

Supporting Growth

North (Silverdale,
Ōrewa, Wainui and
Dairy Flat)

Indicative Business
Case for Route
Protection

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Disclaimer

The option assessment undertaken and the Indicative Strategic Transport Network plans shown were identified through Indicative Business Cases endorsed by the Auckland Transport and NZ Transport Agency boards in early 2019. Proposed corridors shown are yet to be prioritised for funding and delivery over the next 30 years. They will require further technical investigations and engagement to confirm the detail of locations for proposed upgrades or proposed new route alignments, and any associated land requirements. This additional assessment will include development of detailed design and costings to inform further economic analysis for funding purposes. Any land requirement may also require statutory approvals, which would be subject to the processes of the Resource Management Act 1991 and Land Transport Management Act 2003. The Indicative Strategic Transport Network also includes a suite of travel demand management initiatives and supporting public transport services.

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- C – Transport Assessment
- D – Economics Assessment
- E – Design and Cost Report
- F – Design Philosophy Statement
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- J – Property Strategy
- K – Route Protection Strategy
- L – Risk Assessment

M – Affordability Assessment

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Acronyms

Acronym	Description
AMT	Alliance Management Team
AT	Auckland Transport
ATAP	Auckland Transport Alignment Project
AUP: OP	Auckland Unitary Plan (Operative in part)
BCR	Benefit cost ratio
CAPEX	Capital expenditure
CCO	Council controlled organisation
CIP	Crown infrastructure partnership
CRH	Coatesville Riverhead Highway
CVA	Cultural values assessment
DBC	Detailed Business Case
DFH	Dairy Flat Highway
ECR	East Coast Road
FULSS	Future Urban Land Supply Strategy
FUZ	Future urban zone
GPS	Government Policy Statement on Land Transport (2018)
ha	hectare
IAF	Investment Assessment Framework
IBC	Indicative Business Case
IO	Investment objective
KFR	Kahikatea Flat Road
KPI	Key performance indicator
LoS	Level of service
LRT	Light rail transit
MCA	Multi-criteria analysis
MoE	Ministry of Education
MUL	Metropolitan Urban Limit
NoR	Notice of requirement
NPV	Net present value
N-S	North-south
NZ Transport Agency	New Zealand Transport Agency
OIM	Owner Interface Manager
PBC	Programme Business Case
PPP	Public private partnership
PT	Public transport
QoS	Quality of service
RLTP	Regional Land Transport Programme
RT	Rapid transit
RUB	Rural urban boundary
SEA	Significant Ecological Area
SH1	State highway 1
SOI	Statement of Intent
TfUG	Transport for Future Urban Growth
VCR	Vehicle: capacity ratio
vpd	Vehicles per day

EXECUTIVE SUMMARY

Purpose

The purpose of the Supporting Growth Programme is to identify and protect the recommended transport networks to support Auckland's planned urban growth over the next 30 years.

This Indicative Business Case (IBC) identifies key elements of the recommended transport network in the North future urban area, which include areas of Future Urban Zone (FUZ) land in Silverdale, Ōrewa, Wainui and Dairy Flat. It recognises that the implementation of this network is a key contributor towards improved sustainable urban mobility in Auckland. As such the transport system will need to be appropriately staged to anticipate and support growth, improve accessibility, provide high quality and sustainable mobility which facilitates mode shift – particularly towards greater use of public transport, walking, and cycling.

The IBC:

- Confirms the strategic context and policy alignment of the proposed investment
- Confirms the case for route protection and the need to invest
- Identifies an integrated transport network that enables and supports growth in the North.

The objective of the IBC is to seek endorsement of the recommended transport network for future route protection to take forward to a Detailed Business Case (DBC).

Business case history

In 2016, Auckland Transport (AT), the New Zealand Transport Agency (NZ Transport Agency), and Auckland Council worked in partnership to develop a Programme Business Case (PBC). The PBC was a response to the pace, scale, and staging of growth identified in the Auckland Unitary Plan: Operative in Part (AUP: OP) and the Future Urban Land Supply Strategy (FULSS).

The PBC identified a preferred transport network for early route protection in the North. The intent of the route protection approach was to save money and minimise social disruption in the long term.

This IBC further tests and develops the recommendations of the PBC to identify a robust indicative recommended transport network for route protection.

Several policies have changed since the PBC was released in 2016. This includes refreshed or new versions of the Government Policy Statement on Land Transport 2018-2021 (GPS), the Auckland Plan 2050, the FULSS, and the Auckland Transport Alignment Project (ATAP). The policies in these strategic documents set a direction for increased focus on an equitable, mode-neutral transport system which places weight on public transport, walking and cycling, improving safety and realising environmental, health and growth outcomes. This is a shift in direction from the previous GPS, which placed more emphasis on efficient travel by motorised modes.

Protecting the corridors

The key objective of the programme is to establish 'route protection' for the recommended options. Route protection identifies and appropriately protects the land corridors necessary to enable the future construction, operation and maintenance of the recommended network. Route protection is important as

it provides property owners, businesses and the community with increased certainty regarding future infrastructure, so they can make informed decisions. It can also significantly reduce long-term costs for local and central government and enable more effective land use and transport outcomes. The Route Protection Strategy (Appendix K) provides more detail in this respect. The route protection process itself will take place over the next four years. Elements not requiring route protection are also identified in this IBC.

The entity carrying out this work

Te Tupu Ngātahi (the Supporting Growth Alliance) is a collaboration between AT and the NZ Transport Agency to carry out the planning phase of the Supporting Growth Programme (formerly known as the Transport for Future Urban Growth Programme).

Te Tupu Ngātahi completed the detailed investigations necessary to recommend a transport network for the North as outlined in this IBC. Once the transport network is confirmed, it will carry out the route protection process, as identified above, to protect the land for these networks.

Te Tupu Ngātahi comprises AT and the NZ Transport Agency as the owner participants, consultants AECOM and Beca, and legal providers Bell Gully and Buddle Findlay.

Partners

AT, the Transport Agency, Auckland Council and KiwiRail are investors and partners to the programme and extensive engagement has been undertaken with all of them through the development of this business case.

Manawhenua are recognised as Treaty Partners by AT and the Transport Agency and Te Tupu Ngātahi recognises these responsibilities in engagement with Manawhenua. AT and the Transport Agency's partnership with Manawhenua provides the project with a framework for working with Māori. Throughout the development of this IBC, Manawhenua has been involved as partners in decision making and their views have been considered when identifying priorities for investment options.

Key stakeholders

Throughout the development of this IBC, engagement has been undertaken with a range of stakeholders and interest groups including significant landholders and developers, the Ministry of Education, other infrastructure providers (e.g. Transpower and Watercare) and the community, including young people. Feedback was received in a variety of ways (meetings, workshops, hui and feedback forms) and was considered in the decision-making process for the recommended network.

Auckland: a story of growth

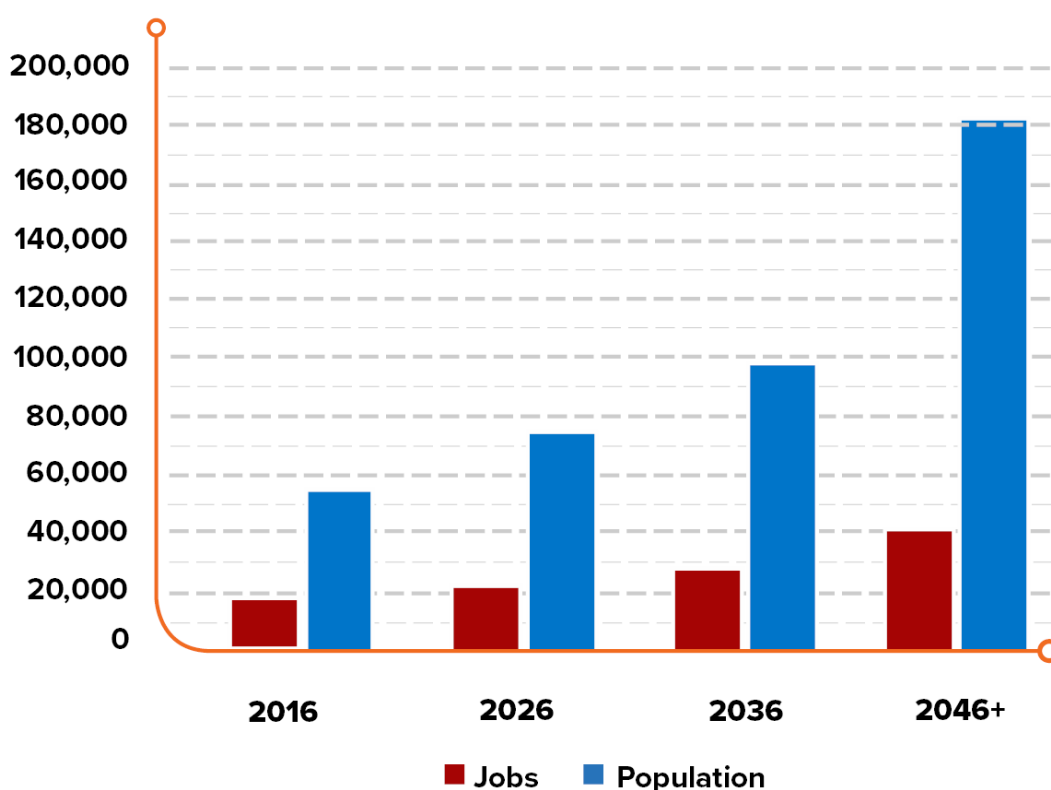
Auckland is home to approximately 1.69 million people. The Auckland Plan 2050 - Development Strategy signals that Auckland could grow by another 720,000 people to reach 2.4 million over the next 30 years. This will generate demand for 313,000 more homes and require land for 263,000 more jobs. This business case supports the urban vision of the Auckland Plan 2050 to support high population growth through provision of quality urban form, improved access for inclusion and opportunities for improved health and wellbeing.

In July 2017, the FULSS was updated in line with AUP: OP zoning, with 15,000 hectares of land allocated for future urbanisation. This gives clarity as to when land identified in the AUP: OP will be 'development ready'. It provides for sequenced and accelerated greenfield growth in ten areas of Auckland, one of which is the North.

Planning for future urban growth in the North

Auckland Council has identified approximately 4,000 hectares (ha) of land for future urban development in the North of Auckland (Silverdale, Ōrewa, Wainui and Dairy Flat), referred to as the 'Northern growth area' in this IBC. The profile of anticipated population and employment growth in the wider North study area (inclusive of Ōrewa, Silverdale and Whangaparāoa existing areas) is outlined in Figure A.

Figure A: Forecast growth in employment and population in North study area (2016-2046+)



This North is anticipated to accommodate approximately 33,000 to 42,000 dwellings. When combined with growth in the existing urban areas in the wider North study area (Ōrewa, Silverdale, Whangaparāoa), the total increase in households could grow to more than three times its existing population of approximately 55,000 people by 2046+.

In addition, the number of jobs in the North study area is expected to increase from approximately 16,000 to 41,000 over the same period.

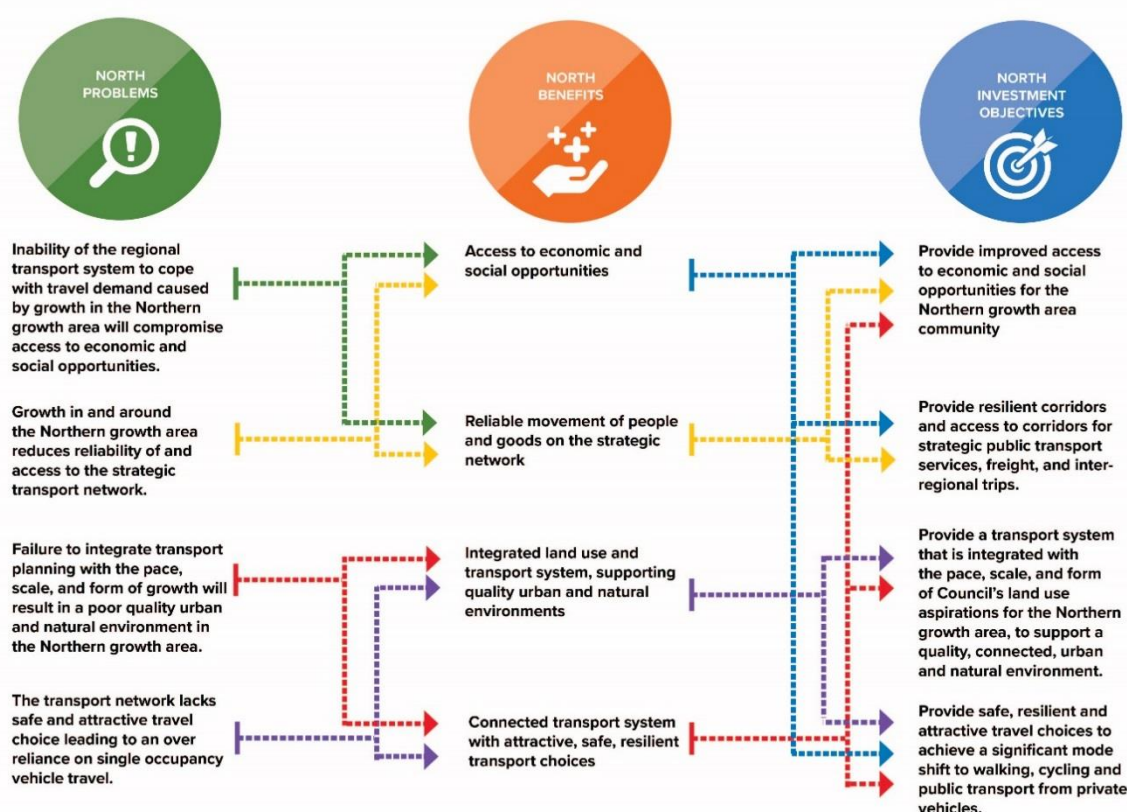
With respect to the release of land, Wainui East is currently development ready and developing now. The Silverdale West – Dairy Flat Industrial Structure Plan area is currently being prepared. The timing and the exact scale and form of growth in the rest of the North is **uncertain**, due to a number of factors, including lack of structure planning and significantly higher dwelling yields in live zoned areas nearby

(such a Whenuapai), relative to previous forecasts. The remainder of the FUZ, in particular Dairy Flat, is not likely to be structure planned until after 2030.

Transport problems

The problems, benefits and investment objectives for this project are summarised in Figure B. They have been derived from the PBC problems and investment objectives then refined and developed further through the workshop process. Key Performance Indicators (KPIs) and targets have also been set. These will be used to measure the success of the investment proposal in the future.

Figure B: Problems, benefits and investment objectives



Influencing travel demand

The guiding principle of this business case is Sustainable Urban Mobility which seeks to develop an urban transport system that fosters a balanced development of all relevant transport modes and encourages a shift to more sustainable modes. Therefore the business case does not provide for unconstrained demand but rather seeks opportunities to influence and reduce demand before infrastructure options are considered. A four-step approach to influencing travel behaviour was therefore developed, as shown in Figure C below. This included consideration of an integrated set of policy-base, soft and technical infrastructure measures to achieve the desired goal.

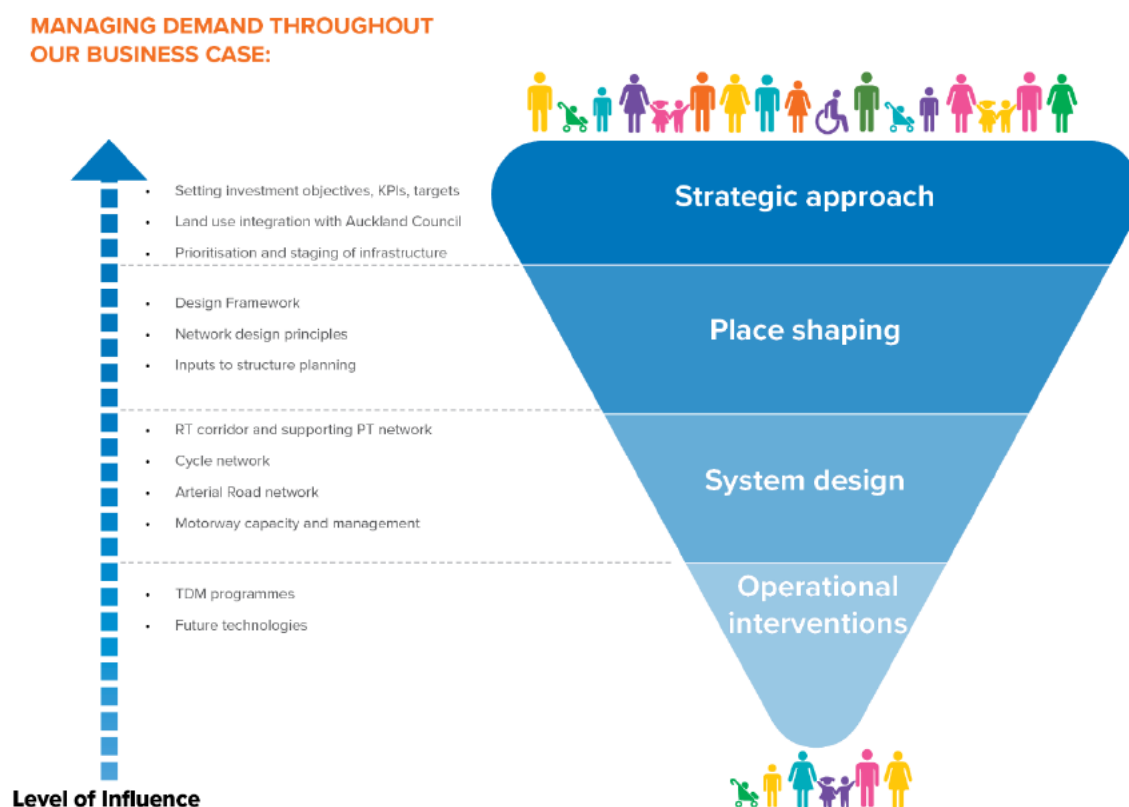
The application of these demand management principles in the Northern growth area is forecast to result in a significant shift in transport mode for the future residents of the growth area in conjunction with the recommended network. Transport modelling of the recommended network suggests around 12% of

travel will be via active modes and 21% of travel via public transport in the morning peak in 2046 (refer to Table A). With an effective demand management strategy, this could improve further leading to a reduction in private vehicle travel of between 21-30%.

Table A: Estimated changes in mode share

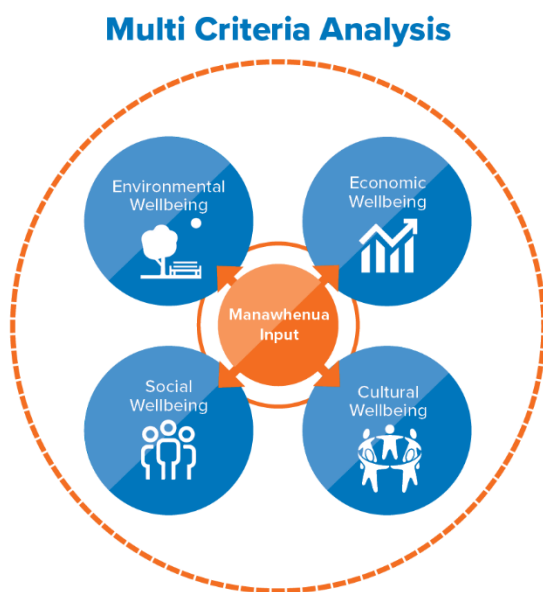
Scenario	Active modes	Public transport	Car
Existing 2018	3%	9%	88%
Recommended network (2046)	12%	21%	67%
Recommended network with medium demand management scenario (2046)	14%	22%	64%
Recommended network with high demand management scenario (2046)	16%	26%	58%

Figure C: Demand management influence through the project life cycle



Option development and assessment

Over 100 options were considered as part of the options long list for this IBC. This included a range of options across all modes, including rapid transit, strategic and local public transport, walking and cycling, and improved and new roading infrastructure.



All infrastructure options have been assessed at the both the long and short list phases against the Te Tupu Ngātahi multi criteria analysis (MCA) framework. The framework assesses option performance against the investment objectives and four well-beings (cultural, social, environmental and economic – refer Figure D). The purpose was to identify potential impacts and opportunities from each option.

Figure D: Four wellbeings of the MCA

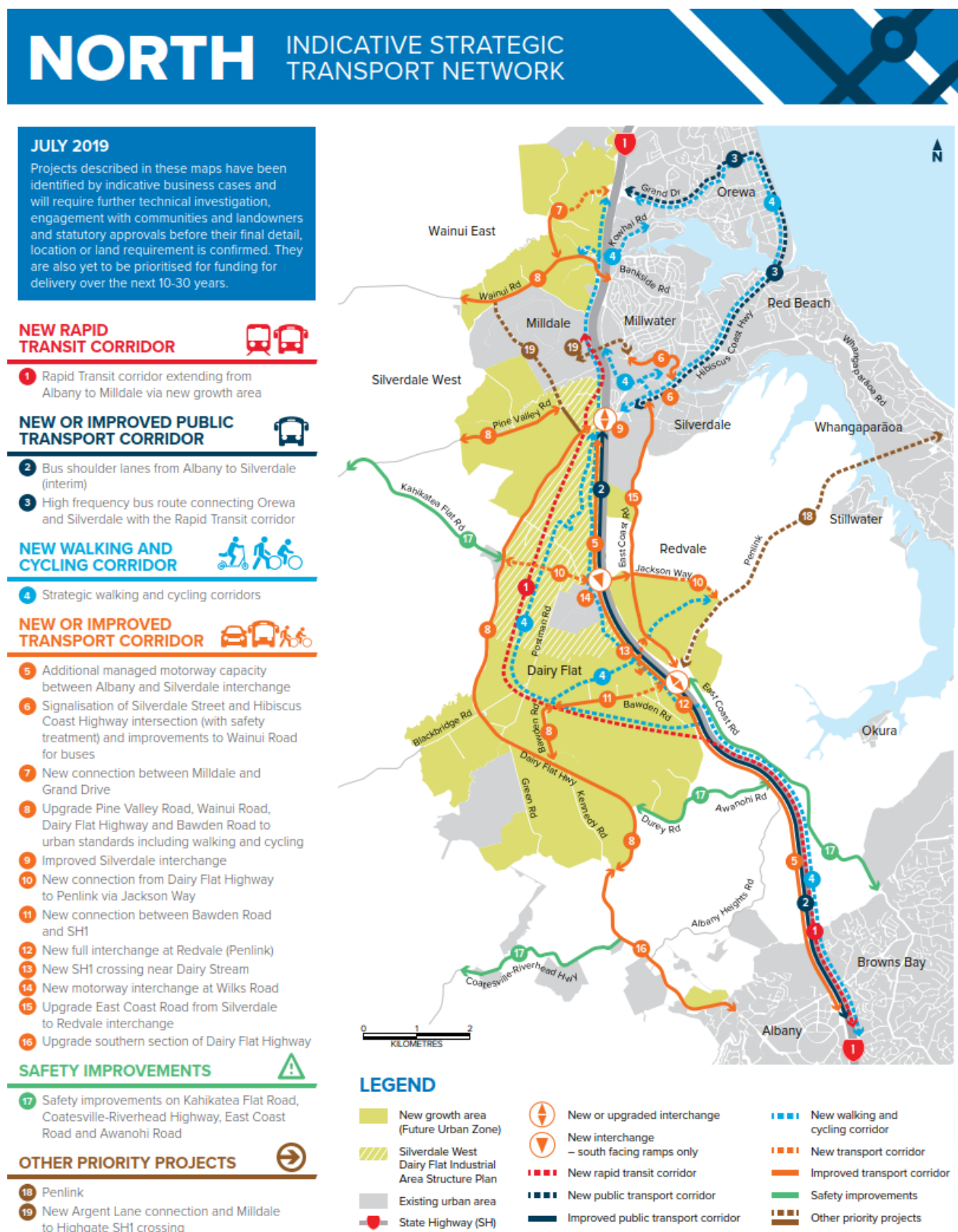
Recommended network

An analysis of the problem statements, evaluation of options, feedback from workshops and stakeholder / community engagement has led to the development of this recommended network.

The recommended North transport network is shown in Figure E and provides:

- A rapid transit network to serve the North will enable a step change in strategic people moving capacity, will enable and support growth and placemaking in the Dairy Flat future urban area and provide access to the Silverdale West – Dairy Flat Industrial Structure Plan area etc.
- New and improved motorway interchanges to provide access to/from the strategic road network to serve development areas.
- A network of strategic road connections providing access and resilience to the strategic network.
- An integrated system of arterial roads that have a dual function to connect sub-regions and to link land uses to the new public transport system and existing strategic road network.
- A strategic active mode network to provide a high-quality network of strategic walking and cycling connections for key movements through, within and to/from the study area, connecting existing and new communities.
- A series of east-west motorway crossings (new or improved either all mode or active mode only) to provide a non-motorway connection across State highway 1 (SH1).
- An active mode extension of Curley Avenue with active mode connection to Brian Smith Drive to allow the movement of people within the future growth areas and to/from Hibiscus Coast Station, Silverdale Town Centre and Milldale, providing access to jobs, amenities and homes.
- Safety improvements on key rural corridors to reduce the risk of deaths and serious injuries (DSIs) in the North.
- Complementary operational demand management measures to support alternative modes and encourage significant mode shift.

Figure E: North recommended transport network



Implementation and staging

The implementation of the transport system to support growth will need to be staged over the next 30 years. The staging described in section 7.2 of this IBC responds to the desired FULSS timings for land release.

Implementation of the recommended network is highly flexible and could be undertaken in different ways to respond to changes such as timing of other infrastructure (e.g. the Northern Interceptor – a new wastewater pipeline from the north-west to the Rosedale Wastewater Treatment Plant; and North Shore Rapid Transit corridor), growth patterns, timing of uptake of developments and complementary urban interventions like network performance improvements (“sweating the assets”) or land use zoning refinements.

Given the scale and duration of the growth proposed, the early protection of these critical transport corridors provides the required certainty for AT, the Transport Agency and stakeholders.

The key drivers of the recommended staging are based on the following strategies:

- **Managing transport demand** – Provision of public transport, walking and cycling infrastructure early will enable a mode shift of the existing communities. This has the potential to defer the need for road capacity. Early provision of public transport and active modes for the longer-term growth will encourage early adoption of public transport and active modes for the growth area.
- **Flexibility to respond to changes** – The form and/or effectiveness of a number of projects within the recommended network are highly dependent on changes to the transport network outside of the study area (e.g. Rapid Transit (RT) south of Albany) or timing of growth. The staging strategy is intended to demonstrate there is flexibility to respond to these changes in an appropriate manner.
- **Shaping the future urban development** – Provision of key infrastructure at the right time (such as the RT, arterials) will drive development patterns within the FUZ, allowing a quality urban form to be achieved.

What’s changed since Transport for Urban Growth (TfUG)?

The Transport for Urban Growth (TfUG) programme identified a comprehensive transport network for the North which aimed to improve the liveability of the area with better access to jobs, environment, travel choice and economic growth.

This IBC (section 7.1) compares the differences between the infrastructure proposed in TfUG (PBC) and the infrastructure proposed by this investment proposal (IBC). The key changes from the proposed TfUG network include:


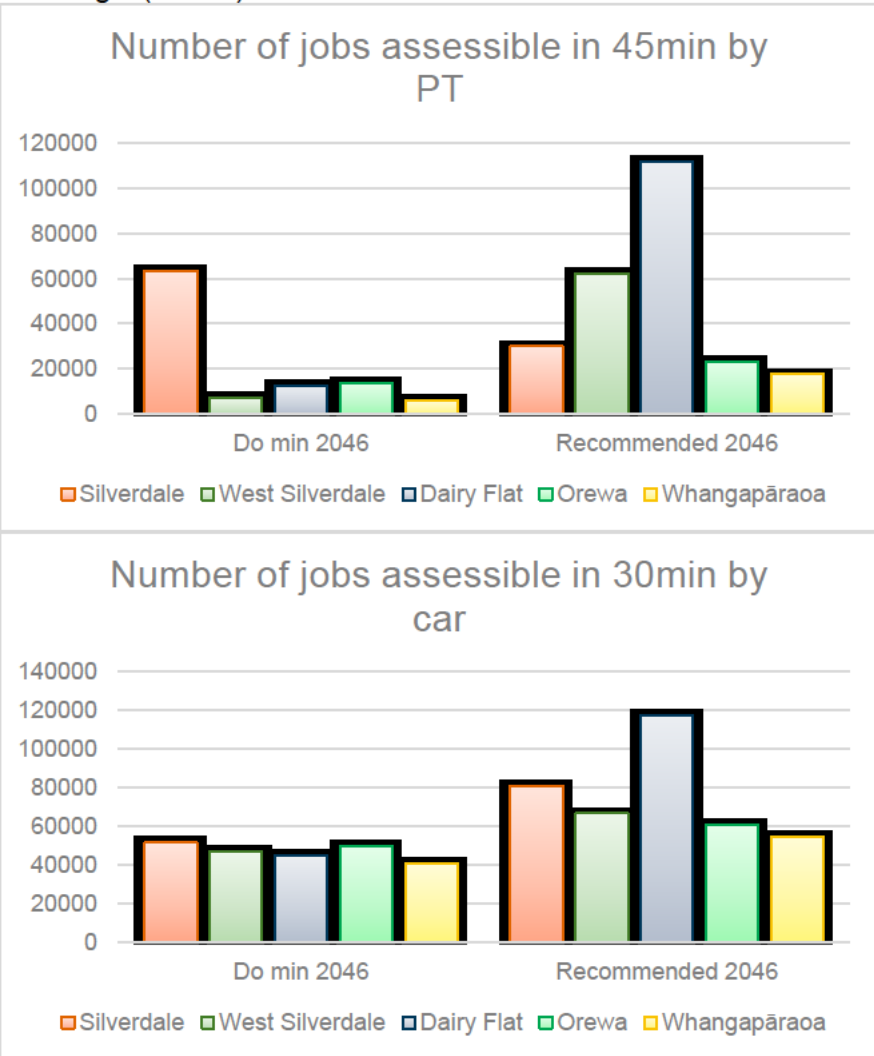
- **A change in the proposed RT alignment** - In the TfUG network, the RT corridor followed the eastern side of the SH1 corridor. In the IBC recommended network, the RT corridor deviates into the FUZ and connects back in with a proposed station at Milldale. The key reasons for this change are that this deviation through the FUZ better enables and supports growth in the Northern growth area and strikes a better balance between transport benefits, land use opportunity, flexibility and cost/benefit cost ratio (BCR) relative to the SH1 alignment.
- **Increased strategic cycling provision** – These projects are considered necessary to achieve the identified mode split targets in the KPIs of this IBC.

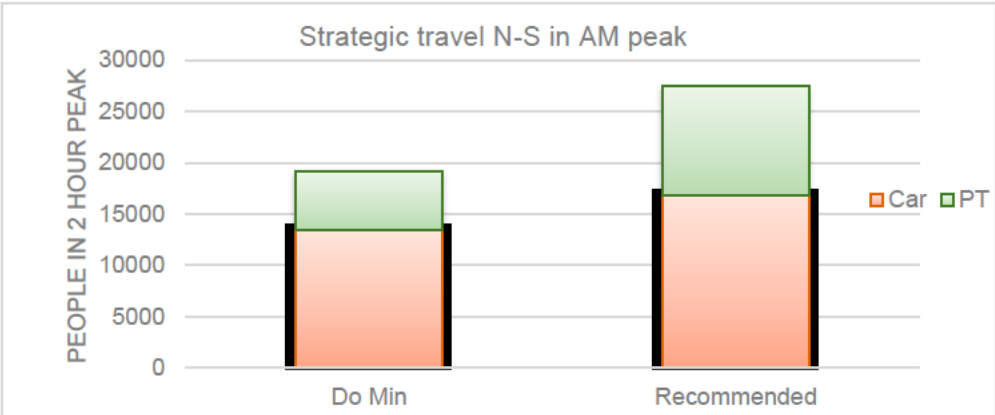



- **Localised changes** – No vehicle connection at Curley Avenue, with use of the existing Wainui Road for buses and provision for walking and cycling. No arterial road on the Postman Road alignment as a collector was considered to adequately serve this function.

Outcomes

Table B describes the outcomes achieved by the recommended network in relation to the measurable KPIs and investment objectives. A benefits realisation plan will be developed in the next project phase to measure success against each of these outcomes.

Table B: Recommended network outcomes

Areas	Outcome
 <p>Access to economic and social opportunities</p>	<p>Better access to economic and social opportunities - 2.0 x the jobs within an accessible range. (KPI 1a)</p>  <p>With the recommended network, jobs accessible using public transport decreases for the existing Silverdale area. This occurs in the transport model as a result of shifting the Hibiscus Coast station to the west of SH1. During the DBC phase options will be investigated to improve public transport accessibility through changes to local services.</p> <p>Provides appropriate capacity to meet the demands of growth.</p>

Areas	Outcome												
	<p>Improved people movement on the strategic north-south (N-S) desire line (SH1, Dairy Flat Highway and East Coast Road). (KPI 1b)</p>  <table><caption>Strategic travel N-S in AM peak</caption><thead><tr><th>Scenario</th><th>Car</th><th>PT</th><th>Total</th></tr></thead><tbody><tr><td>Do Min</td><td>~13,000</td><td>~5,000</td><td>~18,000</td></tr><tr><td>Recommended</td><td>~17,000</td><td>~10,000</td><td>~27,000</td></tr></tbody></table>	Scenario	Car	PT	Total	Do Min	~13,000	~5,000	~18,000	Recommended	~17,000	~10,000	~27,000
Scenario	Car	PT	Total										
Do Min	~13,000	~5,000	~18,000										
Recommended	~17,000	~10,000	~27,000										
<p>Resilience of the strategic network</p> 	<p>Variation in travel time between the peak hour and interpeak is no worse than current (2016) ratio on SH1 in the peak direction. (KPI 2a)</p> <p>Recommended option provides a 25% improvement in AM travel time and 36% improvement in interpeak travel time on SH1 (Silverdale to Albany) compared with the Do Minimum. (KPI 2a)</p> <p>Additional strategic transport corridor offering attractive and effective alternatives to SH1 in both the RT corridor and Dairy Flat Highway. (KPI 2a)</p> <p>The RT corridor caters for 9,400 passengers travelling south of the study area in the 2-hour AM peak. This is representing an increase 2.4 times the patronage expected for the Do Minimum scenario. (KPI 2b)</p>												
<p>Integrated land use and transport</p> 	<p>A flexible staging solution which provides interim benefits for the Silverdale and Ōrewa communities. (KPI 3b)</p> <p>Delivers a comprehensive walking and cycling network which brings 40% of households in the Northern growth area within 400m of high-quality cycle infrastructure on an arterial or strategic facility. (KPI 3c)</p> <p>Public transport accounts for around 9% of internal trips around the study area based on transport modelling. There is significant opportunity to improve this through demand management. (KPI 3d)</p>												
<p>Mode share</p>  <div><div></div><div></div></div>	<p>Roads within the study area and strategic connections are safe, operating at a personal and collective risk of medium or below. (KPI 4a)</p> <p>A significant mode shift to public transport for all travel. Public transport mode share improves from 9% in the existing situation, and 10% in the Do Minimum to 21 - 26% in the AM peak as a result of the recommended network. This is even higher on strategic N-S trips to Albany and south of between 39 - 44% in the AM peak. (KPI 4b)</p> <p>A substantial mode shift to walking and cycling of between 14 - 18% overall. (KPI 4b)</p> <p>A large proportion of the growth area has direct access to the RT corridor with 40% of households within walking distance and 94% within cycling distance of the RT corridor. (KPI 4c)</p> <p>The forecast changes in mode share for the north are at or exceed targets outlined in the PBC of 29% public transport trips out of the area in the AM peak and 16% active mode share for the area.</p>												

Areas	Outcome
	The forecast mode share is well above the current split for Auckland region of approximately 20% and is transformational in comparison to the existing mode share for these areas.

Finance and economics

The capital and operating costs (CAPEX and OPEX, respectively) of options were developed and considered through the option selection process.

For the recommended North package, costs are:

- Total estimated capital costs of [REDACTED]
- Property and land costs of approximately [REDACTED].

Benefit Cost Ratio

The BCR in Table C was calculated using the Net Present Value (NPV) benefits and costs as outlined in Chapter 9 of the IBC.

Table C: Benefit cost ratio – recommended network

Item	BCR
Recommended Network BCR range	1.1 - 1.6

This demonstrates a moderate economic case to support the recommended network for the Northern growth area.

As individual projects progress through the DBC and pre-implementation phases, designs and costs will be developed in more detail and focus on cost-effective ways to deliver the project outcomes.

Implementation

A preliminary property analysis and preliminary route protection strategy have been developed for the North. The recommended network has been divided into thirteen potential consenting packages to be progressed at the DBC phase. The packages were determined based on a combination of urgency, timing of land use change, geographic location, complexity and functional characteristics.

Next steps

There are three key next steps for the progression of each of the elements of the recommended network, being:

- Detailed Business Case (DBC)
- Pre-Implementation
- Implementation – which will be staged over a 30-year period to support the timing of growth.

A DBC is required for each element identified in the recommended network, and further stakeholder and public engagement will take place as the DBCs are developed.

Te Tupu Ngātahi is tasked with completing the DBC and route protection of the following elements of the IBC programme:

- Arterial roads
- Strategic State highway connections
- Strategic cycle links
- Strategic rapid transport network connections.

All other elements of the IBC recommended network will also require completion of a DBC. This will need to be procured separately by the appropriate owner (AT or the Transport Agency).

For the North, these elements are:

- Travel demand management package including bus priority on Hibiscus Coast Highway and Grand Drive
- Rural highway safety improvements
- Kōwhai Road – active mode upgrade
- Argent Lane arterial.

PART A – STRATEGIC CASE

1 Introduction

The purpose of the Supporting Growth programme is to identify the preferred transport networks to support Auckland's planned urban growth over the next 30 years. This Indicative Business Case (IBC) identifies key elements of the transport network in the North future urban area, which includes areas of Future Urban Zone (FUZ) land in Silverdale, Ōrewa, Wainui and Dairy Flat (refer Figure 1). It recognises the implementation of this network will need to be appropriately staged to respond to growth, integrate effectively with land use and facilitate the transformation of mode shift – particularly towards greater use of public transport, walking, and cycling.

The IBC specifically:

- Confirms the strategic context and fit of the proposed investment
- Confirms the need to invest and the case for change
- Identifies a wide range of potential alternatives/options
- Identifies an integrated transport network that enables and supports growth in the future urban areas of the North
- Seeks endorsement of the recommended transport network for future route protection (Part B of this IBC) to take forward to a Detailed Business Case (DBC).

1.1 The growth story

Figure 1: Auckland's future urban growth areas



1.1.1 Auckland

Auckland is New Zealand's largest city, home to approximately 1.69 million people¹, whose aspirations for a prosperous, healthy and connected future for themselves and their families are at the forefront of our strategic focus on wellbeing for people and the liveability of communities. In 2017, Auckland attracted 36,800 new residents; more than the rest of the country combined. The Auckland Plan Development Strategy (2050) signals that Auckland could grow by another 720,000 people to reach 2.4 million over the next 30 years.

The Auckland Plan anticipates that this growth will generate demand for an additional 313,000 dwellings and require land for approximately 263,000 additional employment opportunities²ⁱ.

In response to this demand, the Auckland Unitary Plan (AUP) initially identified ~11,000 hectares (ha) of predominantly rural land for future urbanisation. This land is outside

the 2010 Metropolitan Urban Limit (MUL) and is equivalent to an area 1.5 times the size of urban Hamilton³.

In July 2017, the Future Urban Land Supply Strategy (FULSS) was updated in line with the Auckland Unitary Plan: Operative in Part (AUP: OP) zoning, with an increase to ~15,000 ha of land allocated for future urbanisation (including live zoned areas).

¹ Statistics New Zealand, June 2018

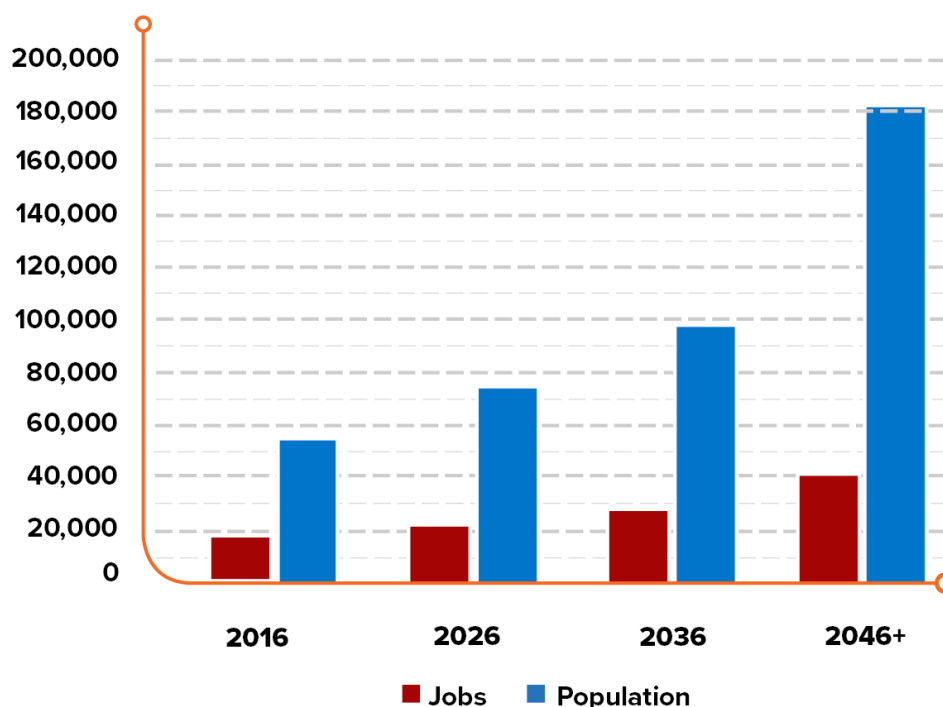
² Auckland Plan 2050 Development Strategy: <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/development-strategy/future-auckland/Pages/what-auckland-look-like-future.aspx>

³ NZ Transport Agency, Auckland Transport, Auckland Council (2015) *Supporting Growth Strategic Business Case*

1.1.2 The North

Auckland Council has identified approximately 4,000 ha of land for future urban development in the North, including parts of Ōrewa, Wainui East, Silverdale West and Dairy Flat (the 'Northern growth area')⁴. This land has been zoned in the AUP:OP as a Future Urban Zone (FUZ), defined as the area within the Rural Urban Boundary (RUB) shown in Figure 4. Over the next 30+ years, this area is anticipated to accommodate between approximately 33,000⁴ to 42,000⁵ dwellings and 604 ha of business (industrial) land. When combined with growth in the existing urban areas in the wider North study area (inclusive of Ōrewa, Silverdale, Whangaparāoa), the total increase in households could grow to more than 3X times its existing population of approximately 55,000 people by 2046+⁵. This is equivalent to adding a town the size of Tauranga to the existing population. In addition, the number of jobs in the wider North study area is expected to increase from approximately 16,000 to 41,000 over the same period (refer Figure 2)⁵.

Figure 2: Population and jobs growth for North IBC study area (2016-2046+)

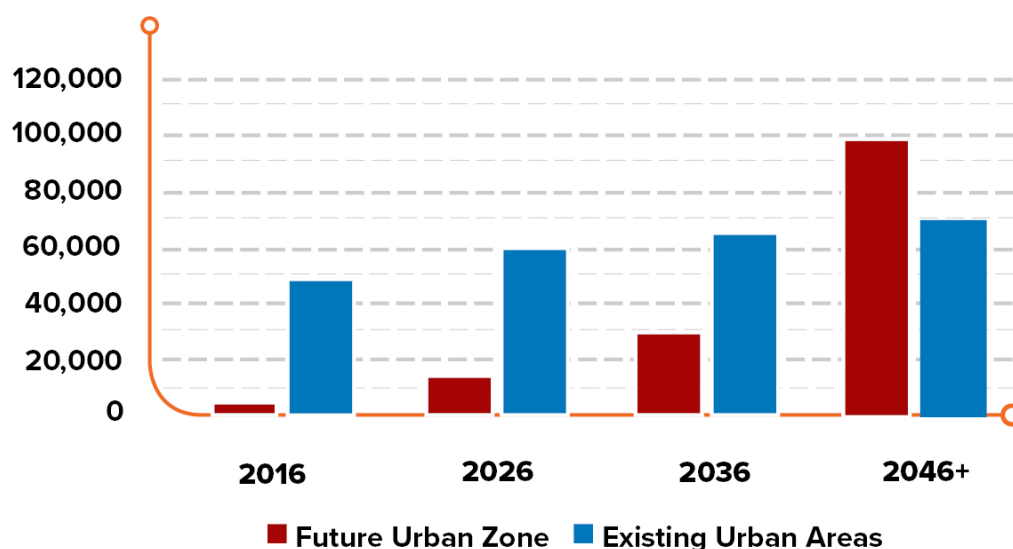


By 2046+, the FUZ areas are anticipated to contribute over 80% of the future residential and employment growth in the North and comprise approximately 60% of the total population (refer to Figure 3).

⁴ Based on the Future Urban Land Supply Strategy update 2017

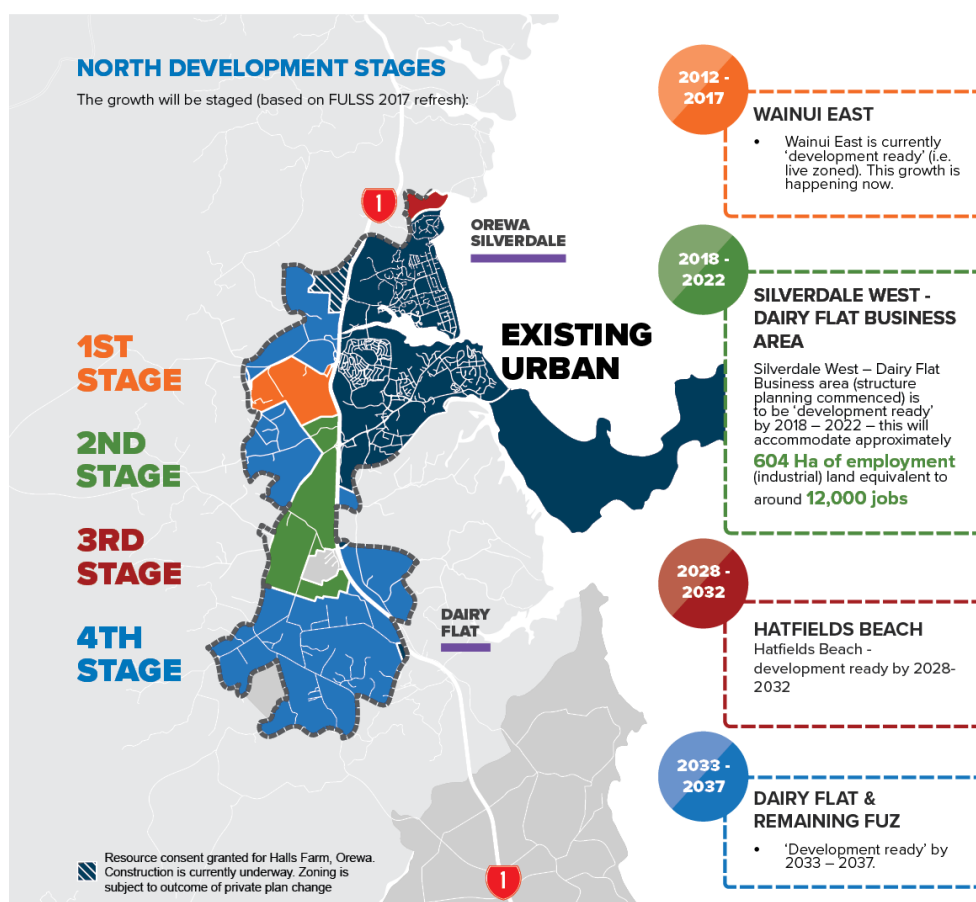
⁵ Based on the 2046+ i11 modelling scenario. The 2046+ projections are based on a modified version of i11 to account for full buildout of the growth areas in light of recent changes in yield of new development areas

Figure 3: Growth in population - future urban versus existing urbanised areas in the North



To provide clarity about when the land identified in the AUP: OP will be 'development ready', Auckland Council developed the FULSS to provide for sequenced and accelerated greenfield growth in the future urban areas of Auckland. The FULSS refresh (2017) provides for a staged release of land in the Northern growth area as indicated in Figure 4.

Figure 4: Northern growth area development stages



In the Northern growth area, the timing and the exact scale and form of growth are **uncertain**, due to a number of factors including the following:

- The Silverdale West –Dairy Flat Industrial Structure Plan area is due to be structure planned by Auckland Council in 2019. Council has signalled that it prefers industrial zoning for this area.
- Structure planning, which will confirm the land use zoning within the FUZ area, has not yet commenced for the majority of the future urban area. Most of the FUZ areas are not likely to be structure planned until after 2030.
- Under the AUP:OP, built or planned subdivisions in live-zoned areas in Auckland (such as Whenuapai) are indicating significantly higher dwelling yields than were previously forecast.

The business case team has been working closely with Auckland Council to align with Council's current aspirations for the future urban areas. This includes input to the Silverdale West-Dairy Flat Industrial Structure Plan Area structure planning process to support this area's development as a successful industrial centre.

Implications of this uncertainty were considered in this IBC in relation to the recommended network (refer Section 7.3). This uncertainty also supports the case for route protection of recommended networks in the Northern growth area, as that allows flexibility to deal with the uncertainty (as discussed further in sections 1.2 and 7.4).

