

Appendix G



SWGP Network Operating Plan



Southwest Gateway

Network Operating Plan

NZ Transport Agency

Reference: 501094-3301-PLN-KK-0002

Revision: 1

08/05/2020



aurecon

Document control record

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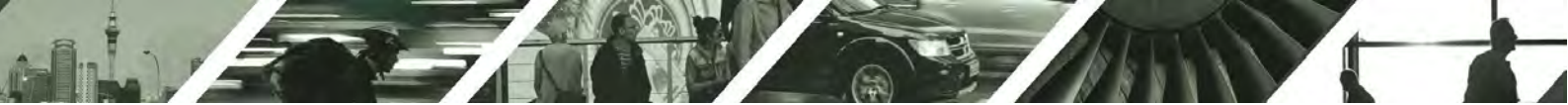
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Document control				aurecon		
Report title		Network Operating Plan				
Document ID		501094-3301-PLN-KK-0002	Project number		501094	
File path		pw:\\designshare.au.aurecon.info\\PW_AUDC1_01\\Documents\\Projects\\501xxx\\501094 - SWG - 20Connect SSBC\\5 Deliver Design\\501 Engineering\\3301 - Airport Access Integration\\PLN-KK-0002 Network Operating Plan\\01 NOP\\501094-3301-PLN-KK-0002.docx				
Client		NZ Transport Agency				
Client contact			Client reference			
Rev	Date	Revision details/status	Author	Reviewer	Verifier (if required)	Approver
1	08/05/2020	Final for Issue for				
0	20/05/2019	Draft for client review				
Current revision		1				

Approval			
Author signature		Approver signature	
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Executive summary

Introduction

The southwest Gateway programme incorporates a range of improvements to the transport network in Southwest Auckland. The most significant of these being 20 Connect (which defines state highway upgrades on SH20, SH20A and SH20B) and Airport to Botany RTN (which defines a significantly enhanced rapid transit corridor between the Airport and Botany, through Manukau).

The Southwest Gateway Network Operating Plan (NOP) is the guiding document to define the desired operational outcomes for the transport network which provides access to Auckland International Airport, and surrounding communities.

The NOP has been prepared for the New Zealand Transport Agency (NZ Transport Agency) with its investment partners Auckland Transport (AT), Auckland International Airport Limited (AIAL) and one of its network operating partners, Auckland Transport Operations Centre (ATOC).

This NOP is forward looking, focusing on outcomes for the year 2048. It provides a common vision and understanding across core operational and planning stakeholders as to how the Southwest Gateway Programme of investments will operate once completed. Its 30-year design horizon has been used to help determine the preferred option under the 20Connect Single-Stage Business Case (SSBC), ensuring that the operation of the network is considered, up front and integrated with both planning and design optioneering workstreams.



Network Operating Principles

Through a series of workshops, the overarching Network Operating Principles have been defined and listed below. These will be used to help test and validate other projects which may come online, currently outside the scope of the Southwest Gateway Programme. This is to confirm the desired operational functionality is achieved under all conditions.

SWG Network Operating Principles

- Improve safety for all users on the transport system.
- Enhance the customer perception of safety.
- Deliver the outcomes as defined by the ANOP and GPS on Land Transport.
- Maintain access along SH20 to ensure the WRR can perform its strategic function as an alternate route to SH1 during unplanned and planned events.
- Provide an agile network that can keep people and goods moving.
- Provide resilient access to and from Auckland Airport to enable it to carry out its function as a lifeline utility.
- To enhance overall network efficiency.
- Efficient and reliable public transport travel times to and from the Northern and Eastern Airport approaches.
- Prioritise public transport on key routes by time of day.
- Provide priority on SH20, SH20A and SH20B for trips to inter-regional markets over local access.
- Prioritise freight movements to / from the north and south industrial areas and airport.
- Prioritise pedestrians within 400-800m of high activity pedestrian areas.
- Support the amenity function around key activity centres by improving walking and cycling access.
- Improve connectivity of walking and cycling network facilities with the wider Auckland network to provide a viable transport mode for local and medium distance trips for users of all ages and abilities, and support access to public transport.
- Improve trip reliability for time sensitive aeronautical traffic (passengers, crew, time sensitive freight) to and from the airport.
- Discourage non-airport related traffic from travelling through the airport precinct.
- Improve local amenity and air quality by reducing 'rat running' commuter traffic and freight on local roads.

Network Priorities

The Network Priorities are shown in Figure 1 below. These Network Priorities were developed from the agreed Operating Principles, the future network diagrams for each mode and through discussions with operating partners. Where conflict points existed between modes, trade-offs were agreed by applying the priorities set out in the Government Policy Statement (GPS) for Land Transport and through discussions with operating partners in Workshop 3.

Along SH20, SH20A and SH20B and some arterials, there are several modes considered to be the highest equal priority. The operating partners decided that consideration should be given to providing facilities for each mode without compromising other modes of equal priority for each major route.

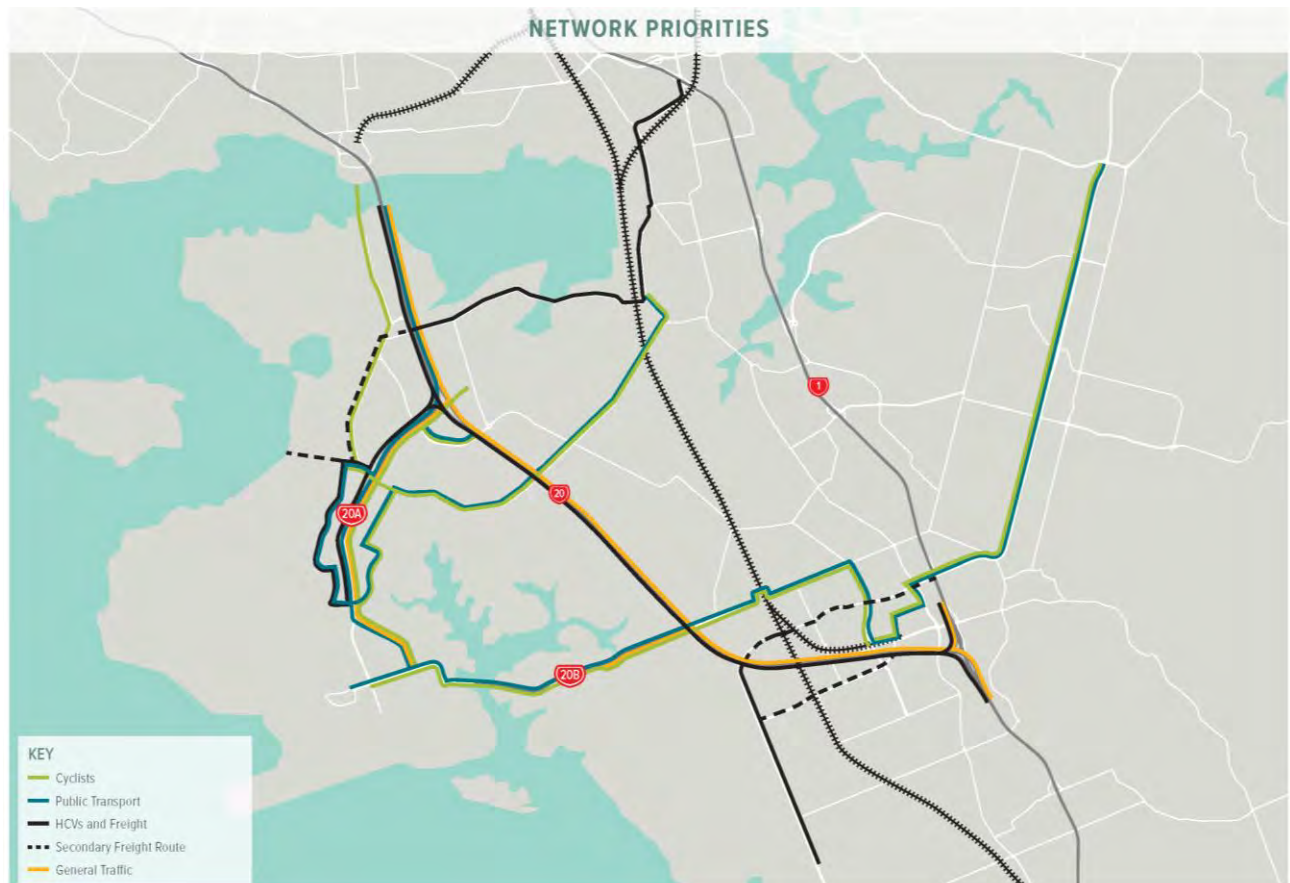


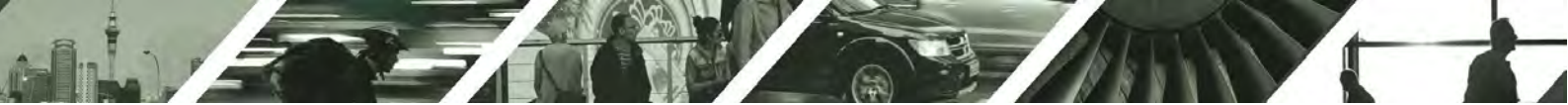
Figure 1 Southwest Gateway Network Priorities

Although not shown on this map pedestrians are also considered a high priority along every corridor with the exception of SH20 where the priority is lower. Notwithstanding this, pedestrians are prioritised around public transport stations (Puhinui, Manukau etc) as well as in town centres such as Mangere, Manukau and on the airport precinct, in particular around the terminal buildings.

On SH20B there is high priority given to both public transport and cycling along the full length of the corridor. High priority is given to general traffic only between SH20 and Prices Road. Freight is considered the lowest priority along this route.

Operational Performance Measures and KPI's

The key aspect of network operations is establishing a methodology for ongoing network evaluation to determine when interventions (i.e. implementation of available management tools and options) are required. The focus of network operations is optimal safety, efficiency and reliability of the transport network, and any ongoing evaluation of the network should be focussed in these areas. To guide this evaluation, KPIs will be used against performance measures that reflect the SWG NOP Operating Principles, using information provided from data sources. This includes AT HOP data, crash and crime databases, ANPR and ATOC



reports, which will be used to address performance measures such as average travel times, incident responses, PT boarding numbers, trip times for key freight origins / destinations etc.

Next Steps

The Operating Principles and Network Priorities will also provide a guide for the Next Steps, such as construction phasing and temporary traffic management plans. These Principles and Priorities will also be used for other more specific detailed procedures and plans going forward, such as an Operating Philosophy, as a Concept of Operations is not currently required for the network. An Operating Philosophy will support the long-term option by incorporating high-level operational thinking in the design philosophy. It will discuss how the proposed long-term infrastructure is to be operated to achieve the investment objectives, operating principles and priorities.

As the transport network evolves, this NOP will require regular and on-going review, particularly in response to changes in land use and technology. These may influence forecast in travel demands, modes of travel and therefore the operation of the future network.



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- Workshop 3 record

Appendix D

- HCV movements for March 2018
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- Operational assessment of long list options

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1 Introduction

1.1 Background

The NZ Transport Agency (Transport Agency), alongside investment partners Auckland Transport (AT) and Auckland International Airport Limited (AIAL) are investigating improvements to customer journey experiences and access to and from Auckland International Airport (Auckland Airport) and the surrounding area, the Southwest Gateway Programme (SWG). In particular, the Transport Agency are seeking to address the gaps between the expected and present performance of the State Highway (SH) 20, SH20A and SH20B corridors, across all modes. The 20Connect Single-Stage Business Case (SSBC) identifies the recommended activities to deliver the required outcomes on the state highway network, in response to future changes in land use and travel demand.

1.2 Project objectives

Auckland is one of the fastest growing regions in New Zealand with businesses in Greater Auckland being a key driver of the New Zealand economy. Auckland International Airport is a major point of entry for both people and goods, entering and leaving the country. However, reliable and timely access to and from Auckland Airport and its surrounding business areas is limited by lack of travel choice. This lack of travel choice is leading to poor journey experiences and is currently putting New Zealand economic potential at risk. With rapid growth, the transport network constraints will be exacerbated. Therefore, the following objectives are sought for the transport network in and around the Airport:

- Enhance and align transport system capacity, connections and management across all modes to carry more people and goods efficiently to meet predicted demand
- Provide better transport choices for people and businesses travelling to, from and within the Southwest Gateway study area
- Enhance transport system predictability and accessibility in the Southwest Gateway study area
- Optimise management of the existing and future transport system to balance demand with reliable throughput and movement of people and goods.

This Southwest Gateway Network Operating Plan (the NOP) has been developed in parallel with the 20Connect SSBC, thus allowing the desired operational outcomes of this plan to inform the option design process in the 20Connect SSBC.

1.3 Project area

This NOP study area covers state highways 20 (between Mangere Bridge and SH1), 20A and 20B. Figure 1-1 below shows the location of these corridors in relation to the surrounding area.

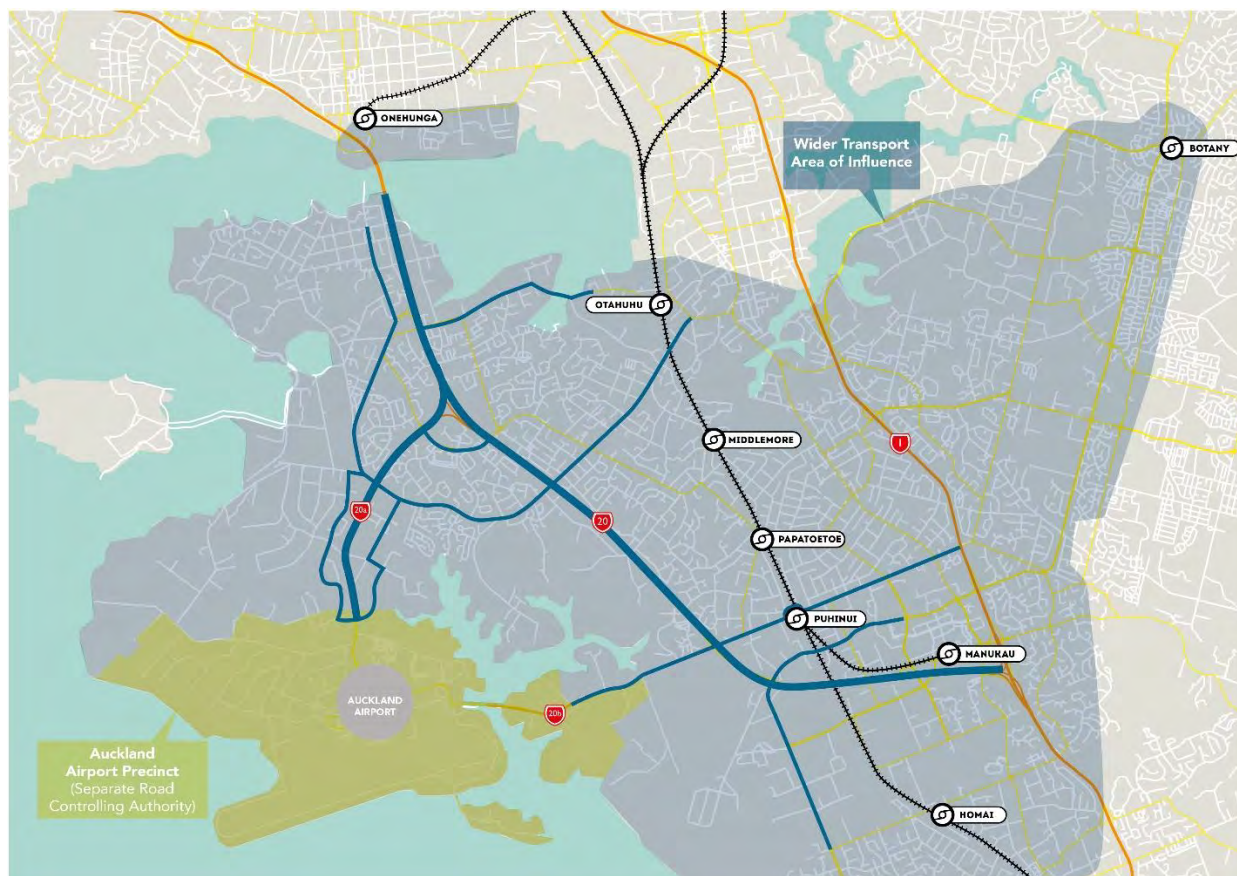


Figure 1-1 Network Operating Plan study area

This NOP also considers arterials and key strategic corridors (highlighted in blue) including Favona Road, Massey Road, Puhinui Road, Bader Drive, Kirkbride Road, Richard Pearse Drive, Airpark Drive, Landing Drive, Westney Road, Verissimo Drive, Roscommon Road and Cavendish Drive.

Note: SH20A has been considered between SH20 and Landing Drive, so far as the Transport Agency's landholdings permit, with the same being the case for SH20B between Orrs Road and SH20. Although the connecting section between SH20A and SH20B is under AIAL's jurisdiction, options that consider this connection are not precluded.

1.4 Area of influence

The area of influence, shown in Figure 1-1 above, covers Auckland International Airport, Airport Oaks, Mangere, Papatoetoe, Puhinui, Manukau, Wiri, East Tamaki and Botany. The area of influence encompasses the main areas in which there are activities which generate, or attract, trips on the transport network and specifically in the study area.

1.5 Infrastructure Projects

Within the area of influence the most significant infrastructure upgrades currently being investigated are:

- City Centre to Mangere Light Rail (Light Rail line between Central Auckland and the Airport)
- 20 Connect State Highway improvements (enhancements to SH20, 20A and 20B)
- Airport to Botany Rapid Transit (A rapid transit connection between Botany and the Airport, through Manukau)
- Auckland Airport Road Network Improvements

1.6 Project staging

The NOP has been developed to support options assessment within the above business cases and project delivery under the Southwest Gateway Project by 2048. Table 1-1 outlines the options being assessed as part of the 20Connect SSBC to be implemented and a description of the interventions proposed as part of each option.

Table 1-1 2048 20 Connect and A2B options

Option No.	Description
1a	SH20B offline with grade separated interchanges SH20/SH20B Puhinui south-facing system interchange ramps SH20 widening north of SH20A and south of SH20B Rapid transit corridor (RTC) on SH20B Pukaki Creek Bridge four-lanes RTC from Puhinui Road to Botany
1b	SH20B offline grade separated connections SH20/SH20B Puhinui south-facing system interchange ramp SH20 widening north of SH20A and south of SH20B RTC on SH20 and SH20A Pukaki Creek Bridge four-lanes RTC from Puhinui Road to Botany
2a	SH20B online widening with at-grade connections SH20A/SH20 southbound system interchange ramp SH20 widening from Mangere Bridge to SH20B RTC on SH20B Pukaki Creek Bridge four-lanes RTC from Puhinui Road to Botany
2b	SH20B online widening with at-grade connections SH20A/SH20 southbound system interchange ramp SH20 widening from Mangere Bridge to SH20B RTC on SH20 and SH20A Pukaki Creek Bridge four-lanes RTC from Puhinui Road to Botany
3a	SH20B online widening with at-grade connections SH20A/SH20 southbound system interchange ramp SH20 widening from Mangere Bridge to SH20B RTC on SH20B Pukaki Creek Bridge two-lanes RTC from Puhinui Road to Botany
3b	SH20B online widening with at-grade connections SH20A/SH20 southbound system interchange ramp SH20 widening from Mangere Bridge to SH20B RTC on SH20 and SH20A Pukaki Creek Bridge two-lanes RTC from Puhinui Road to Botany

All options assume that a shared use path (SUP) is provided at the following locations:

- Beside SH20 between Bader Drive and Puhinui Road
- Beside of SH20B between the western abutment of the Pukaki Creek Bridge and Puhinui Road.



Emerging preferred option

At the time of writing, the emerging preferred option consists of the following improvements.

Physical infrastructure improvements include:

- SH20A/SH20 System interchange grade separated ramp connections:
 - New two-lane system interchange ramp: SH20A northbound to SH20 southbound over the existing SH20 carriageway. The outer lane commencing at Kirkbride Road on SH20A and terminating under the Massey Road overpass on SH20 and the inner lane commencing at the Bader Drive eastbound off-ramp on SH20A and terminating between the Puhinui Road southbound off-ramp and the Puhinui Road underpass
 - Bader Drive eastbound off-ramp removed to allow for SH20A/SH20 system interchange.
- Widening of SH20 (north of SH20A):
 - One additional southbound lane between Rimu Road and the SH20A/SH20 system interchange.
 - One additional northbound lane between the SH20A/SH20 interchange and Mangere Bridge.
- Widening of SH20 (between SH20A/SH20 south-facing system interchange ramps and SH20B):
 - One additional lane northbound between the Puhinui Road northbound on-ramp and SH20A/SH20 system interchange.
 - Two additional lanes southbound between the SH20A/SH20 system interchange and the Massey Road interchange.
 - One additional lane southbound between the Massey Road interchange and the Puhinui Road southbound off-ramp.
- Widening of SH20B:
 - Conversion of the proposed short-term bus shoulders to general traffic lanes, resulting in one additional east and westbound lane from Pukaki Creek Bridge to SH20B/SH20 interchange.
 - Minor widening on the southern side of SH20B to accommodate a median and edge shoulders.
 - At-grade signalised intersections at Campana Road and Manukau Memorial Gardens retained from the short-term works.
 - Access onto SH20B restricted to signalised at-grade intersections at Campana Road and Manukau Memorial Gardens.
 - Property access on northern side of SH20B, via new service road. Access on southern side via realigned Price Road from the short-term works.
- Widening of Pukaki Creek Bridge
 - Existing Pukaki Creek Bridge retained for eastbound carriageway
 - New structure required over Pukaki Creek for westbound carriageway, RTC and SUP, located on the south side of the existing structure
 - Two lanes for each direction on SH20B.
- Shared Use Path
 - SUP provided between Bader Drive and Puhinui Interchange on the eastern side of SH20 and from Puhinui Interchange to the western abutment of Pukaki Creek Bridge on the southern side of SH20B.
- Rapid Transit Corridor (RTC) component:
 - RTC on the southern side of SH20B from Airport to Puhinui Interchange



2 Network operating plan development process

2.1 Scope of the SWG Network Operating Plan

The scope of this document is to outline the high level operational principles and desired mobility outcomes for the immediate project area. Its focus will be on SH20, SH20A and SH20B. However, this NOP will influence the intersecting transport network, facilitate the use of alternative modes and will discuss the interaction with the adjoining area of influence.

This plan describes the transport system functionality (what it will do), guidance on achieving optimal performance (how well it will function) and under what conditions it will operate. The NOP will be used to:

- Inform the long-term options
- Influence other initiatives associated with access to Auckland Airport and the south west.

What it does not cover are the specifics, such as operational procedures and processes for the transport network. These will be covered in the Concept of Operations and Standard Operating Procedures that will be developed at later stages in the project.

2.2 Purpose of the SWG Network Operating Plan

This NOP has been developed to create a strategy led approach that provides guidance to investment partners (the Transport Agency, AT and AIAL) so that they can achieve the outcomes envisaged from the investment in the 20Connect SSBC. It outlines the strategic function and intents of the Southwest Gateway network and its relationship with the wider transport network.

It is based on the requirements and needs identified by the relevant transport network operators and stakeholders, bringing together these stakeholders to:

- Develop a common vision for the operations of the project
- Capture the operational needs and aspirations of key stakeholders
- Develop a reference document outlining appropriate management and operating strategies to support delivery of the desired outcomes.

This NOP will also be used to help define the roles of the operational stakeholders and network/transport operators in achieving a common goal whilst also realising their individual operational objectives.

It explains the roles and functions of the respective transport corridors and State Highways in the project area and how they relate to the wider transport network along with the systems and resources required to facilitate delivery of the desired outcomes.

It also considers the role that user behaviour plays in developing an operations strategy and provides a framework for performance measurement and evaluation. It highlights opportunities and potential network performance issues as well as management strategies to target these opportunities and issues.

This NOP has a focus on the future (2048) but is also cognisant of the shorter-term outcomes. It acknowledges the strategy and the methodologies for implementing the strategy will change over time as the network develops, demand patterns change and technology develops.



2.3 Methodology

2.3.1 Process

The key approach in developing this NOP is the ongoing consultation and collaboration with The Transport Agency's investment partners and network operating partners. The NOP development process has been used to define the roles and functions of stakeholders and as a basis to develop an operational vision. It has been prepared based on input from stakeholders and network operators along with data gathering, customer insights, current best practice and the outputs of strategic modelling.

Key steps in the process have been:

- Information gathering and assessment including:
 - Strategic documents and policies, vehicle / pedestrian data, existing network form and function, customer insights
 - One on one meetings with stakeholders and operators to identify current issues, future plans and works, desired operation, priorities, outcomes and objectives
- Workshop 1, Objectives (Appendix A):
 - Agree user groups
 - feedback from one on ones, potential conflicts / inconsistencies
 - common operational objectives
 - high level user / mode priority
- Workshop 2, Priorities (Appendix B):
 - Network extent and Area of influence
 - Network function
 - Operational principles
 - User/mode priority
 - Conflict points, interim and future state
- Workshop 3, Management strategies (Appendix C):
 - Performance measures and targets
 - Performance gaps
 - Align with DBC long list options
- Preparation of draft NOP
 - preferred strategy
 - deployment plan
 - post implementation evaluation framework

2.3.2 Consultation

Consultation was undertaken with the following stakeholders through a series of one on one meetings and workshops:

- Melanie Alexander - AT Network Management and Safety

-



- [REDACTED]
- [REDACTED]
- Debajeet Baruah - AT, Metro (Facilities)
- Adam Beattie – AT, Walking and Cycling
- [REDACTED]
- [REDACTED]
- [REDACTED]
- Luke Elliot - AT, Metro (Network Development)
- [REDACTED]
- [REDACTED]
- [REDACTED]
- Miguel Menezes – AT, Network Operations
- [REDACTED]
- [REDACTED]
- [REDACTED]
- Steve Patton – AT, Walking and Cycling
- Shweta Rattan – AT, Metro (Networks)
- [REDACTED]
- Renata Smit - AT, Metro
- Irene Tse – AT, Safety
- Danny Xu – AT, Network Management and Safety

2.4 Relationship with other documents and projects

The NOP is an important strategic document linking strategy with operations. This NOP has been developed under the strategic framework of the Auckland Network Operations Plan (ANOP), the Western Ring Route Operating Plan (WRROR) and cognisant of the priorities set out in Government Policy Statement (GPS) on Land Transport, the Transport Agency's Statement of Intent, Auckland Transport's Statement of Intent and the AIAL Transport Strategy.

This NOP informs a suite of documents that set out details in how the operating outcomes are to be achieved. These document relationships are illustrated in Figure 2-1 overleaf.

In reference to projects the NOP covers areas related to Airport to Botany Rapid Transit, 20Connect and the Auckland Airport Precinct Improvements projects. This is illustrated in Figure 2-2 overleaf.



Key:

NOP – Network Operating Plan
 ConOp – Concept of Operations
 SOP – Standard Operating Procedure

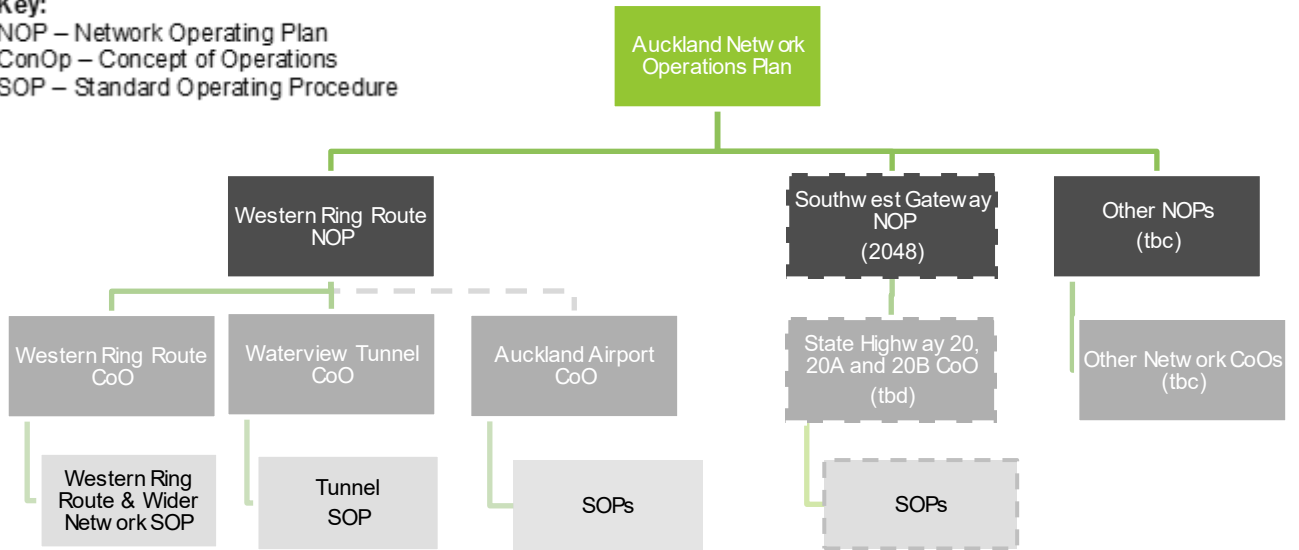


Figure 2-1 Southwest Gateway NOP document relationship structure

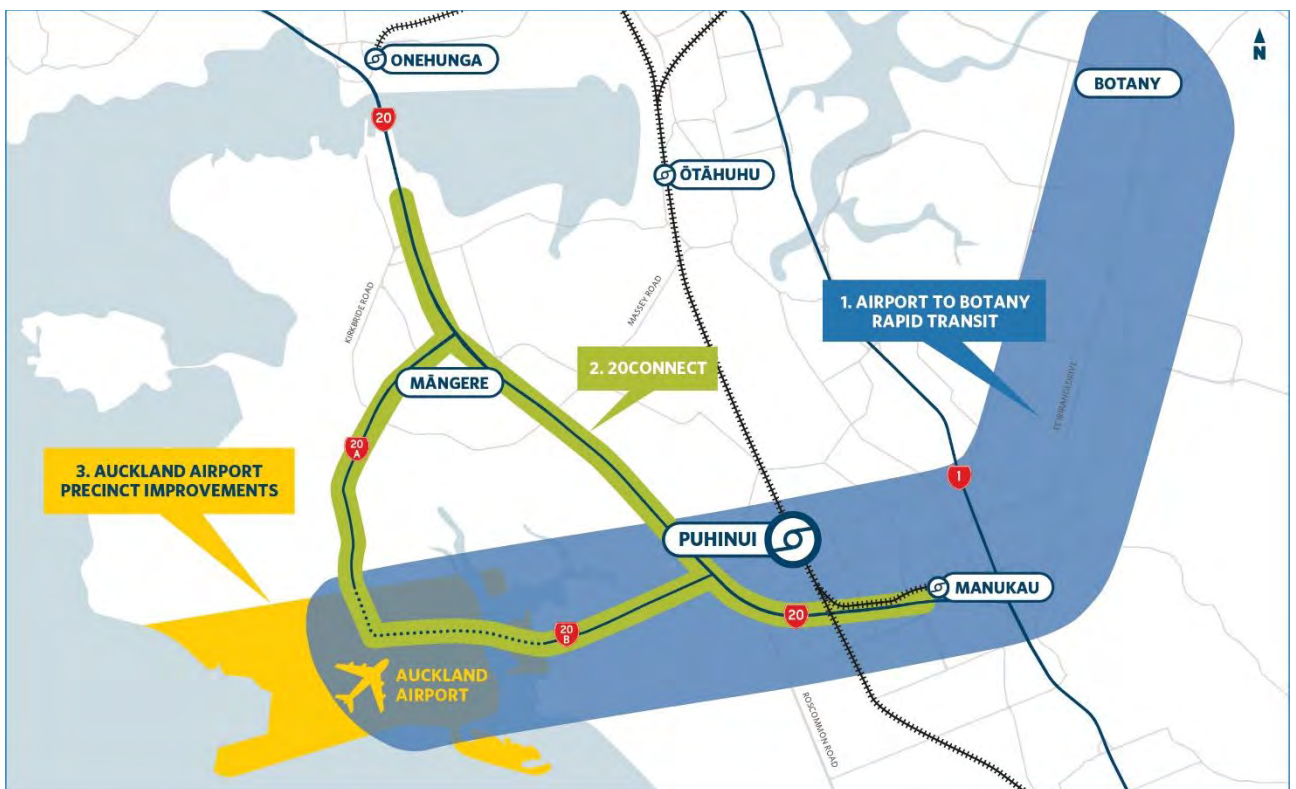


Figure 2-2 Southwest Gateway NOP project relationship structure

2.5 Intended audience

The NOP is aimed at stakeholders impacted or involved in the delivery of access to and from the Auckland Airport. It is also intended for those who are involved in the day-to-day operation, management, maintenance and incident response on the network. It explains the outcomes sought and helps define the various roles and responsibilities.

