

South FTN and Key Connections DBC

November 2023

Version 1.1

Document Status

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Revision Status

Version	Date	Reason for Issue
0.1	12 May 2023	Initial draft for internal review
0.2	29 May 2023	Interim issue for SME review
1.0	23 June 2023	Issue for IQA review
1.1	9 November 2023	Final

Disclaimer

This is a draft document for review by specified persons at Auckland Transport and the New Zealand Transport Agency. This draft will subsequently be updated following consideration of the comments from the persons at Auckland Transport and the New Zealand Transport Agency. This document is therefore still in a draft form and is subject to change. The document should not be disclosed in response to requests under the Official Information Act 1982 or Local Government Official Information and Meetings Act 1987 without seeking legal advice.

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Appendix E: Engagement Summary

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Appendix G: Cost Report

Appendix H: Urban Design Evaluation

Appendix I: Design Report

Appendix J: Economics Assessment

Appendix K: Property Overview

Appendix L: Route Protection Strategy

Appendix M: Risk Register

Appendix N: Staging Consideration

Acronym/Term	Description
ADT	Average Daily Traffic
AT	Auckland Transport
ATAP	Auckland Transport Alignment Plan
AUPOIP	Auckland Unitary Plan - Operative in Part
BAU	Business as usual
BCR	Benefit Cost Ratio
CFAF	Corridor Form and Function
CO2	Carbon Dioxide
Council	Auckland Council
CRV	Increment for traffic congestion
DA	Developer Agreement
DBC	Detailed Business Case
Development ready	Bulk infrastructure is in place to service development, including three waters, transport, and social infrastructure
DoC	Department of Conservation
DSIs	Deaths and serious injuries
FAR	Funding Assistance Rate
FENZ	Fire and Emergency New Zealand
FTN	Frequent Transit Network
FULSS	Future Urban Land Supply Strategy
FUZ	Future Urban Zone
GHG	Greenhouse gases
GPS 2018	Government Policy Statement on Land Transport 2018/19 – 2027/28
GPS 2021	Draft Government Policy Statement on Land Transport 2021/22 – 2030/31
GSR	Great South Road
ha	hectare
IBC	Indicative Business Case
IOs	Investment Objectives
IQA	Investment Quality Assurance

Acronym/Term	Description
ITA	Integrated Transport Assessment
KPIs	Key Performance Indicators
LOS	Level of Service
LOV	Low occupancy vehicle
MCA	Multi Criteria Analysis
MHS	Mixed Housing Suburban
MHU	Mixed Housing Urban
MoE	Ministry of Education
MSM	Auckland Regional Transport Model (Macro Strategic Model)
MSQA	Management, Surveillance, and Quality Assurance
NIMT	North Island Main Trunk Line
NLTF	National Land Transport Fund
NLTP	National Land Transport Programme
No2	Nitrogen Dioxide
NoR	Notice of Requirement
NZUP	New Zealand Upgrade Programme
OIM	Owner Interface Manager
Partners	Collectively refers to Auckland Transport, Waka Kotahi NZ Transport Agency, Manawhenua, Auckland Council
PBC	Programme Business Case
PBIOs	Problems, benefits and investment objectives
PM10	Air quality – Particulate matter
PT	Public transport
P50	Project cost with sufficient funding to provide a 50% level of confidence
P95	Project cost with sufficient funding to provide a 95% level of confidence
RASF	Roads and Streets Framework
RLTP	Regional Land Transport Plan
RMA	Resource Management Act 1991
RPTP	Regional Public Transport Plan

Acronym/Term	Description
SEA	Significant Ecological Area
SGA	Supporting Growth Alliance (referred to as Te Tupu Ngātahi)
SH1	State Highway 1
SiDRA	Intersection modelling software
SSBC	Single Stage Business Case
TDM	Travel Demand Management
Te Tupu Ngātahi	Supporting Growth Alliance
TFUG	Transport for Future Urban Growth
THAB	Terraced Houses and Apartment Buildings
The Programme	The Supporting Growth Programme
TOD	Transit Oriented Development
UDF	Te Tupu Ngātahi Urban Design Framework
Waka Kotahi	Waka Kotahi New Zealand Transport Agency
WEB	Wider Economic Benefits
VEPM	Vehicle Emissions Prediction Model (Waka Kotahi)
VKT	Vehicle Kilometres Travelled
vpd	Vehicles per day
VOC	Vehicle Operating Costs

1 Executive Summary

1.1 The Southern Growth Area

The Southern growth area is approximately 20 kilometres south of Auckland's central city and is approximately 30 kilometres in length. It makes up the largest proportion of future growth areas in Auckland (45%). The area includes the large future growth areas of Takaanini, Opāheke-Drury, Drury West, Pukekohe-Paerata and Clarks Beach. The bulk of the growth is expected to occur in Opāheke-Drury which will grow from a current population of just over 3,300 to a population of around 64,000 by 2046. Pukekohe-Paerata will grow from a current population of around 23,000 to 56,500 by 2046.

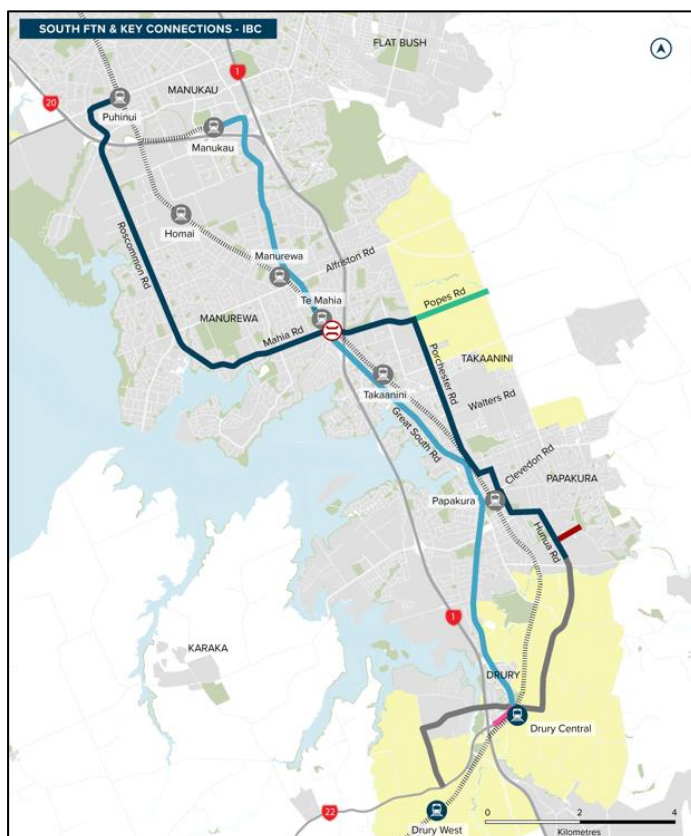
On top of this, the North Waikato is anticipated to grow significantly over the same period impacting the Southern growth area as a large portion of the working age population in these communities is expected to travel to the Auckland region to pursue work opportunities.

In addition, the recent Plan Change 78 and Medium Density Residential Standards (MDRS) mean more intensification may occur in existing brownfield areas, further contributing to growth.

1.2 Scope of project

The South FTN and Key Connections Detailed Business Case (DBC) follows on from the outcomes identified at both the Programme Business Case (PBC) and Indicative Business Case (IBC) stages. It considers two frequent transit network (FTN) routes and three connections identified within the Indicative South Transport Network (ISTN). These are as shown in **Figure 1-1** and are:

Figure 1-1 : DBC Scope



• FTN Routes:

- Great South Road FTN – Between Drury Central Station and Manukau Bus Station
- Takaanini FTN – Between Drury West Station and Manukau Bus Station

• Key Connections:

- Popes Road upgrade
- Croskery Road upgrade
- Great South Road upgrade between Waihoehoe Road and Drury Interchange

Together these projects support the outcomes identified in the South IBC in response to the planned future growth in the South. These investments were identified to enable an integrated transport system to support mode choice in the South by providing for walking and cycling facilities and an enhanced local public transport system.

This document focuses on providing the DBC investment case for route protection and details the recommended route protection strategy. The preparation of the Notice of Requirement (NoR) for applicable corridors is being completed in parallel to this DBC.

1.3 Why is investment needed?

The proposed growth in the South will result in a significant increase in population. This population has the potential to further intensify with the realisation of the Medium Density Residential Standards MDRS¹. When considering growth, along with an existing transport system that is not appropriate for current population and brownfield areas, it is clear investment is still required.