1.2 Business case approach

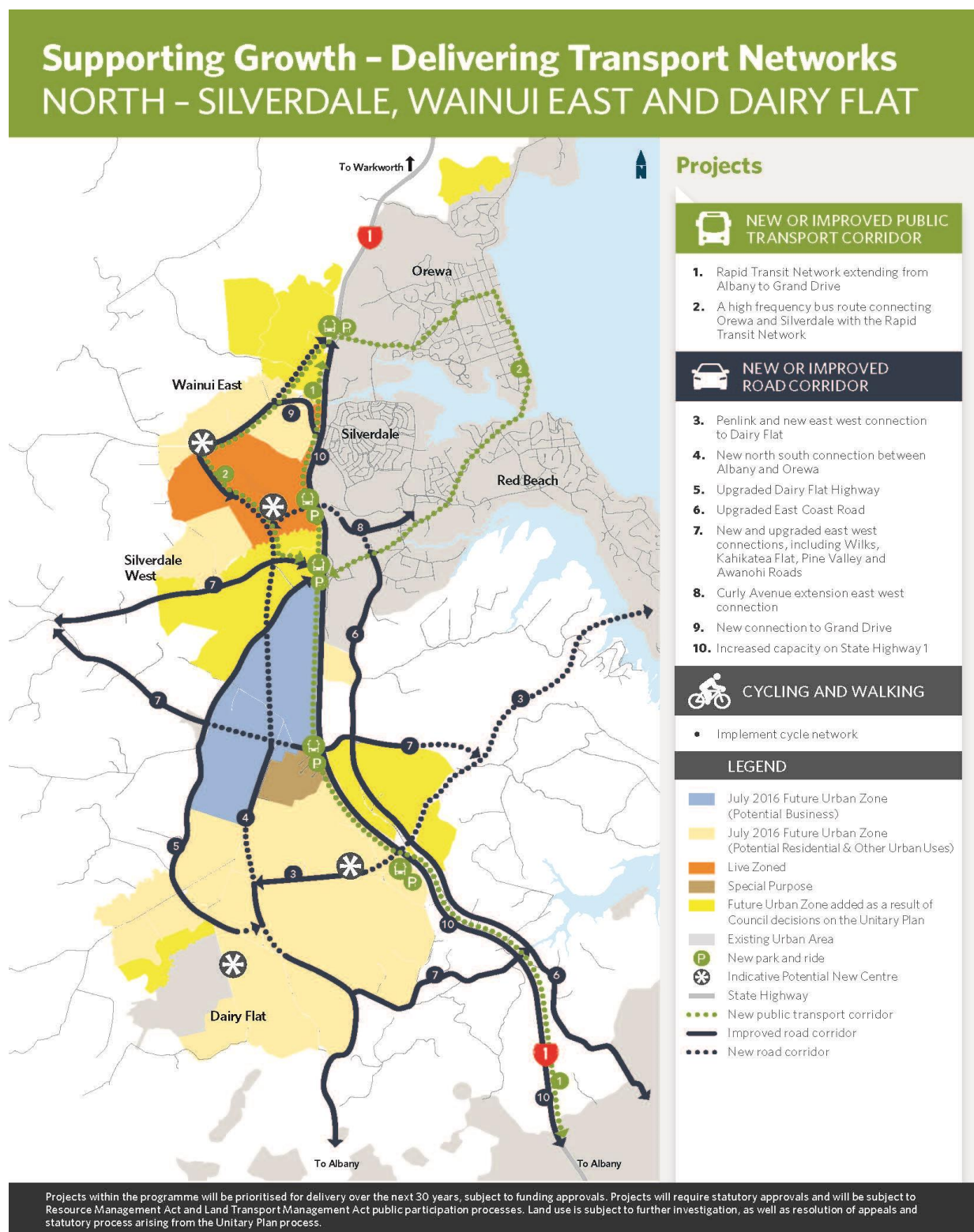
1.2.1 The Programme Business Case (PBC)

Auckland Transport (AT), Auckland Council and the NZ Transport Agency worked in partnership to develop a PBC(2016) that responds to the pace, scale, and staging of growth identified in the AUP:OP and FULSS.

The Transport for Future Urban Growth (TfUG) preferred programme (including demand, supply, and productivity interventions) was identified in 2016, and associated costs have been incorporated by the Auckland Transport Alignment Project (ATAP) in its investigation and prioritisation process over the next three decades.

For the Northern growth area, the TfUG programme recommended a range of infrastructure, including a rapid transit (RT) corridor from Albany to Grand Drive, a high frequency bus route connecting Ōrewa and Silverdale with the RT, increased capacity on State highway 1 (SH1), cycling improvements, new and upgraded roads, new roads, demand interventions and productivity interventions (refer Figure 5). The package included potential business land to balance residential and employment numbers.

Figure 5: TfUG 2016 preferred package



New Zealand Government

1.2.2 Focus of this IBC

This Indicative Business Case (IBC) further tests and develops the recommendations of the PBC to ensure they are robust. An optioneering exercise has been undertaken to determine if any additional options are required to accommodate the demand for movement associated with growth.

This IBC is focused on the identification of the indicative⁶ recommended strategic transport network for route protection. This focus recognises that the PBC recommended progression of the 'preferred transport programme by prioritising initiatives through the next stages of the business case process with an urgency in providing route protection' (p2).

The IBC ensures the strategic transport network is right-sized through implementation of travel demand management initiatives which reduce demand for single occupancy vehicle travel and promote walking and cycling as the preferred modes for short distance trips.

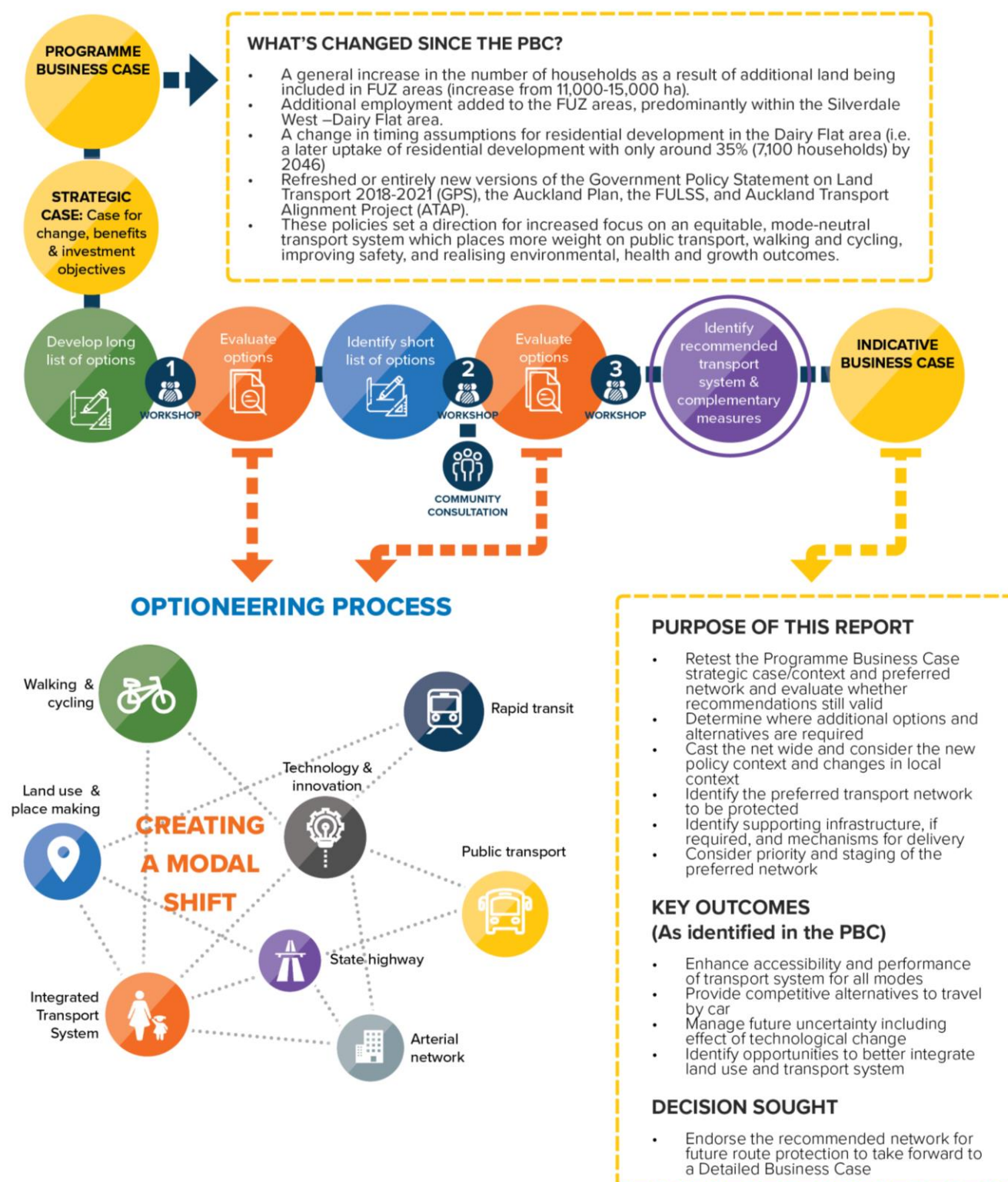
The implementation of the transport system to support the growth will need to be staged over the next 30 years. Given the scale and duration of the growth proposed, the early protection of these critical transport corridors is considered necessary to provide the required certainty for AT, the NZ Transport Agency and stakeholders.

This IBC therefore not only identifies the recommended transport network to facilitate the growth forecast, but also explores and identifies the most appropriate form of route protection. Importantly, this IBC also considers the implications of the proposed route protection for the investors. This includes the potential financial implications as well as stakeholder impacts.

Figure 6 sets out what has changed since the PBC, the IBC process, the purpose of this report, the process followed, the key outcomes and the decisions sought.

⁶ The recommended transport network is indicative. Actual corridor alignments will be confirmed at the next stage of development.

Figure 6: IBC process and timing



2 Strategic alignment

This section describes the:

- Investors, partners, and key stakeholders to the Programme and their engagement in this project (Sections 2.1 and 2.2)
- Approach to community engagement (Section 2.3)
- Process for incorporating feedback into the decision-making process (Section 2.4)
- Alignment with the current wider policy context and key investor organisational policies (Section 2.5).

2.1 Partners

This section describes the investors and partners on this project, and the engagement undertaken. Further information on their roles and responsibilities can be found in Appendix A: Strategic Case.

2.1.1 AT and NZ Transport Agency

AT and the NZ Transport Agency are partners in Te Tupu Ngātahi. Engagement with the wider organisations has been facilitated via Owner Interface Managers (OIMs) within Te Tupu Ngātahi. Engagement has been through:

- regular forums leading up to IBC milestones
- attendance at all three IBC workshops
- meetings to test the short list
- support at public open days, including representatives from Northern Corridor Improvements, and Dairy Flat Highway Safety Improvements projects.

2.1.2 Auckland Council

Auckland Council is a key project partner in the programme. This IBC has been developed in a manner that is consistent with the AT Engagement Framework and Statement of Intent (2017 -2020), which specifies AT's obligations regarding engagement with Auckland Council, Local Boards, and other Council Controlled Organisations (CCOs).

The partnership between AT, Auckland Council and CCOs requires a commitment to collaboration, openness and transparency, adhering to a “no surprises” policy and engaging with other CCOs to ensure a coordinated approach.

Programme wide, Te Tupu Ngātahi has facilitated a regular Auckland Council Integration Forum to enable these commitments and actively manage and identify risks and opportunities that are inherent to the programme.

Engagement with Auckland Council in regard to the North has been closely aligned with the current Structure Planning process that is currently underway for the Silverdale West-Dairy Flat Industrial Structure Plan Area, as well as early planning of other areas of FUZ. This has included joint attendance at open day sessions, provision of supporting technical advice and attendance by key Council specialists at IBC workshops.

Regular presentations have been made to Local Boards and to Councillors via the Structure Plan Political Reference Group.

2.1.3 Manawhenua

Manawhenua are recognised as Treaty Partners by AT and the NZ Transport Agency and, as such, Te Tupu Ngātahi recognises the responsibilities and commitments in engagement with Manawhenua. AT and NZ Transport Agency's partnership with Manawhenua provides the project with a framework for working with Māori. These frameworks set out a vision to build a strong relationship with Māori, moving towards a second generation of partnership focusing on co-management and co-governance.

Regarding the development of the IBC, this has meant involving Manawhenua as partners in decision making and considering their views when identifying priorities for investment options.

Ten Manawhenua (Ngāi Tai ki Tāmaki, Ngāti Manuhiri, Ngāti Maru, Ngāti Te Ata Waiohū, Ngāti Whanaunga, Ngāti Whātua, Te Maunga Whakahī o Kaipara, Te Ākitai Waiohū, Te Patukirikiri and Te Kawerau ā Maki) have been involved in the development of this business case. Ngāti Maru and Ngāti Manuhiri provided Cultural Values assessments (CVA).

Te Tupu Ngātahi maintains a Manawhenua Forum (for operational and kaitiaki level interaction) and enables linkages with the wider governance level relationships of AT and the NZ Transport Agency via the Tāmaki Transport Table and Auckland Council's Kaitiaki Governance Table.

The focus of this group is programme-wide delivery, particularly seeking consistency across projects. In addition, representatives from the Manawhenua Forum have attended long list design, option evaluation and recommendation making processes (along with other technical specialists and key stakeholders). In terms of specific Iwi attendance at each workshop and the specialist sessions completed for the Northern growth area refer to Appendix H: Engagement Summary.

2.2 Key stakeholders

Engagement with stakeholders has been undertaken primarily at an Area wide (Warkworth, North, North West, South) and Programme wide level, through a series of Stakeholder Reference Group presentations and one-on-one meetings with the following groups: a Development/Freight/Road Users Group; an Active Modes/Public Transport Advocacy Group; and an Environmental/Social Impact Group. Other stakeholders have been engaged with through one-on-one meetings including utilities providers and the NZ Fire Service.

In the Northern growth area, area-specific engagement has included:

- Utilities providers including Watercare Services Ltd and Transpower
- A presentation to Business North Harbour
- The NZ Fire Service – to discuss potential new fire station locations in Wainui and Dairy Flat areas and issues/opportunities with the short-listed options.
- The Ministry of Education (MoE) – to discuss potential new school locations in Wainui and Dairy Flat areas and issues/opportunities with the short-listed options. These discussions with MoE are occurring at a joint level with AT and Auckland Council.
- Significant developers/landowners in the North such as AV Jennings (Hall's Farm), Fulton Hogan, North Shore Aero Club, Wilks Road landowners and the Hugh Green Group. The overall purpose of these meetings was hear about developer/landowner plans and potential issues/opportunities with the short-listed options.

Written feedback has been received from Highgate (Highgate Business Park Ltd, Highgate Commercial Ltd and Highgate Residential Ltd), who are developers of the large block of land located between SH1 and Wainui Road north of Wēiti Stream in Silverdale.

More information is contained Appendix H: Engagement Summary.

2.3 Community engagement

A public feedback period was held between 16 August and 7 September 2018. Two public open days were held in the North, at the Dairy Flat Hall and Silverdale Mall, drawing 127 people across both days. The information presented showed the key decisions being made by the Project team at the short list phase, and key information to consider associated with each option. Project staff were on hand and available to take attendees around each board, and speak to the information, as well as answer specific questions.

Other information was presented at the open days on projects in the area to give a more detailed picture of the wider transport network in the North – including Dairy Flat Highway Safety Improvements (AT), Northern Corridor Improvements (NZ Transport Agency) and the Silverdale West-Dairy Flat Industrial Structure Plan (Auckland Council).

Attendees were encouraged to give feedback via Post-it notes on the information boards and through online/hard copy survey forms.

2.3.1 Future customers

At this stage, public engagement has largely attracted people from the current communities in growth areas or surrounding areas. It is highly likely that, in future, communities in these areas will be different than today, with much of the future communities made up of today's children and young people. To engage with children and young people, Te Tupu Ngātahi ran four workshops with schools, Auckland Council's Youth Advisory Panel, and young professionals, which focused on key transport issues and future aspirations for Auckland as a successful city to live in.

2.4 How feedback has been used

Feedback from partners, key stakeholders, future customers and the community has been considered alongside technical assessments in the decision-making process on the recommended network (as a non-scored criterion in the multi-criteria analysis). The key feedback themes have been summarised in Section 6.3.1.2, with comments made on how this feedback is / is not consistent with the recommended network, and any issues for further consideration. The themes from engagement were also used alongside other data sources to compile current community insights on the existing network and suggestions for the future network (as included in Section 4.4 below).

2.5 Policy context and organisational alignment

As described in Section 1, the AUP initially identified 11,000 hectares (ha) of predominantly rural land for future urbanisation in Auckland. In July 2017, the FULSS was updated in line with the AUP: OP zoning, with an increase to 15,000 hectares of land allocated for future urbanisation.

The wider policy context and organisational alignment relating to the investment proposal in this IBC is illustrated in Figure 7 and Table 1. In relation to the GPS, the key points are:

- The GPS strategic priority of 'Access' is of particularly high relevance. Increasing access, transport choice and network resilience using a mode neutral approach closely aligns with the investment objectives of this IBC.
- The GPS supports 'increasing the supply of serviced land for housing development in high growth urban areas, allowing for lead and other investments in transport infrastructure to support this growth'.
- Significantly reducing the number of deaths and serious injuries that occur on the transport network is a key priority for GPS 2018. In line with the GPS objective 'enabling transport choice and access', the GPS 2018 supports investment in the urbanisation of road corridors and provision of appropriately designed and maintained infrastructure (e.g. cycleways). Speed management is particularly important to increase access to, and uptake of, active forms of travel.
- The GPS supports transport and land use planning that reduces the need to travel by private vehicle (especially single occupancy), more frequent and highly patronised public transport services, extending greater priority on urban and rural routes for walking, cycling and public transport, and better management of parking.

Overall, this investment proposal is strongly aligned with existing policy, including the AT Statement of Intent and the NZ Transport Agency's Long Term Strategic View. Further detail is included in Appendix A: Strategic Case.

Figure 7: Policy context and organisational alignment

WHAT THIS MEANS FOR NORTHERN GROWTH AREA

GPS 2018/19 – 2027/28

Sets priorities for a transport system which is: safe, provides access to economic and social opportunities, enables choice, is resilient, reduces the impact on the environment, climate, and public health, and delivers value for money.

The transport system in Northern Growth Area will need to deliver on these priorities.

ATAP 2.0

The ATAP 2.0 themes align with the GPS 2018 and the Auckland Plan 2050. Available funding for greenfield projects in the ATAP Package includes \$1.3 billion allocated to greenfield transport infrastructure within the next 10 years. The package recognises that significant investment in transport infrastructure will be needed to enable the planned growth in future urban areas, to encourage the use of public transport and active modes, and to provide a reasonable level of service to future residents.

The ATAP Package includes the Penlink project and extension of the Northern Busway to Silverdale via bus shoulder lanes (to be confirmed as part of this IBC).

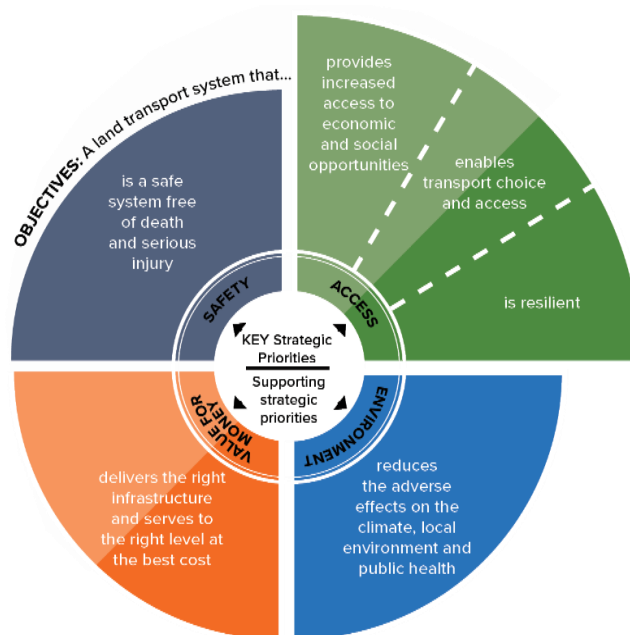
FULSS

Sets the pace and scale of growth for Northern Growth Area over the next 30 years, with:

- 32,900 new households by 2046
- 11,500 new jobs by 2046
- Associated employment within centres.

Auckland Plan

- Identifies significant area of residential development to be developed in 2033-2037 in the North.
- Anticipates that the Silverdale west/ Dairy Flat Business Structure Plan area will supply employment for the growth in the Orewa Silverdale and Dairy Flat growth areas.
- The remaining FUZ areas (apart from the live-zoned Wainui East) will be structure planned to identify the mix and location of housing, employment, retail, commercial and community facilities.
- Supports the need to identify land use opportunities and effective land use transport integration, particularly around rapid transit networks and stations.



GPS 2018/19 – 2027/28

- Sets Government priorities for the NZ transport system

Auckland Transport Alignment Project 2.0

- Recommends Auckland's transport investments for 2018-2028
- Reflects Auckland Council and government shared

Future Urban Land Supply Strategy (FULSS)

- Provides for sequenced and accelerated greenfield growth in Auckland
- Endorsed by NZ Transport Agency and Auckland Transport boards in 2016

Auckland Plan

- Long term spatial plan to ensure Auckland grows to meet opportunities and challenges of the future

Table 1: Organisational alignment

Organisation & policy	Summary and relevance
AT Statement of Intent	<p>AT's Statement of Intent (SOI) covers the three-year period from July 2018 to 2021. The primary purpose of the SOI, is to state publicly the activities and intentions of AT and the overall objectives of AT. To this end, AT's key priorities for the next three years include:</p> <ul style="list-style-type: none"> • Improving the safety of the transport system • Delivering an efficient and effective transport network • Focusing on the customer • Ensuring value for money across AT's activities • Urban regeneration and placemaking.
Transport Agency Long Term View	<p>NZ Transport Agency's Long Term Strategic View provides insight into the 30-year influences on the transport system; the challenges and opportunities they will create; their scale; and when, where and why they will emerge.</p> <p>It then provides direction on where effort is needed over the next ten years to address these challenges and opportunities. It provides useful context for each corridor being re-evaluated, including the key drivers of change –technology, demographics, economic structure, climate change, funding sustainability, data and information.</p>
Transport Agency Statement of Intent 2018-22 (Draft)	<p>NZ Transport Agency's SOI responds to recent changes in its operating environment, including the release of the new GPS on Land Transport 2018/19-2027/28, and a new outcomes framework for the transport sector. The policy statement focuses on creating a safe, resilient, well-connected and multimodal transport system that enables new housing opportunities, liveable cities and sustainable economic development in regional NZ.</p> <p>This supports the enduring outcomes for the transport sector:</p> <ul style="list-style-type: none"> • Inclusive access • Economic prosperity • Resilience and security • Environmental sustainability • Healthy and safe people. <p>NZ Transport Agency's focus remains on creating great journeys that are easy, safe and connected to keep New Zealand moving. Eight position statements describe what the Transport Agency see as the significant challenges for the sector and the Transport Agency for at least the next four years: Transport Safety; Inclusive Access; Liveable Communities; Transport Technology; Resilience; Environment; and Regulatory.</p>

3 Local context

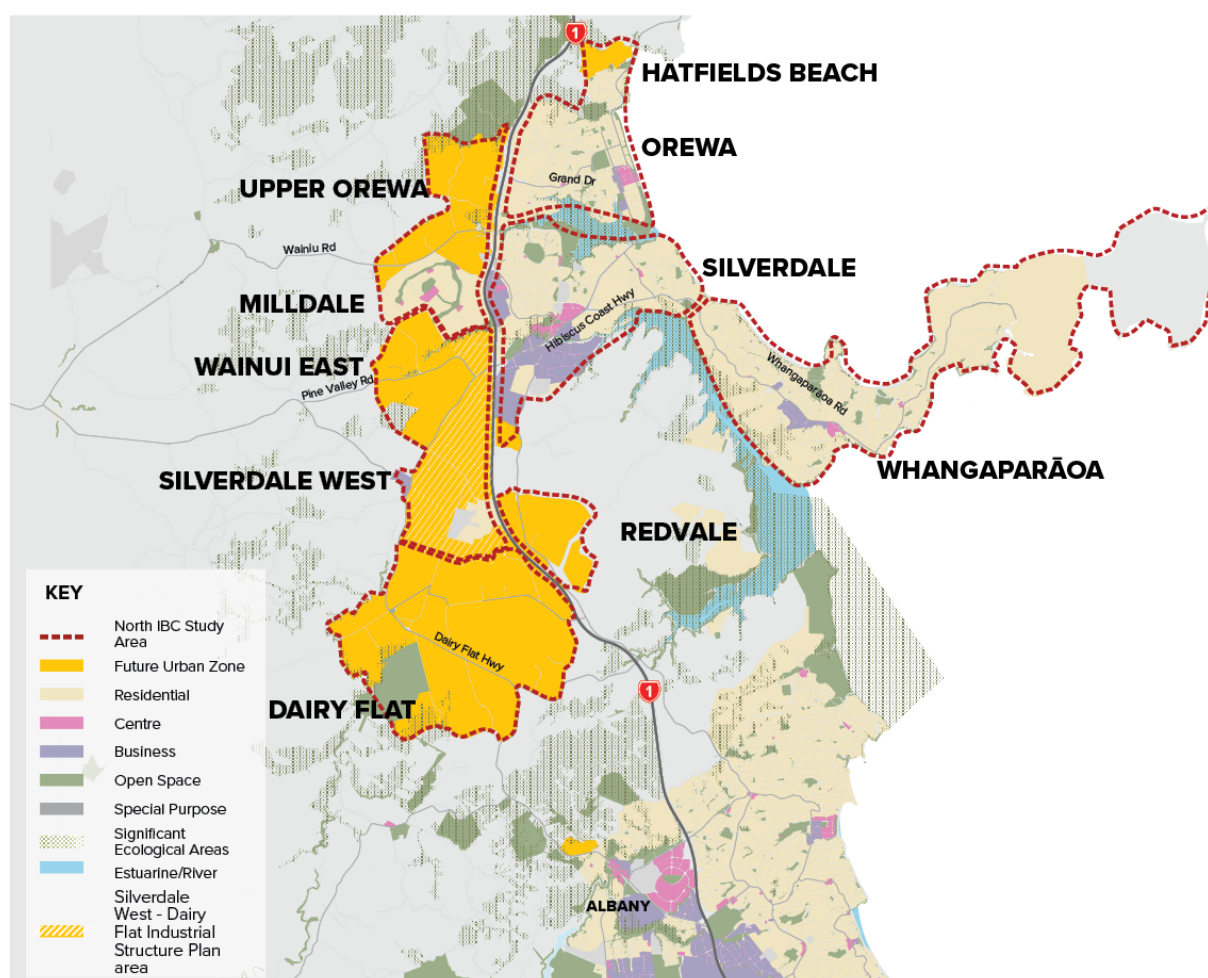
This section sets out the local context for the North study area and identifies what this means for this IBC, both in terms of constraints and opportunities. Further information on the transport context is provided in Section 5.

3.1 Study area

The North IBC study area (refer Figure 8) is approximately 14km in length, 4km north of Albany, and 20km north of the city centre.

The study area includes not only the FUZ areas of Upper Ōrewa, Wainui East, Silverdale West and Dairy Flat, but also the existing urbanised areas of Ōrewa, Silverdale and Whangaparāoa Peninsula. These existing communities rely on the same strategic network and therefore contribute to, and are affected by, future growth in the study area. The IBC considers connections to the south (to Albany) and to the west (e.g. Coatesville) of the study area.

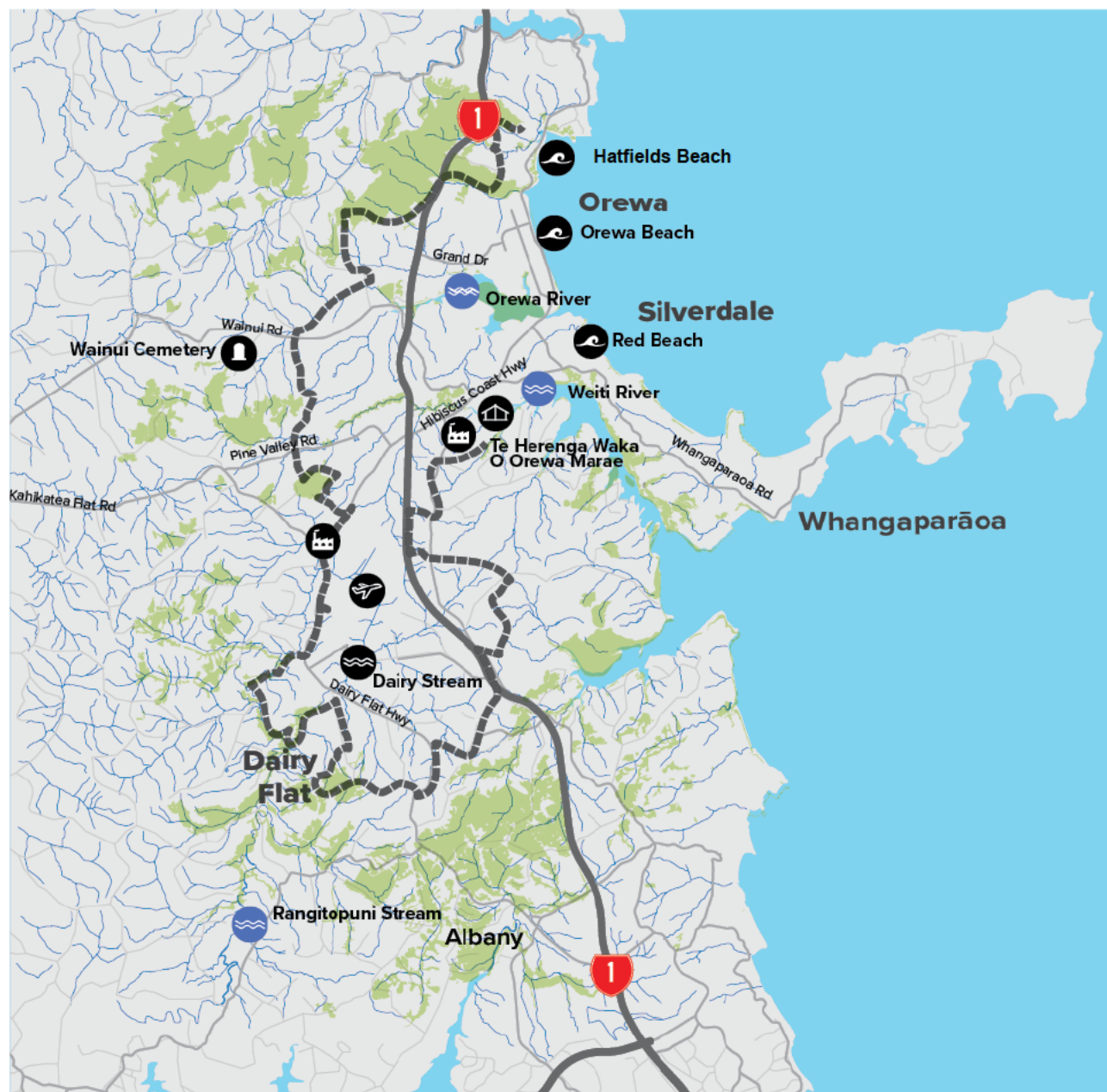
Figure 8: North study area



3.2 Environmental and social context

Key environmental features /constraints in and around the study area are shown in Figure 9. Further detail is in Appendix A: Strategic Case, including constraints maps.

Figure 9: Key environmental features/constraints



Community facilities are primarily concentrated to the west of the IBC study area including North Harbour Sports and Country Club, Dairy Flat School, Dairy Flat Community Hall, Dairy Flat Tennis club, North Shore Aero Club, and Greenpark Pre-school (just to the north of the IBC study area).

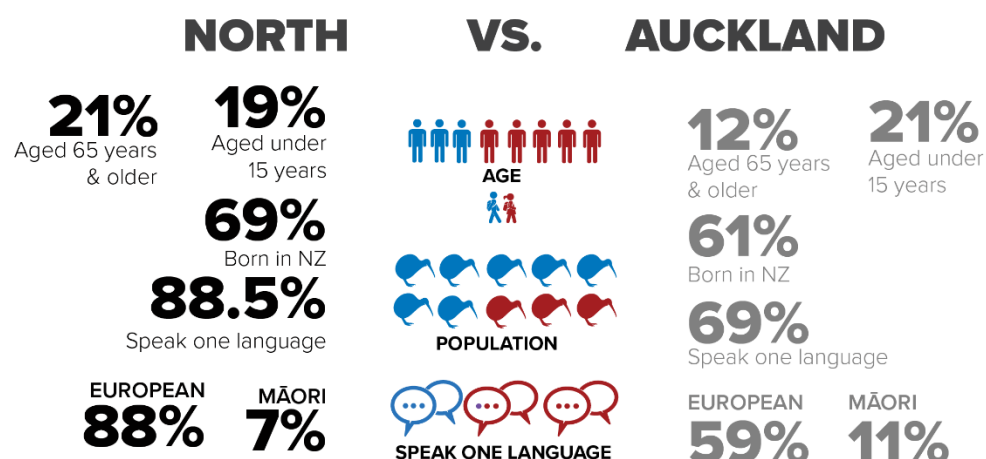
The following education facilities have catchments within the study area: Ōrewa College, Whangaparāoa College (partial catchment extending into Red Beach), Ōrewa Primary, Red Beach Primary, Ōrewa West Primary, Ōrewa North Primary, Silverdale School, Albany Senior High School, Albany Junior High School, and Dairy Flat School. Three private schools (Meraki Montessori Primary School, Stella Maris

Primary School & Kingsway School) and multiple kindergarten / child care facilities also service the IBC study area. A number of new social facilities are expected to be planned within the FUZ areas as part of future structure planning.

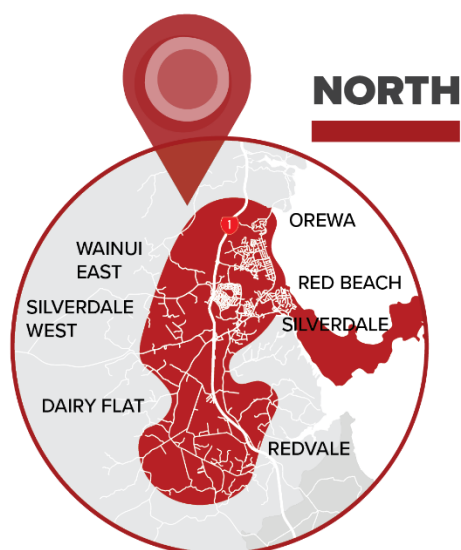
The existing demographic context in the Northern study area is summarised in Figure 10.

Figure 10: Existing demographic context

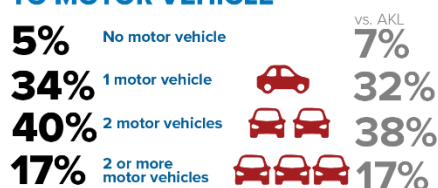
WHO WE ARE & WHAT WE DO?



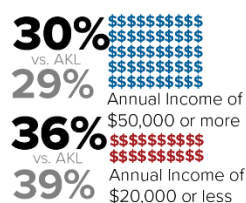
TOP 5 INDUSTRIES



HOUSEHOLD ACCESS TO MOTOR VEHICLE



PERSONAL INCOME (ENTIRE STUDY AREA)



3.3 Economic context

The existing Ōrewa and Silverdale town centres serve the surrounding residential areas (Hatfield's Beach, Millwater, Red Beach, Whangaparāoa Peninsula) and wider rural catchment. Local employment opportunities are currently located within the Silverdale industrial park, North Shore Airport, Silverdale and Ōrewa town centres and the developing Highgate business park. Auckland's city centre and Albany centre are major employment centres and will likely continue to account for a large portion of commuter trips from the study area in the future.

The existing population within an Auckland region context has:

- A higher proportion of people within the working age bracket
- A lower proportion of low-income households.

Business in the area is dominated by construction, education and manufacturing.

In future, the new Silverdale West-Dairy Flat Industrial Structure Plan area is planned to provide an additional ~12,000 industrial jobs, with another 5,000 jobs likely in and around the future Dairy Flat town centre⁷.

4 Strategic assessment

This section sets out current transport context, constraints, and opportunities. It describes the 'Do Minimum' scenario i.e. What happens to the Northern growth area (and the wider study area) if growth happens without corresponding investment in transport infrastructure.

It also describes the problems, benefits, investment objectives, and key performance indicators (KPIs) that specifically relate to the Northern growth area.

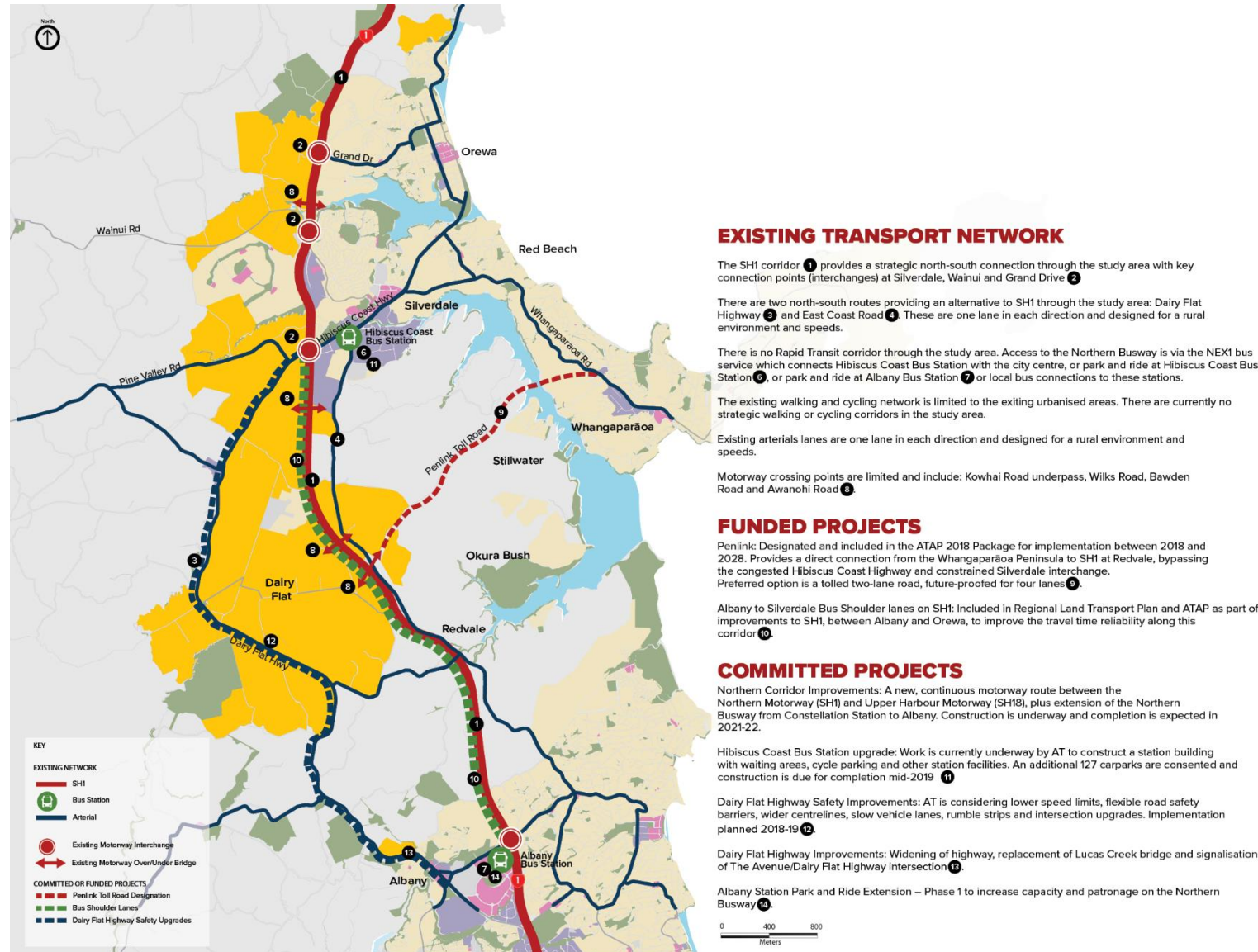
4.1 Current travel patterns/context and related transport projects

Public transport is playing an increasingly significant role in Auckland. Rail and bus rapid transit (RT) patronage is increasing as is active planning for new RT corridors. Given Auckland's dispersed settlement, the State highway network provides key linkages within the Auckland region and surrounding regions.

The existing transport context in the Northern growth area is summarised in Figure 11, including committed and funded transport projects that are interrelated with this IBC.

⁷ Based on Auckland transport model projections using i11 scenario

Figure 11: Transport context and related committed/ funded projects



4.2 Future transport challenges and opportunities

Current travel patterns in the Northern growth area (described in Section 4.1), combined with the planned growth and existing constraints identified previously, pose a number of future transport challenges and opportunities. The key challenges and opportunities are listed below with more detailed analysis in the problem statements in Section 4.5:

- **SH1 severance:** Overcoming severance between newly developing residential areas on both sides of the SH1 corridor, and between the FUZ areas to the west of SH1 and the existing centres of Silverdale, Ōrewa and Millwater on the eastern side.
- **Penlink:** This project will relieve pressure on Whangaparāoa Road, Hibiscus Coast Highway and Silverdale SH1 Interchange. It will also improve access for Whangaparāoa Peninsula residents to the south but could potentially add a new congestion hotspot at Redvale with downstream effects on SH1 south of the study area.
- **Supporting transport choice/mode shift:** The high reliance on private vehicles will place increasing pressure on the strategic transport network and will limit access to social and economic opportunities unless transport choices are improved.
- **Development pressure:** It is likely the proposed Penlink and new east west connection will already be in operation before the Dairy Flat growth area is ready to accommodate its planned growth. Therefore, it is important to manage pressure from developers to meet the aspirations for the Northern growth area.
- **Providing transport connectivity to surrounding town centres:** The Dairy Flat growth area will not be geographically connected to the nearest town centres such as Albany, and the Silverdale growth area. It is important to provide well-connected transport links to the surrounding town centres or provide enough amenities to enable the growth area to be self-contained to reduce the number of unnecessary trips.
- **Increased provision of local jobs:** Given the study area is located within Auckland's peripheral area the availability of local jobs will have significant benefits to the population and wider region through reducing longer distance travel, increasing job accessibility and making best use of existing infrastructure through changes in distribution of travel (more demand in counter peak direction).
- **Staging of development:** With the Wainui East live zone occurring prior to the development of the Silverdale West-Dairy Flat Industrial Structure Plan area, new residents will have limited opportunity to work in the local area. This, coupled with lead times on upgrades to public transport infrastructure and services, is likely to lead to a high reliance on private vehicle travel.
- **Staging and provision of improved public transport** to match the pace and the location of development within the study area will be challenging. The delay in full development in Dairy Flat poses challenges for extending the current strategic public transport corridor from Albany to serve the northern half of the study area first and ensuring that a viable and attractive public transport service is in place to reduce reliance on car travel.
- **Providing good access for freight:** The Silverdale West- Dairy Flat Industrial Structure Plan area is likely to cater for industry type development. This type of land use is heavily reliant on connections to the strategic road corridor in order to be desirable for businesses to locate in the area.

4.3 Network integration

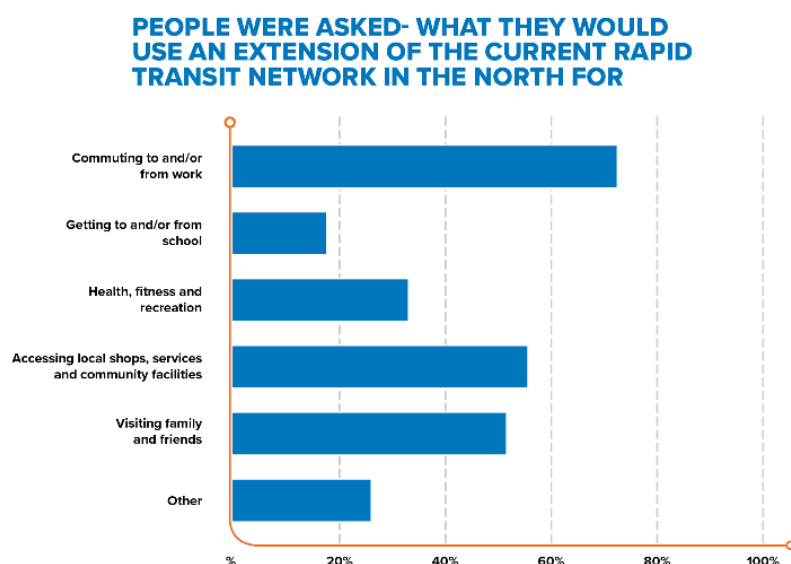
The transport network within the Northern growth area needs to integrate with the wider regional transport system. Of key relevance to this IBC, the Transport Agency and AT are currently undertaking a joint project, the **North Shore to City Strategic Corridor**, to look into the following two major (currently unfunded) projects, including completion of a business case:

- **North Shore RT** –The PBC for this project is being updated to address future capacity constraints expected for the Northern Busway from Albany south to the City Centre. This will consider higher capacity modes than the busway such as light rail / heavy rail and their timing. To date, investigations suggest upgrading the Northern Busway to a higher capacity mode may be required by the mid-2030s, earlier than previously anticipated. This would require a new RT crossing of the Waitematā Harbour.
- **Additional Waitemata Harbour Crossing** - Current investigation work needs to be completed to provide more certainty about the optimal timing, modal mix, configuration and operation of the crossing. The additional crossing, together with the existing Auckland Harbour Bridge, could provide a multi-modal option, with potential for RT. The next stage is route protection. Construction is not anticipated to commence until at least the late 2030s.

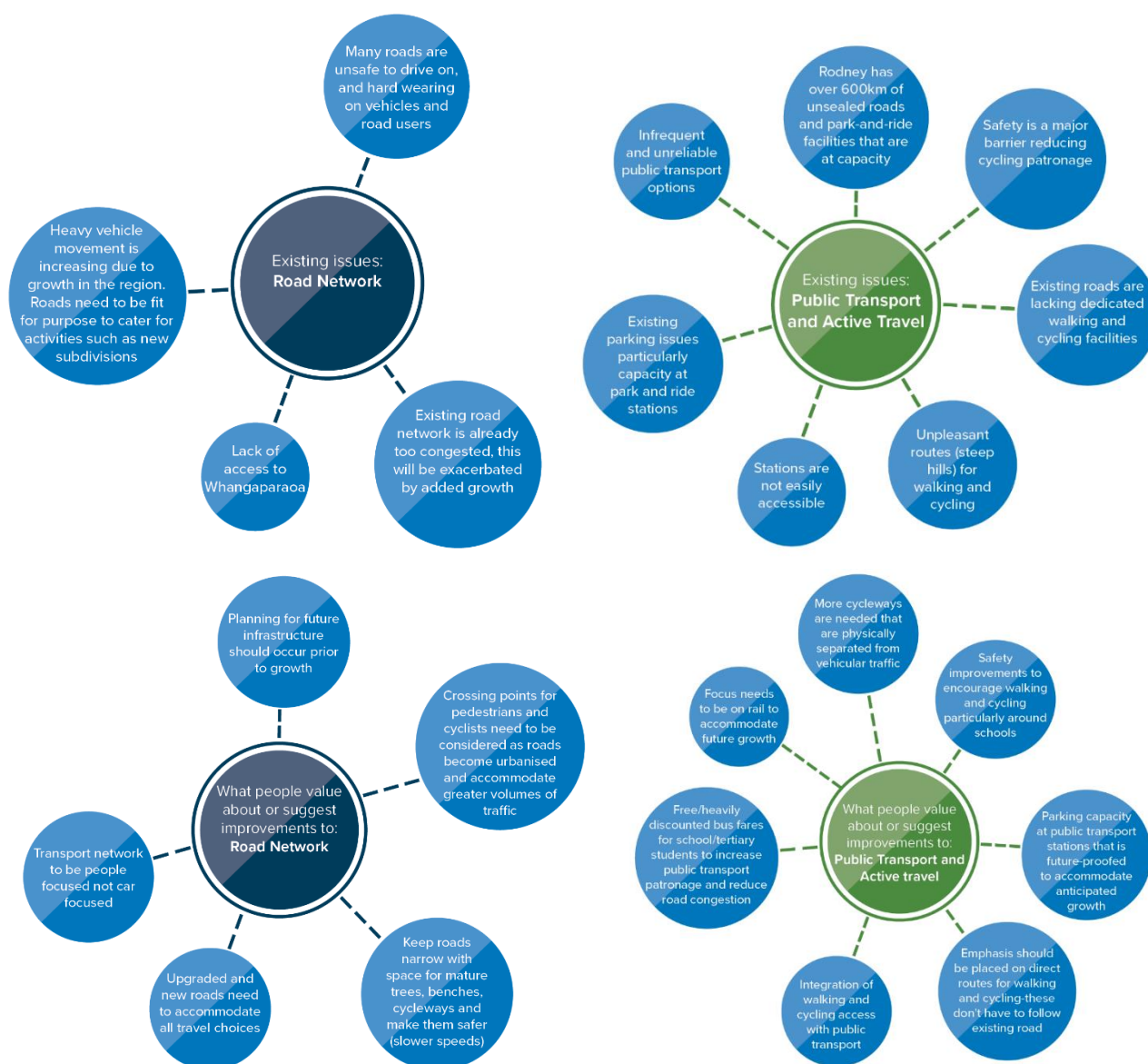
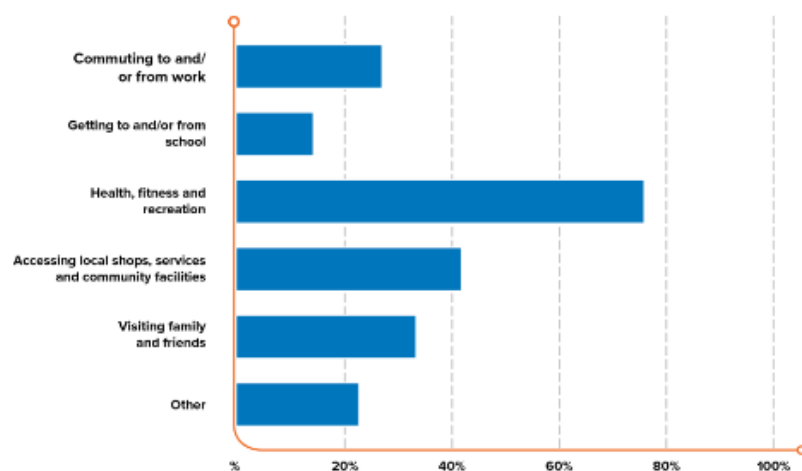
4.4 Customer insights on the existing network

Current customer insights on problems with the existing Northern transport network and suggestions for the future network are summarised in Figure 12, based on feedback received during the public consultation period (plus other survey and data sources, as described in Appendix H: Engagement Summary Report). These customer insights have been used in defining the problem, benefits/investment objectives and development/assessment of options.