The key target audiences are the network operators, the investment partners and the emergency services.



The network operators are:

- Auckland Transport Operations Centre (ATOC)
- Auckland Motorway Alliance (AMA) or their successor
- Waterview Tunnel Joint Operations (WTJO)
- AIAL

The roles and responsibilities of these network operators and investment partners are covered in Section 3.10 of this plan. The Southwest Gateway NOP highlights the main focus areas of each operating partner to achieve the agreed strategic outcomes as stated in Section 3.1.

This NOP is written to also inform and influence other stakeholders who have an operational interest in the access to and from Auckland International Airport. These include Auckland Council, vehicle recovery services, heavy haulage association and the Automobile Association (AA), public transport operators, etc.

2.6 Intended use

The NOP has been developed in consultation and collaboration with the Transport Agency, and its investment partners AT and AIAL. It will be used to inform and guide the development of:

- The design of SH20, SH20A and SH20B Long-term Improvements, particularly priority movements and the ITS design
- Long-term State Highway 20, 20A and 20B Concept of Operations
- Auckland Airport Concept of Operations (Live document, completed September 2018)

System operating requirements / other operating documents / technical notes associated with operational responses within the project area.

3 Network overview

3.1 Operational objectives

The key stakeholders / project partners are all aiming to deliver transport and economic benefits to Auckland and New Zealand on behalf of the government. As such, the GPS has been given due cognisance in developing operational outcomes that give effect to the investment objectives. The operational outcomes are:

- A network that is safe.
- A network that is resilient.
- A network that provides access.
- A network that enables transport choice.
- A network that reduces adverse effects on the local environment.
- A network that provides value for money.

3.1.1 Auckland Network Operations Plan

The operating objectives for the Auckland network are outlined in the ANOP. This is a strategy led document setting the framework to achieve the desired outcomes of improving mobility and managing congestion in and around the Auckland region whilst getting the most out of the transport asset. The network is prioritised by mode, time of day and corridor / intersection.

To achieve the optimal outcomes from each route, a road user hierarchy has been developed by allocating each mode to routes based on the strategic function and location of the route. Priority weightings for each mode are then allocated to routes and intersections on a time of day basis. In general, the hierarchical order for assessment is:

- Pedestrian
- Cyclist
- Public Transport
- Freight
- General vehicle

Current functions and priorities on routes in the project area of influence are shown in Figure 3-1 below.

AUCKLAND AIRPORT NETWORK OPERATING PRIORITIES



Figure 3-1 ANOP Functions and Priorities

From the figure above, it is evident that the current priorities on SH20 are freight and general traffic, while SH20A priorities include active transport, and public transport within the Airport precinct. For SH20B, current priorities include freight and public transport. It should be noted that priorities do vary by time of the day.

3.1.2 Western Ring Route

SH20 and its connections to SH20A and SH20B form part of the WRR. The main goal of the WRR is to provide a north-south alternative to SH1, and a by-pass route around the Auckland City Centre during normal operations and on exceptional periods such as major events, incidents, major maintenance and emergency closures on SH1. Operating outcomes and principles developed for the Southwest Gateway need to align with, and not conflict with, the WRR operating outcomes and principles as per the WRR Network Operating Plan and WRR Concept of Operations. The WRR operational outcomes that are most relevant for the airport access include:



- SH16 / SH20 is an alternative north-south route to SH1
- Reliable trips / journeys; west to south (SH16 / SH20), north to south (SH18 / SH16 / SH20) and CBD to south and airport (SH16 / SH20 / SH20A)
- The motorway network (as opposed to local network) is to from the primary routes for regional, cross-city, freight and goods movements
- Primary freight routes are SH16 to / from CMJ and Ports of Auckland and SH20 to / from Onehunga Wharf, Auckland Airport and Wiri Freight Hub

The WRR operating principles are shown in Table 3-1.

Table 3-1 WRR Operating Principles

WRR Operating Principles	
■	Desired outcome is to operate the tunnels at an average vehicle speed of above 20km/hr over the full length of the tunnel as this is considered best international practice.
■	Dangerous goods vehicles prohibited from the tunnel and a suitable alternate route maintained at all times.
■	Over height Vehicles to be detected efficiently and prevented from entering the tunnel.
■	Prioritise predictable journeys for bus by optimising motorway access and egress.
■	To deliver outcomes as defined by Auckland Network Operating Plan on urban arterials.
■	Aim to ensure that at least 1 detour or alternative strategic route is available during planned and unplanned events.
■	Prioritise trips to and from Auckland Airport
■	Improve interregional access to markets and ports in Auckland
■	Improve the efficiency of intra- regional travel for trade and services during business hours
■	WRR prioritised for regional over local journeys.
■	To deliver outcomes as defined by Strategic Auckland Network Operating Plan including prioritisation of use (General Traffic, Freight, Public Transport and other modes).
■	To ensure that access to employment from West Auckland is not unduly restricted at the expense of other competing priorities
■	Discourage undesirable use of the local network for regional journeys through signage and optimisation of ITS assets
■	To deliver outcomes as defined by Auckland Network Operating Plan including prioritisation of use (General Traffic, Freight, Public Transport and other modes).

3.1.3 Auckland Airport Precinct Concept of Operations

The management and operation of the Auckland Airport internal road network is the responsibility of AIAL as the road controlling authority. The Auckland Airport CoO has been developed in parallel with the Southwest Gateway NOP and seeks to deliver the following two overarching strategic outcomes from the operation of the Auckland Airport road network:

- Enable aeronautical services (such as flight crews and catering services) to reach the terminals on time to avoid impacts to flight schedules
- Keep a balance between traffic entering and traffic leaving the precinct, such that during periods of high demand the Airport road network continues function at an acceptable level of service.

To deliver these outcomes, a set of operational principles were developed. They are to:

- 
- Provide sufficient capacity and/or queuing space for the outbound movements from the Airport precinct to allow the Airport network to continue functioning during periods of high demand (heavy congestion)
 - Prioritise trips out of the airport precinct over inbound trips
 - Prioritise traffic heading away from the domestic and international terminals over traffic travelling towards the terminals
 - Prioritise higher occupancy modes and/or passenger transport services for travel within the Airport precinct
 - Discourage public pick-up and drop-off at the terminal forecourts (with a view to a response that provides other opportunities)
 - Discourage non-Airport related through traffic on George Bolt Memorial Drive (GBMD) (south of Nixon Road) and Tom Pearce Drive (TPD)
 - Maintain access along Cyril Kay Road to Checkpoint Charlie
 - Maintain access for pedestrians to and from The Quad (including the Ibis Hotel) and to and from the terminal buildings

Maintain access for cyclists where it is currently available within the Airport precinct.

3.2 “One network” Operating principles

The Southwest Gateway transport network will operate under the collaborative “One Network” principle, which is a partnership approach between the Transport Agency and AT to better address user needs for a more consistent road network. In March 2011 a Partnership Charter was entered between the Transport Agency and AT with the purpose to:

“Operate one transport system that delivers a satisfying experience to customers by providing an integrated approach to moving people, goods and services safely and effectively through the Auckland Region.”

The Charter’s aim is to enable customers to make smarter and more informed choices about the way they travel, achieving the most from Auckland’s transport services and infrastructure and keeping Auckland moving by a single network approach. This will be achieved by:

- One Network – operating one reliable network across all modes throughout the region
- Customers – putting customers first by being responsive and providing accurate and timely information
- Co-Operation – creating a jointly governed, managed and staffed operations centre for the Auckland region
- Safety – ensuring the safety of all
- Technology – optimising the efficiency and effectiveness of the network through innovation and the operation of appropriate technology in real time
- Expertise – providing technical advice for operations, strategic planning, investigations, design and construction
- People – creating and maintaining a healthy enthusiastic organisation
- One Team – proactively and collaboratively use our experience, resources and expertise to work together to deliver enhanced value for money.

Operating arrangements have been implemented to give effect to the “One Network” charter including the following parties:

- Auckland Transport Operations Centre (ATOC) – join charter between the Transport Agency and AT
- Auckland Motorway Alliance (AMA)
- Waterview Tunnel Joint Operations (WTJO).

These network operators work together as one team to proactively and collaboratively utilise their experience, resources and expertise to deliver the one network operating outcomes. The roles and responsibilities of each of the above network operators are defined in Section 3.10.

3.3 Customer behaviour

A range of customers access the study area, not only for international and domestic travel but also for work, to send and receive goods and for business travel. The array of major customer groups identified reflects the variety of activities. The different types and proportions of customers who access the Airport and the surrounding area are identified in Figure 3-2.

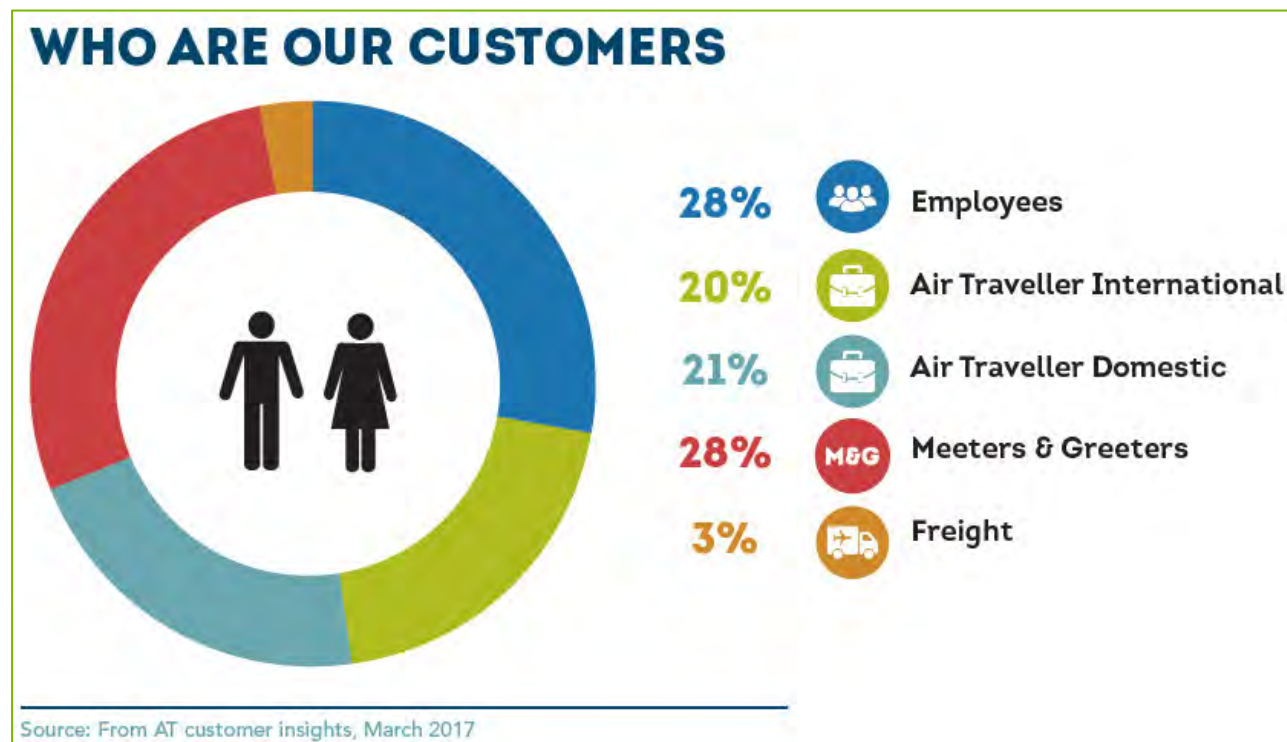


Figure 3-2 Users of the State Highway network who access Auckland Airport

There are currently more than 900 businesses located near Auckland Airport, employing around 21,000 people, with approximately 12,000 employees based on the Airport's land. In addition to the Airport's core, areas adjacent to the Airport are predicted to experience ongoing population and employment growth. Less than 2% of workers use public transport. Approximately 45% live to the south of the Airport, meaning that SH20B is their main travel route to and from work.

The modes that are currently being used by customers to travel to and from Auckland Airport and the surrounding area include public bus, rail/bus, park and ride, SkyBus, taxi, cycle and private car. However, car use is the most dominant travel mode for Auckland Airport customers, employees and visitors.

Approximately 84% of workers in the Auckland Airport and surrounding area currently use private vehicles to travel to work. Public transport options are currently lacking in priority, with the nearest rail station, Puhinui Station, located several kilometres away. There are currently no dedicated bus facilities on SH20B, leading to unreliable travel times for customers which in turn influences their travel mode choice.

Within the wider customer groups, business travellers have very different expectations of surface transport from non-business travellers, especially those using low-cost airlines. International leisure travellers may be self-sufficient (free independent travellers) or may be in large tour groups. Lower-paid shift workers have different requirements from executives and so on, and those transporting high value/time critical freight also have particular needs.

Travel time reliability for transporting freight to and from the Airport and the surrounding area is a key factor in the cost of doing business. Auckland Airport plays an important role in movement of high-value, low-

weight, time-critical cargo. Imports and exports via Auckland Airport include industrial parts and machinery, medical, optical, photographic parts and machinery, audio and video parts and machinery, pharmaceuticals, gems and precious stones. Exports via the Airport that outweigh imports include food and plant products, particularly fish, crustaceans, live animals, flowers and dairy products.

3.4 Land use

The existing land use adjacent to SH20A predominantly comprises light industrial and business park activity. SH20B is predominantly rural/ green-fields in character with very little development. Some land remains undeveloped to the far west of the study area.

In addition to Auckland Airport's core, areas adjacent to the Airport are predicted to experience ongoing population and employment growth.

Since becoming operative in part, the Auckland Unitary Plan (AUP) has provided greater certainty on how population and employment growth will occur in the area surrounding Auckland Airport. There is an estimated 400 hectares of land currently available in the study area around the airport available for further industrial and commercial development. Additionally, there are currently three main Future Urban Zones within the Project Area shown in the AUP planning maps which will enable further development.

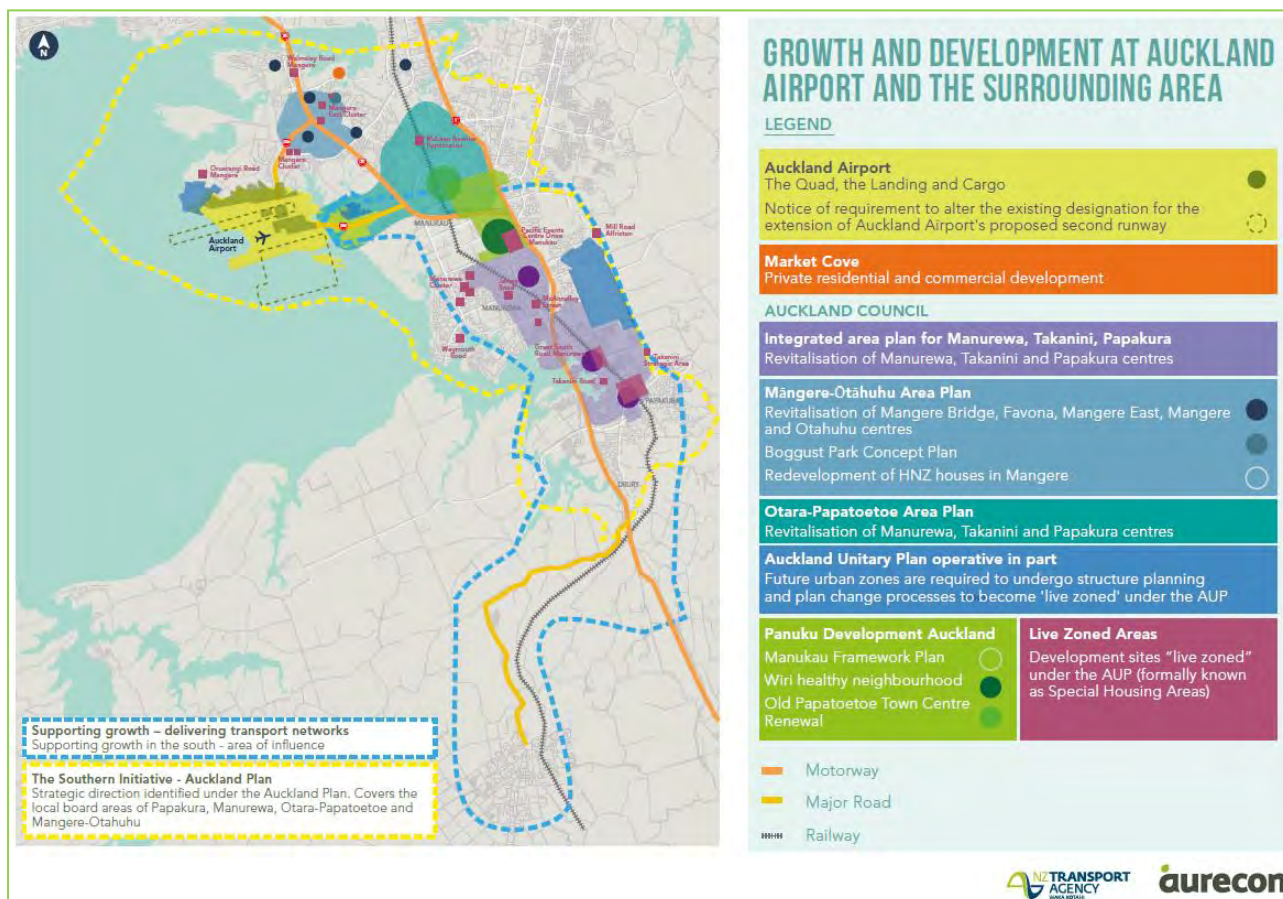


Figure 3-3 Key growth areas and development in the Auckland Airport surrounds (20Connect SSBC)

There are a number of developments, strategies and associated projects already planned in the study area (refer to Figure 3-3), however some strategies branch out wider into the surrounding areas. The relevant developments, strategies and associated projects include:

- The Puhinui Precinct and Māngere Gateway Precinct which will increase the level of development immediately adjacent to SH20B, and in the vicinity of SH20A



- The Future Urban Zone (FUZ) has been modestly extended south to provide further development in areas, including Pukekohe, Drury, Paerata and Takanini¹
- Residential zoning rules have been relaxed, enabling denser development both in new subdivisions and additional infill and redevelopment in the existing urbanised area. This has been achieved through changes that permit smaller lot sizes and more dwellings per site in residential zones, as well as 'rezoning' of some suburbs to allow for apartment buildings and terraced housing. Intensification is concentrated within Māngere, Papatoetoe, Manurewa, Ōtara, Otahuhu, East Tamaki and Flat Bush, with areas rezoned for apartment and terrace housing
- As part of the Auckland Housing Accord, housing developments (formally known as Special Housing Areas²) were set up to speed up the supply of housing in Auckland. In the surrounding area, these are mainly located in FUZs, which are planned to deliver set amounts of new dwellings by a certain timeframe which differs depending on the facilities and utilities available. These include:
 - Oruarangi Road, Māngere (33 hectares for 480 homes over an eight-year period)
 - Māngere East Cluster (150 homes over an eight-year period)
 - Manurewa Cluster Extension (additional 125 homes to the 35-40 originally planned homes over a two-year period).

Refer to Figure 3-4 below for the location of these developments and an overview of the proposed growth initiatives and developments.

¹ The FUZ is applied to greenfield land that has been identified as suitable for urbanisation. The FUZ is a transitional zone and will remain in place until a structure plan and concurrent plan change re-zones the land to the appropriate urban zone (e.g. residential or business). Land may be used for a range of general rural activities but cannot be used for urban activities until the site is re-zoned for urban purposes.

² Auckland Council (2013). Special Housing Areas. Accessed 27 September 2017, from

<http://temp.aucklandcouncil.govt.nz/EN/ratesbuildingproperty/housingsupply/Pages/home.aspx>

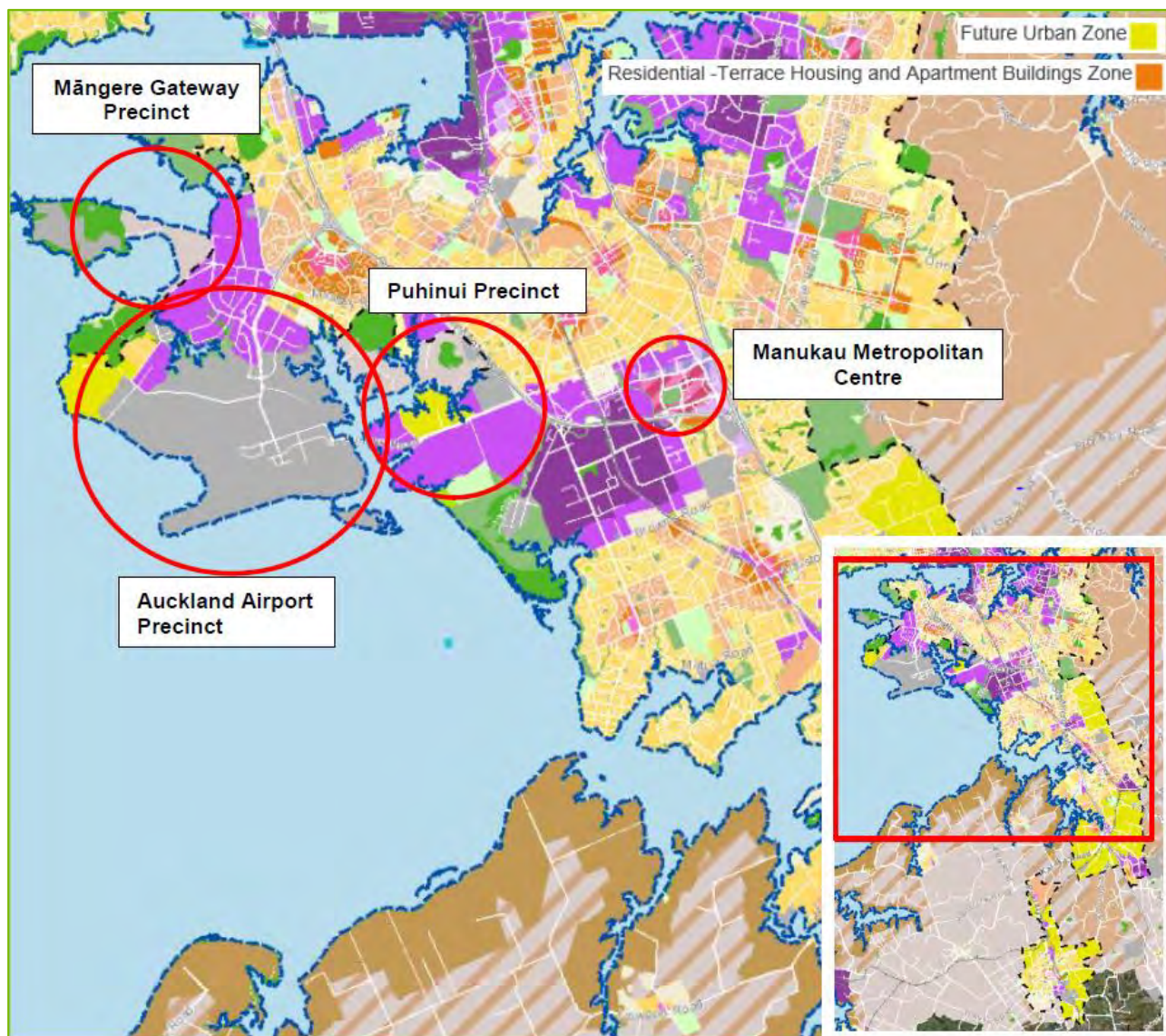


Figure 3-4 Relevant land use changes under the Auckland Unitary Plan

The combined effect of these adjacent developments is likely to add significant pressure on the south-western transport system, where customers travelling on SH20, SH20A and SH20B and local roads will experience significant levels of increasing demand and associated delays, congestion and unreliability in their journeys.

3.5 Road network infrastructure

Auckland Airport and the surrounding area is effectively a peninsula and is constrained in terms of connections to the wider transport network, with very few minor roads providing alternatives for access.

3.5.1 State Highway network hierarchy and infrastructure

There are three state highways SH20, SH20A and SH20B.

SH20A is a four-lane expressway with bus shoulders, which has recently been upgraded to motorway standard as part of the SH20A to Airport project. SH20A primarily provides access to the airport and the airport industrial area from the north. It carried approximately 43,000 vehicles per day in 2016, of which, approximately 7% were heavy vehicles.



SH20B is a two lane, undivided highway with local access from side roads. SH20B provides access to the airport from the east and south. In 2016, it carried approximately 27,000 vehicles per day, of which, approximately 4% were heavy vehicles.

SH20 is a four-lane motorway which operates as an alternative to SH1 for north-south traffic connecting Manukau to the south with Waterview to the north. It carried approximately 74,000 vehicles per day in 2016, between the Puhinui and Massey Road interchanges, of which approximately 6% were heavy vehicles. Recent upgrades along SH20 include the Waterview connection, which completed the Western Ring Road (WRR).

3.5.2 Arterial network

There are local arterial roads that provide alternative access to the state highways. Key arterial routes in the area include Massey Road, Kirkbride Road, Bader Drive, and Walmsley Road. These roads provide additional east-west access to the airport area, as well as facilitating access to the south from the northern parts of the airport industrial district. Puhinui Road is also a key arterial connecting directly to SH20B to the east of SH20 and plays an important role in providing public transport access from Puhinui Rail Station.

Puhinui Road is a two-lane road east of SH20B and is a key route for public transport connections to and from the Airport. Puhinui Road connects directly onto SH20B at the SH20 Puhinui Interchange and is the primary route for buses connecting to the wider Manukau and Botany areas.

Kirkbride Road is a two-lane, undivided road, connecting SH20 to the north via McKenzie Road with SH20A and Massey Road to the south. The SH20A/Kirkbride Road intersection has been grade separated, and the Kirkbride Road/Westney Road intersection signalised as part of the SH20A to Airport project.

Massey Road is a two-lane, undivided road, connecting SH20A at Kirkbride Road to the west with SH20 to the east.

3.5.3 Auckland Airport network

Although outside of the scope of the NOP the existing Auckland International Airport road network is noted below and in Figure 3-5. It will change significantly this is being developed by AIAL. Recent improvements to AIAL's road network include:

- Changes to lane configurations at the Puhinui Road and Tom Pearce Drive intersection to increase traffic flows through the intersection.
- Changes to lane configurations on George Bolt Memorial Drive and Laurence Stevens Drive roundabout to improve traffic flows to the domestic terminal
- Nixon Rod bypass for southbound traffic through to SH20B and signalisation of the Jimmy Ward Crescent roundabout
- Domestic forecourt reconfiguration
- Development of a Concept of Operations document to record and formalise the existing operating procedures of the Airport precinct and adjoining state-highways.

