**	**Base cost plus 50 per cent**	**Base costs plus 75 per cent**
Base case growth to 2022 - subsequent base demands growing by 200 per cent of population growth and with higher response to changes in costs (elasticity = -2.5)	1.8	1.5	1.2

Again, these combined tests highlight the sensitivity to substantial cost changes but with only limited sensitivity to demand changes. At the most extreme level, with lower demand and costs 75 per cent higher than the base, the Recommended Programme achieves a BCR of 1.

9.4.7 Economic Appraisal Summary

Overall, therefore the results of the economic appraisal are fairly stable in relation to the sensitivity tests undertaken, with the BCRs lying in a range between 1.6 and 3.0 for all the alternatives considered. These results would generally leave the ranking of **Low** unchanged.

The economic returns with a core BCR in response to demand changes of about 1.5-1.9 are considered robust for a major public transport programme in an urban area. The sensitivity testing in particular indicates that these results are not unduly affected by longer term forecasts of patronage and benefits both in the case where these cease to grow after 2031 or where the evaluation period is shortened to just 20 years. There is however more sensitivity to the costs of the operation and the potential environmental benefits and further work is required to refine these as the programme progresses.

9.5 Investment Profile

The National Land Transport Fund (NLTF) is the primary funding mechanism for Crown investment in the land transport system. The National Land Transport Programme (NLTP), reviewed and updated every three years in line with the release of the Government Policy Statement on land transport (GPS), identifies the activities likely to be funded by the NLTF.

The role of Waka Kotahi is to give effect to the GPS including the activity class funding range. Waka Kotahi achieves this by using the Investment Prioritisation Method (IPM) to determine which proposals should receive funding within the GPS activity class funding ranges.

GPS 2021 has four strategic priorities:

- Safety
- Better travel options
- Improved freight connections
- Climate change.

These priorities are expected to guide land transport investments from 2021/22 to 2030/31. The Investment Prioritisation Method for 2021–24 NLTP has three factors, namely:

- GPS Alignment
- Scheduling
- Efficiency

The recommended programme falls under the following activity classes:

- public transport services (including rapid transit)
- public transport infrastructure (including rapid transit)

9.5.1 GPS Alignment

The recommended programme aligns strongly with Better travel options and Climate change.

The recommended programme aligns with Better Travel options through improving transport options for people who face barriers to access, e.g. improving accessibility for the mobility impaired, better connectivity to other modes, better access to Frequent

It also aligns with climate change as it is working towards a low carbon transport system that supports emission reductions, while improving inclusive access through replacement of diesel to electric ferries, better integration with active and other PT modes, less noise and air pollution.

The recommended programme impacts more than one priority as highlighted above. The investment prioritisation table below (Table 49) from Waka Kotahi's IPM acknowledges this and this category has been selected for the GPS alignment rating.

Table 49: GPS Alignment Investment Prioritisation as Defined by the IPM for the 2021-24 NLTP

GPS Alignment					
GPS Priority	**Benefit**	**Low**	**Medium**	**High**	**Very High**
Better Travel options and Climate Change (GHG emissions reduction and air quality improvements)	Impact on mode choice		Up to 3% change in share of private passenger vehicle based trips to other modes* Investment to support behaviour change (e.g. education, promotion) to improve mode shift outcomes	>3 and up to 6% change in share of private passenger vehicle-based trips to other modes*	>6% change in share of private passenger vehicle-based trips to other modes*

*Other modes include walk, cycle, public transport, micro-mobility and need for trip being eliminated (e.g. working from home, ordering online)

For this category, the analysis of mode shift was based on the movements in the AM peak between the ferry catchment areas and the CBD for 2018/9 since this was the only period for which comprehensive network wide traffic data including both car and ferry movements is available. The analysis was based on:

- the 2018 MSM data to estimate the number of car passenger journeys and
- observed data for the number of ferry journeys.

This gives a current modal split for these movements of 60 per cent by ferry.

The potential effects of the recommended programme were assessed by considering the increase in demand for the 2048 AM peak to provide an estimate of the full effects of the proposed scheme. This gave an increase of about 12 per cent compared with the DM for that year. This factor of 12 per cent was then applied to the observed ferry journeys. On this basis the hypothetical recommended programme flows for 2018/19 would be 12 per cent higher than those for the DM.

This is illustrated in the following figure.

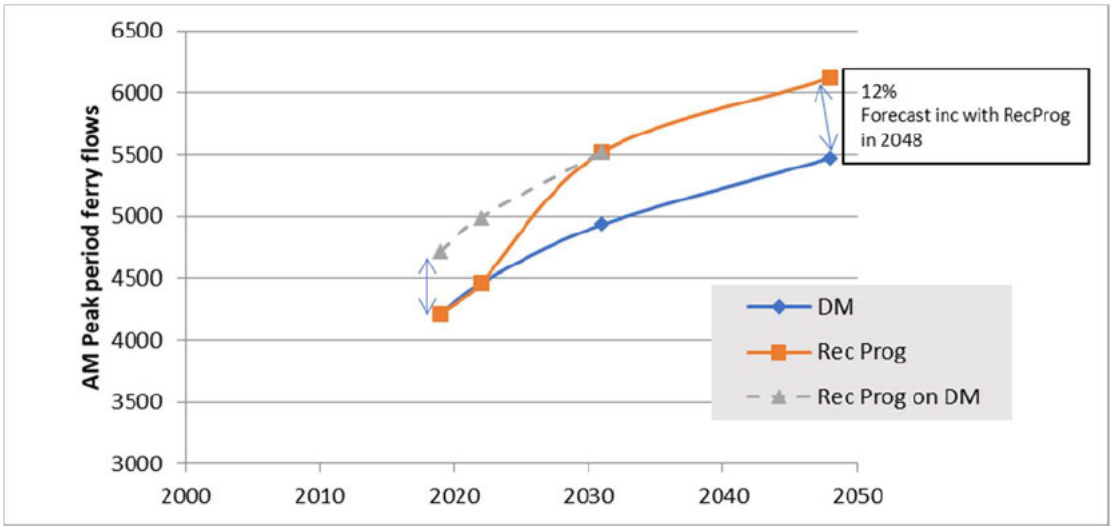


Figure 53: Morning peak period ferry flow projection

Assuming that the total number of trips remains the same, the application of the 12 per cent increase factor to the 2018/19 ferry flows would give an average modal split for these movements of 67 per cent, with the car mode share declining from 40 per cent to 33 per cent. There would therefore be a reduction in the car modal share of 7 per cent or alternatively a reduction in the number of car trips of 17 per cent (with the modal share declining from 40 per cent to 33 per cent). The details of this are set out in Table 50 below.

Table 50– Analysis of mode shift from private vehicle for movements from ferry catchment areas to the CBD 2018 AM peak

	Car passengers from MSM model	Observed Ferry passengers	Total flow of car and ferry passengers	Observed modal split (% by ferry)	Ferry passengers with assumed growth of 12%	Modal split with increased ferry passengers (% by ferry)
Devonport	218	960	1178	81%	1074	91%
Hobsonville	76	141	217	65%	158	73%
West Harbour	370	295	665	44%	330	50%
Pine Harbour	9	219	228	96%	228	100%
Gulf Harbour	146	227	373	61%	254	68%
Bayswater	332	292	624	47%	327	52%
Birkenhead	147	204	351	58%	228	65%
Half Moon Bay	436	281	717	39%	314	44%
Total	1733	2619	4352	60%	2913	67%

Based on the category for better travel options from Waka Kotahi's IPM, this gives the GPS alignment a very high rating with a 17 per cent shift from private passenger vehicle-based trips from the ferry catchment areas to the CBD in the AM peak to other modes (with the car share of the combined car and ferry movements declining from 40 per cent to 33 per cent.

9.5.2 Scheduling

Scheduling indicates the criticality of the proposed activity or combination of activities with other activities in a programme or package or as part of a network (See Table 51 for assessment of rating)

Table 51: Scheduling Investment prioritisation as defined by the IPM for the 2021-24 NLTP

SCHEDULING			
	LOW	MEDIUM	HIGH
Criticality	Need to undertake this activity in order to deliver/ prepare for remainder of programme/package which doesn't need full implementation for 7 or more years • Significance	Need to undertake this activity in order to deliver/ prepare for remainder of programme/package which doesn't need full implementation for 4–6 years • Significance of	Need to undertake this activity in order to deliver/ prepare for remainder of programme/package where its implementation is to begin in 2021–24 NLTP • Significance of activity as

SCHEDULING			
	LOW	MEDIUM	HIGH
	of activity as part of the network, with any loss of service having minimal impact to users due to availability of alternative(s)	activity as part of the network, with any loss of service having moderate impact to users due to some availability of alternative(s)	part of the network, with any loss of service having severe impact to users due to limited availability of alternative(s)

Based on above criteria, the recommend programme has a scheduling rating of High due to a third of the vessels being life expired which could lead to loss of service due to a greater risk of breakdowns. Figure 13 shows the number of cancellations due to asset issues which was high as 140 in Aug 2019.

9.5.3 Efficiency

Efficiency indicates expected return on investment and considers the whole life costs and benefits through cost-benefit analysis. As defined by the IPM for the 2021-2024. (Table 32).

Table 52: Scheduling Investment prioritisation as defined by the IPM for the 2021-24 NLTP

Rating	BCR
Very High	Greater than 10
High	6.0 to 9.9
Medium	3.0 to 5.9
Low	1.0 to 2.9
Very Low	< 1.0

The recommended programme has a BCR of 1.8 therefore a rating of Low.

9.5.4 Overall Investment Profile

Table 53: Investment Profile

GPS Alignment	Rating
GPS Alignment	Very High
Scheduling	High
Efficiency	Low

The recommended programme has been assessed against the NLTP Investment Prioritisation Method (IPM). The assessment indicates that the recommended programme has a High GPS alignment, high rating for criticality under Scheduling and a 1.8 BCR, indicating that the recommended programme will be included in the NLTP.