Without significant transport investment, the South will experience:

- **Reduced climate change outcomes** resulting from an inability to shift to low emission transport modes with continued reliance on private vehicles. The network will remain susceptible to climate change risks such as flooding.
- **Limited transport choice and public transport resilience.** In the event the rail line is full or closed, high-quality frequent bus services provide additional capacity, resilience, and choice for the community. The current lack of appropriate active mode facilities discourages uptake.
- **Decreased safety** including conflict between active modes and increasing traffic and rural roads which are not safe or efficient for future multimodal travel.
- **Reduced reliability** for public transport as corridors become congested with increased demand for private vehicle travel further reducing climate change outcomes.
- **Poorly integrated land use** which will result in reduced access to social and economic opportunities and reduced opportunities to maximise transport catchments to increase mode shares for public transport, walking and cycling.

Specifically, the Takanini FTN Projects will provide increased Public Transport and active mode access to the southern rail line (regional RTN) as well as increased mode choice for local trips. Therefore, it is critical that these transport requirements are planned for. Route protection is the first and critical step to ensuring the transport enhancements needed can be provided. 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 option(s).

Route protection provides the mechanism to protect the network in advance as opposed to retrospectively making the transport interventions fit the existing urban form. The key benefits of route protections are that it:

- Provides certainty and direction for future land use integration such as intensification around stations and public transport routes facilitating transportation benefits and good urban outcomes.
- Provides a way for future financial investment while retaining flexibility on the detailed development of the infrastructure, enabling it to respond to the pace, scale, and location of the future growth.

¹ While it is noted that the recently released Future Development Strategy (FDS) has recommended the removal of the Takaanini Future Urban Zone (FUZ) and partial removal of the Ōpaheke-Drury FUZ, there is still uncertainty around the FDS growth changes and this DBC responds to this uncertainty.

- Allows for major infrastructure to be implemented at the right time enabling urban growth/development and behaviour change.
- Reduces future cost risk through early acquisition or notices of requirement which can potentially reduce some land costs.
- Prevents land from being developed in a manner which makes projects more expensive, compromises outcomes or worse, impacts whether the project is feasible. Although much of the Project is in the brownfields and thus already developed, the recent NPS-UD and MDRS will allow further intensification to occur. Therefore, there are still benefits to route protection.

1.4 Problems, benefits, and investment objectives

Six investment areas (access, integration, travel choice, resilience, safety, and climate change) were carefully considered as part of the DBC to maximise land use and transport integration to align with the Ministry of Transport (MOT) Transport Outcomes Framework and the GPS 2021. These informed the development of the problem statements.

Separate problems, benefits and investment objectives were developed for the FTN and key connections. These are as shown in **Figure 1-2** and **Figure 1-3**.

Figure 1-2 : PBIO for GSR and Takaanini FTN

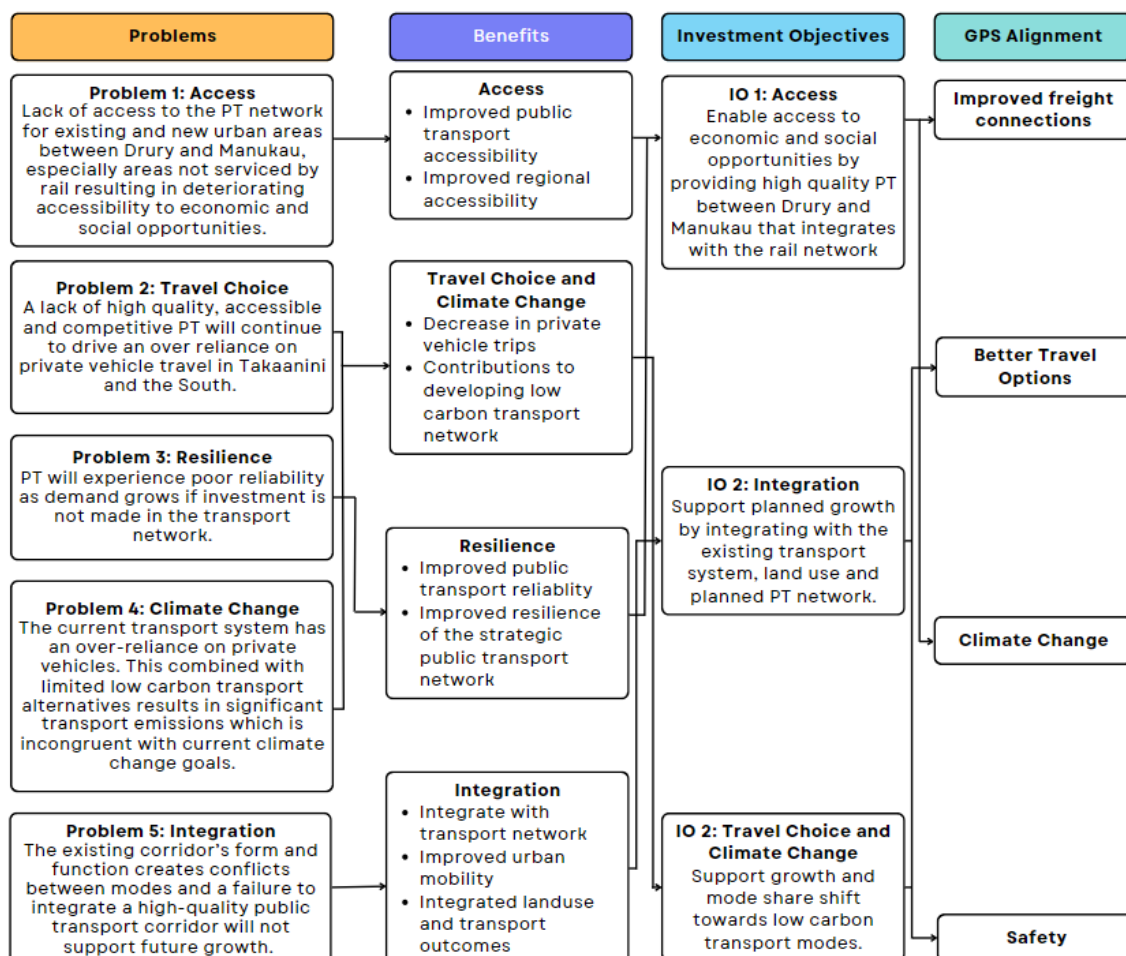
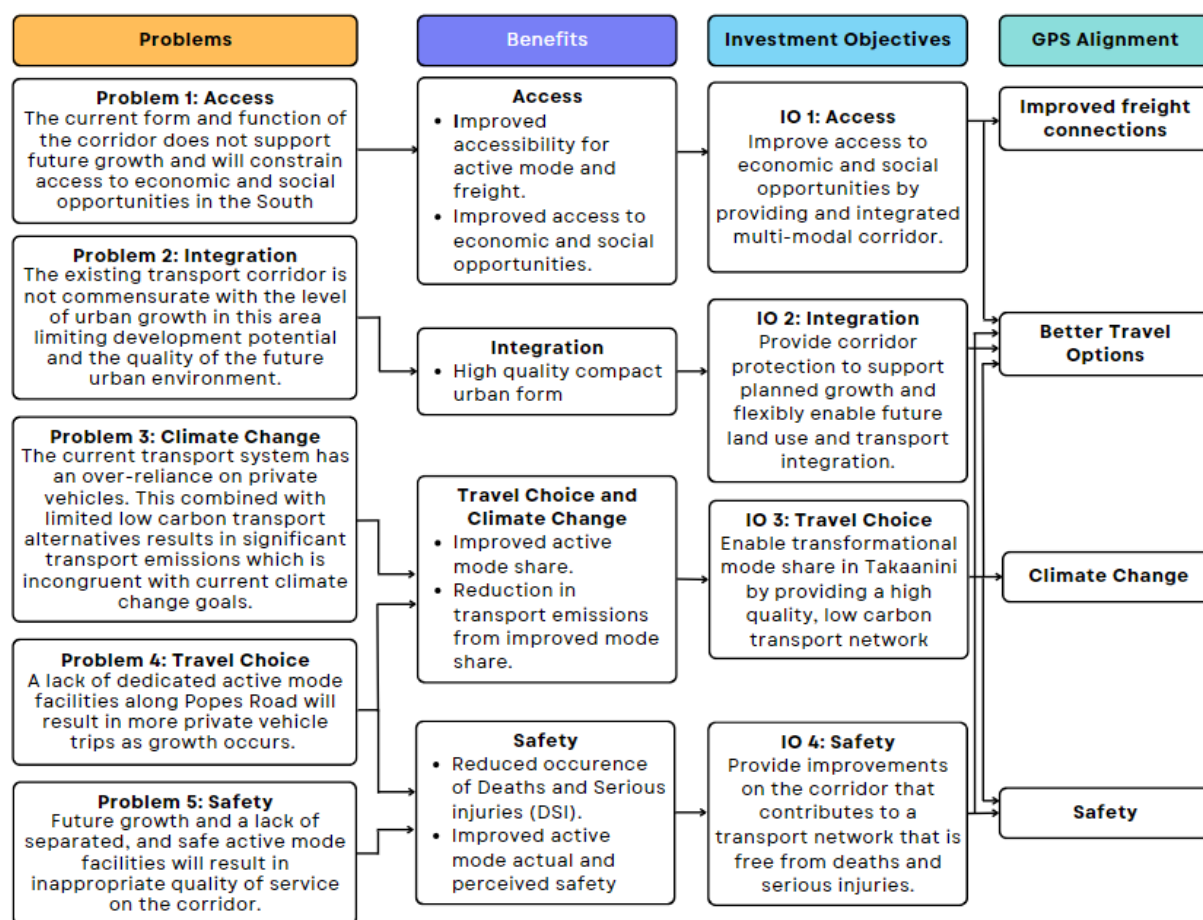


Figure 1-3 : PBIO for key connections



1.5 Recommended transport package

In developing the recommended transport package, the DBC recognises the complexity in route protecting in this brownfields area, especially for the Great South Road and Takaanini FTN.