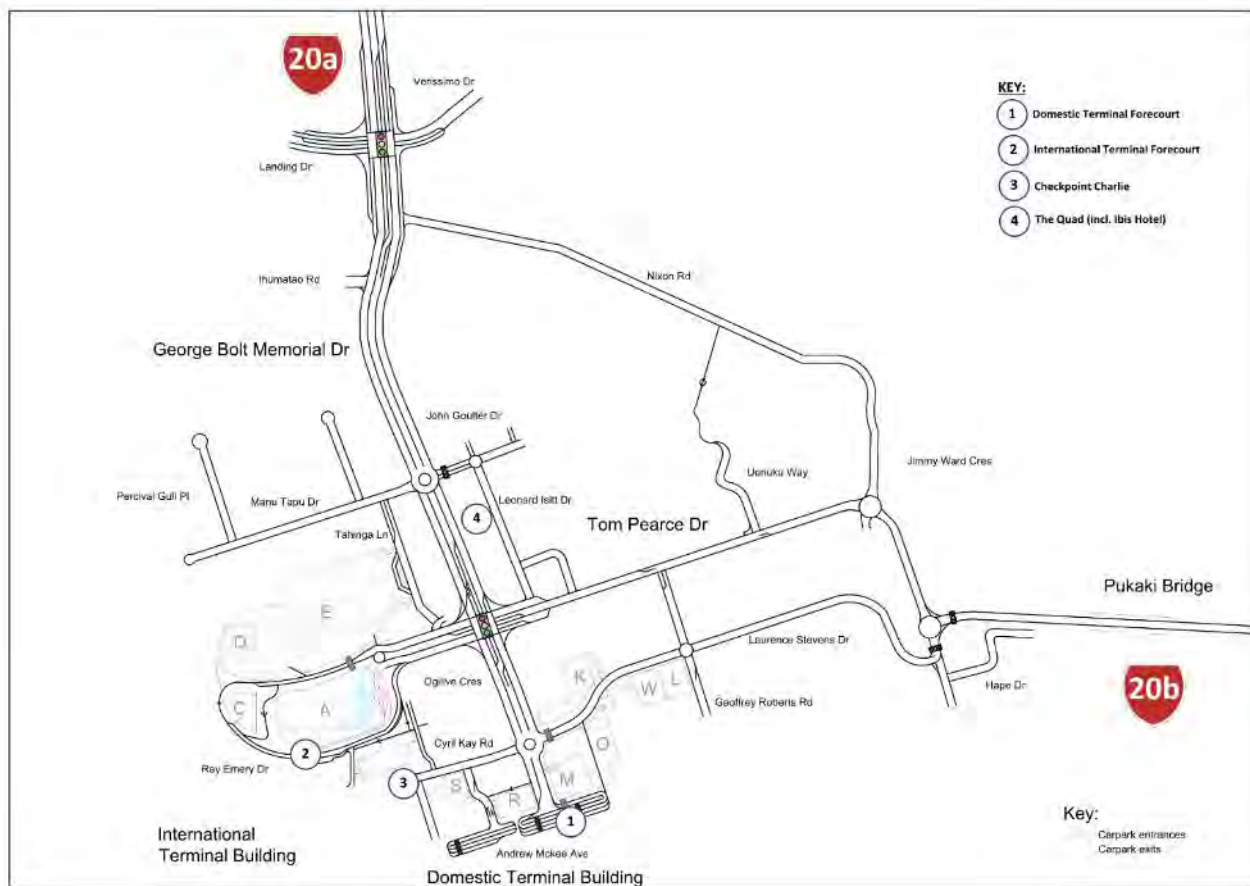


Figure 3-5 Auckland Airport internal road network

3.5.4 Roads and Streets Typologies

The main corridors within the study area have been classified in accordance with Auckland Transport's Roads and Streets Framework (RASf) guidelines by the project team. Consideration was given to both the place and movement function of each corridor, as well alignment with the NZ Transport Agency's "One Network Road Classification" typically focussed on only the 'movement' functions. The relationship between the one network and RASf classification system is shown in Figure 3-6 overleaf.

SH20A and SH20B are important access routes for the airport precinct and surrounding development, facilitating regional accessibility of the Airport. In terms of the NZ Transport Agency's "one network" road functional classification guidelines, both SH20A and SH20B are state (or national) highways, with a primary mobility function. However, within the immediate vicinity of the airport precinct, which has an important place-function, these roads could be classified as "Main Street Collector", in terms of the RASf guidelines.

Since there are limited access options to the airport, it will be necessary to accommodate both the mobility, access and place requirements of the Airport precinct within the same available space and therefore a compromise between mode priorities is necessary.

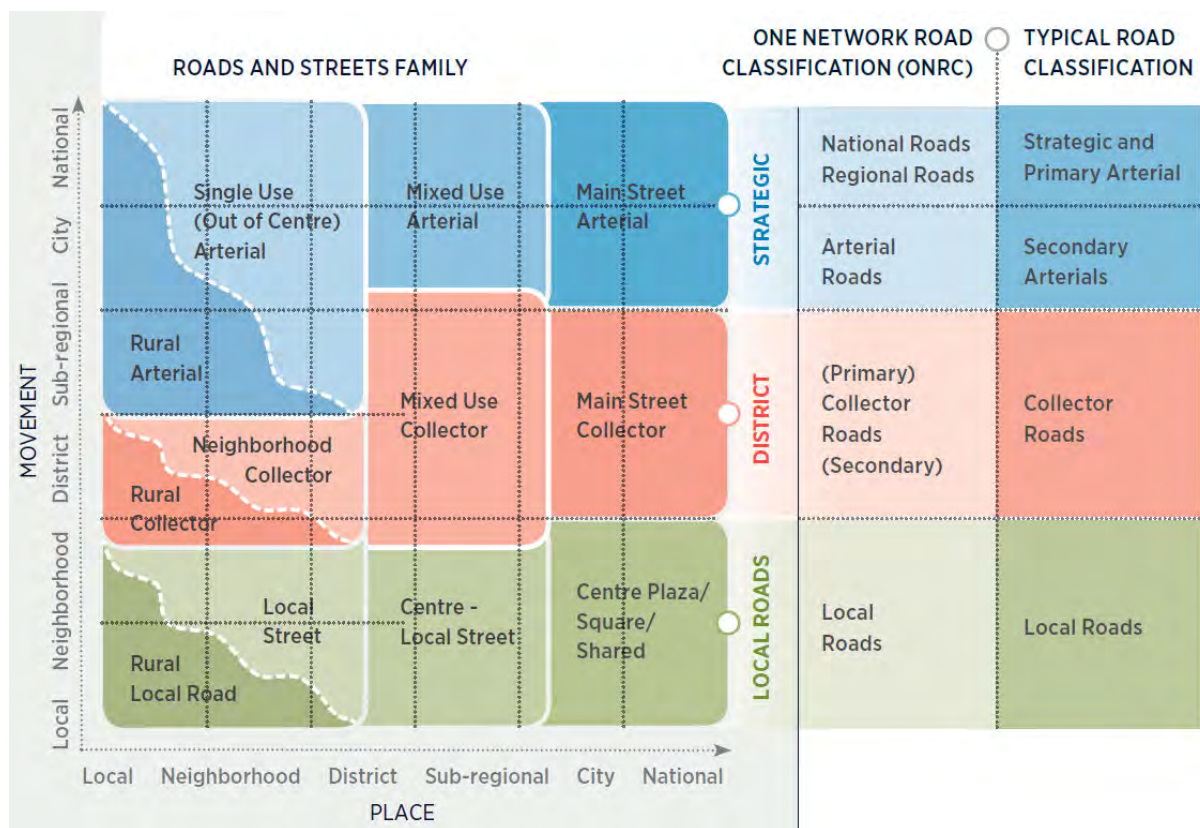


Figure 3-6 Relationship between NZTA's ONRC, typical road classifications and the RASF

For each of the corridors considered in this NOP, their typology has been determined by the project team as shown in Figure 3-7.

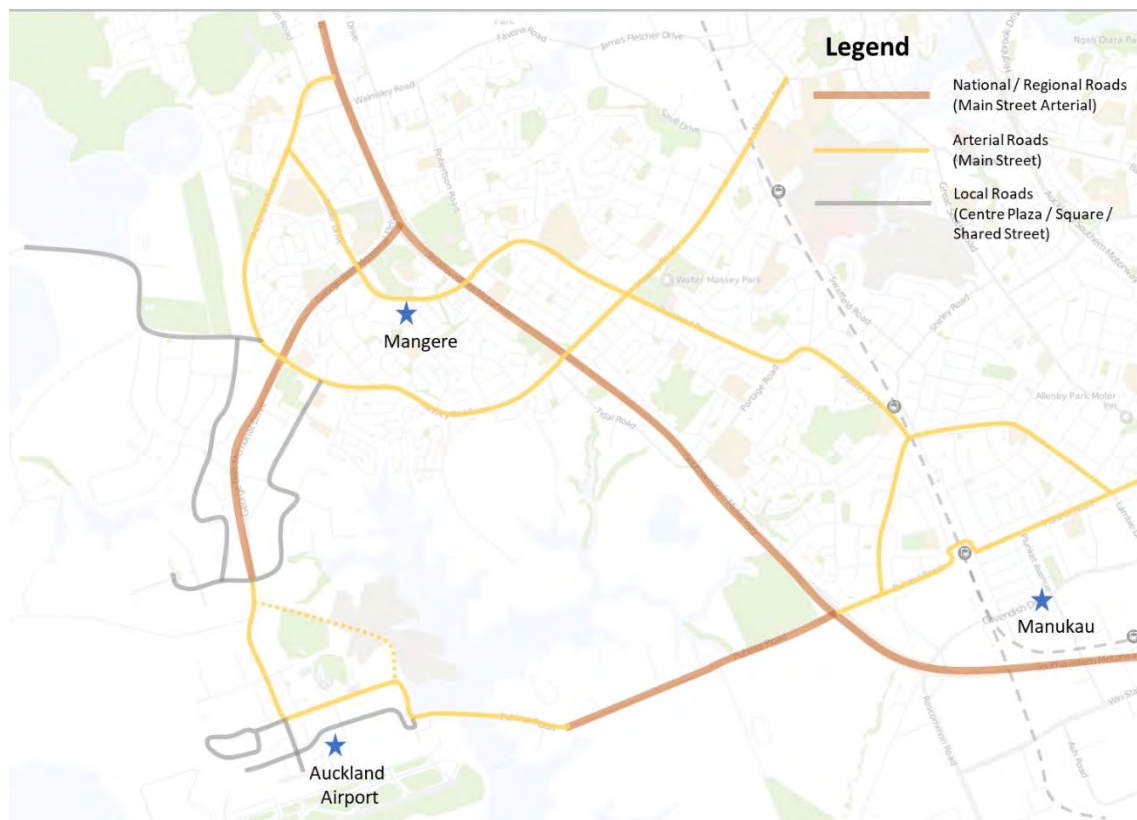


Figure 3-7 Local road network classification

3.6 Public transport network

There are bus shoulders along part of SH20A and no dedicated bus facilities currently provided on SH20B. This means that bus travel to and from Auckland Airport is often unreliable because of congestion on the road network.

SkyBus uses SH20A between Auckland Airport and Auckland's City centre. It carries approximately 780 inbound passengers and 600 outbound passengers per day and runs every 10 minutes, all day.

The Airporter 380 uses SH20B between Manukau and the Airport. The Airporter 380 runs a service every 15 to 20 minutes during the day, 7 days a week, 365 days of the year, between Manukau and Onehunga which travels via Papatoetoe Station and Onehunga Station. It serves the employment areas in the outer airport precinct area. It takes a non-direct and relatively circuitous route, particularly between the Airport and Onehunga. Prior to the recent frequency changes in December 2017, it carried approximately 520 inbound passengers and 360 outbound passengers per day.

The closest rail public transport services to Auckland Airport are located on the NIMT Line, several kilometres to the east of Auckland Airport at Puhinui Station and the Manukau branch line that currently terminates at the Manukau metropolitan centre.

The proposed bus routes and future mass rapid transit services proposed to be operating by 2028 are shown in Figure 3-8.

AUCKLAND AIRPORT PUBLIC TRANSPORT

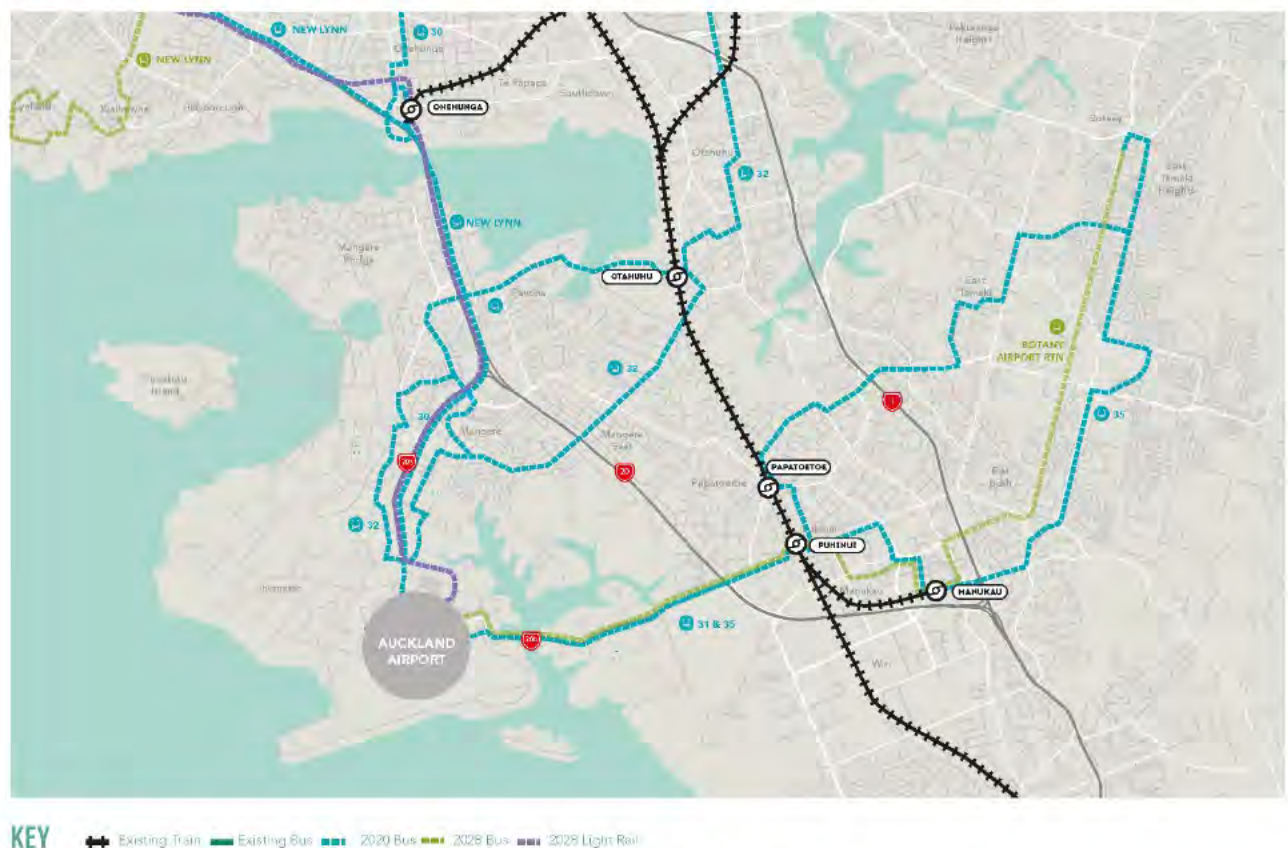


Figure 3-8 Proposed public transport services under investigation, 2020 and 2028

3.6.1 Auckland Airport to City Centre Mass Rapid Transit Corridor

In March 2017 the Transport Agency and AT announced an agreement on a staged integrated transition from bus to light rail transit (LRT) from the Airport to City Centre, based on future demand and capacity, and to commence route protection for this important gateway corridor between two of Auckland's key growing employment areas.

3.6.2 Auckland Airport to Botany Mass Rapid Transit Corridor

AT is commissioning a SSBC for the Airport to Botany MRT and short-term airport access improvements to progress key elements of the Access to Airport Programme. This includes an investigation into an upgrade of the Puhinui station into a bus-train interchange by 2020 and improved bus services to Auckland Airport from the south-east along SH20B. Beyond this, over the decade 2026 to 2036, AT plan to add an eastern busway from Airport to Botany via Manukau.

3.7 Walking and cycling network

There is limited active mode provision in the area adjacent to Auckland Airport. Dedicated cycle lanes are provided on parts of SH20A, Bader Drive, Buckland Road, Cavendish Drive, Lambie Drive and Kirkbride Road. Shared paths are provided on some coastal routes, local roads and in reserves. There are no provisions for pedestrians and cyclists coming from the east of Auckland Airport.

The existing and proposed walking and cycling network identified by both AT and within Auckland Council's area plans is shown in Figure 3-9.

AUCKLAND AIRPORT WALKING & CYCLING (EXISTING & PROPOSED)

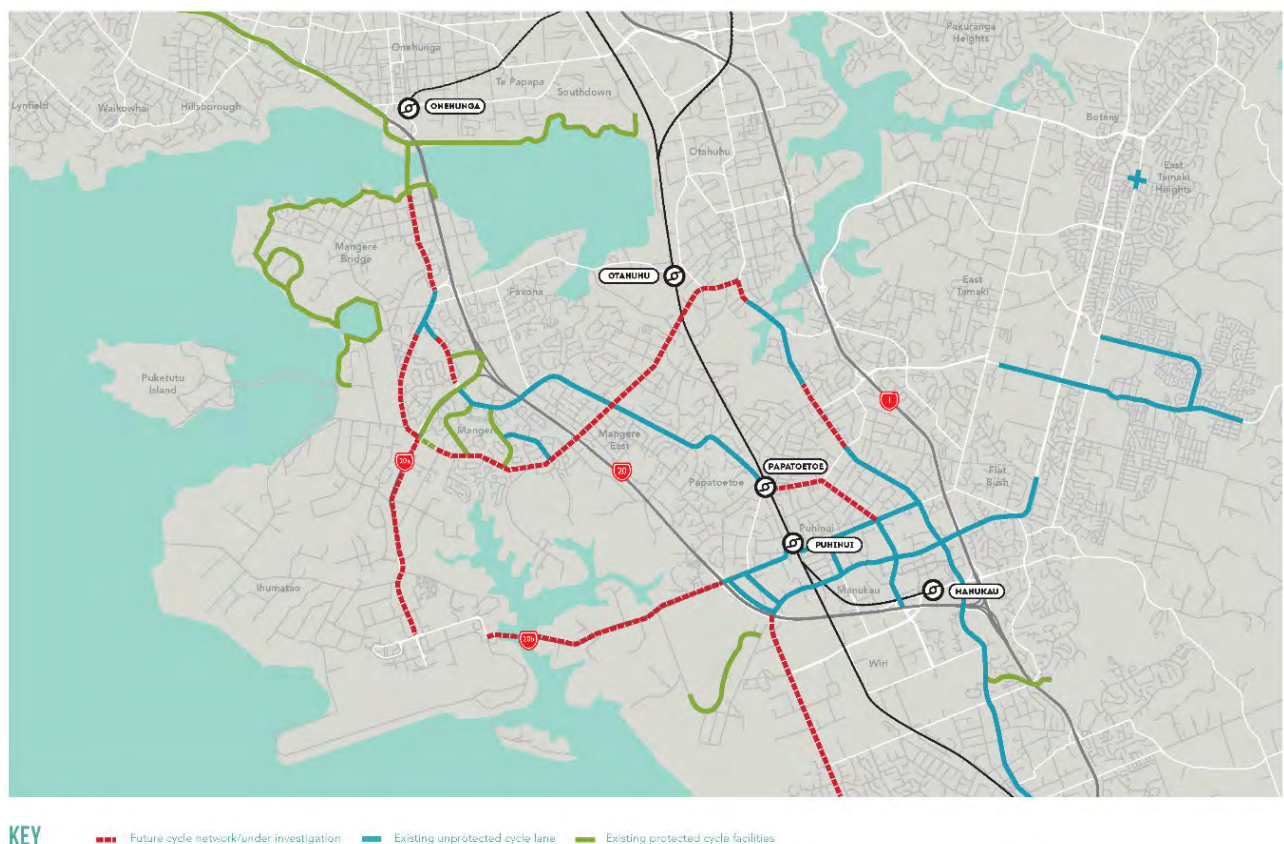


Figure 3-9 Existing and Proposed Auckland Airport Walking and Cycling Network

3.8 Freight network

The demand for the movement of freight is substantial and the road network is the dominant mode for moving goods, as there is no heavy rail access to the Southwest Gateway project area. Auckland International Airport handles time sensitive, high value freight. It is New Zealand's largest air cargo port and handles 16% of imports and exports by value.

SH20A and SH20B, alongside SH20 between Manukau and the SH20A intersection are areas of high heavy commercial vehicle use on or around the strategic freight network. Auckland Airport and Wiri/ Manukau and their surrounds are both international gateways and are major freight generating and attracting areas.

Road-based freight traffic is forecast to grow substantially in the future by almost 75 per cent between 2012 and 2042 putting significant pressure on the freight network.

Figure 3-10 shows the strategic freight network in the study area (based on the *Auckland Regional Land Transport Plan (RLTP) 2015 – 2025*), with routes depicted as follows:

- Level 1A – Motorways serving strategic inter- and intra-regional movements
- Level 1B – Arterial roads serving strategic inter- and intra-regional movements
- Level 2 – Roads serving industrial parks
- Level 3 – Roads with no freight priority but requires active management

The strategic freight network is overlain with the Transport Agency's over-dimension vehicle routes.

The various industrial zoned areas zoned from the *AUP* are also shown on Figure 3-10.

AUCKLAND AIRPORT FREIGHT

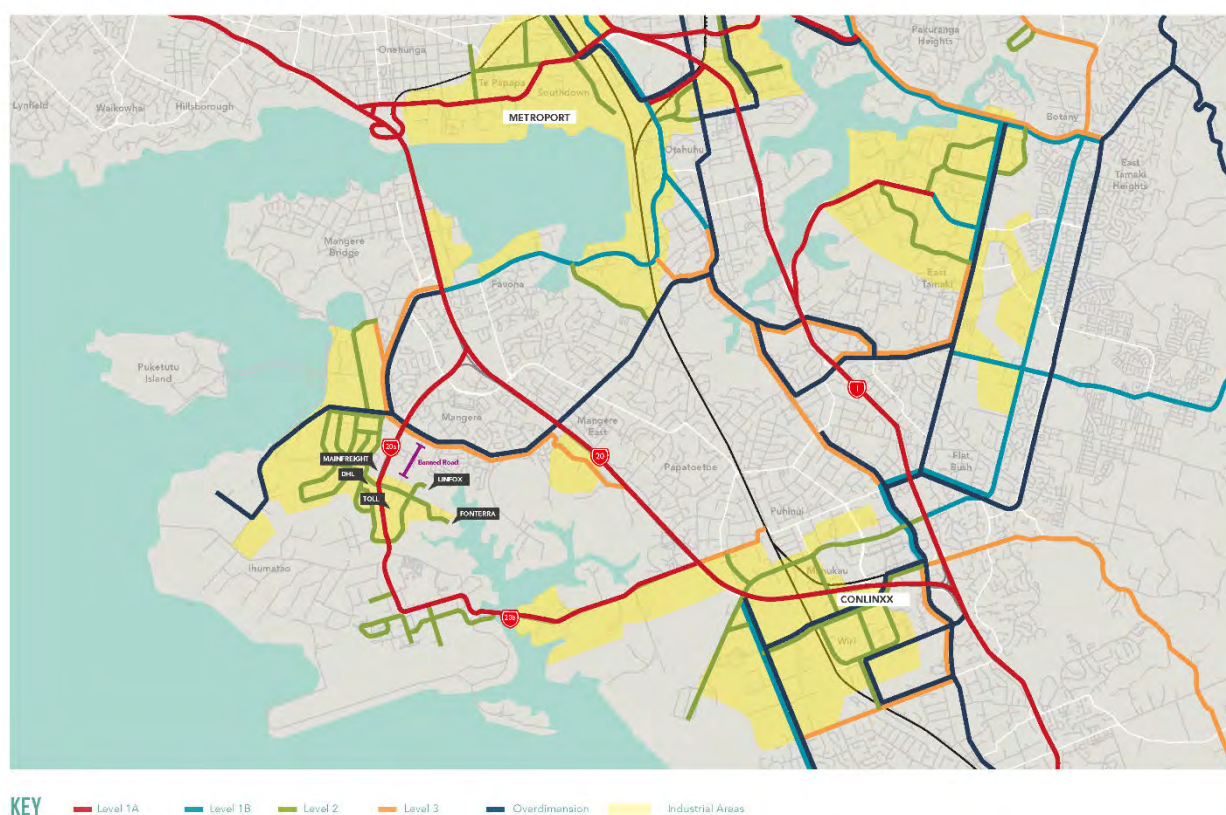


Figure 3-10 Strategic freight network, inland container ports and industrial areas

The Auckland Airport and surrounding area forms Auckland's main industrial, warehousing and distribution area. For this reason, a number of freight-related operations are located in the area due to the many competitive advantages that proximity affords, including shorter transit times to end destinations and improving the overall supply chain efficiency.



The Figures in Appendix D provide a summary of the existing freight (HCVs) movements and routes for the month of March 2018. The figures have been produced from eRUC data produced by EROAD, which represents approximately 45% of the total number of HCV movements. It is a significant enough sized sample, that provides for the relative importance of each origin/destination. The key findings are summarised below.

The typical movements of HCVs for the 24hr period and afternoon peak follows relatively the same travel patterns. The total number of trips generated during afternoon peak is about 18% of the total trips generated in the 24-hour period. Given that the afternoon peak only accounts for 12.5% of the day, there are a high portion of HCV trips during the afternoon, which conflicts with other modes and movements such as the afternoon commuter peak and airside arrivals, congesting the network.

For the HCVs coming into the system on SH20 from Mangere Bridge southbound, most stay on SH20. For the HCVs coming into the system from SH20 from Lambie Drive westbound, most of the vehicles stay SH20 westbound and then northbound. This means that SH20 supports more inter-regional freight journey's rather than journeys to / from the airport area.

For the HCVs coming into the system from SH20A (SH20A/Ihumatao Road) northbound, most of the vehicles travelled north towards Mangere Bridge via SH20A and SH20.

For the HCVs coming into the system northbound, from Roscommon Road, most of the vehicles either travelled eastbound via SH20 or travelled northwest bound via SH20. Only a small portion of the HCVs travelled towards the Airport area via SH20B.

Some HCVs leave the system via local roads and off-ramps where no screen-lines were analysed.

SH20 has the highest volume of HCV movements accounting for 49% of southbound journeys (from Mangere Bridge) and 32% of northbound journeys throughout the day as it's an important link for HCVs that travels from the industrial area in Onehunga/Penrose to Wiri/Manukau or vice versa. It's noted that a significant number of vehicles travelling southbound from Mangere Bridge might be using Walmsley Road, McKenzie Road for the freight route. The strategic freight network plan shows that Walmsley Road is classified as level 3 and for oversized vehicles. Thus, currently, HCVs are travelling through the route which does not have freight priority and a screen-line at Walmsley Road westbound or McKenzie Road southbound is recommended for further tracking of HCV movements. Furthermore, for the trips generated from screen-line D, 37% of the trips were not captured. Thus, a screen-line at Roscommon Road southbound is recommended.

3.9 Network ITS infrastructure

The existing network operating infrastructure provided for the study area consists of a range of equipment and tools that can be utilised for a variety of traffic management applications. Similar to Auckland's wider transport network, this includes but is not limited to: CCTV footage, Variable Message Signs (VMS), Lane Control Signs (LCS), Variable Speed Signs (VSLs), Ramp Metering System (RMS) and Traffic Signals. These can be used to monitor and control traffic, and update travellers on delays and road / lane closures etc.

3.10 Roles and Responsibilities

The stakeholders in relation to this NOP and the operation of the southwest gateway network have roles and responsibilities that may be similar to other networks, however due to the long-term orientation of this NOP these must remain flexible for an unknown future. These stakeholders are: The Transport Agency, Auckland Council and AT, AIAL, the Collaborative Operations Group (COG), Iwi and the network operators ATOC, WTJO, AMA and emergency services.



4 Network operations strategy

Access to the airport precinct is currently facilitated by the State Highway network, with almost no direct local arterial access. The limited road network access therefore has to serve competing uses. With the Auckland Airport being such a significant port of entry, for people and goods, and a major employment hub, all user groups are important, not only for the airport, but for the economy of New Zealand as a whole.

Competing needs therefore need to be catered for, and where they do conflict, some will have higher priority depending on time of day. There is also scope to “motivate” travel behaviour through infrastructure and service provision, as well as mode prioritisation and transport network management.

4.1 Operating Principles

The following Operating Principles were developed by investment partners at the first and second workshops. They are the guiding principles by which any changes to the operational environment should be governed to ensure the desired network outcomes are achieved.

SWG Network Operating Principles

- Improve safety for all users on the transport system.
- Enhance the customer perception of safety.
- Deliver the outcomes as defined by the ANOP and GPS on Land Transport.
- Maintain access along SH20 to ensure the WRR can perform its strategic function as an alternate route to SH1 during unplanned and planned events.
- Provide an agile network that can keep people and goods moving.
- Provide resilient access to and from Auckland Airport to enable it to carry out its function as a lifeline utility.
- To enhance overall network efficiency.
- Efficient and reliable public transport travel times to and from the Northern and Eastern Airport approaches.
- Prioritise public transport on key routes by time of day.
- Provide priority on SH20, SH20A and SH20B for trips to inter-regional markets over local access.
- Prioritise freight movements to / from the north and south industrial areas and airport.
- Prioritise pedestrians within 400-800m of high activity pedestrian areas.
- Support the amenity function around key activity centres by improving walking and cycling access.
- Improve connectivity of walking and cycling network facilities with the wider Auckland network to provide a viable transport mode for local and medium distance trips for users of all ages and abilities, and support access to public transport.
- Improve trip reliability for time sensitive aeronautical traffic (passengers, crew, time sensitive freight) to and from the airport.
- Discourage non-airport related traffic from travelling through the airport precinct.
- Improve local amenity and air quality by reducing ‘rat running’ commuter traffic and freight on local roads.