The priority order for the project would be 2 based on the IPM prioritisation order

Part B Conclusions

The PBC outlines the process of recommended programme development and assessment. This began with an optioneering session to generate initial ideas, moved on to developing programme options, and was completed by defining a recommended programme. As part of this process, a range of programmes were developed in order to explore different levels of intervention in the ferry network. Waka Kotahi's Intervention Hierarchy was included as an input, and as a result, all programmes except the do-nothing programme have some elements of the hierarchy.

The programmes examined through this business case are:

1. Programme I – Do Nothing (existing network with secured investment only), which was not considered to represent a long-term sustainable position for the ferry network and would result in a decline in service levels as existing vessels became unserviceable;
2. Programme II – Do Minimum, which was considered to be the minimum required to maintain existing levels of service on the ferry network and was subsequently used as the main base for assessment;
3. Programme III – Network improvements to meet demand;
4. Programme IV – Network improvements to grow demand;
5. Programme V – Long-term network development; and
6. Programme VI – Balanced Investment.

The initial programmes, Programmes II to V, were designed to explore the effects of increasing levels of investment in the network. However, the increased cost associated with increasing levels of intervention had implications for economic efficiency and affordability. A blended programme, Programme VI – Balanced Investment, was therefore subsequently developed to be more in line with the anticipated budget constraints, drawing the highest priority interventions from other programmes.

The programme assessment process, using an MCA process, indicative economic assessment, and sensitivity testing, showed that Programme V would align best with the investment objectives, but that Programme VI would achieve a more balanced outcome between objectives and cost, and would perform well from an economic perspective. Programme VI was consequently confirmed as the recommended programme.

The recommended programme of investment includes ferry fleet upgrades, improvements to terminal and wharf infrastructure, and improved service levels. These are supported by improved bus integration with ferry services, and improvements to walking and cycling infrastructure at all ferry terminals. Ferry patronage can be expected to increase from approximately 6.0 million to 8.6 million passengers a year as a result of the investment programme, which has BCR of between 1.7 and 1.9.

Additional interventions that were not included in the recommended programme remain as longer-term options and may move forward to the medium term if additional funding becomes available.

Part C

10 Financial Case

10.1 Outlining the Financial Case

The purpose of this section is to set out the programme financial implications of the Recommended Programme. The costings of the programme will be affected by the method of procurement of services and vessels, and in particular the ownership model adopted. The high levels costings in this financial case are based on current operator/ owner model (i.e. where operators procure the vessels required to operate the services proposed in the Recommended Programme and then recover the costs of these vessels through the gross operating costs charged to AT). In this base scenario, the risk to operators that they will be left with vessels for which they have no use if the initial contracts are not renewed, would be mitigated by an end of term transfer provision that AT will purchase the vessels back at their depreciated value.

Alternative options with either no end of term transfer or with AT purchasing the vessels and making these available to the operators have also been assessed at a high-level.

The analysis assumes that the changes in costs and revenues from the current observed situation to the future position will occur linearly over the 6-year period from 2021/22 to 2027/28. The future position includes the development of services in line with the proposals in the Recommended Programme, with the provision of new vessels to replace those at or close to the ends of their lives and the expansion of services to meet and support growing demands.

10.2 Programme Cost

10.2.1 Operating Costs

Operating costs for the Recommended Programme have been estimated using a model developed by Auckland Transport which has been used to assess the future operating costs associated with fixed capital charges, fuel, labour, maintenance charges, overheads and margin. This is based on the types of vessels used for the particular services and the length of time over which these vessels are in operation on the different routes. The model also takes into account the full recovery over time of the capital costs of the investment in new vessels and the estimated return required by the operators.

In particular this model assumes:

- Depreciation - the vessels are depreciated over 20 years on a straight-line basis.
- Operator cost of capital - 8 per cent
- Operator return on capital investment - 10 per cent
- Margin on total costs of 8 per cent

While these parameters are believed to be appropriate, they have not been fully confirmed by the potential ferry operators.

The operating costs would increase over time from the current position reflecting:

- Replacement of existing fleet over the course of the Recommended Programme
- Increases in the level of service provided with higher frequency sailings and the extension of services to provide better coverage in the interpeak and weekend periods.

The total gross operating cost of the future ferries development programme over the three-year RLTP period from 2021/22 to 2023/24 is estimated to amount to ~ $133m. Over the ten-year period from 2021/22 to 2030/31 the increased total gross operating costs would amount to about $750m. These would be offset by revenues of $57m over the first three years and $240m over 10 years.

The details of this are set out in Table 54 together with the RLTP forecast budget as of March 2021. Attention has been focussed on the first three years for which RLTP funding is being sought, but the table also includes a summary for the remainder of the 10-year period. The Devonport service (currently exempt) is included in the analysis.

Table 54: Financial Assessment - Forecast Operating Costs - Recommended Programme and RLTP Forecast Budget($m)

	2021/22	2022/ 23	2023/ 24	3 Year Total	10 Year Total
Recommended Programme					
Total gross operating costs	34.2	44.1	54.4	132.7	750.8
Total passenger revenues	17.3	18.8	20.4	56.5	242.2
Net Cost Impact	17.0	25.3	33.9	76.2	508.7
RLTP Forecast Budget (March 21)					
Total gross operating costs	38.9	49.1	57.0	144.9	549.9
Total passenger revenues	14.1	19.3	20.3	53.7	228.8
Net Cost Impact	24.8	29.8	36.7	91.2	321.1
Net Opex Surplus/(Deficit)	**7.9**	**4.4**	**2.8**	**15.1**	**(187.5)**

It should be noted that at the time the RLTP budget was prepared, although there was information for the first three years of the programme where the forecasts for the Recommended programme and RLTP budget are similar, there was no firm information for the position beyond 2023/24. Because of this, no allowance was made in the RLTP budget for any significant increases in operating costs or expenditure on capital items in the final 7 years of the programme, which results in the greater disparity for the later years. Differing assumptions about the number of vessels and scope of infrastructure works were also made. It is however possible that future revisions of the RLTP budget reflecting the on-going proposals for the enhancement of the ferry services will provide a greater allocation of funding.

Of the changes in the forecast gross operating costs of the services at the end of the transition period in 2027/28 for the Recommended Programme, about 70 per cent reflects the costs associated with the replacement of the existing fleet with new vessels to provide a more sustainable and higher quality pattern of operations and about 30 per cent the effects of the expansion of the ferry services themselves.

10.2.2 Capital Costs

The complementary capital investments include a number of land-based elements intended to facilitate and enhance the operation of the improved ferry services including new wharves and the development of the shoreside charging facilities necessary to support the introduction of electric ferries. These have been costed in outline using standard costing factors for new facilities.

The complementary investments proposed are set out set out in Table 55

Table 55: Capital Costs of Proposed Wharves and Land-Side Investments

Proposed Capital Expenditure	Year	Cost ($m)
Bayswater terminal new facilities	2024	15.9
Implement central vessel service location to support the fleet growth[111]	2024	10.6
Wharf upgrades to allow access for the new ferries	2024	5.3
Shoreside charging infrastructure	2024	3.7
Additional berth for Hobsonville	2025	2.2
Develop real time, multi-lingual, digital information service at all terminals	2025	1.1
Provide HOP Card dispensers at all terminals	2025	0.5
Pine Harbour terminal new facilities	2026	16.6
Wynyard Quarter new terminal	2027	13.5
Ferry terminal upgrades: improved lighting, CCTV, Emergency Health Points, sufficient seating and all-weather shelter at all terminals	2027	2.8
Provide sufficient secured bicycle parking + basic repair kits	2027	0.9
Ensure all terminals and fleet comply with accessibility standards	2027	2.3
Dynamic berth allocation, dynamic speed control en route depending on berth availability (dynamic sailing control)	2027	1.1
Total		**76.5**

The phasing of the capital costs and the potential RLTP budget availability is set out in Table 56. As noted above the RLTP budget currently provides no allocation for capital expenditure beyond the initial three-year period.

Table 56 Recommended Programme – Potential RLTP budget Availability to Meet Capex Costs ($m)

	2021/22	2022/ 23	2023/ 24	3-year total	10-year total
Recommended programme capital costs	0.0	0.0	35.6	35.6	76.5
RLTP Forecast Capex Budget (March 21)	2.0	12.0	16.0	30.0	30.0
Capex Surplus/(Deficit)	2.0	12.0	(19.6)	(5.6)	(46.5)

[111] Note this excludes property costs associated with site acquisition.

10.3 Affordability

The combined net operating costs of the project outlined in Table 54 and capital costs set out in Table 56 can be compared with the possible current availability of funding from the RLTP for capital and current expenditure and this is set out in Table 57.

This indicates a small surplus of $9.5m over the initial 3-year period but with a deficit of about $230m over the 10-year period as a whole. This surplus over the initial period reflects differing assumptions between the recommended programme and the RLTP budget about the timing of vessel procurement and service improvements.

Table 57: Recommended Programme Potential RLTP Budget Availability to Meet Total Costs ($M)

	2021/22	2022/ 23	2023/ 24	3 Year Total	10 Year Total
Recommended Programme total costs (net)	17.0	25.3	69.5	111.7	585.2
RLTP Forecast Budget (March 21)	26.8	41.8	52.8	121.2	351.1
Total Surplus/(Deficit)	**9.8**	**16.5**	**(16.7)**	**9.5**	**(234.0)**

It is assumed that the costs of the Recommended Programme including an allowance for administration costs of 5.7 per cent would be financed by a combination of Auckland Transport and Waka Kotahi funding, with Auckland Transport meeting 49 per cent of the total costs. This gives the cash flows set out in Table 58.