Upgrading the existing corridors to provide for bus priority and active mode facilities would generally require a minimum width of 26.5m. Given these urbanised corridors vary in width between 20m to 30m, applying the desired width throughout the FTN corridors would:

- Provide for future flexibility, urban amenities and optimal transport outcomes, but it would have significant property impacts with approximately over 2,000 properties affected across the two FTNs.
- Provide modest benefits in the low hundred millions. This far outweighs the investment required, expected to be approaching \$2bn.

Thus, it highlights that a balance needs to be struck between the desired outcomes and the resulting impacts. It indicates careful consideration is necessary when evaluating various corridor options, leading to the identification of suitable areas for route protection. This is especially important in an already urbanised area where further intensification can still occur under the MDRS and where there are still benefits to be gained from route protection.

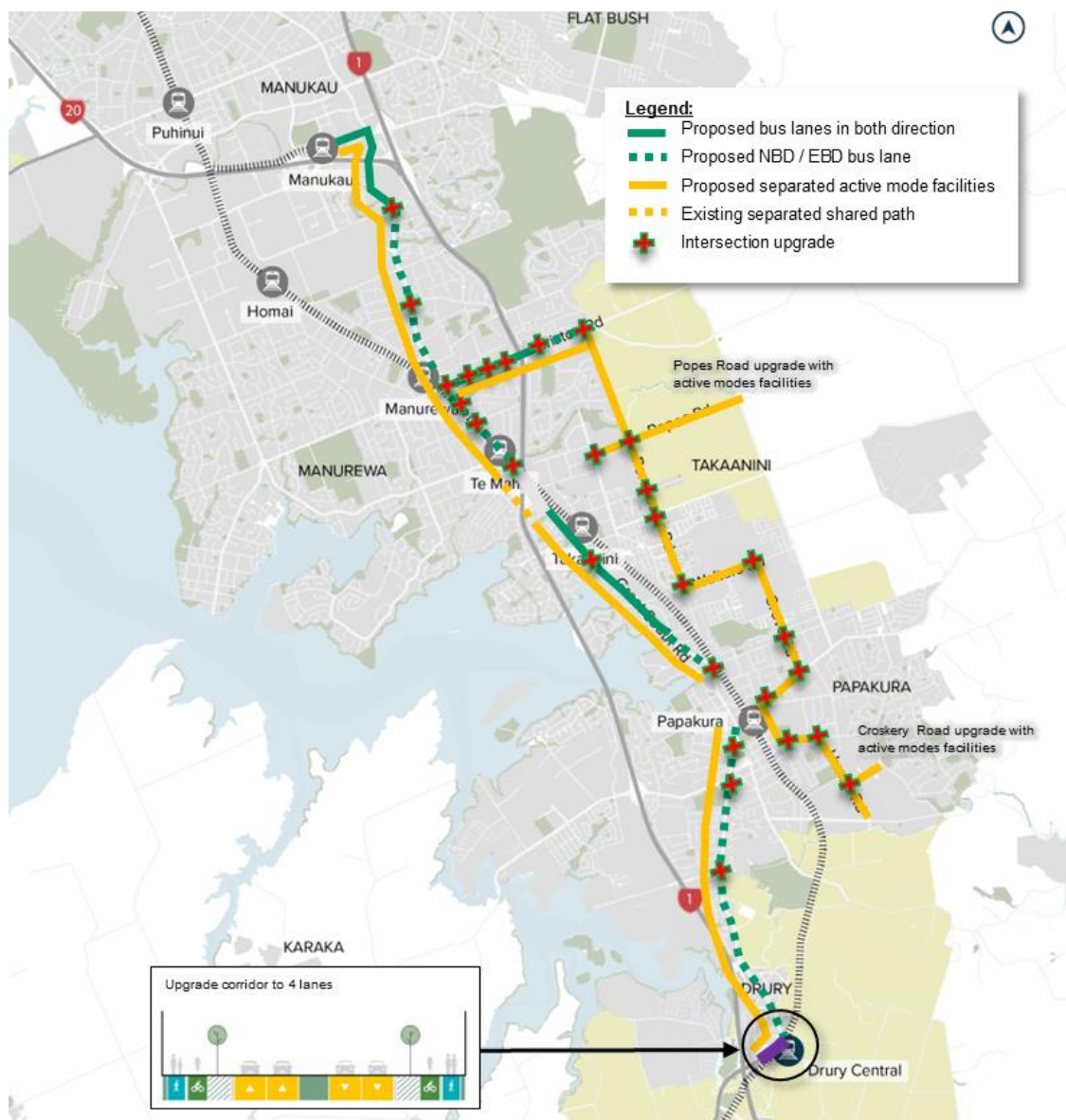
The DBC therefore recommends an option for the FTNs that balances potential impacts of the projects and the outcomes sought, by proposing a generally smaller cross-section, which has been enabled by targeted widening of the road corridor (and therefore route protection). This approach:

- Targets priority areas for route protection including intersection upgrades to maximise transport benefits and minimise impacts.
- Optimises the existing infrastructure to get the most out of existing investment at targeted locations by reallocating road space allowing the road to work more efficiently.
- Meets the functional intent of the corridors and meet the investment objectives in providing for high-quality public transport and active modes to support mode shift.

It is also noted that the recommended option would not preclude implementation of an alternative cross-section option to be implemented in the future if the environment changes. There are, however, cost and risk implications that would need to be considered.

The recommended transport package is shown in **Figure 1-4**.

Figure 1-4 : Recommended transport package



Overall, the recommendation is a comprehensive transport solution that will support:

- Long term development of a low carbon transport system that supports future growth and facilitates mode shift from private vehicles to public transport and active modes, to reduce greenhouse gas emissions.
- Increased reliability and resilience for public transport via improvements to the bus infrastructure and network.
- Provision of an alternative/support to the rail by improving local public transport accessibility/connectivity for an already public transport deprived South community.
- Real travel choice with high quality, attractive alternatives to the private vehicle. This includes active mode upgrades that connects people to key destinations and encourages active mode trips within the urban area.
- A focus on safety through applying Road to Zero safety principles, fully separated cycling facilities, well designed intersections, and sufficient space for all modes to interact safely.

The outcomes will be achieved by:

- Timely implementation of bus infrastructure and intersection upgrades to support the operation and patronage of a high frequency local bus service.
- Provision of active mode facilities on all corridors including an opportunity to integrate with the proposed Drury Central Station to further support mode shift.
- Upgrade the southern section of Great South Road to relieve a future bottle neck and provide efficient access for the Drury community.

It is noted that other supporting measures will also be required to maximise benefit realisation including travel demand management, operational funding to provide for increased bus frequencies, implementation of a collector local network to link to the FTN and ongoing land use integration.

1.6 Outcomes achieved

The key outcomes for this recommended network are shown in **Figure 1-5**.

Figure 1-5 : Transport Network Outcomes

Overall investment outcomes for the South FTN recommended transport network (2048+)				
Outcomes achieved	Alignment			
Access	 Employment accessibility 30 min by PT	Manurewa ↑ 4% Takaanini ↑ 12%	Papakura ↑ 1%	 177,000 jobs accessible within 30 minutes by active modes
Reliability	 Up to 11 mins travel time saving on the GSR FTN (peak period)	 Up to 9 mins travel time saving on the Takaanini FTN (peak period)	 Improvement in PT travel time reliability. Reduction in travel time spread to 18 minutes on GSR FTN and to 12 minutes on the Takaanini FTN.	
Safety /Integration	 27km New and improved cycle network	 80 DSIs estimated to be saved over 40 years	 29km of new and improved network with enough space to improve street amenity appropriate for the place and built form	
Travel Choice	 19km New bus lanes to support the FTN network	 2,800 daily patronage increase across the FTN network	 2,900 additional walk-km daily 1,400 additional cycle-km daily	
Climate Change	 54,800 less vehicle kilometres travelled daily	 2,250 tonnes reduction of CO ₂ per year. 89,800 tonnes reduction of CO ₂ over 40 years.	 Stream crossings designed to accommodate 1 in 100 year flooding to respond to climate change.	