Figure 12: Customer insights in the Northern growth area



PEOPLE WERE ASKED- WHAT THEY WOULD YOU USE A GOOD WALKING AND CYCLING NETWORK FOR IN THE NORTH



4.5 Defining the problem

The PBC identified the following problems for the future urban areas of Auckland:

- **Problem 1:** Inability to respond in a timely way to the pace and scale of greenfield development will restrict access to jobs, education and other core services round and in growth areas.
- **Problem 2:** Inability of the regional transport system, to cope with the growing demand of greenfield expansion will reduce travel choice and efficient movement of people and goods.

To identify the problems likely to affect the future transport system in the Northern growth area, the project team reviewed existing documentation, met with key stakeholders⁸ and held a workshop on 17 May 2018 to present the evidence that had been gathered. At this workshop, the PBC problems were challenged and expanded given the local context and changes in strategic policy (as summarised in Figure 7) and growth. Four key problems were identified:

- Problem Statement 1: Inability of the regional transport system to cope with travel demand caused by growth in the Northern growth area will compromise access to economic and social opportunities.
- Problem Statement 2: Growth in and around the Northern growth area will reduce the reliability of the strategic transport network.
- Problem Statement 3: Failure to integrate transport planning with the pace, scale and form of growth will result in a poor quality urban and natural environment.
- Problem Statement 4: The transport network lacks safe and attractive travel choice, leading to an overreliance on single occupancy vehicle travel.

These identified problems are described and evidenced in the following sections. A full account of the process and evidence base can be found in Appendix A: Strategic Case.

4.5.1 Problem Statement 1: Access

Inability of the regional transport system to cope with travel demand caused by growth in the Northern growth area will compromise access to economic and social opportunities (30%)

4.5.1.1 The cause

Cause 1: Significant residential and employment growth is planned

As described in the previous sections, significant residential and employment growth is planned in the North. The key areas for population growth are Milldale and Dairy Flat, whereas the Silverdale West-Dairy Flat Industrial Structure Plan area and Dairy Flat town centres are the key areas for employment growth (refer Figure 4).

Cause 2: Imbalance between households and jobs

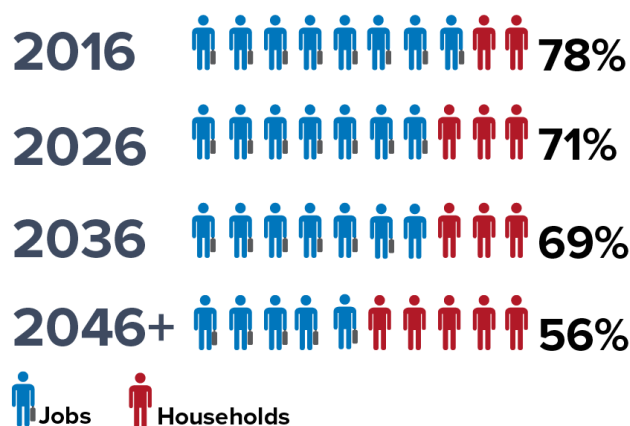
⁸ List of stakeholders provided in Appendix H – Engagement Summary.

Despite the growth in employment, transport modelling indicates that the increase in jobs will not match the growth in households, as shown below in Figure 13:

- In the wider Northern area, the current ratio of jobs to households is 78% (in the 2016 base year)
- By 2046+, despite the provision of approximately 24,000 new jobs in the wider North study area (including ~12,000 additional jobs in the Silverdale West-Dairy Flat Business Area), the ratio of jobs to households is forecast to drop to below 60%.
- This means people still need to travel outside the study area to access jobs. Overall the total number of jobs will increase, given the growth in population.

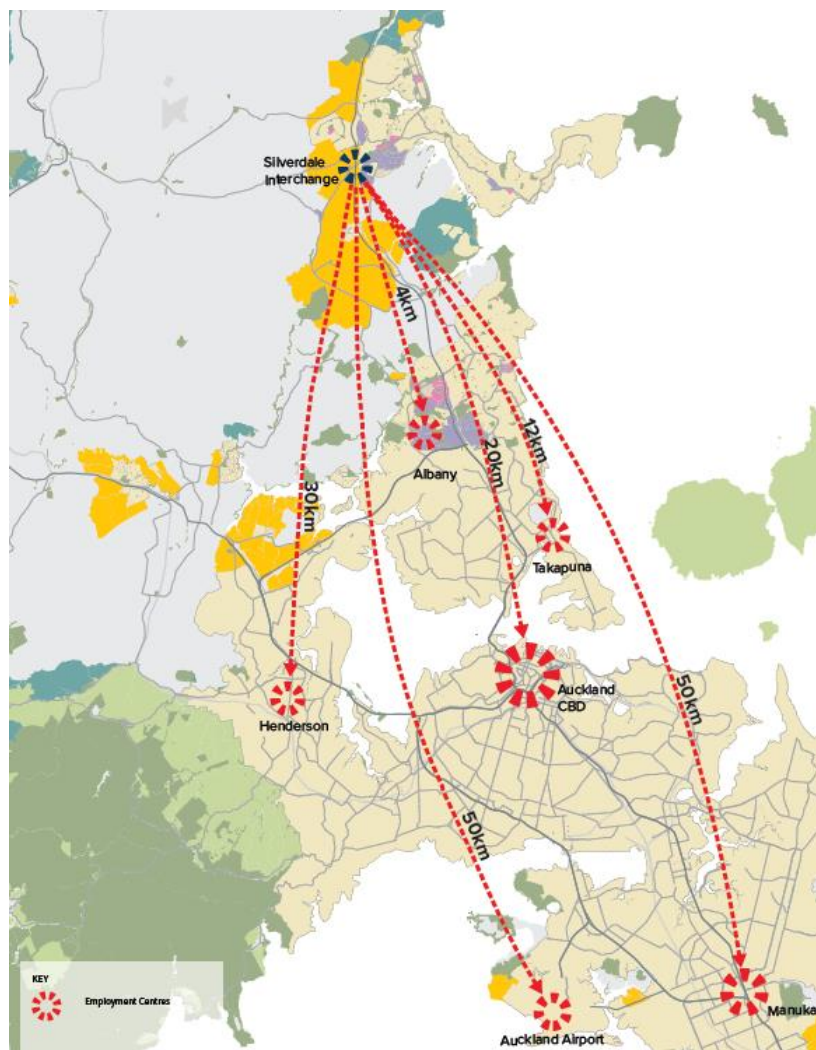
Figure 13: Ratio of jobs to households in North

Jobs to Households Ratio



Cause 3: Isolation from main employment centres

Figure 14: Where will the jobs be in 2046+?



As shown in Figure 14, the Northern growth area is isolated from the main employment centres (which generally also include important community facilities/services).

Currently, access to employment in the North is not as convenient as many areas within the Auckland region i.e. people travel further to access employment than other areas of Auckland closer to employment hubs. As shown in Figure 14, Silverdale is approximately 20km from the Auckland city centre, which compares to an average journey to work trip length in the Auckland region of close to 12km⁹.

The proposed business (industrial) area and other growth in employment (such as in a future Dairy Flat town centre) are forecast to lead to an increase in internal trips to access employment, with around two-thirds of traffic from the residential areas in the study area (including Whangaparāoa Peninsula)

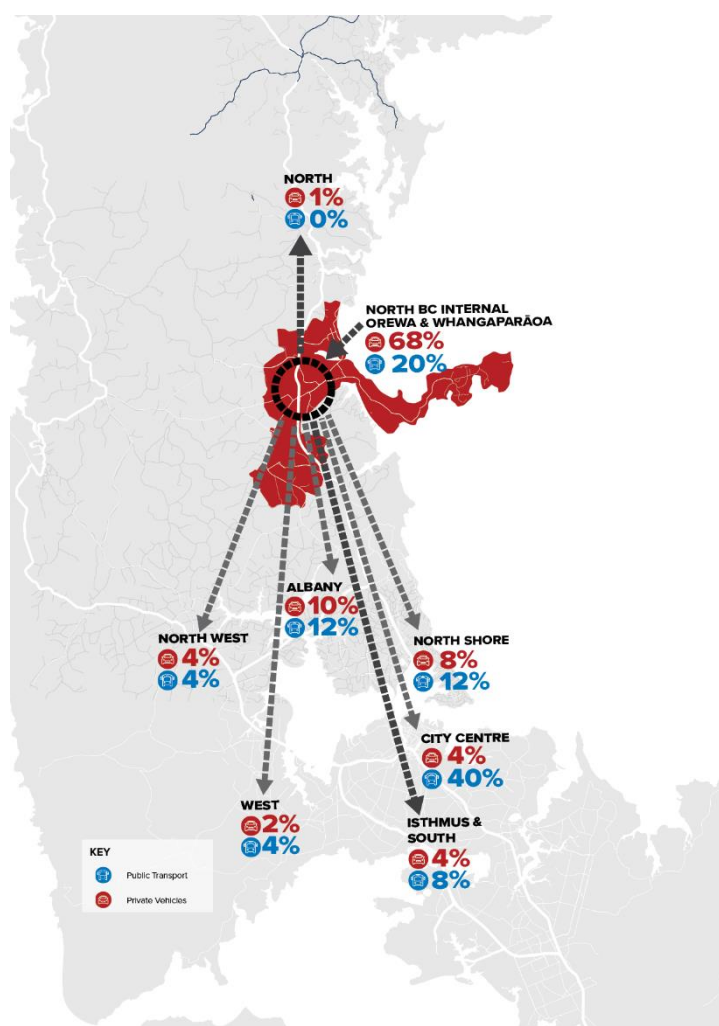
forecast to remain as internal trips. This will reduce some travel demand out of the area. However, significant numbers of people will still need to travel outside the North to access jobs, with key locations comprising Albany, Takapuna, Henderson, City Centre and Manukau.

In particular (as shown in Figure 15):

- Traffic modelling indicates that in 2046+ there is still strong demand for general vehicles to travel to the Albany and North Shore areas (20% of trips leaving in AM peak); with around 10% travelling to the City Centre and areas to the south.
- For public transport, travel demand depends heavily on availability of services – such that a large proportion of travel demand is for the city centre (around 1/2 of trips by bus), making use of the existing RT (Northern Busway). North Shore and Albany are also popular (24%).

⁹ Richard Paling: Journey to Work Patterns in the Auckland Region based on 2013 Census journey to work data)

Figure 15: Modelled (Do Minimum 2046+) trip distribution for outbound car and public transport trips in AM peak



Cause 4: Limited choice and capacity constraints in the existing network

Limited mode and corridor choice is discussed under Problem Statement 4. This is also a key cause of Problem Statement 1, as lack of choice will limit access to social and economic opportunities.

The existing transport network is subject to a number of network constraints that will not be fully addressed by currently committed or funded projects, and which will be put under increasing pressure as the Northern growth area develops. For general vehicles these constraints include:

- Congestion at the SH1 Silverdale interchange
- Safety and capacity constraints on the north-south alternatives to SH1 (i.e. Dairy Flat Highway and East Coast Road)
- North-south corridor capacity, including existing congestion issues on SH1 from Albany to the south.

For public transport and active modes, these constraints include:

- Congestion at the SH1 Silverdale interchange

- Physical constraints, including one-lane bridges (in each direction) and steep topography, on alternative north-south routes (i.e. Dairy Flat Highway and East Coast Road)
- Limits on access to the existing RT network (Northern Busway) associated with the lack of walk up catchment to Hibiscus Coast Bus Station; the severance effect of SH1 and the Hibiscus Coast Highway for active travel; congestion effects on public transport connections to the Hibiscus Coast Bus Station; and capacity constraints on park and ride.

Further evidence on capacity issues is presented under Problem Statement 2.

4.5.1.2 *The consequence*

If this problem is not addressed, the following consequences can be expected in the North.

Consequence 1: Poor access to jobs, education, community facilities and services for future residents

If this problem is not addressed, growth will exacerbate and add to the transport access challenges and constraints in the North. In particular:

- North-south corridor capacity on SH1 from Albany south will be exceeded, affecting vehicles and the reliability of buses which use SH1 to connect the study area to the Northern Busway at Albany
- Congestion at Silverdale interchange will be exacerbated, affecting private vehicle and public transport reliability
- Forecast increases in traffic heading south on Dairy Flat Highway and East Coast Road will exacerbate safety issues and capacity constraints, including for buses
- Access constraints to the Northern Busway will be exacerbated as demand increases and new areas of FUZ (on the west of SH1) will be even more separated from the Northern Busway.

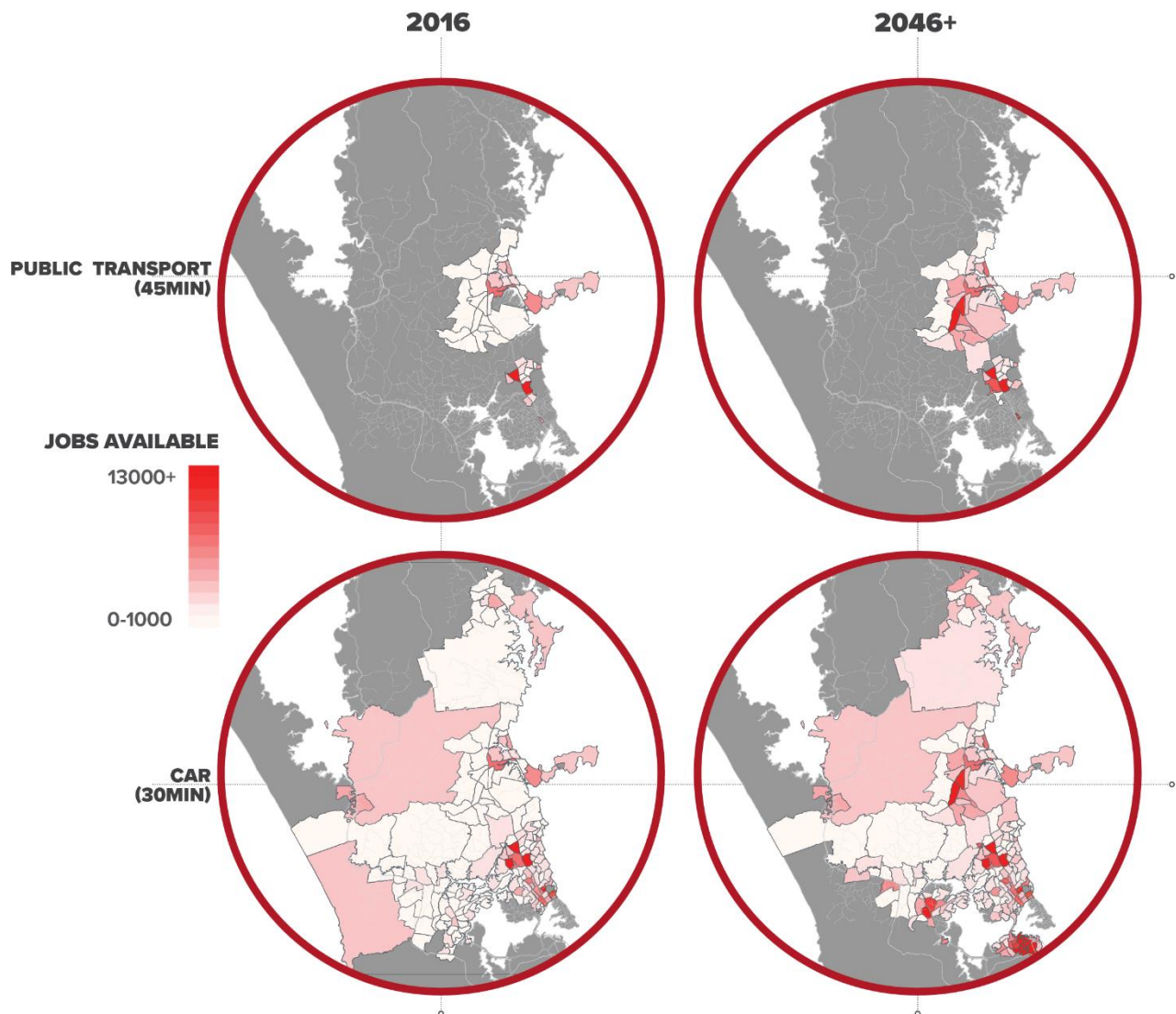
Access will depend on the availability of local jobs and social opportunities/facilities, plus the availability and effectiveness of the transport network to access these. People will need to use the strategic network to access key employment centres. If this problem is not addressed, accessibility will decrease in future due to lack of transport connections and congestion on the network. The success/growth of the new Silverdale West-Dairy Flat Industrial Structure Plan area will also be constrained without good access to labour and transport networks.

As evidence, future access has been measured by transport modelling of the number of jobs accessible within 45 mins by public transport and 30 mins by car, comparing 2016 (existing) with Future (2046+) based on the Do Minimum scenario (refer Figure 16). The 2046+ 'Do Minimum' network assumes Penlink, Northern Corridor Improvements (NCI), Northern Busway to Albany, and bus shoulder lanes to Hibiscus Coast Bus Station. Note: Employment centres are also a proxy for access to social opportunities because these are often located in and around employment centres. This comparison shows that:

- Between 2016 and 2046+, the forecast number of jobs accessible by car and public transport increases, reflecting increased employment opportunities in the study area and in other employment centres.
- However, while the number of jobs accessible to the study area increases, the population is increasing, meaning more competition for available jobs.

- The jobs accessible by public transport are significantly less than those accessible by car, for both 2016 and 2046+.

Figure 16: Access to jobs via public transport and car (2016 versus 2046+ Do minimum)



Consequence 2: Poor quality of life for residents and employees in the area

Poor access to where people live, work and play has a direct impact on quality of life (e.g. longer journey times so less time spent with family, impacts on health and wellbeing).

4.5.2 Problem Statement 2: Reliability

Growth in and around the Northern growth area will reduce the reliability of the strategic transport network (40%)

4.5.2.1 The cause

Cause 1: Travel demand - commuters

With the expected growth in and around the Northern growth area, demand is predicted to significantly exceed capacity on north-south strategic transport routes. This is compounded by the lack of route choice on the strategic network.

The strategic transport network in the North is dominated by the Northern Motorway (SH1) – which is the most important north-south route for people and freight travelling to regional destinations such as the city centre for employment, and the port/airport for freight. Other strategic north-south routes include East Coast Road and Dairy Flat Highway.

These routes already have significant capacity constraints as demonstrated in Figure 17. The current situation has some minor additional capacity, but given the growth forecast, this is insufficient to cater for growth.

Growth in the North is predicted to more than double the travel demand to the south, mainly related to travel to jobs outside the study area (as described in Problem Statement 1). If no significant improvements are done to the network (Do-minimum scenario¹⁰), the demand will be limited by the total available capacity. All available capacity will be used for car trips and a substantial proportion of trips will make use of bus services (assumed to be shoulder running on the motorway) as this is the only alternative to a congested road network. Given the level of congestion and demand (and overcrowding) on the bus shoulder lanes, performance of this facility is predicted to be highly compromised in the long term.

By 2046, if an investment is made to the study area (Reference case scenario¹¹), forecast demand for both car and public transport increases, indicating that the recommended network releases a significant amount of suppressed travel demand. Much of the additional capacity is provided via the public transport network, driven by an improved quality of service, better accessibility and offer of an attractive choice compared to car travel.

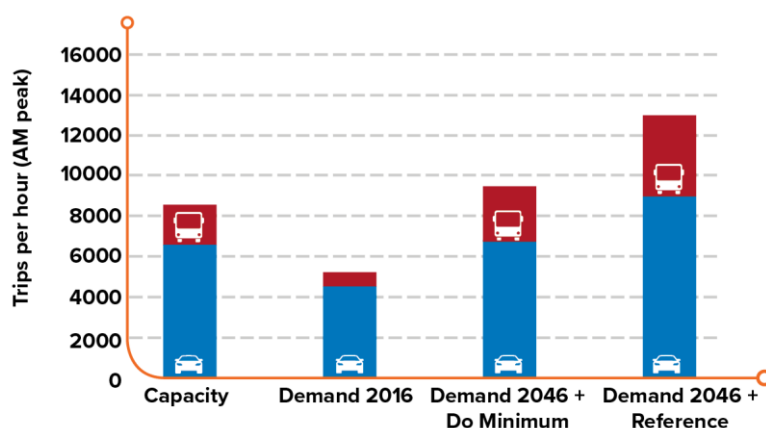
The travel demand and mode split is dependent on the transport connections provided and thus will change under different transport scenarios. However, this analysis provides an indication of the total capacity constraints.

¹⁰ Do-minimum network – No significant investment to the area but includes bus shoulder lanes to Silverdale, Penlink and improvements to local bus services.

¹¹ Reference case – a package of investment in the area similar to TfUG preferred network which includes SH1 widening and a RT Corridor to Milldale.

Figure 17: Capacity versus demand for trips from the study area to the south 2016 and 2046+ (cars and public transport)

Trips from the study area to South



Cause 2: Travel demand - Freight

The expected regional growth in volumes of freight between Northland and Auckland over the next 30 years is approximately 30% (compared to around 60% nationally).¹² However, the upgrade of SH1 between Puhoi and Warkworth (and potentially to Wellsford) will likely increase the attractiveness of road for freight movements between Northland and Auckland in the future.

In comparison, the projected increase in freight trips heading south of the study area over the next 30+ years is higher, at approximately 50% in the AM peak and 40% in the inter-peak period, based on the 2046+ Do Minimum scenario¹³. This suggests that freight trips generated within the study area will contribute more to downstream freight demand than to freight trips originating from north of the study area. Supporting this, the modelling data projects that freight trips generated in the study area will account for approximately 80% of the freight trips heading southbound in the AM peak.

Within 10-15 years, the existing industrial land in the south of Silverdale will be supplemented by another very large freight-generating zone in the study area - the proposed industrial land in the Silverdale West-Dairy Flat Industrial Structure Plan area. While the new industrial area will increase the proportion of heavy freight in the study area (particularly on key links) there may be a general trend towards lighter vehicles in the future with the growth in on-line shopping services and delivery of goods directly to consumers' homes from distribution centres. This indicates that the local network will also provide a key role in freight movements. Modelling projections under the Do Minimum network indicate that 50%-60% of freight trips originating in the study area will be internal trips.

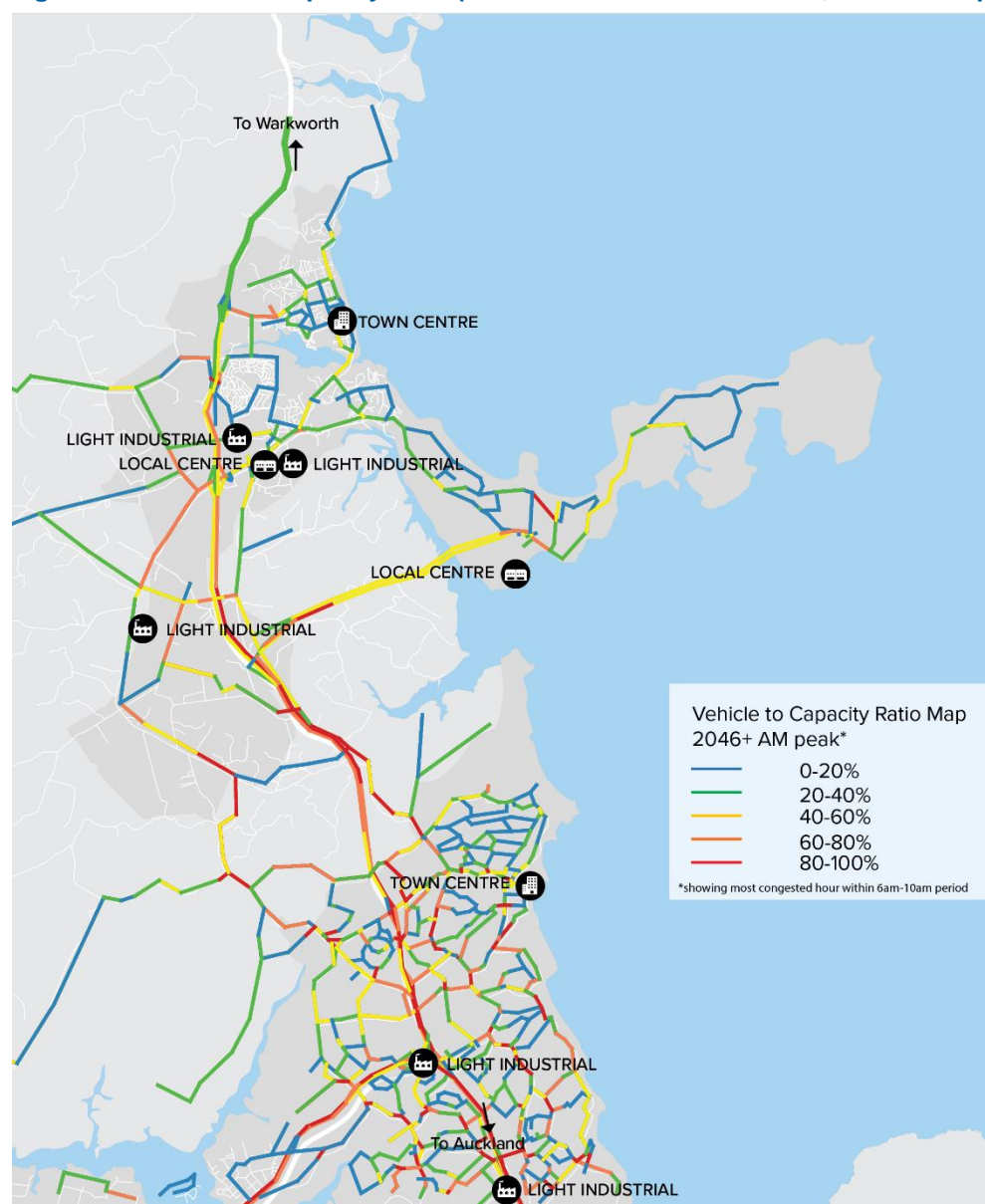
¹² Ministry of Transport's National Freight Demand Study (2014)

¹³ Using the Auckland transport model i11 (2046+) Do Minimum scenario

Cause 3: Reduced ability of the network to cope with demand

AIMSUM modelling indicates that, in 2046+ under a Do Minimum transport network, many of the transport network links are under considerable strain (refer Figure 18:). This data shows the traffic demand compared to the capacity of the road on which it is travelling, or VCR (Vehicle: Capacity Ratio)¹⁴.

Figure 18: Vehicle to capacity ratio (2046+ Do Minimum scenario, AM 2-hour peak)



From a north-south perspective, all available routes (SH1, Dairy Flat Highway and East Coast Road) are over capacity with Level of Service (LOS) E or F. Other pinch points include the east-west approaches to SH1 at the Wainui Road, Silverdale and Penlink (south-facing) interchanges.

The analysis indicates that the three main north-south strategic routes providing access to the south (SH1, Dairy Flat Highway and East Coast Road) will experience reduced reliability, impacting on the resilience of the strategic network overall. The same is expected for access to SH1.

¹⁴ A 4-hour period was looked at and the most congested hour is shown

Cause 4: Limited mode choice

The limited mode choice along strategic corridors and access to those corridors is another key cause of the reliability problem. This issue is further discussed under Problem Statement 4.

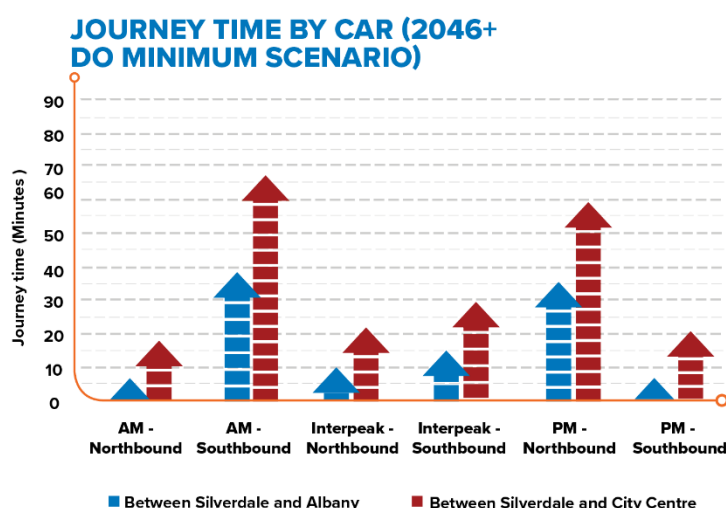
4.5.2.2 The consequence

The following key consequences can be expected if this problem is not addressed:

Consequence 1: Unreliable access to and along the strategic transport network

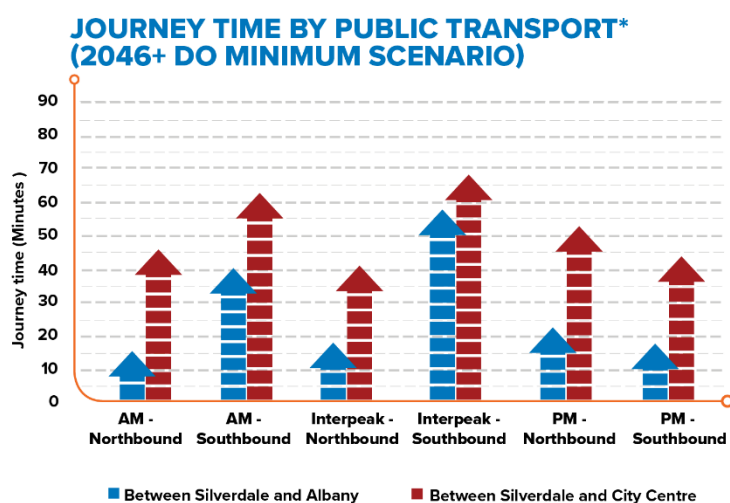
As shown in Figure 19, traffic modelling indicates a significant difference in journey times to the city centre by car and public transport in 2046+ between peak and inter-peak periods. This shows significant variability of travel time experienced during the day, which is an indicator of travel time reliability. Travel time reliability is important to users/customers of the transport network, as they plan their daily activities and make life decisions about living in this area.

Figure 19: Journey time to the city centre by car (2046+ Do Minimum scenario)



Reliability is a key factor for freight and for public transport effectiveness and attractiveness. Inter-regional and local network freight movements rely on these strategic connections. Freight logistics planning strongly depends on reliable freight routes.

For public transport, studies and experience overseas have consistently shown that patronage growth on urban bus services is directly linked to improvements in frequency and reliability. For example, experience with major bus system improvements (in Australia and Europe) shows that the largest patronage growth levels are related to increases in service levels and in bus RT and bus



*The public transport journey time includes waiting time at the station to board the service

priority systems targeting improved reliability.¹⁵

In the Auckland context, the patronage on the RT network has increased substantially over the past decade. AT data shows that the total patronage on the rail network increased from 6 million people in 2007 to over 20 million in 2017. The total patronage on the Northern Busway increased from 0.7 million people in 2007 to over 5 million people in 2017.

Unreliable access to the strategic network will in turn have the following consequences:

- **Consequence 2:** Reduced attractiveness of public transport, placing more pressure on the road network and increased reliance on the car
- **Consequence 3:** Effects on regional productivity
- **Consequence 4:** Impacts on access to regional employment and social opportunities, which are predominantly to the south (including Albany, the North Shore, and the city centre).

4.5.3 Problem Statement 3: Integration

Failure to integrate transport planning with the pace, scale and form of growth will result in a poor quality urban and natural environment (10%)

4.5.3.1 The cause

Cause 1: Pace and scale of urban development

The proposed staging of development in the Northern growth area¹⁶ focuses on growth in the northern half of the area first (i.e. Milldale, Millwater, Wainui East) before the Silverdale-West Dairy Flat Industrial Structure Plan area and Dairy Flat residential and town centre areas fully develop. This means:

- New residents will have limited opportunity to work in the local area.
- There will be challenges for extending the current strategic RT corridor from Albany to serve the northern half of the study area first and ensure that a viable and attractive public transport service is in place to reduce reliance on car travel.
- In those areas developing now, there is urgency to achieve transport and land use integration.
- In Dairy Flat and rest of the FUZ, there is significant opportunity for the transport system to integrate positively with land use and urban form through future structure planning.

Freight access to the strategic network will also be needed to support the proposed Silverdale-West Dairy Flat Industrial Structure Plan area.

Cause 2: The transport system is a major determinant of urban form and urban form influences travel behaviour

The benefits of a fully sustainable urban mobility system include:

- Improved accessibility for all users.
- Balanced system that responds to diverse demands for people, businesses and industry.

¹⁵ Currie G., Wallis I. (2008) Effective ways to grow urban bus markets: A synthesis of evidence. *Journal of Transport Geography*, 16 (2008), 419-429.

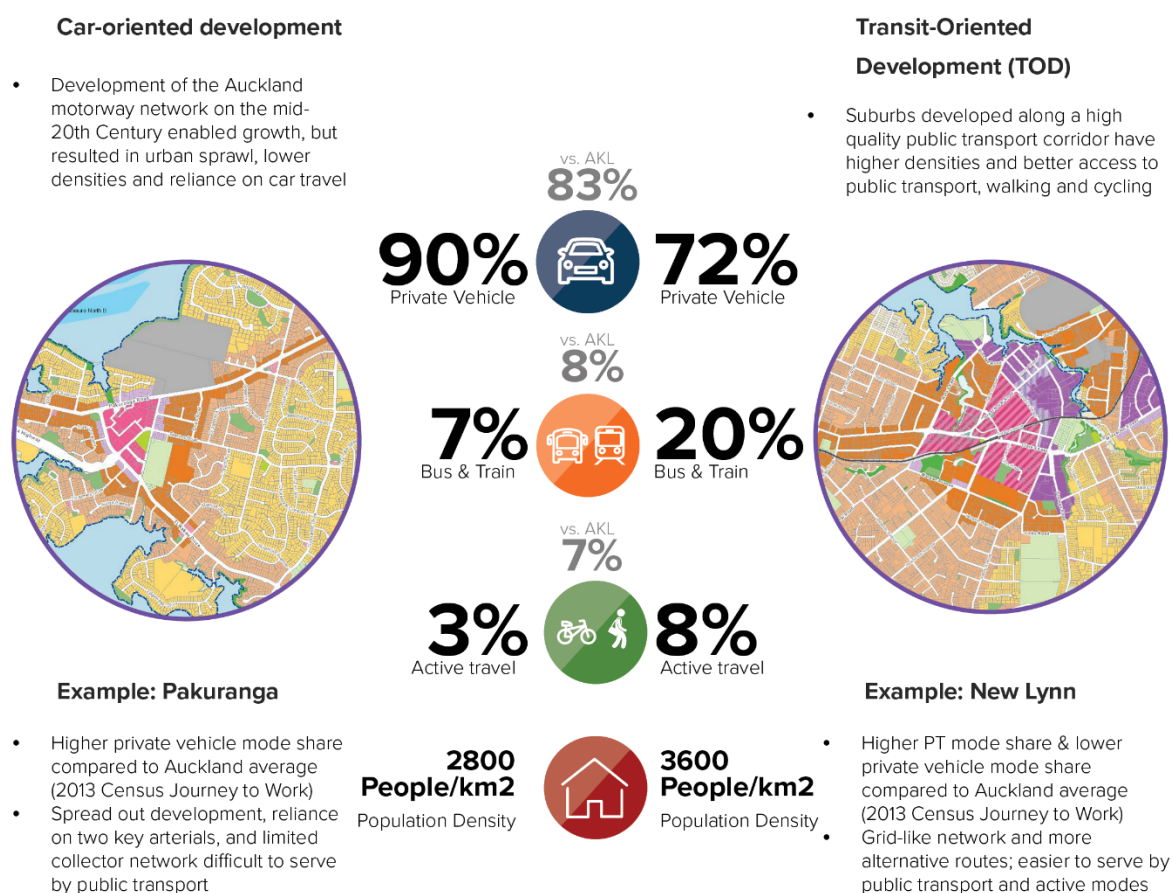
¹⁶ Section 7.1 provides a more detailed summary of the proposed staging of development for the recommended network.

- Integration of different transport modes.
- Is sustainable and balances the need for economic viability, social equity, health and environmental quality.
- Optimised efficiency and cost effectiveness.
- Better use of urban space and existing transport infrastructure and services.
- Enhanced attractiveness of the urban environment, quality of life and public health.
- Improved safety and security.
- Reduced air and noise pollution, greenhouse gas emissions and energy consumption.

Figure 20 demonstrates the interaction between the transport system and urban form in different parts of Auckland. A transport system dominated by infrastructure for private vehicles will generally promote peripheral low-density urban developments that are reliant on access by private car. Furthermore, incremental upgrades to existing dominant car infrastructure (like in Auckland), reinforces current behaviour.

In comparison, transport systems that include high quality public transport and walking and cycling promote and support development of higher density urban centres and corridors, which in turn attract more development and people. As evidence of this, the AUP has implemented higher intensity zoning around RT catchments such as AMETI Stage 2a (Panmure to Pakuranga). Recent analysis of consenting data in Auckland shows that this intensity is being taken up i.e. 40% of dwellings consented in the 2016 defined urban area were in RT catchments, even though the catchments make up only 25% of Auckland's area (Chief Economist Unit, Auckland Council, 2018).

Intense, compact, mixed-use environments at centres and along corridors reduce trip numbers and trip lengths and encourage mode shift away from private vehicle travel.

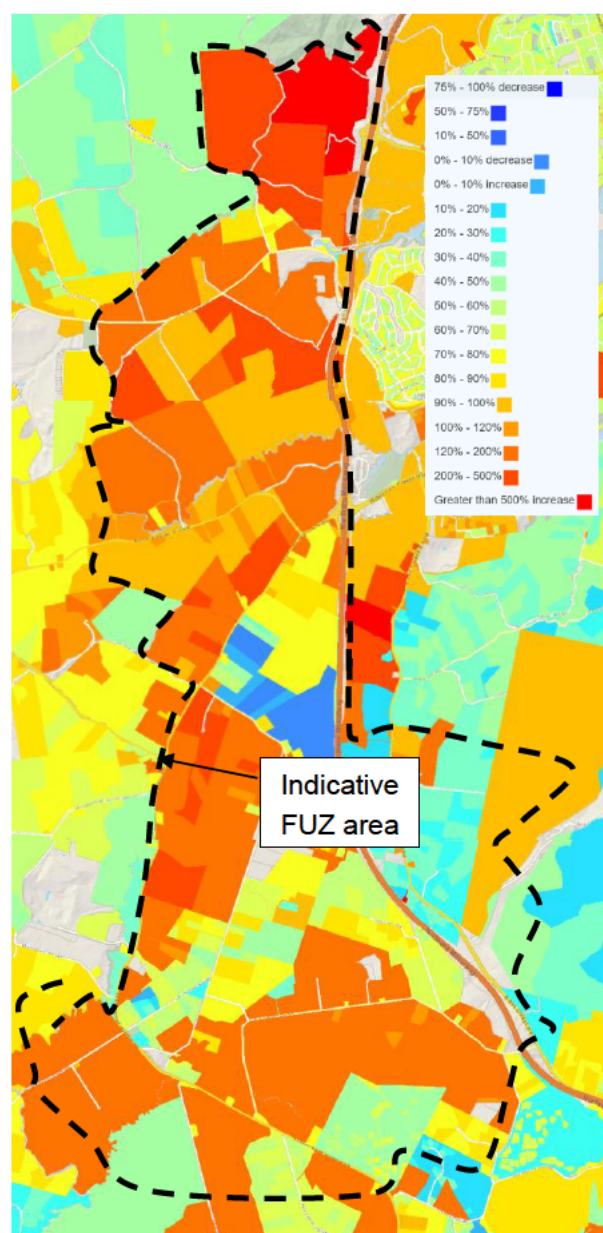
Figure 20: Interaction between transport system and urban form in Auckland

4.5.3.2 The consequence

The following key consequences can be expected if this problem is not addressed:

Consequence 1: Escalation in cost to deliver required infrastructure

Property prices within the Auckland region are growing at a significant rate. In addition to the general increase in property value for residential areas, changes in land zoning have a significant impact on the

Figure 21: Change in land value (% change from 2017 revaluation)

value of land. A research paper by the Ministry of Business Innovation and Employment (MBIE)¹⁷ reported a threefold change in average value between land just within and just outside the Metropolitan Urban Limit¹⁸ in the Auckland region.

Land prices are escalating rapidly. Auckland Council property information¹⁹ shows the magnitude of change in land value between 2014 and 2017. The percentage increase in land values in the North are shown in Figure 21. As this graphic illustrates, land values across the area have increased predominately by over 100%, with the value of red areas escalating by greater than 500%.

The Northern growth area may face significant build-out pressures and the cost of purchasing land retrospectively (once infrastructure has been built) is high. This only adds to the impetus that appropriate corridors should be protected before live zoning and development proceeds.

If not protected, land acquisition for future infrastructure projects has the potential to be financially prohibitive. This has significant implications for delivering a future network to support growth in the FUZ areas and supports the case for route protection as an approach to the delivery of the recommended network.

Consequence 1: Poor quality urban and natural environment

A lack of integrated land use and transport planning will limit the ability of the transport system to positively contribute to liveability and a quality, connected urban environment in the growth areas. If

¹⁷ MBIE, 2017 National Policy Statement on Urban Development Capacity Price efficiency indicators technical report: Rural-urban differentials.

¹⁸ Data is from pre-AUP: OP. The Metropolitan Urban Limit has been replaced by the Rural Urban Boundary.

¹⁹ <https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>

transport and land use are not integrated well, the transport system could promote land uses that do not support the land use outcomes sought for Auckland in the Auckland Plan and AUP: OP.

It is more difficult to upgrade strategic transport corridors when adjacent land is already urbanised – as this means more disruption, more encroachment on existing development and the natural environment, and more requirement for mitigation of impacts on the existing environment (e.g. for noise, visual, natural environmental impacts).

Consequence 2: Lost opportunity for the transport system to influence travel demand

In the North IBC study area, there is an opportunity to influence future travel behaviour through identifying and route protecting a preferred network that:

- Provides attractive alternatives to car travel for local and strategic trips
- Ensures a high level of access for the existing and future communities to an RT network
- Provides RT stations in locations that support intensification
- Provides public transport and active mode connections between existing and future communities to land uses that provide social and economic opportunities
- Reduces the need to travel longer distances by enhancing local connections between residential areas and centres and business land.



Example: SH1 Southern Corridor



Consequence 3: Lost opportunity for land use planning to support strategic transport interventions

Aligning timing and capacity of new strategic corridors with planned growth achieves more positive transport and land use outcomes:

- Higher amenity
- Higher public transport mode share
- Less disruption.

Land use to encourage public transport use:

- Density and community focal points around stops and stations increase demand of services and increase their viability.
- RPTP 2015 indicates high density corridors are required for rapid services and medium to high density corridors for frequent services

Land use to encourage walking and cycling:

- A well-connected network of neighbourhood streets with a range of destinations

Example: Almere, Netherlands – where the city achieves over two-thirds mode share by public transport and active modes

Consequence 4: Reduced development potential of the area

The new Silverdale West-Dairy Flat Industrial Structure Plan area is intended to help address demand for industrial land at a local and regional level (Market Economics (2017)). If there is no transport network to support it, this will reduce the development potential of this area.

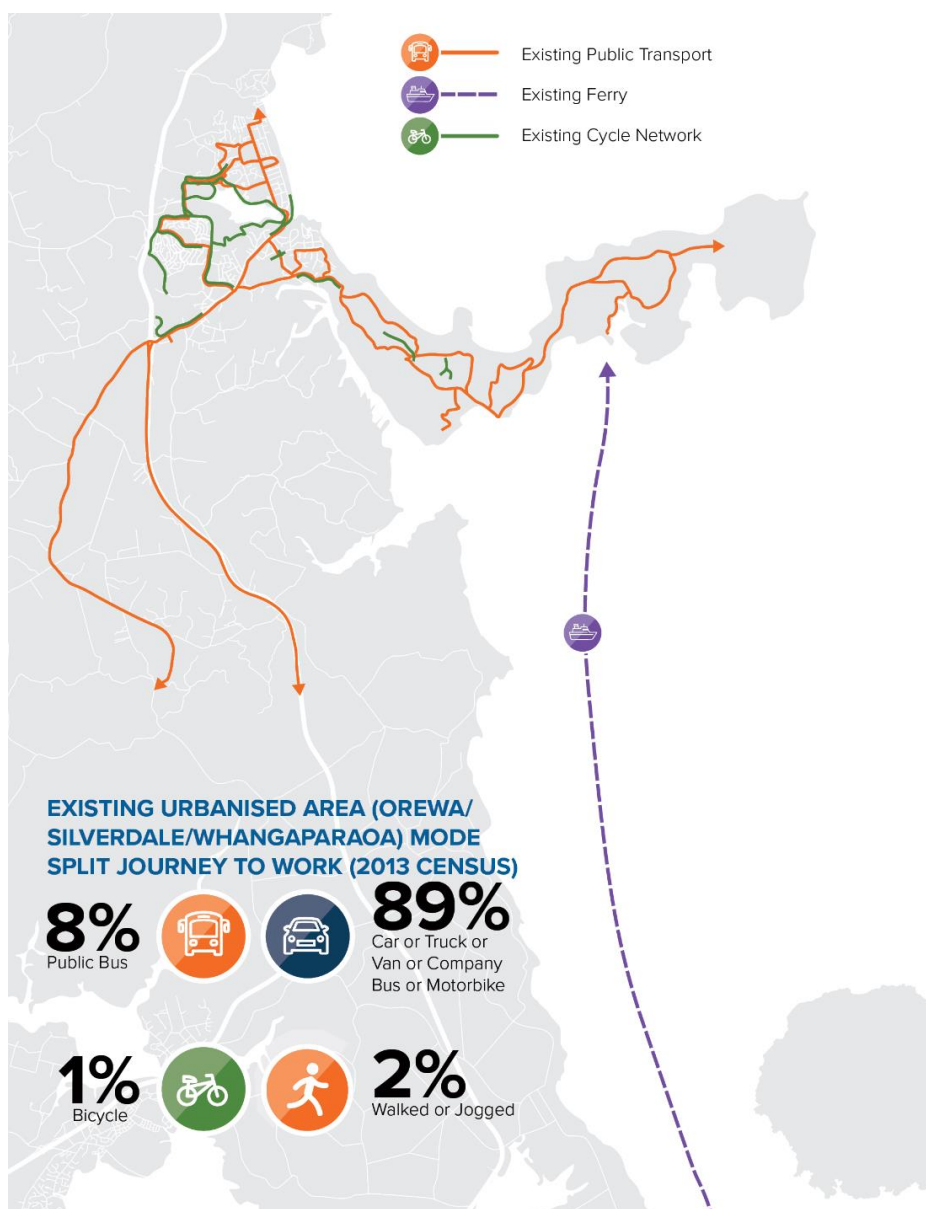
4.5.4 Problem Statement 4: Travel Choice

The transport network lacks safe and attractive travel choices, leading to an overreliance on single occupancy vehicle travel (20%)

4.5.4.1 The cause

Cause 1: The North lacks safe, attractive travel choices

Figure 22: Existing public transport and cycle network and mode share in study area



The existing public transport and cycle networks are limited in the North study area (refer Figure 22).

Existing mode share data shows reliance on car travel for commuting (refer Figure 22).

Public transport use in the North is currently low (~8%) and walking and cycling mode share is particularly low (~1%), reflecting car-oriented transport and land use form and limited choices.

Population density is needed to support high quality and frequent public transport services.

However, without investment in planned strategic public transport and active mode corridors, there is a risk that development progresses without the travel choices in

place, reinforcing old development form and travel patterns.

Analysis of the generalised cost (time and money) of journeys between a car versus public transport in 2046, shows that public transport only provides a competitive alternative to car travel for trips to and from the south (Albany, North Shore, City Centre) along the RT spine (with an assumed PBC network).

The GPS (2018) indicates that it is important for investment to provide safe, resilient travel choices via a range of modes, to incentivise mode shift away from private vehicle travel. The PBC has an objective of achieving 29% public transport trips from the growth area in the AM peak and 16% walking and cycling trips by 2045.

Significant mode shift will be required to meet this aspiration in the North; however there are opportunities to significantly increase walking and cycling for local trips as the future urban area is less than 10km from north to south and 4km from west to east.

Evidence shows that travel choices need to be safe and attractive to lead to significant mode shift.^{20 21}

A transport network that enables a significantly higher proportion of trips to be made by public transport, walking and cycling will support the intended growth while minimising the impacts of congestion.

Increasing public transport service catchment areas is an important part of maximising public transport mode share, particularly for long distance travel from the urban periphery. This effective catchment can be significantly expanded through provision for active mode and micro-mobility modes such as e-bikes and e-scooters). These modes extend the distance people are able and willing to travel to reach a public transport node (without using a vehicle) and can replace short to medium private vehicle or taxi trips. The micro-mobility modes have a further advantage of minimising external effects such as steep gradients and personal fitness levels.

In addition to a transport network that can physically support walking and cycling and micro-mobility modes, suitable support infrastructure will be required at rapid transit stations and key public transport interchanges such as bicycle or micro-mobility parking, electric charging points and lockers.

4.5.4.2 The consequence

The following key consequences can be expected if this problem is not addressed:

What makes an attractive PT network?

- Core network of frequent, reliable services (RPTP 2015)
- Density and community focal points around stops and stations (proximity to RTN)
- Safety – both perceived and actual
- Sensitive public space design where people wait to catch PT

What makes an attractive network for cycling/walking?

- Well-connected network of neighbourhood streets
- Range of destinations within comfortable walking/cycling distance
- Safety – both perceived and actual
- Sensitive public space design

²⁰ Lee, C. and Mouden, A. (2008) Neighbourhood design and physical activity. *Building Research and Information*, 36, 395-411

²¹ Prins, R. et al (2016) Causal pathways linking environmental change with health behaviour change: Natural experimental study of new transport infrastructure and cycling to work. *Preventive Medicine*, 87, 175-182

Consequence 1: Over-reliance on car travel

This is undesirable as:

- It will not solve our congestion problem or support growth.
- It will lead to poor urban form (i.e. car dependent urban form is lower density and has less efficient use of land than transit oriented urban form).
- It will add more greenhouse gases to the environment.
- Roads are less efficient at moving large numbers of people than public transport.
- Social isolation and health impacts.
- Those without a car cannot get around. This is most likely to affect the already vulnerable segments of the community including youth, the elderly and those with lower incomes.

Consequence 2: Safety implications

Increasing traffic volumes resulting from growth will exacerbate existing safety issues.

Existing safety issues are present on Dairy Flat Road, Pine Valley Road, East Coast Road (intersection with Tavern Road) – see Appendix A: Strategic Case for more detail. Note: Safety improvements on Dairy Flat Highway are already underway as a separate project.