It should be noted that all of the principles are applicable and ensuing KPI's could potentially be achieved for the year 2048. These principles will be used to help validate other projects which may come online, currently outside the scope of the Southwest Gateway Programme to ensure the desired operational functionality is achieved at all conditions.

4.2 User Priorities

The following user groups and mode priorities have been defined through workshops with investment partners and discussions with the project team technical specialists.

4.2.1 User Group Definition

To better understand the types of users for each modes of transport, the following user groups were defined with stakeholders at the first workshop.

Figure 4-1 below outlines the user groups defined as part of this NOP to be considered.

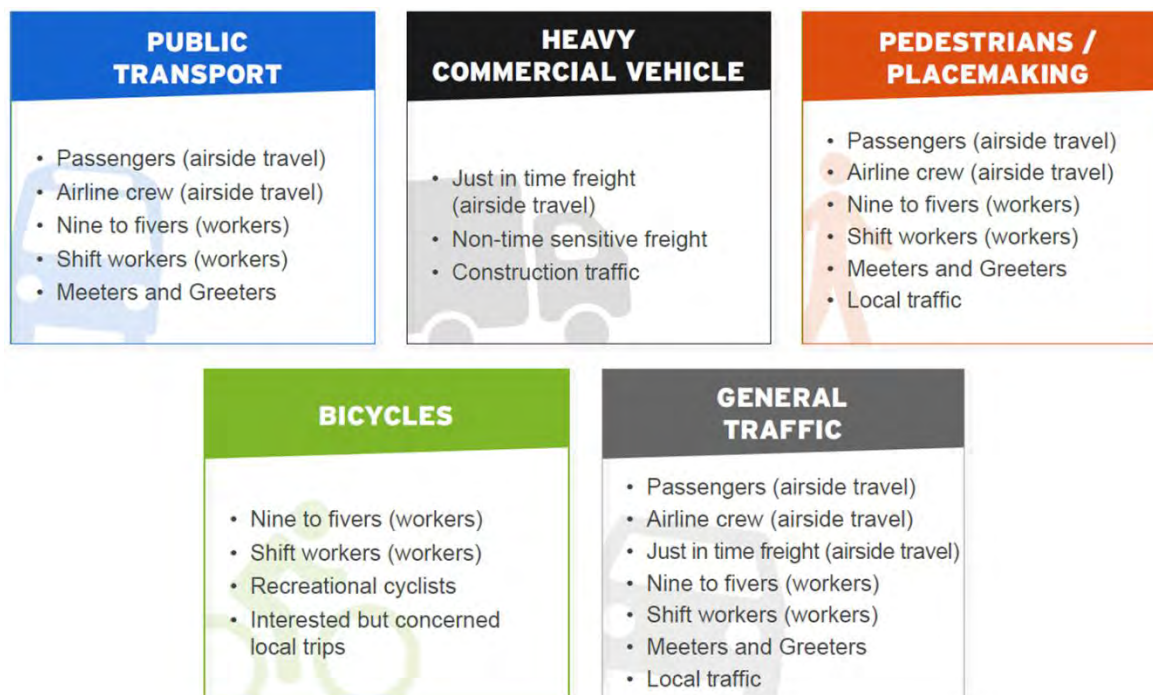


Figure 4-1 Southwest Gateway NOP User Groups

A user hierarchy was developed by allocating each transport mode to routes based on the strategic function of the route, the location and the time of day.

For roads which were not specifically defined, in term of priorities as part of this NOP, the following hierarchy applies to the transport modes to achieve the desired operational outcomes:

1. Pedestrians / placemaking
2. Bicycles
3. Public transport
4. Heavy Commercial Vehicle
5. General Traffic.

4.2.2 Priorities

Since there are limited access options for the airport, it is necessary to accommodate both the mobility and access requirements of the Airport precinct within the same available space and therefore a compromise between mode priorities is required. The following mode priorities for each corridor were determined applying the priorities set out in the GPS, and where conflicts exist, through discussions with network operating partners in Workshop 3.

The main priorities by mode, for the NOP study area are outlined below and illustrated in Figure 4-2.

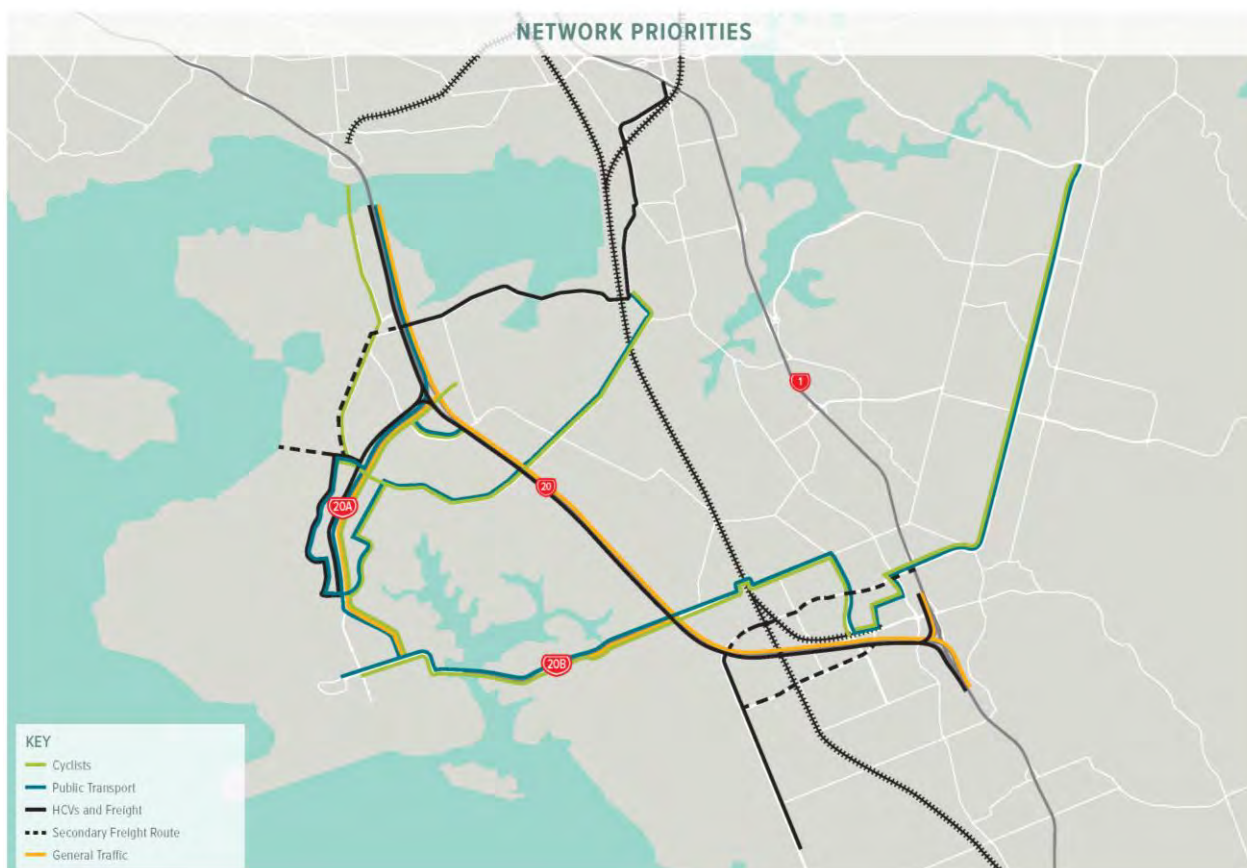


Figure 4-2 Network route priorities

Public Transport

Public transport is shown as a high priority along all proposed frequent bus or rapid transit routes.

Cycling

Active modes are a high priority down both SH20A and SH20B corridors. Typically cycling is provided as a high priority along all corridors on which public transport is a high priority to support last mile trips from public transport stops. Cycling has also been provided as a high priority on McKenzie Road and Coronation Road to connect cyclists travelling north-south with the new Mangere Bridge and SH20 cycleway.

On Massey Road only the active modes and public transport are given priority to better support the place and movement function of this east west connection.

Note: that although SH20 between Mangere Bridge and SH1 does not show cycling as a high priority, it should still be accommodated, and facilities provided for it along the SH20 corridor or a parallel corridor. This is explained further in Section 5.

Pedestrians

Although not shown on this map pedestrians are considered a high priority along every corridor with the exception of SH20 as noted above. Notwithstanding this, pedestrians are prioritised around public transport stations (Puhinui, Manukau etc) as well as in town centres such as Mangere, Manukau and on the airport precinct, in particular around the terminal buildings.

Freight

Freight is a high priority on SH20 to facilitate inter-regional trips and access to the inland ports at Wiri and Onehunga. Freight is a high priority on SH20A and parallel Kirkbride Road, Richard Pearce Drive and Landing Drive to facilitate access to and from Airport Oaks given the large industrial and freight forwarding land use. Freight is a high priority along Favona Road and Walmsley Road to support east-west freight movements, previously provided for on Massey Road.



There is no freight priority provided on SH20B however freight will still be accommodated. Southbound freight from airport Oaks will be encouraged, through mode prioritisation to first head north on SH20A and then south on SH20. At the time of writing this NOP, the SH20A - SH20 southbound connection is missing

Secondary freight routes are shown by the dashed line, which represents an alternative access for freight to the state highway to ensure there is resilience in the system for freight which is typically time sensitive in nature.

General Traffic

General traffic and freight is only prioritised on SH20 and SH20A. General traffic is also given priority on SH20B but only between SH20 and Prices Road/ Campana Road where the Auckland Airport Park and Ride South is proposed as well as access through to future greenfields developments on this peninsula.

Although general traffic is not prioritised on any other corridors, it will still be accommodated. Typically it is a lower priority to the other modes as outlined in the overall hierarchy in previous section.

5 Operational scenarios

The travel demand within the airport district is determined by a number of factors. The peaks are driven by flight schedules and employee shift changes. The two-way traffic is generally at its highest during the PM peak. To establish the basis for time of day prioritisation, the existing flow profiles on SH20A and SH20B were analysed, using SCATS data for the two-week period between 25th February and 10th March 2018, as summarised below.

On SH20A, the average airport-bound (southbound) traffic flows remain above 1,000 vehicles per hour throughout the day, peaking to between 1,500 and 2,000 hourly volumes in the morning and early afternoon. The outbound (northbound) traffic flows are higher during the PM peak period, reaching a maximum flow of 2,300 vehicles per an hour across two traffic lanes.

On SH20B, both the airport-bound (westbound) peaks at just under 1,000 vehicles per hour during the AM peak, and remain constant (at around 500 vehicles per an hour) for the remainder of the day. The outbound (eastbound) traffic is lower during the AM peak and steadily increases throughout the day, reaching a maximum of about 1,500 vehicles per an hour during the PM peak. The PM peak period is significantly longer on SH20B, almost 6 hours as compared to SH20A, 3 hours.

For both SH20A and SH20B, the PM peak period has the highest two-way traffic volumes. This is evidencing a conflict in movement demand overlap of the peak employee movements and peak passenger demand periods.

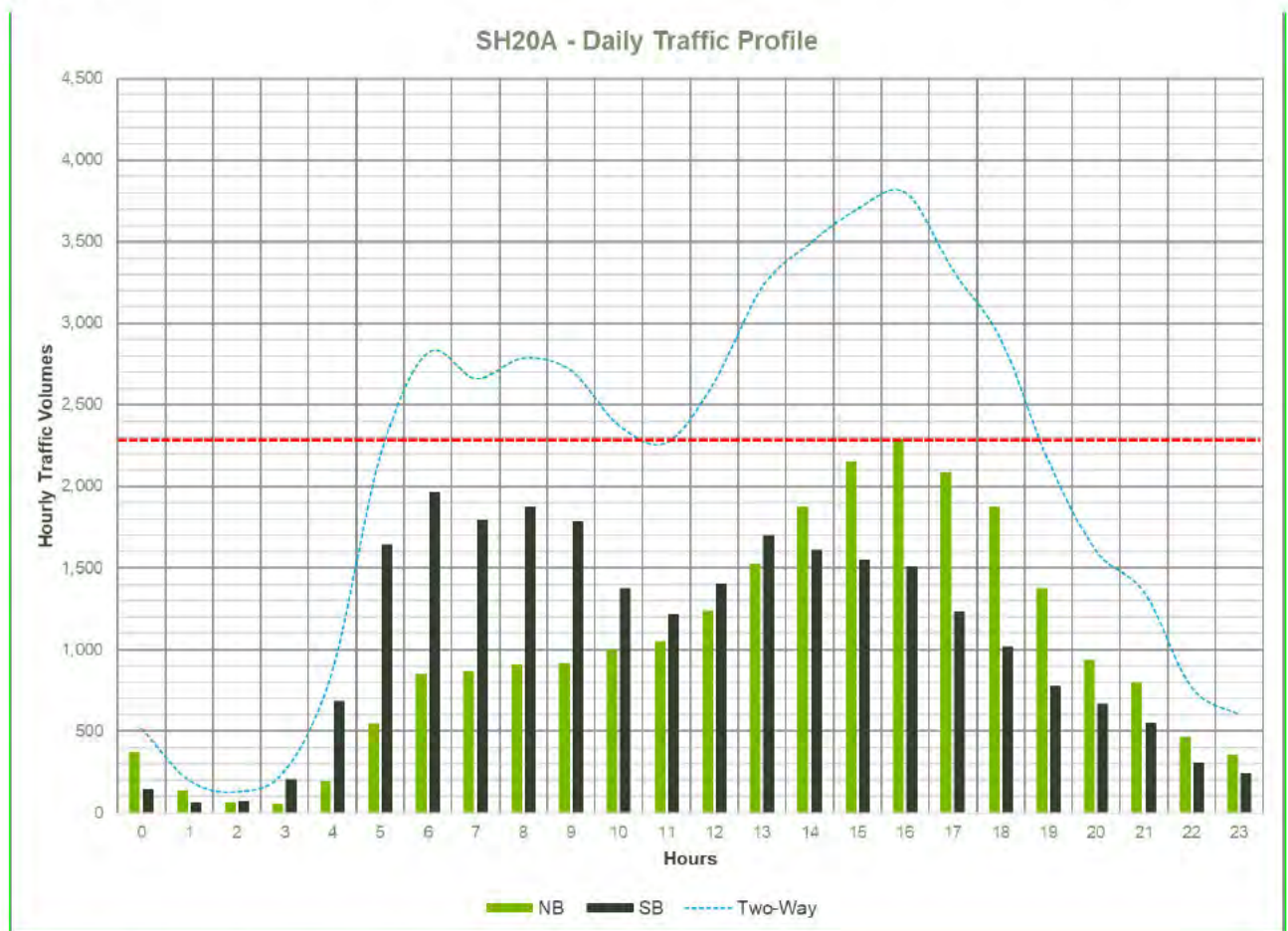


Figure 5-1 Average weekday traffic profile – SH20A (SCATS data)

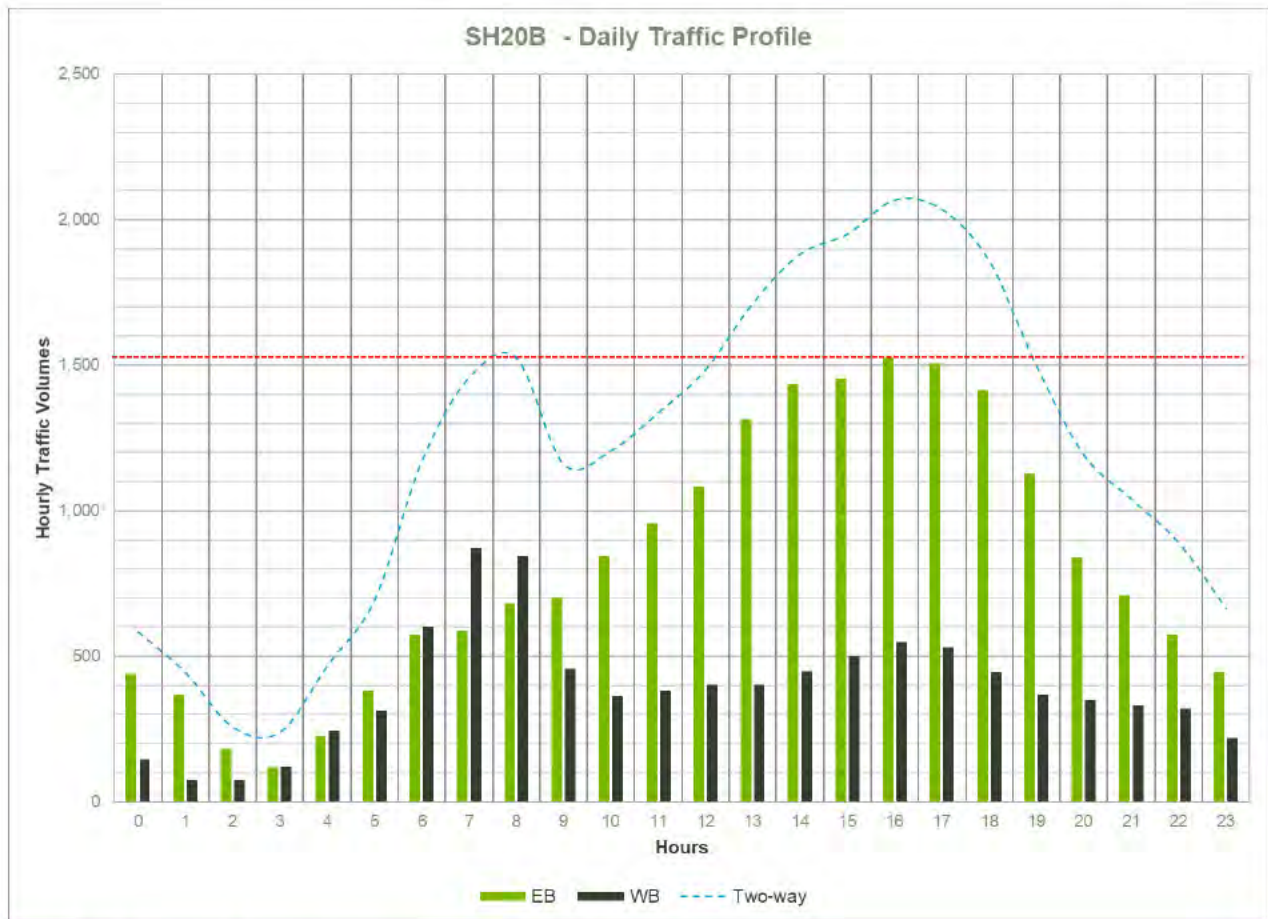


Figure 5-2 Average weekday traffic profile – SH20B (SCATS data)

When demand increases beyond the capacity of the road network, and no (or little) alternative routes exist, the excess demand will generally be distributed to periods outside of the peak periods. As a result, the network becomes congested for more hours of the day as compared to the baseline (i.e peak spreading). The excess demand that is displaced from the ideal time of travel can also be considered latent travel demand. This is traffic demand that would most likely return to the peak period, if the capacity of the network is improved to take advantage of the additional capacity. Under this scenario, managing the network becomes more complex and compromises, between competing modes, are unavoidable. Sustainable strategies therefore require provision of infrastructure and optimised network operation to prioritise active modes and those which move more people.

Operational scenarios that can be expected on the immediate transportation network are discussed further below.

5.1 Normal Operating Conditions

Under normal operating conditions the network operating hierarchy should give active modes the highest priority and general traffic / cars as the lowest priority, summarised in Figure 5-3 below:

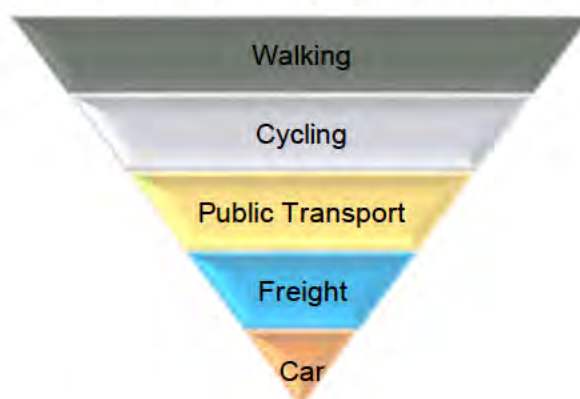


Figure 5-3 Southwest Gateway Network Operating Hierarchy

Active modes should be given priority at major conflict points, followed by public transport (i.e Light rail, bus and taxis), high-occupancy vehicles (HOVs), freight and then private car travellers. Priority consideration should also consider the functional classification of the transport network (e.g. freight has a lower priority than other modes on local roads, and a higher priority on regional freight corridors such as SH20).

The following sections outline differences in mode priority under normal operating conditions along the main corridors by time of day. The tables should be read with the following key.

Key	Description
-	Discouraged
•	Lowest priority
••	Medium priority
•••	Highest priority

5.1.1 AM Peak

During the AM peak, the inbound traffic coincides with the peak airside departures, and employee traffic. To maintain relatively safe and efficient operations within the airport core, it is critical to be able to decongest the airport precinct. Thus, outbound traffic flows are also prioritised. General traffic on SH20B is given a slightly high priority for traffic inbound to Park and Ride South, it is assumed that the priority will drop to the match the eastbound direction west of Prices Road.

Public transport priority is high in both directions, inbound for departing passengers and employees and outbound for arriving passengers. This is so that public transport reliability can remain high and therefore maintain or increase public transport mode share. On SH20 south of SH20A this priority drops back to a low priority given that there are few bus routes that travel along this section.

Freight is actively discouraged from Massey Road to ensure efficient access for public transport and safe access for active modes. The modal priorities during the typical AM peak are summarised in

Figure 5-4 overleaf. Freight is given a high priority on Richard Pearce Drive and SH20, however is a lower priority on SH20A to enable the highest movement priority to be provided for public transport.

Corridor / Direction					
SH20 – NB	●●	●●	●●●*	●●●	●●●
SH20 – SB	●●	●●	●●●*	●●●	●●●
SH20A – SB (to airport)	●●●	●●●	●●●	●●	●●
SH20A – NB (from airport)	●●●	●●●	●●●	●●	●●
SH20B – WB (to airport)	●●●	●●●	●●●	●	●●
SH20B – EB (from airport)	●●●	●●●	●●●	●	●
Richard Pearse Drive	●●●	●●●	●●●	●●●	●
Massey Road	●●●	●●●	●●●	-	●

* High priority north of SH20A only. South of SH20A there is low priority for PT on SH20.

Figure 5-4 Southwest Gateway NOP AM-peak modal priorities

5.1.2 Business Peak

During the business peak (or inter-peak) period approximately 10am to 2pm, freight traffic will play a key role owing to the surrounding land use, which is mainly industrial and logistics, and is given high priority on SH20, SH20A and Richard Pearse Drive. It will also be important to incentivise freight traffic to travel during the inter-peak and off-peak periods, rather than during the AM and PM peak periods, where commuter traffic is at its busiest. The network priorities summarised in

Figure 5-5 below reflect the desire to offer travel time savings incentives to freight outside the commuter traffic peaks.

Corridor / Direction					
SH20 – NB	●●	●●	●●●*	●●●	●●
SH20 – SB	●●	●●	●●●*	●●●	●●
SH20A – SB (to airport)	●●●	●●●	●●●	●●●	●●
SH20A – NB (from airport)	●●●	●●●	●●●	●●●	●●
SH20B – WB (to airport)	●●●	●●●	●●●	●	●●
SH20B – EB (from airport)	●●●	●●●	●●●	●	●●
Richard Pearse Drive	●●●	●●●	●●●	●●●	●
Massey Road	●●●	●●●	●●●	-	●

* High priority north of SH20A only. South of SH20A there is low priority for PT on SH20.

Figure 5-5 Southwest Gateway NOP Business peak modal priorities

5.1.3 PM Peak

In the afternoon peak, the outbound commuter peak from businesses coincides with peak airside arrivals, increasing the overall outbound demand significantly. To maintain relatively safe and efficient operations



within the airport core, it is critical to decongest the airport precinct. Accordingly, outbound traffic will be prioritised on all corridors. High public transport priority for both inbound and outbound directions will also be maintained to ensure reliability can remain high.

Freight will be actively discouraged from using SH20B in the afternoon peak with the priority of general traffic eastbound being elevated to medium priority.

The afternoon peak mode priorities are summarised in Figure 5-6.

Corridor / Direction					
SH20 – NB	●●	●●	●●●*	●●●	●●●
SH20 – SB	●●	●●	●●●*	●●●	●●●
SH20A – SB (to airport)	●●●	●●●	●●●	●	●
SH20A – NB (from airport)	●●●	●●●	●●●	●●	●●
SH20B – WB (to airport)	●●●	●●●	●●●	–**	●
SH20B – EB (from airport)	●●●	●●●	●●●	–**	●●
Richard <u>Pearse</u> Drive	●●●	●●●	●●●	●●	●
Massey Road	●●●	●●●	●●●	–	●

* High priority north of SH20A only. South of SH20A there is low priority for PT on SH20.

** Assuming SH20A southbound ramp is implemented, freight needs to be discouraged along SH20B in order to discourage rat-running through the airport terminal precinct

Figure 5-6 Southwest Gateway NOP PM-peak modal priorities

5.1.4 Off-Peak

Traffic volumes are generally lower off-peak during the night and on the weekends. There are also lower volumes of pedestrians and cyclists on the network in these times making it an ideal time for freight movements within the airport precinct, especially given that there is very limited residential land use.

Public transport priority is retained through these times on the state highways and Massey Road. It is reduced to a medium priority on Richard Pearce Drive as there are few commuter trips at this time and airport bound riders will typically be travelling on direct PT routes which use the SH20A corridor.

Freight is elevated to a high priority along Richard Pearce Drive off-peak. The mode share priorities for the off-peak period are summarised in

Figure 5-7.

Corridor / Direction					
SH20 – NB	●●	●●	●●● *	●●●	●●●
SH20 – SB	●●	●●	●●● *	●●●	●●●
SH20A – SB (to airport)	●●●	●●●	●●●	●●●	●●
SH20A – NB (from airport)	●●●	●●●	●●●	●●●	●●
SH20B – WB (to airport)	●●●	●●●	●●●	●	●●
SH20B – EB (from airport)	●●●	●●●	●●●	●	●●
Richard Pearce Drive	●●●	●●●	●●	●●●	●
Massey Road	●●●	●●●	●●●	-	●

* High priority north of SH20A only. South of SH20A there is low priority for PT on SH20.

Figure 5-7 Southwest Gateway NOP Off-peak modal priorities

5.2 Incidents and Unplanned Activities

In the context of network operations / management, an incident is an unplanned event or activity that may lead to disturbances in normal traffic flow conditions, affect public transport reliability or may pose risk to human life and the transport infrastructure. It is an important consideration for this NOP as it is essential for maintaining a safe and efficient network.

Incident detection, response and escalation will be coordinated through ATOC, in consultation with other partners, depending on incident level and defined partner roles and responsibilities. The generic response protocol is summarised in Figure 5-8 below:



Figure 5-8 Incident response strategy protocol

5.3 Maintenance and Planned Activities

During planned events, a safe and efficient network means the road users shall be well informed of the event in advance, and well-planned traffic diversions are in place to minimise the impact on customer journeys.



Temporary traffic management plans (TTMPs) will need to be prepared and approved by relevant authorities, for all planned maintenance. TTMPs should retain the mode and time of day priorities outlined in this NOP.

5.4 Special Events / Demands

Traffic management plans will need to be prepared and approved by relevant authorities for events that may interfere with normal network operations.

With events involving VIPs such as heads of states, the NZ Police generally take command for transporting VIPs, including route selection to be used due to the higher security protocols for some travellers. ATOC-Smales generally support the NZ Police to facilitate efficient transportation of VIPs on such event days through the use of ITS infrastructure and provision of appropriate traveller information where major disruptions are expected. Key events that are likely to require transport priority include:

- Visits by international leaders
- Large funeral processions at Manukau Memorial Gardens
- Sporting team's arrivals



6 Network Gaps

Network gaps exist where the existing network does not meet the operating principles and priorities set out for the network therefore preventing it from achieving the desired operational outcomes. The identified deficiencies, in the existing transport network within the study area are discussed below and have been incorporated into the options proposed within the business case.

6.1 Access

- There are very limited alternative options to access the airport and surrounding area. The Massey Road / Kirkbride Road corridor provides an alternative east-west connection and southbound access to SH20, however Massey Road provides priority for public transport and active modes and therefore is not a viable alternative for freight traffic.
- The SH20A / SH20 interchange does not currently have a southbound ramp to provide the connection needed for southbound freight and general traffic. As a result, rat running occurs on local roads such as Massey Road and Kirkbride Road and SH20B carries higher than desired freight and general traffic volumes, compromising public transport reliability.
- Traffic travels through the airport terminal or local arterial roads to get south from the Airport Oaks area, thus diminishing the amenity and place functions in these areas for pedestrians and workers.

6.2 Public transport

- Public transport provision is currently limited to a few routes and only provided by a combination of premium (Skybus) services linking to the city centre and north shore, and the Airporter 380 routes that connects the airport to Onehunga, Papatoetoe and Manukau rail stations.
- There are currently approximately 15 buses per hour per direction serving the airport (including sky premium services), with combined capacity of just under 800 persons per hour per direction. This is approximately 17% of the current person capacity per hour per direction on the local transport network.
- Lack of bus priority measures means buses compete for space with freight and general traffic, resulting in lower (perceived and actual) travel time reliability. Recently opened bus lanes on SH20A will help improve bus Sky bus service reliability. Public transport is not currently perceived as faster, convenient and more reliable means of accessing the airport, hence the high reliance on private car travel for airport district employees, travellers and visitors.
- Public transport access from the east (Botany/ Pakuranga) and the west (New Lynn/ Henderson), which are popular residential places for employees in the study area, require at least one transfer with either rail or bus service. This makes it a less desirable option as existing frequencies are low, and interchanges between public transport services incur additional waiting and transfer time between services; resulting in an increase of total journey time (i.e. transfer penalty).