Table 58 Recommended Programme – Indicative Funding Shares[112]

	2021/22	2022/ 23	2023/ 24	3-year total	10-year total
NZTA funding	9.1	13.6	37.5	60.2	315.4
AC Funding	8.8	13.1	36.0	57.9	303.1
Total	**17.9**	**26.7**	**73.4**	**118.1**	**618.5**

In addition, there may be opportunities to consider private-sector contributions to costs of ferry operations/ network development in selected locations with high levels of property development (as has occurred in the past at Gulf Harbour, Pine Harbour and Hobsonville). These opportunities should be considered on a case-by-case basis.

10.4 Risks

10.4.1 Affordability

As noted above, the overall affordability of the programme is a significant risk to successful programme delivery. Risks may also arise to achievable benefits from scope reduction, or delayed/staged roll out of the programme as a consequence of potential affordability constraints. Providing confidence around affordability including detailed staging of the programme will be an important consideration to address at the detailed business case stage.

112note figures inclusive of Waka Kotahi administrative change (5.7%)

10.4.2 Cost Risks

The proposed future ferry services would be served by a combination of low emission vessels including electric and hybrid vessels where feasible. There are very few examples currently in service of an EV or hybrid commuter ferry fleet (with current examples mainly focussed on slower car/ passenger vessels) and also technology is likely to be rapidly developing. As such, capital and operating costs for these vessels are subject to some uncertainty.

10.4.3 Demand Risks

The forecasts of demand are based on a central estimate of the responses to changes in the quality of end-to-end journey offered by the ferries service including frequency and travel time improvements. There is little information available on these potential responses, and as a result the forecasts are subject to an element of uncertainty. However, experience from overseas does suggest that users are fairly responsive to improvements in services and as a result the demand forecasts and the revenues generated may be conservative.

The forecasts also assume a recovery from COVID such that flows in 2021/22 will be at a similar level to those experienced before the outbreak. While these is considerable uncertainty about this, the current position within the Auckland region has indicated that the impact of COVID on ferry flows is currently less than that for other forms of public transport.[113]

10.4.4 Transition Periods

The analysis assumes that the changes in costs and revenues from the current position to the ferry operations with the new procurement model and expanded level of services will occur linearly over the six-year period from 2021/22 to 2027/28. It is possible that in practice the transition may be different to this with new services and operating contracts being put into place either earlier or later than is implied by this approach.

10.5 Alternative Procurement Options

In addition to the main operating case on which the financial assessment described above has been developed two alternative forms have been considered briefly. These are:

- A continuation of the existing position where operators own all the vessels but take the risk in their being required or not at the end of the contract periods and with no AT buyback guarantee. This risk would be compensated through a higher rate of return on capital
- A position where Auckland Transport procures the vessels and makes them available to the ferry operators so removing the risk to the operators that the vessels become surplus to requirements. As the ferry operators do not have any capital costs, it is assumed that they receive profit through a margin on their total costs of operation taken to be 8 per cent.

The effects of these alternative procurement options on the gross operating and capital costs are summarised briefly in Table 47. The revenue assumptions are assumed to remain unchanged between these options.

[113] 81% as at March 2021

Table 59: Financial Assessment – Comparison of Gross Operating Costs with Alternative Procurement Options ($M)

Procurement Option	Total Gross Operating Costs		Total Capital Costs		Total Capital and Operating Costs	
	3 years	10 years	3 years	10 years	3 years	10 years
Base Case - Operator Procurement with End of Term transfer	s7(2)(b)(ii) Prejudice to commercial position					
Operator Procurement - No EOT provision						
AT Direct vessel procurement[114]						

Notes (1) Includes an allowance for the acquisition of spare vessels

Compared to the base case identified (operators procuring the vessels with an AT guarantee at the end of the initial contract period), the total operating costs incurred with the option with no guarantee would be about 7 per cent higher over 3 years and about 17 per cent higher over 10 years. The capital costs, relating to the land-side facilities, would be similar.

For the option where AT purchases the vessels, including spares, the operating costs over 3 years would be about 14 per cent lower over 3 years and about 31 per cent ess over 10 years. However, this reduction in operating costs with the AT procurement option would be offset by increased capital costs of over 3 years and m over 10 years. In total the capital and operating costs would be higher over 3 years but less over 10 years.

While this comparison of the alternative procurement options has been undertaken over a 10 year period to 2030/31, this would underestimate the cost savings associated with the AT Direct Procurement Strategy for operation over the subsequent 10 year period. For this period with this procurement strategy the capital costs associated with the purchase of the vessels by AT would have been covered in the earlier period. This would be in contrast to the position for the two other operator purchase strategies where the costs of capital recovery would continue to be charged.

[114] Includes an allowance for the acquisition of spare vessels

11 Commercial Case

11.1 Due Diligence

This Commercial Case:

- Outlines the current commercial arrangements and attributes of the Auckland ferry market
- Defines the desired future commercial state of the Auckland ferry market
- Identifies the commercial options that exist for delivery of the Recommended Programme identified in the Part B of this Programme Business Case

It is not intended to arrive at a preferred procurement strategy for individual components of the Recommended Programme. This activity will be completed in the following business case(s), procurement strategies and other project development documentation that AT will develop for identified packages of the Recommended Programme.

11.1.1 Current and Future Commercial State

The Investment Logic Mapping process in the Strategic Case identified a problem statement that "Current legislative settings, operating models and barriers to entry make it difficult to sustain or improve the ferry network in a value for money way".

The problem indicates commercial and market challenges with the current operating environment and helps to identify the desired future commercial state of the Auckland ferry market. The following table outlines the current commercial state, the commercial objectives of the Recommended Programme and the desired future state, all of which are discussed in more detail below.

Current Commercial State	Commercial Priorities of Recommended Programme	Desired Future Commercial State
ILM Problem 2: Current legislative settings, operating models and barriers to entry make it difficult to sustain or improve the ferry network in a value for money way.	Reduction in the barriers to entry for the Auckland ferry market enabling additional ferry operators to enter. Procurement of a new fleet of vessels over the programme period, using a method or methods that provide AT with ownership or control over the entire fleet at the end of the programme period. AT (or joint AT and operator) development of vessel designs, ensuring consistency of vessels (across required classes) and standardised maintenance requirements. Development of a standardised operating contract, including performance standards, service specifications, duration, etc. Greater ability to influence exempt ferry services considered integral to the PT network.	A consistent legislative setting, operating model and operating contracts across the Auckland ferry network. In the long term, ensure a competitive ferry operator market and low barriers to entry for new entrants through: • A standardised and AT owned or controlled fleet • An AT owned or controlled maintenance facility A consolidated unit (or small number of units) for competitive tendering, comprising the majority of the integral routes and annual passenger numbers. A consistent customer experience across all integral routes.

Current Commercial State

The current commercial state of the Auckland ferry network includes several issues that impact the network's ability to deliver AT's strategic objectives. These include:

- A mixed specification, ageing and diesel-reliant fleet of vessels that are privately owned;

- Bespoke infrastructure that is not transferrable across operators and vessels;
- Contracts with misaligned expiry (many of which have been rolled over), which may not be providing AT with optimal value for money;
- Operator performance frameworks that are not effective in incentivising or do not reflect current customer priorities, leading to sub-optimal service quality;
- A mixed exempt and contracted model, and a legislative anomaly with the application of these two models to integral routes (especially Devonport and Waiheke);
- Some complexity in access arrangements between AT, operators and private marina landowners (e.g. West Harbour, Pine Harbour and Gulf Harbour);
- Challenging integration between exempt routes and other transport modes, which together create operational inefficiencies and an inconsistent customer experience; and
- High barriers to entry for potential new domestic or international ferry operators (including current contracts requiring operator-owned and maintained vessels with contract terms misaligned with the capital payback period), with one dominant and well-established incumbent operator in the Auckland market.

The status quo commercial approach – i.e. contracting for single routes with operator-owned vessels and supporting maintenance infrastructure – is likely to perpetuate the current commercial issues; the high barriers to entry for new operators will remain or increase.

While the historical commercial environment presents some significant challenges, the Programme presents AT with an opportunity to effect substantive change over the programme period and establish a commercial landscape that better supports achievement of AT's wider objectives. In particular, AT will focus on delivering a commercial model that is attractive to participants in New Zealand and Australia's unique ferry operator market (i.e. a small number of players that vary significantly in size).

11.1.1.1 Desired Future Commercial State

AT's long-term commercial objective is to position the ferry market in a way that AT can undertake a full competitive tender across the entire network (for one or two comprehensive units) at the conclusion of the contracts developed as part of this Programme. It is acknowledged that this will take time to achieve in light of current constraints in the market and the existing owner-operator model.

The identified commercial priorities for the Programme (outlined in the table above) are expected to realise this objective and help determine AT's preferred option(s) for the interventions required under the Recommended Programme.

11.1.2 Risks

In developing subsequent business cases and procurement strategies, AT will prepare a comprehensive risk framework that identifies key risks, documents risk mitigations and optimises the procurement approaches to efficiently allocate risks to the parties that are best able to manage them. An appropriate and robust risk management process will minimise the expected risk cost to the Programme by minimising risk-pricing from participants and allowing AT to develop a more efficient contractual and operating structure for the ferry network.

Details of key programme risks are set out within the management case at section 12.3.

11.2 Optioneering

This part outlines the commercial optionality that exists for the delivery of the Recommended Programme identified in the Economic Case and sets out the various ways that AT could package up and deliver the interventions across the life of the Programme. This optionality includes bundling routes into units[115], the packaging of various interventions through commercial contracts, the ownership and control structure for new vessels, and the various methods by which each of those contracts could be procured. While this Commercial

[115] Note 'unit' or 'units' in this commercial case refer to aggregations of service routes, which may or may not be structured as formal PTOM units under the LTMA. The unit definitions will be finally resolved via the RPTP development process.

Case does not arrive at a recommended approach for each component of the Programme, the optimal combination (or combinations) of these four variables is referred to as the 'Preferred Commercial Solution'.

The following table outlines AT's four-step process for arriving at the Preferred Commercial Solution and describes outputs that will be arrived at through the subsequent project business case or procurement strategy development process. Each step is explained in more detail in the following sections.