How can safety be addressed?

- Safety in Design – safety needs to be inherent in the design /route protection process and consider the full lifecycle, including operational and maintenance safety
- Full separated or segregated cycle connections
- Public transport interchanges that are well lit and designed with passive surveillance
- Roadway connections that meet safety standards and separate modes
- Grade separation where this is warranted

4.5.5 Summary

In summary, there is compelling evidence for the cause and consequence of these problem statements i.e. the evidence confirms the problem statements. The problems identified above have associated benefits and objectives, which are outlined in the following section.

4.6 Benefits and investment objectives

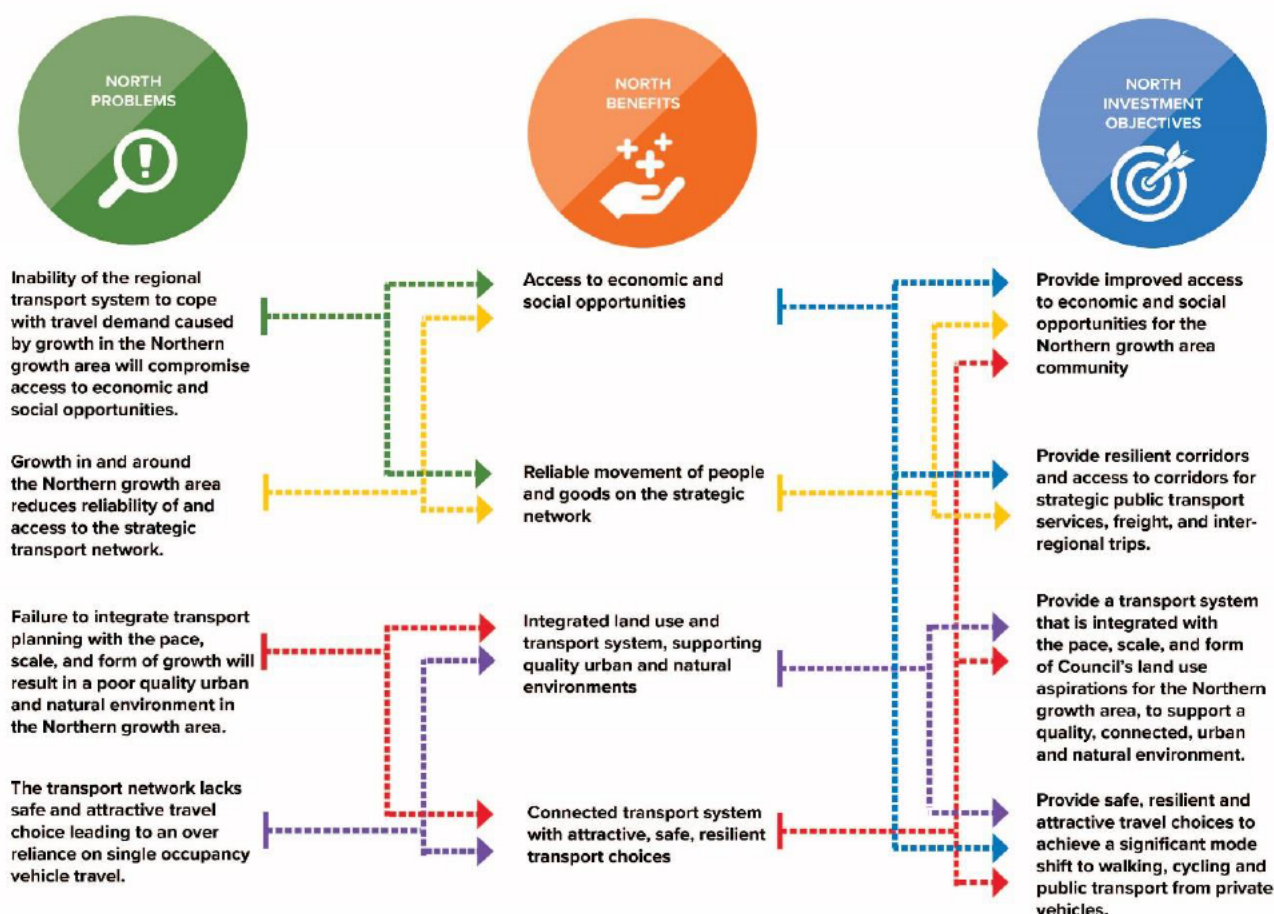
The Northern growth area problem statements, benefits and investment objectives are outlined in Figure 23. Addressing the problems will provide a wide range of benefits for the Northern growth area. A total of four investment objectives were developed for the IBC based on the PBC objectives, in collaboration with Te Tupu Ngātahi partners, whose views were sought at Workshops 1 and 2.

The objectives align well with the GPS 2018, which recognises that investment for improved access should be guided by: land use and transport planning that reduces the need for single occupant vehicle trips in urban areas; making the best use of the existing network and services; and providing new infrastructure or services where necessary to support planned growth (including housing developments).

This IBC investigation aligns itself with these principles via an established partnership with Auckland Council to ensure effective transport and land use integration. This integration aims to reduce the need to travel by providing access to opportunities but also by making public transport, walking and cycling connections more attractive than car travel where travel takes place. It also adopts the Transport Agency's hierarchy of interventions in developing options, thereby considering options which make the best use of the existing network before new infrastructure is considered. A strong focus is on developing a mode-neutral strategic transport system which enables transport choice for residents and provides

access to economic and social opportunities and achieves the overall target of improved sustainable urban mobility.

Figure 23: North problems, benefits and investment objectives



4.7 Consistency with the PBC

As part of the process of developing the investment objectives for the North, close attention was paid to the investment objectives set out in the PBC. Five investment objectives were developed for the PBC and these have been translated into four investment objectives relevant to the North area. Table 2 sets out the links between the objectives and where there are differences, elaborates on these.

Table 2: Links and differences between the PBC and IBC objectives

PBC Investment Objectives	IBC Investment Objectives	Rationale
IO1: Enhance Auckland's liveability by providing a level of access to jobs and core services for each future urban area equal to the wider Auckland region by 2046.	IO1: Provide improved access to economic and social opportunities for the Northern growth area community	The IBC targets the same issues but drops the target of 'equal to the wider Auckland region'. The IBC's has only a partial ability to influence access to jobs and social opportunities. The critical measure is an improvement over current and do-minimum level.

PBC Investment Objectives	IBC Investment Objectives	Rationale
IO4: Support economic growth through maintaining travel time reliability for freight and interregional trips on strategic corridors at existing (2016) levels.	IO2: Provide resilient corridors and access to corridors for strategic public transport services, freight and inter regional trips.	Change in language from 'travel time reliability' to 'resilient and access', to reflect updated GPS priorities.
IO5: Enable land to be developed in line with the Future Urban Land Supply Strategy by ensuring required transport infrastructure is delivered on time.	IO3: Provide a transport system that is integrated with the pace, scale and form of Councils land use aspiration for the Northern growth area, to support a quality, connected, urban and natural environment.	Investment objectives 2 and 5 combined to include achieving FULSS timings as well as delivering a quality urban and natural environment.
IO2: Enhance Auckland's liveability through improved environmental, cultural, and community outcomes (air and water quality, biodiversity, safety).	IO4: Provide safe, resilient, and attractive travel choices to achieve a significant mode shift to walking, cycling and public transport from private vehicles.	<p>The PBC target of 45% comprised of a 29% public transport mode share on external trips from the growth area and 16% mode share for active modes for all trips in the AM peak.</p> <p>Both components of the target have been retained and have been included as targets for related KPIs.</p>
IO3: Enhance Auckland's liveability and connectivity through achieving a morning peak mode share for walking, cycling, and public transport in all future urban areas of 45% by 2043.		

4.8 Key performance indicators (KPIs)

In order to solve the problems identified and meet the identified investment objectives, targets (KPIs) need to be set and measures put in place. The identified investment KPIs and measures for this IBC are detailed in Table 3 and are described in further detail in Appendix A: Strategic Case.

Table 3: KPIs and measures

North problems	Benefits	Investment objective	Investment KPI	KPI measure / target
P1: Inability of the transport system to cope with travel demand caused by growth in the Northern growth area will compromise access to economic and social	B1: Access to economic and social opportunities	Investment Objective 1 (IO1): Provide improved access to economic and social opportunities for the Northern growth area community	KPI1a. Increase the level of access to economic and social opportunities	<ul style="list-style-type: none"> The number of jobs accessible within 45-minute travel time from study area improved on the Do Minimum scenario (based on model) Accessibility between residential areas and social opportunities is equal to established areas

North problems	Benefits	Investment objective	Investment KPI	KPI measure / target
opportunities (30%)			KPI1b. Improve the effectiveness of transport corridors	of Ōrewa and Silverdale
				<ul style="list-style-type: none"> People throughput of the collective transport corridors south of the study area. Throughput is improved on the Do Minimum scenario (based on model)
				<ul style="list-style-type: none"> Availability of Quality of Service (QoS) 1²² cycle facilities between high density residential, centres and RT stations. All key desire lines have an available route
P2: Growth in and around the Northern growth area reduces the reliability of and access to the strategic transport network (40%)	B2: Reliable movement of people and goods on the strategic network	Investment Objective 2 (IO2): Provide resilient corridors and access to corridors for strategic public transport services, freight and inter-regional trips on strategic corridors	KPI2a. Maintain reliable performance of inter- and intra-regional connections	<ul style="list-style-type: none"> General vehicles journey time reliability ratios (between peak and inter-peak) are no worse than the Do Minimum scenario (based on model)
				<ul style="list-style-type: none"> Public transport journey time reliability ratios (between peak and inter-peak) are no worse than the Do Minimum scenario
				<ul style="list-style-type: none"> Availability of viable alternative routes

²² QoS 1 cycle facilities are defined as the following: 'Facility is consistent with, or exceeds best practice design guidance. Facility is suitable for a very wide range of users'. Source: Auckland Transport (2016) 'Evaluating Quality of Service for Auckland Cycle Facilities: A Practitioner's Guide'

North problems	Benefits	Investment objective	Investment KPI	KPI measure / target
				for strategic travel (all modes). All strategic movements have an alternative
				<ul style="list-style-type: none"> The extent to which the Northern growth area network integrates with the wider network
			KPI2b. Enable access to the strategic network	<ul style="list-style-type: none"> 80% of households in study area within 400m of good quality, well connected cycle infrastructure (QoS 1 cycle facility)
				<ul style="list-style-type: none"> Total patronage on the RT corridor south of the Northern growth area. RT corridor triples ridership from the area compared with existing (2018).
P3: Failure to integrate transport planning with the pace, scale, and form of growth will result in a poor quality urban and natural environment in the Northern growth area (10%)	B3: Integrated land use and transport system supporting quality urban and natural environments	Investment Objective 3 (IO3): Provide a transport system that is integrated with the pace, scale and form of Council's land use aspirations for the Northern growth area, to support a quality, connected, urban and natural environment	KPI3a. Support quality urban form	<ul style="list-style-type: none"> 70% positive feedback in the public survey of AT arterial roads for the Environment criteria
			KPI3b. Timing of infrastructure supports land use	<ul style="list-style-type: none"> The level of interim/ short term benefits if an option could be staged earlier
			KPI3c. Connected urban environment	<ul style="list-style-type: none"> 80% of households in study area within 400m of good quality, well connected cycle infrastructure (QoS 1 cycle facility)
			KPI3d. Provide an attractive public transport network to serve local trips	<ul style="list-style-type: none"> 20% of the internal Northern growth area trips in the AM peak are on public transport

North problems	Benefits	Investment objective	Investment KPI	KPI measure / target
P4: The transport network lacks safe and attractive travel choice leading to an over-reliance on single occupancy vehicle travel (20%)	B4: Connected transport system with attractive, safe, resilient transport choices	Investment Objective 4 (IO4): Provide safe, resilient and attractive travel choices to achieve a significant mode shift to walking, cycling and public transport from private vehicles	KPI4a. Provide a safe future transport system	<ul style="list-style-type: none"> More than 90% of surveyed cyclists perceive an improvement in safety and attractiveness of cycle facilities based on survey results All roads have a personal and collective risk of medium or lower as defined by KiwiRAP
			KPI4b. Improve the attractiveness of PT and active mode choices	<ul style="list-style-type: none"> Public transport journey time is equal to or better than general vehicle journey times between Silverdale and the city centre 90% of local public transport services are within 3 minutes of timetable. 29% of total daily trips are made by public transport 16% of trips are made via active modes
			KPI4c. Quality transport options are available	<ul style="list-style-type: none"> 90% of households in study area within a walkable (800m) or cyclable (3km) distance of a RT station

PART B – ECONOMIC CASE

5 Options development and assessment process

5.1 Overview

This IBC further tests and develops the recommendations of the PBC. A wide range of options and alternatives has been tested, including those identified in the PBC, as a means to resolve the problems and meet the investment objectives outlined in Section 4.

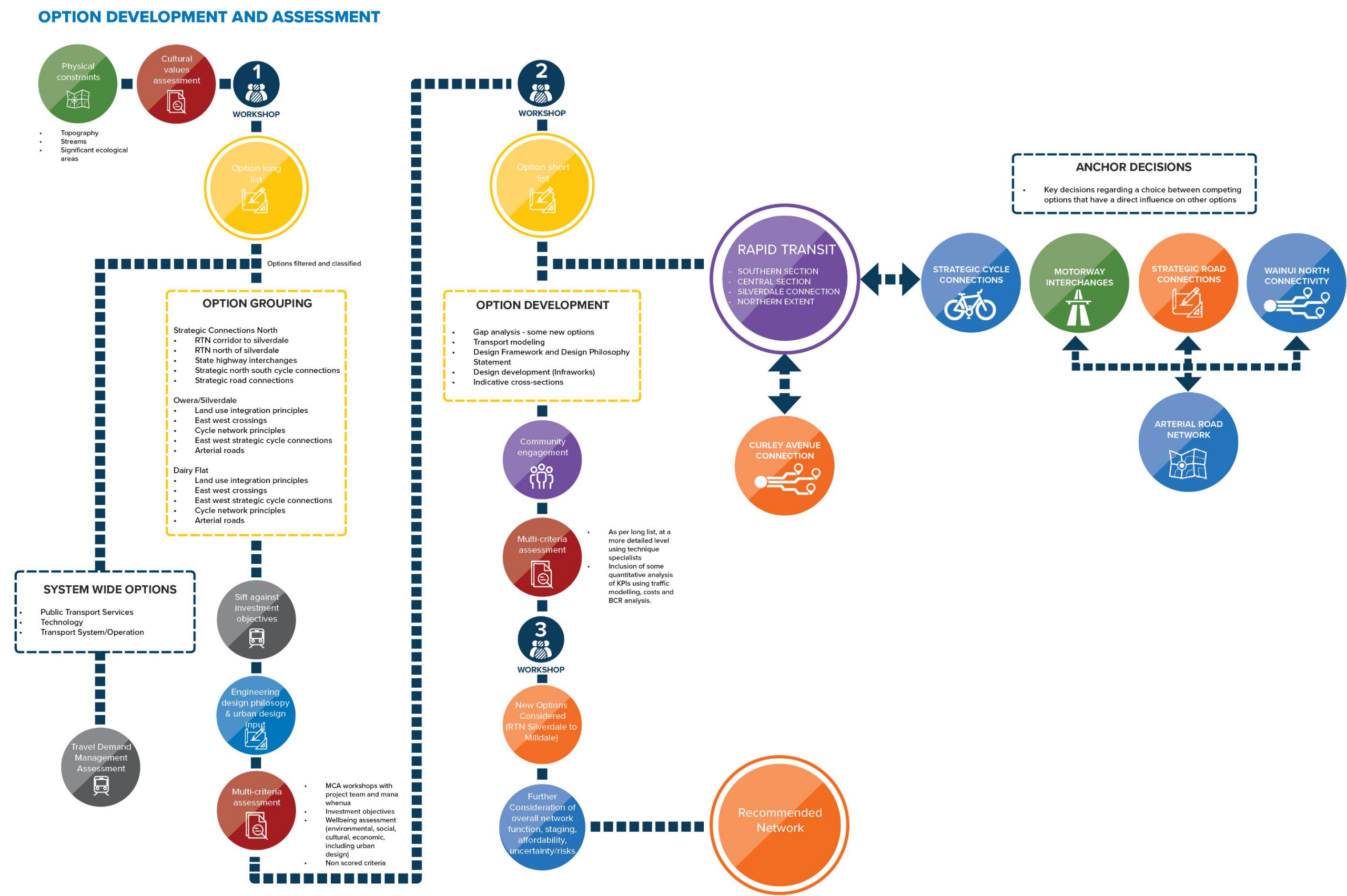
Engagement with partners, stakeholders and the public was a key part of this process, as described above in Section 2.

This section sets out the:

- Steps involved in the option development and assessment process from the long list to the short list and from the short list to the recommended network (Figure 24)
- Approach to travel demand management (Section 5.2)
- Multi criteria assessment process used to identify and evaluate the effects, opportunities and other relevant factors associated with each option (Section 5.3)
- Assumptions made and refined through the optioneering process (Section 5.3.3)
- Summary of the Long List and Short List options and a summary of the reasons for selecting each recommended option (Sections 5.4 and 5.5).

Further details are provided in Appendix B: Options Assessment Report, Appendix C: Transport Assessment Report and Appendix D: Economic Report.

Figure 24: Option development and assessment process – the North IBC

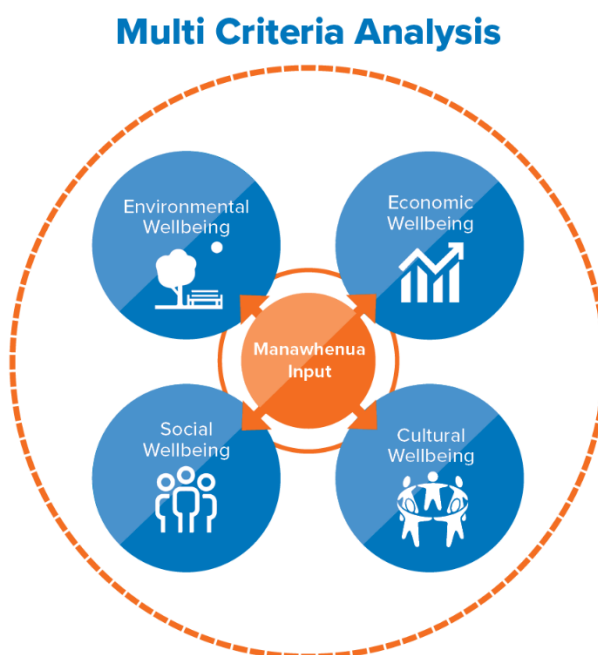


5.2 Multi criteria assessment process

All infrastructure options have been assessed at both the long list and short list phases against the Te Tupu Ngātahi multi criteria assessment (MCA) framework. The framework assesses option performance against the investment objectives and four wellbeings: Cultural, Social, Environmental and Economic (refer Figure 25). Under each wellbeing grouping, a combination of effects and opportunities was considered. The options were assessed in the context of an environment where FUZ land has been live-zoned and urbanised and other existing zones have developed in a manner anticipated by the AUP:OP. The MCA wellbeings and criteria are summarised in Figure 25 and explained in more detail in Appendix B: Options Assessment Report. The wellbeings are groupings of related criteria which operate alongside the investment objectives i.e.. the investment objectives also assess social and economic impacts of options.

The purpose of the MCA framework is to identify relevant effects, opportunities and factors for the assessment of the options. The MCA was used to inform the project team's recommendations on which options to discard and which to include in the recommended network.

Figure 25: MCA wellbeings and criteria



5.2.1 Cultural – Manawhenua

Under the cultural wellbeing grouping, several criteria relate to Manawhenua. Although not limited to the assessment of these alone, Manawhenua have stated a preference to rank where possible and as a collective Manawhenua response rather than individually. Following a targeted specialist workshop, two wider workshops, and a follow up Hui, Manawhenua representatives have expressed views, provided specialist advice and raised key issues.

5.2.2 Non-scored criteria

In addition to the scored criteria, several non-scored criteria were considered (refer Table 4). These criteria were assessed qualitatively due to their complexity and importance.

Table 4: Non-scored criteria

Criteria	Description
Stakeholder feedback	Stakeholder feedback for each option identifying scale / validity of objections, identified preference / proposed changes to options etc. Feedback provided by other key partners / stakeholders. At long list stage, stakeholder feedback was limited primarily to workshop participation and limited additional meetings. At short list it included public consultation feedback.
Policy analysis	Options alignment with the strategic policy framework including the AUP: OP with particular consideration to provisions that derive from Section 6 of the Resource Management Act 1991. The recommended network was assessed against the directions in the Auckland Plan.
Value for money	Provide an estimate of likely value for money in conjunction with transport outcomes and construction costs. Long list assessment – provide an early indication of funding efficiency by defining the likely BCR (High/Medium/Low/Very low) for each option. Short list Assessment – Indicative BCR.
Resilience	Avoid adverse geology; avoid steep slopes; seismic impacts; other resilience risks (low level infrastructure near coastlines, inundation areas).

The full MCA framework and outcomes of the option assessment and refinement process can be found in Appendix B: Options Assessment Report. An assessment of each recommended option was also undertaken against the Design Framework.

5.3 Influencing demand

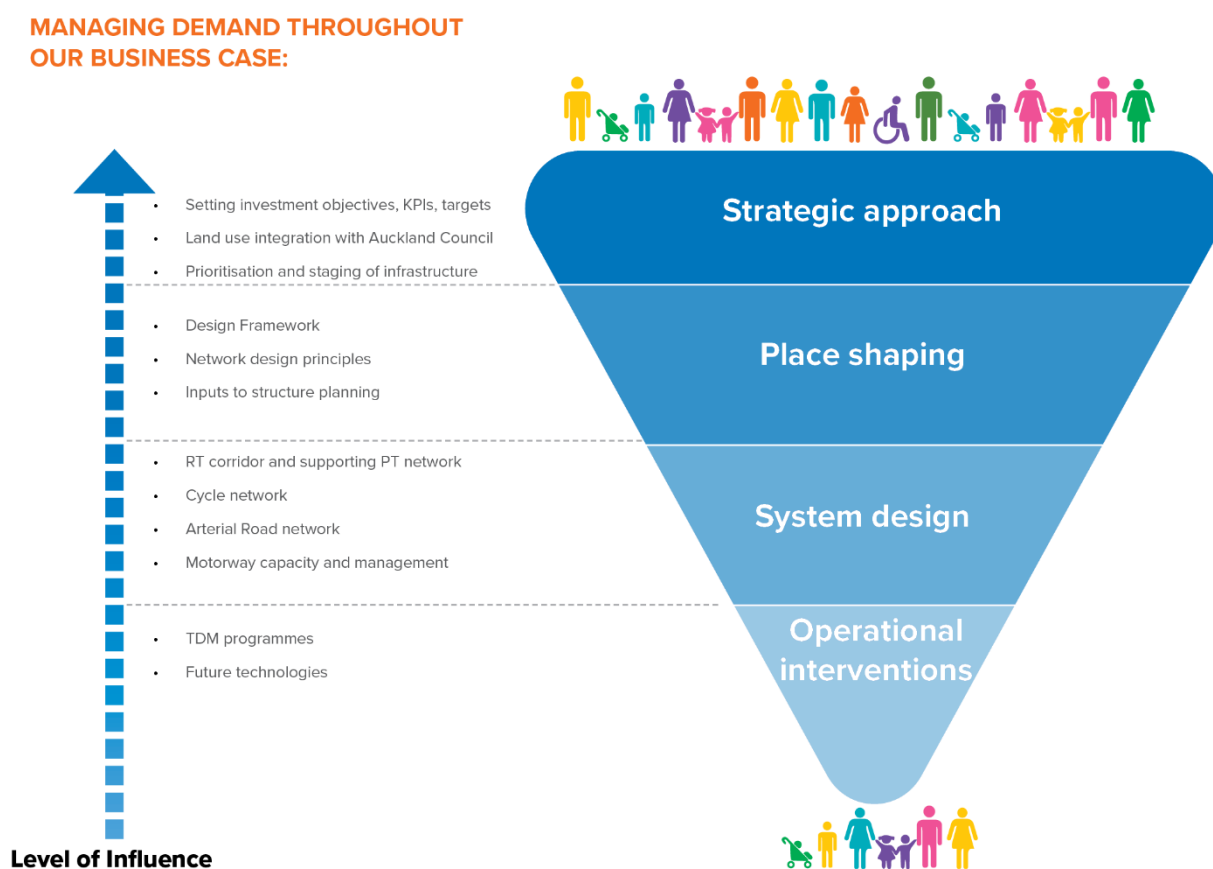
Making assumptions about travel behaviour and the ability to influence it is critical at each phase of option development and assessment and is an integral part of urban and transport planning and achieving sustainable urban mobility. Fundamentally, it is not feasible or economic to build infrastructure to accommodate unconstrained transport demand. Central and local governments, with constrained available funding, are required to prioritise infrastructure investment to deliver best value for money, usually through projects that deliver the greatest benefit to the most people.

As projects move through progressively more detailed development phases, the ability to influence travel behaviour reduces, as shown in Figure 26.

At a strategic level, decisions have broader effect and have the potential to significantly alter transport demand at a regional level (e.g. the proportion of local jobs provided, land use integration with transport corridors such as transit orientated developments) and therefore the outcomes achieved. Once a project has been designed, opportunities to manage demand are more limited, often to localised, add-on or complementary interventions (e.g. school travel plans cannot fix poor safety perception caused by a new wide road corridor with no footpaths, they can only enable safer crossing).

This hierarchy of intervention for travel demand has been at the forefront of thinking within the North IBC process as shown in Figure 26.

Figure 26: Demand management influence through the project life cycle



5.3.1.1 Step 1 – Strategic approach

At a strategic level, a framework of problems, benefits and investment objectives has been developed for the Northern growth area (see Section 4.6). A set of KPIs and measures has been developed to quantify the outcomes associated with each investment objective. These KPIs have been used to evaluate options in both a quantitative (where possible) and qualitative manner.

Options must respond to these indicators, amongst other things such as providing access to key destinations and connecting desire lines, and options that respond best will be selected for a recommended network of improvements.

These objectives explicitly guide option development and assessment towards a reduction in single occupant vehicle travel (Investment objective 4) and integration with land use (Investment objective 3), which is at the heart of managing demand. The objectives require that 'reliable access is maintained' and not that 'sufficient capacity be provided' to meet demand. This guides decision makers towards options that do not over-provide capacity and instead focus on what is required for reliability.

5.3.1.2 Step 2 – Place shaping/ Developing good urban form

The importance of place shaping and developing good urban form is paramount to influence travel behaviour. This includes designing new neighbourhoods with jobs, local centres, schools and parks within walking or cycling distance of houses and connected with good quality, frequent public transport. This provides attractive travel choices and significantly reduces the need to travel by private vehicle.

The North IBC has reflected this place shaping importance through adoption of an investment objective specifically targeting the integration of land use and transport. Options are evaluated against their contribution to this objective, and options that deliver poorer integration outcomes are less likely to be adopted.

Place shaping is integrated into the North IBC in several ways to achieve desirable demand management outcomes, as follows:

- Applying transport and land use integration principles to the design of options to maximise access e.g. co-locating public transport interchanges with centres and/or intensification (e.g.. Milldale RT station)
- Working closely with Auckland Council to articulate the interdependencies between major transport projects and land use to inform future structure planning (i.e. the RT corridor and Dairy Flat town centre)
- Where Auckland Council is currently undertaking structure planning (Silverdale West –Dairy Flat Industrial Structure Plan area), the Te Tupu Ngātahi team is undertaking an integrated transport assessment to ensure that transport corridors and networks are aligned with land use and maximise access to walking, cycling and public transport
- Applying urban design framework principles to the development of options e.g. considering the RT corridors' relationships to urban centres.

Figure 27 : System design examples

5.3.1.3 Step 3 – System design

A range of system design options to influence travel demand were considered during the option development and evaluation process (refer Figure 27). The relative effectiveness of different options to manage demand was evaluated in a Northern growth area specific context using the agreed investment objectives and KPIs. Options that performed better against these indicators were selected for the recommended network.



5.3.1.4 Step 4 – Operational interventions

A range of operational travel demand management options have been identified (refer Figure 28) that could be applied in parallel to complement the strategic network infrastructure recommended in the IBC.

Figure 28: Operational option examples

5.3.2 Influencing demand and behaviour in the North

The application of these demand management principles and urban interventions in the Northern growth area is forecast to result in a significant shift in transport mode for the future residents of the growth area in conjunction with the recommended network.

Transport modelling of the recommended network suggest around 12% of travel will be via active modes and 21% of travel via public transport in the morning peak in 2046. Active mode trips are generally shorter distance in nature catering for internal trips within the growth area. Public transport mode share is heavily weighted to longer distance external trips such as Albany, North shore and city centre. Low mode share is expected on internal trips (under 10%) as travel via public transport is less competitive with active and vehicle travel.

This represents a significant change from current travel patterns as the vehicle network becomes more congested (particularly to the south of the study area). While certain trips are more attractive than others for public transport (i.e. trips to and from the City Centre) short distance internal trips receive low mode share for public transport according to the transport model.

In order to complement the physical infrastructure, demand management interventions²³ are critical to increasing mode shift in both active mode and public transport. The assessment suggests active modes and public transport could achieve a 36-42% mode share in the AM peak period if an effective demand management strategy is implemented (refer Table 5). This equates to a reduction in private vehicle travel of between 21-30%. The forecast mode shift exceeds the PBC target of 29% of AM peak trips from the Growth area via public transport and could meet the 16% active mode target if effective demand management and high-quality facilities were provided.

²³ These are described in detail in Appendix I - Travel Demand Management.

Table 5: Estimated changes in mode share

Scenario	Active modes	Public transport	Car
Existing 2018	3%	9%	88%
Recommended network (2046)	12%	21%	67%
Recommended network with medium demand management scenario (2046)	14%	22%	64%
Recommended network with high demand management scenario (2046)	16%	26%	58%

In order to achieve the medium/ high demand management scenarios, additional investment has been identified over and above the physical infrastructure cost associated with the recommended network. The following components have been included:

- **System design:** While most options are identified as part of the recommended network, bus priority measures on existing corridors such as Hibiscus Coast Highway, West Hoe Road and Grand Drive have been identified and costed as part of demand management strategy. Costs for this project have been included in the overall capital cost for the recommended network in Section 8.
- **Operational interventions:** Behaviour change schemes, promotion and educational campaigns – Cost has been included as an ongoing operational cost in Section 8.

5.4 Cross-section assumptions

In developing the options short list, several assumptions have been made regarding road typologies to inform high level design and assessment of effects within the MCA. The cross-section assumed for each option was based on a number of typologies developed with reference to AT's Roads and Streets Framework. During the IBC phase, design has focused on maintaining flexibility on the transport corridors identified. During the DBC stage for each of the recommended options, a more detailed assessment of typology will inform the required corridor width.

The primary cross-sections used for the assessment of short list options are outlined below.

5.4.1.1 Arterial roads

Form – 32m arterial route, accommodating separated walking and cycling, and four lanes for public transport, freight, and general traffic.

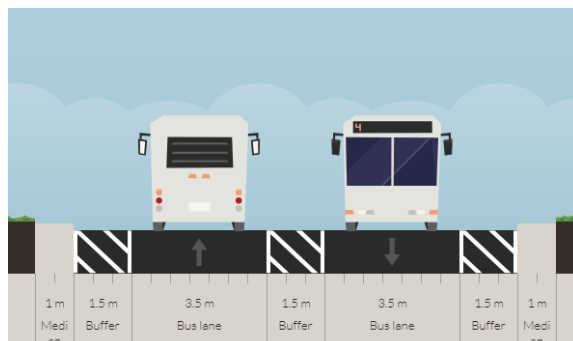
Application – Strategic movement corridors to cater for all modes, including freight.



5.4.1.2 State highway RT

Form – 12-14m RT corridor, accommodating bus or light rail.

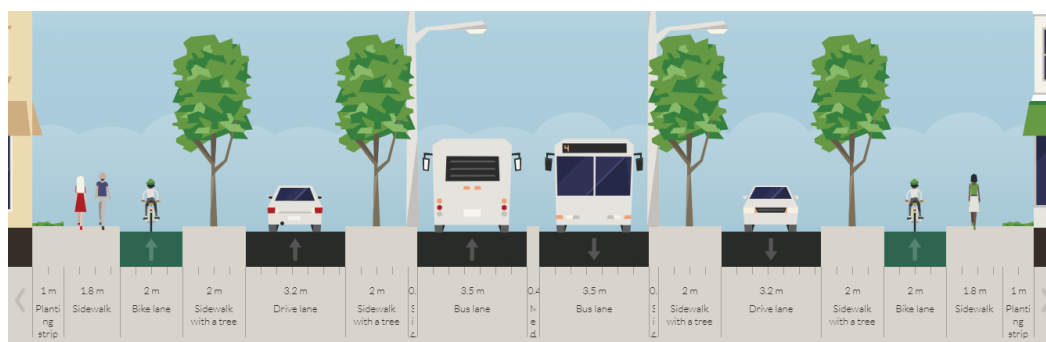
Application – Strategic movement corridor to cater for bus and light rail. Grade-separated at intersections with defined station locations.



5.4.1.3 Urban RT arterial

Form – 32m urban RT route, accommodating centre running RT, separated walking and cycling, and two lanes for freight, and general traffic.

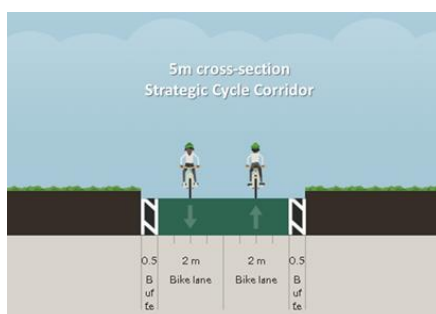
Application – Strategic movement corridors to cater for RT through an urban area with provision for all modes, including freight.



5.4.1.4 Strategic cycle route

Form – 5-7m strategic walking and cycling route.

Application – Provision of walking and cycling facilities. Cross-section depends on context of the route.



Further detail on the typologies and more detailed design assumptions are included in Appendix F: Design Philosophy Statement and Appendix E: Engineering and Cost Report. Other assumptions made as part of the options assessment are included in Appendix B: Option Assessment Report.

6 Options analysis

This section:

- Starts by describing the recommended transport network for the Northern growth area in full, including the key outcomes it delivers (Section 6.1)
- Provides a summary of the long list, demonstrating the breadth of options considered (Section 6.2)
- Summarises the short-listed options and rationale for selection of those options that make up the recommended network (Section 6.3).

6.1 Recommended network

The long term vision of sustainable urban mobility for the Northern growth area *will be achieved through* guiding principles to; shape travel behaviour by integrating with land use activities; to encourage travel by active modes and public transport to reduce reliance on private vehicle travel; to reduce pressure on the environment; and to create a cohesive community with a strong character and sense of identity that is not dominated by car travel.

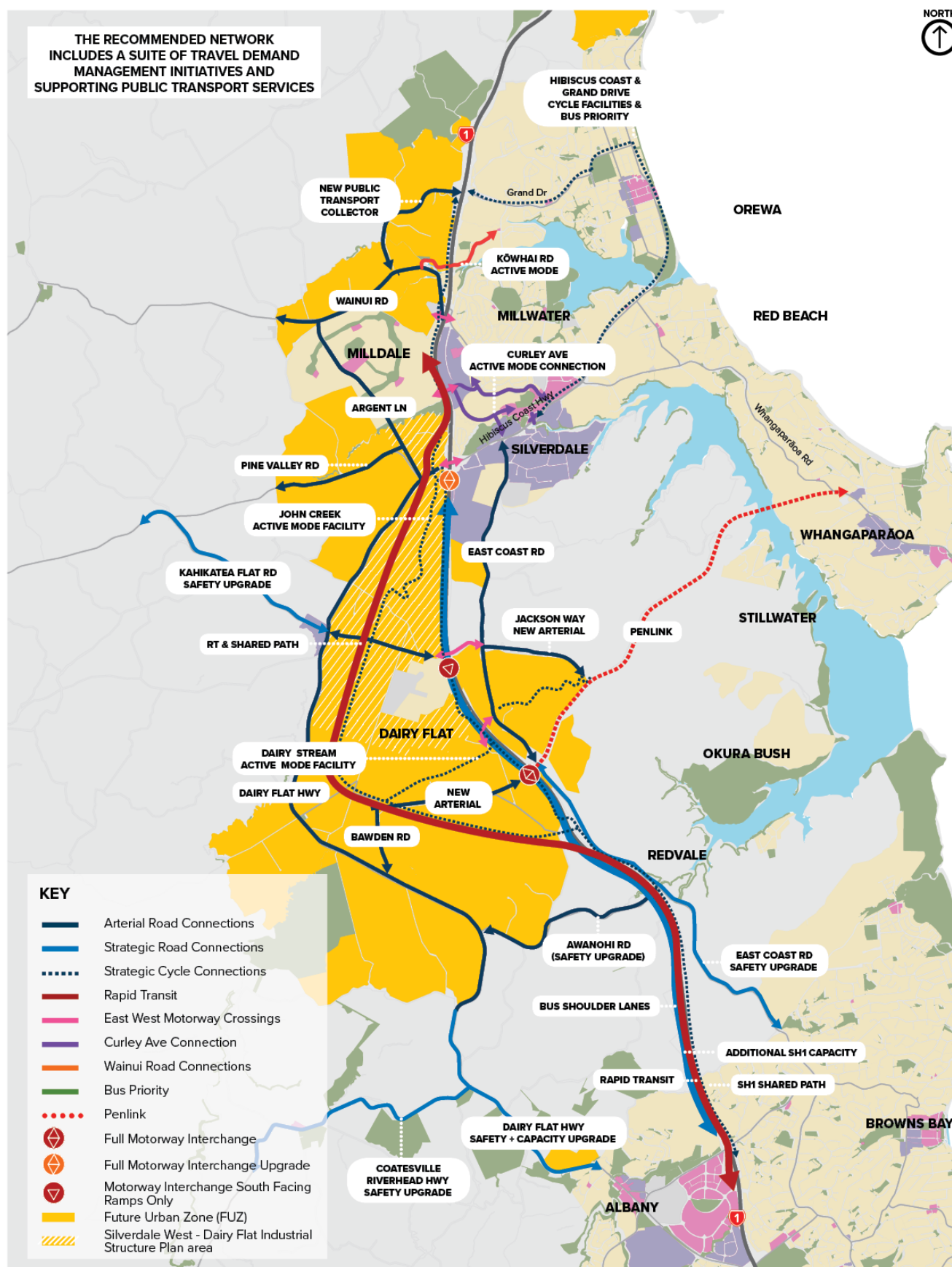
The transport network has been chosen to best deliver against the investment objectives described in Section 4. The recommended network provides the following key highlights:

- **A focus on demand management and sustainable urban form** to influence travel behaviour in the growth area and surrounding existing communities.
- **An RT corridor** which strikes the best balance between integration with land use and serving the existing communities. The RT corridor provides opportunity to influence the form and density of land use along the corridor and around station locations, leading to an increased public transport mode share and improved accessibility.
- **Public transport** provides the majority of additional transport capacity to serve the growth area particularly for the key north-south movements.
- **Improvements on SH1** will provide access to the proposed business (industrial) land and maintain reliability for freight and inter-regional travel, but will be staged and managed to ensure this does not undermine mode shift targets.
- **Improvements to other strategic roads** will focus on safety, with the exception of Dairy Flat Highway which provides capacity and resilience benefits to the network.
- **A comprehensive walking and cycling network** will provide high quality, safe and attractive routes along desire lines and linking to key attractions such as centres and public transport stations. A high quality and comprehensive network will enable significant mode shift to active modes and an improved urban environment.
- **Improved and additional east-west motorway crossings** will connect new communities to already established areas and improve movements within the North.
- **A staging approach** which will drive a change in behaviour. Provision of public transport, walking and cycling infrastructure early will enable a mode shift within existing communities. This has the potential to prolong the need for road capacity. Early provision of public transport

and active modes for longer-term growth will encourage early adoption of public transport and active modes within the growth area.

The outcome of this integrated approach is a forecast reduction in private vehicle demand from current rates of 88% to 64%. In doing this, the recommended network doubles the number of jobs within accessible reach and provides significant opportunity for a quality connected urban environment. The recommended network of infrastructure projects is outlined in Figure 29. The sections that follow summarise the options long list and short list developed and assessed in arriving at the recommended network.

Figure 29: Recommended transport network package



6.2 Options long list

The options long list for the North IBC consisted of approximately 70 non-infrastructure options and 90 infrastructure options. The non-infrastructure options are detailed in Section 5.3 and Appendix I – Demand Management Report. Infrastructure options are summarised below. The reasons for discarding options and selecting other options for the short list are detailed in Appendix B: Options Assessment Report.

6.2.1 Strategic connections infrastructure options

The following strategic connection infrastructure options were considered for the North IBC:

- RT corridor – Albany to Silverdale (8 options)
- RT corridor – Silverdale to Grand Drive (7 options)
- SH1 (Motorway) interchanges (7 options)
- North-south strategic cycling connections (3 options)
- Strategic road connections (20 options, including a mix of bus shoulder lanes, managed lanes, additional general lanes on SH1; a SH1 bypass to the west; a SH1 safety upgrade; upgrades to Dairy Flat Highway and East Coast Road; upgrades to Coatesville Riverhead Highway and Kahikatea Flat Road; and upgrade Green Road/Sunnyside Road as a connection to Coatesville Riverhead Highway).

6.2.2 Local area infrastructure options (Silverdale, Ōrewa, Wainui and Dairy Flat)

The following 'local area' connection infrastructure options were considered for the North IBC:

- East west motorway crossings (13 options)
- East west strategic cycling connections (5 options)
- North-south arterial roads (9 options)
- East-west arterial roads (12 options)
- Cycle network principles (3 options).

Local level bus services and network operating principles were also considered during the long list phase, but for the purposes of route protection, the long list options focused on the infrastructure needed to make those services attractive and successful.

6.3 Options short list

The options short list consists of the following key elements (refer to Table 6). Maps of each of the option groupings are included in Section 6.3.1.

Table 6: Options short list

Strategic connections	
RT corridors	Motorway interchanges
<ul style="list-style-type: none"> • RT corridor –southern section (Albany to south of Bawden Road) – choice between 4 options • RT corridor – middle section (south of Bawden Road to south of Silverdale SH1 interchange) – choice between 8 options 	<p>A choice from the following options (may be in combination):</p> <ul style="list-style-type: none"> • Silverdale interchange upgrade • Wilks Road south-facing ramps only • Wilks Road full interchange • Spur Road south-facing ramps only

Strategic connections	
<ul style="list-style-type: none"> RT corridor – northern section (south of Silverdale SH1 interchange to Milldale station) – choice between 8 options RT corridor – Grand Drive extension – choice between 3 options RT corridor – Hibiscus Coast connection – choice between 3 options 	<ul style="list-style-type: none"> Spur Road full interchange Redvale (Penlink) full interchange
Strategic cycling connections	Strategic roading connections
<ul style="list-style-type: none"> Shared path along SH1 (Albany to Grand Drive interchange) Shared path North-South route through FUZ from Albany to Silverdale Hibiscus Coast Highway/ Grand Drive cycle facility John Creek riparian facility with tie-in North of Silverdale interchange East west - Dairy Stream (Dairy Flat to Redvale via riparian corridor) Penlink corridor cycleway 	<p>Bus shoulder lanes on SH1 – choice between:</p> <ul style="list-style-type: none"> Albany to Penlink OR Albany to Silverdale interchange OR Albany to Wainui Road interchange OR Albany to Grand Drive interchange <p>Additional motorway capacity – choice between:</p> <ul style="list-style-type: none"> Albany to Wainui Road interchange OR Albany to Grand Drive interchange <p>Strategic road upgrades:</p> <ul style="list-style-type: none"> Upgrade to Dairy Flat Highway for access, safety and capacity (Albany to Silverdale) Upgrade to East Coast Road for access, safety and capacity Upgrade to Coatesville Riverhead Highway - connection to Riverhead/north-west Upgrade to Kahikatea Flat Road - arterial connection to the north-west
Local area connections	
Curley Avenue connectivity	Wainui North connectivity
<p>Choice between:</p> <ul style="list-style-type: none"> Use existing roads + signalise Silverdale Street intersection Use existing roads with active mode only connection on Curley Ave and Brian Smith Drive All modes Curley Ave extension, OR All modes Curley Ave extension + Brian Smith Drive bridge 	<p>Choice between:</p> <ul style="list-style-type: none"> Kōwhai Road active mode only crossing Kōwhai Road active mode only crossing and arterial road connection between Wainui Road and Grand Drive (choice between two alignments for road connection) Kōwhai Road all mode crossing, OR Kōwhai Road all mode crossing and arterial road between Wainui Road and Grand Drive (choice between two alignments for road connection)
East west motorway crossings	Arterial road connections
<ul style="list-style-type: none"> Milldale-Highgate all modes crossing Silverdale active mode only crossing Wilks Road active mode improvement Spur Road all mode crossing Dairy Stream all modes crossing 	<ul style="list-style-type: none"> Choice between new arterial – North-South Milldale to Grand Drive OR New arterial North-South Milldale to Grand Drive short version Choice between New arterial: North-South Pine Valley Road to Wainui Road OR New arterial -

Strategic connections	
<ul style="list-style-type: none"> Redvale (Penlink) active modes only crossing Wainui active modes upgrades 	<p>North-South Pine Valley Road to Postman Road extension</p> <ul style="list-style-type: none"> Choice between new arterial - North-South Postman Road or similar through business land OR New arterial - Postman Road extension to Pine Valley Upgrade Dairy Flat Highway between Silverdale to end of FUZ area Upgrade East Coast Road from Hibiscus Coast Hwy to end of FUZ area Upgrade Wainui Road Upgrade Pine Valley Road New arterial - East-West through proposed industrial area New arterial - North-South Postman Road or similar through proposed industrial area Upgrade Awahori Road as arterial Choice between Bawden Road new arterial OR Bawden Road extension OR Bawden Road to Dairy Flat Highway OR New east-west arterial south of Bawden New arterial - Wilks Road Interchange to Penlink via Jackson Way North-South arterial between Redvale and Coatesville Riverhead Highway

6.3.1 Short list assessment

This section describes the choice of options from the short list and sets out the rationale for discarding the remaining options. The full short list assessment is contained in Appendix B: Options Assessment Report.

6.3.1.1 Partner engagement input

All project partners inputted to Workshop 3, which focused on analysis of the short list and selection of the recommended network.

Manawhenua also attended three option assessment Hui (3rd September 2018, 13th September 2018 and 4th October 2018). Valuable feedback was provided that influenced the recommended network. Strong alignment was reached with Manawhenua on the majority of recommended transport interventions. Table 7 contains a summary of key issues and opportunities as expressed by Manawhenua Kaitiaki during the engagement process. More specific feedback on short list options is summarised in Section 6.3.1.3.

Table 7: North specific Manawhenua issues and opportunities

Key Issues	Opportunities
<ul style="list-style-type: none"> <ul style="list-style-type: none"> 	<ul style="list-style-type: none"> <ul style="list-style-type: none">

Key Issues	Opportunities

A full record of partner feedback is included in Appendix B: Options Assessment Report.

6.3.1.2 Public consultation/stakeholder input

The short list assessment summaries in Section 6.3.1.3 below include a summary of feedback from key stakeholders and the public, received during the public consultation period. This feedback does not relate directly to all the option components outlined in this section, as only key decisions were included in the public engagement material. The key decisions people were asked to comment on include:

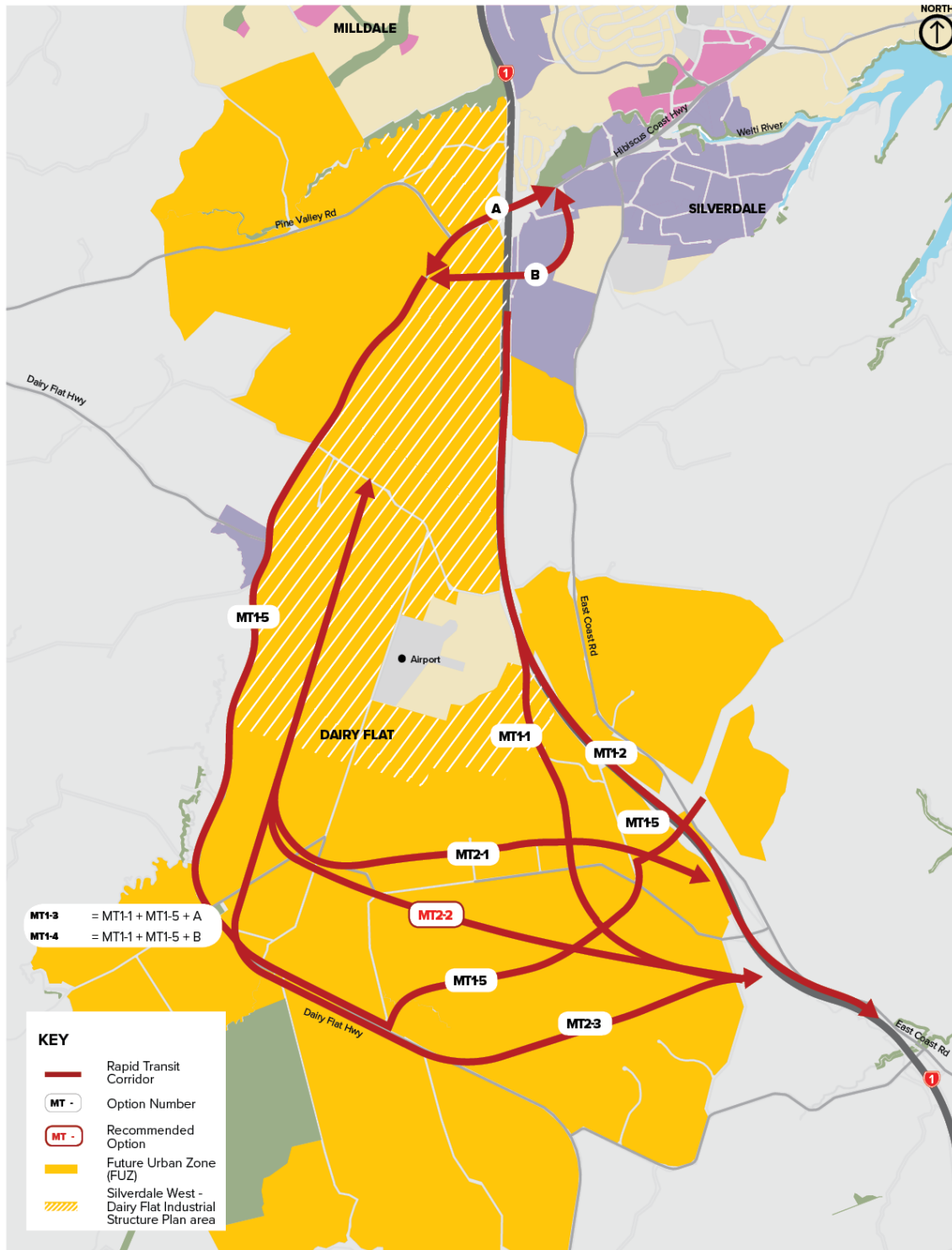
- **RT southern and central section** – two options from Albany to Silverdale: Whether this should run alongside the SH1 corridor or through the FUZ to the west of SH1
- **RT northern section** – two options at Silverdale: Whether this should continue along SH1 to Grand Drive or terminate at the existing Hibiscus Coast Bus Station
- **Walking and cycling** – three options for strategic walking and cycling corridors: Along SH1, through the FUZ and/or Hibiscus Coast Highway loop to Grand Drive
- **SH1 interchanges** – three options to access to/from SH1: Upgrades to Silverdale Interchange, a new interchange at Wilks Road (partial/full) and/or a half or full Penlink interchange
- **SH1 improvements** – two components: bus shoulder lanes between Albany and Silverdale and whether an additional lane on SH1 should function as a 'managed lane' or be for general traffic.