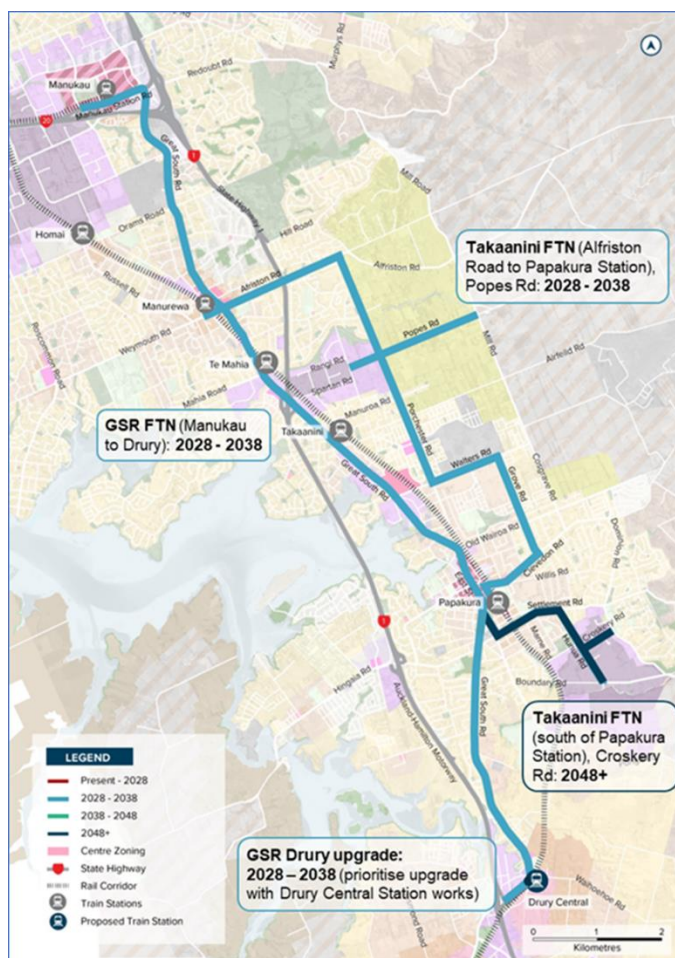
1.7 Staging

The staging on the implementation of the Recommended Option has been considered. A set of key principles has been applied to the recommended transport package, which links staging to broader strategic goals regarding desired modal shift and minimising impacts during construction. This has identified that it is recommended to prioritise the Great South Road, Drury upgrade to be timed with the implementation of the Drury Central Station. This is a key opportunity to provide required infrastructure at the onset of development.

Implementation of the rest of the FTN should be developed progressively, focusing on upgrades to key stations and on areas which will relieve traffic pressure that would otherwise affect PT services. Any projects that can reduce traffic demand on Great South Road such as Mill Road and Ōpāheke N-S arterial, four-tracking of the rail line should be implemented so that works can begin on Great South Road and would minimise disruption on the community.

Considering the above and the current understanding of how the land use is planned to develop, the recommended staging is shown in **Figure 1-6**.

Figure 1-6 : Recommended Staging



1.8 Costs and benefits

The overall estimated cost (P50 undiscounted) for the package of works is \$797M of which \$177M is associated with property purchase.

The Benefit Cost Ratio (BCR) for the package is shown in **Table 1-1**. The BCR is 0.6 and 0.7 with and without Wider Economic Benefits (WEBs).

Table 1-1 : BCR with and without WEBs

Projects	BCR without WEBs	BCR with WEBs
Full recommended transport package	0.6	0.7
Great South Road FTN	0.5	0.5
Takaanini FTN	0.7	0.8

The evaluation is based on the standard evaluation methods for transport infrastructure, which is typically dominated by transport benefits such as that of travel time savings. It excludes non - monetised benefits that would also arise from 'urbanisation' or account for such elements such as liveability and urban amenities. The purpose of the Projects is either to support mode shift towards a low carbon transport mode e.g. the FTNs or, provide basic infrastructure (active mode facilities) to facilitate growth in a sustainable manner (Croskery Road and Popes Road). These either:

- Generate traffic disbenefits where road space has been reallocated away from private vehicle uses for buses; or
- Have a high cost but relatively small transport benefits, primarily walking/cycling benefits.

This has contributed to the overall low BCR for the package of work of 0.6 which is noted to be less than 1.

Despite the lower BCR, the recommended transport package is still needed to respond to the planned growth and the existing issues experienced within this brownfields area, and is a key part of the wider southern area package of transport interventions required to meet growth projects and deliver the wider transport system outcomes. This collectively has benefits that exceed costs as indicated by the BCR of 1.5 in the South IBC. This will enable wider transport outcomes to be achieved, in particular a mode shift push in the right direction. Further, the focus of the DBC is on route protection and thus, no value engineering of the preferred option was undertaken. This could be done at the latter stages to potentially reduce the cost and improve the economic efficiency. Hence, the DBC still recommends the transport package to be route protected.

1.9 Proposed route protection

A Route Protection strategy has been developed to support the DBC and makes recommendations on the prioritisation, packaging and preferred planning mechanism to secure route protection of the packages.

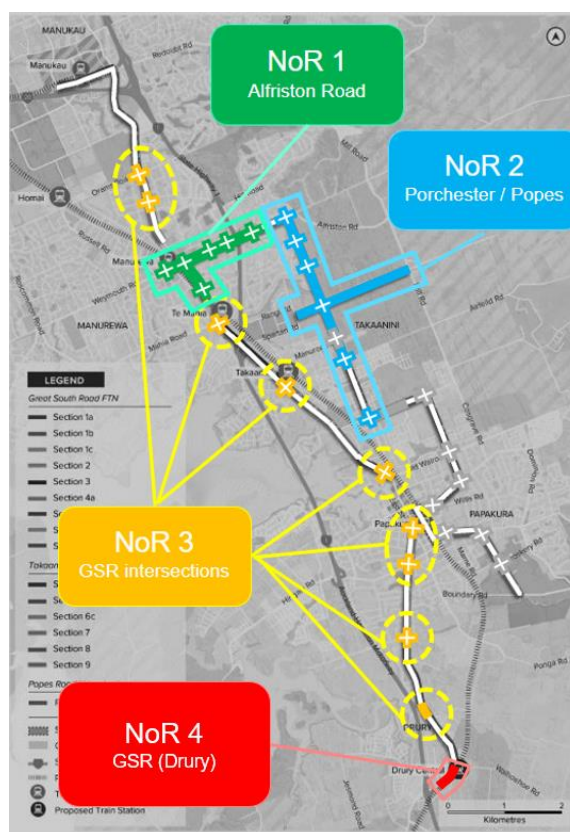
The proposed route protection strategy (of four packages) is shown in **Figure 1-7**.

No route protection is required for the Croskery Road upgrade as works are anticipated to be accommodated within the existing road reserve.

NOR 2 has specifically been identified as a separate package in response to the potential removal of the Takaanini FUZ under the draft FDS. In the event this happens, this NoR may not need to proceed and could easily be split out from the rest of the Project and abandoned/surrendered as appropriate.

A separate consenting strategy will be prepared as part of the NoR process which will confirm consenting pathways, technical assessments and NoR staging. Processes will be put in place to manage the non NoR route protection pathways.

Figure 1-7 : NoR packaging



1.10 Property Implications

There are potential property cost implications where a NoR will be lodged. A total of 446 property (partial and full) interests have been identified for acquisition.

While the vast majority (60% to 80%) of property purchase is typically anticipated in the three years immediately prior to implementation, this acquisition could occur prior to route protection being enacted, or during the route protection process.

NoR route protection costs consist of three components:

- Post lodgement funding for NoR.
- **Early property acquisition** – property costs that could be anticipated during the route protection process.
- **Implementation property acquisition** – costs that would be incurred in the 3 years prior to project implementations.

The overall cashflow associated with the cost of route protection (NoR Post lodgement, Early property acquisition and property implementation) is shown in **Figure 1-8**.



The above illustrates the majority of the potential early property acquisition costs (light blue) will occur in the first 8 years then phase into the bulk of the implementation costs in the following 3 years prior to construction. This is attributed to the majority of the corridors are expected to come online by 2038.

The current RLTP is from 2021/2022 to 2030/2031 and the costs that fall into this period are shown in **Figure 1-8**. It details the route protection costs only (NoR and early property acquisition) for this period which totals [REDACTED] (10% escalation).