1. Route Options	2. Packaging Options	3. Ownership Options	4. Procurement Options
Currently Auckland's ferry services are made up of individually contracted routes and exempt routes. The route options analysis will determine AT's preferred approach to consolidating these routes into units, and the contracted and/or exempt status of each of these.	Packaging refers to the potential ways that different interventions in the Programme scope could be combined for procurement and delivery of each unit. Interventions will be delivered in an aggregated or disaggregated packaging approach, structured to best achieve AT's objectives.	The requirement for operators to supply vessels is seen as one of the major barriers to entry. AT has determined that long-term ownership or control of vessels should lie with AT by the end of the Programme. There are different models that could facilitate this, with the potential for different models to be applied across units.	Once AT has identified its preferred units, packaging options and ownership strategies, a preferred procurement model will need to be determined for each individual contract. While different procurement models exist for each intervention, these three factors will heavily guide the selection.
Output: Defined PTOM units to be tendered or negotiated, plus any routes that will remain exempt.	**Output:** Packaging solutions to deliver the required interventions across the defined PTOM units.	**Output:** A long-term ownership and control strategy for all vessels across the contracted units.	**Output:** Preferred procurement methods for each of the defined packages and ownership strategy.

11.2.1 Route Options

This Commercial Case considers potential options for how individual routes on Auckland's ferry network could be bundled under new contractual arrangements. These options range from a single, all-inclusive unit for the entire network through to a fully disaggregated private sector model where all routes are provided as exempt services by private operators.

Currently, AT's contracted ferry services are structured as a unique unit for each route, on the basis that ferries serve a point-to-point market with little or no intermediate travel. Certain other routes are structured as exempt services operated by a private operator with minimal control or intervention by AT.

The outcomes of AT's 2017 tender process showed that the supplier market has a preference towards aggregating service routes into larger, multi-service PTOM contracts. Larger contracts are more attractive to the market as they provide economies of scale for both tendering and operations, create operational efficiencies for interfaces and service planning, and improve consistency of customer experience. Operationally, larger PTOM units allow operators to better cross-utilise vessels, back-up boats and depot and maintenance facilities. From AT's perspective, larger units are also seen as an effective means of signalling future market size and encouraging contestability for these services.

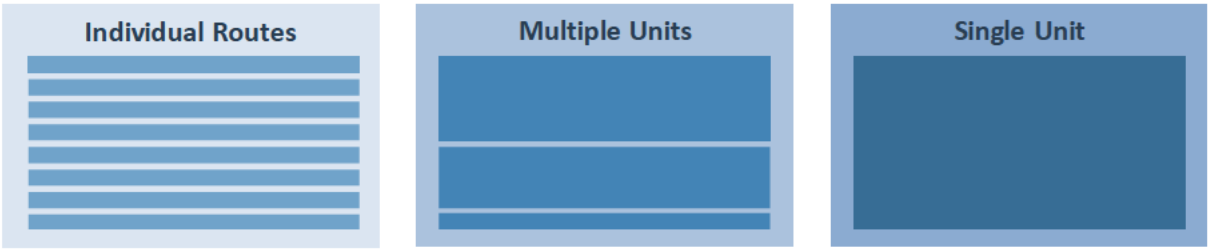
AT will consider several factors in determining the number and composition of units as part of the Preferred Commercial Solution, including a preference for bundling routes that have:

- Common operational attributes, such as requiring the same vessel size or currently being served by the same operator
- Opportunities for improved vessel utilisation by being bundled together
- Common destination themes, e.g. leisure or tourist markets, and/or linkages to complementary services

- A high likelihood of attracting multiple bids when bundled together in a competitive tender environment

For those routes currently operated as exempt services, where possible AT will seek to integrate these within one or more bundles of contracted services as part of a long-term strategy of achieving full service integration for 'integral 'routes identified in the RPTP across the ferry network. In this situation, AT would require that the current operator formally relinquishes and de-registers its exempt registrations for any exempt services expected to be incorporated within contracted PTOM units. If currently exempt services are not able to be bundled within contracted PTOM units, AT intends to negotiate improved terms of service with incumbent operators (e.g., through a new partnering agreement) to address community concerns regarding levels of service, network integration, ticketing, perceived preference to visitors above locals and surety of long-term service. AT also retains the option to regain control of exempt services through an LTMA order-in-council process, or to potentially "contract over" the exempt service.

AT's options for bundling ferry routes under the Recommended Programme are shown in the diagram below. Based on the above, **AT's preferred approach is to establish a small number of large units that are structured as contracted PTOM services with minimal exempt services.**



Where possible, Devonport is AT's preferred choice for integrating an existing exempt service with a new, larger unit of contracted routes as part of the Recommended Programme. Adding Devonport to AT's contracted services would make considerable progress towards AT's desired future commercial state outlined in section 11.1 by:

- delivering the greatest step-change in AT's contracted passenger volumes (adding approximately 1.9 million annual passenger journeys to AT's current contracted patronage of approximately 1.5 million annual journeys);
- improving service quality, fleet specification and customer experience due to AT being able to set and incentivise performance standards; and
- Incorporating a significant inner harbour route into the contracted network which is identified as integral to the regional public transport network in the RPTP.

Consideration has also been given to the Waiheke service and its current exempt status. AT's current preferred approach is, rather than bringing the service directly under PTOM, a form of 'Quality Partnership Arrangement' or similar to provide some degree of governance/oversight of the Waiheke Service. This would cover minimum service levels, capacity (especially during 'tourist' season), and some fare settings (e.g. the potential inclusion of Fullers' Waiheke service in AT's outer ferry monthly pass).

A key reason for treating the services differently is that the Devonport service has high levels of operational and fare interdependencies with AT's other contracted inner harbour ferry services, and a high proportion of commuters on the route. In contrast, the bespoke nature of the Waiheke service and the complexities involved in servicing a strong tourist market means AT considers it more appropriate for this service to retain its commercial focus, while providing mechanisms to ensure that Waiheke residents have good transport options. Should the Quality Partnering Arrangement concept be unsuccessful in addressing known issues with existing levels of service on the Waiheke route, this approach will need to be revisited and options further considered. It is also possible that the status of both routes will be affected by the current PTOM review (as noted further in the risk management discussion at 12.3.

In summary, AT's Preferred Commercial Solution will include a structure that repositions the Auckland ferry market into a small number of bundled PTOM units to maximise competition and increase network operating efficiencies. Contracts for each unit will be tendered competitively, with AT reserving the option to negotiate directly with an operator for a single unit if one or more currently exempt services are included.

11.2.2 Vessel Ownership Options

The requirement for operators to supply vessels is seen as one of the major barriers to entry under the current market structure, requiring significant capital investment and lead time for a new entrant into the market. Direct AT ownership or control of vessels could increase competition by attracting new service providers and also remove the need to align fleet design life and contract tenure. However, AT ownership or control can potentially introduce the requirement for a significant capital investment from AT and presents increased or additional risks around vessel ownership and maintenance (including residual value risk, ongoing asset condition risk and other risk of ownership such as health & safety or insurance).

At the Programme Business Case stage, high level consideration has been given to the following vessel ownership options as alternatives to the existing owner/operator model:

- **End of Term Transfer:** Operator(s) continue to procure, own and maintain vessels, but AT has an end of term option to require vessels to be transferred back to AT (on an agreed valuation and/or asset condition basis).
- **AT Ownership:** AT procures, funds and owns vessels and leases them to the operator(s) to operate and maintain.
- **Third Party Ownership:** A third party owns and funds vessels and leases them to AT or the operator(s), with an end of term option for the vessels to be transferred to AT or sold (on an agreed valuation and/or asset condition basis).

A further detailed assessment of the advantages and disadvantages of different ownership models will be developed as part of either the business cases for vessel procurement or the business cases or procurement strategies for an integrated operator and vessel package. Note that AT may consider different ownership structures for different route units, where appropriate.

11.2.3 Packaging Options

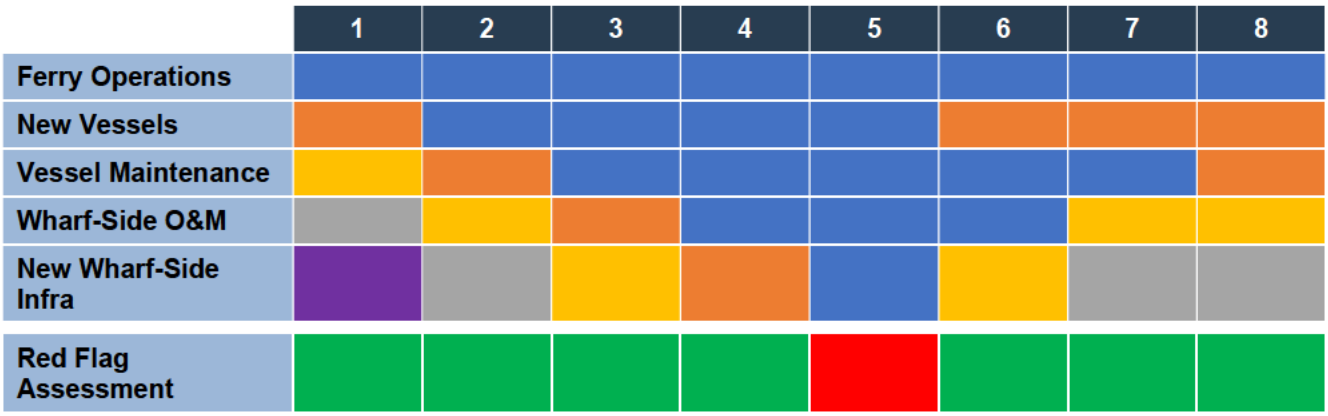
Packaging refers to the potential ways that discrete elements of the programme scope could be combined for procurement and delivery.