6.3.1.3 Short list assessment summaries

The short list assessments for each option grouping (including the anchor decisions referred to in Figure 24 are summarised below. For the North IBC, the most significant option decision (anchor decision) related to the choice of RT corridor alignment, particularly the middle corridor section between south of Bawden Road to south of the Silverdale SH1 interchange. This decision required careful consideration of the advantages and disadvantages of the various options, as explained below, and is therefore discussed first.

RT corridor – middle section (south of Bawden Road to south of Silverdale SH1 interchange) – 8 options

Functional intent: Provide strategic public transport network to serve study area north of Albany to Silverdale



Recommended option: MT2-2 – High speed FUZ corridor – central town centre*. This option assumes a high-speed RT alignment through the FUZ, enabling growth of the Silverdale West and Dairy Flat growth areas, including:

- Higher speed / lower access through the proposed industrial area
- Grade separated crossings with arterial and collector roads
- A high quality / separated facility with improved accessibility and lower speed around a Dairy Flat town centre in the middle portion of the FUZ.

***Note:** The corridor is approximate and allows flexibility to consider a range of more detailed alignments within this broad corridor at DBC stage including the south west town centre option (adjacent to Green Road reserve).

The mode of the RT using the corridor is uncertain. Changes to the RT corridor south of the study area will influence this decision. Potential options include a fully segregated busway or light rapid transit (LRT).

This option responds to long-term transport demands for the area and will be complemented by staging options in the short and medium term. These could include bus shoulder lanes on SH1 (motorway), opportunity for early implementation of sections of the RT corridor, or use of parallel corridors (see staging discussion in Section 7.2).

Reasons for selection:

- The option scores very well against the investment objectives (scores of 4 out of 5), reflecting a high level of accessibility to jobs; very good integration with the pace, scale and form of Council's land use aspirations; and very good patronage and mode shift outcomes.
- No high or significant adverse effects were identified against the environmental, social, cultural and economic wellbeing criteria, with positive urban design and social opportunity scores for the MT2-2 FUZ corridor.

Overall, the recommended option best enables and supports growth in the Northern growth area and strikes the best balance between the key differentiating attributes, as follows:

- **Transport benefits, including ridership/patronage and travel time benefits —** The FUZ corridor option strikes a balance between providing an attractive and accessible service to the future residents of the future urban area (evidenced by increases in overall patronage on the service) while still providing a high-quality service to the residents living in the northern part of the study area (Ōrewa and Silverdale). The recommended option provides a predicted 6% increase in overall passengers compared with a State highway (SH1) alignment RT corridor (MT1-2). The travel time disbenefit for the recommended option is expected to be in the order of 5-10 minutes for the Silverdale and Ōrewa areas (dependant on how much the RT is slowed down through the Dairy Flat centre), but critically remains faster than a comparative car journey between Silverdale and the City Centre. Travel times for the Dairy Flat and Silverdale West areas are significantly improved, as direct access can now be achieved as opposed to connection via a local bus service for large portions of the area.
- **Land use opportunity, including opportunity for transit-oriented development and good urban design outcomes —** The FUZ options facilitate the opportunity to open up Dairy Flat for land use development, with higher density around the future town centre and RT corridor. This opportunity is considered greatest for the recommended option as it better supports Council's aspirations for a town centre to the west compared to a SH1 option and has the greatest opportunity for density around the RT corridor, with a large direct catchment. The FUZ option enables around 40% of the growth area to be within walking distance of the RT corridor, which represents twice the proportion achieved by a corridor following SH1. There is a recognised risk around certain urban design

outcomes of a grade-separated high-speed corridor, including potential severance issues. However this is able to be mitigated through the more detailed design and assessment process (at DBC stage). In particular, at-grade segments that respond to a town centre and urban context can be investigated. Landuse and complementary urban interventions will be key opportunities in the DBC to assist the development of an urban form that promotes the principles of a sustainable urban mobility system.

- **Flexibility, including stageability, ability to integrate with the North Shore RT, and flexibility to respond to changes in land use assumptions** — Further staging investigations will be undertaken at the next stage of this business case. However, there are some good opportunities to effectively stage the recommended option, including bus shoulder lanes in the short term and implementation of the RT southern section before the remainder of the network, but post the North Shore RT upgrade (2030+) – refer Section 7.2 for further details. The route protection approach of this IBC also provides and responds to this need for flexibility.
- **Cost and BCR** — Although not the lowest cost option, the recommended option shows good economic benefits considering the ratio of costs to benefits (refer to Appendix D: Economics assessment).

Manawhenua feedback summary: The Manawhenua preferred option is [REDACTED]

Public/stakeholder consultation feedback summary:

- Overall support for an RT north of Albany
- Some feedback suggested the RT corridor should run along SH1 as this was perceived to provide a direct route and faster travel time
- An RT along SH1 would promote development in the North, in particular Whangaparāoa, Silverdale and Ōrewa
- Support for FUZ option to provide connection to new growth areas, enable good integration of transport and land use and service existing communities.

While the feedback on the RT corridor was mixed, the majority was in favour of the SH corridor as it better serves the existing communities with a more direct route. This message will need to be considered during the DBC phase and will guide how key messages about the RT are communicated to the public, including other parts of the network, benefits to existing communities, travel time differences for existing communities, and designing for attractive and accessible services for future communities.

RT corridor –southern section (Albany to south of Bawden Road) – choice between 4 options

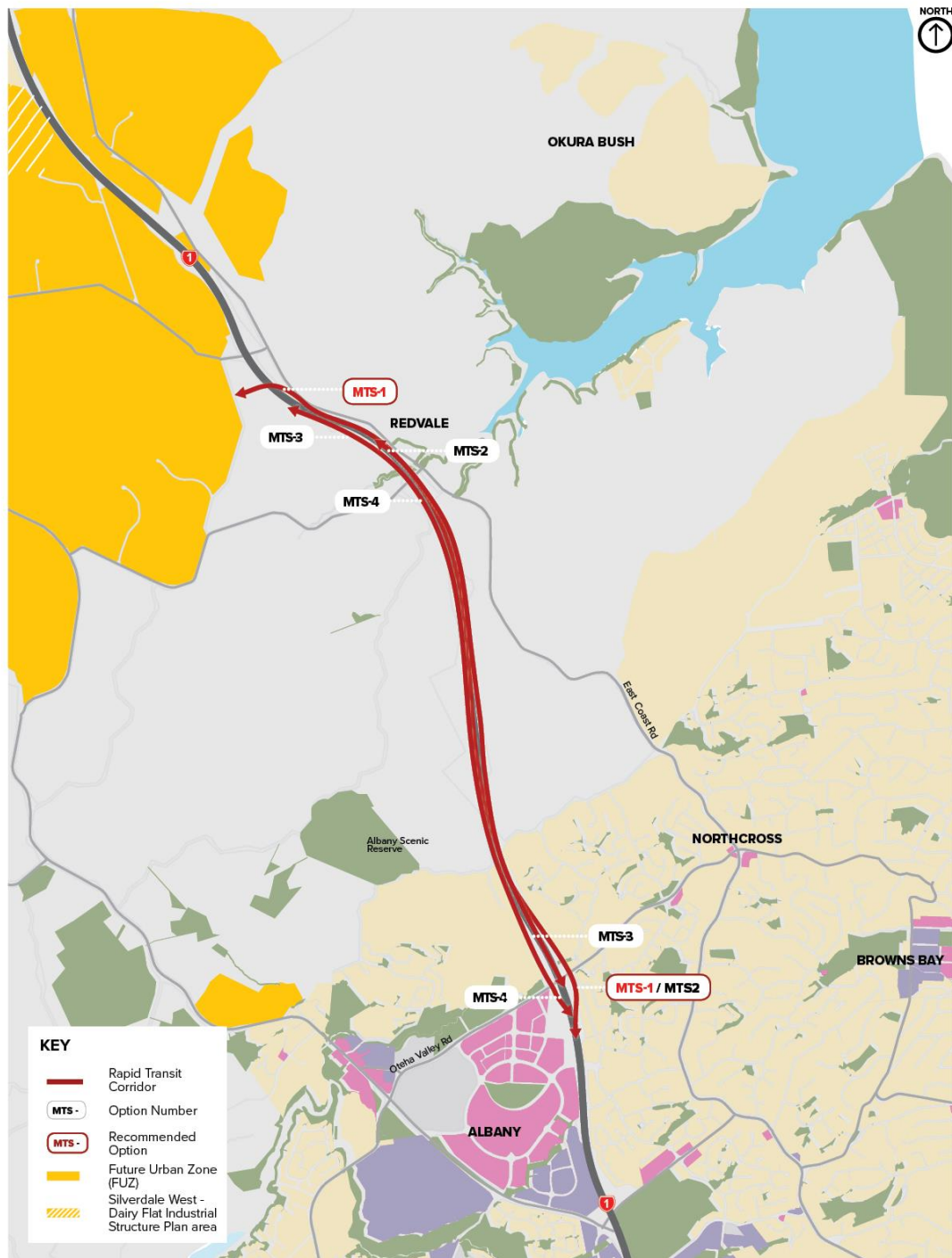
Functional intent: Provide strategic public transport network extension from Albany to start of study area (south of Bawden Road)

Recommended option: MTS-1 - Motorway corridor east (with crossing). This option ties into the Northern Busway (including Albany Station) and crosses over the motorway (from east to west) just north of Awanohi Road.

Reasons for selection:

- Aligning the southern section of the RT network on the eastern side of SH1 avoids some potentially significant adverse effects on SEAs and associated environmental and cultural values.

- The option will connect the Northern growth area to the existing RT at Albany, thereby improving access to economic and social opportunities, improving the resilience of strategic corridors and supporting a shift away from private vehicles.
- As no stations are proposed over this section and all options are comparable in length, no differentiation was found between options from a transport perspective or in scores against investment objectives.
- The recommended option ties-in well with the recommended option for the RT middle section (previous page). The crossing over the motorway is located north of the SEA areas, thereby minimising environmental impacts. This crossing is necessary to connect to the recommended RT alignment to the north (previous page).

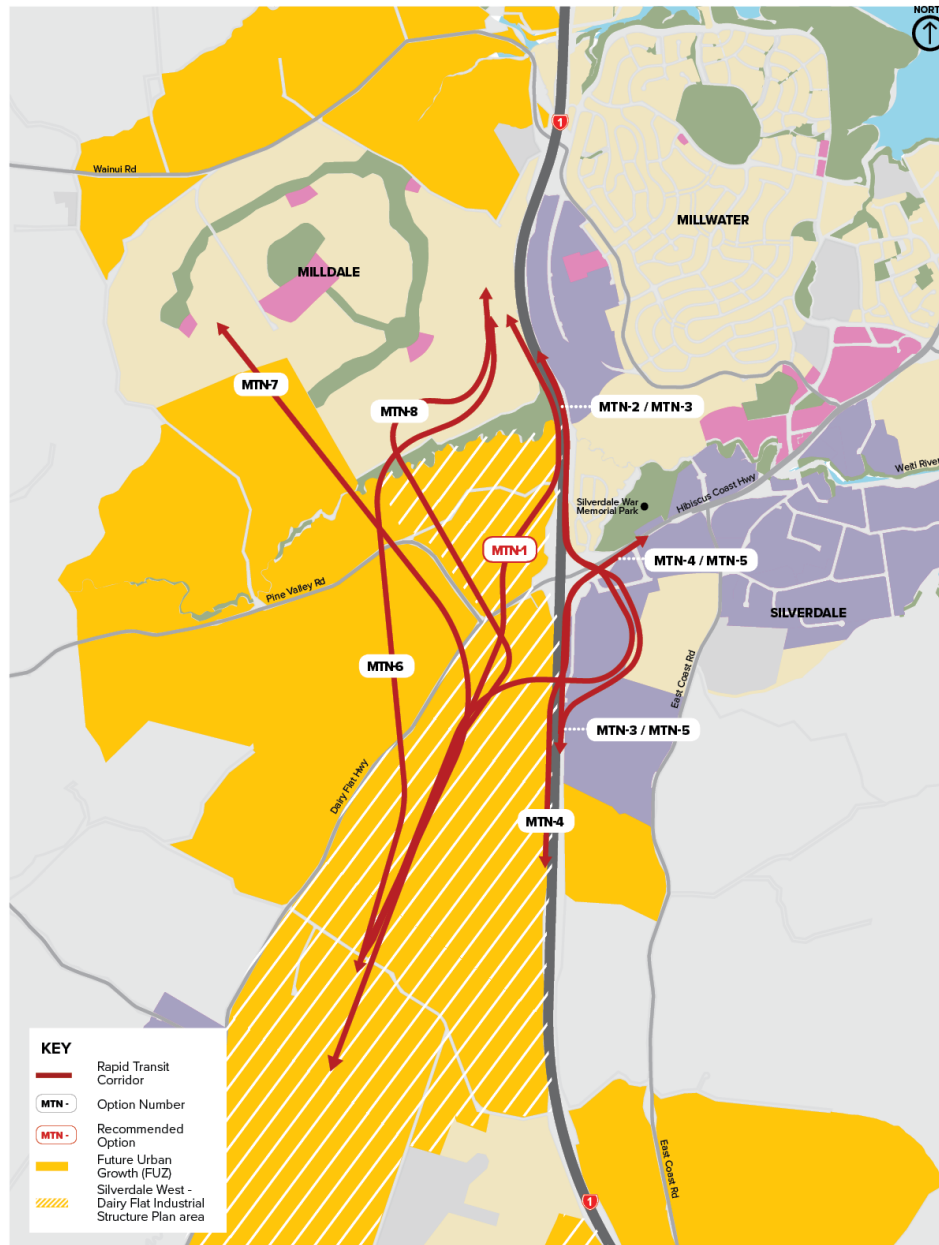


Manawhenua feedback summary: The Manawhenua preferred option for the southern RT alignment is [REDACTED]

RT corridor –northern section (south of Silverdale SH1 interchange to Milldale station) – 8 options

Functional intent: Provide strategic public transport network north of Silverdale to either the Hibiscus Coast Station or a new Milldale Station for the Milldale, Ōrewa and Millwater communities.

Recommended option: MTN-1- Pine Valley Station and motorway corridor west (PBC Reference option). This option includes extension of the RT corridor northwards on the western side of SH1 to a station at Milldale on an alignment close to the motorway corridor. The recommended option requires a new station to be provided on the west of SH1 in place of the current Hibiscus Coast Bus Station. In the short to medium term, the Hibiscus Coast Bus Station will play an important role in providing interim access to the RT corridor.



Reasons for selection:

- This option scores very well against the investment objectives as it provides additional catchment for a new Milldale Station including Milldale and Millwater (serving both sides of the Motorway); provides good resilience by increasing the availability of strategic corridors; integrates well with the proposed development at Milldale (supporting this development); and provides additional travel choice for the local catchment.
- The option scored most positively overall, particularly in relation to social wellbeing, transport and urban design benefits.
- The option was considered to strike the best balance of providing additional benefit by extending to Milldale while still providing access to the existing Silverdale catchment on the eastern side of SH1.
- Options to Milldale have better integration with local bus services than options that terminate at Hibiscus Coast Bus Station, as services can operate between key local destinations (e.g. Wainui/Milldale centre and Silverdale centre) via a Milldale Station. This means routes will serve both a local and feeder service role, improving the

efficiency of the bus network (as opposed to requiring separate routes for each function).

The option also provides:

Flexibility and future proofing for a potential northern extension to the corridor and should relieve pressure on Hibiscus Coast Highway and the Silverdale interchange.

The recommended RT extension may result in environmental impacts, including minor encroachment of an SEA and QEII covenanted area and a crossing of the Wēiti River. Manawhenua [REDACTED]

[REDACTED] Of the western side Milldale options, the recommended option has the least amount of SEA clearance with opportunity for further reduction through localised narrowing and/or changes to the neighbouring Motorway corridor.

Manawhenua feedback summary:

Manawhenua are [REDACTED]

Public/stakeholder consultation feedback summary:

These options were not specifically consulted on during the public consultation period. However, key themes from feedback that relate to the existing Hibiscus Coast Bus Station and public transport access in the Silverdale area include:

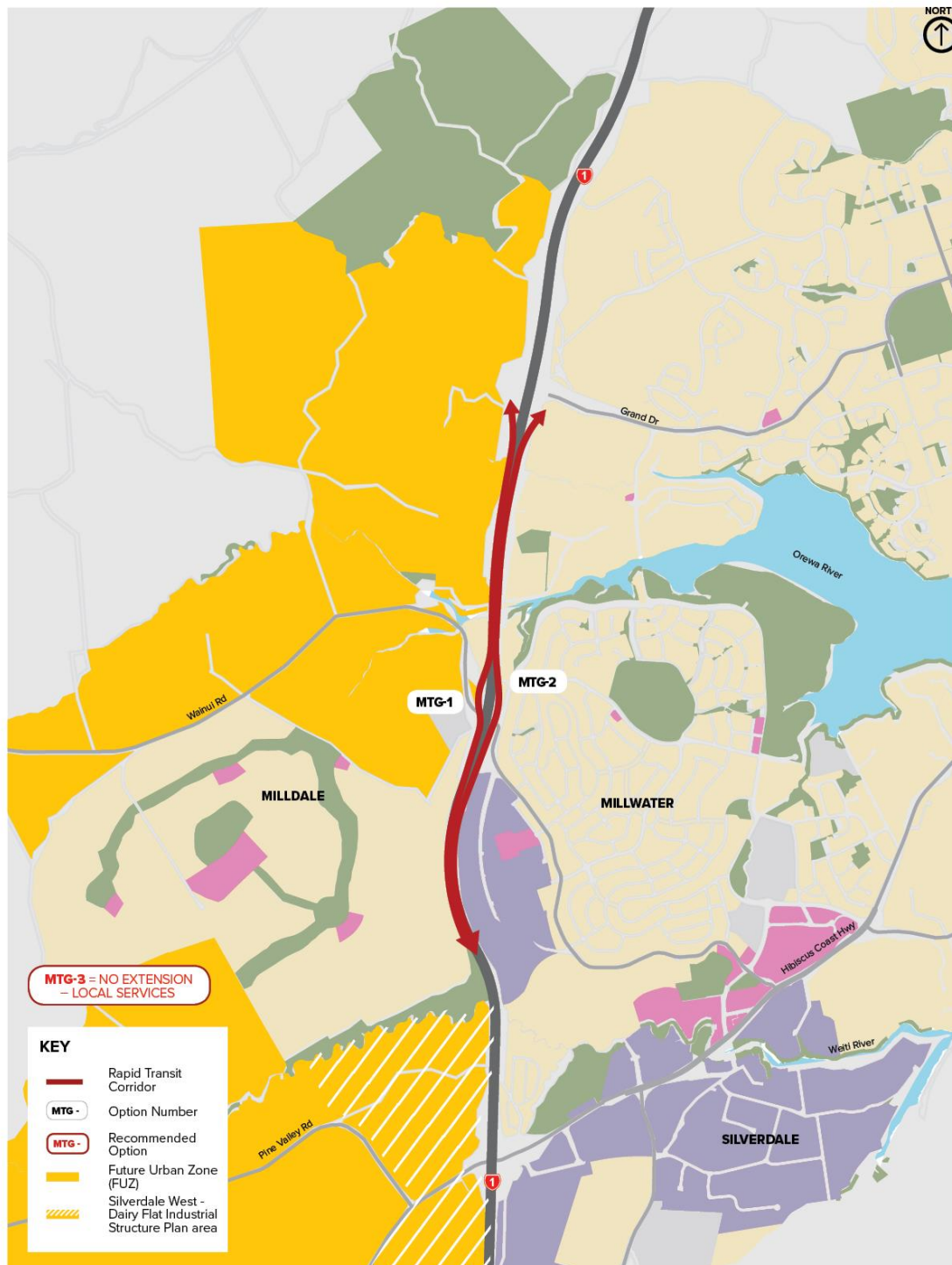
- An extension of the RT will take pressure off the existing Hibiscus Coast Bus Station
- A connection into Silverdale will increase connectivity to the existing business area.

A key consideration going forward will be that the decision to potentially close the Hibiscus Coast Bus Station in the long term (due to its replacement with an RT station at Milldale) was not part of the public consultation material and, therefore, will need to be addressed in the next phase of engagement. In the short-medium term, the recommended network is consistent with the feedback received.

RT corridor – Grand Drive extension – 3 options

Functional intent: Provide strategic public transport network north of Milldale to Ōrewa.

Recommended option: MTG-3- No extension – local services. This option assumes a new Milldale Station is the terminus of the RT corridor. Connectivity to the north of Milldale is provided via local bus services.



Reasons for selection:

- Local services to Grand Drive can achieve a good level of accessibility and connectivity for the areas. The local bus network remains relatively similar whether

the RT extends to Grand Drive or not and provides a good level of accessibility to an RT station at Milldale.

- In comparison, the other options (Options MTG-1 and MTG-2), which require extension of the RT corridor, have not shown sufficient transport benefits for their relative costs of implementation. Modelling has forecast that the options which require extension would only have a minor effect on total patronage (less than 5% during the 2-hour AM peak) relative to the recommended option. The RT extension options will also need to traverse challenging topography and have high environmental impacts (crossing Ōrewa River and impacting SEAs).
- The recommended option avoids impacts of the other options associated with a widened Wēiti River crossing, other stream crossings and direct impacts on an SEA.

Manawhenua feedback summary:

Extension of the RT to Grand Drive is [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

Public/stakeholder consultation feedback summary:

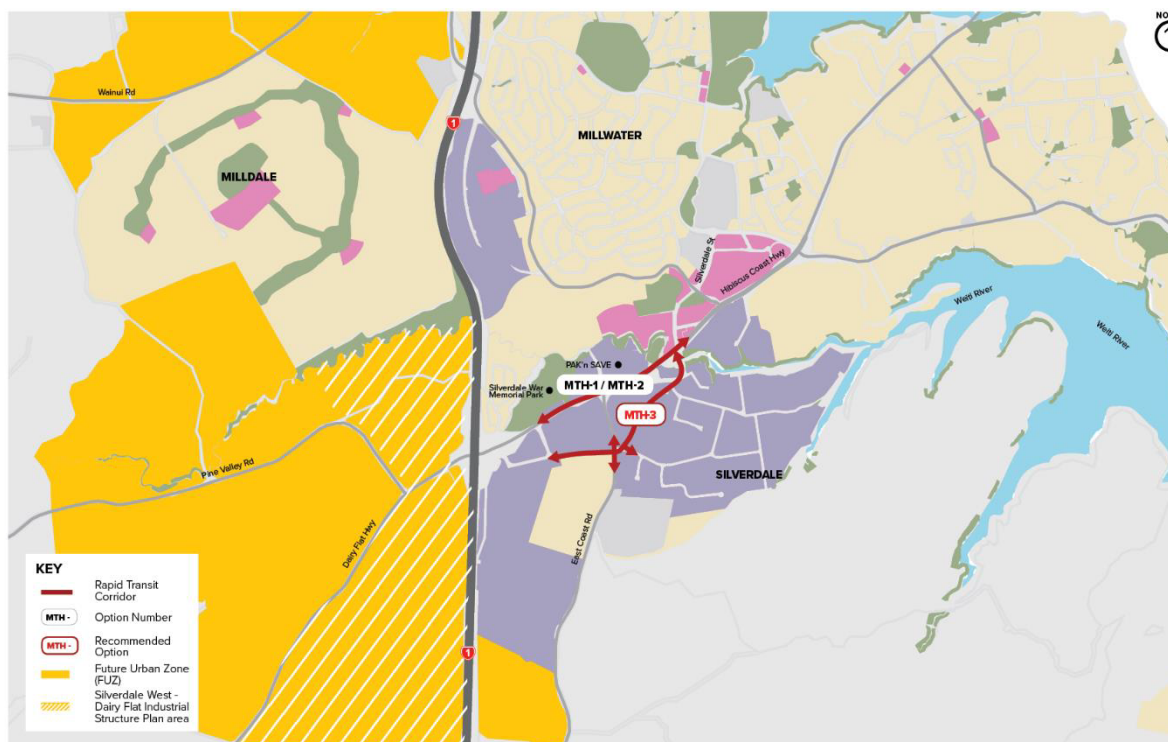
- Support for extending RT from Silverdale north to service existing communities.
- An extension of the RT will take pressure off the existing Hibiscus Coast Bus Station
- A connection into Silverdale will increase connectivity to the existing business area.

The recommended option is partially consistent with the feedback received, as the majority of the feedback was supportive of extending the RT north of Silverdale (noting most said it should be extended to Grand Drive). In the next phase, clear key messages will need to be produced about how public transport connectivity will be provided for up to the existing urban area of Ōrewa (i.e. the Grand Drive area).

RT corridor –Hibiscus Coast connection– 3 options

Functional intent: Provide a public transport connection between Hibiscus Coast Bus Station and Silverdale Town Centre. Although the recommended option for an RT corridor – northern section includes an extension of the RT north to a station at Milldale (see above), the Hibiscus Coast Bus Station is expected to play an important part of the transport network for up to 20 years; hence an improved public transport connection is important. The improved Silverdale Street / Hibiscus Coast Highway intersection will benefit local bus services once the Milldale Station is operational and will have the added benefit of allowing public transport to access the Silverdale industrial area (in the vicinity of Tavern Road).

Recommended option: MTH-3- No extension – use of local roads. This option uses local roads south of Hibiscus Coast Highway for bus services and includes new signalised intersections at East Coast Road / Tavern Road and at Silverdale Street / Hibiscus Coast Highway.



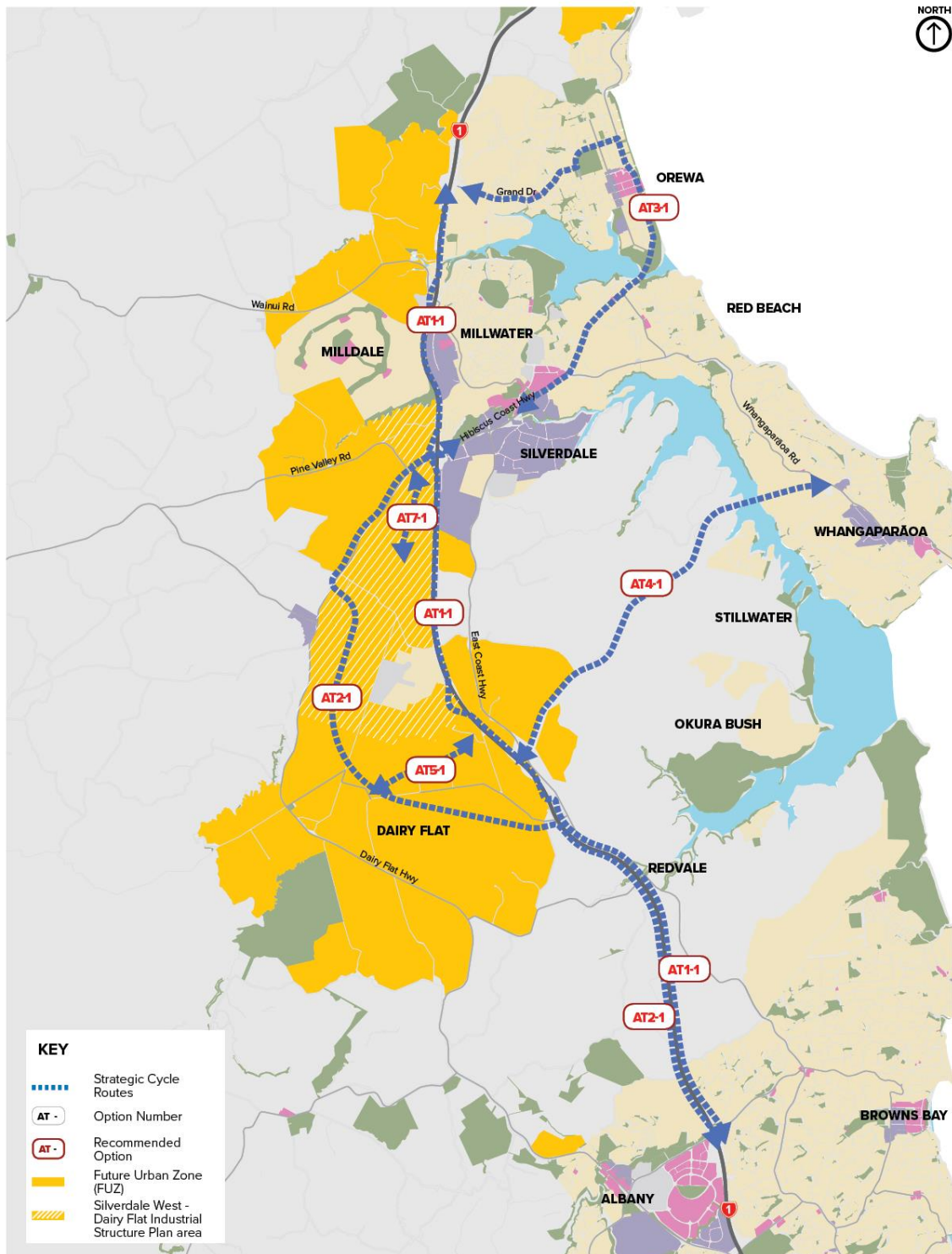
Reasons for selection:

- The use of local roads for bus services can achieve a good quality public transport connection with relatively minor impact, physical infrastructure and cost.
- The intersection upgrades are a necessary part of this option, noting that an upgrade of Silverdale Street intersection is also recommended as part of the Curley Avenue connectivity package (discussed separately below).
- In comparison, options using Hibiscus Coast Highway have a high cost and impact, and a large effect on the operation of the corridor through reallocation of road space.

Strategic cycling connections

Functional intent: Provide a high-quality network of strategic walking and cycling connections for key movements through, within and to/from the study area, connecting existing and new communities.

Recommended option: All three north-south option elements: **AT1-1: Shared path along SH1 (Albany to Grand Drive interchange); AT2-1: Shared path north-south route through FUZ from Albany to Silverdale; AT3-1: Hibiscus Coast Highway/ Grand Drive Cycle Facility;** Plus all three east-west option elements: **AT7-1: John Creek riparian facility with tie-in North of Silverdale interchange; AT5-1: East west - Dairy Stream (Dairy Flat to Redvale via riparian corridor); and AT4-1: Penlink corridor cycleway.**



These facilities will be high quality and separated from general traffic. For new corridors, high quality separated walking and cycling facilities are proposed. For the retro-fitting of existing corridors, it is expected that a mixture of shared path and separated facilities will be provided. Note: The Penlink corridor cycleway option (AT4-1) relies on implementation of a 2-lane Penlink road corridor, leaving room in the existing designation for a cycleway.

Reasons for selection:

- While cycling trips are typically shorter in distance compared with other modes, provision of high-quality strategic routes promotes longer distance travel and will future proof the network for changes in technology.
- All the recommended connections perform positively in achieving the investment objectives and are considered necessary to achieve a significant shift away from private vehicles and towards active modes (i.e. to achieve the identified mode split targets in our KPIs – refer Section 4.8). All options provide highly attractive and safe facilities with physical separation from arterial vehicle traffic and provide significant benefits as they will connect between RT stations, employment sites and town centres. These connections are also critical for providing a complete strategic cycling network.
- The SH1 alignment option (AT1-1) provides medium-term benefits for current and future communities on both sides of the motorway, including connections to RT stations.
- The FUZ aligned option (AT2-1) provides longer-term benefits to the network, running through/close to the future Dairy Flat Town Centre, RT stations, and Albany, thereby offering opportunity for higher density development along the corridor. This option has potential to be integrated with the recommended RT option (middle section).
- The Hibiscus Coast Highway option (AT3-1) provides a high-quality connection to and for existing communities and town centres, including Silverdale, Millwater, Red Beach and Ōrewa, so will have immediate benefits.
- The Penlink and Dairy Flat east-west routes (AT4-1 and AT5-1) provide a continuous high-quality connection between communities.
- The John Creek riparian facility (AT7-1) will form the northern section of the FUZ corridor (AT2-1) approaching Silverdale. This is seen to have good network benefits in terms of accessibility and resilience.
- All options (and particularly the north-south connections) have identified environmental, social, cultural and economic impacts, including a number of SEA and stream crossings and direct property / access impacts. AT3-1 will potentially result in impact on the frontage of a significant amount of properties along Hibiscus Coast Highway. Initial investigations indicate there are likely opportunities to avoid, remedy or mitigate impacts where necessary.
- There are opportunities to reduce costs and impacts of the options by integrating them with other (e.g. RT or SH1 widening projects) options.

Manawhenua feedback summary:

Manawhenua [REDACTED]

[REDACTED]

Public/stakeholder consultation feedback summary:

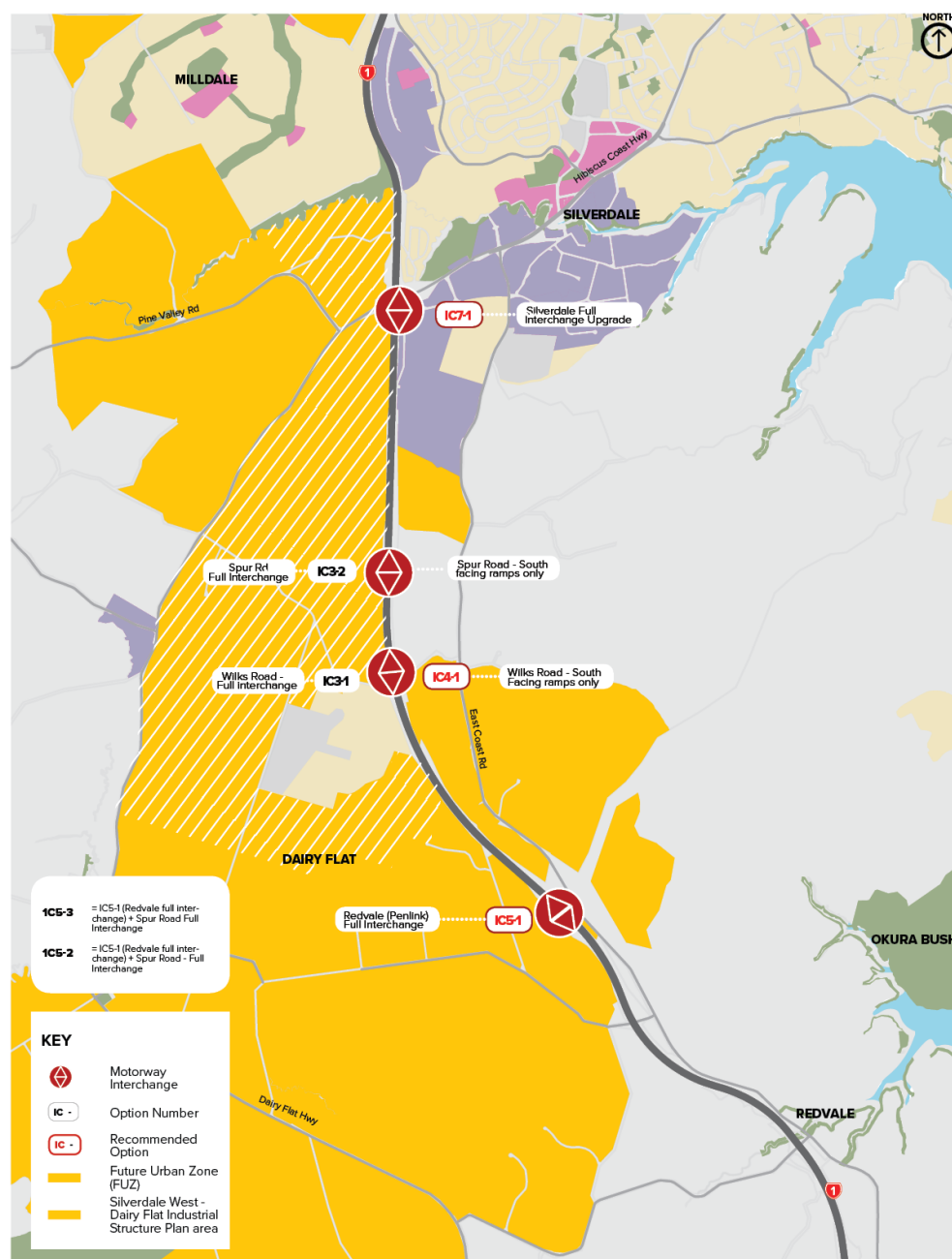
- Overall strong support for all three north-south options
- Some feedback noted the need to consider a 'finer grain network' i.e. how people will access these key strategic routes
- Safety and segregation highlighted as most important components of walking and cycling network
- Consider routes to/along Ōkura River walkway, Wēiti River and Te Ara Tāhuna (Ōrewa Estuary path)
- Concern for potential lack of amenity associated with the SH1 option
- Support for extension of Redvale (Penlink) walking and cycling connection.

The feedback received on the three strategic routes is consistent with the recommended option. Consideration needs to be given to providing information or seeking further feedback regarding how the community will be able to access these routes from a wider walking and cycling network.

Motorway interchanges

Functional intent: Provide access to/from the strategic road network to serve development areas

Recommended option: IC7-1: Silverdale interchange capacity upgrade: Includes addition northbound off-ramp capacity, additional east west movement and changes to intersections. **IC4-1: Wilks Road south facing ramps only; and IC5-1: Redvale (Penlink) full interchange.** The form and operation of any new SH1 interchange connection is yet to be determined. Potential options include general traffic access or managed access (e.g. bus, freight).



Reasons for selection:

- A Silverdale interchange upgrade was seen to have good benefits in enabling development in the short term (pre-Penlink) and catering for cross connectivity in the longer term. These improvements will service an important existing and future connection between communities. The interchange is already at capacity and an upgrade is critical prior to development of the new Silverdale West-Dairy Flat Industrial Structure Plan area.
- Traffic modelling and investigations have demonstrated improved levels of access when two sets of south-facing ramps are provided (i.e. Redvale/Penlink and an additional site), which is reflected in a fivefold increase in benefits over Redvale alone.
- Only one set of additional north-facing ramps are required to service demand. Two sets of north facing ramps (Redvale and Wilks) showed nominal additional transport benefits over the recommended option (refer to Appendix D: Economics assessment), but resulted in an increase in cost.
- South-facing only ramps at Wilks Road and a full interchange at Redvale (Penlink)) will provide good benefits to the wider and more local communities (existing and future) seeking access to the SH1 strategic network.
- The Wilks Road south-facing ramps are critical to enabling development of the proposed Silverdale West-Dairy Flat Industrial Structure Plan area (option detailed in the Silverdale West / Dairy Flat Structure Plan Integrated Transport Assessment).
- Interchange options in the vicinity of Spur Road (which are not part of the recommended option) would have the greatest effect on land outside the RUB, including visual/landscape effects and do not perform as well from a transport network perspective.
- North-facing ramps are predicted to be most effective at Redvale (Penlink), as this location will minimise impact on longer distance (strategic) traffic movements, including freight.

Manawhenua feedback: The Manawhenua preferred options are [REDACTED]

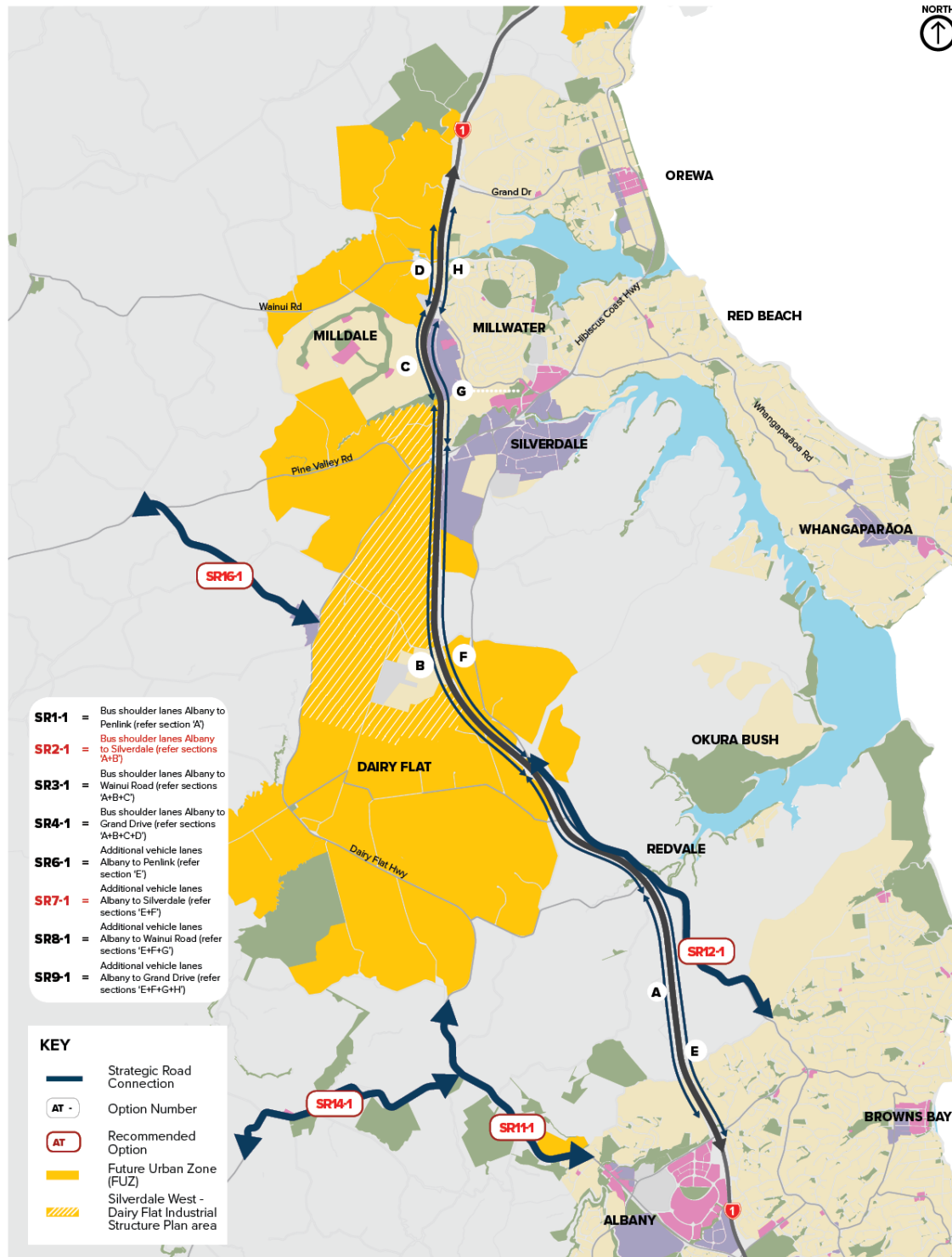
Public/stakeholder consultation feedback summary:

- Most respondents supported prioritising upgrades to Silverdale interchange due to existing issues
- Strong support for full interchange at Redvale (Penlink)
- Some support for Wilks Road interchange but less recognition of need (compared to other options).

Feedback on motorway interchanges is consistent with the recommended option as it responds to the need to improve connectivity to both local and wider communities and improve access to the proposed Silverdale West-Dairy Flat Industrial Structure Plan area.

Strategic road connections

Functional intent: Strategic north-south routes providing access and resilience to the strategic network.



Recommended option: Combination of the following option elements:

SR2-1: Bus shoulder lanes on SH1 Albany to Silverdale interchange: The bus shoulder lane element uses the existing SH1 shoulder lanes. It may require localised widening in

places. This option can be combined with an option that adds an additional lane, as long as a SH1 shoulder is retained. Whether it is provided north/south or both directions is still to be determined.

SR7-1: Additional motorway capacity - Albany to Silverdale interchange: This option adds an additional lane on to SH1.

SR11-1: Upgrade Dairy Flat Highway (DFH) - improved capacity and safety between Albany and Silverdale; and **SR12-1: East Coast Road (ECR) upgrade**: Safety and active mode upgrade between Oteha Valley Road and Hibiscus Coast Highway. On Dairy Flat Highway, upgrades will increase capacity and improve safety and operational performance to align with strategic movements. The form is still to be determined although the assessment has highlighted geometric and construction challenges along this route. East Coast Road is recommended to receive safety upgrades with no additional capacity added to the corridor south of the FUZ area.

SR14-1: Safety upgrade to Coatesville Riverhead Highway (CRH) - connection to Riverhead/north-west; **SR16-1: Safety upgrade to Kahikatea Flat Road (KFR):** Arterial connection to the north-west. The form of a safety and operational upgrade is still to be determined but does not include additional capacity along the corridors. These options improve the safety and operation of these arterials to improve resilience of the wider network i.e. alternatives to SH1 if disrupted.

Reasons for selection:

- The bus shoulder lanes on SH1 up to Silverdale provide a short- to medium-term staging option for improving reliability and travel time for public transport in the area. Bus lanes are only considered effective where there is a need to bypass congestion; hence the recommended option terminates at Silverdale. They will provide the function of connecting the study area with key destinations within and outside the study area. In the long term, the bus lanes have the benefit of being converted into general traffic lanes to provide added capacity for SH1. It is acknowledged this option will have moderate ecological impacts, but it will provide regionally significant benefits.
- The additional motorway capacity between Albany and Silverdale will help retain the strategic function of SH1 in light of higher local demand from the communities in the study area. The option will manage additional capacity in the longer-term to deliver on targets for mode share and urban form. This option was selected over the other capacity options, as traffic modelling indicates that future demands north of Silverdale do not warrant extension further north. All motorway capacity options score negatively from an ecological perspective due to SEA and waterway crossings.
- Upgrading DFH and ECR will provide strategic alternatives to SH1, linking the study area to the south. Capacity improvements are only recommended on DFH. The DFH upgrade will provide a good level of resilience to the rest of the network, as it can be used as an alternative to SH1 if needed. Upgrades to ECR will focus on safety improvements as downstream constraints limit the effectiveness of any capacity upgrades. Both upgrades will have moderate impacts on cultural and social wellbeing and potentially major impacts on the environment as a consequence of SEA and waterway crossing impacts. This will require further focus in the next phase of the business case.
- The CRH and KFR upgrades will have minimal impacts and are necessary to improve the safety of the roads as the population in the Northern growth area expands.

Manawhenua feedback:

Consultation feedback summary:

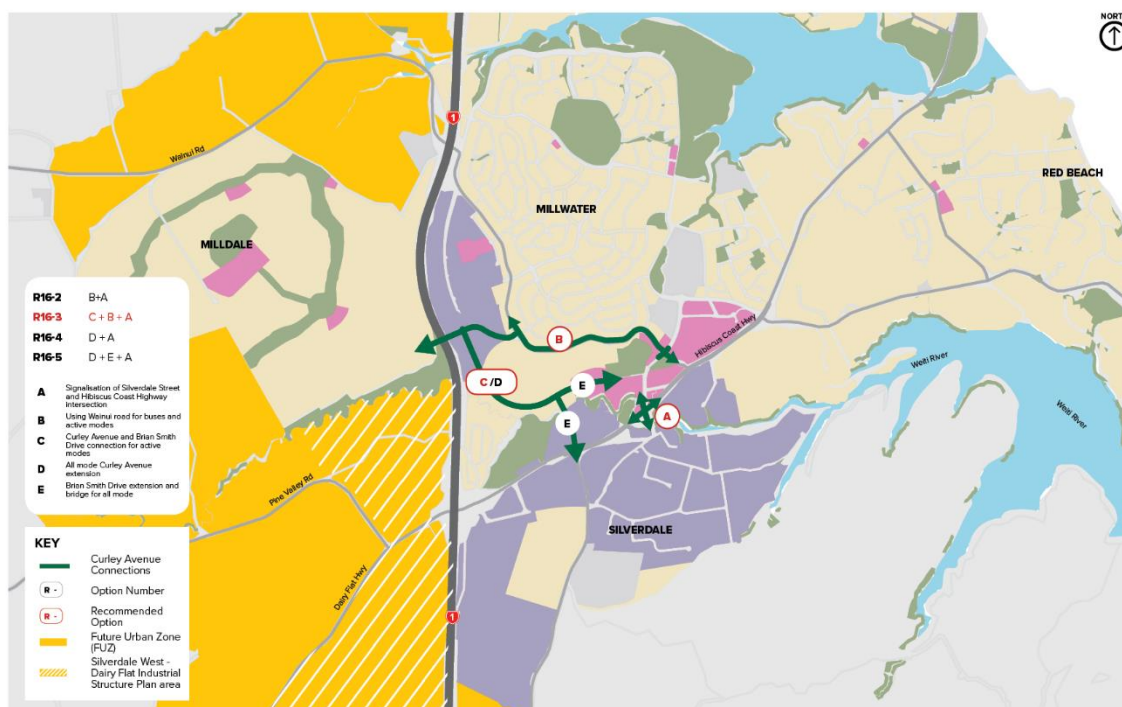
- Strong support for bus shoulder lanes between Albany and Silverdale
- Respondents noted urgent need for this extension now to serve existing communities
- Strong support for additional lanes on SH1 to function as 'managed lanes'
- Some feedback on whether managed lanes could operate in peak periods and for general traffic at other times
- Additional lanes on SH1 are needed now (not in 20-30+ years) especially where they can be accommodated in the existing designation.