6.3 Walking and cycling (active modes)

- With the exception of SH20A, there are currently very limited, if any, walking and cycling facilities provided along the state highway corridors.
- The vehicle speeds and volumes on SH20B are not considered appropriate for safe walking and cycling (although these activities are permitted), given the current lack of protection for vulnerable users on the road (i.e. more than 80kph and 1,300 vehicles per hour per lane per direction during peaks).
- There are few safe, dedicated crossing points for active modes across the network.



6.4 General traffic and freight

- SH20 tends to be congested during the PM peak in both the northbound and southbound directions from effects downstream which has flow on effects to the Southwest Gateway study area and preventing SH20A and SH20B operating effectively.
- There is no SH20A to SH20 southbound link therefore there is limited choice or resilience for southbound routes.
- Without Park and Ride South (yet to be constructed) there is still a high demand for general traffic to travel through the airport precinct to get to a Park and Ride facility. Therefore, until the early improvements are completed, SH20B cannot achieve the desired operational outcomes.

6.5 Technological disruption

Times of change and rapid revolution of technology in the transport sector is affecting the way people travel and the needs people will have from a service and infrastructure perspective. Many emerging technologies such as Mobility as a Service (MaaS), autonomous vehicles etc. are in their infancy now, but their potential impact may change the demand for different modes and is yet to be fully understood.

E-hailing services, such as Uber, Taxify, etc, have disrupted the traditional metered taxi sector across the world. These app-based services have increased choice and flexibility for travellers. Similar disruptions are happening in the logistic sector, where distributors are increasingly using on-demand app-based delivery services, using similar “shared fleet” and “partner-driver” strategies. The impact of this disruption may see a greater demand for small ‘general traffic’ vehicles which make more trips per day than existing heavy freight vehicles.

Electric buses (e-buses) are also being continually developed and trialled in more cities globally. A combination of growth in development of e-bus technology, including increase in travel distance range, efficient charging, and improvement in the autonomous driving capabilities, may result in more efficient and environmentally sustainable bus networks and services.

It may be possible to run park and ride shuttles, or even longer distance bus routes services, using autonomous pods, minibuses and e-buses. These will reduce the operational cost for running the system with less labour cost, higher frequencies and longer operational hours.

Private autonomous vehicles can also offer efficiency and network capacity improvements, through reduction of required headways or traffic gaps to safely navigate the network (i.e vehicles could travel closer to each other without increased risk of collision, thus increasing the lane capacity of the road network). As mentioned earlier, autonomous vehicles may also be requested (whether e-hailing services, rental cars, own vehicles or shared) on demand, from a remote location. They will therefore require fewer parking bays close to the core airport terminals (as bays are used multiple times for drop-off and pick-up).

Although the emerging and future technologies and disruptions in transportation may be considered too far into the future for the project horizon, the signs are there already of the potential impact and speed at which these technologies are launched to consumers, with less flexible legislative framework being the major drawback. These technological improvements will have an impact on how the future transport network is managed and operated.

There is therefore, a need for design flexibility in the provision of infrastructure within the airport district and immediate surroundings. This flexibility will allow re-purposing of spaces and infrastructure to respond to disruptions e.g. convert general traffic lanes to public transport lanes, parking areas to more productive land uses, kiss and ride bays, etc.

7 Network performance evaluation

The key aspect of network operations is establishing a methodology for ongoing network evaluation to determine when interventions (i.e. implementation of available management tools and options) are required. The focus of network operations is optimal safety, efficiency and reliability of the transport network, and any ongoing evaluation of the network should be focussed in these areas. To guide this evaluation, the following KPIs will be used against performance measures that reflect the SWG NOP Operating Principles, using information provided from the given Data Sources.

The assessment criteria required to evaluate the Auckland Airport access is aligned with the GPS and Auckland Transport Statement of Intent.

Table 7-1 Performance Measures, KPIs and relevant ITS Equipment for 20Connect SSBC

20 Connect Investment Objectives	Southwest Gateway NOP Operating Principles	Performance Measure(s)	KPI(s)	Data Source(s)
1. To improve health, safety and security of people.	- To improve safety for all users on the transport system. - To enhance the customer perception of safety.	- Safer journeys / safe system - Customer experience / Barrier free accessible transport (i.e. feel safe using it)	- No. of deaths and serious injuries on the transport system per capita and vehicle kilometres travelled (i.e. all modes). % users or customers that feel safe / are satisfied with their experience using the transport system - Increase in number of users by mode / age / ability on public transport and active modes in the transport system - Transport officer hours / number of transport officers - No. of criminal activities reported in or around transport system.	- Police crash report; - CAS (NZ Transport Agency); - AT HOP data; - Cash Ticket Sales; - Operator Database; - Periodic manual surveys; - Staff list from AT/NZ Transport Agency; - Crime and victimisation database
2. To improve the reliability and resilience of the transport system.	To deliver the outcomes as defined by the ANOP and GPS on Land Transport.	Availability of alternative modes to and from airport	- Service availability - No. of unplanned service outages % time alternative modes available	Telematics data (e.g. Tomtom / Google traffic/NZ Transport Agency)



20 Connect Investment Objectives	Southwest Gateway NOP Operating Principles	Performance Measure(s)	KPI(s)	Data Source(s)
	■ To maintain access along SH20 to ensure the WRR can perform its strategic function as an alternate route to SH1 during unplanned and planned events. ■ Provide an agile network that can keep people and goods moving. ■ To provide resilient access to and from Auckland Airport to enable it to carry out its function as a lifeline utility.	during incident & events – Detour / diversion route plans set up – Network / Service availability ■ Reliable travel times to / from Airport (by mode and time of day)	– % of time SH20A and SH20B are available / % of time on SH20, SH20A and SH20B where one or more lanes is impacted by unplanned events / incidents – Average road closure time (full closure, partial closure) – No. of detour plans designed / set up for all modes / change in travel time & route length – Service availability (on SH, transport corridors and key arterials e.g. Puhinui Rd, Massey Rd, Kirkbride Rd, McKenzie Rd, Walmsley Rd, Bader Dr) – No. of boardings on alternative modes (non-car) ■ Incident detection, response, clearance & recovery times ■ Average travel times / 95%ile travel times on – SH20, 20A, 20B – key arterials (Puhinui Rd, Massey Rd, Kirkbride Rd, McKenzie Rd, Walmsley Rd, Bader Dr) – PT routes ■ % of trips within x% of average or 95%ile travel time to / from Airport and strategic locations – Auckland City Centre – Puhinui Station – Freight depots	■ ANPR, etc ■ Mobile phone tracking (Bluetooth, Wi-Fi scanners, etc) ■ NZ Transport Agency TREIS Database for road closure durations ■ Automatic accident detector sensors / system ■ Emergency phones / mobile network base station (universal coverage) / High-speed internet connectivity (sensor networks and emergency reporting) ■ Infrared cameras or manual surveys (periodic sample surveys)/AT HOP Data/Cash Ticket Sales ■ ATOC Reports or incident response times (VIDSYS and TREIS) NZ Transport Agency NTIS information and journey time boards ■ AT Bus travel data



20 Connect Investment Objectives	Southwest Gateway NOP Operating Principles	Performance Measure(s)	KPI(s)	Data Source(s)
3. To improve economic performance of the airport area, Auckland and New Zealand	■ To enhance overall network efficiency. ■ Efficient and reliable public transport travel times to and from the Northern and Eastern Airport approaches. ■ Prioritise public transport on key routes by time of day. ■ Provide priority on SH20, SH20A and SH20B for trips to inter-regional markets over local access. ■ Prioritise freight movements to / from the north, south, industrial areas and airport. ■ Prioritise pedestrians within 400-800m of high activity pedestrian areas. ■ Support the amenity function around key activity areas / centres by improving walking and cycling access. ■ Improve connectivity of walking and cycling network facilities with the wider Auckland network to provide a viable transport mode for local and medium distance trips for users of all ages and abilities, and support access to public transport. ■ Improve trip reliability for time sensitive aeronautical traffic (passengers, crew, time sensitive freight) to and from the airport. ■ Discourage non-airport related traffic from travelling through the airport precinct.	■ Transport system productivity ■ Travel time to / from the airport (by mode) ■ Proportion of Auckland population who live within a X minute trip via public transport to Auckland Airport ■ Trip reliability – Predictability (by mode and time of day) – Travel time difference between modes ■ Pedestrian LoS C or better as per AT User Experience Table ■ Facilities provided / barrier free transport ■ % through trips vs airport related trips	■ Volume of people or \$ value of goods x travel speed ■ Level of service (by mode and time of day) ■ No. of boardings on public transport ■ % of public transport services that arrive within X minutes of scheduled time ■ Population within 45minute public transport journey / Auckland population ■ Volume of people and freight by strategic route by time of day ■ Trip times to / from key freight origins / destinations – Airport – Airport Oaks – MetroPort / Onehunga – Wiri Freight Hub – Otahuhu – Highbrook / East Tamaki ■ % of trips within x% of average or 95%ile travel time to / from Airport and strategic locations (also in 2.) – Auckland City Centre – Puhinui Station – Freight depots ■ No. new / upgraded pedestrian & cycle facilities	■ Infrared cameras or manual surveys (periodic sample surveys); ■ Telematics data (e.g. Tomtom / Google traffic) ■ ANPR, etc ■ Mobile phone tracking (Bluetooth, Wi-Fi scanners, etc); ■ Automatic counters for freight bus fleet management systems (GPS logs); ■ Operator database / periodic manual surveys ■ Government population census ■ Cycle / pedestrian counters (Radar / Cameras / loops / CCTV virtual loops); ■ Km of new SUP/cycle facilities/active modes installed



20 Connect Investment Objectives	Southwest Gateway NOP Operating Principles	Performance Measure(s)	KPI(s)	Data Source(s)
			- Km of new pedestrian / cycle facilities installed - No. of / km of age / ability appropriate facilities implemented (i.e. facilities for young, elderly, mobility impaired, buggies / pushchairs, inclusive cycles, those with luggage etc)	
4. Reduce the effects of the transport system on the environment and taonga	Improve local amenity and air quality by reducing 'rat running' commuter traffic and freight on local roads.	- Route Optimisation - Prioritises local traffic over commuter traffic and vice versa – reduced through traffic on local roads - Carbon emissions, pollution generated in key locations	- PPM Carbon Monoxide in key locations and on key routes / section of routes: - Mangere Town Centre - Massey Rd - Auckland Airport shopping centre - PT stations / hubs - SUPs - Tonnes per vehicle volume / tonnes per network km on key routes - HCV / freight volumes on local roads - No. of EVs and vehicles on alternative fuel across all modes on the network	- Air Monitoring Stations; Vehicle emission monitoring system; - Weather station - No. of users of SUPs - PT patronage from AT HOP card data at specific stations - Automatic counters for freight volumes and loads - Government/EV car registrations
5. A network that provides value for money	- Flexible infrastructure to allow for changes in operating requirements. - Flexible infrastructure to allow for changes in transport technology.	- Future-proofed transport corridor* e.g. - A network that operates on 4G or 5G - Asset & system availability (i.e. reliable)	% of corridors with multi-use lanes; permitted users can change by time of day, day of week - No. of plug in / swap out components / elements installed - Number of ITS equipment that operates on ADSL / VDSL % availability / up-time / on-line by asset & system	- No. of ITS equipment linked to Fibre or Fibrea coverage along SH network - No. of ITS equipment capable of 4G/5G



8 Next Steps

The Operating Principles and Network Priorities will also provide a guide for the Next Steps, such as construction phasing and temporary traffic management plans. These Principles and Priorities will also be used for other more specific detailed procedures and plans going forward, such as an Operating Philosophy, as a Concept of Operations is not currently required for the network. An Operating Philosophy will support the long-term option by incorporating high-level operational thinking in the design philosophy. It will discuss how the proposed long-term infrastructure is to be operated to achieve the investment objectives, operating principles and priorities.

As the transport network evolves, this NOP will require regular and on-going review, particularly in response to changes in land use and technology. These may influence forecast in travel demands, modes of travel and therefore the operation of the future network.



Appendix A

Workshop 1 record

*Bringing ideas
to life*

Airport Access DBC

Network Operating Plan Operational Objectives

21st February 2018

**A NZ TRANSPORT
AGENCY**
WAKA KOTAHU

aurecon

Agenda

1. Introduction
2. Our user groups
3. Feedback from one-on-ones and existing networks
4. Prioritisation discussion
5. Next steps

*Bringing ideas
to life*

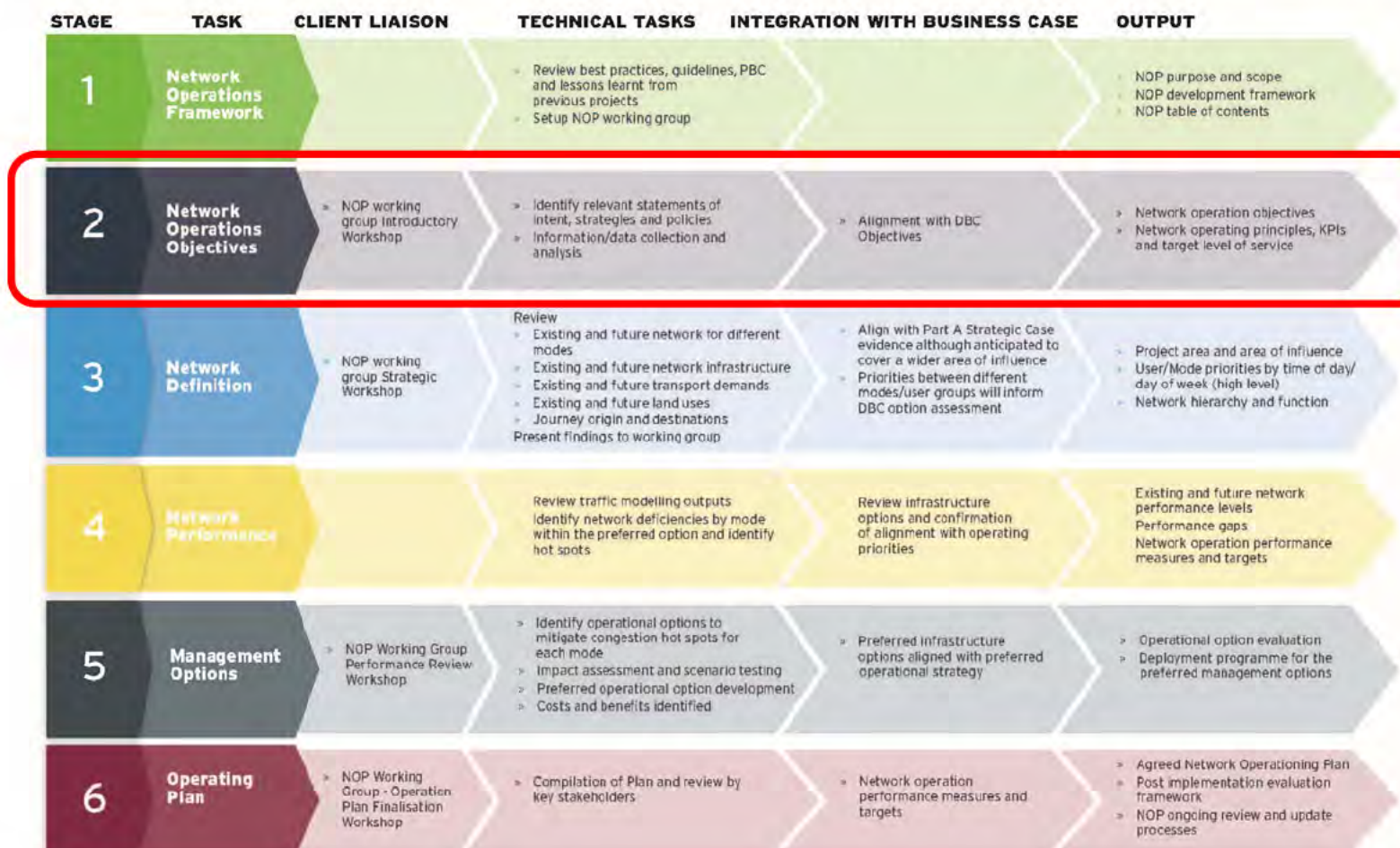
Round Table

Purpose of Network Operating Plan (NOP)

- Capture the operational objectives and outcomes sought.
- Achieve consensus on 'what' needs to be achieved.
- Capture the operational principles to achieve the agreed objectives.
- Create alignment and build partnerships between the stakeholders.
- Verify/inform improvement options, tested in the DBC

What success looks like...

Airport Access DBC: Network Operating Plan – Development Framework



What success looks like...

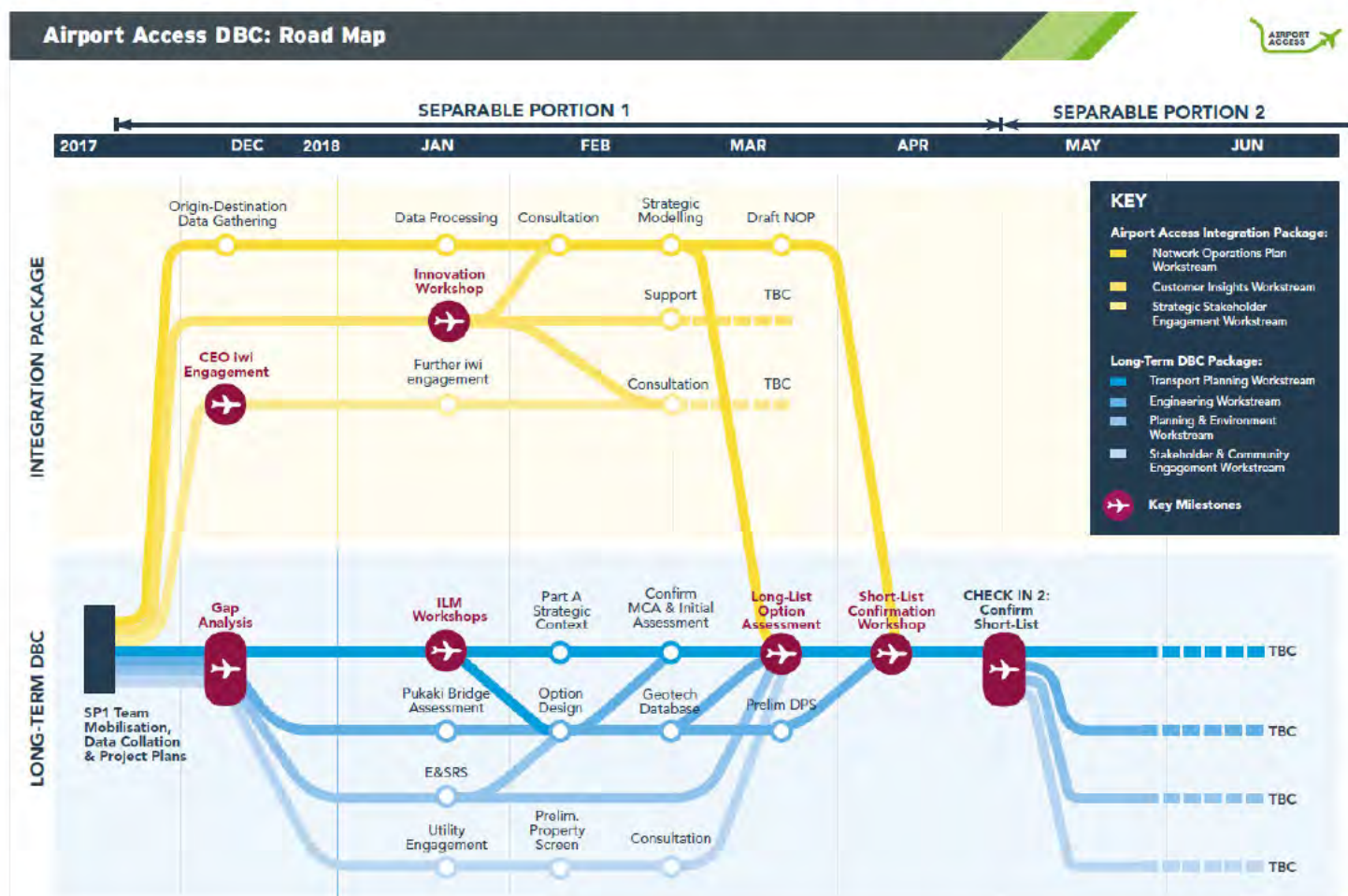
Airport Access DBC: Network Operating Plan – Development Framework



Workshop No.	Title	Key Discussion Topics	Dates
1	Operation Objectives Workshop	Agree user groups Potential conflicts / inconsistencies Common operational objectives High level user/mode priority	Mid February 2018
2	Operation Priorities Workshop	Agree on the area of influence Network function Agree user/mode priority	Mid March 2018
3	Management Strategies Workshop	Performance measures and targets Performance gaps Aligning with DBC long list options	Early April 2018
4	Agreement on First Draft NOP Workshop	Preferred strategy Deployment plan Post implementation evaluation framework	End of April 2018



Network Operating Plan vs Detailed Business Case



*Bringing ideas
to life*

DETAILED BUSINESS CASE

INVESTMENT LOGIC MAP

LONG LIST OPTION
ASSESSMENT

SHORT LIST OPTION
ASSESSMENT

PREFERRED
OPTION

JANUARY

FEBRUARY

MARCH

APRIL

MAY

JUNE

JULY

AUGUST

SEPTEMBER

OCTOBER

NOVEMBER

DECEMBER

OPERATIONS
OBJECTIVES
WORKSHOP

MANAGEMENT
STRATEGIES
WORKSHOP

AGREEMENT ON
FIRST DRAFT NOP
WORKSHOP

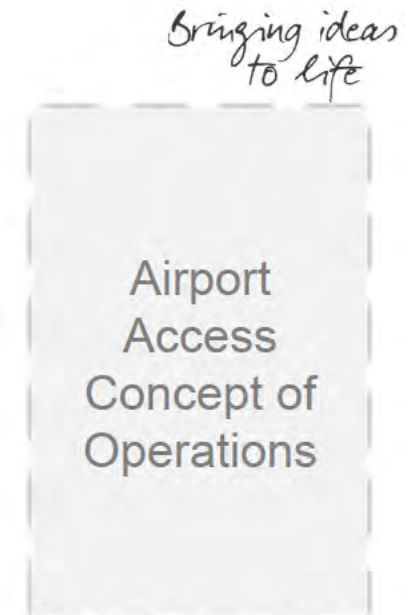
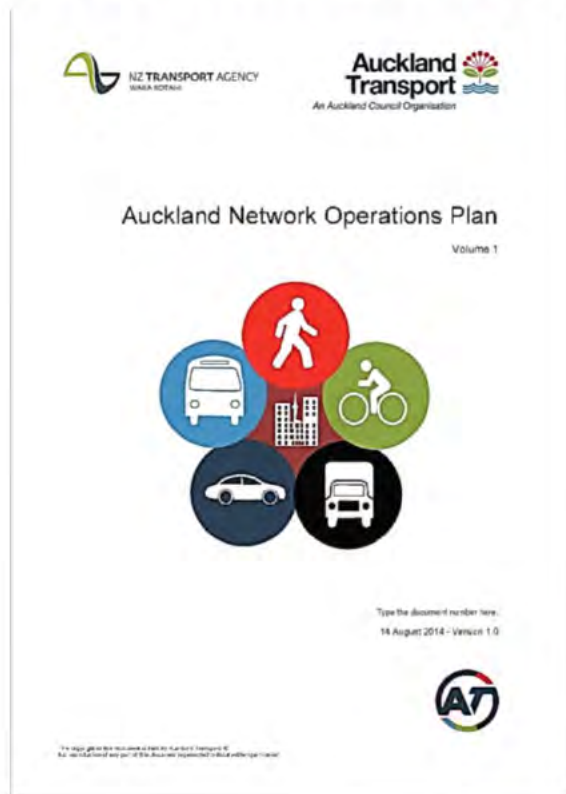
DRAFT NOP ——— ONGOING REVIEW AND REFINEMENT ———→

INTRODUCTORY
MEETING

OPERATIONS PRIORITIES
WORKSHOP

NETWORK OPERATING PLAN

Auckland NOP



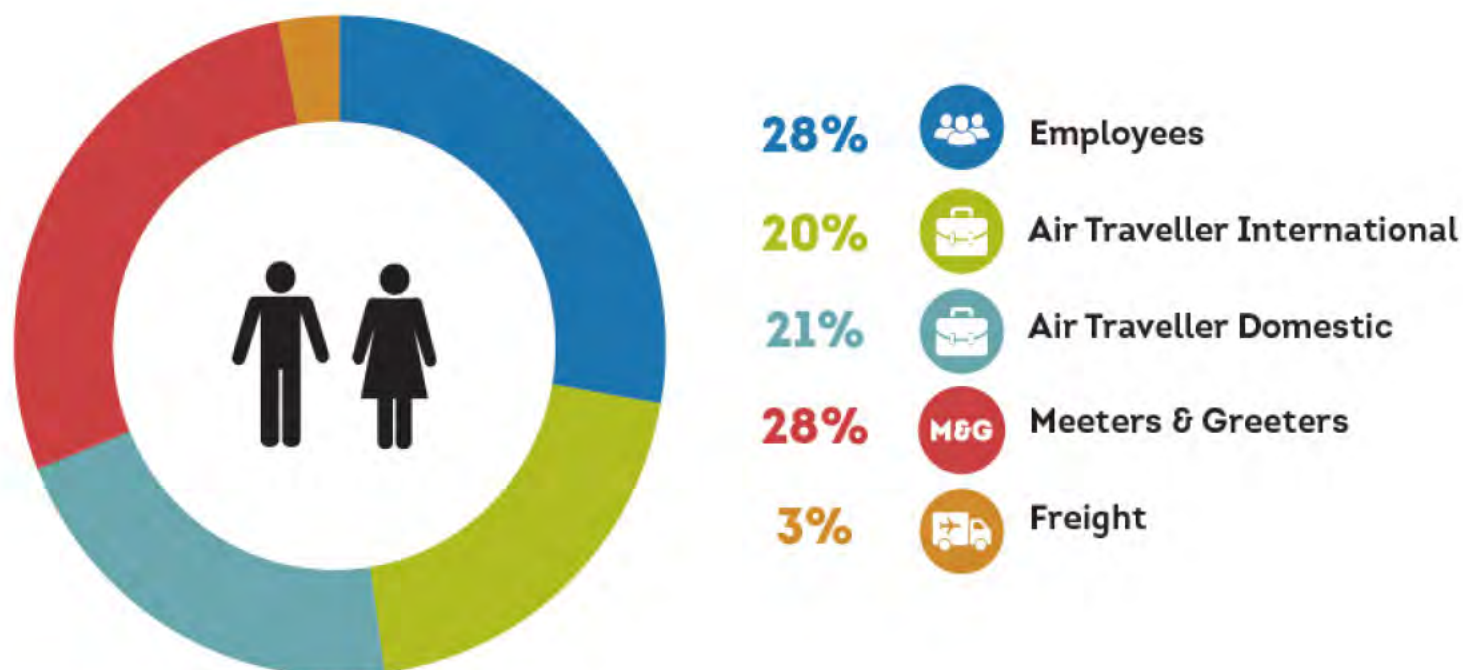
'Provide faster access and greater trip reliability to Auckland International Airport'



Study area



Who are our users?