While there are likely to be nuanced scope elements included within the final packages for delivery, this section considers how the identified interventions might potentially be packaged to best deliver the commercial outcomes AT is seeking to achieve. For the purposes of the packaging analysis, the interventions for consideration, as outlined in section 3 of Part A, include:

- Ferry Operations
- New Vessels
- Vessel Maintenance
- Wharf-Side O&M
- New Wharf-Side Infrastructure

Multi-modal infrastructure at terminals and other potential interventions (e.g., timetabling, fare integration, etc.) have been excluded from the programme level analysis but will be included in subsequent commercial analysis at the project business case or procurement strategy stage. In addition to these interventions, it is assumed that the low emissions vessels trial will be delivered as a separate package, which will be subject to close oversight by AT.

The table below outlines eight examples of packaging solutions to deliver the interventions required for the Recommended Programme. Under each option (1 to 8), each colour represents a different contract for delivery, ranging from a fully separated option (option 1) through to a fully integrated option (option 5). It is possible that AT may choose to progress with different packaging options for each bundled route unit if more than one unit is procured.



Based on a "Red Flag" assessment, Option 5 has been ruled out from future consideration.

Option 5 packages the new wharf-side infrastructure delivery with the operator. This could present several challenges, including but not limited to:

- A fundamental difference in skill sets between operations and infrastructure development
- An inability to meaningfully or efficiently transfer interface and design risks due to the brownfield nature of new infrastructure
- A misalignment of timing between tendering or negotiating for operations contracts and developing the new infrastructure developments

AT has determined that any new wharf-side infrastructure will be packaged and delivered separately to the remaining interventions in the Programme.

The remaining packaging options differ based on three elements – the procurement of new vessels, the maintenance of vessels, and the O&M of wharf-side infrastructure. AT will determine the final packaging solution or solutions through the project business cases or procurement strategies to be developed following completion of this Programme Business Case. The process to determine AT's preferred packaging option(s) will draw on the evaluation criteria outlined in the following table.

Evaluation Criteria	Description
Size and Scale	The packaging option is of sufficient value to be attractive to the market without placing undue financial risk on operators, and provides opportunities for economies of scale in tendering and operations
Market Capacity and Interest	The packaging option can be delivered by the market and will encourage existing operators to expand and/or new operators to enter the Auckland market
Innovation	The packaging option creates opportunities for innovation in the delivery of ferry services and vessels, benefiting customers and/or improving long-term value for money to AT
Technical Requirements	Different interventions require similar technical / skills / capabilities that would provide value to AT in keeping together or risk in splitting apart
Functional Inter-Dependence	Extent to which interventions have inherent functional interdependencies that need to be managed
Time	The packaging option can deliver the project within AT's time constraints and provide any required time certainty
Risk Allocation	The packaging option supports effective risk management with risks allocated to the party(ies) best placed to manage them
AT's Capacity	The extent to which AT has the internal organisational capacity and experience to support delivery of the packaging option, especially managing interface risks

11.2.4 Procurement Options

This Commercial Case outlines various options for how AT may engage with the supplier market to procure the various interventions required for the Recommended Programme. All options are consistent with and will adhere to procurement rules set out by both AT and Waka Kotahi, and include:

- Open market tender through a one- or two-stage competitive procurement process
- Direct award of contract to operator(s) under a negotiated deal, where competition will not help obtain best value for money and there are demonstrable benefits of doing so (e.g. inclusion of currently exempt services)[116];
- An extension to current contractual arrangements with existing operators (where it is on terms that are commercially acceptable to funding partners)
- Some combination of the above

In the event of direct negotiation of routes with any operator, AT would develop and price a "best alternative to a negotiated agreement" ('BATNA') to create commercial tension during negotiations and ensure continuity of the ferry programme should negotiations fail.

While a negotiated deal could present some challenges to AT in terms of demonstrating value for money, this approach can have advantages in a unique commercial environment like the current Auckland ferry market. These include:

- Maximising operational efficiencies by tailoring route bundles (potentially including currently exempt services) to make maximum use of vessel utilisation, spares and timetables
- Avoiding the downside risk of where operators have no incentive to integrate with the rest of the network and customer service is negatively impacted (e.g., fare separation/ differentiation for routes within the same zones)
- De-risking transition to a new operational and commercial model.

Note that a Crown-funded pilot investment in electric ferries is likely to proceed in parallel to AT's wider procurement process(es) and is independent of AT's choice of procurement model for the remainder of the network.

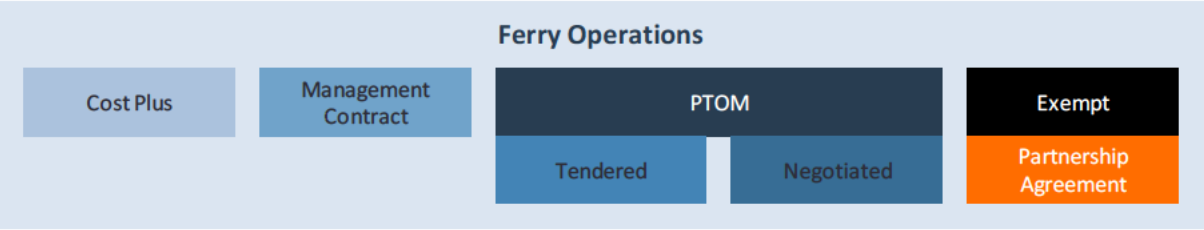
11.2.4.1 Long-List of Procurement Options

The selection process for procurement options will ultimately depend heavily on AT's choice of preferred packaging options for delivering the Recommended Programme, with each discrete package requiring a procurement method selection process.

The sections below outline the procurement options and key considerations for procurement of all interventions required to deliver the Recommended Programme. All options will be subject to further detailed assessment in subsequent business cases and procurement strategies.

11.2.4.1.1 Ferry Operations Procurement

The long list of potential procurement options available to AT for delivering the ferry operations broadly represent a continuum from a fully in-house, AT-operated ferry network through to a full commercial network model with exempt services on all routes. This spectrum is shown in the illustrative diagram below.



[116] See rules 10.11 and 10.27 NZTA Procurement Manual

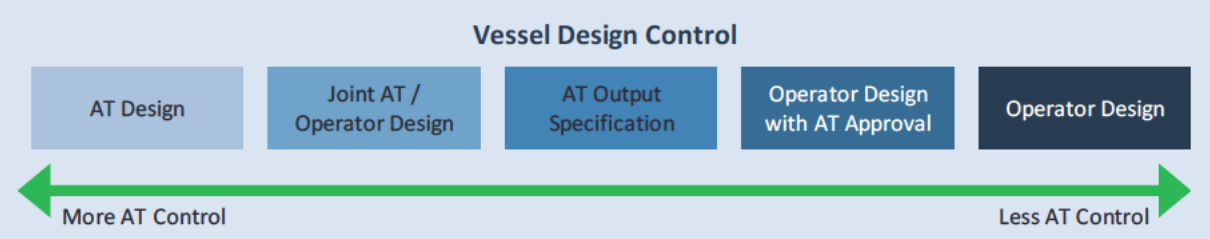
AT's preference is to procure all or most integral units through a tendered PTOM approach, adopting a standardised PTOM contract across all ferry units and demonstrating value for money through a competitive process. However, as discussed in the "Route Options" section, current commercial constraints may lead to the Preferred Commercial Solution involving one or more sole-source negotiated PTOM contracts, and/or the continuation of certain integral routes being operated as exempt routes (utilising partnership agreements to secure more advantageous commercial terms for AT where possible).

11.2.4.1.2 Vessel Procurement

The two key considerations for AT in determining the procurement model for new vessels are (a) who is the party responsible for vessel procurement (separate from long-term ownership or control, which will lie with AT), and (b) which party is responsible for and takes risk on vessel design.

The desire for AT to have long-term ownership or control of the full fleet of vessels for the contracted units requires AT to have a high level of influence over design. This is because regardless of who originally procures and owns the vessels (AT, an operator or a third party), it is possible that multiple operators will operate them through their lives and they will serve multiple different routes, meaning standardisation of design and cross compatibility of vessels is critical. As such, AT anticipates needing to procure at least three classes of vessel to meet differing service requirements across the network.

AT will need to determine the level of control it needs over the design of the final vessels and ensure that this is built into the procurement option. The spectrum of design control is included in the illustrative diagram below.



The choice of the party responsible for procuring new vessels (including any hybrids/EVs) is subject to several factors that will influence whether AT can purchase new vessels outright, or whether a third-party financing structure (including potentially by an operator) is required. This will depend on:

- the extent of funding available to AT (subject to Auckland Council's Long-Term Planning budget-setting process currently being undertaken for the 2021-24 period, and for subsequent years for later parts of the Programme);
- the extent of funding available from the NLTF (subject to the Government's three-yearly GPS, funding allocated to PT activity classes and Waka Kotahi's NLTP development processes); and
- the extent of funding available through other Government funding sources, including the possibility of a Crown-funded pilot for electric ferries.

Irrespective of whether vessels are procured outright by AT (if capital funding is sufficient to do so) or by a third party (including operators), it is expected that either a Construct Only or a Design and Build model will be used to enable a single point of accountability and control. AT's desired level of control over vessel design will determine whether bundling design with vessel construction is suitable.

In procuring vessels AT intends to work with operators and various shipbuilders to manage vessel construction across multiple facilities to expedite delivery and potentially enhance local New Zealand industry and workforce outcomes[117]. AT anticipates that vessel delivery will be staged throughout the Programme to enable operational handover at the appropriate time.

11.2.4.1.3 Vessel Maintenance

AT's options for procuring vessel maintenance will be largely determined by its choice of packaging options (i.e., the extent of vertical integration achieved by combining vessel procurement, O&M in a single contract).