The total early property acquisition ranges from [redacted] (5% escalation) to [redacted] (15% escalation) (for the RLTP period) depending on the level of escalation assumed. The assumed staging demonstrates the speed at which the early property acquisition is anticipated to start to meet the current implementation timeframes.

1.11 Funding Share

Figure 1-9 : Funding split

The estimated funding split for the P50 costs is shown in and **Figure 1-10**. This highlights that \$317M is likely to be required from the National Land Transport Fund (NLTF) which consists of the Waka Kotahi share plus Auckland Transport FAR share. Auckland Transport’s local contribution is estimated to be around \$304M.

There are opportunities for the Auckland Transport share (and ultimately NLTF) to be reduced through the ability to harness contributory funding from developers which is currently estimated to have an indicative value of around \$176M.

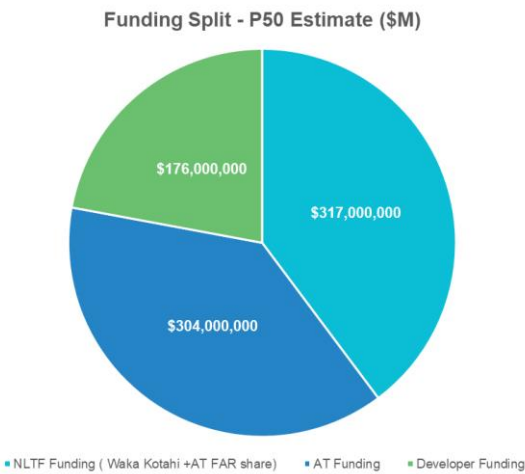
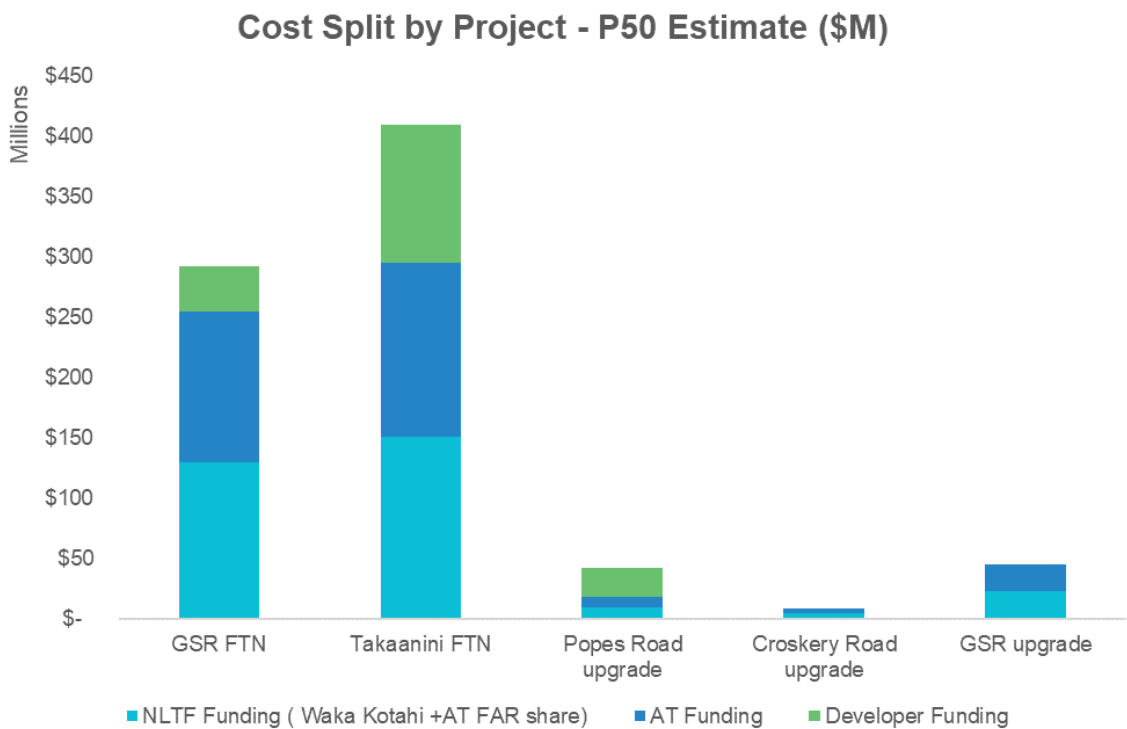


Figure 1-10 : Funding split for projects



A future Implementation DBC will seek funding for the actual implementation of the projects.

1.12 Key risks and opportunities

A Risk and Opportunity Management Plan has been developed and endorsed by the Te Tupu Ngātahi governance team. This risk management process is consistent with AS/NZS ISO 31000:2009 and is consistent with typical risk management processes undertaken by AT and the Waka Kotahi. Programme-wide and DBC specific risks and opportunities are shown in **Figure 1-11**.

Figure 1-11 : Key risks and opportunities

Key Risks and Opportunities	
Programme-wide	DBC Specific
 Legal challenge due to climate change	 Implementation and/or funding not prioritised – particularly through urbanised areas for the Great South Road and Takaanini FTN (Alfriston Road in particular).
 Political perspective changes staging and or priorities	 Removal of the Takaanini FUZ under the FDS – Although providing and planning for the growth forms the premise of this DBC, the issues identified for the projects exists today especially for the Great South Road FTN. The route protection strategy also accounts for this through its NoR packaging.
 Scale of affordability gap	 Regional consenting complexities – mostly associated with wetlands, flooding and ecological areas.
 Opportunity for improved future urban form where there is a change in road corridor	 Interface uncertainties with rail upgrades – risks around the rail line and around train stations such as that of Weymouth Road bridge and Papakura train station with designs not being aligned with rail upgrades.
 Different growth pace than assumed	
 Design changes and site investigation feedback leads to additional unexpected property impacts	
 Poorly understood/mitigated construction impacts lead to objections	
 Protracted negotiations with property owners	

The most significant risk for route protecting now is affordability due to the early property acquisition costs. This can be managed through Programme wide initiatives to address this issue including:

1. Having a property team focused on the Te Tupu Ngātahi programme.
2. Developing an agreed position for the programme on the approach and application to betterment.
3. Developing and providing a programme position on advanced property purchase.
4. Providing the agreed programme positions outlined above to the Auckland Transport and Waka Kotahi boards for endorsements in the latter half of 2023.

It is acknowledged that this business case is focussed on route protection and that there are funding implications associated with the potential early property acquisition of this route protection.

This business case does not seek to resolve issues surrounding the funding required for the delivery of the recommended infrastructure and services. For a range of reasons, there is uncertainty surrounding the ability to fund the projects using traditional funding mechanisms/NLTF over the long-term.

Given this uncertainty and the potential long-term funding gap, it is recommended that route protection be completed at this time to provide:

- **Ability to plan infrastructure to support the community:**
 - Route protection enables the provision of planned infrastructure rather than “responsive” infrastructure which typically results in infrastructure being retrospectively added and squeezed into already developed land.
 - The DBC has demonstrated the substantial impacts it would have along Great South Road and through Takaanini (brownfield corridors) if an optimal transport solution is sought in a retrospective manner.
 - Thus, route protection provides the owners with significant opportunity to front foot and respond to key issues such as climate change and other mitigation/ adaptation needs of the network. It also protects the ability to realise the step change in transport outcomes (mode shift and accessibility enhancements) which could otherwise be compromised as space is restricted.
- **Financial upside.**
 - Financially, a small investment now is forecast to save many millions of dollars in property and implementation costs that makes financial sense.
 - The DBC has identified over 2,000 properties could be impacted within the urbanised corridors when attempting to accommodate everything into the limited space available. This will only be further exacerbated when six-storey apartments/ new townhouses are built under the MDRS.
 - This further increases the funding gap for implementation potentially preventing project implementation.
 - Thus, route protection requires some upfront expenditure (costs of obtaining NoR and early purchase of some property) but reduces overall cost of implementation and property purchase.
- **Ease of implementation.** Implementation will be considerably less difficult (and costly) with designations in place.
- **Ability to deal with unplanned growth.** While the growth in the Takaanini FUZ is planned in the next 20 years, private plan changes are likely to occur out of sequence. This is already happening with the potential of the Alfriston Plan Change. With designations in place, AT have set expectations on what infrastructure is required to support FUZ development.

1.13 Recommendations sought for approval

This DBC sets out the rationale for investing in route protection for the FTNs and key connections in the south. Based on the information provided throughout this document, the following approvals are sought:

1. **Approve the recommended transport package.**
2. **Approval of lodgement** of the 4 NORs to protect the transport corridors.
3. **Acknowledgement of the potential early property acquisition liability** and associated risk arising from route protection of the recommended transport package.