The feedback received is consistent with the recommended option. For the longer-term future of SH1, it will be important to reiterate through key messages that route protection provides flexibility regarding how lanes may operate (i.e. whether an additional lane is provided for vehicle traffic or is a managed lane).

Curley Avenue connection

Functional intent: Allow the movement of people within the future growth areas and to/from Hibiscus Coast Bus Station, Silverdale Town Centre, Millwater and Milldale, providing access to jobs, amenities and homes.

Recommended option: R16-3: Use existing roads with active mode only connection on Curley Avenue and Brian Smith Drive. This option assumes the existing Wainui Road will be used for buses. An upgrade of the Silverdale Street/Hibiscus Coast Highway (HCH) intersection is a critical component, which requires a change to the speed environment on HCH. There is uncertainty regarding if the Silverdale Street/HCH intersection improvements can be implemented due to the current form and function of the HCH. This will be investigated in more detail during the DBC stage.



Reasons for selection:

- The recommended option enhances permeability of the transport network, promoting a mode shift to walking and cycling by providing connection to the Hibiscus Coast Bus Station (benefiting Millwater, Milldale and Highgate) in the short/medium-term. The connection is vital to support the recommended RT option in the short to medium-term, by unlocking benefits from early investment in the RT corridor through increased accessibility to the Hibiscus Coast Bus Station. The recommended option is expected to save approx. 13 mins for a walking trip and 3 mins for a cycle trip between Millwater and the Hibiscus Coast Bus Station. The recommended option also allows local services to travel through Silverdale Town Centre en route to the Hibiscus Coast Bus Station.
- An all mode connection would provide positive transport outcomes establishing a link between Hibiscus Coast Highway, Silverdale Town centre and the Highgate / Millwater / Milldale area but is not recommended as the benefits at this stage are outweighed by the potentially high to very high environmental, cultural impact and cost of the project.
- The recommended option is considered a feasible and practical alternative operating with minimal delay in both the AM and PM peak periods with a lower environmental impact and cost. With no Curley Avenue connection, traffic volumes using Wainui Road are forecast to remain below 10,000 vehicles per day (vpd) and does not require upgrade to an arterial standard.
- The environmental impacts of a walking and cycling connection are also more likely to be able to be mitigated than an all modes connection. Further work including onsite investigations and further engagement with Manawhenua will be carried out during the next DBC phase to determine the most appropriate route through this area, as well as how impacts can be avoided, remedied, mitigated or offset.

Manawhenua feedback summary:

Manawhenua [REDACTED]

[REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]

Consultation feedback summary:

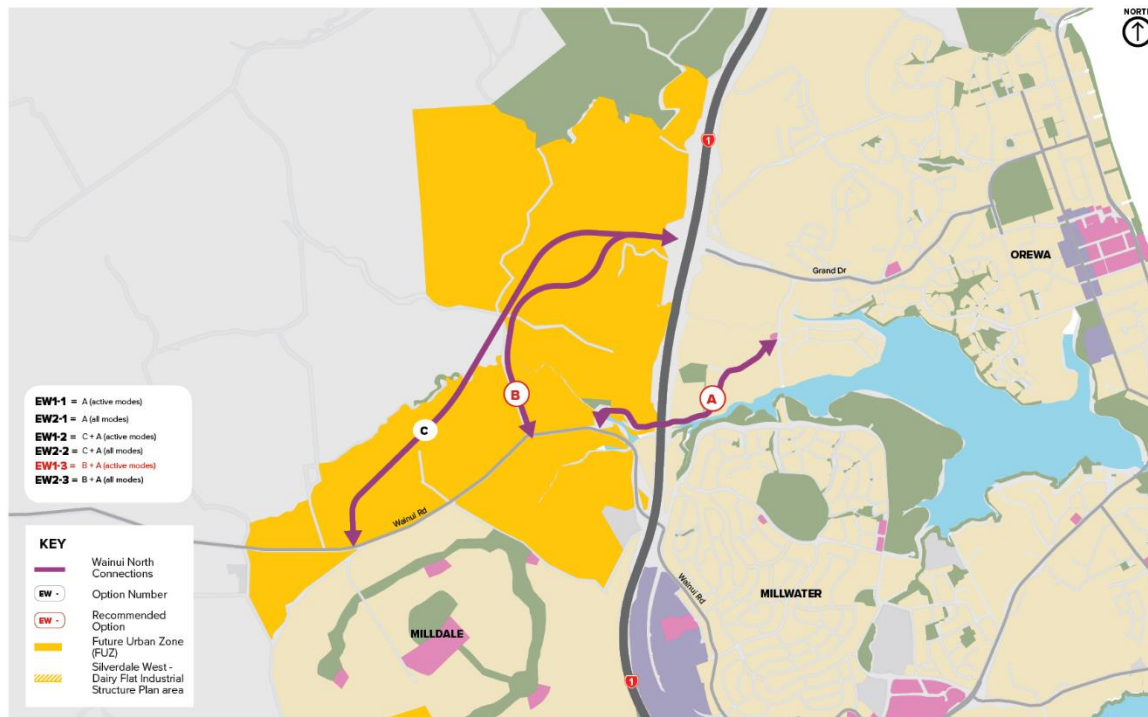
- Feedback was received from a developer in the area which was supportive of an extension of Curley Avenue.

The consultation period did not specifically ask people for their feedback on Curley Avenue as an active mode connection only. Therefore, consideration will need to be given in the next phase to communicate the decision-making process regarding this connection and benefits of an active mode connection.

Wainui North connectivity

Functional intent: To improve connectivity in Wainui North and/or between Wainui Road, Grand Drive and Milldale, providing resilience to the network.

Recommended option: EW1-3: Kōwhai Road active mode only crossing and strategic connection for buses between Wainui Road and Grand Drive.



Reasons for selection:

- This option provides a high-quality walking and cycling route connecting into existing facilities around the Ōrewa River.
- The active mode only crossing at Kōwhai Road has high amenity, safety and access benefits for the adjacent residential catchments. It minimises effects on the Ōrewa River and adjacent properties. An all modes crossing would have limited benefit and potentially significant environmental impacts.
- While the traffic forecasts are low (for an arterial road at around 10,000 in 2046) on the link between Wainui Road and Grand Drive, the connection has significant benefits to local network resilience particularly for public transport; and improved accessibility for the Upper Ōrewa catchment to social opportunities and to the strategic cycle network.

Manawhenua feedback summary: Manawhenua indicated a preference for [REDACTED]

Public/stakeholder consultation feedback summary:

- Support for increased connectivity across SH1, and these connections will mean that short journeys can occur without the need for a car
- Some feedback that crossings should be over the motorway, rather than under because of safety issues for pedestrians and cycling

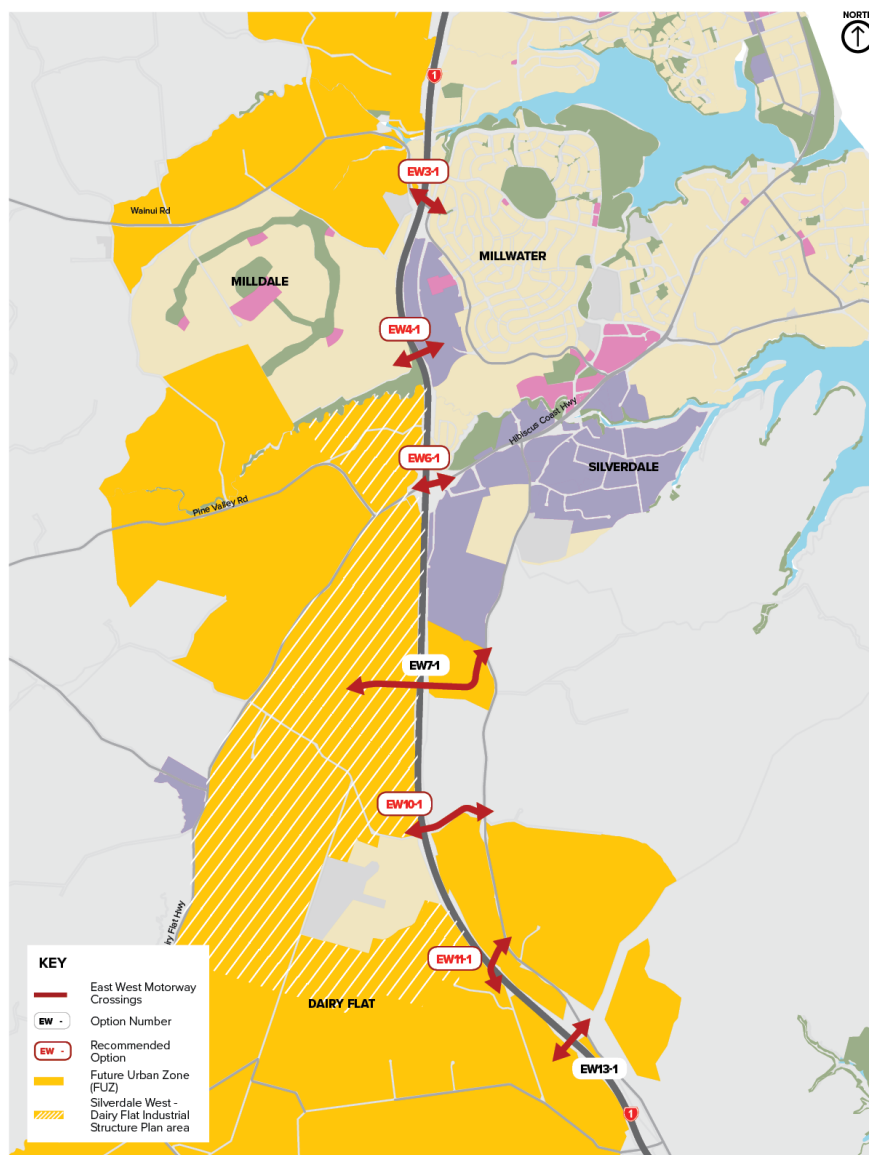
- These will provide connections between housing and employment
- Connections will open up freight and public transport access to existing and future developments that will occur in Dairy Flat
- Safety for all modes should be considered.

The feedback received is consistent with the recommended option.

East west Motorway crossings

Functional intent: Provide a non-motorway connection (either by active mode only or all modes) across SH1.

Recommended options: EW3-1: Wainui active mode only crossing; EW4-1: Milldale-Highgate all modes crossing; EW6-1: Silverdale active mode only crossing; EW10-1: Wilks Road active mode improvement (improved crossing for active modes at Wilks Road bridge). This option is dependent on whether the interchange option is provided in this location; and EW11-1: Dairy Stream all modes crossing - a two-lane corridor, plus active mode facilities to connect FUZ on either side of the SH at or near Dairy Stream.



Reasons for selection:

- These crossings are fundamental to service connectivity between communities and access to social and economic opportunities between and on both sides of the existing SH1. Given the quantum of growth expected, the provision of east-west connections exclusive of the motorway interchanges would provide resilience to the network and avoid funnelling all movements through the bottleneck of east-west motorway crossings.
- None of the recommended crossings have high environmental, social, cultural or economic impacts and, in combination, they provide a good level of mode shift encouragement, accessibility to and between communities, and suitably cater for expected travel demand.
- EW7-1 is not recommended as this option provides the lowest overall contribution to investment objectives, has the highest environment impacts and scored lowest against the economic criteria.
- Collectively the east-west crossings proposed provide a similar crossing provision to that seen on the North Shore network south of Albany.

Manawhenua feedback summary: Manawhenua have [REDACTED]

[REDACTED]
[REDACTED].

Public/stakeholder consultation feedback summary:

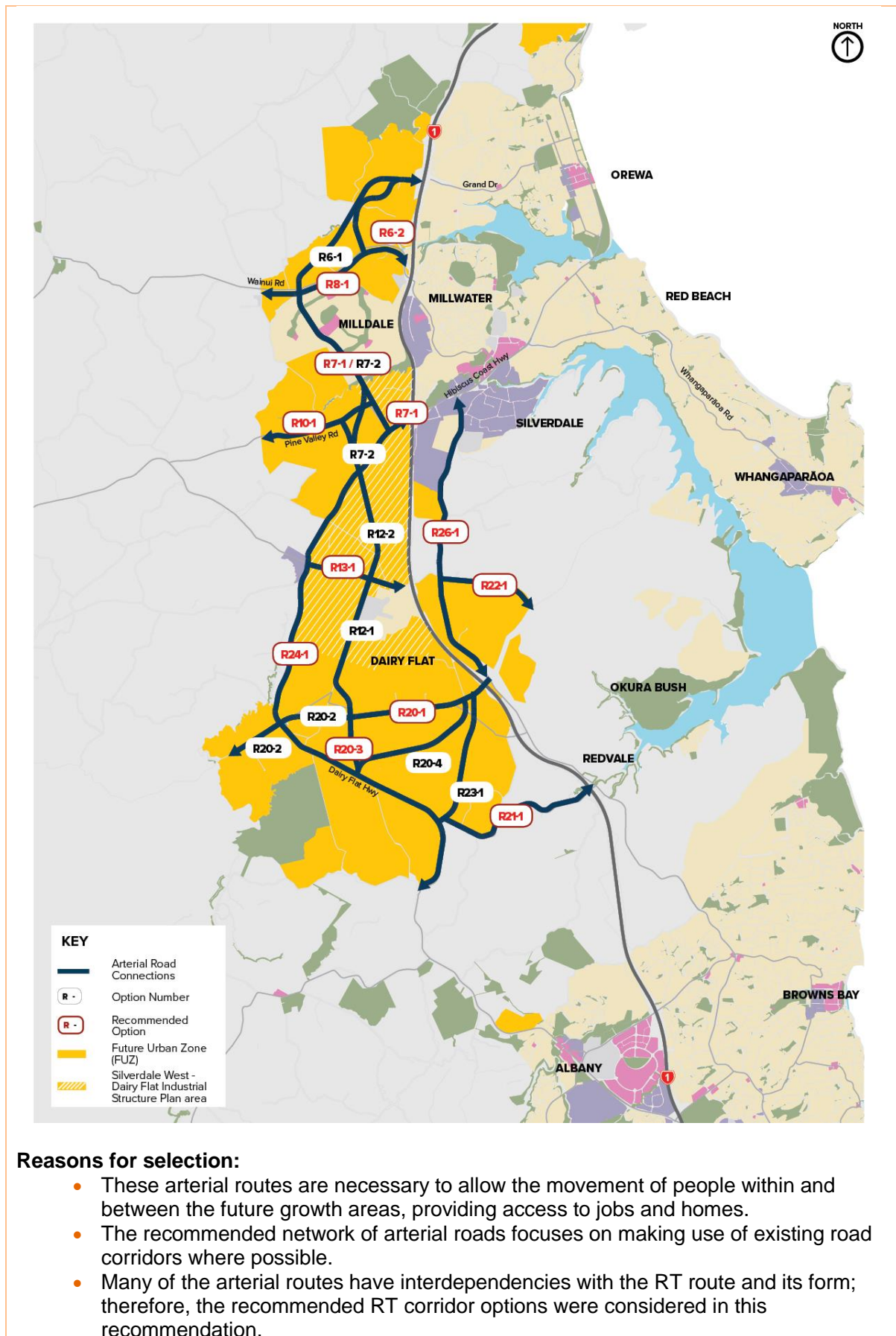
- Support for increased connectivity across SH1 from housing to employment, and these connections will mean that short journeys can occur without the need for a car
- Some feedback that crossings should be over the motorway, rather than under because of safety issues for pedestrians and cycling
- Walking and cycling improvements needed across Silverdale interchange
- Connections will open up freight and public transport access to existing and future developments that will occur in Dairy Flat
- Safety for all modes should be considered.

The feedback received is consistent with the recommended option.

Arterial roads

Functional intent: Provide safe and direct connections for all modes (public transport, walking and cycling and general traffic) between key movement points or destinations in the study area, including the potential town centre in Dairy Flat and existing and emerging town centres further north, as well as access to the strategic transport network.

Recommended options: R6-2: New collector - North-South Milldale to Grand Drive; R7-1: New arterial - North-South Pine Valley Road to Wainui Road; R24-1: Dairy Flat Highway between Silverdale to end of FUZ area; R26-1: East Coast Road Hibiscus Coast Highway to end of FUZ area; R8-1: Upgrade Wainui Road (within the FUZ area); R10-1: Upgrade to Pine Valley Road (within the FUZ area); R13-1: New arterial - East-West through industrial area; R21-1: Upgrade Awano Road (safety upgrade); R20-1: Bawden Road new arterial; R20-3: Bawden Road to Dairy Flat Highway; and R22-1: New arterial - Wilks Road Interchange to Penlink via Jackson Way



- All the recommended connections provide safe routes that cater for significant movement of people (all modes) between key points on the network.
- Arterial roads provide benefits for all users with sufficient space within the corridor for protected walking and cycling facilities and public transport provision.
- The recommended network of arterials is generally expected to cater for traffic volumes consistent with the AT Road classification (annual daily traffic of over 10,000 vehicles per day) except for two options: R6-2 and R22-1. R6-2 (Wainui to Grand Drive) is considered an important public transport connection and is recommended to be included as a strategic collector type route. R22-1 (Jackson Way) is recommended to be included as it provides connection between Penlink and the Wilks Road interchange and is important in reducing short trips on the motorway.
- The potentially high environmental impacts of some of the connections (R7-1, R21-1) are acknowledged and will require further focus in the DBC phase. These options require quite major stream crossings and will have associated ecological, cultural and visual/landscape impacts.

Manawhenua feedback summary: Manawhenua have [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Public/stakeholder consultation feedback summary:

- Support for previous PBC network
- Support for north-south arterial between Redvale (Penlink) and Awanohi intersection and Bawden Road to Jeffs Road extension.

The recommended option does not include a new north-south arterial between Redvale (Penlink) and Awanohi intersection and Bawden Road to Jeffs Road extension. The key messages for the next phase will need to explain the other connections that will provide for future connectivity in the area and the decision as to why the additional arterial connections were not included in the recommended network.

7 Recommended network

The recommended network for the Northern growth area is summarised in Table 8, including alignment with the North IBC investment objectives and GPS (2018) priorities.

The recommended network of infrastructure projects is outlined in Figure 30.

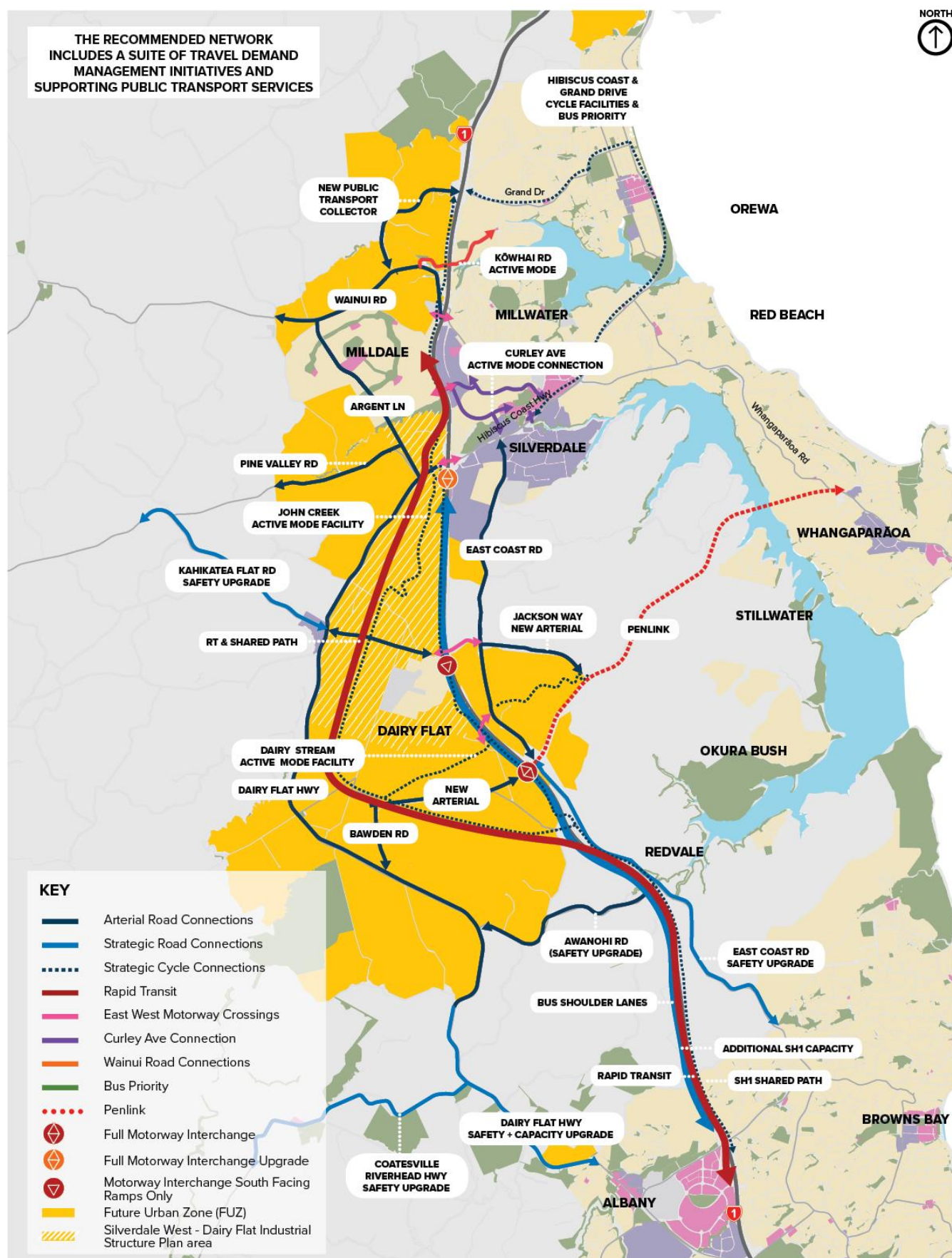
Table 8: Recommended network projects

Option group	Brief description of option as recommended	Investment objectives				GPS priorities			
		1. Access	2. Resilience	3. Integration	4. Travel choice	Safety	Access	Environment	Value for money
Rapid transit	Future urban alignment – central town centre (but with design and treatment changes to reduce severance impacts)	H	H	H	H	M	H	H	M
	Motorway corridor east (with crossing north of Awanohi Road)	H	H	H	H	M	H	H	M
	Pine Valley Station and motorway corridor west (PBC Ref)	H	H	M	H	M	H	H	M
	No extension - local services	M	L	L	L	L	L	H	H
Motorway interchange	Silverdale interchange upgrade - no further access	M	L	M	L	L	M	L	H
	Wicks Road south-facing ramps only	M	L	M	L	L	M	L	H
	Redvale full interchange	M	L	L	L	L	M	L	M
Strategic cycle connections	Shared path along SH1 (A bany to Grand Drive interchange) (Note: part of this replaced with John Creek riparian facility)	H	M	M	M	H	H	H	M
	Shared path North-South route through FUZ from A bany to Silverdale (Note: southern section of alignment is shared with above option)	H	M	H	H	H	H	H	M
	Hibiscus Coast Highway/ Grand Drive Cycle facility	H	M	M	M	H	H	H	M
	John Creek riparian facility with tie-in North of Silverdale interchange	M	L	H	M	H	H	H	L
	East west - Dairy Stream (Dairy Flat to Redvale via riparian corridor)	H	L	H	H	H	H	H	M
Strategic Roads	Bus shoulder lanes on SH1 Albany to Silverdale interchange	M	L	L	L	L	M	M	M
	Upgrade Dairy Flat Highway - improved capacity between A bany and Dairy Flat	M	H	L	M	H	M	M	M
	East Coast Road upgrade south of FUZ (safety upgrade and improvements only)	L	L	L	L	H	L	M	M
	Additional managed motorway capacity - Albany to Silverdale	M	M	L	L	L	M	M	M
	Upgrade to Coatesville Riverhead Highway - connection to Riverhead/north-west (safety upgrade and improvements only)	L	L	L	L	H	L	L	M
	Upgrade to Kahikatea Flat Road - Arterial connection to the north-west (safety upgrade and improvements only)	L	L	L	L	H	L	L	H
Curley Avenue connection	Use existing roads with active mode only connection on Curley Avenue and Brian Smith Drive (option includes signalisation of Silverdale Street intersection and use of Wainui Road for buses)	M	L	L	M	H	M	M	L

Option group	Brief description of option as recommended	Investment objectives				GPS priorities			
		1. Access	2. Resilience	3. Integration	4. Travel choice	Safety	Access	Environment	Value for money
Wainui North connection	Kōwhai Road active mode only crossing and arterial road between Wainui Road and Grand Drive (R6-2)	M	M	M	M	H	H	M	L
East West crossings	Wainui Road active mode only crossing	M	M	M	M	H	H	M	L
	Milldale-Highgate all modes crossing	H	M	H	M	L	M	M	M
	Silverdale active mode only crossing	M	M	M	M	H	H	M	L
	Wilks Road active mode only improvement	M	M	M	M	H	H	M	L
	Dairy Stream all modes crossing	M	M	H	H	L	M	M	L
Arterial roads	New public transport connection - North-South Milldale to Grand Drive	L	L	M	M	H	H	M	M
	New arterial - North-South Pine Valley Road to Wainui Road	M	M	M	M	H	H	M	M
	Dairy Flat Highway between Silverdale to end of FUZ area	H	M	M	M	H	H	M	M
	East Coast Road Hibiscus Coast Highway to end of FUZ area	H	M	M	M	H	H	M	M
	Upgrade Wainui Road	M	M	M	M	H	H	M	M
	Upgrade Pine Valley Road	M	M	M	M	H	H	M	L
	New arterial - East-West through industrial area	M	M	M	M	H	H	M	M
	Upgrade Awanohi Road as arterial (safety upgrade and improvements only)	L	L	L	L	H	L	M	M
	Bawden Road new arterial	M	M	M	M	H	H	M	M
	Bawden Road to Dairy Flat Highway	M	M	M	M	H	H	M	M
	New arterial - Wilks Road Interchange to Penlink via Jackson Way	M	M	M	M	H	H	M	M
Demand management	Bus priority measure: Hibiscus Coast Highway, West Hoe Road and Grand Drive	M	M	M	M	L	M	H	H
	Technology package	L	M	L	M	L	M	M	H
	Travel behaviour change schemes	L	M	M	M	L	L	H	H
	Promotional / educational campaigns	L	M	M	M	H	L	H	H
Other projects	Penlink (including cycleway)	M	L	M	M	H	H	H	M

Note: For clarity, Appendix N includes a summary of the naming conventions for the various elements of the network, from short list through to the recommended network.

Figure 30 : Recommended transport network package



7.1 What's changed since TfUG?

The TfUG programme (PBC 2016) identified a comprehensive transport network for the North that centred around improving the liveability of the Northern growth area through improving access to jobs, environment, travel choice and economic growth. Table 9 summarises the impacts of the TfUG North network on the TfUG programme investment objectives.

Table 9: TfUG programme effects

TfUG objective	Summary of TfUG network effects
Access to jobs and core services	<p>Extension of the RT network from Albany to Grand Drive (along a SH1 alignment) will significantly increase the population within walking and cycling distance of the RT and provide additional public transport capacity and resilience for Wainui East, Silverdale and Ōrewa.</p> <p>Provision of a better public transport service along the entire route, with the segregated RT removing the need for buses to join general traffic at interchanges.</p> <p>High proportion of population with jobs accessible by public transport (45 minutes); 24.6% of all regional jobs will be accessible by public transport.</p>
Improved environmental, cultural and community outcomes	<p>Improved public transport mode share results with consequential reduction in vehicle emissions.</p> <p>The Ōrewa-Silverdale frequent transport network will also improve community mobility for those with limited access to private vehicles.</p> <p>Opportunity for rehabilitation of ecological connection along transport corridors.</p> <p>Decreased level of emissions likely as a result of the more efficient operation of the road network. Increased road capacity will make public transport relatively less attractive than travel by car.</p>
Improved public transport peak mode share to 29%	<p>RT busway between Albany and Grand Drive will increase public transport mode share, leading to a reduction in private car travel at peak times in the peak direction.</p> <p>With an RT in place, around 42% of AM peak hour trips leaving the growth area are made using public transport.</p>
Economic growth through travel time reliability	<p>High investment in transport will improve reliability across all modes, supporting economic growth through mode choice for Wainui East, Silverdale and Ōrewa.</p> <p>SH1 shoulder bus lanes will encourage a mode shift to public transport, decreasing demand for private car travel and lowering peak period peak direction congestion levels on SH1.</p>
Land development in line with FULSS	<p>Assist Silverdale West-Dairy Flat business area to develop with good accessibility to the north / south.</p> <p>Improved accessibility of Dairy Flat and Wainui East will assist development of residential and employment lands.</p>

This network was reassessed as part of the Te Tupu Ngātahi programme and this section compares the differences between the infrastructure proposed in the TfUG PBC (Section 1.2.1) and the infrastructure proposed by this IBC.

The difference between the two networks is shown in Figure 31. Table 10 and Table 11 provide additional detail and rationale for the changes.

Figure 31: Changes between the TfUG and Te Tupu Ngātahi recommended networks

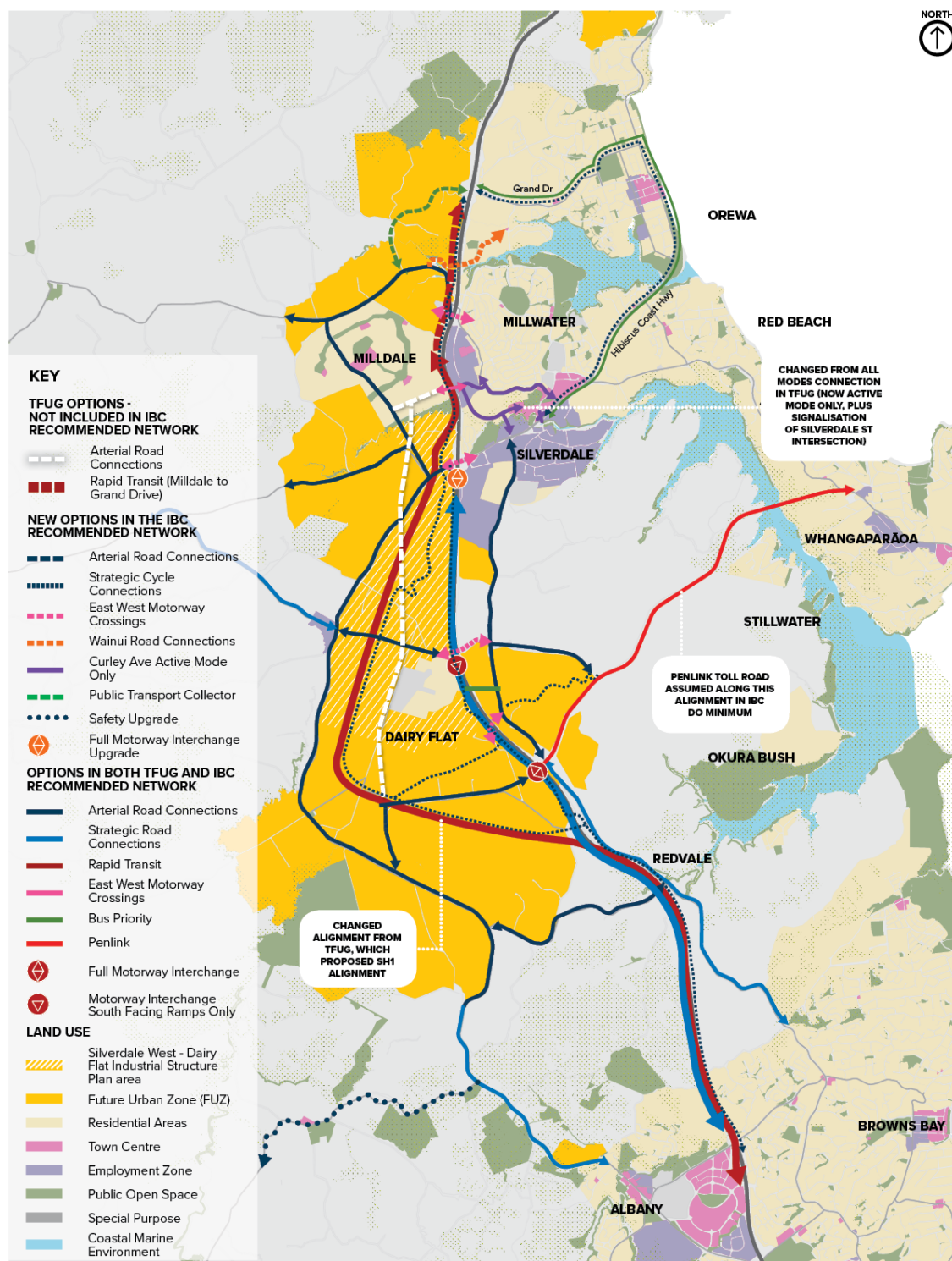


Table 10: Elements added to the TfUG network

Infrastructure	Description	Rationale
New strategic cycle connections	Shared path along SH1 (Albany to Grand Drive interchange)	<p>These new, separated, high quality cycling and walking facilities are considered necessary to achieve the identified mode split targets in the KPIs (refer Section 4.7) and IO4 of this IBC i.e. to provide safe, resilient and attractive travel choices to achieve a significant mode shift to walking, cycling and public transport from private vehicles.</p> <p>While cycling trips are typically shorter in distance compared with other modes, provision of high-quality strategic routes will promote longer distance travel and futureproof the network for changes in technology.</p> <p>All options provide highly attractive and safe facilities with physical separation from arterial vehicle traffic and provide significant benefits as they will connect between RT stations, employment sites and town centres.</p> <p>These connections are also critical for providing a complete strategic cycling network.</p>
	Shared path along RT alignment through FUZ (Albany to Silverdale), including John Creek riparian facility	
	Hibiscus Coast Highway/Grand Drive cycle facility	
	Dairy Stream east west active mode connection (Dairy Flat to Redvale via riparian corridor)	
Motorway interchanges	Silverdale interchange upgrade	<p>This interchange is already at capacity and an upgrade is seen to have good benefits in enabling development of the proposed Silverdale West-Dairy Flat Industrial Structure Plan area in the short-term (pre-Penlink) and catering for cross-connectivity between communities in the longer term.</p>
Improved road corridor	Coatesville Riverhead Highway safety upgrade	<p>This upgrade is needed to improve the safety of this strategic link, as the Northern growth area expands.</p>
	Public transport collector between Wainui and Grand Drive	<p>While the traffic forecasts for this road connection are low between Wainui Road and Grand Drive (at around 10,000 in 2046), the connection has significant benefits to local network resilience, particularly for public transport. An upgrade as a public transport collector would also enable better accessibility for the Upper Ōrewa catchment to social opportunities and the strategic cycle network.</p>
East west Motorway crossings	Kōwhai Road (active modes only)	<p>These crossings are fundamental to service connectivity between communities and access to social and economic opportunities between and on both sides of the existing SH1. Given the quantum of growth expected, the provision of east-west connections exclusive of the motorway interchanges would provide resilience to the network and avoid funnelling all movements through the bottleneck of east-west motorway interchanges.</p> <p>In combination, these crossings provide a good level of mode shift encouragement, accessibility to and between communities, and suitably cater for expected travel demand.</p>
	Wainui Road (active modes only)	
	Dairy Stream (all modes)	
	Silverdale (active modes only)	
	Wilks Road (active modes only)	

Table 11: Elements removed or changed from the TfUG network

Infrastructure	Option	Change and rationale
RT corridor	RT corridor from Milldale to Grand Drive (removed)	The IBC recommended network assumes the RT corridor terminates at Milldale and connectivity to the north is provided by local bus services. These local services are expected to achieve a good level of accessibility and connectivity for these areas. In comparison, extension of the RT corridor does not show sufficient transport benefits for the costs and impacts of implementation.
RT corridor	RT corridor alignment between Albany and Milldale (changed)	<p>In the TfUG network, the RT corridor followed the eastern side of the SH1 corridor between Albany and the Penlink interchange, before crossing to the western side and continuing northwards alongside the SH1 alignment to Milldale. In the IBC recommended network, the RT corridor also commences on the eastern side of SH1 at Albany and crosses to the west of the motorway around Redvale, but then deviates into the FUZ and connects back in with a proposed station at Milldale.</p> <p>The key reasons for this change are that this deviation through the FUZ better enables and supports growth in the Northern growth area and strikes a better balance between transport benefits, land use opportunity, flexibility and cost/BCR relative to the SH1 alignment.</p>
New or improved road corridor	Curley Ave extension east west connection (changed)	<p>In the TfUG network, an all modes road connection was proposed, including a Brian Smith Drive bridge connection. In the IBC recommended network, this has changed to an active mode only connection. Key reasons include:</p> <ul style="list-style-type: none"> Without an all modes connection, traffic volumes using Wainui Road are forecast to remain below 10,000 vehicles per day (vpd), indicating that an arterial standard upgrade is not required. An all modes connection positive transport outcomes establishing a link between Hibiscus Coast Highway, Silverdale Town centre and the Highgate / Millwater / Milldale area, but these benefits at this stage are considered to be outweighed by the potentially high to very high environmental, cultural impact and cost of the project. An active mode connection is vital to support the recommended RT option in the short to medium-term, by unlocking benefits from early investment in the RT corridor through increased accessibility to the Hibiscus Coast Bus Station. The recommended option also allows local bus services to travel through Silverdale town centre on route to the Hibiscus Coast Bus Station. The environmental impacts of a walking and cycling connection are also more likely to be able to be mitigated than an all modes connection.

Infrastructure	Option	Change and rationale
Arterial road	Postman Road arterial upgrade (removed)	In the TfUG network, a new north-south road corridor connection between Albany and Ōrewa was proposed, including an upgrade along the alignment of Postman Road. The Postman Road section of this upgrade has been removed from the recommended IBC network because traffic modelling indicated that an arterial upgrade is not warranted through this section, in addition to other north-south upgrades (i.e. SH1, Dairy Flat Highway and East Coast Road).
	New arterial from Argent Lane to Highgate bridge (provided by others)	This link will be provided by the developer of the Milldale development (in addition to the Milldale to Highgate bridge over the motorway).
	Awanohi Road, Kahikatea Flat Road and East Coast Road (outside the FUZ) (change)	In the TfUG network, full arterial road upgrades were assumed for these roads. In the IBC recommended network, safety upgrades only are proposed for these stretches of road. The key reason for this is that these road sections are located outside the FUZ; therefore urban arterial upgrades are considered unnecessary. Safety upgrades are warranted to improve safety of these roads in the context of the proposed increase in population of adjacent FUZ areas. Also, East Coast Road has downstream constraints that would limit the effectiveness of any capacity upgrade.
Strategic road	Penlink (assumed in Do Min)	Penlink was proposed as part of the TfUG network. In the IBC, Penlink was assumed in the Do Minimum, as this new road link is already designated as a two-lane corridor.

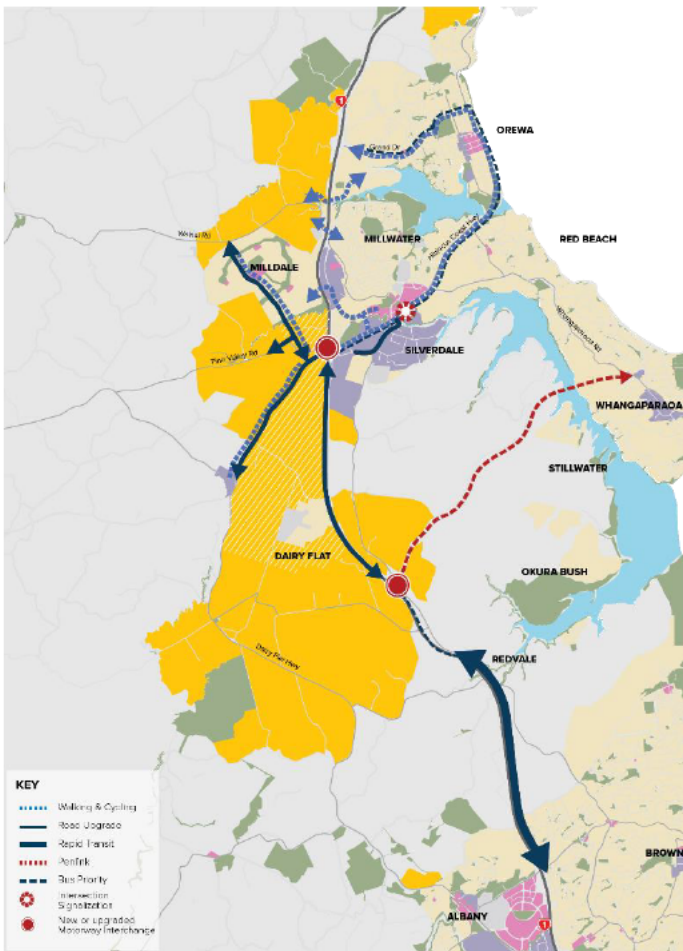
7.2 Staging

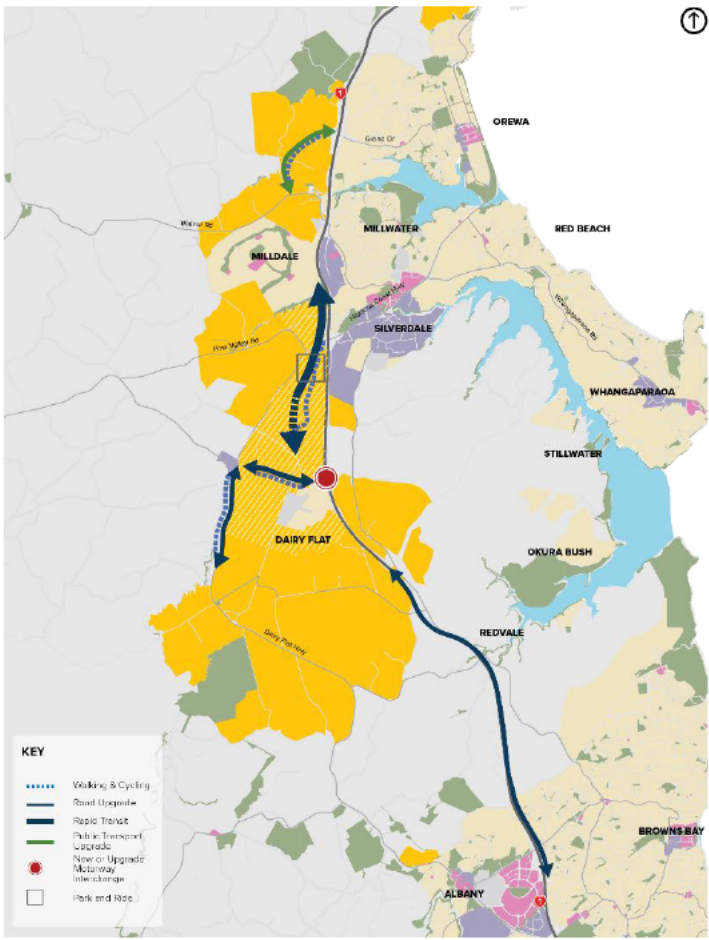
The staging has been developed based on a principles-based approach informed by high level technical analysis. Staging is critical as growth is currently planned to take place over a number of decades. The key drivers of the recommended staging are based on three key strategies:

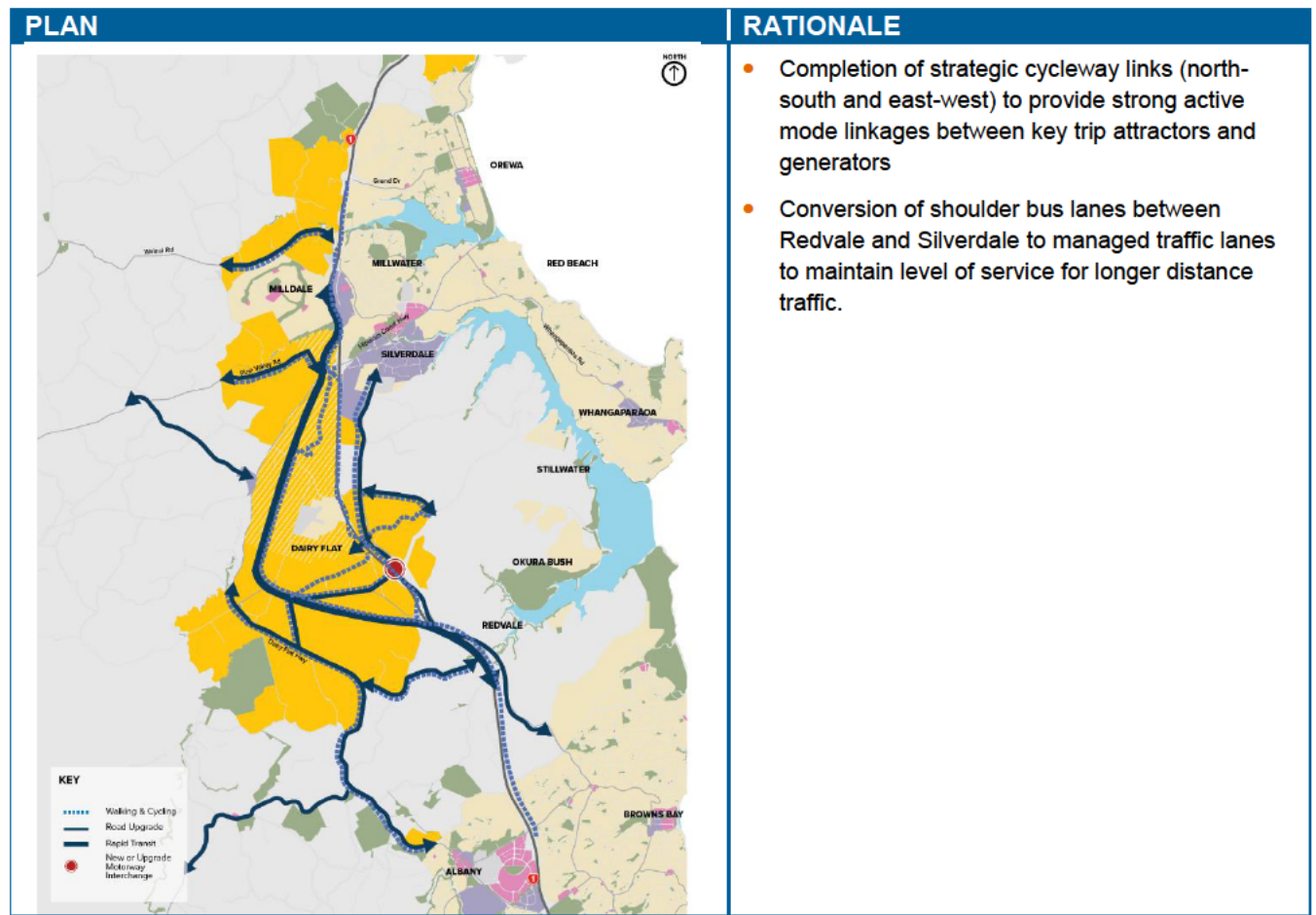
- **Managing transport demand** – Provision of public transport, walking and cycling infrastructure early will enable a mode shift of the existing communities. This has the potential to defer the need for road capacity. Early provision of public transport and active modes for the longer-term growth will encourage early adoption of public transport and active modes for the growth area.
- **Flexibility to respond to changes** – The form and/or effectiveness of a number of projects within the recommended network are highly dependent on changes to the transport network outside of the study area (e.g. RT south of Albany) or timing of growth. The staging strategy is intended to demonstrate there is flexibility to respond to these changes in an appropriate manner.
- **Shaping the future urban development** – Provision of key infrastructure at the right time (such as the RT, arterials) will drive development patterns within the FUZ, allowing a quality urban form to be achieved.

Staging is outlined by decade in the following pages. The proposed staging has been one of a number of factors considered in development of the route protection strategy outlined in Section 10.3. The staging approach will be further developed and refined during the DBC phase including the effects of harnessing

land use opportunities or other interventions such as improved network performance to delay the need for implementation of transport infrastructure.

PLAN	RATIONALE
 <p>KEY</p> <ul style="list-style-type: none"> Walking & Cycling Road Upgrade Rapid Transit Penlink Bus Priority Intersection Signalisation New or Upgraded Motorway Interchange 	<h3>Stage 1 – 2018 – 2028</h3> <p>Supports 1st decade land release (Milldale 2nd stage, Wainui East, Silverdale, Pine Valley and Dairy Flat industrial), actively encourages mode shift to public transport and active modes, provides resilient network</p> <ul style="list-style-type: none"> • Demand management programme to target existing Ōrewa, Silverdale and Whangaparaoa communities. • RT southern section (Albany to Bawden Road) to encourage public transport use. • Three RT options have been identified north of Bawden Road: <ol style="list-style-type: none"> 1. Upgrade East Coast Road to provide a strategic bus connection to the Hibiscus Coast Bus Station 2. Bus shoulders on SH1 and construction of north-facing ramps at Redvale/Penlink interchange (recommended) 3. Busway on east side of SH1 that could be converted to a cycleway by 3rd Decade) • Penlink North facing ramps included in the construction of the Redvale interchange. These could be operated as a bus only connection in the interim. • Milldale arterials including footpaths and separated cycle facilities, to support land release and encourage active mode use. • Bus priority measures on Hibiscus Coast Highway, West Hoe Road and Grand Drive to improve the PT quality of service for the existing communities. • Active mode links to Hibiscus Coast Bus Station (including signals at the Silverdale/Hibiscus town centre) – increasing accessibility to the station and addressing the significant perception that walking and cycling is not currently safe in Silverdale/Ōrewa. • Arterial road upgrades to support Silverdale West –Dairy Flat structure plan area. The structure planning indicates a north to south build out of the area, requiring upgrades to the infrastructure in the north within the first decade. An upgrade to Dairy Flat Highway and Silverdale interchange is required.