[117] Ie subject to relevant NZTA and AT procurement guidelines and procedures

Contractual structures that package fleet O&M together are commonplace in PT and are currently in place on AT's bus and rail network. The advantages of an integrated O&M solution arise from reduced interface risk between the operator and a third-party maintenance provider, allowing the operator to be more efficient in providing both planned maintenance (i.e., scheduling regular maintenance around timetables) and reactive maintenance (i.e., responding quickly to faults or breakdowns) of the vessels. Given AT's requirement to retain ownership or control of all vessels, under a combined O&M structure AT would require operators to comply with ongoing asset condition assessments over the life of the contract to ensure vessels meet agreed end-of-term asset condition and valuation targets.

Alternatives to a combined O&M solution include AT taking responsibility for all vessel maintenance across the fleet, effectively separating the roles of the party that operates the ferries from the party that maintains them. While this would provide AT with greater transparency and confidence of asset condition and residual value, separating O&M could create additional interface risks, introduce service inefficiencies and create challenges around fault attribution. Without an established in-house maintenance function AT would also need to outsource its vessel maintenance to a third party (likely on similar terms to an operator), negating any potential cost advantages to AT of retaining maintenance risk.

11.2.4.1.4 Wharf-Side Operations and Maintenance

AT's options for procuring operations and maintenance of wharf-side infrastructure are largely independent of how other interventions in the Recommended Programme are packaged together. Instead, these options represent a trade-off between delivering operating efficiencies (i.e. where ferry operators are responsible for wharf O&M at route terminals and potentially at the DTFT) and avoiding significant interfaces between AT, third-party wharf O&M providers and ferry operators (or multiple operators if AT chooses to procure more than one bundled route unit).

Giving ferry operators responsibility for wharf O&M at terminals on their routes has the potential to create a more consistent gate-to-gate customer experience and deliver more efficient operations around staffing and maintenance supply chains. However, with facilities maintenance outside the core skill set of most ferry operators and therefore likely to be outsourced to a third party, AT is unlikely to achieve cost savings and/or sufficient risk transfer from packaging wharf O&M with ferry operating contracts. Operator-led wharf O&M at the DTFT (and potentially other terminals) presents additional interface risks if AT chooses to procure more than one bundled route unit, with robust interface agreements required in the event that one operator is responsible for operating and maintaining terminals that are serviced by another ferry operator.

An option where AT is responsible for wharf O&M across the network (or, at a minimum, the DTFT) would likely mitigate the interface risks outlined above and allow for a high level of AT control over consistency of wharf O&M across the network. Note, however, that this option is unlikely to deliver material cost advantages to AT given that wharf O&M services will still need to be outsourced. Further work will be completed in subsequent business case(s) and procurement strategies to determine the most appropriate means of packaging wharf O&M with other interventions.

11.2.4.1.5 New Wharf and Landside Infrastructure Procurement

AT has determined that the procurement of new wharf-side infrastructure will not be packaged with other interventions. With a variety of different wharf and landside improvements required (including charging infrastructure for hybrids/EVs an current uncertainty around propulsion technologies), AT's preference is that wharf and landside infrastructure will be procured as multiple, discrete activities staged over the Programme, rather than through a single procurement process. Several well-defined procurement options exist for new wharf and landside infrastructure assets, which are summarised in the table below.

	Abbreviation	Traditional	Collaborative	Bundled
Direct Managed	DM	■		
Construct Only	C	■		
Design and Build	DB	■		■
Early Contractor Involvement*	ECI	■	■	■
Construction Management	CM		■	
Managing Contractor	MC		■	
Alliancing	A		■	■
Design, Build, Maintain	DBM			■
Design, Build, Finance, Maintain	DBFM			■
Build, Own, Operate, Transfer	BOOT			■

Based on a number of factors – including the large number of relatively small capital projects (12 projects ranging from $0.5m to $15.0m in size), the operational "brownfield" nature of the projects, the interdependencies with existing infrastructure, and AT's relative experience across different procurement models – AT has determined that Construct Only and Design and Build will be shortlisted for further consideration in the business cases or procurement strategies for the new wharf and landside infrastructure (which will align with AT's supported Procurement Strategy).

11.2.4.2 Demonstrating Value for Money

AT's preferred approach is to contract as many services as possible through a competitive tender process. By tendering a small number of large units, AT expects to attract multiple bids whose competitive pricing will provide a strong basis for demonstrating value for money. To maximise competition and allow bidders to provide the best possible value offering, AT intends to minimise barriers to participation through provision of network information and an open data room for all bidders, removing any incumbency advantages.

Should AT proceed to contract part or all of the network under a negotiated sole source arrangement with a single operator, demonstrating value for money will be critical. To address the absence of market competition under a negotiated deal structure, AT would do one or more of the following:

- Require that pricing agreed under a negotiated deal is provided on a fully open-book basis, giving AT full transparency of input costs, margins, escalation and other assumptions;
- Require that operators are fully transparent with regard to their subcontracting arrangements, including the requirement to competitively tender subcontracted elements and for open-book pricing of subcontractors;
- Use cost data from any procurement process for tendered routes (if available) to undertake a benchmarking exercise to gain comfort that the proposed cost structure under a negotiated deal is competitive;
- Use a similar benchmarking process to assess negotiated pricing against AT's current ferry operating contracts;
- Implement an enhanced performance framework if contracted as a PTOM unit (or, if exempt services, introduce robust performance standards that mimic the partnering concepts of the PTOM model). This would use financial and non-financial incentives to drive positive operator behaviour through KPIs and pain/gain share on costs, and potentially include performance-based criteria for any extensions to the initial term;
- Develop a shadow bid (in conjunction with a third-party operator and/or technical and commercial advisors) to act as a comparator to assess and challenge the operator's proposed negotiated pricing; and

- Develop and price a BATNA (see above) to define commercial and pricing arrangements for AT if it were to proceed without the counterparty (e.g. if negotiations were to fail). Having a credible alternative delivery structure is also expected to add commercial tension to negotiations.

11.2.5 Contract Features

AT's intent is to develop and implement a consistent approach to contracting for the interventions required to deliver the Recommended Programme. This approach will be closely modelled off the existing PTOM contracting approach for buses and will be expanded to include bespoke elements that reflect the unique attributes of Auckland's ferry network.

AT will look to implement a consistent approach across the majority of the commercial and contractual features of the new contracts, including:

- **Performance**. To build on the partnering concepts inherent to PTOM contracts, it is expected that AT will introduce a performance framework within the new ferry contracts that includes financial and non-financial incentives (potentially including revenue pain/gain-share and service reliability standards), a mechanism that links contract extensions to operator performance and various other contractual performance requirements (e.g. payment retentions or step-in rights). AT will seek technical and commercial advice to develop KPIs for the new contracts that incentivise improved and more consistent operator performance across the network, plus performance standards relating to maintenance and asset condition if this is in scope.
- **Contract length**: AT will seek to align contract terms between units (whether tendered or negotiated), supporting a highly competitive re-tender process on conclusion of the Programme.
- **Payment structures**: At present, ferry operators are paid an all-inclusive Annual Gross Price ('AGP') that is adjusted by a pre-determined escalation mechanism, with service variations priced according to a pre-agreed rate card. Under the new contracts, AT intends to expand its current AGP payment structure to incorporate various performance incentives, potentially including a revenue pain/gain sharing mechanism and additional incentives relating to innovations introduced by the operator. Given that AT intends to introduce new operating technologies (e.g. hybrids/EVs) as part of the Programme, the new contract(s) may include additional cost-sharing mechanisms to manage unforeseen operating cost volatility.
- **Security and insurance**
- **Contractual interfaces**, including fault attribution and compensation arrangements.
- **End of term arrangements and hand back requirements**

11.2.6 Transition to New Commercial Model

Any reform to the ferry service contracts will require significant implementation considerations; a focus on transition and integration activities will support effective introduction of any new contracts with minimal impacts to ongoing operations and customers.

The potential routes, packaging, ownership and procurement options discussed above have the potential to result in complex transitions, requiring well planned transition arrangements. Potential arrangements include:

- Short extensions to current contracts
- Transition from an exempt route to a contracted route
- Integrating multiple routes or interventions into a single contract
- Transfer of existing vessels from incumbent operators to AT

Once a Preferred Commercial Solution is determined, detailed transition planning should be completed to ensure that key transition risks are identified and mitigated, and sufficient timeframes are allocated for activities.

11.3 Market engagement

During Q3 2021, AT will commence a formal market engagement process to consult with industry on its preferred packaging and procurement approaches. This will build on an initial phase of informal market engagement with incumbent operators, boat builders, designers and other relevant suppliers.

AT intends to align its market engagement process with guidance issued by the New Zealand Infrastructure Commission (Te Waihanga), which sets out a structure that may involve AT conducting one or more of the following steps:

- An industry briefing with suppliers
- A written questionnaire
- One-to-one interviews with a select group of suppliers

The outcome of this market engagement will be used to support AT's development of subsequent business case(s) for the Programme, with feedback from potential suppliers – including ferry operators, shipbuilders, third-party finance providers and the construction industry (design, contractors and maintenance) – helping to inform AT's final recommended commercial option. Market engagement is also intended to build industry appetite and create competitive tension among suppliers prior to AT entering a formal procurement process(es).

12 Management Case

12.1 Outlining the Management Case

The purpose of the management case is to describe the arrangements that will be put in place for the successful delivery of the programme and its constituent projects, both to ensure successful delivery and to manage programme risks. It outlines the arrangements that will be put in place for the successful delivery of the programme, and to manage programme risks. To further develop and understand the programme, the next step is to develop a series of more detailed Business cases (BCs) for the Future Ferry Development Programme.

12.1.1 Programme Management Strategy and Framework

The programme will be delivered under the AT Enterprise Project and Programme Management Framework (EPMF), which is to provide a standard approach to project management. Programme management will be considered a superset of project management with information rolled-up and managed in a similar way. Through application of the EPMF, the programme will achieve consistency and best practise in the delivery of the projects.