Source: From AT customer insights, March 2017

Our customers

- **Workers**
 - Nine to Fivers
 - Shift workers
 - Airline crew
- **Passengers**
 - Leisure travellers
 - Business travellers
- **Meeters and Greeters**
- **Local traffic**
- **Freight**
 - Distribution centre trips to/from south-east
 - Distribution centre trips to/from north
 - Internal commercial vehicles
 - Dolly trains
 - Just in time
 - Construction Traffic
- **Others?**

*Bringing ideas
to life*



Feedback from one-on-ones

AUCKLAND AIRPORT USER DESIRES



KEY

- PT (Largely workers, desire to grow travellers)
- Freight
- Cycling
- Airport passengers / terminal traffic

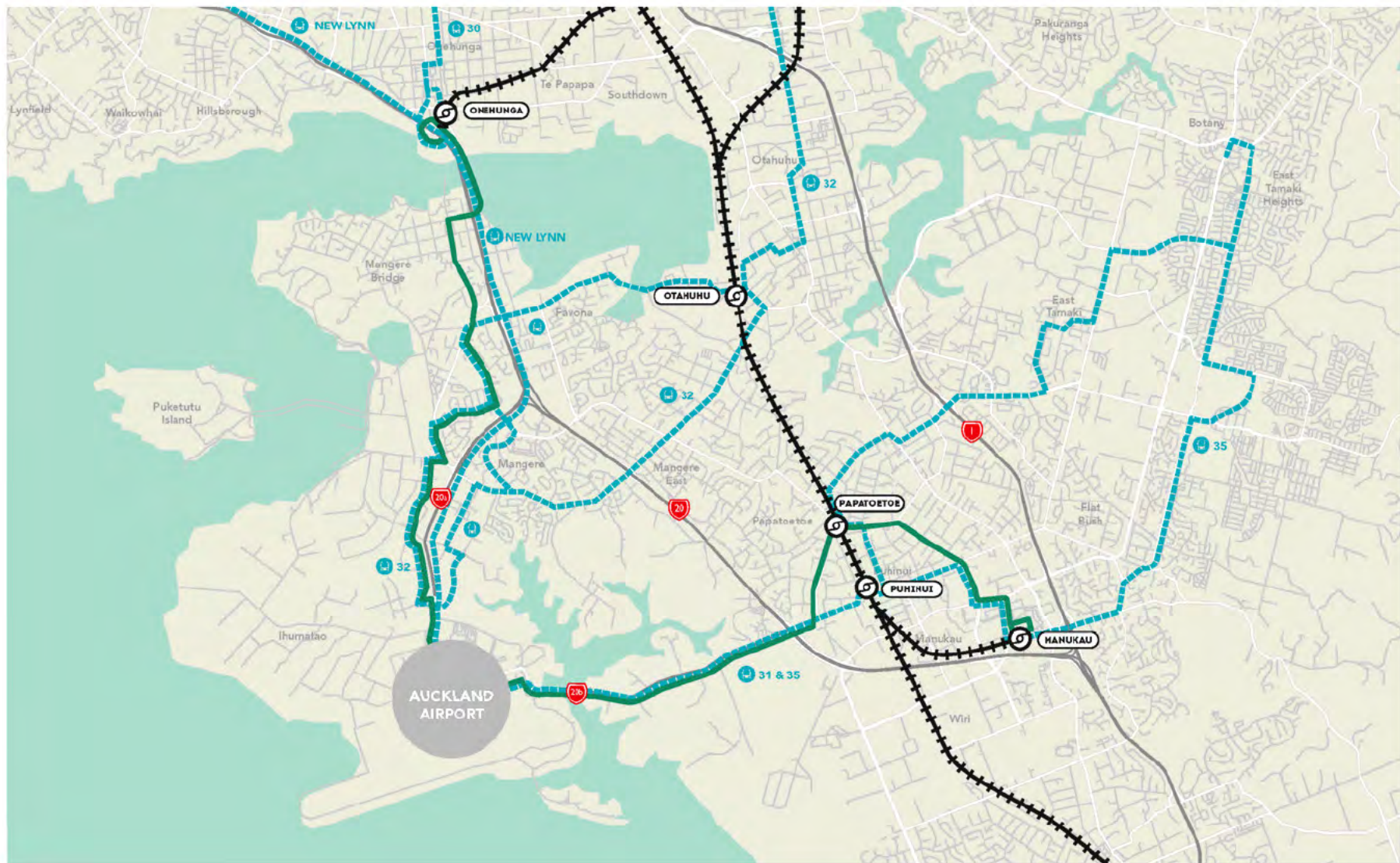
AUCKLAND AIRPORT PUBLIC TRANSPORT



KEY

Existing Train Existing Bus

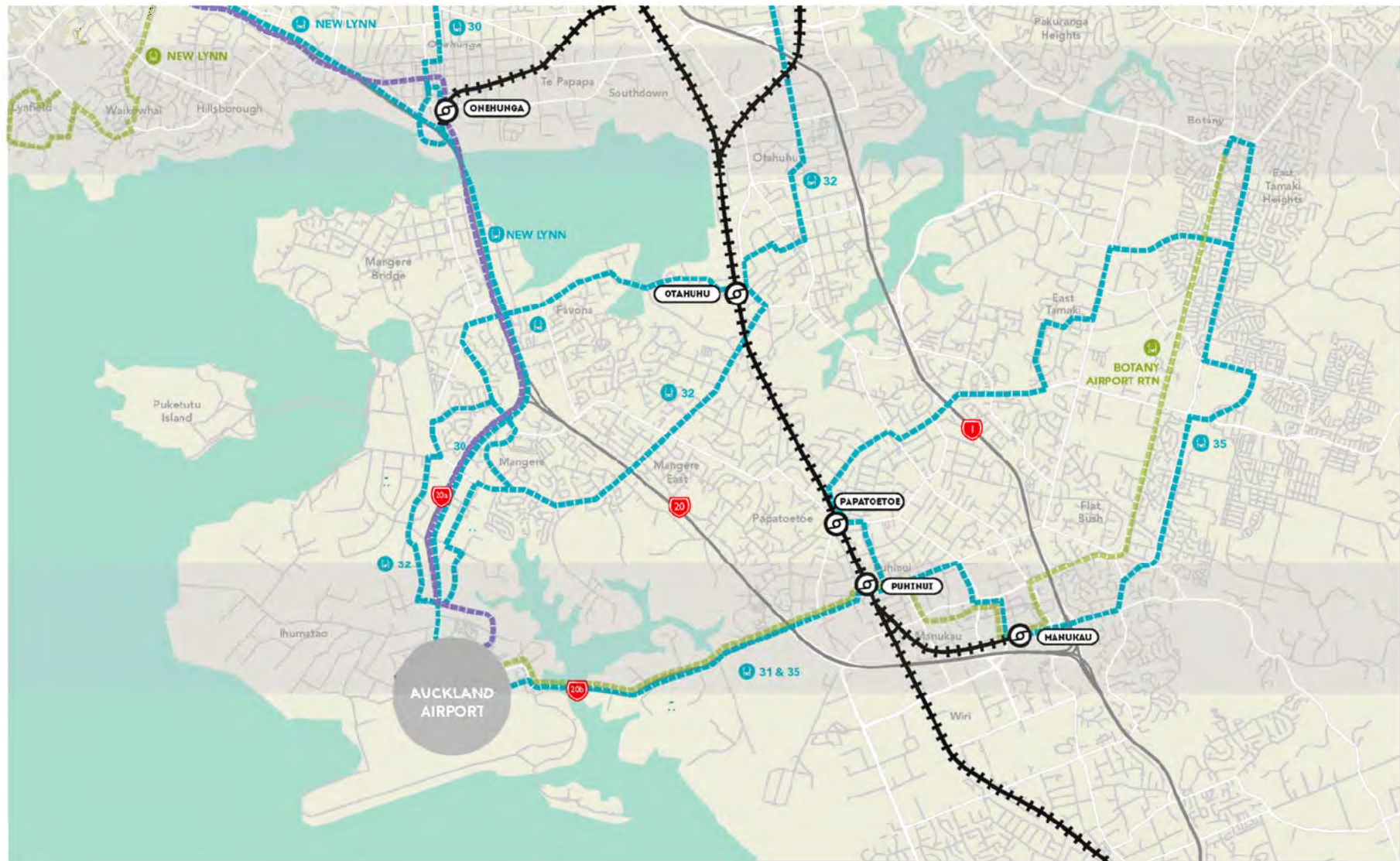
AUCKLAND AIRPORT PUBLIC TRANSPORT



KEY

Existing Train
 Existing Bus
 2020 Bus

AUCKLAND AIRPORT PUBLIC TRANSPORT



KEY

Existing Train
 Existing Bus
 2020 Bus
 2028 Bus
 2028 Light Rail

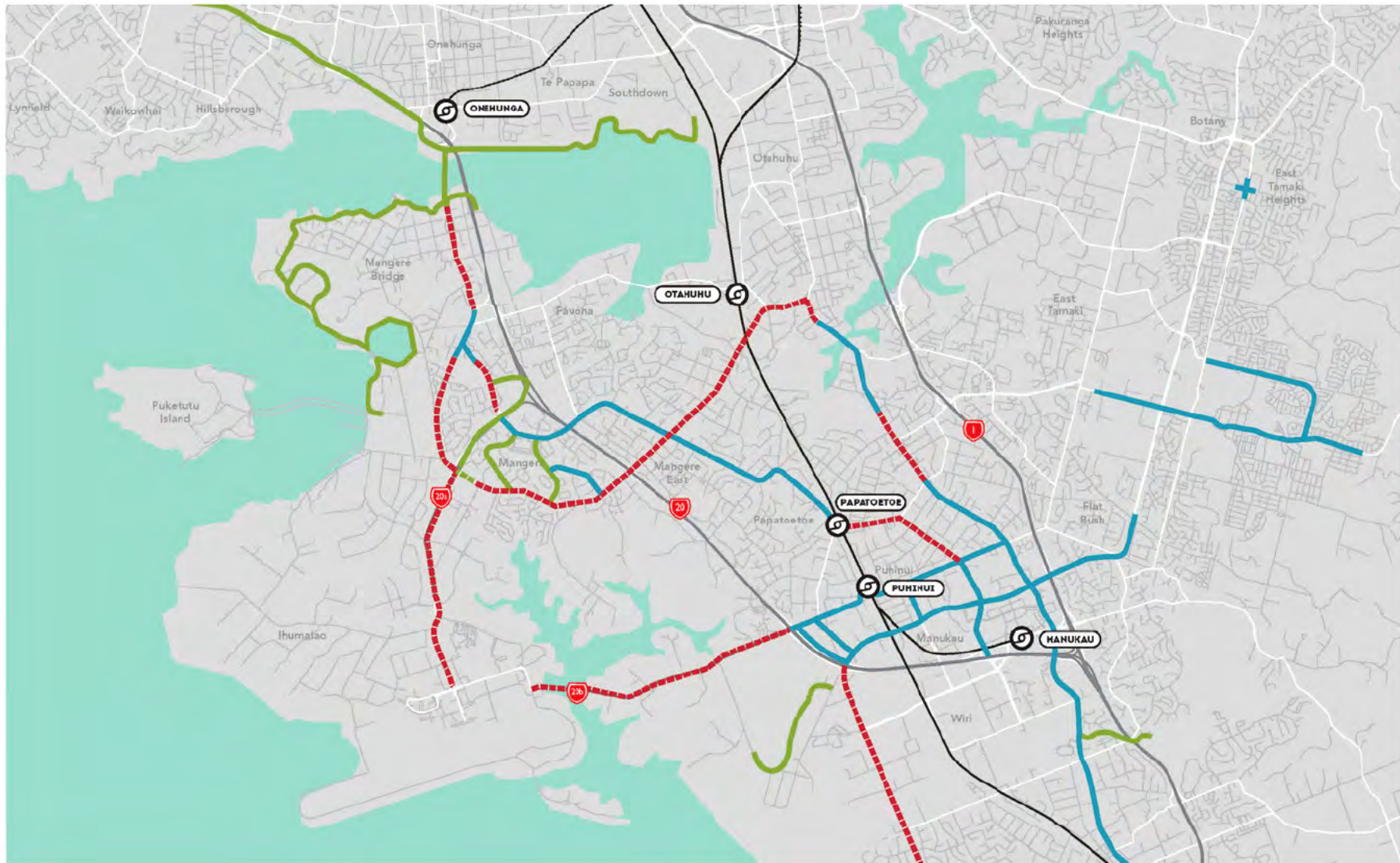
AUCKLAND AIRPORT FREIGHT



KEY

- Level 1A
- Level 1B
- Level 2
- Level 3
- Overdimension
- Industrial Areas

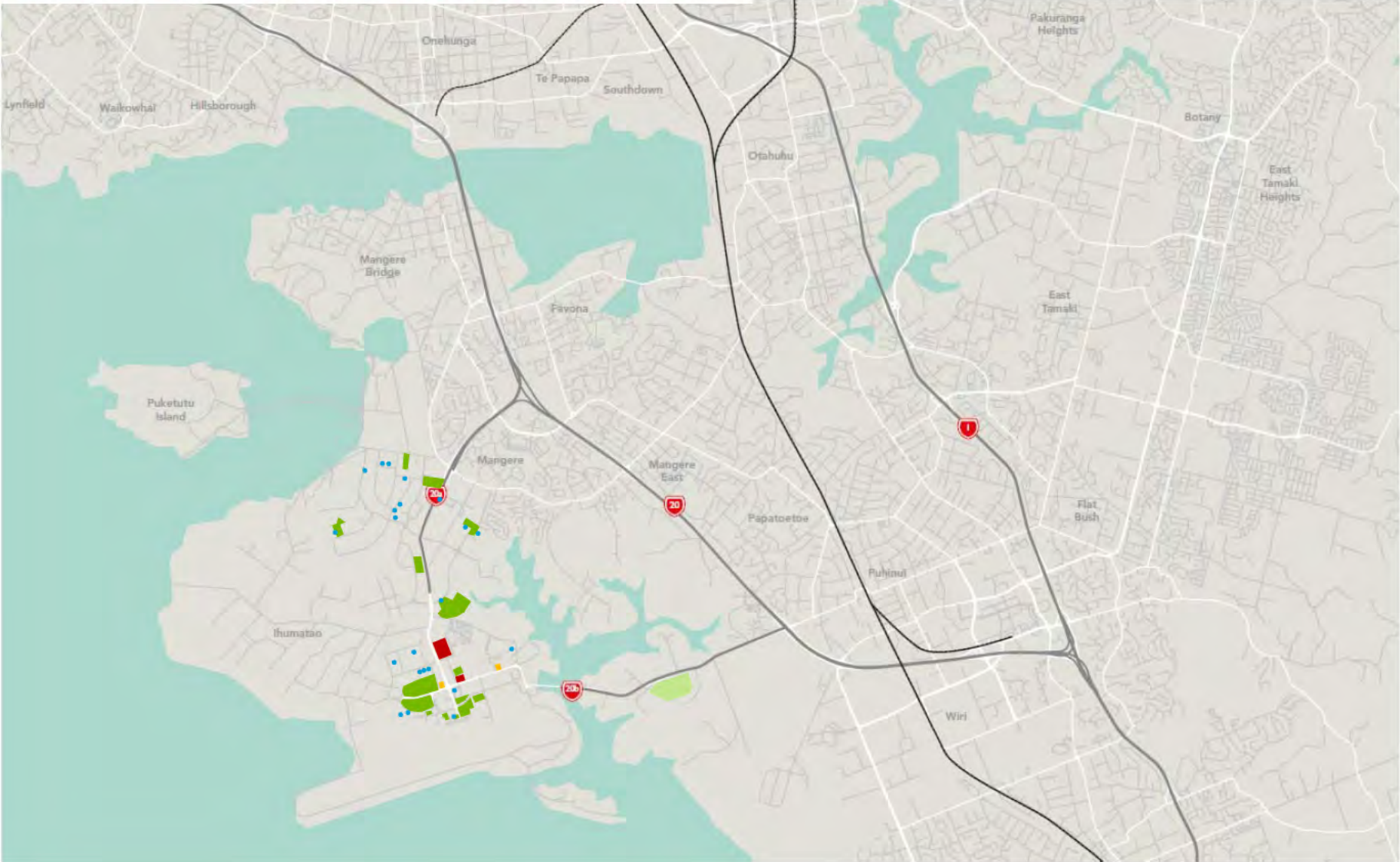
AUCKLAND AIRPORT WALKING & CYCLING (EXISTING & PROPOSED)



KEY

- Future cycle network/under investigation
- Existing unprotected cycle lane
- Existing protected cycle facilities

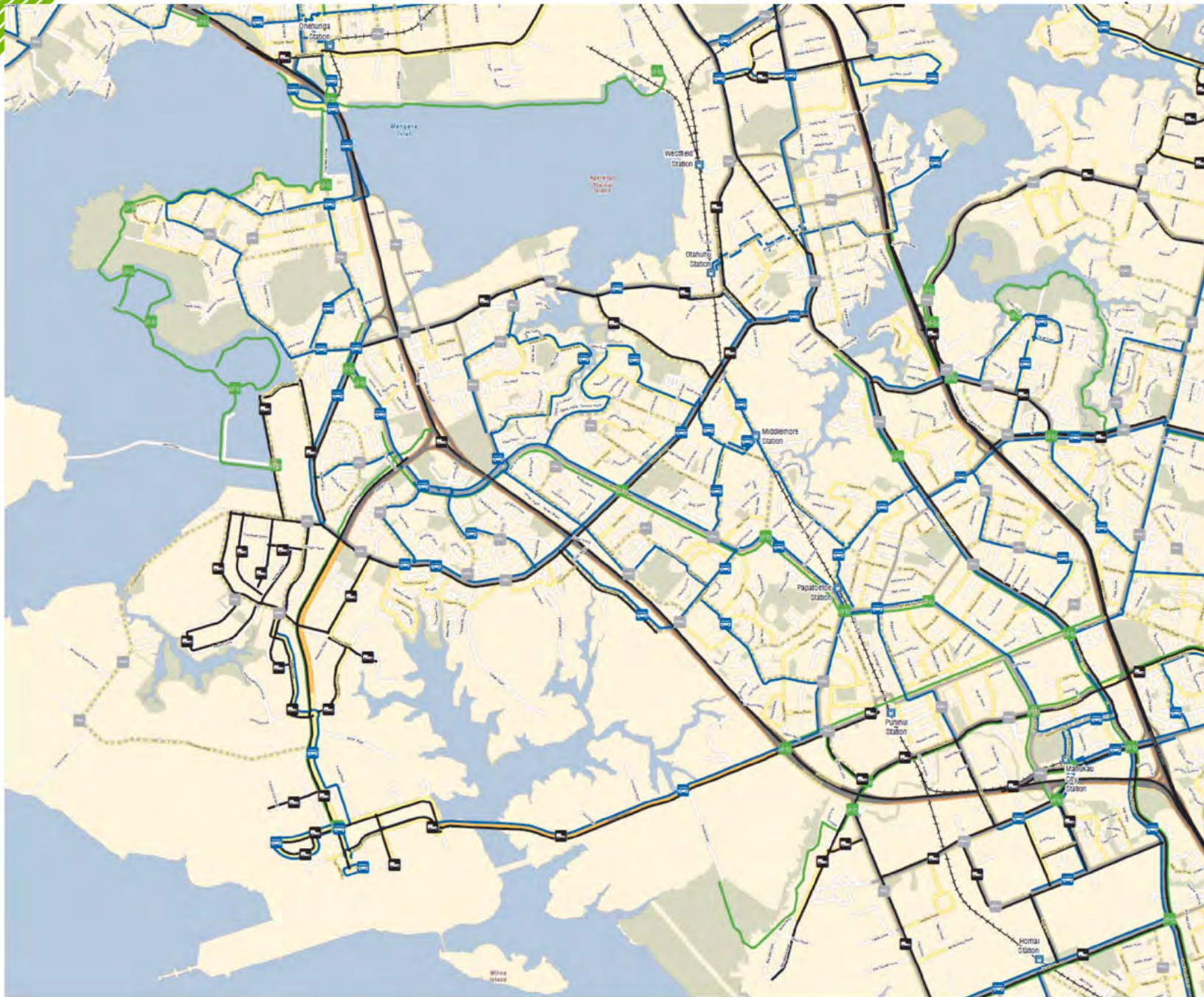
AUCKLAND AIRPORT GENERAL TRAFFIC FEATURES



KEY ■ Parking ■ Shopping Centres/
Food Court ■ Petrol Stations ■ Car Rentals

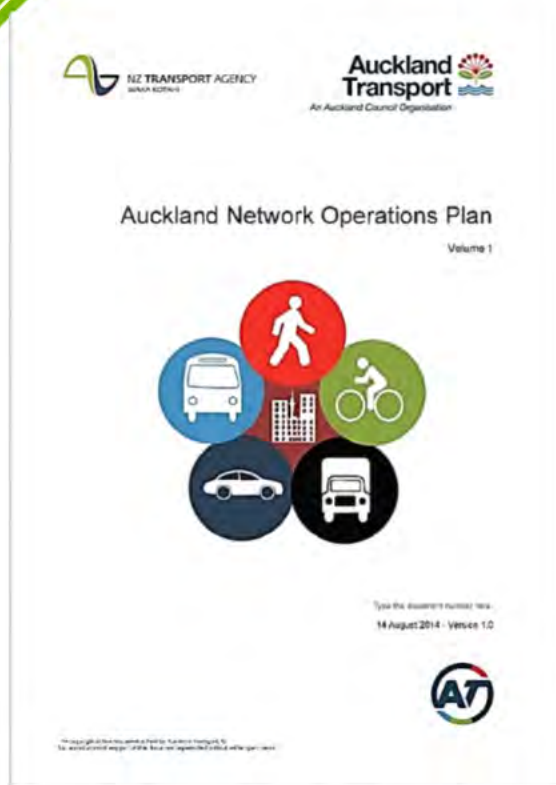
Changing shape of transport at the Airport





ideas
life

Bringing ideas
to life



ANOP road user hierarchy

1. Pedestrian
2. Cyclist
3. PT
4. Freight
5. General vehicle

?

26 However, hierarchy based on the strategic function of the route, its location and time of day.

aurecon

Testing the ANOP Priorities

Our customers

- **Workers**
 - Nine to Fivers
 - Shift workers
 - Airline crew
- **Passengers**
 - Leisure travellers
 - Business travellers
- **Meeters and Greeters**
- **Local traffic**
- **Freight**
 - Distribution centre trips to/from south-east
 - Distribution centre trips to/from north
 - Internal commercial vehicles
 - Dolly trains
 - Just in time
 - Construction Traffic
- **Others?**

Next Steps

- Refine operational objectives
- Develop prioritisation for customers by route
- Workshop 2 (mid March)



Appendix B

Workshop 2 record

*Bringing ideas
to life*

Airport Access DBC

Network Operating Plan Operational Priorities

26th March 2018



aurecon



A | Auckland
Airport

Agenda

1. Since the last workshop...
2. Workshop objectives
3. Agree Operational Principles
4. Discuss priorities (future state)
5. Interim network prioritisation
6. Next steps

Round Table



Since the last workshop

Airport Access DBC: Network Operating Plan – Development Framework



Workshop No.	Title	Key Discussion Topics	Dates
1	Operation Objectives Workshop	Agree user groups Potential conflicts / inconsistencies Common operational objectives High level user/mode priority	Mid February 2018
2	Operation Priorities Workshop	Confirm operational objectives Agree user/mode priority Network function	Mid March 2018
3	Management Strategies Workshop	Performance measures and targets Performance gaps Aligning with DBC long list options	Early April 2018
4	Agreement on First Draft NOP Workshop	Preferred strategy Deployment plan Post implementation evaluation framework	End of April 2018



DETAILED BUSINESS CASE

• INVESTMENT LOGIC MAP

• LONG LIST OPTION
ASSESSMENT

• SHORT LIST OPTION
ASSESSMENT

• PREFERRED
OPTION

JANUARY

FEBRUARY

MARCH

APRIL

MAY

JUNE

JULY

AUGUST

SEPTEMBER

OCTOBER

NOVEMBER

DECEMBER

• OPERATIONS
OBJECTIVES
WORKSHOP

• MANAGEMENT
STRATEGIES
WORKSHOP

• AGREEMENT ON
FIRST DRAFT NOP
WORKSHOP

• DRAFT NOP ----- ONGOING REVIEW AND REFINEMENT ----->

• INTRODUCTORY
MEETING

• OPERATIONS PRIORITIES
WORKSHOP

NETWORK OPERATING PLAN

Our users

- Airside Travel
 - Passengers
 - Airline crew
 - Time sensitive freight
- Workers
 - Nine to Fivers
 - Shift workers
- Meeters and Greeters
- Local traffic
 - Local trips
- Freight
 - Non-time sensitive freight
 - Construction Traffic
- Cyclists
 - Interested but concerned/ commuters
 - Recreational/ Tourist cyclists
- Placemaking function

Our modes

PUBLIC TRANSPORT

- Passengers (airside travel)
- Airline crew (airside travel)
- Nine to fivers (workers)
- Shift workers (workers)
- Meeters and Greeters

HEAVY COMMERCIAL VEHICLE

- Just in time freight (airside travel)
- Non-time sensitive freight
- Construction traffic

PEDESTRIANS / PLACEMAKING

- Passengers (airside travel)
- Airline crew (airside travel)
- Nine to fivers (workers)
- Shift workers (workers)
- Meeters and Greeters
- Local traffic

BICYCLES

- Nine to fivers (workers)
- Shift workers (workers)
- Recreational cyclists
- Interested but concerned local trips

GENERAL TRAFFIC

- Passengers (airside travel)
- Airline crew (airside travel)
- Just in time freight (airside travel)
- Nine to fivers (workers)
- Shift workers (workers)
- Meeters and Greeters
- Local traffic

Draft Operating Principles



Discussion Time

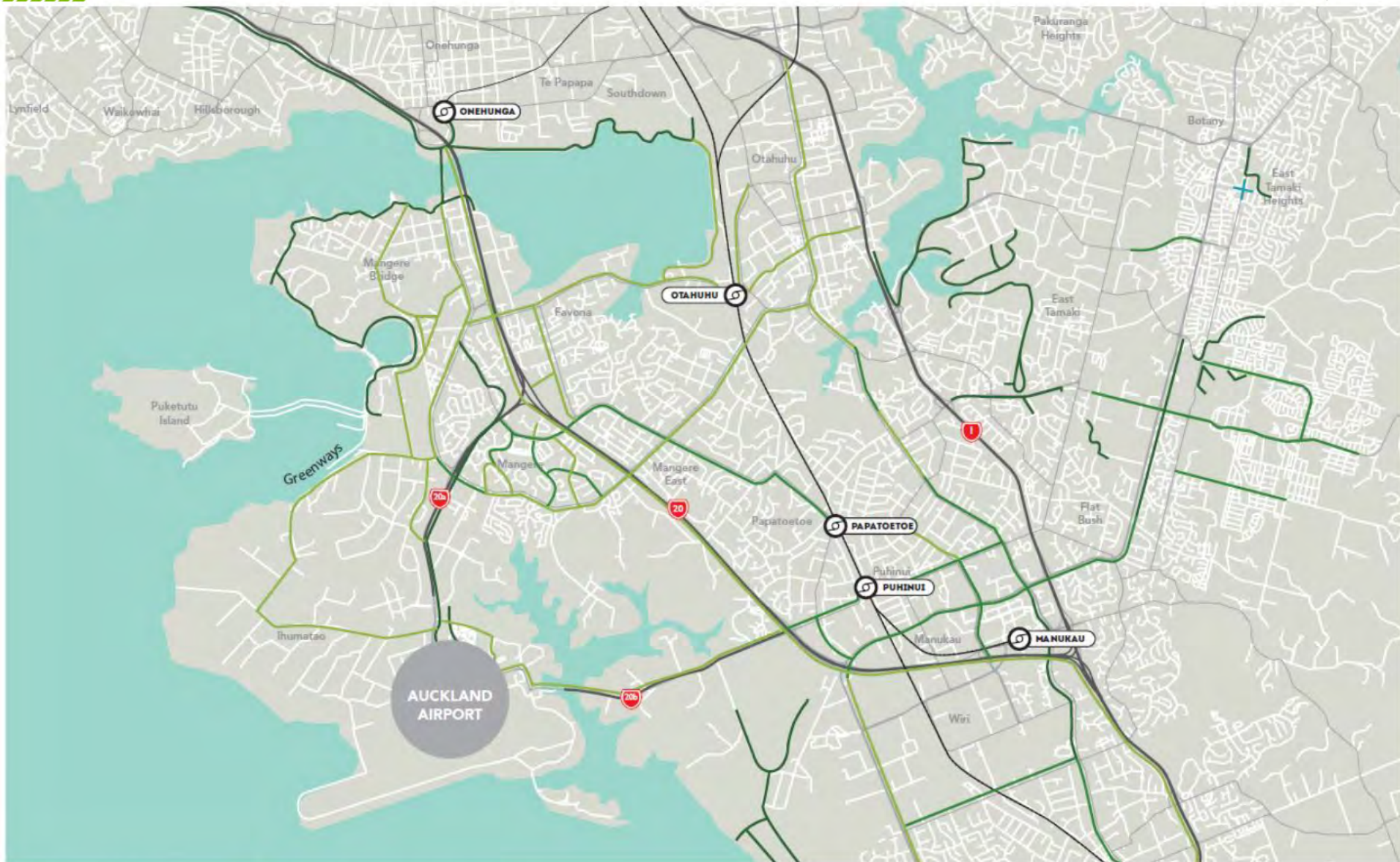
Network Priorities

Future focus – look toward the 2046 network

1. Priorities by mode
2. Priorities by time of day

From this we will address potential gaps in operational priority (develop a network management strategy) which will inform the DBC long list.