This will ensure the future transport network requirements in this area are appropriately protected and enabled for when subsequent implementation is required.

2 Introduction

The purpose of the Te Tupu Ngātahi (Supporting Growth) Programme is to recommend a sustainable transport network for route protection to support Auckland's planned greenfield growth over the next three decades. Providing access to high quality public transport and attractive walking and cycling options will minimise new transport emissions as growth occurs.

The South Frequent Transit Network (FTN) Detailed Business Case (DBC) follows on from the outcomes identified at both the Programme Business Case (PBC) and Indicative Business Case (IBC) stages. It further confirms the need and investigates the corridor details for the FTN corridors and other elements of the South network. This DBC:

- Identifies changes since the IBC.
- Reviews the IBC assumptions, evidence, and findings.
- Develops and assesses options and confirms the preferred option for each of the projects.
- Develops the economic case and measures the expected benefits and outcomes, and
- Identifies requirements needed for delivery.

It is important to note that the scope of this DBC is limited to considering the case for route protection only of the projects. As projects progress for funding consideration and construction, separate implementation business cases will need to be prepared.

2.1 The Southern growth area

The Southern growth area is approximately 20 kilometres south of Auckland's central city and is approximately 30 kilometres in length. It makes up the largest proportion of future growth areas in Auckland (45%). The area includes the large future growth areas of Takaanini, Opāheke-Drury, Drury West, Pukekohe-Paerata and Clarks Beach. The bulk of the growth is expected to occur in Opāheke-Drury which will grow from a current population of just over 3,300 to a population of around 64,000 by 2046. Pukekohe-Paerata will grow from a current population of around 23,000 to 56,500 by 2046.

On top of this, the North Waikato is anticipated to grow significantly over the same period impacting the Southern growth area as a large portion of the working age population in these communities is expected to travel to the Auckland region to pursue work opportunities.

In addition, the recent Plan Change 78 and Medium Density Residential Standards (MDRS) mean more intensification may occur in existing brownfield areas, further contributing to growth.

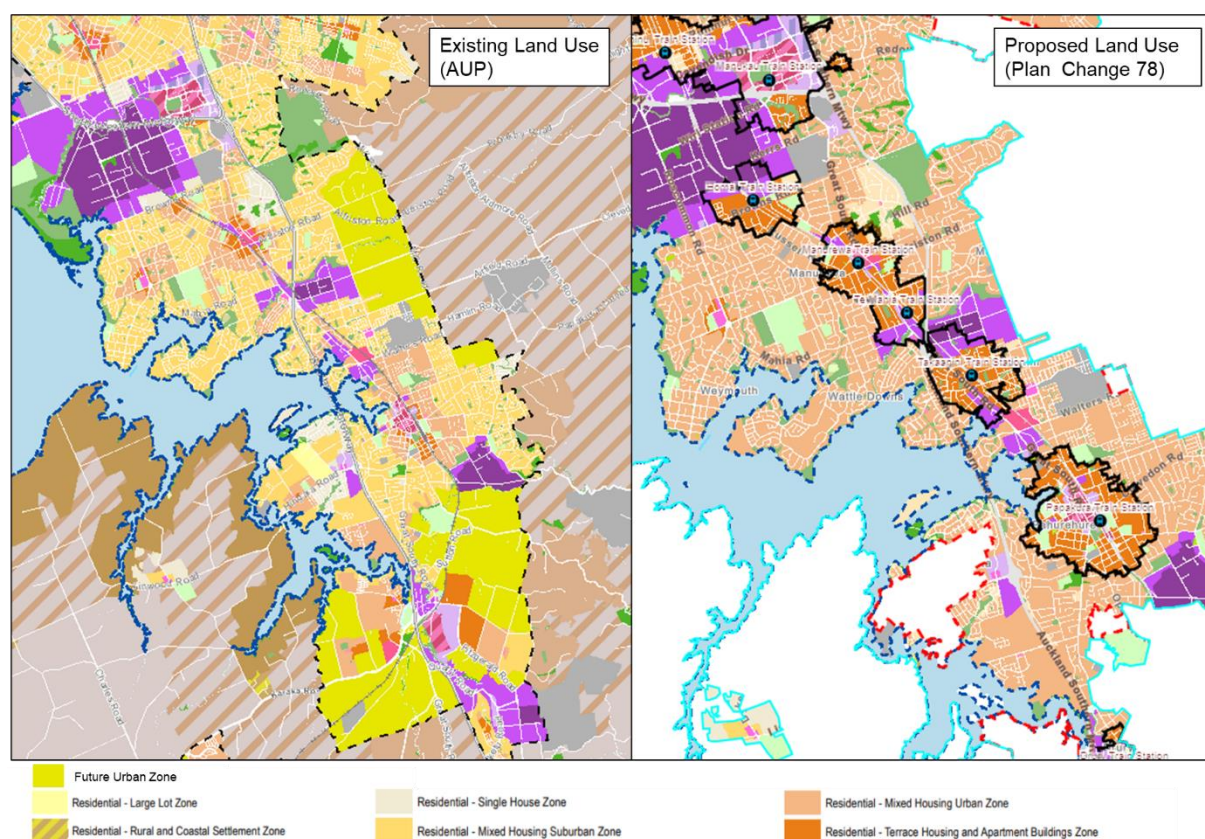
2.2 Future land use

2.2.1 MDRS and Plan Change 78

Recent policy changes include the Medium Density Residential Standards (MDRS). This will enable housing choice in main urban areas through development of three homes up to three storeys on each site, without the need for resource consent. To enable this, the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 (RMA-EHS) requires Tier 1 territorial authorities in the likes of Auckland to incorporate the MDRS into every relevant residential zone in their district plan.

In the case for the South, this is being progressed through Plan Change 78 (PC78) as shown in **Figure 2-1**.

Figure 2-1 : Existing Land Use and Proposed Land Use



As shown, PC78 will enable greater densities within the existing urban areas especially around the train stations where apartments of up to six storeys will be allowed. This will support walking and cycling catchments to the existing town centre and increase public transport uptake. At this point, it is still uncertain when and to what extent there will be an increase in density, but it is possible that this could occur in the near future.

2.2.2 Rezoning and Plan Change Processes

Aside from the uncertainties regarding land use due to policy decisions, there are also ongoing doubts about the current Future Urban Zone (FUZ) zoning in Takaanini. According to the Auckland Future Urban Land Supply Strategy (FULSS), Takaanini is planned for development in the latter half of Decade Three (2043-2047). However, there are considerable challenges such as flooding and geotechnical constraints in this area, which may lead to the likelihood of developing being low. In addition, the draft Future Development Strategy (FDS) has proposed the removal of the Takaanini FUZ due to the issues identified within the FULSS. It should be noted that the FDS also recommends partial removal of the Ōpaheke-Drury FUZ. This further adds to the uncertainty of development of the FUZ. In response to this, the DBC has considered this throughout the options assessment process and in staging of the projects.

Furthermore, there are indications of continued development pressure in the area of varying natures through Plan Changes. At the time of producing this report, the project team is aware of the Alfriston Road Plan change which may have an impact on the future transport network. The project team has considered this as part of the optioneering process.

2.3 The South Indicative Transport Network (ISTN)

In response to the planned growth in south Auckland, a South Area Wide Indicative Business Case (South IBC) was undertaken by Te Tupu Ngātahi in 2018 and endorsed by the Auckland Transport (AT) and Waka Kotahi Boards in 2019.

This IBC recommends the South Indicative Strategic Transport Network (ISTN) as shown in **Figure 2-2**.

Figure 2-2 : Indicative South Network (ISTN)



Table 2-1 provides a summary of the key North-South corridor and its role on the transport network.

Table 2-1 : Key North-South corridors and its function in the South network

Key N-S Route	Future expected #lanes/ tracks	Role in the network
North Island Main Trunk (NIMT)	4-tracks	Main rapid transit spine & freight movement
SH1	6-8 lanes	Inter-regional general traffic & freight
Mill Road	4 lanes	Long-term suburban connectivity, freight & active modes
Opāheke arterial	4 lanes	Public transport, local access & active modes
Porchester Rd	2 lanes	Public transport, local access & active modes
Great South Rd	2-4 lanes	Public transport, local access, freight & active modes

The figure and table indicates:

- The key north-south routes are components of the existing transport network with Great South Road, Porchester Road and the NIMT running through existing developed Brownfield areas.
- The NIMT forms the rapid transit network (RTN) and is the main public transport into the City Centre with the FTN supporting this providing for access to the stations and local trips.
- SH1 and Mill Road serves as the primary inter-regional and suburban north-south travel corridors.
- This part of urban Auckland is also highly constrained, bounded to the west by the Pahurehure inlet and the east by the Hunua Ranges. This results in a relatively narrow corridor, dominated by north-south regional and national-level strategic transport corridors. The narrow overall corridor and dominance of the strategic transport infrastructure also results in constrained east-west local movement, with resulting community severance and poor transport choices and accessibility.
- There is limited east-west connections between Mill Road and Porchester Road for the Takaanini Future Urban Zone and the Takaanini Industrial Area. Popes Road is an existing link that will remain a key east-west connection for the area.