12.1.1.1 Governance Arrangements

The governance approach for the project consists of the following (Table 60):

Table 60: Governance Description

Group	Role
Programme Control Group (PgCG)	The PgCG is to provide leadership, oversight and governance across the programme and to ensure that Auckland Transport (AT) is ready to advance through each stage of subsequent procurement processes and relevant internal approvals. The PgCG will also assist with issues resolution and risk management, approve tactical responses, make decisions that improve strategic alignment. Membership of the group will include EGMs/ Group Managers for Integrated Networks, Finance, Customer Experience, Metro, Enablement, Independent Ferries Specialist and NZTA representative
Project Sponsor	The Project Sponsor is accountable for the programme, and for ensuring it meets objectives and delivers the expected benefits. The PS needs to direct the programme and take decisions; for example, whether to delay or stop any part of the programme. The initial Ferry Programme sponsor is Group Manager of Integrated Networks Enablement
Programme Manager	The Programme Manager is responsible for overall leadership of the programme and responsible for reporting to governance groups and oversees day to day decision making, and project management
Project Manager	The Project Manager will establish and monitor formal reporting arrangements on project

Group	Role
	procurement, readiness and general project progress to the PgCG via the monthly FFNIP Director's Report and in person. Responsible for budgeting/forecasting, programming, procurement/contract admin processes, and day to day project management.
Project Leads	The Project Leads will report to the PgCG and attend PgCG meetings as required. They will undertake formal executive and leadership reporting. Project leads include: **Technical** - provides senior leadership of technical workstreams (Vessel Design, Vessel Procurement, Maintenance Planning, E-Ferry) **Commercial** - provides commercial advice and input, in particular in respect of procurement model, tender documents and evaluation including overseeing the day-to-day delivery of the business case(s). **Comms/ Stakeholder** - Responsible for Communications and Customer and Stakeholder Engagement plans, processes and delivery. Co-ordinates major internal and external consultation processes. **Operational/CX** - Responsible for operational advice and input on all aspects of the programme. Ensure that routes, vessels and timetables meet or exceed the current and future expectations of customers and AT's LOS requirements. **Innovation/ Sustainability** - Embrace and implement new technologies and promote a system / long term view and in doing so, anticipate trends relevant to the Programme so that decisions are to the extent possible future-proofed. **Funding -** Organising and facilitating funding application and facilitating claims. Tracking of claims against approved funding to ensure timely actions for organising additional funds as and when necessary. **Financial** - collates, confirms, distributes (monthly) and maintains project budgets (project team / procurement and project itself). Compiles monthly dashboards/ PCG reporting. **Procurement** - ensures rules of sourcing are complied with, assisting project team put in place supply arrangements (procurement, evaluation and contracting of suppliers to support project) **Project controls** - ensure appropriate project processes, controls and disciplines are in place (across the project and for individual workstreams)

Group	Role
	focusing on time, cost quality and risk measurements
Subject Matters Experts	Representatives from teams from across AT, Waka Kotahi and Auckland Council will be called on to contribute to discrete work tasks based on their area of expertise.

12.1.1.2 *Programme* Structure

A core AT team will work alongside the successful consultant team(s) to deliver the business cases (BCs). A proposed project structure and team is set out below in Figure 54, this will be refined with partners as the future business cases are developed and resource availability becomes clearer.

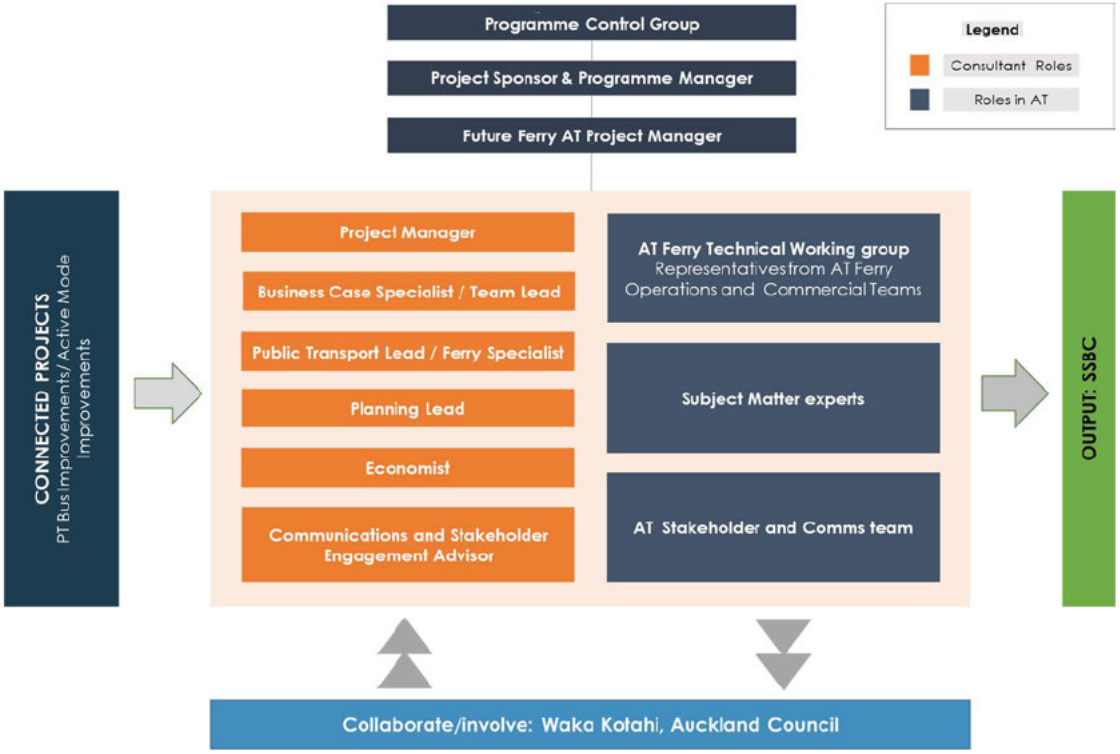


Figure 54 Programme Structure for more detailed BCs

12.2 Delivery

12.2.1 Future Ferry Development Programme – Business Case Pathway

The approach to delivering the recommended programme is to follow Waka Kotahi's Business Case process. The focus will be on delivering improvements through more detailed analysis of the recommended programme options identified in this PBC through a series of more detailed business cases as packaged below:

- Vessels + Infrastructure for accommodating vessels
- Ferry Service improvements + Improvements to bus services
- Landside and Wharf Improvements (Upgrades, Improvements to facilities, active modes)

Detailed business cases are proposed for each of the packages identified below which have been staged to broadly align with RLTP Funding cycles for example, the ferry service and bus services improvements business case. Vessels and infrastructure improvements (e.g. charging infrastructure) has been grouped together as these are highly independent. Other remedial/ wharf works are dealt with separately.

Individual BCs are likely to be required significant individual capex projects, e.g. Bayswater, Pine Harbour and Wynyard Quarter.

The future BCs will provide further validation that the options considered represent the best value for money, provide more detailed analysis of the costs, risks and benefits of the preferred option and more detailed reporting of the financial, commercial and management aspects of the recommended programme. Table 61 shows the proposed packaging of the detailed business cases to be taken forward. Refer to Section 9.3 for the methodology for the phasing of the programme and Figure 50 which provides more details on the short, medium and long-term plan and of the recommended programme timeline

The approach to delivering the programme needs to be flexible and revisiting timings of the programme regularly is essential to check for impacts on other delivery priorities, the pace in which the technology is changing e.g. Electric vs Hydrogen fuel cell, changes in forecasted growth in patronage

For this reason, it is proposed that the PBC is reviewed at a half-way point in the programme development.

Table 61 Proposed packaging of detailed BCs and timeline

<table>
<tr><th>BUSINESS CASE CATEGORY</th><th></th><th>SHORT TERM
2021 -2024</th><th>MEDIUM TERM
2024-2027</th><th></th><th>LONG TERM
POST 2027</th></tr>
<tr><td>Vessels and associated infrastructure</td><td rowspan="4">Future Ferry Programme PBC Approved</td><td colspan="2">First tranche of vessel procurement + associated charging infrastructure</td><td rowspan="4">Review Ferry PBC and Update</td><td>Additional vessel procurement (as required)</td></tr>
<tr><td>Network and Operations (Ferry Service Improvements)</td><td>PT Ferry Service Improvements + exempt service integration option</td><td>PT Ferry PT Ferry Service Improvements</td><td>PT Ferry Services Improvements</td></tr>
<tr><td>Landside and Wharf Improvements</td><td>Shoreside charging included in the Vessel BC</td><td>Wharf & Infrastructure Upgrades</td><td>Wharf & Infrastructure Upgrades</td></tr>
<tr><td>Individual business Cases</td><td colspan="3">New Terminal Facilities and Major Infrastructure facilities e.g. Bayswater, Pine Harbour, Central Maintenance Facility</td></tr>
</table>

Initial business case tranche are outlined in red above.

12.2.2 Outline Programme Plan

Table 62 outlines the key milestones to be delivered for the short-term business cases as identified in Table 61.

Table 62: Key Programme Milestones

Proposed key milestones	Estimated timing
PBC Approvals	Q3 2021
Procurement - establishment phase – market engagement for developing BCs for PT ferry service improvements and vessel and infrastructure BCS	Q3 2021
Develop business cases for above	Q3/ Q4 2021
Commence detailed vessel design	Q4 2021
Commence marketing engagement /procurement processes for vessels and services	Q4 2021
Commence procurement of infrastructure	Q2 2022

In light of affordability constraints, the programme phasing will be prioritised against the investment objectives and overall criticality (eg need for urgent renewal of end of life vessels), and can be scaled to any budget provision in future LTP/ RLTP/ NLTP processes. AT will consult with stakeholders and its funding partners to ensure that urgency and priority considerations are fully understood.

12.2.3 Organisational Change Management

Change management is the process to prepare, support, energize and mobilise people through change, it is essential to ensure the readiness for new ways of working, and that systems and processes are understood so organisational results can be achieved.

AT will seek to supplement existing resourcing within the organisation to ensure the capability to deliver great customer experiences and operational excellence, and manage the technology and operational transitions required by the Recommended Programme.