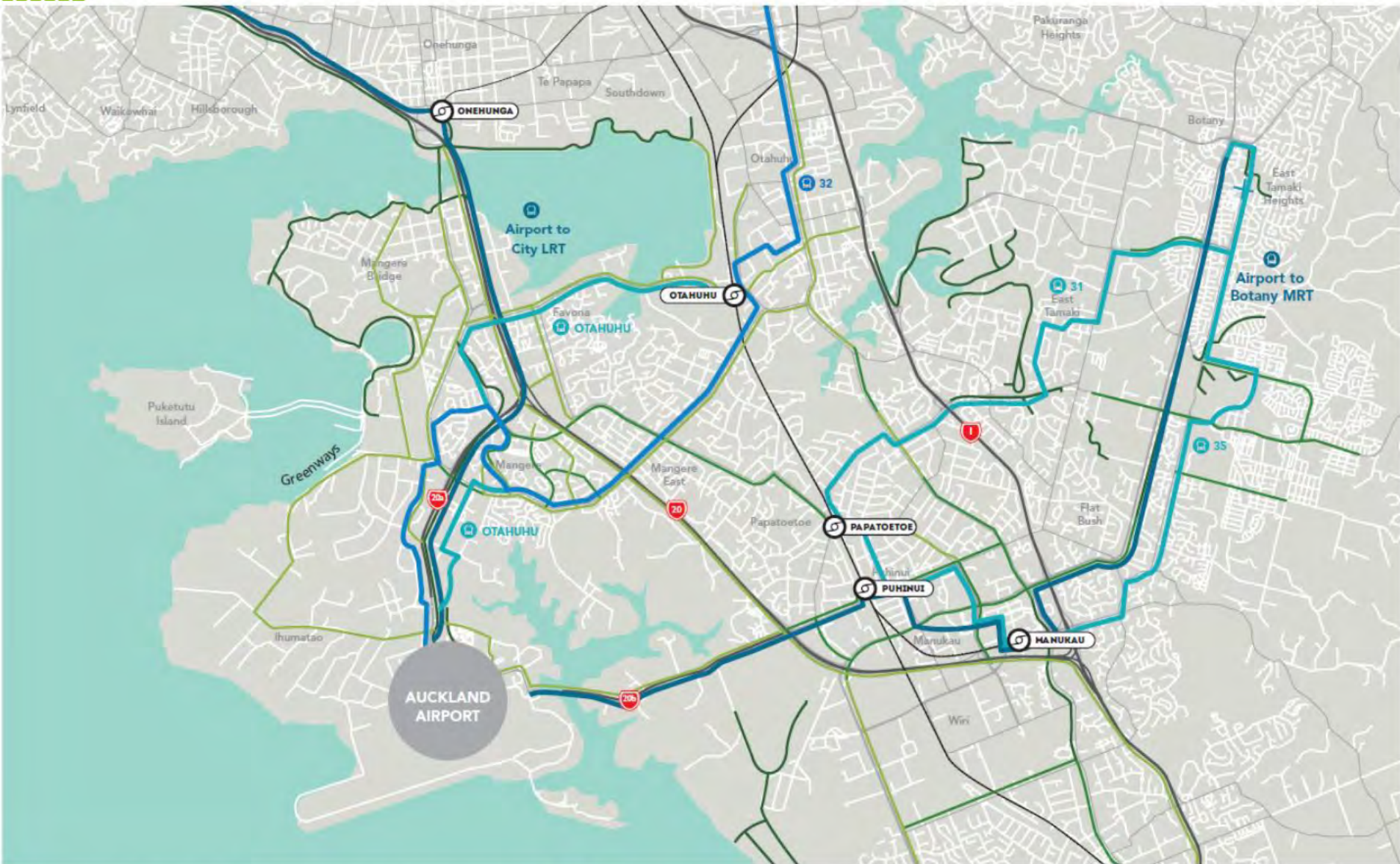
Bringing ideas
to life



KEY

- Arterial
- Motorway
- Separated Facility or Protected Cycle Lanes
- Unprotected Cycle Lanes
- Future Cycle Network

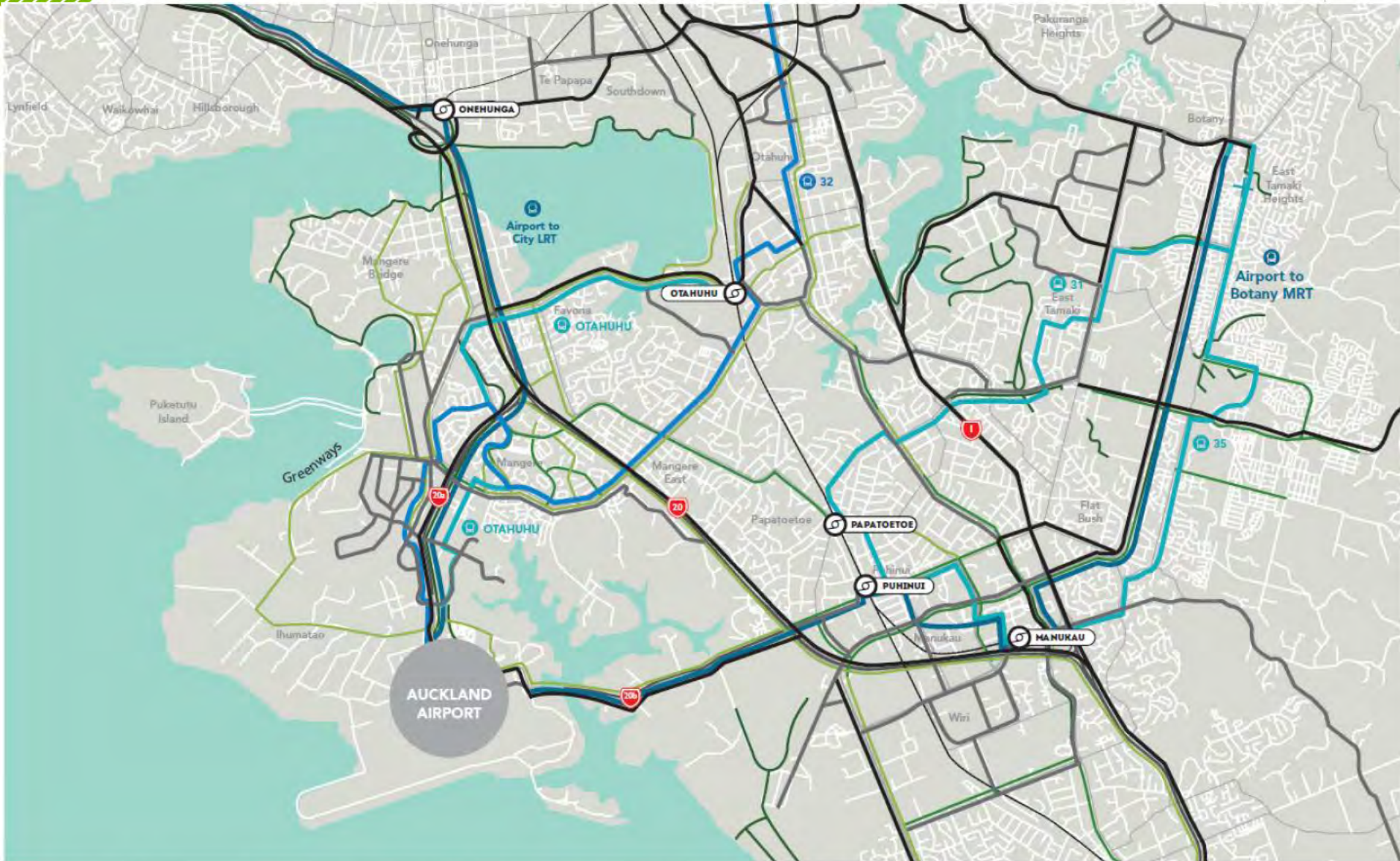
Bringing ideas
to life



KEY

- | | | |
|------------|---|-----------------------------------|
| — Arterial | — Separated Facility or Protected Cycle Lanes | — Mass Rapid Transit |
| — Motorway | — Unprotected Cycle Lanes | — Frequent Bus Service |
| | — Future Cycle Network | — Local or Connector Bus Services |

Bringing ideas
to life



KEY

- | | | | |
|------------|---|-----------------------------------|---------------------------|
| — Arterial | — Separated Facility or Protected Cycle Lanes | — Mass Rapid Transit | — Freight - Level 1A & 1B |
| — Motorway | — Unprotected Cycle Lanes | — Frequent Bus Service | — Freight - Level 2 & 3 |
| | — Future Cycle Network | — Local or Connector Bus Services | |

Next Steps

- Update network priorities based on today's discussion
- Feedback on final draft priorities?
- Finalise priorities by mode and by time of day
- Confirm network function
- Draft performance measures and performance targets for discussion.



Appendix C

Workshop 3 record



Southwest Gateway Programme Network Operating Plan

Workshop 3 – Network Performance

24th August 2018



Who's who





Safety share

Workshop Objectives



Determine network performance measures and KPIs



Agree mode priorities along key routes



Introduce long list options and Operations input into the multi-criteria analysis



Share operations inputs into the Long-list MCA assessment



Discuss the way forward for Network Operations/ Concept of Operations development for 2020



1. Recap

NOP Workshops

Workshop No.	Title	Key Discussion Topics	Dates
1	Operation Objectives Workshop	Agree user groups Potential conflicts / inconsistencies Common operational objectives High level user/mode priority	Mid February 2018
2	Operation Priorities Workshop	Agree on the area of influence Network function Agree user/mode priority	Mid March 2018
3	Network Performance Workshop	Performance measures and targets Aligning with DBC long list options	August 2018
4	Agreement on First Draft NOP Workshop	Preferred management strategies Deployment plan Post implementation evaluation framework	tbc

Operations Plan Hierarchy

Network Operating Plan (NOP)

Road Controlling
Authority's vision and
priorities

**Concept of Operations
(CoO)**

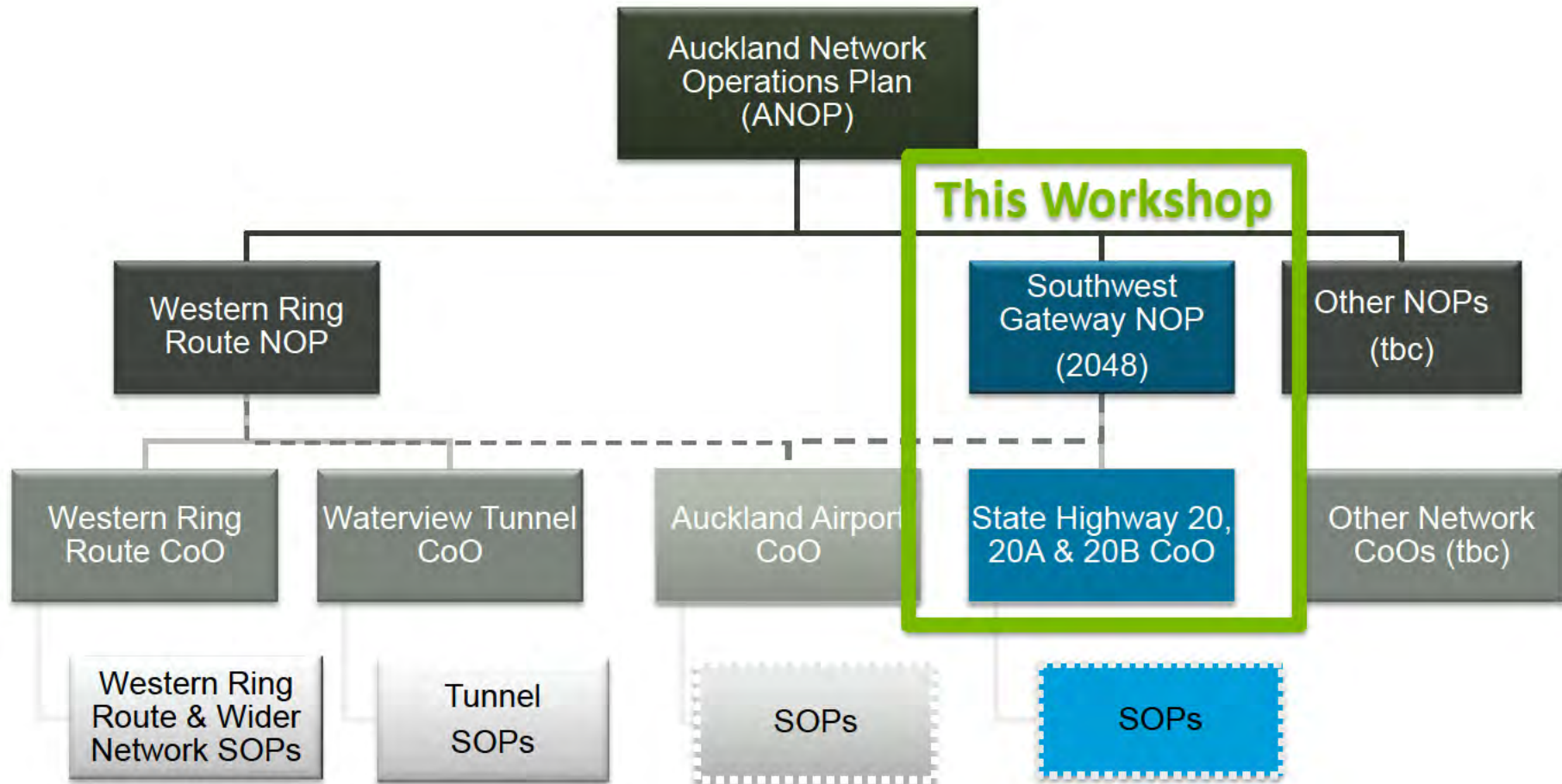
Network operators
responses to deliver
outcomes in NOP

**Standard Operating
Procedures
(SOPs)**

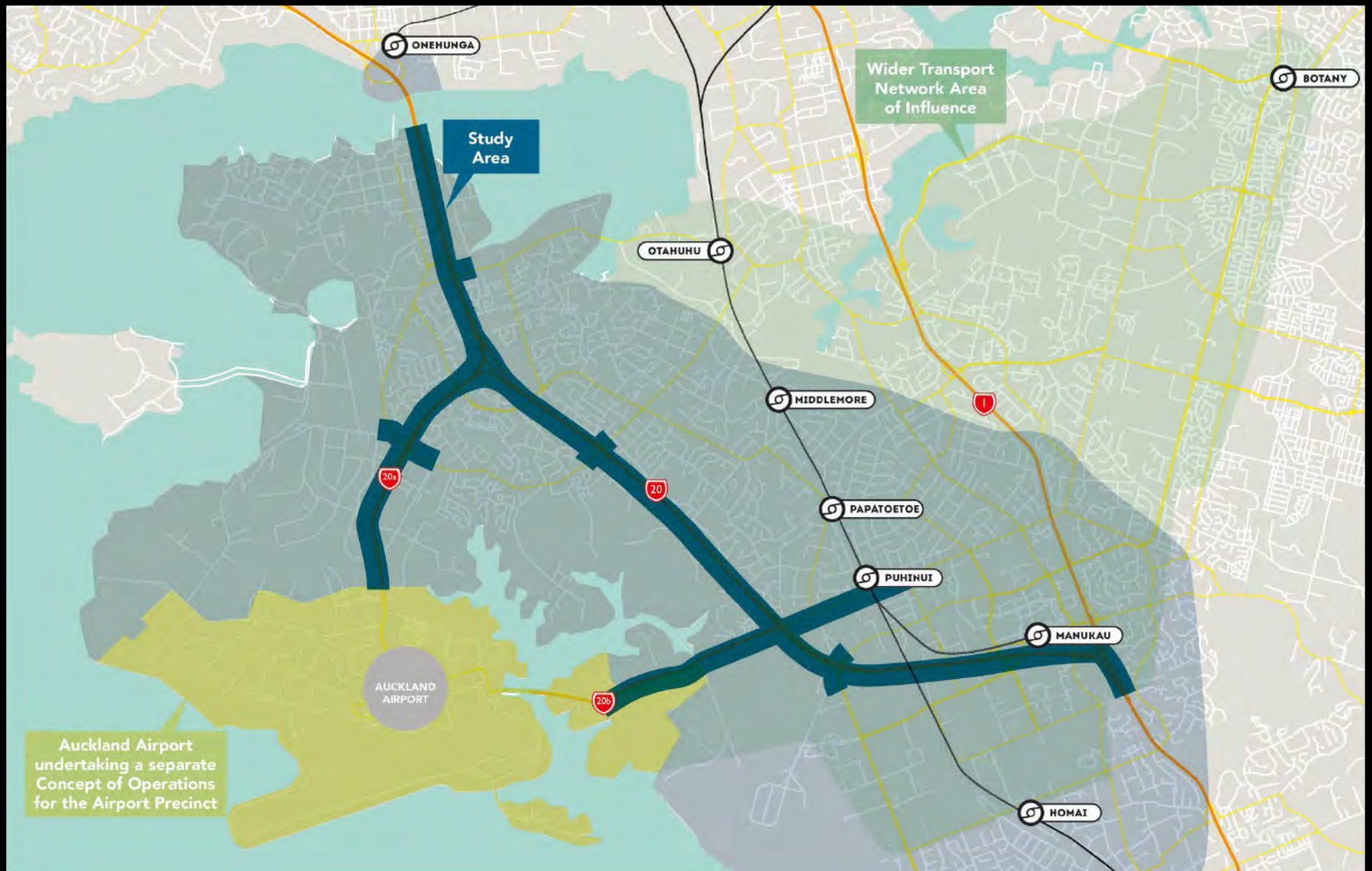
Set of instructions to
operators



Southwest Gateway Operations Workstreams



Study Area





Our Operating Principles





What's been happening

- Stakeholder engagement
- Identification of long list of options for state highway improvements and public transport corridors
- Developed a list of key performance indicators and measures to assess network performance
- Development of scheme linking Puhinui Station to the Airport for early implementation.



2. Key Performance Indicators and Measures



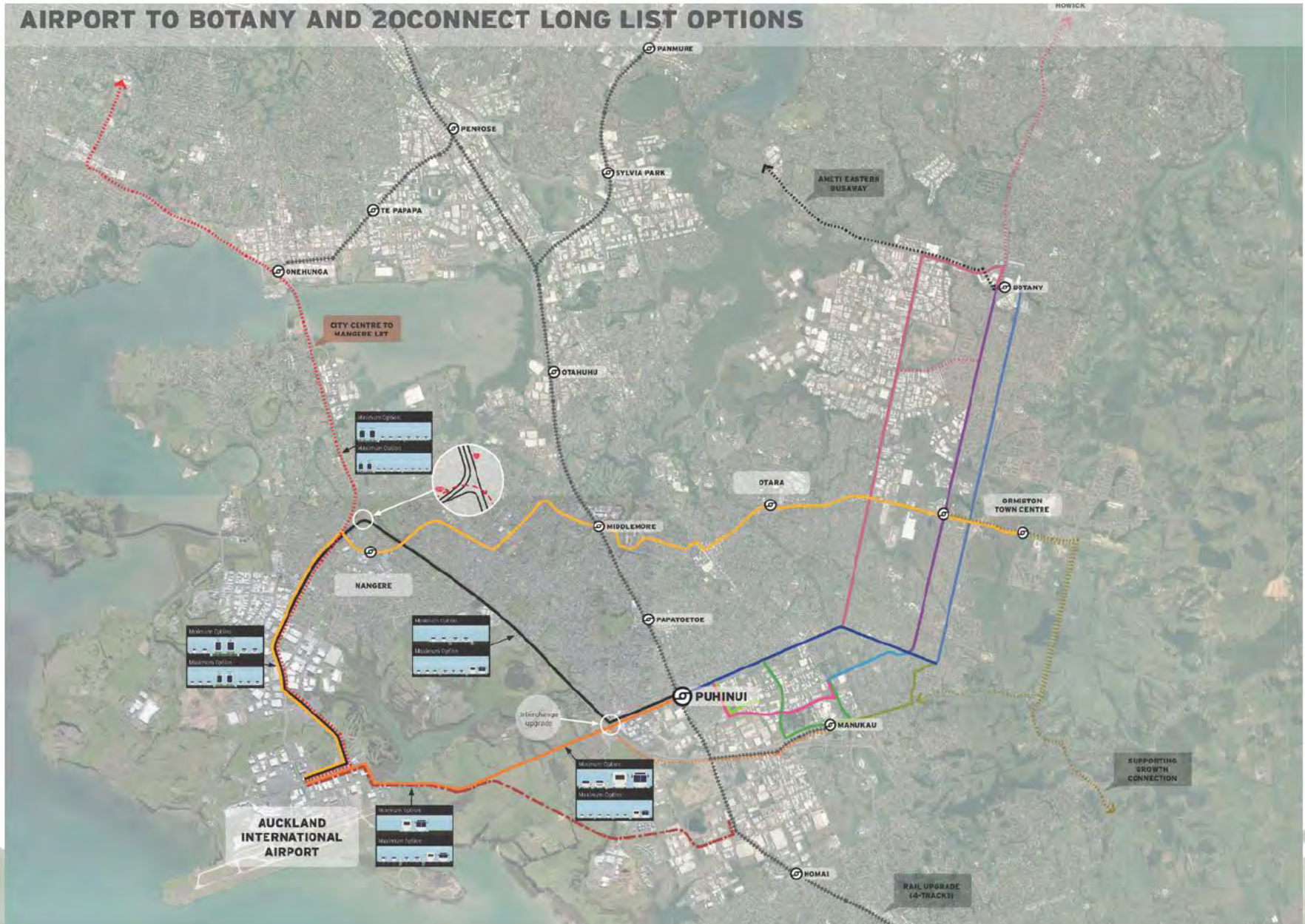
3. Mode Priorities

4. Longlist Options

Option	Intent	Key Considerations
C1a: SH20A High Investment Only With/Without MRT / LRT on SH20a	Reduce reliance on SH20B SH20A becomes main access to airport	• MRT/LRT • Pukaki Bridge • SH20 widening
C1b: SH20A High Investment - 20B converted to RTN	Reduce reliance on SH20B	• Pukaki Bridge • TDM – RTC • SH20 widening
C2a: SH20B High Investment Only - Motorway Puhinui South-Facing Ramps Only	Improve access to development land from the south	• SH20A corridor • Memorial Gardens • SH20 widening
C2b: SH20B High Investment Only - Motorway Puhinui All Ramps	Improve access to development land and airport from the north and south	• Memorial Gardens • TDM • SH20 widening
C3: SH20A and SH20B High Investment	Improve access to the airport through SH20A and SH20B corridors	• PT uptake – mode split/TDM • SH20A Corridor • Pukaki Bridge • SH20 widening
C4a: Balanced Approach - SH20B Expressway	Provide improved access through SH20B corridor Resilience through 20A to 20 Connection	• SH20B grade-separation • SH20 widening



Longlist Options



Investment objectives						Option number	1	2	3	
						Option title	Base Case	C1a	C1a1	
						Option description	Existing Environment	SH20A high investment Only With MRT C1a/ LRT on SH20a	SH20A high investment Only Without MRT / LRT on SH20a	SH20A / 20B co
						Weighting				
20Connect Benefits										
20Connect Investment Objectives										
20Connect KPI										
20Connect Measures										
Actions and precinct area	1. More reliable and resilient transport system	To improve the reliability and resilience of the transport system	KPI 1: Capacity in the system v forecast demand	Degree of saturation of key links and intersections	5.00%	0	2	2		
			KPI 2: Separation of movements and amount of conflict in the system	No. and performance of grade separations and at-grade junctions and intersections	5.00%	0	-1	3		
			KPI 3: Ability for high priority trips to be have reliable journeys	Length of separated rights of way for freights, PT, HOVs and special uses.	5.00%	0	-1	3		
				Volume/capacity of key routes and special purpose lanes	5.00%	0	-1	3		
Choices limits customers, goods	2. A more prosperous Airport Precinct area, Auckland and New Zealand.	To improve economic performance of the airport area, Auckland and New Zealand	KPI 4: Population accessible to jobs in the airport area	Population within 30 minute trip during peak hours 2046	5.00%	0	-1	3		
			KPI 5: Jobs accessible from Ormiston, Otara, Botany, Manukau and Papakura	Jobs within 30 minutes trip during peak hours 2046. Correlate with deprivation and Do-min levels of access	5.00%	0	-1	3		
			KPI 3: Ability for high priority trips to be have reliable journeys	Length of separated rights of way for freights, PT, HOVs and special uses.	5.00%	0	-1	3		
				Travel time for key journeys: - City - Airport - Papakura - Airport	5.00%	0	2	2		
			KPI 6: Travel time and reliability for key routes.	Assessment of reliability for each	5.00%	0	-1	3		
				Emissions assessment from models	10.00%	0	1	1		
			KPI 7: Air quality / emissions from transport system.	Change in quantity and quality of stormwater due to changes in paved area and stormwater management infrastructure introduced	5.00%	0	-1	3		
			KPI 8: Water quality effects of transport system	Extent of effects on: - sites, buildings and places of heritage value. - sites and places of archaeological value.	5.00%	0	-1			
Environment is air enhanced	Reduce the effects of the transport system on the environment and tsonga.		KPI 9: Effects on places of Heritage	Extent of effects on the relationship of Māori to their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other Tsonga (tangible and intangible).		0	-1			
			KPI 10: Māori communities and wellbeing.	Eff - water and other sources in Māori.		0	-1			
			KPI 11: Te Taiao (Air, Land, water, Tsonga):	opportunities to the relation, water, site, and place.						
			KPI 12: Effects on culture or title	Tsonga (tangible and intangible).						

MCA Assessment – operations inputs



5. Horizon 2020

Do these Operating Principles still apply?

Offering Thoughts for short term operating Principles

Construction Traffic

- Prioritise construction traffic access over HCV through trips

Safe Access

- Maintain safe access for pedestrians and cyclists (where it already exists)?

Temporary Traffic Management

- Maintain two way access during peak periods

Rat Running/ Local amenity

Can we deliver on these principles in the short term in the absence of the SH20A to SH20 southbound connection?



6. Next Steps

- Engage with stakeholders
- Longlist assessments
- Identify operational design options to mitigate conflict hotspots

Appendix D

HCV movements for March 2018

eRUC data screen-lines analysed

AUCKLAND AIRPORT NETWORK OPERATING PRIORITIES

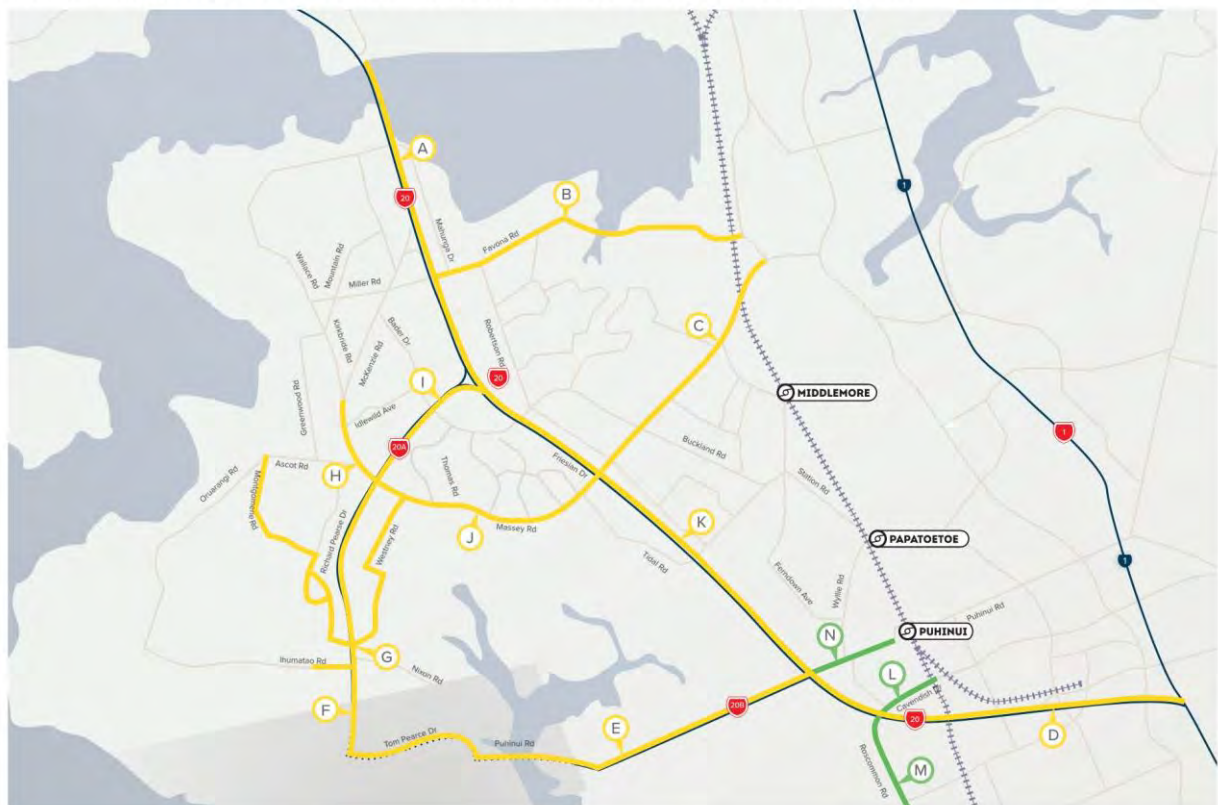


Figure D-1 Approximate screen line locations

HCV journeys from specified origins

The following images provide a snapshot of the journeys taken by HCVs in the network. They provide a sum total of the trips undertaken in the weekdays of March 2018. i.e. are a sum of 22 days' worth of HCV movements. The following plots are for a 24 hour and a 3 hour PM peak period with trips entering the network at screen-lines A, D, F and M.