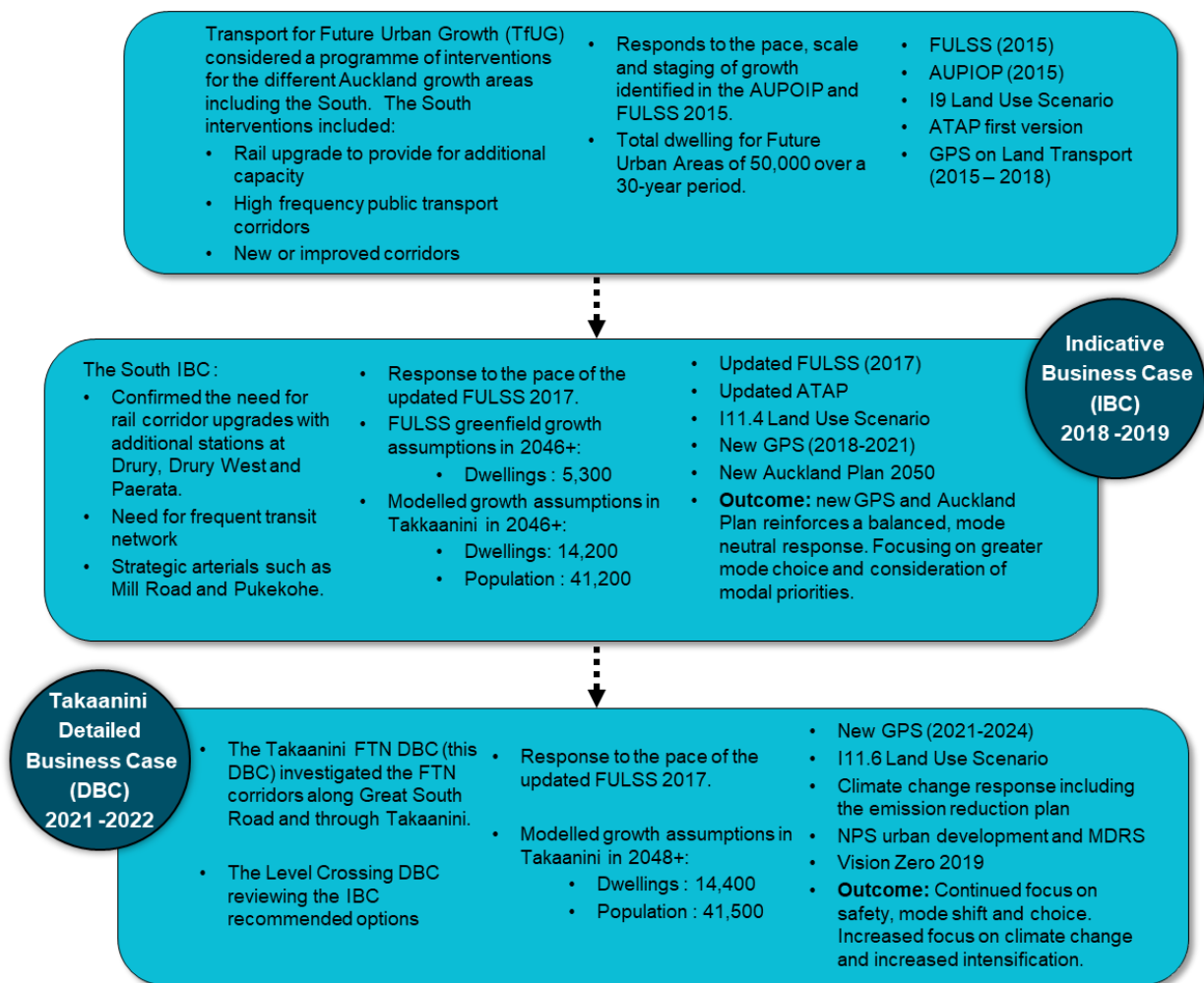
There is uncertainty around Mill Road and SH1 FTN. If these do not proceed, the role of Great South Road on the transport network will be more prominent, serving as the primary North-South public transport alternative to the rail and major route for traffic.

2.4 Business Case change history

The history of the South FTN and Key Connections DBC history is shown in Figure 2-3. It summarises the recommended network for each stage, the growth assumptions and the applicable regulatory and planning policies influencing decisions made. The underpinning drivers have remained the same throughout this process:

- **Growth in the South:** Population, households and jobs assumptions have increased throughout the business case stages. There is potential for more growth with the latest National Policy Statement on Urban Development (NPS-UD) and the Medium Density Residential Standards (MDRS) as greater intensification is permitted.
- **Regulatory and planning policies:** Policies have continued to shift away from the single vehicle focus to mode neutral and low carbon transport interventions.

Figure 2-3 : Business Case Change History



Note: AUPOIP : Auckland Unitary Plan Operative in Part, FULSS : Auckland Future Urban Land Supply Strategy, ATAP : Auckland Transport Alignment Project, GPS : Government Policy Statement, NPS : National Policy Statement, MDRS : Medium Density Residential Standards

2.5 South DBC Packages

To help simplify the DBC process, components within the ISTN have been separated into separate DBC packages for route protection considerations and to better define the investment story. The DBC package and its corresponding IBC elements are shown in **Table 2-2**.

This DBC is one of the two DBCs under the Takaanini DBC Package with there being overlaps and dependencies between the two DBCs. Any decisions made in one DBC may have an impact on the other in terms of the network impacts and form and function of the corridors. However, they are effectively two separate package of projects and as such to better inform decisions and outline the case for investment, two separate DBCs have been prepared.

Table 2-2 : DBC Packages in the South

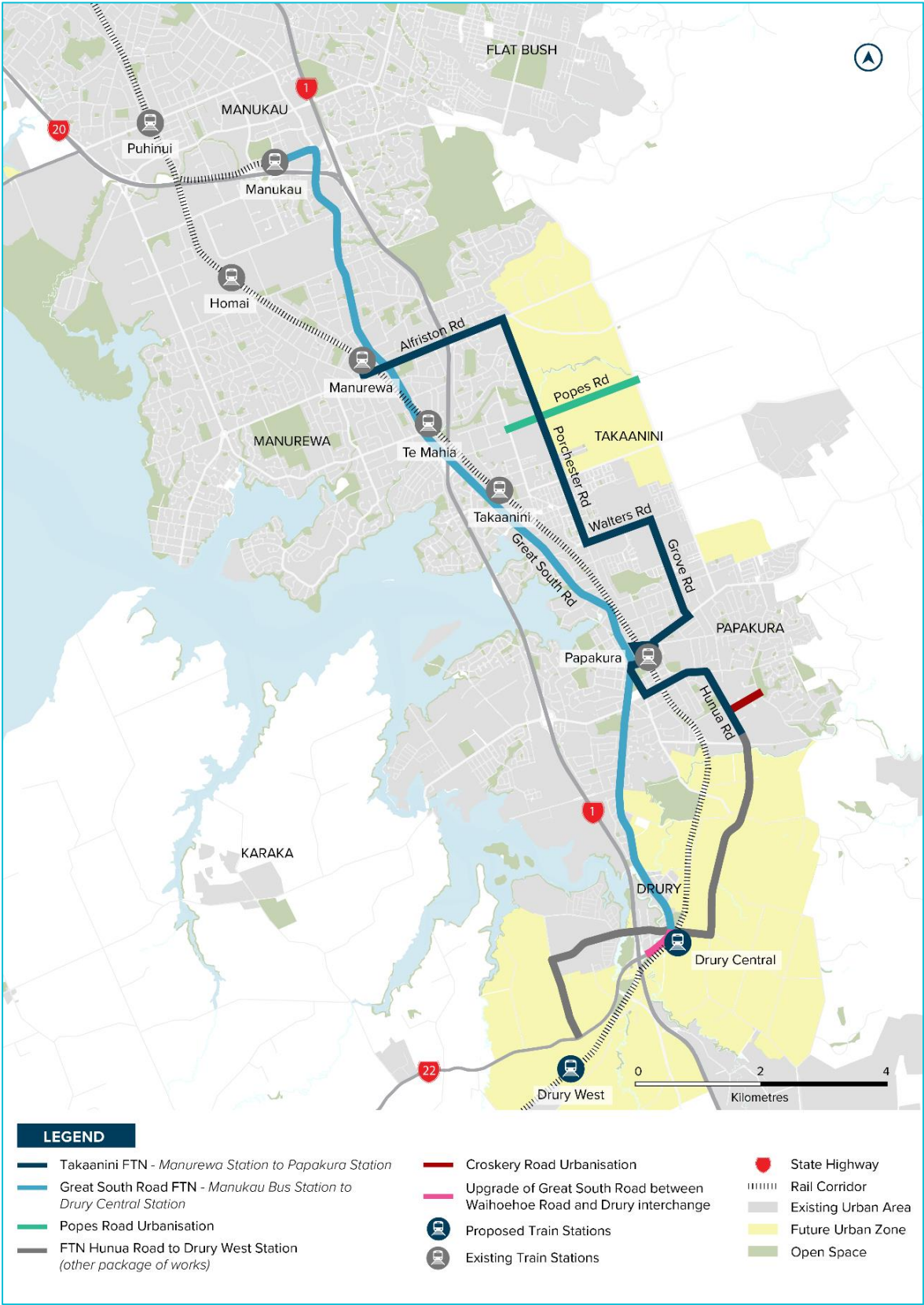
DBC Package	DBC	Projects / IBC elements
Takaanini DBC Package	Frequent Transit Network and key connections (this DBC)	- Great South Road FTN between Drury Central Station and Manukau - South FTN between Drury West Station and Manukau Station - Popes Road and Croskery Road urbanisation - Upgrade of Great South Road between Waihoehoe Road and Drury interchange
	Level Crossings DBC assessed for removal and/or replacement (submitted for approval)	- Taka Street - Manuroa Road - Walters Road - Spartan Road - Rangi Road / Popes Road
Rail DBC Package	Rail DBC	- New Drury West Station - New Drury Central Station - New Paerata Station - Additional rail capacity (four tracks between Wiri and Pukekohe)
South Strategic DBC Package	Mill Road and Drury DBC	- Mill Road Corridor upgrades - Upgrades in Drury
	Pukekohe DBC	- Alternative route to SH22 between SH1 and Pukekohe - New arterial connections to the proposed Pukekohe
Drury Local	Drury Local Arterials DBC	New Drury arterial network