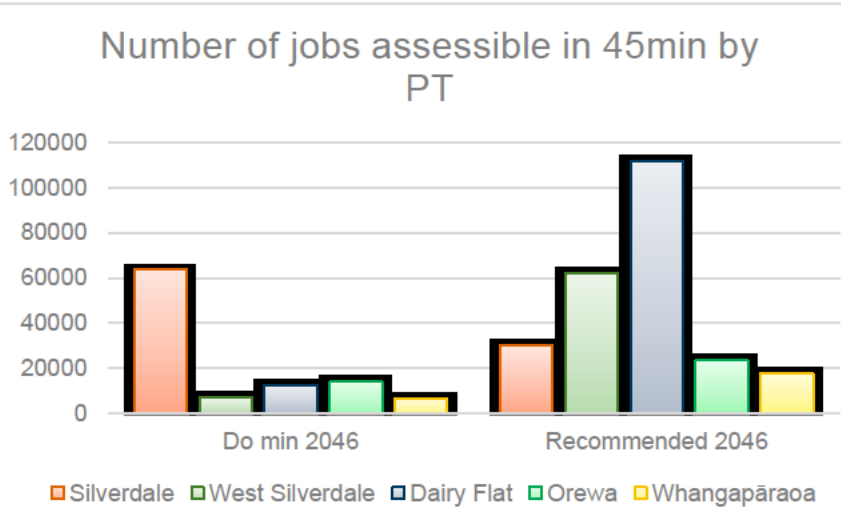
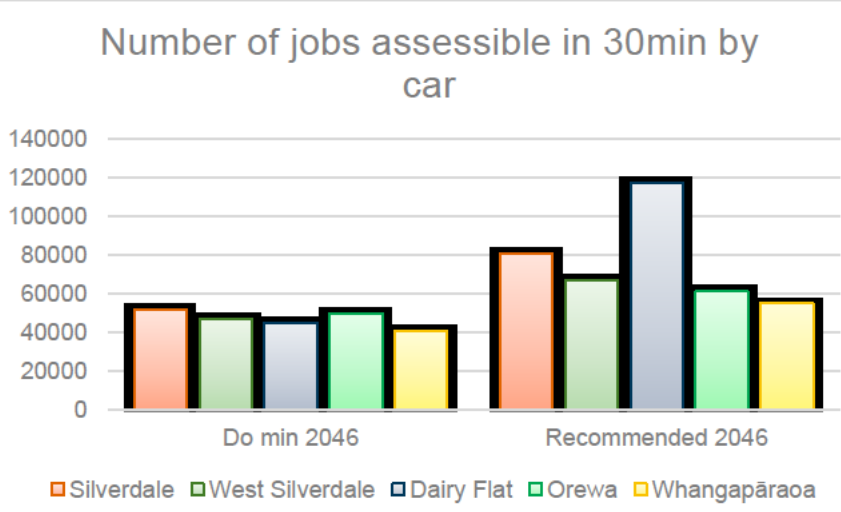
PLAN	RATIONALE
	<h3>Stage 2 – 2028 – 2038</h3> <p>Supports 2nd decade land release (Silverdale West –Dairy Flat Industrial Structure Plan area and full buildout of the Milldale area)</p> <ul style="list-style-type: none"> • Demand management programme to target the proposed industrial area and Milldale community. • RT Milldale to Silverdale West to support release of additional land in Silverdale West, signal to developers that the FUZ RT route will be completed by 3rd Decade, and further encourage 'early adoption' of public transport. • RT services use existing road network to connect between northern and southern sections as an interim solution. • Wilks Road interchange to serve the Silverdale West-Dairy Flat industrial area and link the RT to SH1 or East Coast Road. • East west arterial within the Silverdale West-Dairy Flat industrial area to connect to Wilks Road interchange. • Public transport arterial between Wainui and Grand Drive. • Managed motorway capacity between Albany to Redvale to maintain level of service for longer distance traffic and maximise the benefits of Penlink.
	<h3>Stage 3 – 2038+</h3> <p>Supports 3rd decade land release (majority of FUZ land is developed including Dairy Flat residential/centre)</p> <ul style="list-style-type: none"> • Demand management programme to target new residents in the area and influence travel behaviour • Completion of RT from Milldale to Albany via FUZ, perhaps as a light rail service • Selective additional Park and Ride to help fund early implementation of RT (value capture), and to encourage 'early adoption' of public transport • Completion of arterial upgrades in Dairy Flat area and Silverdale West area including walking and cycling facilities. • Upgrades to strategic road connections between Dairy Flat and Albany, and between the North area and the North West, to address safety issues and support urbanisation.

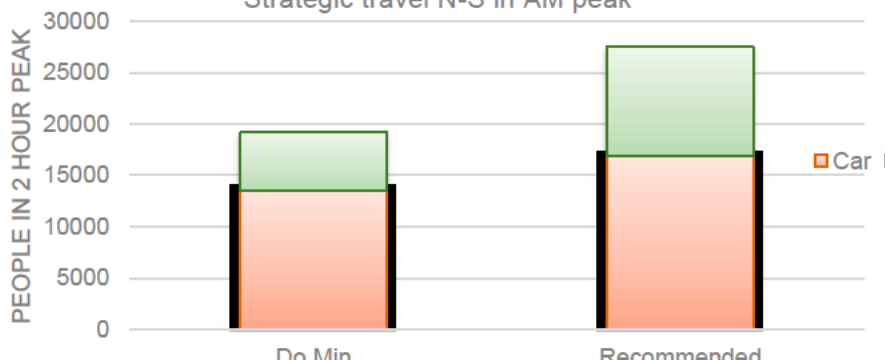





7.3 Outcomes delivered

Outcomes delivered by the recommended network are summarised in Table 12.

Table 12: Recommended network outcomes

Areas	Outcome																																				
<div></div> <div>Access to economic and social opportunities</div>	<div>Better access to economic and social opportunities - 2.0 x the jobs within an accessible range. (KPI 1a)</div> <div><div><div>Number of jobs assessable in 45min by PT</div><table><caption>Number of jobs assessable in 45min by PT</caption><thead><tr><th>Area</th><th>Do min 2046</th><th>Recommended 2046</th></tr></thead><tbody><tr><td>Silverdale</td><td>~65,000</td><td>~30,000</td></tr><tr><td>West Silverdale</td><td>~10,000</td><td>~65,000</td></tr><tr><td>Dairy Flat</td><td>~15,000</td><td>~115,000</td></tr><tr><td>Orewa</td><td>~15,000</td><td>~25,000</td></tr><tr><td>Whangapāraoa</td><td>~10,000</td><td>~20,000</td></tr></tbody></table></div><div><div>Number of jobs assessable in 30min by car</div><table><caption>Number of jobs assessable in 30min by car</caption><thead><tr><th>Area</th><th>Do min 2046</th><th>Recommended 2046</th></tr></thead><tbody><tr><td>Silverdale</td><td>~55,000</td><td>~85,000</td></tr><tr><td>West Silverdale</td><td>~45,000</td><td>~70,000</td></tr><tr><td>Dairy Flat</td><td>~45,000</td><td>~120,000</td></tr><tr><td>Orewa</td><td>~50,000</td><td>~65,000</td></tr><tr><td>Whangapāraoa</td><td>~45,000</td><td>~55,000</td></tr></tbody></table></div></div> <div><p>With the recommended network, jobs accessible using public transport decreases for the existing Silverdale area. This occurs in the transport model as a result of shifting the Hibiscus Coast station to the west of SH1. During the DBC phase options will be investigated to improve public transport accessibility through changes to local services. Provides appropriate capacity to meet the demands of growth.</p><p>Improved people movement on the strategic north-south (N-S) desire line (SH1, Dairy Flat Highway and East Coast Road). (KPI 1b)</p></div>	Area	Do min 2046	Recommended 2046	Silverdale	~65,000	~30,000	West Silverdale	~10,000	~65,000	Dairy Flat	~15,000	~115,000	Orewa	~15,000	~25,000	Whangapāraoa	~10,000	~20,000	Area	Do min 2046	Recommended 2046	Silverdale	~55,000	~85,000	West Silverdale	~45,000	~70,000	Dairy Flat	~45,000	~120,000	Orewa	~50,000	~65,000	Whangapāraoa	~45,000	~55,000
Area	Do min 2046	Recommended 2046																																			
Silverdale	~65,000	~30,000																																			
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Whangapāraoa	~45,000	~55,000																																			

Areas	Outcome												
	<p>Strategic travel N-S in AM peak</p>  <table><caption>Strategic travel N-S in AM peak (Estimated values from chart)</caption><thead><tr><th>Scenario</th><th>Car (Orange)</th><th>Public Transport (Green)</th><th>Total (Black Outline)</th></tr></thead><tbody><tr><td>Do Min</td><td>~13,000</td><td>~6,000</td><td>~19,000</td></tr><tr><td>Recommended</td><td>~17,000</td><td>~10,000</td><td>~27,000</td></tr></tbody></table>	Scenario	Car (Orange)	Public Transport (Green)	Total (Black Outline)	Do Min	~13,000	~6,000	~19,000	Recommended	~17,000	~10,000	~27,000
Scenario	Car (Orange)	Public Transport (Green)	Total (Black Outline)										
Do Min	~13,000	~6,000	~19,000										
Recommended	~17,000	~10,000	~27,000										
<p>Resilience of the strategic network</p> 	<p>Variation in travel time between the peak hour and interpeak is no worse than current (2016) ratio on SH1 in the peak direction. (KPI 2a)</p> <p>Recommended option provides a 25% improvement in AM travel time and 36% improvement in interpeak travel time on SH1 (Silverdale to Albany) compared with the Do Minimum. (KPI 2a)</p> <p>Additional strategic transport corridor offering attractive and effective alternatives to SH1 in both the RT corridor and Dairy Flat Highway. (KPI 2a)</p> <p>The RT corridor caters for 9,400 passengers travelling south of the study area in the 2-hour AM peak. This is representing an increase 2.4 times the patronage expected for the Do Minimum scenario²⁴. (KPI 2b)</p>												
<p>Integrated land use and transport</p> 	<p>A flexible staging solution which provides interim benefits for the Silverdale and Ōrewa communities. (KPI 3b)</p> <p>Delivers a comprehensive walking and cycling network which brings 40% of households in the Northern growth area within 400m of high-quality cycle infrastructure on an arterial or strategic facility. (KPI 3c)</p> <p>Public transport accounts for around 9% of internal trips around the study area based on transport modelling. There is significant opportunity to improve this through demand management. (KPI 3d)</p>												
<p>Mode share</p> 	<p>Roads within the study area and strategic connections are safe operating at a personal and collective risk of medium or below. (KPI 4a)</p> <p>A significant mode shift to public transport for all travel. Public transport mode share improves from 9% in the existing situation, and 10% in the Do Minimum to 21 - 26% in the AM peak as a result of the recommended network. This is even higher on strategic N-S trips to Albany and south of between 39 - 44% in the AM peak. (KPI 4b)</p> <p>A substantial mode shift to walking and cycling of between 14 - 18% overall. (KPI 4b)</p>												

²⁴ Assumes bus shoulder running between Silverdale and Albany

Areas	Outcome
	<p>A large proportion of the growth area has direct access to the RT corridor with 40% of households within walking distance and 94% within cycling distance of the RT corridor. (KPI 4c)</p> <p>The forecast changes in mode share for the North are at or exceed targets outlined in the PBC of 29% public transport trips out of the area in the AM peak and 16% active mode share for the area.</p> <p>The forecast mode share is well above the current split for Auckland region of approximately 20% and is transformational in comparison to the existing mode share for these areas.</p>

7.4 Dealing with uncertainty

Growth within the Northern growth area is staged over a number of decades, with the majority of FUZ land scheduled to be development ready by 2038-2043 according to the FULSS timelines. Planning for transport corridors to serve future growth has a high degree of uncertainty. The major uncertainties for the Northern growth area, and the extent to which these could influence the recommended option have been explored in Table 13.

Table 13: Effect of uncertainty on recommended option

Uncertainty	Effect on recommended network
<p>Changes to the RT network south of the study area</p> <p>Current forecasts suggest the Northern Busway will reach capacity early in the 2030s. The future mode and form of the corridor is uncertain.</p>	<p>The recommended network ties in with the current Northern Busway. Changes south of Albany can be accommodated by the recommended RT corridor and do not influence the selection of the recommended corridor.</p> <p>The timing of changes south of the study area will influence RT staging. If LRT is implemented, an intermediary interchange will be required in the medium term around Awanohi Road.</p>
<p>Changes in timing of growth</p> <p>Growth in the FUZ area could occur quicker (market driven, politically driven) or slower than predicted by the FULSS (due to a demand shortage or other infrastructure requirements).</p>	<p>While changes in timing will change the overall quantum of growth, significant changes in timing will place additional emphasis on certain users. External influencing factors such as bulk infrastructure (timing of the Northern Interceptor) will affect the timing of land release.</p> <p>If growth in the FUZ is delayed, additional emphasis would be placed on serving the existing communities.</p> <p>Equally, if growth occurred faster than predicted, infrastructure would need to be provided in the FUZ to respond and enable this growth.</p> <p>The recommended network and proposed staging sequence, prioritise infrastructure for the existing communities in the short term. Infrastructure timing for the packages of projects to support FUZ development could change in timing according to land use timeframes.</p>

Uncertainty	Effect on recommended network
	An economic sensitivity test has been undertaken to understand impacts of changes in growth timing on the recommended network and is outlined in Section 8.4.
Changes in land use type The Northern growth area is forecast to provide between 33,000–42,000 additional households and ~604 ha of industrial area	<p>Changes in the composition of the FUZ area will impact on the ratio of local jobs to population and influence the travel demand from the area.</p> <p>At a holistic level, a decrease in the number of jobs in the study area will increase travel demand to employment areas further away, placing strain on the transport network and reducing accessibility to jobs and the reliability of the strategic network.</p> <p>At a local level, residential development within the industrial area could increase public transport patronage as residential land typically generates more public transport users.</p>
Changes in yield - Recent development in the South has resulted in increased yields being achieved in greenfield development areas over and above what was previously planned for.	<p>It is feasible that yield of the greenfield areas could change in the future. This could lead to a change in travel demand and behaviour.</p> <p>A significant change in yield could warrant review of the recommended network with more infrastructure required to accommodate the growth. This could include additional RT capacity (addition of a complementary line), additional strategic connections and roads.</p>
Local networks The SGA programme focuses on strategic and arterial transport links. Local transport networks will be developed further through structure planning and are expected to be delivered by developers	<p>The quality of the local network will have a significant impact on travel behaviour in the growth area. This is particularly prevalent in the walking and cycling networks. Local and collector routes play an important part in ensuring a legible and attractive mode choice is available.</p> <p>Public transport services are often required to make use of local transport connections in order to access people. The design of the local road connections can influence the reliability and attractiveness of PT services.</p> <p>If the local transport networks are not provided to an acceptable level, this could impact on the performance of the recommended network against the investment objectives.</p>

7.5 Results alignment

The recommended network of improvements has been assessed using the Investment Assessment Framework (IAF). The IAF requires cost benefit appraisal and results alignment evaluation²⁵ against the

²⁵ <https://www.nzta.govt.nz/planning-and-investment/planning-and-investment-knowledge-base/2018-21-nltp-investment-assessment-framework-iaf/developing-an-assessment-profile-2018-21/#results-alignment>

GPS. The cost benefit appraisal has been assessed as **LOW**. The analysis to support this assessment is described in Appendix D: Economics Assessment.

Alignment with the four GPS priorities (safety, access – thriving regions, access – liveable cities, and environment) is evaluated against four categories from low to very high.

Assessment profiles are developed according to activity class groupings. The recommended network of improvements for the Northern growth area is predominantly within the following activity classes:

- Promotion of demand management programmes
- Walking and cycling improvement activities
- Public transport improvement activities
- Road improvement activities.

To determine a proposal's priority, the two assessment factors of results alignment and cost-benefit appraisal are brought together to form an investment assessment priority profile.

Auckland is identified as a high-growth urban area. The Te Tupu Ngātahi programme has been specifically developed to respond to the access requirements of an additional 320,000 new dwellings in the Auckland region and the significant gap identified between the current transport system and the identified need.

The recommended Northern growth area network responds to the access requirements of between 33,000⁴ to 42,000²⁶ dwellings and 604 ha of new business land. The package is integrated with Auckland Council's land use aspirations and outlined in the FULSS. The Te Tupu Ngātahi team has worked closely with Auckland Council on sections of the study area not yet underway in the structure plan process to understand the relationship between transport infrastructure and land use planning.

It has been assessed as having **VERY HIGH** results alignment against the public transport improvements activity class. In addition, it has **HIGH** results alignment against the three remaining activity classes, as indicated by the elements in Table 13. Table 13 also indicates the proposal's investment priority.

In addition to the Access Liveable Cities category, the recommended programme also delivers **HIGH** results alignment from a safety and environment perspective as follows:

- Addresses a high perceived safety risk to use of cycling
- Targets promotion of significant lower emissions from the transport system to reduce environmental and public health harms
- Targets the use of active modes for health and environmental benefits
- Enables a significant modal shift from private motor vehicles to active modes.

²⁶ Based on the 2046+ i11 modelling scenario. The 2046+ projections are based on a modified version of i11 to account for full buildout of the growth areas in light of recent changes in yield of new development areas

Table 14: Results alignment – access liveable cities

Activity Class	Very High	Priority
Public transport improvements	<ul style="list-style-type: none"> Enables a substantial increase in access to social and economic opportunities for large numbers of people along dedicated key corridors and enables transit-oriented development – programme includes an RT corridor between Albany and Milldale. This is likely to be a continuation of the North Shore RT corridor. This will substantially increase access for all the Northern growth area. 	1

Activity Class	High	Priority
Walking and cycling improvements	<ul style="list-style-type: none"> Supports increasing the uptake of children using walking and cycling especially to and from school – by including walking and cycling facilities along desire lines to schools. Strategic active mode corridors provide high quality and safe corridors which will provide access to schools in the future. Supports agreed integrated land use and multi-modal plans in major metros – with transport interventions that support land use, i.e. public transport interchanges next to high density residential and local centres, connected with safe, attractive walking and cycling facilities. Addresses a significant gap in access to new housing in high growth urban areas – 90% of future Northern growth area residents will be within 3km of employment opportunities or the RT corridor using safe, attractive, separated cycle facilities. 	5

Activity Class	High	Priority
Public transport improvements	<ul style="list-style-type: none"> Addresses significant gap in access to new housing in high growth urban areas - 80% of future residents will live within 400m of reliable, frequent public transport services. Supports agreed integrated land use, multi-modal plans and mode shift in major metros – public transport interchanges provided adjacent to centres, high density residential activity and potential new school sites. Strong walk-up catchment. Improves intermodal connectivity where this enhances the appropriate use of public transport. The walking and cycling network provides quality and attractive connection to stations. Secure cycle parking to be provided at public transport stations. Good walk-up catchment to public transport stations in proximity to high density residential and centres. Makes best use of the public transport service operations and connection to other services – public transport service designed to provide connection to the RT corridor as well as providing for local trips. All services to hubs through town centres, enabling good quality connection to other services and maximising walk-up demand and foot traffic to local retail. 	5
Promotion of demand management programmes	<ul style="list-style-type: none"> Targets opportunity to establish and promote active modes or public transport access to new housing in high growth urban areas. Facilities designed to directly connect schools, RT stations and the centres mean that potential users can be more specifically targeted. 	5

Activity Class	High	Priority
Road improvements	<ul style="list-style-type: none"> Addresses significant gap in access to new housing in high-growth urban areas – a resilient, reliable transport system that connects new housing areas to jobs and social opportunities and includes viable alternatives to private vehicle travel. 	5

8 Economics

This section sets out the costs, benefits, and BCR for the recommended network. Further detail on the economic analysis undertaken can be found in Appendix D: Economics Assessment. Further detail on the cost estimating approach can be found in Appendix E: Engineering and Cost Report.

8.1 Benefits

The economic benefits of the recommended network are summarised in Table 15.

Table 15: Economic benefits – recommended network

Item	Benefit (\$M) (net present value)
Travel Time Costs	1,130
Congestion Costs	310
Trip Reliability	60
Vehicle Operating Costs	280
Active Modes	590
Crash savings	150
PT Benefits	1,620
CO ₂	10
Wider economic benefits	830
PV total net Benefits	4,990

Wider economic benefits (agglomeration) have been estimated at 20% of conventional benefits. Further assessment on wider economic benefits (WEBs) will be undertaken during the DBC phase of projects.

8.2 Costs

The capital and operating costs of options were developed and considered through the option selection process. Individual project elements comprising the recommended network were priced to an IBE level. Table 16 summarises the CAPEX costs of the recommended network.

Table 16: Capital cost range - recommended network

P50 estimate (\$M)	P95 estimate (\$M)

Operating costs were also calculated as outlined in Appendix D: Economics Assessment. OPEX costs have been provided in a net present value (NPV) format as there are varying costs per year due to

renewals that make it difficult to provide a typical yearly figure. All NPV figures have been calculated over a 40-year period. Table 17 summarises the discounted costs for the recommended network.

Table 17: Discounted costs- recommended network

Discounted costs -recommended network Item	Cost (\$M NPV)
Capital cost	██████
Maintenance and periodic	██████
Stations	██████
Public transport operating costs - Fare Revenue	██████
Total costs	██████

8.3 Benefit cost ratio

The benefit cost ratio (BCR) was calculated using the NPV benefits and costs described above. This is shown in Table 18. Given the level of uncertainty in both costs and benefits, a risk analysis has been undertaken to assess the BCR range of the recommended network, given that some assumptions were made for both the costs and benefits at this stage. This risk analysis was undertaken based on a high-level risk-based Monte Carlo analysis approach. Based on the Monte Carlo analysis with 5,000 iterations, a BCR distribution range was developed.

Table 18: BCR – recommended network

Item	BCR
Recommended network BCR range	1.1 - 1.6²⁷

This demonstrates a moderate economic case to support the recommended network for the Northern growth area.

8.4 Sensitivity testing

A range of sensitivity tests were undertaken, and the results are provided in Table 19.

Table 19: Summary of sensitivity tests

Sensitivity	Test 1	Test 2	Test 3
Discount rate	Base case 6% 1.3	Discount rate 4% 1.7	Discount rate 8% 1.0
Benefits progression	Base case (7% @ 2026 - 54% @ 2036) 1.3	Delayed benefits (0% @ 2026 - 30% @ 2036) 1.1	Faster benefits (15% @ 2026 - 75% @ 2036) 1.6
Cost estimate	Expected case (P50) 1.3	Low cost (20% reduction) 1.6	High cost (P95) 1.1

²⁷ Based on 5th and 95th percentile Monte Carlo analysis output distribution profile

Sensitivity	Test 1	Test 2	Test 3
Postponed time zero	Base case (2024)	Time zero 2028	Time zero 2034
	1.3	1.6	1.9
Agglomeration	Base case (20%)	Pessimistic (10%)	Optimistic (30%)
	1.3	1.2	1.4

Sensitivity testing suggests the BCR could range between 1.0 – 1.9 with changes to key assumptions. The sensitivity testing highlights a significant sensitivity to when the infrastructure is provided relative to development of the area. Optimum implementation timing will be further refined for each element in the DBC stage.

9 Incremental economic assessment

Incremental benefit cost analysis is often undertaken for mutually exclusive options to identify optimal economic solutions. Mutually exclusive options occur when acceptance of one alternative or option precludes the acceptance of others. For example, when a new road is proposed and there is a choice between two different alignments, and the choice of one alignment precludes the choice of the other, the two options are mutually exclusive.

The options investigated for the Northern growth area are generally individual sections that collectively form a transport network; hence incremental BCR calculations have not been undertaken as these options are not mutually exclusive. There were some short list options with different mutually exclusive alignments; however the differences operationally were too minor to be distinguishable and hence option selection was made based on other considerations, such as construction complexity and extent of land acquisition required.

9.1 Scenario testing

The recommended network responds to the investment objectives, current policy context (particularly the GPS), and desired urban form outcomes, in a balanced and appropriate manner. Given the rural nature of the transport network in the Northern growth area, achieving these outcomes will require AT and the NZ Transport Agency to allocate a sizable portion of funding in the second and third decades to the Northern network. Affordability of the package is acknowledged as the main barrier to approval and implementation. To that end, a series of alternative scenarios have been put forward which would require lower levels of investment and reduce the overall network cost. Although pure incremental benefit cost analysis has not been undertaken, economic benefits and costs have been calculated for each scenario and compared with the recommended network.

The expected estimate cost for the Northern growth area recommended network is \$[REDACTED]. The recommended network delivers **HIGH** results alignment and a BCR of 1.1 - 1.6. Four scenarios have been tested to explore alternative investment scenarios for the Northern growth area which include:

1. **S1 Reduced arterials:** Upgrade existing arterials to urban collector road standard i.e. new arterial roads are downgraded to an urban collector road standard and implemented by developers.
2. **S2 Increased strategic capacity:** Dual RT corridor and additional north-south capacity via East Coast Road.

3. **S3 Reduced walking and cycling provision:** Strategic active mode connections are removed from the recommended programme.
4. **S4 No motorway upgrades:** No additional ramps or motorway widening.

Table 20 summarises the approximate changes in network cost and anticipated effect on the network BCR for each of these alternative investment scenarios.

Table 20: Scenario evaluation summary

Scenario	Change in funding required (M)	BCR (Low-High)	Incremental BCR	IO1: Access	IO2: Resilience	IO3: Integration	IO4: Mode Share	GPS: Access	GPS: Safety	GPS: Value for money	GPS: Environment
Recommended network	N/A	1.1 - 1.6	N/A								
Scenario 1: Reduced arterials	-\$1,300	1.1 - 2.0	1.2	-	=	-	-	-	-	=	+
Scenario 2: Increase strategic capacity	+\$800	1.0 - 1.4	0.9	+	+	=	=	+	=	-	=
Scenario 3: Reduced active	-\$600	1.1 - 1.6	1.0	=	-	-	-	-	-	+	-
S4: No motorway capacity / access	-\$500	1.1 - 1.4	0.9	-	-	-	+	-	-	-	+

Scenario 1 reduces provision of arterial roads, leading to a significant reduction in overall cost. While this could potentially lead to a stronger economic performance for the network, this network has impacts on active modes, public transport and urban form. The critical impact of adopting this scenario is a reduced level of control over the transport network which puts outcomes of the IBC at risk.

Scenario 2 increases the overall cost of the network but provides additional benefits, both from an economic perspective and against the investment objectives. From a BCR perspective, the additional benefits are outweighed by additional cost leading to a negative incremental BCR.

Scenario 3 and Scenario 4 show a significant decrease in costs. These are generally outweighed by decreases to economic benefits and impacts on the investment objectives.

In weighing up all of the scenarios, the recommended network still provides the best balance of economic performance, affordability and delivery against the investment objectives and key outcomes sought for this investment.

While wholesale changes to the arterial road package or active mode network are considered to negatively affect the investment objectives and do not provide strong economic justification, there may be some instances where reduced cross-sections or consolidated corridors (i.e. in the case where an arterial road and strategic cycleway are parallel in close proximity) could have limited effects on the

outcomes sought. These opportunities will be explored in more detail during the DBC phase for each project.

PART C – IMPLEMENTATION

10 Implementation

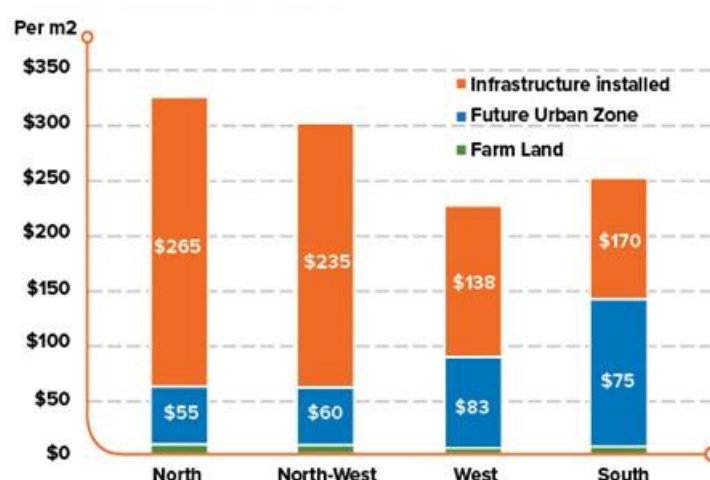
This section sets out the benefits of route protection, and the preliminary route protection and property strategies required to implement the recommended network.

10.1 Benefits of route protection

The next stage of implementation for the recommended network depends in part on the nature of the intervention identified and the organisation (be it infrastructure provider, land developer or Council) best placed to deliver it. A large (but not exclusive) element in the next stage of implementation will be to establish 'route protection' for the recommended options, as recommended in the PBC. The intent of route protection is to identify and appropriately protect the land corridor necessary to enable the future construction, operation and maintenance of the recommended network options. There are a number of potential mechanisms for route protection, which are discussed further in Appendix K: Route Protection Strategy. The route protection process itself is proposed to take place over the next four years.

While the IBC has focused on the 'benefits and impacts' of the intervention itself, there are a number of benefits of this initial step of 'route protection'. In summary, the key benefits of route protection are that it:

- **Provides a mechanism for AT and the NZ Transport Agency to plan for future financial investment while retaining flexibility** on the detailed development of the recommended future network, enabling it to respond to the pace, scale, and exact location of future urban growth.
- **Allows for major infrastructure to be implemented at the right time**, integrated with the urban development driving the desired transport and urban outcomes. This means that projects can be delivered to meet project objectives, with the transport network in mind and gives certainty that the transport system can be operated.
- **Reduces future cost risk.** If the corridor is protected by either early acquisition or notices of requirement, then there is an opportunity to reduce some land costs. This is in part associated with the increasing land values that occur as 'live zones' are implemented, and costs savings associated with the control or management that route protection can place on development on the land. Figure 32 illustrates the component costs of land as farmland, FUZ zone, and land once developed. In comparison with the other growth areas in Auckland, the North has the highest land cost once developed; hence the highest level of risk.

Figure 32: Mid-point land values in relation to the RUB (Sources: Auckland Council; CBRE)

- **Provides certainty to landowners**, the existing community and future customers. This can minimise the risk of social disruption that can occur when infrastructure is retrospectively delivered within developing and established urban areas. It allows the NZ Transport Agency and AT to release historic designations which are no longer required. It can also enable new and establishing communities to plan with more certainty (e.g. they can move to an area knowing there will be public transport travel options for them in the future).
- **Enables developers to commit investment to progress infrastructure.** Where a transport network affects multiple parcels of land, the certainty of route protection enables developers to commit to provision of early 'contributing' infrastructure, with the expectation that subsequent stages of development will complete other elements of the network. For example, protecting an arterial road corridor gives certainty to existing adjacent developers that have lodged private plan changes.
- **Supports Council's subsequent stages of land use planning and development and improves the quality of the urban environment** with more certainty. For example, enabling Council to identify areas of higher density residential development in areas that will be serviced by RT networks or other higher quality public transport options (e.g. location of public transport interchanges adjacent to a proposed local centre and high-density residential activity).

Balanced against the above benefits, there are costs. These include increased expenditure on land (in circumstances where early purchase is required) and the risk of potential planning 'blight' (adverse social and economic impacts associated with the lack of development on a protected corridor).

Further discussion on specific route protection options is provided for below in Section 10.3 and Appendix K: Route Protection Strategy. The Route Protection Strategy provides an overview of the overall route protection options (e.g. designation, plan change / zoning, structure planning or precinct plan provisions and landowner agreements). The Financial Case (Section 11) provides further cost evaluation of the above benefits (and costs).

10.2 Priority for route protection

The benefits of route protection of transport corridors are not equal across the range of projects identified in the recommended network. The benefits of route protection for each corridor are dependent on a number of criteria including:

- **Financial benefits obtained from protection** – Route protection has the ability to reduce property and construction costs associated with a project. Significant benefits are achieved if protection is obtained prior to development of the area, but these erode over time for projects in the longer term.
- **Place shaping** – certain projects have an increased influence on the surrounding urban environment. Protection of these project corridors is likely to enable land use and shape the urban form within an area.
- **Potential for value capture** – Some projects have significant value capture opportunities which are enabled through corridor protection and increased certainty for land use and development opportunities.

Based on the suite of projects identified within the North recommended network, Table 21 sets out a high-level assessment of the relative route protection priority across the network.

Table 21: Route protection priority

Decade	Project type	Urgency	Financial saving	Place shaping	Value capture	Overall priority
Short term projects	Walking and cycling, existing arterial upgrades	✓✓✓	✓✓✓	✓		High
Medium term projects	Walking and cycling, existing arterial upgrades	✓✓	✓✓	✓		Medium
	RT corridor	✓✓✓	✓✓	✓✓✓	✓✓✓	High
	SH upgrades	✓✓	✓✓			Medium
Long term projects	Walking and cycling, existing arterial upgrades	✓	✓	✓		Low
	RT corridor	✓✓✓	✓	✓✓✓	✓✓✓	High
	New arterial roads	✓	✓			Low

10.3 Route protection strategy

This IBC contains a preliminary route protection strategy (Appendix K) for the recommended area-based network, developed with the assistance of a Technical Guidance Note that sets out a methodology for identifying potential route protection packages on the basis of a range of "drivers" or factors. These include (for example): opportunities for place making/achieving liveability outcomes; timing of Council's structure planning processes; developer readiness; whether growth pressure is imminent; presence of Central Government interest; number of affected landowners; availability of funding; presence of scheduled environmental features; potential for adverse environmental or cultural effects.

For each notional package of components, preliminary route protection mechanisms have been selected from a range of options, including NoRs for designation, developer agreements, and structure plan/plan change opportunities. These mechanisms reflect three distinct layers of route protection, namely

identification, communication and formal protection. These layers are discussed in greater detail in the **Programme Wide Management Case** document.

Formal protection via Notices of Requirement for designation provides the most robust and permanent method of route protection for transport corridors, signalling the intention of the requiring authority to implement the infrastructure at some future time (usually within a statutory lapse period) and ensuring that land subject to the designation is not used or developed in a manner that is incompatible with the transport purpose. The designation enables the relevant requiring authority to retain control and provides long term certainty to the community, landowners and developers. Acquisition of land or entry into developer agreements provide similar levels of permanent route protection.

Lower levels of route protection include identification and communication of the recommended transport network, including utilising opportunities presented by structure planning and plan change processes. While use of these planning processes does not provide the highest and best level of route protection, they do offer a mechanism that will "buy time" by signalling future network intentions to the community and property owners until such time as formal route protection becomes necessary or urgent due to growth pressure and the application of live zoning.

All three levels of route protection will be used at various times for the Supporting Growth network, depending on the urgency and priority of individual network components and any funding constraints. Ultimately, however, much of the recommended network is likely require NoRs for formal route protection.

Appendix K for this IBC identifies NoRs as the ultimate form of route protection for the majority of recommended network components, along with some plan change processes and a number of developer agreements. The reasons for this relate principally to the uncertainty of timing in respect of developer readiness/alignment and the Council's structure planning timetable. While all available opportunities for these lower level route protection mechanisms will be explored, those opportunities will arise sooner in some areas than others and may only enable individual pieces of network components to be protected.

The route protection strategy in Appendix K is reasonably high level and assumes completion of formal route protection for most network components within the next 4 years. It also anticipates that further refinement of the strategy for the whole programme will be undertaken at a programme wide level having regard to competing priorities between each IBC area, in addition to feedback from the IQA process in relation to programme affordability.

Further work done in the DBC phase will result in more detailed prioritisation of network components and further refinement of the programme wide route protection strategy to include a more layered approach. This is likely to involve NoRs for specific first decade projects and lesser levels of protection in the interim for projects that do not require the highest level of protection immediately.

Appendix K needs to be read in the context of these next steps, on the basis that it represents a starting point for the development of the programme wide route protection strategy rather than an end point for route protecting the network recommended in this IBC.

10.4 Summary of preliminary route protection strategy

The components of the recommended network have been grouped into 13 packages for the purposes of route protection based on the methodology set out in Appendix K. The packages are summarised in Table 22 below, having regard to factors such as:

- How urgent the project or projects are (i.e. whether they are more desirable in the short term or whether there is live zoned land required, whether there is a risk of build out of subject land, or whether there is a high degree of local or central government interest)
- How complex the project or projects might be (i.e. significant potential adverse effects, numerous landowners affected and difficulty in acquiring land, the nature of landholdings, or a sensitive or difficult receiving environment)
- Whether opportunities are enhanced through packaging or by strategically timing the route protection (e.g. earlier).

Table 22: North route protection strategy summary table

Package	Components	Level of certainty	Mechanism	Priority	Requiring Authority
N1 State Highway 1	SH1 works including southern RT section (MTS-1), SH1 widening and bus shoulder lanes and strategic cycleway next to SH1 (AT1-1)	High - Upgrade to the SH1 corridor has been announced as part of the ATAP improvements and is included within the Regional Land Transport Plan funding allocation. While the ultimate form and operation is less certain, the corridor is subject to a high degree of certainty.	Notice of requirement (NoR) alteration and new NoR	High	NZ Transport Agency
N2 Silverdale West Arterials /Wilks Road Motorway Interchange	Dairy Flat Highway (R24-1) – upgrade future urban section (northern)	High - Growth in the Silverdale West area is forecast to begin within 5 years. Auckland Council is currently undertaking a structure planning process. Projects within the area primarily involve upgrade to existing road corridors.	NoR	Medium	AT
	New east-west arterial road through industrial area (R13-1)				AT
	Jackson Way (R22-1) - new link between East Coast Road and Penlink				AT
	Pine Valley Road (R10-1) upgrade				AT
	Wilks Road interchange (IC4-1)				NZ Transport Agency

Package	Components	Level of certainty	Mechanism	Priority	Requiring Authority
	Wainui Road (R8-1) (urban section) upgrade				AT
	Wilks Road active mode improvement (EW10-1), to be integrated with interchange improvement works				AT
N3 Dairy Flat Arterials + East Coast Road (R26-1)	East Coast Road (R26-1) – upgrade existing	Low - The Dairy Flat area is anticipated to be development ready between 2038-2043 and is scheduled as one of the last FUZ areas for development. Upgrades within the area are interdependent with the land use patterns.	NoR	Low	AT
	Dairy Flat Highway (R24-1) –upgrade part (central)				AT
	Bawden Road (R20-1) (R20-3) – new and upgrade existing				AT
	Dairy Stream crossing (EW11-1) – new road and structure with active modes (crosses SH1)				TBC
N4 RTN Milldale to Dairy Flat	RT Network (staged – middle and north) (options MT2-2 and MTN-1) with interim protection of middle section via corridor in Silverdale West-Dairy Flat Industrial Structure Plan followed by multiple NoRs	High - While the detailed alignment of the RT corridor is uncertain and subject to further refinement during the next phase, the corridor itself is a fundamental part of the recommended network. It provides the majority of additional people moving capacity to serve the northern growth area	Structure Plan and multiple NoRs	High	NZ Transport Agency
N5 Hibiscus Coast Active Modes (AT3-1) and Silverdale active mode crossing improvement (EW6-1)	Upgrade to add walking and cycling facilities. Addresses an existing deficiency. Will likely involve numerous landowners with small impacts on their properties and varied complexity; no bridge widening.	High - The project addresses an existing problem and follows an existing route providing a high level of certainty.	NoR	Medium	AT

Package	Components	Level of certainty	Mechanism	Priority	Requiring Authority
	Includes bus priority measures at intersections along the alignment. Unlikely to require larger operational footprint.				
N6 Curley Ave & associated works	Curley Ave (R16-3) – walking & cycling connection	Medium - A number of previous studies have been undertaken in the area. Some uncertainty is associated with the practicality of the signals at the Silverdale Street and use of Wainui Road for buses.	NoR	Medium	AT
	Silverdale Street – signalise intersection with Hibiscus Coast Highway		Not required		
	Milldale / Highgate all-mode SH1 crossing (EW4-1).		Not required – to be implemented by others		
N7 Strategic cycle connections	John Creek (AT7-1) – note possible Structure Plan for interim protection	Low - Cycle corridors provide additional design flexibility and could be accommodated on existing infrastructure corridors.	NoR	Low	AT
	Dairy Stream (AT5-1) – note possible Structure Plan for interim protection, SH1 crossing provided by EW11-1		New NoR		
	Wainui Road active mode crossing of SH1 (EW3-1)		Alteration or new NoR		
N8 Dairy Flat Highway between Dairy Flat and Albany	SR11-1 - between Dairy Flat and Albany – upgrade existing to 4 lanes	Medium - Upgrade of an existing corridor; however is subject to differing levels of certainty along the route. The northern end is required to service short term development of the Silverdale West – Dairy Flat Industrial Structure Plan area. The section south of Dairy Flat provides a long-term strategic route to Albany and is subject to a	NoR	Medium	AT
	Potentially could be integrated into N3.				

Package	Components	Level of certainty	Mechanism	Priority	Requiring Authority
		greater degree of uncertainty due to timeframes and changes to travel demand in the future.			
N9 East Coast Bays Road (SR12-1)	From Penlink to Long Bay - safety upgrades, not four lanes. Confirmation in DBC if works require route protection. If not required could move to N10.	Low - Upgrade of an existing corridor; however East Coast Road caters for movements between the Dairy Flat and Redvale area which is forecast in the third decade.	NoR	Low	AT
N10 Rural highway safety improvements	Kahikatea Flats Road (SR16-1) Coatesville-Riverhead Highway (SR14-1) Awanohi Road (R21-1) Safety upgrades only and so are likely to be undertaken by AT within the existing road corridor without any additional route protection.	High - Safety upgrades on the rural highway routes are well defined and on set corridors.	Not required	n/a	AT
N11 Kōwhai Road	Upgrade to add active modes (EW1-3). Can likely be done within the road corridor by AT, without any additional route protection.	High - Minor upgrades to an existing route	Not required	n/a	AT
N12 Wainui North	Public transport arterial connection (R6-2) (not 4 lanes)	Medium - New road link anticipated to be required in the medium term but dependant on land use within the area. Potential for significant developer contributions.	NoR / Consent	Medium	AT
N13 Argent Lane	Consent in place for northern part. An NoR for the remaining part is being progressed separately by AT.	High - currently in development and subject to a Crown Infrastructure Partnership (CIP) agreement	Not required	n/a	AT

10.5 Property acquisition strategy

A preliminary property analysis has been developed for this project. This is included in Appendix J: Property Strategy. This plan has considered the long-term nature of the proposed route protection of the recommended network and concluded that:

- Route protection of the identified infrastructure will provide certainty for landowners and a better financial outcome for the NZ Government.
- Route protection can take multiple paths including an NoR (which provides the highest level of direct protection), property negotiation or identification of roads in the planning process. All of these should be considered. Some route protection mechanisms create different liability outcomes, and these should be considered when confirming a route protection approach.
- Route protection through an NoR process will carry a financial liability for the protected property. However, based on previous projects, most property transactions occur in the 2 years prior to implementation and therefore an assumption can be applied that, on average (across multiple projects), only 10-20% of properties with designation over them will require purchase prior to this three-year period. The assumed financial liability of route protection of the recommended option(s) is therefore in the order of 20% of the total property cost, not the full cost.
- The earlier a property is purchased the lesser the cost of acquisition is likely to be. Purchasing prior to live zoning would make strong fiscal sense. Early funding of property in this regard will save total project costs.

11 Financial case

This section outlines the financial case for both route protection of the recommended network and ultimate implementation of the network.

11.1 Cost of route protection

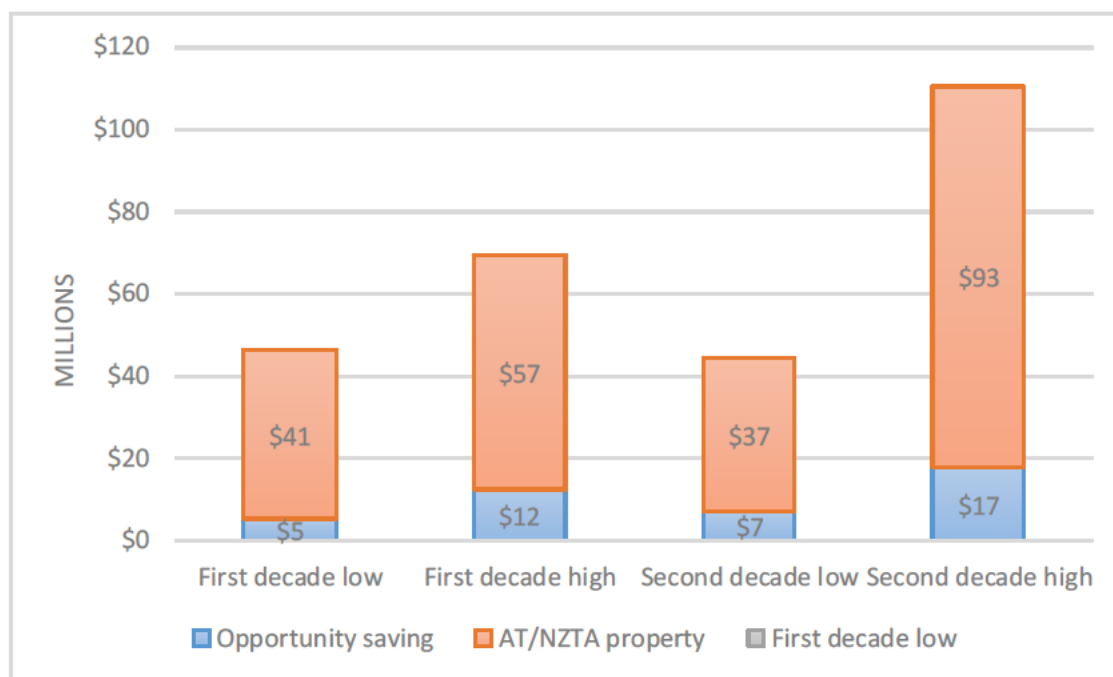
This IBC seeks funding to progress to DBC and route protection for the recommended network. Some elements of the network will likely progress through alternative funding sources such as existing safety programmes. The majority of the network will require further investigation with a route protection approach recommended.

The cost and funding required for this next step can be described as follows:

- **DBC and NoR costs** – Route protection using Notices of Requirement (NoRs) is the recommended mechanism for a number of projects identified in the recommended network. The IBC seeks to progress the recommended network to the next phase including further investigation (DBC) and NoRs. For the North, the DBC and NoR phase for the recommended network is expected to cost █████ M.
- **Expected property costs from NoRs** – Once a designation is in place, history suggests a proportion of the total property required will be purchased by the requiring authority (outlined in Appendix J: Property Strategy). Like the capital costs, there is potential for some property cost savings through delivery of projects via developers in the area and this has been taken into account. It is assumed that most property transactions would take place in the three years prior to implementation, with approximately 20% of transactions taking place prior to this period.

Applying this assumption to the timing of the recommended package results in an estimated property liability as summarised in Figure 33. Given the nature of property prices, there is a high degree of uncertainty as to property cost in the future. As such, property liability has been reported using low (0% escalation) and high (10% per annum) property price escalation. For the North, the estimated property cost as a result of NORs is between \$79-150m distributed over two decades.

Figure 33: Estimated property cost as a result of NoRs



Implementation of each project is not included in the cost of route protection and is discussed further in Section 11.3.

11.2 Early route protection – return on investment

An approach has been developed to quantify the return on investment associated with early route protection. This methodology assumes that there are property and construction cost savings arising from route protection now, rather than in the future, given the long-term nature of some of the interventions in the recommended network.

Construction cost savings are expected due to the potential savings associated with lower mitigation requirements (and therefore costs) for projects consented in an undeveloped environment rather than in an existing developed area. Similarly, property costs are expected to be lower if a designation is in place which will control subsequent land development (e.g. while some land value increases may be experienced, a factor has been applied for the ‘avoidance’ of development cost risk).

The following assumptions have been made:

- Early route protection would be in place by 2020
- Late route protection would be in place by 2027
- 10% saving in construction cost
- A 7% saving in property cost is achieved through early route protection

- Escalation in property price has been tested at 0% (low) and 10% (high) per annum
- Early route protection requires acquisition of property early (20% within 2020-2028).

This methodology has been applied to projects recommended for implementation after 2028 (Stages 2 and 3) only. It has been assumed that route protection is required immediately for projects to be implemented before 2028 and limited savings are therefore likely.

Early route protection for medium- to long-term projects will require more upfront investment. With discounting (6% discount rate), the increase in cost of early route protection compared with late route protection is estimated at approximately [REDACTED] additional cost across the programme.

When future cost savings (reduction in property cost, development costs and construction cost) are considered and discounted, these equate to between [REDACTED] in cost savings.

While this assessment will need to be confirmed with project specific details and timing, the high-level analysis shows a strong financial case for early route protection of the recommended network. Financial benefits of route protection have to be considered against other benefits and management issues outlined in Section 10.1.

The analysis shows a return on investment for early route protection of the recommended programme of over 4.

11.3 Recommended network cashflow

11.3.1 Financial case uncertainty

The financial case and, in particular, the cost and critical property liability aspect (given the route protection focus) is based on a number of assumptions. This is because long-term route protection has not previously been widely undertaken. The main uncertainty relates to the potential cost required for property purchase. This uncertainty includes:

- The level of third party (developer) funding, as this requires negotiation and agreement and must be undertaken on a case by case basis
- More or fewer properties required to be purchased
- Cost of property is higher or lower than assumed
- Growth is quicker or slower than assumed.

This uncertainty should be considered by funders when allocating property funding.

11.3.2 Capital costs for recommended network

A cost estimate for the recommended package has been developed and is reported in detail in Appendix E: Engineering and Cost Report. Costs have been developed for each project element, as described in Section 8.2.