Dedicated working groups will be established to transition the existing services and fleet and identify required additional resources to avoid any impacts to BAU services. AT has already engaged specialist procurement resources to manage initial market engagement and procurement planning for the vessel and operator workstreams, including a highly experienced New Zealand ferry industry consultant. In addition, infrastructure programme and transition programme resources will be engaged as the programme develops.

12.2.4 Benefits Realisation Management

The planned approach to benefits realisation is to follow the guidelines as indicated in the AT Benefits Realisation process under the AT Enterprise Programme Management Framework. The Programme management team will be responsible for monitoring and reporting on programme benefits realisation.

Table 63 below sets out the plan for monitoring non-monetised benefits measures. The baseline and forecasting information, baseline source can be found in Section 6 of Part A.

Table 63 Benefit Monitoring Plan

Benefits	Non-monetised benefit measure	Frequency	Responsibility
Improved customer experience leading to more people choosing ferries	KPI 1: Percentage of trips that are punctual (AT SoI)	Annually	AT Metro
	KPI 2: Proportion of timed connections arriving within 15 minutes of connecting service	Aligned with timetable updates	AT Network Planning
	KPI 3: Number of routes meeting RPTP Frequency Targets	Review with RPTP updates	AT Network Planning
	KPI 4: Percentage of passengers satisfied with public transport services (AT SoI)	Annually	AT Network Planning
	KPI 5: Ferry patronage and mode share	Annually	AT Metro
	KPI 6: Overall PT patronage	Annually	AT Metro
Improved access to opportunities from using ferries	KPI 1: Number of people whose trip would be faster by ferry than other modes in peak times	Annually	AT Metro
	KPI 2: Number of people who access ferry services via active modes	Annually	Customer Experience team
	KPI 3: Number of fully accessible vessels/ facilities	In line with PBC review	AT Metro
Improved productivity and utilisation of the ferry network	KPI 1: Cost per passenger service km	Annually	Integrated Network
	KPI 2: Operating cost per service hour	Annually	Integrated Network
	KPI 3: Farebox recovery rate	Annually	Integrated Network
Reduced impacts on greenhouse gas emissions and marine quality	KPI 1: Average CO_2 equivalent emission	Annually	AT Sustainability Team

The benefits will be revisited and refined as more detailed BCs are developed.

12.3 Risk Management

Table 64 outlines the key risks to the delivery of the recommended programme.

Table 64 Risks Associated with the Progression of Recommended Programme

Risk Type	Risk	Risk Mitigation
Consenting	Infrastructure proposed in the recommended may result in unconsentable design solutions. This could be due to inadequate planning around RMA and not addressing issues in the coastal marine environment	Planners to flag any issues around proposals early particularly around marine issues and ecology and ensure designs minimise consenting risk
Inadequate funding	Lack of capital or opex funding arising from constrained funding environment post Covid 19	Identify funding requirement early and potential funding streams (Including direct crown funding in the case of EV trials). Develop a vessel procurement plan to enable staged rollout of the programme. Engage with NZTA proactively on development of programme procurement strategy
Stakeholder	Lack of buy-in from key stakeholders due to concerns about impacts may result in an inability to develop workable solutions Delays due to inadequate e.g. engagement with Mana whenua on cultural and heritage sites	Identify key partners and stakeholders and map interests to develop an effective engagement approach that meets AT requirements, including demonstrating responsiveness to the needs and aspirations of mana whenua. Engagement with Mana Whenua is ongoing, need to demonstrate that the recommended programme responds to the needs and aspirations of mana whenua.
Procurement	Market failure: Ultimate success in the delivery of this programme requires support from incumbent operators.	To the extent possible, engaging with incumbent operators on a transparent basis, listening to their feedback and concerns as part of market sounding and capturing these in the planning phase will help build goodwill by avoiding surprises. Also, ensuring that the right behaviours are financially remunerated.
Climate Change adaptation	Existing Infrastructure will be affected by risk from future climate change events	Develop solutions to make the infrastructure more resilient to climate change form so that as sea level rises, they adapt.
Skills Shortage	Disruptions to services	Highlight resourcing risks early to governance Recruitment / appointment of additional external/internal dedicated resources as required

Risk Type	Risk	Risk Mitigation
Technology and innovation risk	Risks associated with the rapid evolution in the market for hybrids/EVs and ensuring appropriate specifications are developed/ contractualised	Joint development of specifications with expert advisors, operators, expert SME review + independent QA, engaging industry leading design team.
Political	The risk that Programme priorities and / or delivery timetables require modification as a result of the Government's ongoing review of PTOM, or intervention in relation to current exempt services.	Ensuring AT keeps up to date with the review and can respond to any changes as needed and minimise potential impacts. Proactive engagement with MoT on exempt services review.
Scope Creep	The risk that AT's approach to delivering the Programme is sufficiently different from that proposed in the Programme Business Case that it requires re-approval and a change in approach.	Monitor Programme approach and change progressively, including change process for material variations. Pro-active engagement with Waka Kotahi throughout the process.

AT have developed a risk register for the overall Ferry Programme which was recently refreshed in May 2021 with relevant SMEs. It will be retained a living document as the programme starts to roll out and progresses to the more detailed stages of the BCs. The current risk register can be found in **Appendix I**. In addition, a detailed procurement and commercially focussed risk framework is being developed as part of the Programme procurement workstream.

12.4 Stakeholder engagement and communications planning

Section 5.1 lists potentially interested and impacted stakeholders who should be informed about the preferred programme soon after the business case is approved. This list includes groups who are yet to be engaged and likely have an interest in the following outcomes:

- Sustainable management of the Hauraki Gulf
- Sustainable transport growth in Auckland
- Effective management of transport infrastructure, particularly for lifeline communities, like Waiheke and Great Barrier Island
- Legal compliance and best practice implementation of transport activities on the harbour
- Economic development of wharves and host communities.

In addition to generally informing the public and ensuring that key stakeholders are effectively managed, there are a number of areas where collaboration will be required to support the detailed design phases. Specific organisations that are likely to be impacted/interested and require some planning to ensure effective collaboration include:

- Mana whenua – early engagement and identification of cultural impacts in the development of a consenting strategy and (if appropriate) opportunities to deliver commercial and cultural outcomes consistent with the Treaty of Waitangi

- Local boards to support connectivity with other programmes of works, such as greenways and active transport initiatives
- Marina operators and other potentially impacted communities where infrastructure enhancements are planned, in particular at Bayswater, Hobsonville, Gulf Harbour y and Pine Harbour marinas
- First/last mile service providers, such as e-scooter and e-bike hire companies
- Maritime New Zealand, NZ Police, Emergency Services and Civil Defence and Emergency Management.

The key risk of engagement through the next phase is in relation to compromising or misaligning outcomes with future consenting or market engagement activities. Section 6.2 outlines a high-level plan for engaging operators and other suppliers. All engagement will be planned in close coordination with procurement activities, so that market engagement is fair and equitable. Other risks include:

- managing expectations about programme timeframes and benefits
- Local host community resistance to service enhancements (e.g. increased ferry frequency perceived to impact noise and cause other amenity loss)
- Potential partners and key stakeholders resist or oppose plans due to unanticipated issues and risks.

A more in-depth draft communication and engagement plan for the programme can be found in **Appendix B**.

12.5 Programme and Business Assurance Arrangements

Throughout the pre-implementation and implementation phases of the project there will be ongoing internal and external independent reviews. These will be undertaken to ensure the robustness of all project aspects, including design and construction, and to ensure quality, compliance with standards, health and safety requirements and project objectives.

The Probity Plan will be developed to provide the control framework for the tasks, procedures and treatment required to manage the probity-related aspects of the procurement process. The overarching objective of the Probity Plan will be to ensure, through the identification of key risks and the adoption of a set of guiding principles and specific controls, that probity issues are taken into account throughout, and reflected in, the procurement. The Probity Plan will assist in:

- Ensuring that the main processes and decision-points are relevant to the needs of the project, readily identifiable and well understood by all those associated with it.
- Ensuring that roles and responsibilities within the procurement are clearly allocated, provide a strong basis for decision-making, and enable those responsible to be held accountable for their actions.
- Ensuring compliance with all process requirements, thereby promoting the use of best practice, and minimising the risk of procedural or other challenge.
- Minimising the risk of material conflicts of interest not being identified and appropriately managed.
- Maintaining public sector integrity by generating and preserving confidence in the process.
- Enabling the procurement to result in an outcome which delivers the best value for money.
- An independent Probity Auditor will be appointed to the Project, and will report to the Programme Director.

12.5.1 Next Steps

The next step is to develop the scope of the initial tranche of business cases identified above (i.e. PT Ferry Improvements 21 – 24 and Vessels + related shoreside infrastructure). Point of entry documentation is being developed for further consideration by Waka Kotahi. The business cases subsequent to this Programme Business Case will need to integrate monitoring at a programme level with the wider programme and ensure a means of monitoring is put in place. A more detailed understanding of the programme elements will be developed through the further business case processes, and this may identify a need for updating the targets set at the programme level

The endorsement of this business case is required now to make the decision to move forward with investment in the ferry network to address the issues identified including level of service improvements, and the renewal / upgrade of the existing fleet. As noted, without a funded plan of action, the Ferry Network will enter a period of managed retreat / decline in coming years.

APPENDIX A – MEETING MINUTES

APPENDIX B - STAKEHOLDER CONSULTATION AND COMMUNICATION PLAN

APPENDIX C – VESSEL CHARACTERISTICS

APPENDIX D - LONG LIST OF INTERVENTIONS

APPENDIX E - MEDIUM LIST OF INTERVENTIONS

APPENDIX F - ASSESSMENT OF NEW ROUTES

APPENDIX G - DO NOTHING MCA SENSITIVITY TEST

APPENDIX H - MCA ASSESSMENT WITH RATIONALE

APPENDIX I – RISK REGISTER

ADDITIONAL INFORMATION