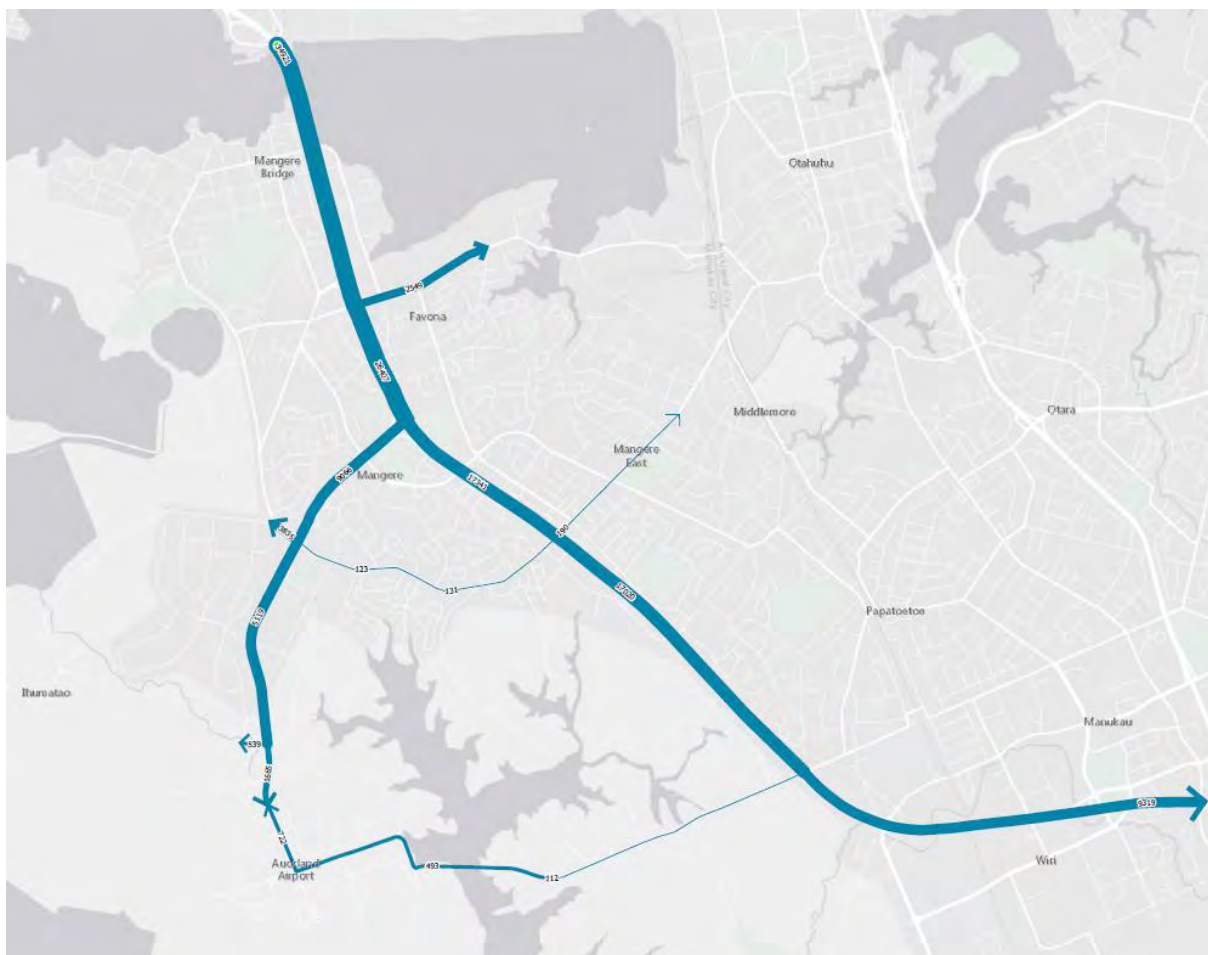


Figure D-2 24hr period HCV eRUC volume, origin A southbound



Figure D-3 Afternoon peak HCV eRUC volume, origin A southbound



Figure D-4 24hr period HCV eRUC volume, origin D westbound

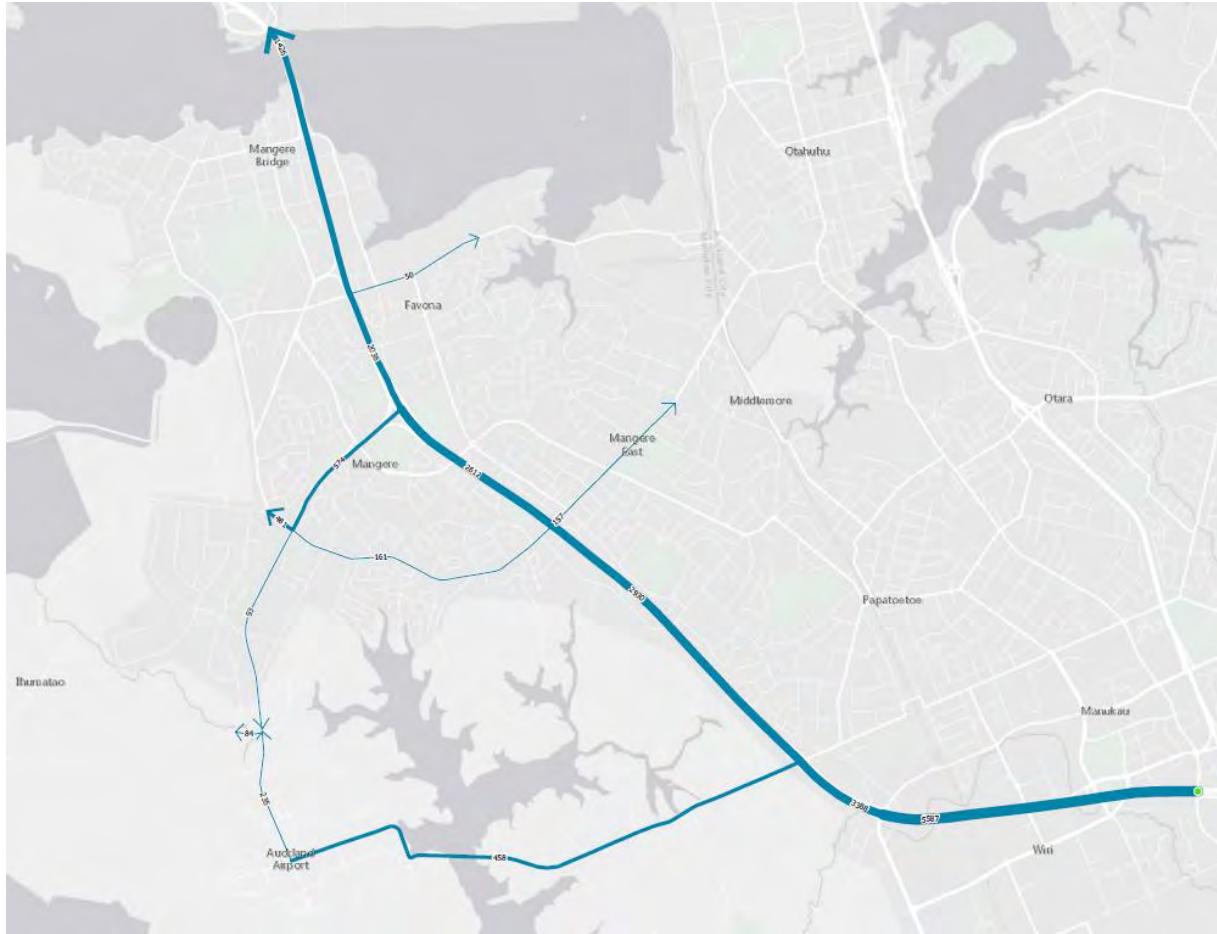


Figure D-5 Afternoon peak HCV eRUC volume, origin D westbound

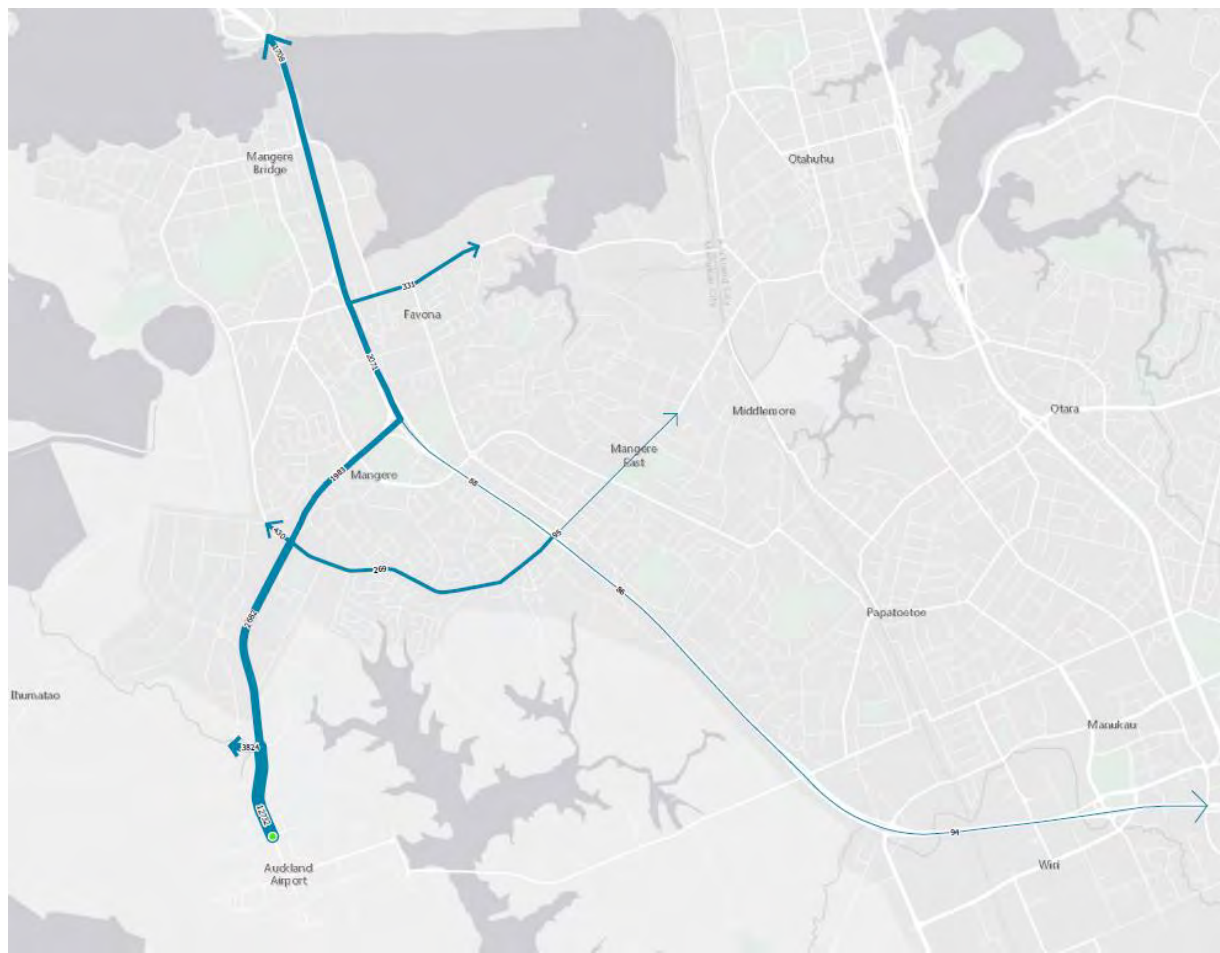


Figure D-6 24hr period HCV eRUC volume, origin F northbound

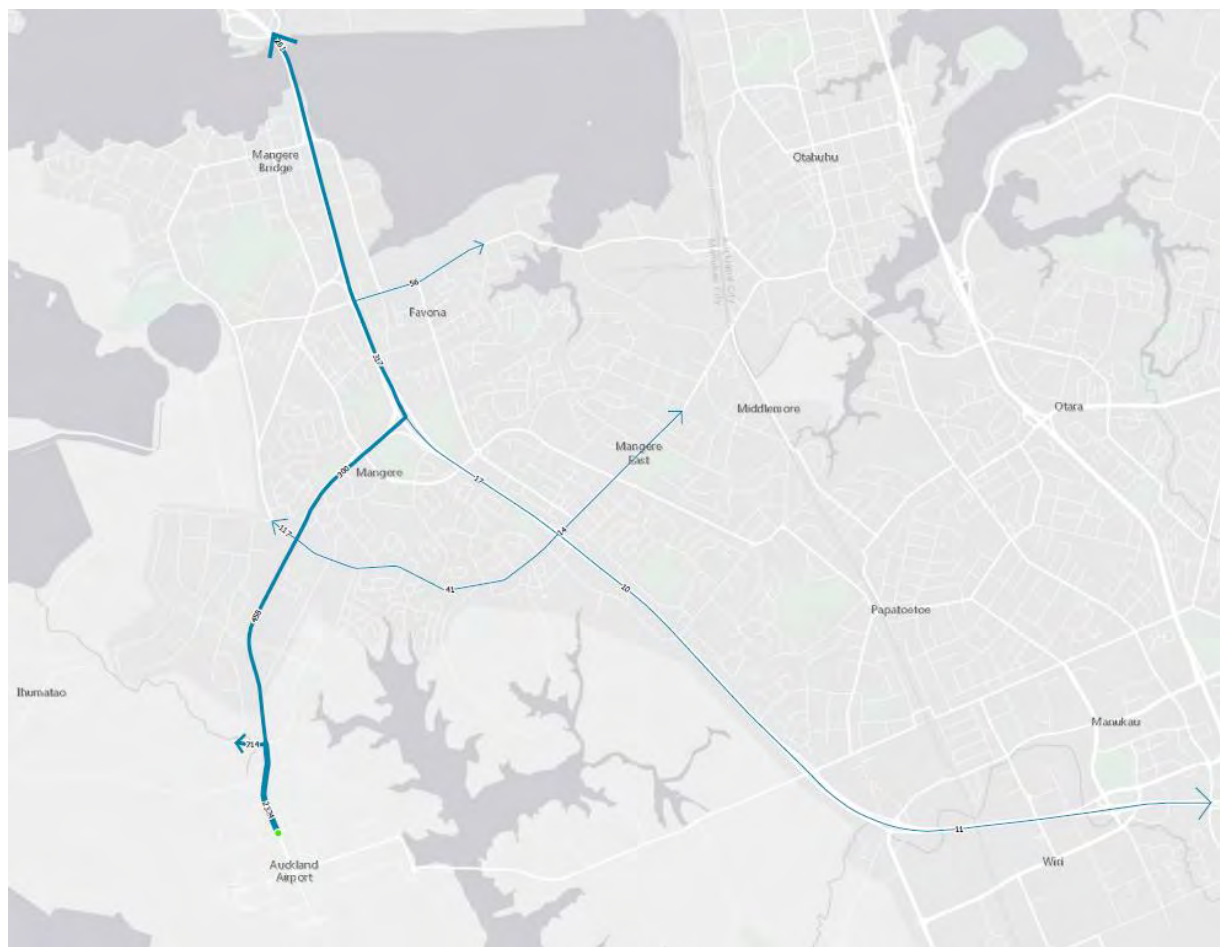


Figure D-7 Afternoon peak period HCV eRUC volume, origin F northbound



Figure D-8 24hr period HCV eRUC volume, origin M northbound

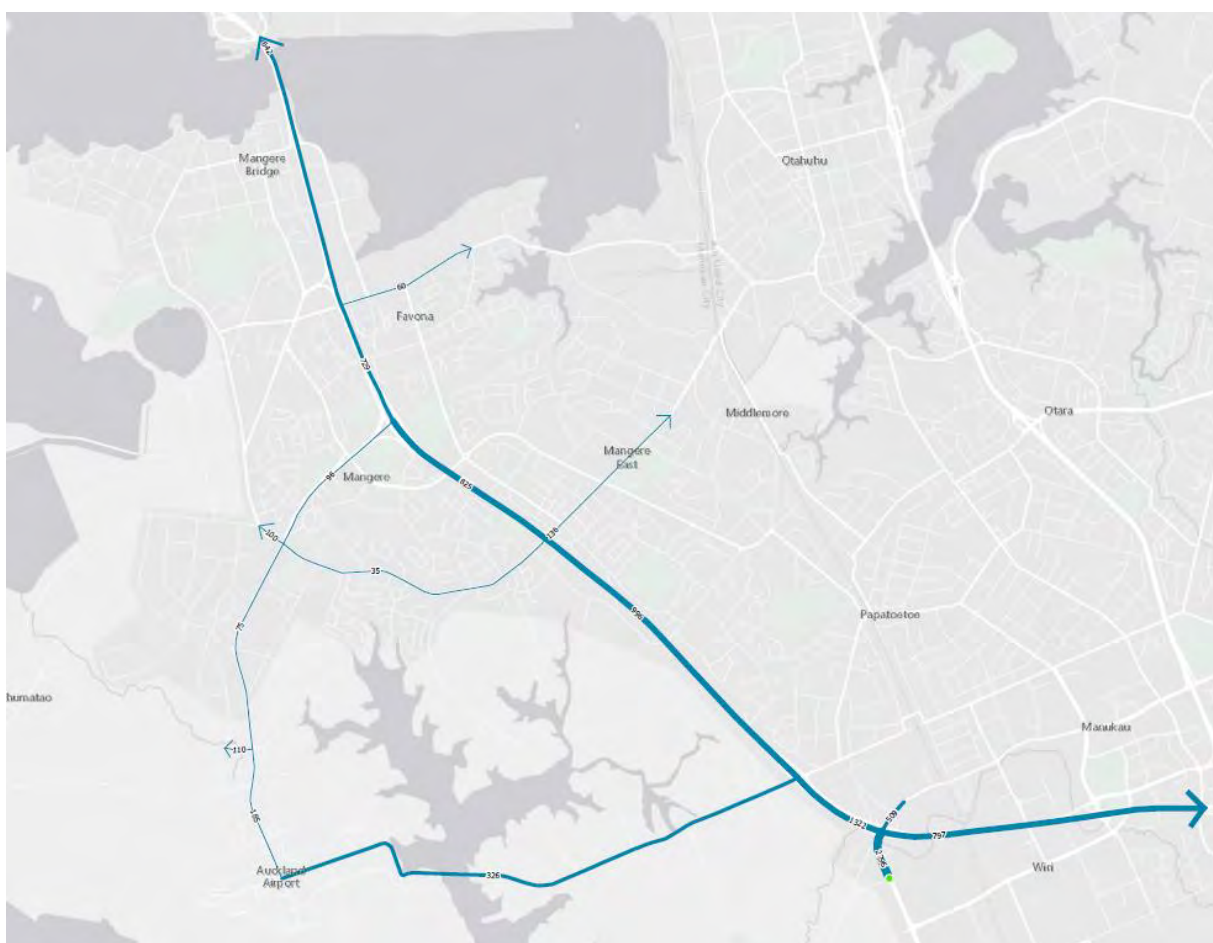


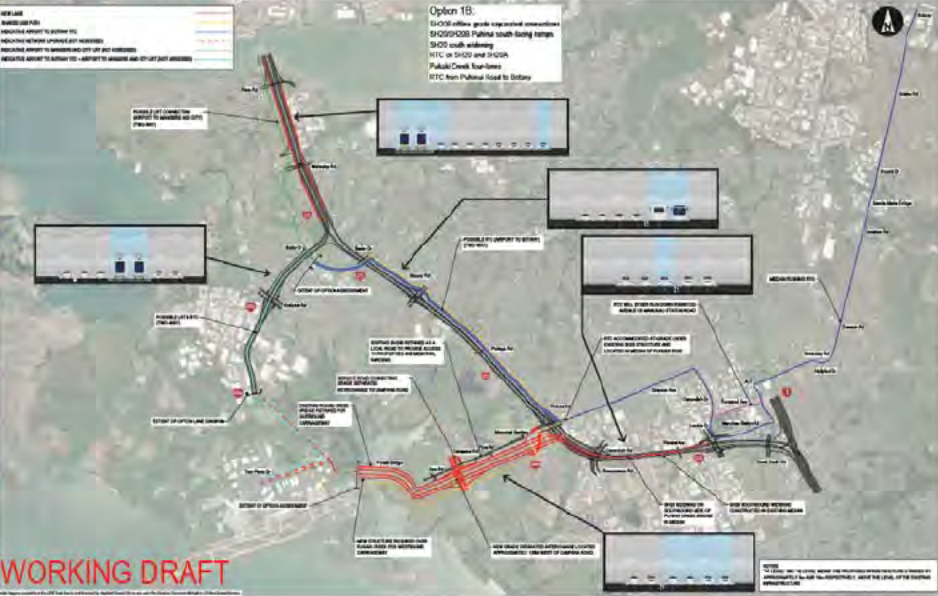
Figure D-9 Afternoon peak HCV eRUC volume, origin M northbound

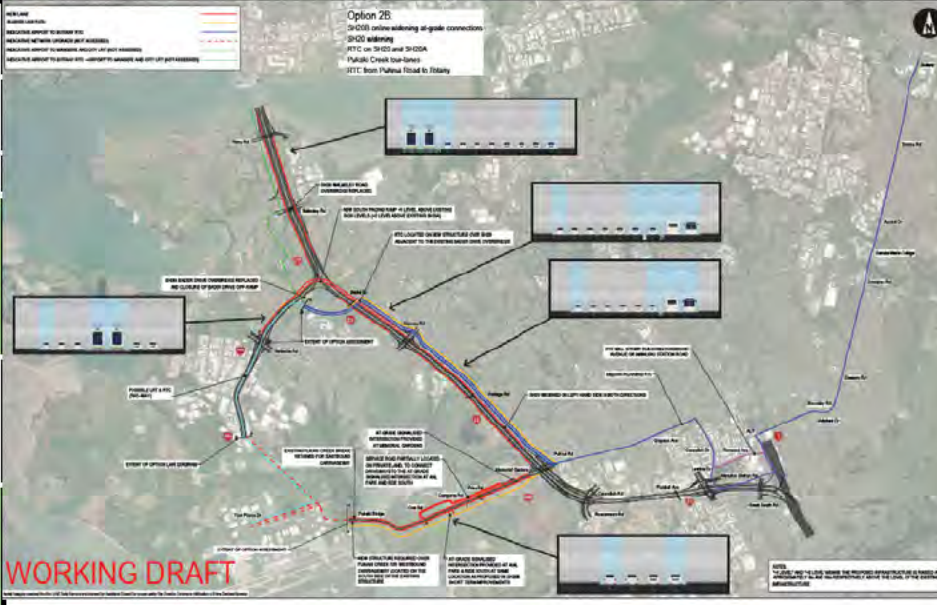


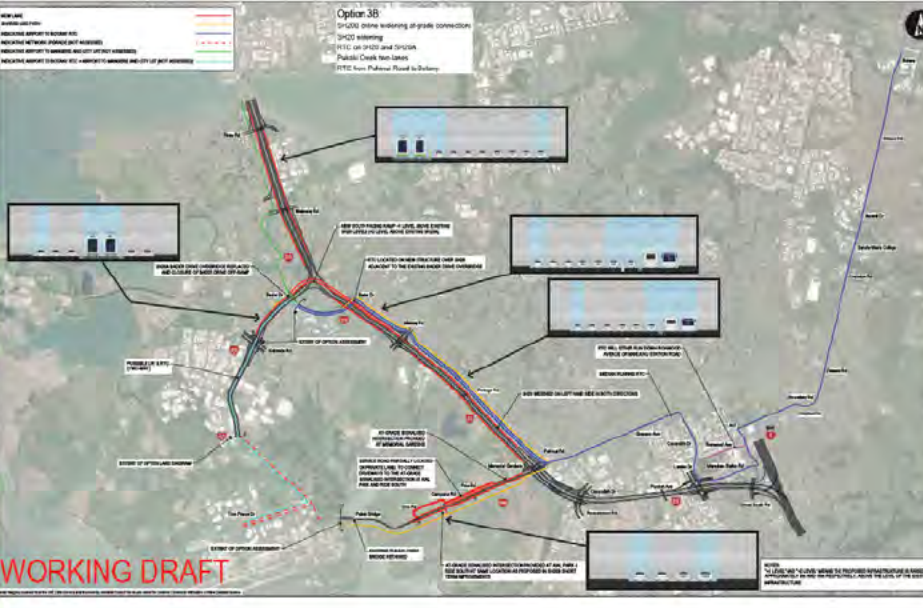
Appendix E

Operational assessment of long list options

Investment Objectives and Associated NOP Operating Principles

Option Descriptions		Assessment	SCORE: To improve health, safety and security of people	SCORE: To improve the reliability and resilience of the transport system	SCORE: To improve economic performance of the airport area, Auckland and New Zealand	SCORE: Reduce the effects of the transport system on the environment and taonga	SCORE: A network that provides value for money	Map
Option 1A	SH20B offline grade separated connections	Reduction in vehicle conflicts; Improved safety of users; Reduction in travel times; Improved travel time reliability; Minimal impact on amenity function of local town centre and residential area;	2	2	2	0	0	
	SH20/SH20B Puhinui south-facing ramps	Improve travel time reliability to the airport; Increased arrival rates at SH1/ SH20 could increase localised delays and queue build up on SH20.	1	1	1	0	0	
	SH20 widening	Reduction in conflict points; Reduced weaving on through lanes	1	1	1	0	0	
	RTC on SH20B	Improve public transport journey experience; Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required.	2	3	3	2	2	
	Pukaki Creek four-lanes	Improved airport access; Improved trip reliability for airport traffic; Reduced travel time; Increased trip reliability along SH20B. Additional capacity could encourage rat-runs through the airport.	0	1	1	0	0	
	RTC from Puhinui Road to Botany	Improved public transport journey experience; Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required; Improve accessibility to local town and business.	2	3	3	2	2	
Option 1B	SH20B offline grade separated connections	Reduction in vehicle conflicts; Improved safety of users; Reduction in travel times; Improved travel time reliability; Minimal impact on amenity function of local town centre and residential area;	2	2	2	0	0	
	SH20/SH20B Puhinui south-facing ramps	Improve travel time reliability to the airport; Increased arrival rates at SH1/ SH20 could increase localised delays and queue build up on SH20.	1	1	1	0	0	
	SH20 widening	Reduction in conflict points; Reduced weaving on through lanes	1	1	1	0	0	
	RTC on SH20 and SH20A	Improve public transport journey experience - but longer journey time from eastern approach than A options Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required;	2	3	2	1	2	
	Pukaki Creek four-lanes	Improved airport access; Improved trip reliability for airport traffic; Reduced travel time; Increased trip reliability along SH20B. Additional capacity could encourage rat-runs through the airport.	0	1	1	0	0	
	RTC from Puhinui Road to Botany	Improve public transport journey experience; Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required; Improve accessibility to local town and business.	2	3	3	2	2	

Investment Objectives and Associated NOP Operating Principles							
Option Descriptions		Assessment	SCORE: To improve health, safety and security of people	SCORE: To improve the reliability and resilience of the transport system	SCORE: To improve economic performance of the airport area, Auckland and New Zealand	SCORE: Reduce the effects of the transport system on the environment and taonga	SCORE: A network that provides value for money
Option 2A	SH20B online widening at-grade connections	Reduced speed differential, through facilitation of local traffic via Service road; Some reliability improvements for time-sensitive airport traffic Fewer diversion/ detour route availability than offline option	1	1	1	0	0
	SH20A/SH20 southbound interchange ramp	Alternative routes for southbound traffic; Reduction of rat-running freight and general traffic through airport precinct and local roads, improving local amenity	1	2	3	2	
	SH20 widening	Reduce weaving on through lanes; Reduce conflict points;	1	1	1	0	0
	RTC on SH20B	Improve public transport journey experience - more direct connection than SH20; Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required.	2	3	3	2	2
	Pukaki Creek four-lanes	Improved airport access; Improved trip reliability for airport traffic; Reduced travel time; Increased trip reliability along SH20B. Additional capacity could encourage rat-runs through the airport.	0	1	1	0	0
	RTC from Puhinui Road to Botany	Improve public transport journey experience; Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required; Improve accessibility to local town and business.	2	3	3	2	2
Option 2B	SH20B online widening at-grade connections	Reduced speed differential, through facilitation of local traffic via Service road; Some reliability improvements for time-sensitive airport traffic Fewer diversion/ detour route availability than offline option	1	1	1	0	0
	SH20A/SH20 southbound interchange ramp	Alternative routes for southbound traffic; Reduction of rat-running freight and general traffic through airport precinct and local roads, improving local amenity	1	2	3	2	
	SH20 widening	Reduce weaving on through lanes; Reduce conflict points;	1	1	1	0	0
	RTC on SH20 and SH20A	Improve public transport journey experience - but longer journey time from eastern approach than A options Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required; Improve accessibility to local town and business.	2	3	2	1	2
	Pukaki Creek four-lanes	Improved airport access; Improved trip reliability for airport traffic; Reduced travel time; Increased trip reliability along SH20B. Additional capacity could encourage rat-runs through the airport.	0	1	1	0	0
	RTC from Puhinui Road to Botany	Improve public transport journey experience; Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required; Improve accessibility to local town and business.	2	3	3	2	2
							
							

Investment Objectives and Associated NOP Operating Principles							Map
Option Descriptions	Assessment	SCORE: To improve health, safety and security of people	SCORE: To improve the reliability and resilience of the transport system	SCORE: To improve economic performance of the airport area, Auckland and New Zealand	SCORE: Reduce the effects of the transport system on the environment and taonga	SCORE: A network that provides value for money	
Option 3A	SH20B online widening at-grade connections Reduce speed differential (Service road); Improve reliability for time sensitive airport traffic Fewer diversion/ detour route availability than offline option	1	1	1	0	0	
	SH20A/SH20 southbound interchange ramp Alternative routes for southbound traffic; Reduction of rat-running freight and general traffic through airport precinct and local roads, improving local amenity	1	2	3	2		
	SH20 widening Reduce weaving on through lanes; Reduce conflict points;	1	1	1	0	0	
	RTC on SH20B Improve public transport journey experience; Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required.	2	3	3	2	2	
	Pukaki Creek two-lanes Increased weaving on either side of the Pukaki Bridge; No significant airport access improvements, west of the P&R; Possible increased in local delays, affecting airport traffic trip reliability. There could be an increase in local traffic demand.	-1	-1	0	0	0	
	RTC from Puhinui Road to Botany Improve public transport journey experience; Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required; Improve accessibility to local town and business.	2	3	3	2	2	
Option 3B	SH20B online widening at-grade connections Reduce speed differential (Service road); Improve reliability for time sensitive airport traffic Fewer diversion/ detour route availability than offline option	1	1	1	0	0	
	SH20A/SH20 southbound interchange ramp Alternative routes for southbound traffic; Reduction of rat-running freight and general traffic through airport precinct and local roads, improving local amenity	1	2	3	2		
	SH20 widening Reduce weaving on through lanes; Reduce conflict points;	1	1	1	0	0	
	RTC on SH20 and SH20A Improve public transport journey experience - but longer journey time from eastern approach than A options Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required; Improve accessibility to local town and business.	2	3	2	1	2	
	Pukaki Creek two-lanes Increased weaving on either side of the Pukaki Bridge; No significant airport access improvements, west of the P&R; Possible increased in local delays, affecting airport traffic trip reliability. There could be an increase in local traffic demand.	-1	-1	0	0	0	
	RTC from Puhinui Road to Botany Improve public transport journey experience; Increased people carrying capacity of the network; Dedicated right of way for transit (Bus priority); Reduction in private vehicles travelling along the corridor; Transit lanes can be converted to HOV lane; Transit lanes can facilitate emergency vehicle access if required.	2	3	3	2	2	

Score	Definition
3	Significantly positive
2	Moderately positive
1	Minor positive
0	Neutral (against the do-minimum)
-1	Minor adverse
-2	Moderately adverse
-3	Significantly adverse

20 Connect Investment Objectives

To improve health, safety and security of people

To improve the reliability and resilience of the transport system

To improve economic performance of the airport area, Auckland and New Zealand

Southwest Gateway NOP Operating Principles

To improve safety for all users on the transport system.

To enhance the customer perception of safety.

To deliver the outcomes as defined by the ANOP and GPS on Land Transport.

To maintain access along SH20 to ensure the WRR can perform its strategic function as an alternate route to SH1 during unplanned and planned events.

Provide an agile network that can keep people and goods moving.

To provide resilient access to and from Auckland Airport to enable it to carry out its function as a lifeline utility.

To enhance overall network efficiency.

Efficient and reliable public transport travel times to and from the Northern and Eastern Airport approaches.

Prioritise public transport on key routes by time of day.

Provide priority on SH20, SH20A and SH20B for trips to inter-regional markets over local access.

Prioritise freight movements to and from the northern and southern industrial areas and airport.

Prioritise active modes within 400-800m of high activity pedestrian areas.

Support the amenity function around key activity centres by improving walking and cycling access.

Improve connectivity of walking and cycling network facilities into the wider Auckland network. This will provide a viable transport mode for local and medium distance trips for users of all ages and abilities, and support access to public transport.

Reduce the effects of the transport system on the environment and taonga
A network that provides value for money

Improve trip reliability for time sensitive aeronautical traffic (passengers, crew, time sensitive freight) to and from the airport.

Discourage non-airport related traffic from travelling through the airport precinct.

Improve local amenity and air quality by reducing 'rat running' commuter traffic and freight on local roads.

Provide flexible infrastructure to allow for changes in operating requirements.

Design flexible infrastructure to allow for changes in transport technology.



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