For the recommended North network, costs are as follows:

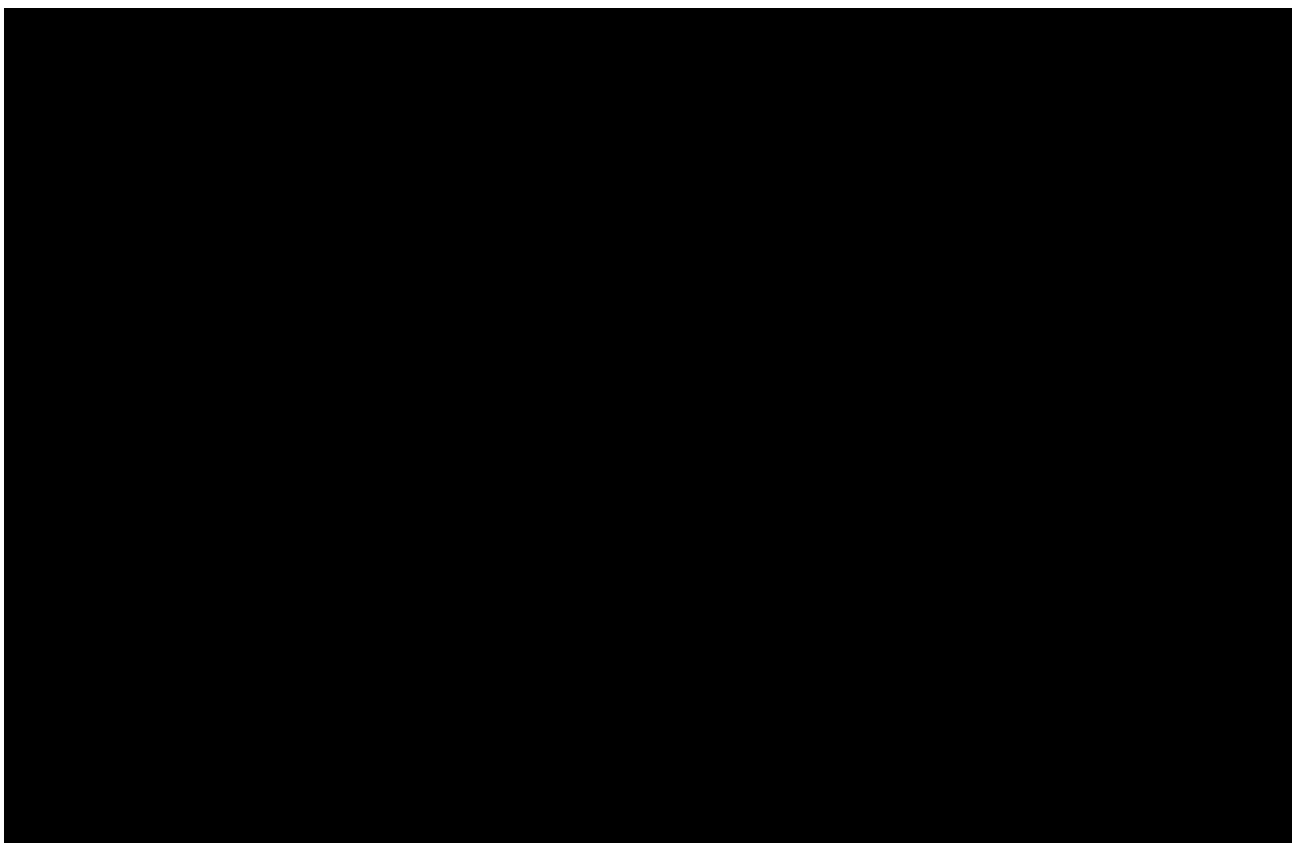
- Total estimated capital costs of [REDACTED] (P50 and P95)
- Property and land costs of approximately [REDACTED].

It is noted that the costs are still subject to peer review and may change. As individual projects develop through the DBC and pre-implementation phases, designs and costs will also be developed in more detail and focused on cost-effective ways to deliver the project outcomes.

Section 11.7.1 describes cost allocation and cost sharing arrangements.

Based on current estimates, the anticipated cash flows for the investment proposal over its intended life span are summarised in Figure 34. Costs will be spread over multiple decades, based on the staging outlined in Section 7.2 and will be shared between the NZ Transport Agency, AT and other parties according to the assumptions summarised in Sections 10.2 and 10.4.

Figure 34 : Cashflow for recommended programme (P50)



11.4 Ongoing operations and maintenance costs

Operations and maintenance costs for the recommended network²⁸ have been outlined by category as an annual ongoing cost in Table 23. Section 11.7 describes cost allocation and cost sharing arrangements between the NZ Transport Agency and AT.

²⁸ Over and above the costs associated with the Do-Minimum network

Table 23: Ongoing annual costs

Item	Recommended network (\$M)
Bus operating costs	■ p.a.
Fare revenue (negative cost)	■ p.a.
Station operations and maintenance costs	■ p.a.
General infrastructure maintenance (annual) and bridges maintenance (after 10years)	■ p.a.
Resurfacing (every 10 years)	■ p.a.
Travel demand management	■ p.a.

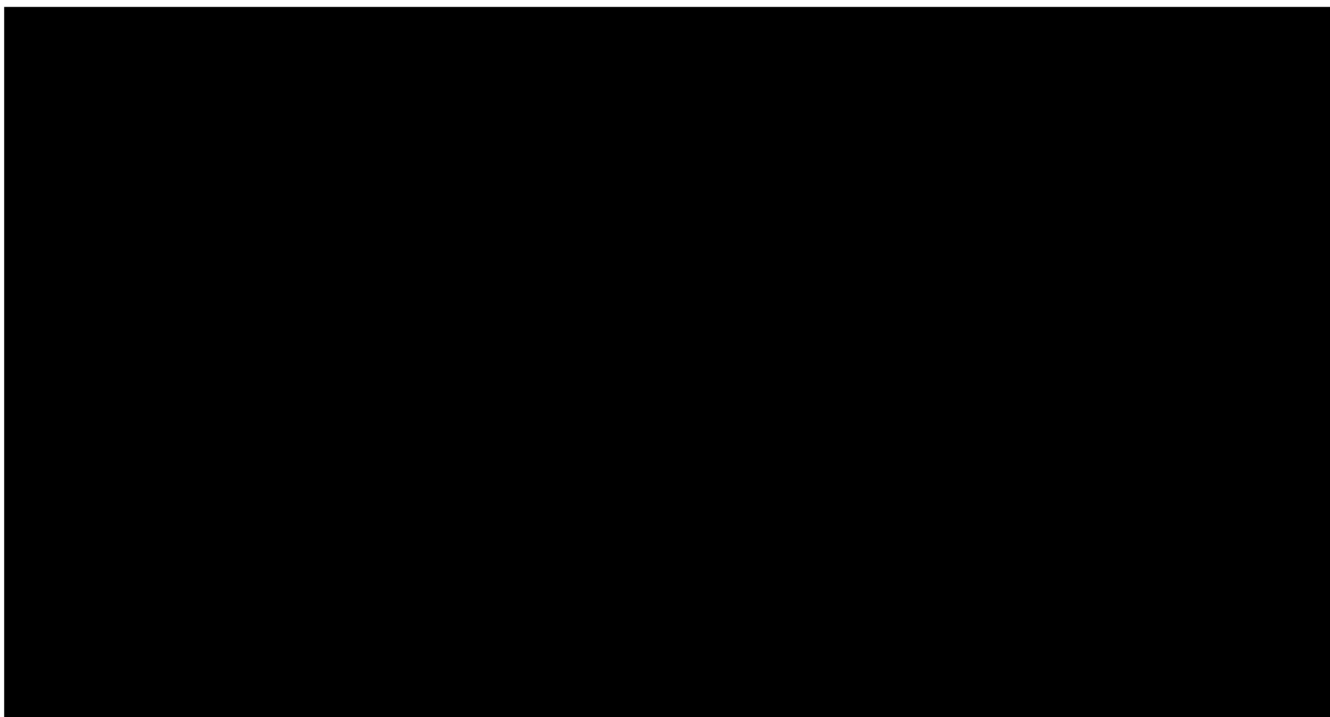
11.5 Cost by area

The recommended network includes projects serving existing communities in the North IBC study area and the future urban area (FUZ). Costs for the recommended network have been split based on whether a project primarily serves the existing area (Silverdale, Ōrewa, Whangaparāoa) or the FUZ area.

The following assumptions have been made:

- The southern section of the RT corridor and bus shoulder lanes on SH1 are considered to primarily serve the existing area.
- All infrastructure geographically within the growth area has been assigned to the FUZ area.
- All infrastructure geographically within the existing area has been assigned to the existing area.
- A project which responds to an existing problem, but is made worse by the growth area, has costs split evenly between the existing and FUZ areas.

Costs by decade for the existing area and FUZ area are outlined in Figure 35 below.

Figure 35: CAPEX (P50) split by area

11.6 Programme-wide staging

The staging is based on the recommended network and achieving key drivers such as aligning transport improvements with growth timings and targeting investment that supports early mode shift outcomes. As outlined in this IBC, different affordability scenarios have also been developed to understand the implications of reduced investment. This IBC is part of a wider programme of supporting growth throughout the Auckland region and the affordability challenges and prioritisation of investment are best addressed across the entire programme, with the scenario testing undertaken in this IBC informing that programme-wide discussion. This programme-wide affordability and prioritisation issue has been considered in a Programme Wide Summary note which sets out the work done in this area and the approach to this critical issue in the next stage of the programme development (DBC).

11.7 Cost comparison with PBC

The projected estimate for the package is **██████████ Billion**. This cost assumes the total cost of implementation of the recommended network.

This cost is considerably greater than the cost of the TfUG PBC recommended network of **██████████** billion. This difference has been analysed as outlined in Appendix E: Engineering and Cost Report and is compared in Table 24.

Table 24: Cost comparison between PBC and IBC recommended network

Component	TfUG PBC (P50 cost)	North IBC (P50 cost)
RT corridor	Assumes an RT corridor between Albany and Grand Drive along the SH corridor. Total length of 17km: ██████████ Bus depot and stations costed separately at: ██████████	Assumes an RT corridor between Albany and Milldale with a deviation into the FUZ. Total length of 16km (includes stations, excludes Park and Ride facilities): ██████████
Motorway upgrades and interchanges	Assumes additional lane between Albany and Silverdale with Wilks Road south-facing interchange:	Assumes additional lane between Albany and Silverdale with north facing ramps at Penlink/Redvale, south-facing ramps at Wilks Road and upgrading

Component	TfUG PBC (P50 cost)	North IBC (P50 cost)
		Silverdale Interchange: <div></div>
Arterial roads	Package of upgrades to existing arterials and new links, assuming a 37m corridor and approx. 62km in length: <div></div>	Package of upgrades to existing arterials and new links, assuming a 32m corridor and approx. 75km in length. <div></div>
Cycle infrastructure	TfUG cycling facility assumed a cycling facility integrated with the road corridor: <div></div>	26km of separate strategic facilities: <div></div>
Other items	Includes Penlink <div></div> <div></div> Local frequent transport network - <div></div>	Bus priority measures: - <div></div> <div></div> Penlink is excluded
Total property costs (net)	<div></div>	<div></div>
Complete package (P50)	<div></div> <div></div> (excluding Penlink)	<div></div>

11.8 Opportunity savings from developers

There is potential for new arterial roads to be partially funded by property developers as part of a package of development contributions. AT usually requires new developments to construct identified roads to a collector road standard, based on an agreed cross-section, which is then vested to public

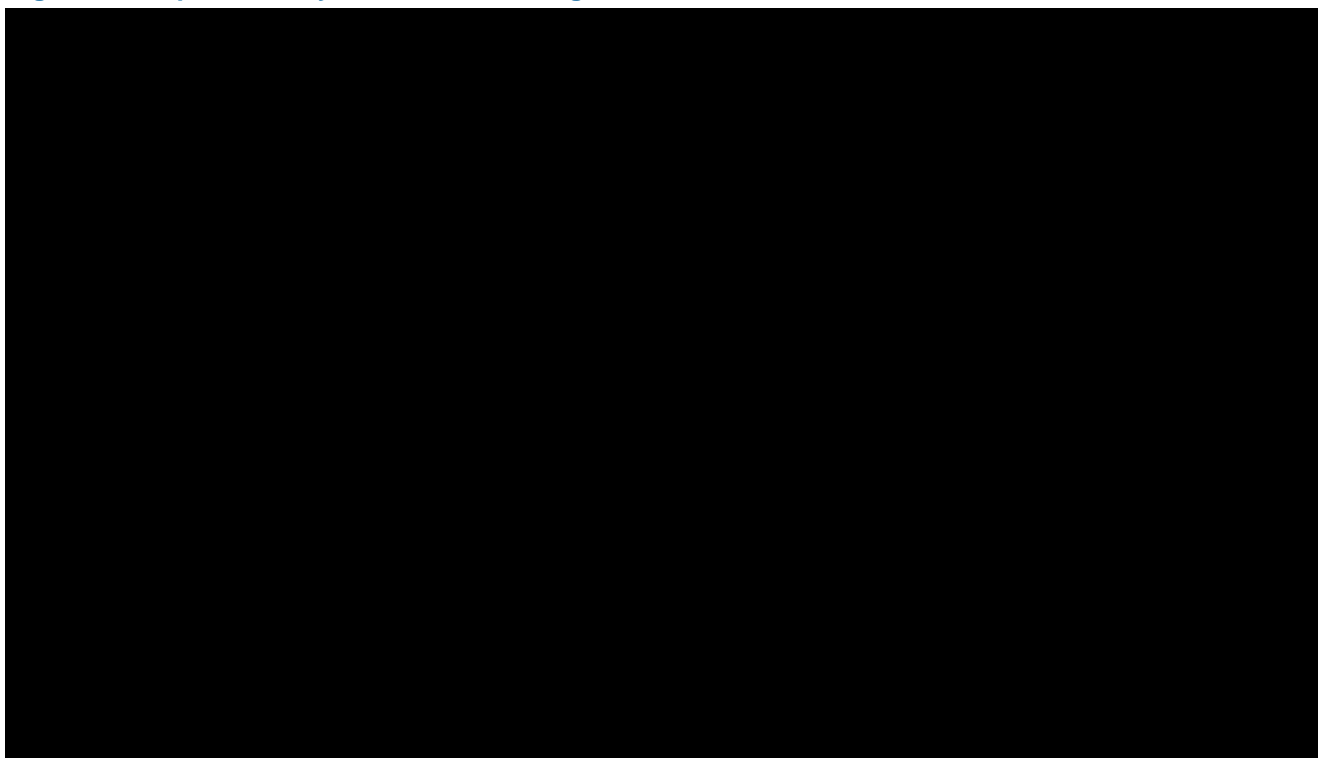
ownership. In some locations, it may be feasible for AT to require contributions (of project delivery costs and property) equivalent to a collector road standard and then be responsible only for the additional cost associated with property and construction of an arterial standard cross-section.

This approach would greatly reduce the implementation cost to AT and the NZ Transport Agency. When determining the opportunity for a reduction in capital cost over the full North IBC, the following assumptions have been made:

- Capital costs of new arterial roads could be reduced by 70%²⁹ from developer contributions.
- Existing arterials have limited potential for development contributions and have been excluded.
- Capital costs for RT could receive developer contributions around stations. This is estimated to account for approx. 1% of cost over the overall cost of the project.
- Active mode and strategic road corridors are fully paid by the NZ Transport Agency/AT.

Analysing the recommended network for these opportunities indicates a limited reduction in required funding for each decade. The required funding [REDACTED] is outlined in Figure 36 taking account of proposed implementation timeframes and reductions in cost from developer-related savings.

Figure 36: Capital cost by decade with savings



11.8.1 Cost sharing

NZ Transport Agency is typically responsible for costs associated with:

- State highway improvements
- Motorway interchanges and ramps

²⁹ Calculated as a ratio of unit rate costs for arterial road vs. collector typology

- Strategic cycle facilities.

AT is typically responsible for costs associated with:

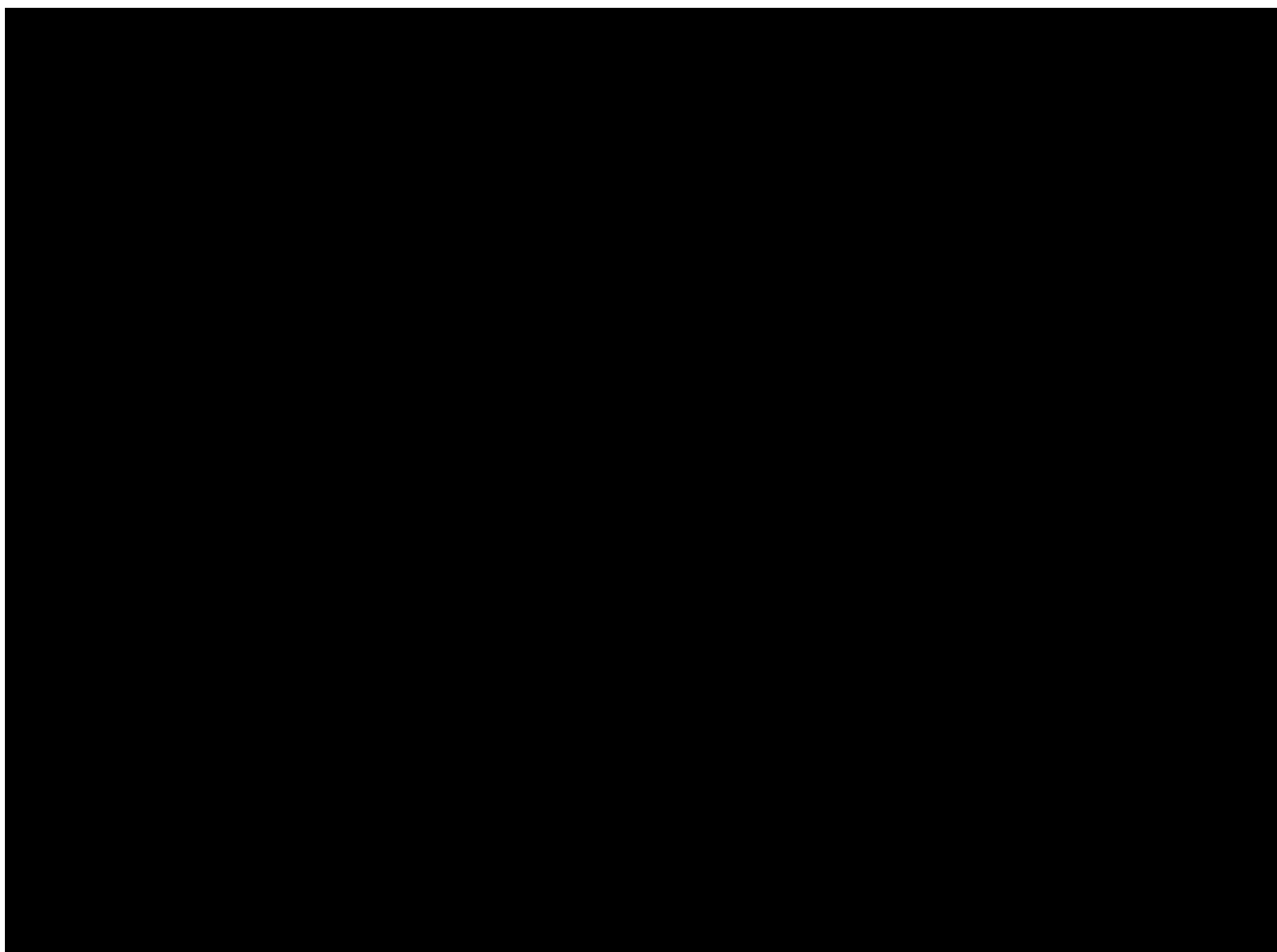
- Arterial road construction
- Improvements to existing arterial roads
- Improvements to existing collector roads
- Public transport interchanges (park and ride; kiss and ride)
- Public transport services.

Total funding requirements for the recommended network are outlined in Figure 37. Funding requirements are split out for developer contributions, potential for cost optimisation during the DBC phase, projects serving existing areas and remaining funding required from AT or the National Land Transport Fund (NLTF).

The assessment of cost optimisation looked at a reduction in cost to the recommended network as a result of:

- Reduced earthworks volumes
- Reduced corridor cross-section
- Potential cost saving on existing corridors if a project can fit within the existing designation.

Given the majority of this funding is required outside the current (2018-2028) Auckland Regional Land Transport Plan (RLTP) period, there is time to further consider the funding requirements and how this could be addressed. The funding requirement for the Northern growth area is substantial and consideration of alternative funding sources is recommended.

Figure 37: Funding breakdown for the North recommended network (\$)

11.9 Funding shortfall

11.9.1 RLTP allocation for the first decade

The RLTP includes the following commentary with respect to the Te Tupu Ngātahi programme of works.

- [REDACTED] identified but unallocated for the Northern growth area
- [REDACTED] allocated to SH1– North of Albany improvements including bus shoulder lanes
- A funding challenge exists for decades two and three of the proposed programme.

This level of funding will not be able to fully support all projects required in major greenfield growth areas. Additional developer funding, an expansion of the Crown Infrastructure Partners (CIP) programme or the creation of other new funding mechanisms will therefore be required.

For certain projects, such as new arterial roads through FUZ areas, the benefits of investing to enable and support growth are largely enjoyed by landowners in the form of higher value land, as it can be urbanised. Further analysis, on a case-by-case basis, will be required to agree the funding arrangements for these investments between landowners and AT.

As the RLTP allocates funding for a 10-year period, costs for the recommended programme within the first decade are shown in Table 25 with commentary on likely funding sources provided.

Table 25: Funding required in first decade

Project	Funding source	Funding required (P50)	Indicative Transport Agency portion	Indicative AT portion
Project development (DBC and route protection)				
Potential property costs from medium / Long term projects				
RT southern section (excluding crossing)				
Bus shoulder lanes - Penlink to Silverdale				
Penlink/Redvale interchange north facing ramps				
Silverdale interchange (NB: offramp lane)				
Silverdale interchange (overbridge and intersections)				
Hibiscus Coast Highway/ Grand Drive cycle facility				
Curley Avenue connection - Silverdale Street				
Curley Avenue active mode connection				
Milldale-Highgate all modes crossing				
Silverdale active mode crossing				
Wainui active mode crossing				
Kōwhai Road active modes				
Argent Lane (collector standard)				

Project	Funding source	Funding required (P50)	Indicative Transport Agency portion	Indicative AT portion
Dairy Flat Highway upgrade between Silverdale and Kahikatea Road				
East Coast Road - Realignment as part of RT				
Bus priority measures: Hibiscus Coast Highway, West Hoe Rd, Grand Drive				
Total (First Decade)				

The RLTP identifies a total of [REDACTED] committed³¹ and [REDACTED] unallocated within the first decade. The proposed recommended network requires a total funding requirement of [REDACTED] and an increase over the RLTP (committed and unallocated) funding identified of [REDACTED]. Staging for the recommended network will be confirmed during the DBC phase.

The remaining RLTP elements included in the short-term recommended network (RT, strategic road upgrades, and active mode projects) do not easily support use of Crown infrastructure funding or seed funding arrangements, as they are generally serving the existing and live zoned areas within the North.

11.10 Programme-wide affordability

Investment within the current 10 year period has also been considered across the Programme and this is presented in the Programme-Wide Summary note.

By way of a summary, this initial analysis indicates that under a funding constrained approach, a number of elements in the recommended network will need to be delayed in their implementation. Under this approach, investment would still be targeted at early growth areas and achieving mode shift and good urban development outcomes, but the reduced investment will likely lead to more of a lag approach to these issues rather than an aligned timing or lead approach.

11.11 Alternative funding sources

There are a number of different investigations currently underway by Treasury, Ministry of Transport and others to consider the mechanisms for the future funding of infrastructure. This includes consideration of:

- Value capture
- Targeted rates

³¹ SH1 North of Albany Improvements and SH1 North of Albany Public Transport Reliability

- Pricing
- Public private partnerships (PPPs).

This IBC has not considered these options in detail as they are significant interventions that require a region-based approach and alignment across a number of projects.

Value capture is a potential option that has stronger merit for these growth focused projects; however until a mechanism is developed across the region it remains a concept rather than a tangible funding option. That said, initial analysis indicates that value capture could significantly reduce the funding gap, particularly for the RT project around park and ride stations where it could contribute to between 5-10% of the total project cost.

The IBC has considered these options at a high level, as potential funding options. As many of these measures require regional alignment and policy but also are very project specific in their application, as outlined in the Programme Wide Management Case, the DBC phase will consider these alternative funding sources in more detail, firstly at the programme wide level and then at the project specific level. This will provide greater clarity on the potential scale and use of alternative funding mechanisms.

12 Management case

The management case assesses whether a proposal is deliverable and demonstrates that an appropriate project management regime is in place for the next phases of the project. It tests the project planning, governance structure, risk management, communications and stakeholder management, benefits realisation and assurance. As well as this IBC specific management plan a Programme Wide Management Case has been developed that sets out the management of the programme elements of this programme of works.

12.1 Programme governance

Te Tupu Ngātahi has been formed to deliver route protection for the recommended network in Auckland's greenfield growth areas. AT and the Transport Agency identified that an Alliance model would deliver these outcomes in an agile, efficient manner within a five-year programme.

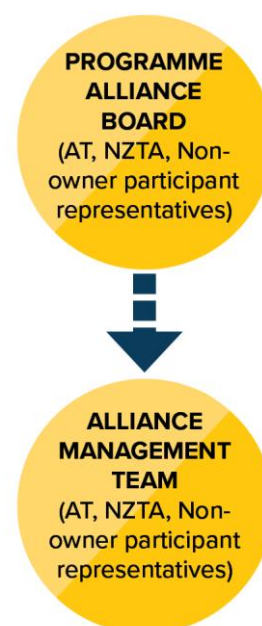
Governance in the context of Te Tupu Ngātahi is defined as the processes by which the Alliance is directed, controlled and held to account. The Governance Management Plan has been developed and guides the implementation of a shared understanding of why, how and who is responsible for the effective governance of Te Tupu Ngātahi. This structure is summarised below in Figure 38.

The Governance Management Plan describes the key roles and responsibilities of each of these groups.

12.2 Assurance and acceptance

As part of standard practice, the NZ Transport Agency and AT have established project assurance and approval processes to support quality investment decision making. These processes will be used, in conjunction with the project team, where appropriate.

Figure 38: Te Tupu Ngātahi governance structure



Prior to the completion of the DBC phase, the following assurance procedures will be undertaken:

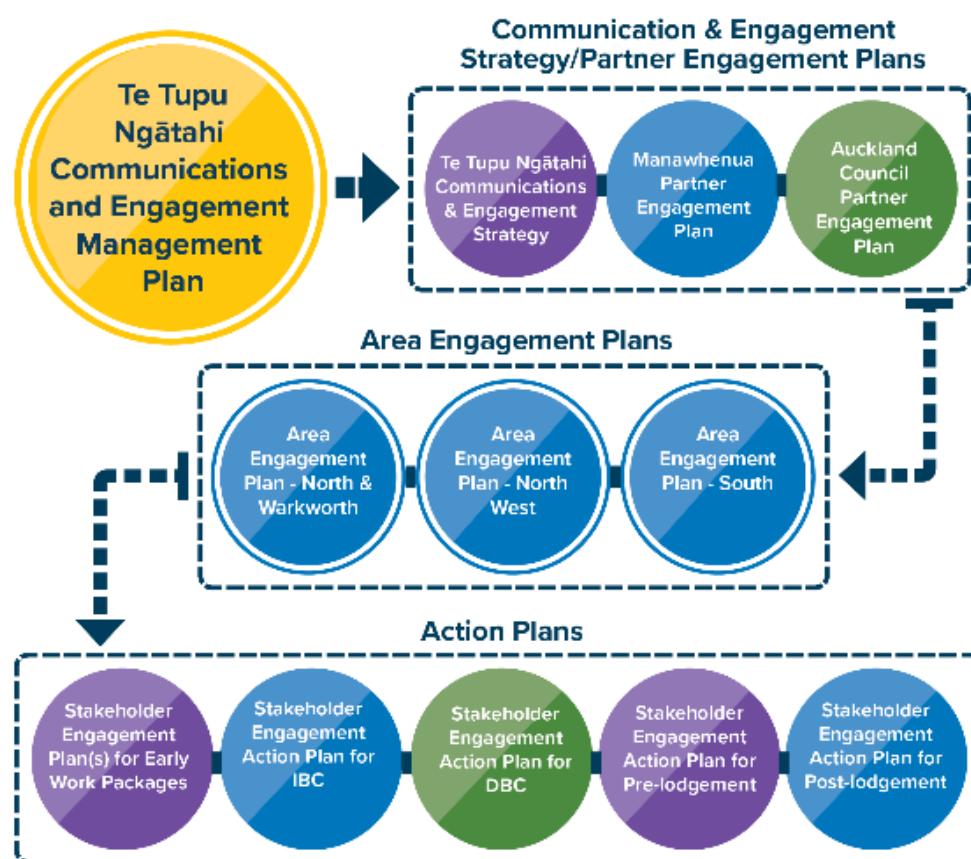
- independent road safety audit
- safety in design workshop and register maintained
- independent peer review of the economic evaluation
- peer review/parallel capital cost estimate.

12.3 Communications and engagement management plan

Te Tupu Ngātahi has an extensive and ongoing engagement and consultation programme.

A Communications and Engagement Management Plan has been prepared which outlines operational policies and procedures for managing the communications, stakeholder and community engagement workstream within Te Tupu Ngātahi. The Management Plan has informed the Communications and Engagement Strategy and a variety of plans to inform engagement with partners, key stakeholders and the community/public. The relationship of these documents is shown in Figure 39.

Figure 39: Communications and engagement framework



1.1.1. Next steps

Engagement and communication in the next stage (following AT and NZ Transport Agency Board endorsement of the recommended network), will build on engagement undertaken during the IBC phase. The focus of the next stage of engagement in the North is to:

- Continue to build understanding of Te Tupu Ngātahi progress and the process of route protection
- Critical ongoing discussion with Auckland Council around land use and transport integration. This will include a range of interactions from detailed structure plans to wider discussions around achieving sustainable urban mobility in the un-zoned future urban areas. This will take place through specific Auckland Council/SGA forums, workshop environments and individual meetings.
- Provide information on staging and timing for the recommended network, including specific opportunities for sequencing of urban development (e.g. integration of utilities within the future transport corridor)
- Understand specific issues/ environmental effects and opportunities in the recommended network to identify potential design responses and environmental management / mitigation (for route protection documentation)
- Undertake one-on-one engagement with landowners / developers regarding potential effects and opportunities for shared alignment in outcomes (e.g. through developer agreements) – particularly in Halls Farm and Milldale where land is live zoned or is about to be developed
- Inform stakeholders about the processes for route protection and provide an opportunity for participation (i.e. submission on the NOR or similar as appropriate)
- Identify opportunities for AT and NZ Transport Agency property acquisition processes (e.g. willing buyer/willing seller arrangements, albeit leading these processes is outside the specific scope of work for Te Tupu Ngātahi)
- Enable Te Tupu Ngātahi to inform decision makers on the risks and opportunities of potential route protection mechanisms for the recommended network

12.4 Risk and opportunity management

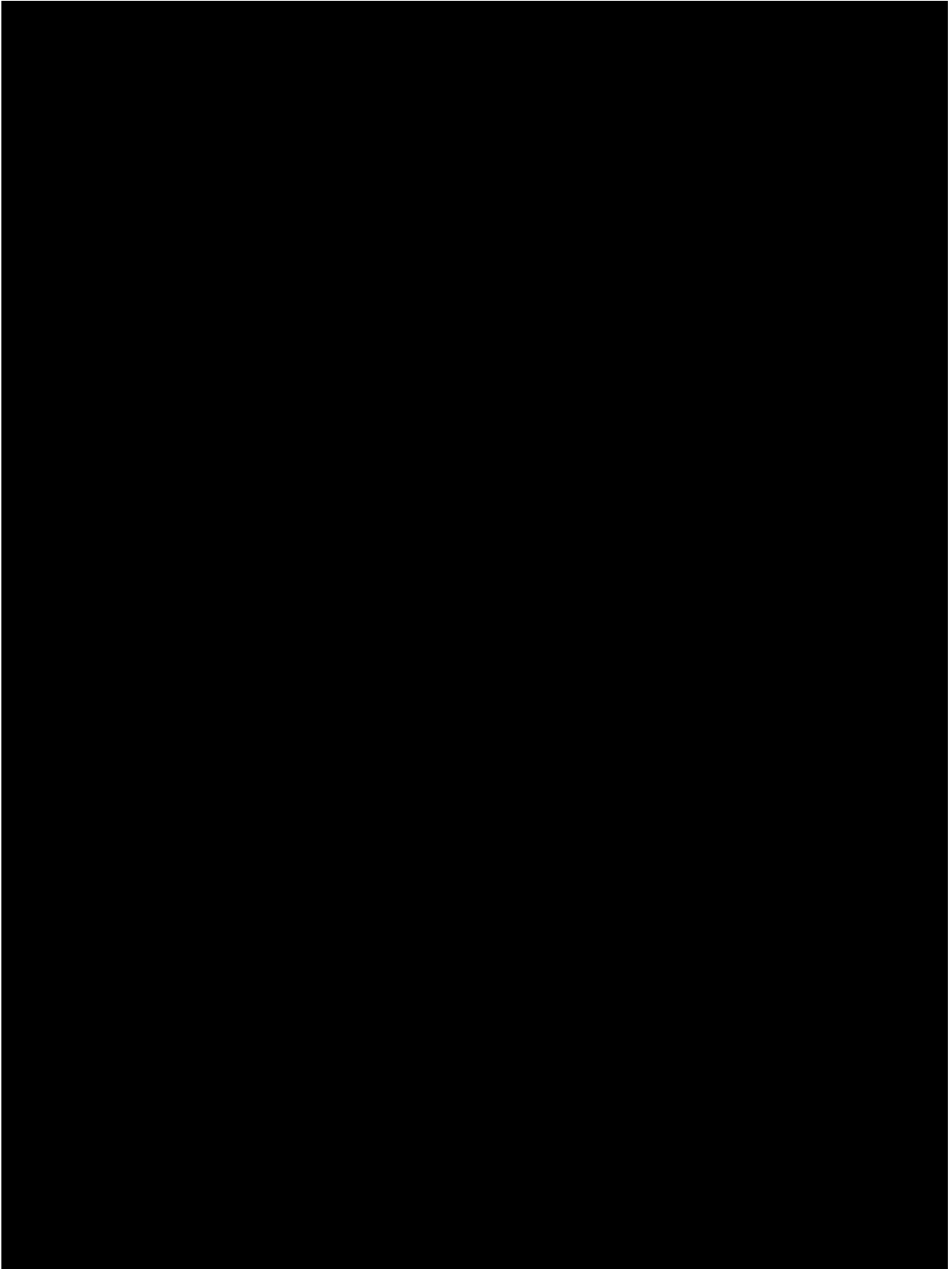
The Te Tupu Ngātahi Programme is a large programme comprised of multiple projects, inherent with areas of uncertainty that transpire into risks and opportunities. These are being managed to enable successful delivery.

Risk and opportunity are being managed at three levels:

- Organisational business risk and opportunity
- Programme wide risk and opportunity
- Project and area-specific risk and opportunity.

A Risk and Opportunity Management Plan has been developed and endorsed by the Te Tupu Ngātahi governance team. The risk management process is consistent with AS/NZS ISO 31000:2009 and is consistent with typical risk management processes undertaken by AT and the Transport Agency.

A specific risk assessment has been completed for the Northern growth area and can be found in Appendix L: Risk Assessment. The 'Critical' and 'High' risks are set out in Table 26, with the full risk register provided in the Risk Assessment.

Table 26: Critical and high risks – The Northern growth area

12.4.1 Funding commitments and obligations

If approval is obtained and the project proceeds to route protection, the project partners have an obligation to secure the funding for the elements of the project for which they are responsible.

Funding will be as agreed by the project partners and includes, but is not limited to:

- Further design
- Consenting
- Potential land acquisition.

Further assessment of the funding implications for AT and the NZ Transport Agency will be undertaken once approval has been received to continue to a DBC and route protection stage.

12.5 Benefit realisation and management

Benefits management is the identification, analysis, planning, realisation and reporting of benefits. These phases align with the Treasury Investment Lifecycle phases of Thinking, Planning, Doing, Reviewing. Benefits management is vital in ensuring that each element identified in the recommended network achieves what it sets out to do. It involves articulating what benefits are expected from the element, how it will be known that the benefits are achieved, and the assessment of what has eventuated against what was planned.

Detailed benefit management plans will be produced for each of the recommended network elements during the DBC phase. The KPI table (Section 4.7) maps the problem statements, benefits, and investment objectives to a range of KPIs and measures on which projects can be measured.

12.5.1 How will this information be used?

Benefit realisation is intended to fulfil two key functions:

1. Assessment against anticipated benefits of a project which helps validate how well the purpose for investment has been achieved
2. At a programme wide level, providing confirmation of the proposed staging approach.

Given the 20-30 year time period for the implementation of the recommended North network, staging of infrastructure is critical to the success of the network in delivering against the investment objectives. Given the suite of first decade projects proposed, measurement and monitoring should be prioritised in areas where change and benefits are expected as a result of these. For the North, this is focused on the existing communities of Silverdale, Wainui East and Ōrewa. Tracking of network performance in the following areas should be prioritised and Table 27 provides an example of what will need to be further developed in the DBC phase:

Table 27: Priority measures for North benefit realisation

Benefit	Relevant KPIs	Measurement focus	Monitoring plan options
Mode shift of the existing areas	KPI 2b and KPI 4b	<ul style="list-style-type: none"> Public transport patronage Total vehicle travel south of Silverdale on SH1, ECR, DFH Mode share data from Stats NZ 	<ul style="list-style-type: none"> Monthly and annual public transport patronage trends NZ Transport Agency TMS database AT traffic counts Census journey to work data
Reliability of public transport services	KPI 2a	<ul style="list-style-type: none"> Public transport journey times between Silverdale and city centre 	<ul style="list-style-type: none"> AT HOP data

Benefit	Relevant KPIs	Measurement focus	Monitoring plan options
Reliability of the strategic road network	KPI 2a	<ul style="list-style-type: none"> General vehicle journey time information Travel time information 	<ul style="list-style-type: none"> NZ Transport Agency TomTom dataset Mobile phone data
Walking and cycling mode share and experience	KPI 4a, KPI 4b.	<ul style="list-style-type: none"> Perception of walking and cycle facilities Crash statistics Walking and cycling numbers on at key locations 	<ul style="list-style-type: none"> AT customer insight biannual survey results NZ Transport Agency CAS database AT cycle count data Monitoring of new facilities

12.6 Next steps

There are three key next steps for the progression of each of the elements of the recommended network, being:

- DBC
- Pre-Implementation
- Implementation.

Each of these steps have very different characteristics and capability needs and are therefore considered separately with regards the procurement strategy

12.6.1 Detailed Business Case (DBC)

This IBC identifies elements of the transport network that should be protected to ensure that housing can be released over the next 30 years. Appendix K: Route Protection Strategy outlines the recommended mechanism(s) for corridor protection for each package of projects. The IBC establishes that the network should be route protected, investment is required and, on this basis, the IBC is going to be progressed to a DBC. The DBC will detail the elements of the recommended network.

It is expected that the DBC process will include further refinement on issues affecting the success of a sustainable urban mobility system including land use zoning, land use form and opportunities for enhanced land use.

The DBCs will focus on:

- Refinement and confirmation of recommended option alignment, including exact land requirements (if any)
- Identification of urban intervention opportunities e.g. land integration opportunities such as higher densities near transport nodes or the location of the centre in Dairy Flat to better support sustainable urban mobility.

- Further development of project costs based on design refinement
- Identification of funding mechanisms and cost to different parties for route protection and implementation, including AT, NZ Transport Agency and third parties
- Confirm route protection mechanism
- Identify priority order for route protection and implementation.

The proposed DBC(s) will follow the structure of the route protection packages described previously. Table 27 sets out the likely DBC packages and the key issues to be addressed as part of each package.

Table 28: DBC packages and key issues to be addressed

Route protection/DBC package	Components	Issues to be addressed in the DBC
N1 State Highway 1	SH1 works including southern RT section (MTS-1), SH1 widening and bus shoulder lanes and strategic cycleway next to SH1 (AT1-1)	<ul style="list-style-type: none"> • Form of tie in with RT at Albany and crossing over SH1. • Further consideration of form of corridors, including alignment and form of Wēiti River crossing for SH1 shared path (and interaction with RT northern section). • Timing of bus shoulder lanes and interaction with other projects such as Wilks Road interchange. • Connections with wider walking and cycling network. • Further consideration of alignment to avoid or minimise impact on sensitive ecological areas. • Engagement with landowners and residents regarding potential property and social impacts.
N2 Silverdale West Arterials /Wilks Road Motorway Interchange	Dairy Flat Highway (R24-1) – upgrade future urban section (northern) New east-west arterial road through industrial area (R13-1) Jackson Way (R22-1) - new link between East Coast Road and Penlink Pine Valley Road (R10-1) upgrade Wilks Road interchange (IC4-1) Wainui Road (R8-1) (urban section) upgrade Wilks Road active mode improvement (EW10-1), to be integrated with interchange improvement works	<ul style="list-style-type: none"> • Further consideration of form and alignment of corridors. • Engagement with large number of landowners, developers (including North Shore Airport and Fulton Hogan) and residents regarding potential property and social impacts. • Ongoing engagement with Council regarding interaction with Silverdale West-Dairy Flat Industrial Structure Plan development and engagement process. • Interaction with bus shoulder lanes and widening/SH1 shared path.

Route protection/DBC package	Components	Issues to be addressed in the DBC
N3 Dairy Flat Arterials + East Coast Road (R26-1)	East Coast Road (R26-1) – upgrade existing	<ul style="list-style-type: none"> Further consideration of form and alignment of corridors, including topographical/geotechnical constraints along East Coast Road. Engagement with large number of landowners, developers and residents regarding potential property and social impacts, including rural-urban interface along Dairy Flat Highway. Engagement with Watercare regarding timing and form of supporting water infrastructure.
	Dairy Flat Highway (R24-1) – upgrade part (central)	
	Bawden Road (R20-1) (R20-3) – new and upgrade existing	
	Dairy Stream crossing (EW11-1) – new road and structure with active modes (crosses SH1)	
N4 RT Milldale to Dairy Flat	RT Network (staged – middle and north) (options MT2-2 and MTN-1) with interim protection of middle section via corridor in Structure Plan followed by multiple NoRs	<ul style="list-style-type: none"> Ongoing engagement with Council regarding interaction with Silverdale West-Dairy Flat Industrial Structure Plan development and engagement process. Further consideration of form and alignment of corridor and stations. Further consideration of form and alignment to avoid or minimise impact on sensitive ecological areas, including QEII covenant area and Wēiti River crossing. Interface with RT shared path and wider walking and cycling network. Engagement with large number of landowners, developers and residents regarding potential property and social impacts.
N5 Hibiscus Coast Active Modes (AT3-1) and Silverdale active mode crossing improvement (EW6-1)	Upgrade to add walking and cycling facilities. Addresses an existing deficiency. Will likely involve numerous landowners with small impacts on their properties and varied complexity; no bridge widening.	<ul style="list-style-type: none"> Further consideration of form and alignment to avoid or minimise property and access impacts. Further consideration of form of Silverdale interchange active mode crossing and interface with upgrade to interchange. Engagement with large number of landowners and residents regarding potential property, access and social impacts. Interface with safety treatment near Silverdale Street intersection as part of Curley Ave connection.
	Includes bus priority measures at intersections along the alignment. Unlikely to require larger operational footprint.	
N6 Curley Ave & associated works	Curley Ave (R16-3) – walking & cycling connection	<ul style="list-style-type: none"> Onsite ecology investigations and further engagement with Manawhenua to determine the most appropriate route and form of the active mode connection, as well as how
	Silverdale Street - install signalised intersection with	

Route protection/DBC package	Components	Issues to be addressed in the DBC
	Hibiscus Coast Highway	impacts can be avoided, remedied, mitigated or offset.
	Milldale / Highgate all-mode SH1 crossing (EW4-1).	<ul style="list-style-type: none"> Further consideration of feasibility and form of Silverdale Street intersection signalisation and associated safety treatment. Consider options for connecting Silverdale to Millwater for general traffic and buses (form and function of Curley Ave connection). Engagement with large number of landowners and residents regarding potential property, access and social impacts. Engagement with developer of Milldale-Highgate crossing.
N7 Strategic cycle connections	John Creek (AT7-1) – note possible Structure Plan for interim protection	<ul style="list-style-type: none"> Ongoing engagement with Council regarding interaction with Silverdale West-Dairy Flat Industrial Structure Plan development and engagement process.
	Penlink walking & cycling (AT4-1)	<ul style="list-style-type: none"> Further consideration of interaction of cycleway with Penlink Toll Road.
	Dairy Stream (AT5-1) – note possible Structure Plan for interim protection, SH1 crossing provided by EW11-1	<ul style="list-style-type: none"> Engagement with large number of landowners and residents regarding potential property, access and social impacts.
	Wainui Road active mode crossing of SH1 (EW3-1)	
N8 Dairy Flat Highway between Dairy Flat and Albany	SR11-1 - between Dairy Flat and Albany – upgrade existing to 4 lanes	<ul style="list-style-type: none"> Interaction with wider safety improvement projects including Dairy Flat Highway / Coatesville Riverhead Highway intersection improvements.
	Potentially could be integrated into N3.	<ul style="list-style-type: none"> Further consideration of form and alignment of corridor, including topographical constraints. Further consideration of sensitive environmental areas adjacent to the highway. Engagement with large number of landowners and residents regarding potential property, access and social impacts.
N9 East Coast Road (SR12-1)	From Penlink to Long Bay - safety upgrades, not four lanes. Confirmation in DBC if works require route protection, if not required could move to N10.	<ul style="list-style-type: none"> Further investigation to confirm whether widening is required. Interaction with East Coast Road and Glenvar Road business case. Further consideration of form and alignment of corridor, including topographical constraints. Engagement with large number of landowners and residents regarding potential property, access and social impacts.
N10 Rural highway safety improvements	Kahikatea Flats Road (SR16-1)	

Route protection/DBC package	Components	Issues to be addressed in the DBC
Progressed as a non-supporting growth project by AT	Coatesville-Riverhead Highway (SR14-1)	<ul style="list-style-type: none"> Further investigation to confirm whether widening is required for each route. Engagement with AT safety team regarding future implementation of these safety improvements. Defining the extent of the safety improvements. Interaction with the North-West business case safety improvement options.
	Awanohi Road (R21-1)	
	Safety upgrades only and so are likely to be undertaken by AT within the existing road corridor without any additional route protection.	
N11 Kōwhai Road	Upgrade to add active modes (EW1-3). Can likely be done within the road corridor by AT, without any additional route protection.	<ul style="list-style-type: none"> N/a – No DBC required Development and implementation via AT walking and cycling teams
N12 Wainui North	Public transport arterial connection (R6-2) (not 4 lanes)	<ul style="list-style-type: none"> Form and alignment of the route requires further investigation, in particular considering topographical constraints. Engagement with large number of landowners and residents regarding potential property, access and social impacts. Investigation of implementation through future structure planning processes.
N13 Argent Lane	Consent in place for northern part. An NoR for the remaining part is being progressed separately by AT.	<ul style="list-style-type: none"> N/a – No DBC required

Table 29 sets out the general considerations at the DBC stage.

Table 29: General considerations at the DBC stage

Component	Issues to be addressed in the DBC
Urban form	<p>Transport and urban form</p> <p>An integrated transport network that supports and enables growth and good urban form in and around future urban areas is a critical success factor for the SGA programme. The transport network has an important role in supporting and enabling land uses and built form responses, such as Transit Oriented Development (TOD) and higher density housing or town centres closer to public transport nodes. Therefore, recommending transport networks that support and enable good urban form will underpin our DBC process.</p> <p>During the IBC development, Programme-wide urban design principles were developed and documented in Part A of the Te Tupu Ngātahi Design Framework (refer Appendix G). Urban design criteria were also considered as part of the option development and assessment, and opportunities to apply the urban design principles were identified for each of the recommended networks. During the DBC phase, Part B of the Design Framework will be developed at a Programme-wide level and applied at a project level in the option development, assessment, design and AEE development. This will include further development and refinement of urban design opportunities and their application at a project and DBC level. As part of this, the Urban Design Framework and DBCs will include more commentary on 'what good urban form is' in the context of these future urban environments,</p>

Component	Issues to be addressed in the DBC
	as well as definition of what urban form is enabled by the transport networks (i.e. the 'people oriented streets' – scale, character and function, and the permeability of the networks that will enable land uses and built form response).
Stormwater management	Integrated approach to stormwater management Working to develop an integrated approach to the catchment management (flooding) and storm water treatment that captures all the potential developments (transport and land use) that are likely over the next 30 years to reduce the impacts of continued development on the health and sustainability of the waterways and improves the resilience of the transport system.
Utilities	Integrated approach to provision of utilities Integrating the transport response with the needs and opportunities of the utility providers to provide a better whole of system outcome. The key examples are the opportunity to the transmission network identified by Transpower which could reduce the complexity and risks associated with their designations.
Active modes	Facility type For the new corridors where cycling facilities are identified, high quality separated walking and cycling facilities are proposed. For the retro-fitting of existing corridors, it is expected that a mixture of shared path and separated facilities will be provided. These will be investigated further at the DBC.
Financial	Financial and Management Cases Further investigations and assessments are required to determine the affordability of the proposals to the requiring authorities and the potential delivery mechanisms including but not limited to: Identify projects that can be partially or fully developer funded, and include sensitivity tests on the potential funding source Ensure that lower cost interventions are considered Identify and explore different funding and revenue streams (where possible) to improve affordability of the recommended network Include a wider range of cost sensitivities and escalation on the capital and property costs.

Through the identification of the recommended network, elements that do not require route protection were also identified. These elements for the Northern growth area are:

- Travel demand management package including bus priority on Hibiscus Coast Highway and Grand Drive
- Rural highway safety improvements (SR16-1, SR16-2, R21-1)
- Kōwhai Road – active mode upgrade
- Argent Lane arterial.

These elements will not be progressed by the Alliance to a DBC. The list of non-strategic elements will need to be considered by AT or the Transport Agency and progress to a DBC and into a funding regime in the RLTP, or whatever mechanism would allocate them funding (e.g. Crown Infrastructure Partnership).

12.6.2 Pre-implementation

Pre-implementation is the further progression of individual projects that require the highest level of formal route protection (NoR) from DBC stage through the statutory approvals stage, including design development, the preparation of an Assessment of Environmental Effects, confirmation of property requirements and securing the appropriate statutory approvals to allow the project to be constructed or

implemented. The result of pre-implementation will be a network of corridors that are permanently route protected by designation shown in the Unitary Plan.

The intent of route protection is to identify and appropriately protect the land corridors necessary to enable the future construction, operation and maintenance of the recommended network options. In its broadest sense, route protection involves three layers: identification, communication and formal protection (as discussed in greater detail in the Programme Wide Management Case). Formal route protection via NoR will not be required for all network components, but is likely to be the ultimate mechanism used for the majority of network components even if lower levels of protection are utilised in the short to medium terms for second or third decade projects.

12.6.3 Implementation

Once a project has been through the pre-implementation phase it will be ready for implementation. This will include detailed design and physical works. There are several different contract models available for both services (including combining them). The contract type will need to consider factors, including:

- Scale
- Complexity
- Programme.

Given that this implementation phase is many years away for most Te Tupu Ngātahi projects, and the factors that would influence the method of implementation procurement will almost certainly change over time, a detailed implementation strategy should be developed for each project at an appropriate time in advance and closer to its implementation.