2.6 DBC Scope

The scope of the DBC mainly considers the two FTN routes identified within the ISTN but also includes other complementary projects to complete the network. The DBC focuses on the investment case for route protection for these projects and details the recommended route protection strategy. It is noted the preparation of the Notice of Requirement (NoR) packages are being undertaken in parallel.

The scope and projects within this DBC are detailed in **Figure 2-4** and in **Table 2-3**.

Figure 2-4 : FTN and Key Connections DBC Scope



Considering the varying extent and nature of the projects across the Te Tupu Ngātahi Programme and the difference in likely timing of implementation (between 10 – 30+ years), three broad DBC types have been identified:

- **Type A: DBC for corridor confirmation** – identification of a preferred corridor and its form and functional requirements. However, no further detailed work undertaken as no investment being sought for route protection.
- **Type B: DBC for route protection** – identification of a preferred corridor and its form and functional requirements with sufficient design to inform the assessment of effects and lodge a NoR. Investment in pre-implementation and resultant property costs sought.
- **Type C: DBC for implementation** – a typical DBC assessment suitable for selection of a preferred option with sufficient detail to progress to pre-implementation and implementation funding is sought.

For this DBC, Type A and B have been applied across the different projects, refer to **Table 2-3**.

Table 2-3 : South FTN and Key Connections Scope

Projects/ Elements	Description	Scope	DBC Type
Frequent Transit Network (FTNs)			
Great South Road FTN	- Planned to be an end-to-end bus service between Drury Central Station and Manukau Bus Station. - Will require land to be protected along certain sections and intersections.	Route refinement	Type B
Takaanini FTN - Puhinui to Drury	- Between Drury West Station and Manukau Bus Station (note this was previously to Puhinui Station via a different route as per the IBC) - The Drury to Papakura corridor has been developed by the Drury Local DBC. This DBC will continue from this location. - Will require land to be protected along certain sections and intersections.	Corridor optioneering and route refinement	Type B
Key Connections			
Popes Road	- Upgrades to the existing corridor between Mill Road and Takaanini School Road to suit the future urban environment. - Key east-west connection in the South network. - Will require land to be protected.	Route refinement	Type B
Croskery Road	- Upgrades to the existing corridor between Mill Road and Hunua Road to suit the future urban environment. Note the design was previously investigated by the Drury Local DBC. This DBC will further confirm the proposal. - Key east-west connection in the South Network - No land required but has been costed for future reallocation of road space.	Route refinement	Type A
Great South Road (south of)	Upgrading of Great South Road between Waihoehoe Road and Drury interchange.	Route refinement	Type B

Waihoehoe Road)	- Provides access to the future Drury Station and improves access for those in Drury. - Will require land to be protected.		
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Although some projects have been identified as Type B projects, the investigation undertaken to determine the value of route protection has indicated that some elements and/or sections of the corridor will be of Type A i.e. no investment being sought for route protection.

A separate DBC, “Takaanini – Level Crossings DBC” was undertaken in parallel which focused on the rail crossing improvements at Takaanini which have interdependencies with this DBC. Further details can be found in the following section.

2.7 Takaanini Level Crossings DBC

A separate business case was submitted for approval in early 2023. This focussed on the level crossings identified in the IBC to be assessed for removal and/or replacement. The DBC recommended option is as shown in **Figure 2-5** and is summarised below:

- The project is no longer recommending a new grade separated crossing/viaduct at **Rangi Road**, as initially recommended in the IBC. The impacts of this on the Popes Road project – which is a key connector to Rangi Road – are discussed later in the DBC.
- A new grade separated bridge connection is proposed between **Manuia Road** and Oakleigh Avenue/ Hitchcock Road. The connection will provide direct access to the Takaanini industrial area.
- Existing at grade level crossings at **Spartan Road** and **Manuroa Road** will be fully closed to vehicular traffic but will be replaced by grade-separated active mode bridges.
- Existing at grade level crossings at **Taka Street** and **Walters Road** will also be closed but will be replaced by grade separated bridges which will accommodate all modes.
- Separated walking and cycling facilities will be provided in the bridge footprint at the location where a grade separated crossing is recommended i.e., Manuia Road, Taka Street and Walters Road.

At the time of writing, the DBC has been submitted for approval and the NoR process is underway.

Figure 2-5: Takaanini Level Crossings Recommended Option



2.8 Structure of DBC

The balance of this document is structured as follows:

Chapter	Details
Strategic Case	- Problems, Benefits, and Investment Objectives (PBIO) - Evidence in support of problems - Approach to partner, stakeholder, and public engagement
Economic Case	- Option development and assessment methodology - Assessment of options to reach a recommended option - Economic analysis for the recommended option
Financial Case	- Capital and operational costs of the recommended option - Funding arrangements
Commercial Case	Procurement, property, and consenting/ route protection arrangements
Management Case	How the recommended option will be delivered and managed

The following appendices are referenced throughout the DBC. Note that a consistent Appendix lettering has been applied across all Te Tupu Ngātahi DBCs. Those greyed out are not applicable for this DBC.

Appendix	Summary of purpose
A: Strategic Case	This is not applicable for this DBC as all information are presented within the main body of this report.
B: Climate Change Response	Summary of the climate change assessment and considerations for the DBC.
C: Options Assessment Report	Details the option assessment process undertaken as part of this DBC.
D: Technical Assessments	Popes Road freight role memorandum that sets out the role of Popes Road in the wider strategic freight network in the long term and the potential next steps.
E: Engagement Summary	Summary of the engagement undertaken for the project to date.
F: Urban Design Evaluation	Urban design evaluation for the project using the Te Tupu Ngātahi Design Framework principles.
G: Transport Outcomes Report	Specific information on transport aspects including form and function assessments, modelling and transport outcomes.
H: Design Report	Engineering report that documents assumptions and decisions for the recommended option.
I: Property Overview	Assumptions and methodology for the calculation of property costs.
J: Cost Report	Assumptions and methodology for costing.
K: Economics Assessment	Economic assessment for the project includes assumptions and outcomes.
L: Route Protection Strategy	Strategy to route protect the projects.
M: Risk Register	Overall programme risks and project risks.
N: Staging Considerations	Sets out staging considerations for the projects.



Strategic Case

3 Why is investment needed?

Auckland is New Zealand's largest city with the largest economic activity. The current transport network with its high reliance on private vehicle use does not align with New Zealand's climate change objectives.

Over the next 30 plus years, the South is expected to see significant growth, making up 45% of the future growth areas in Auckland.

The current form and function of the transport network is unable to support the projected growth and shift towards low carbon transport modes such as public transport. Thus, it is vital that the future transport system supports and shares the scale of the growth proposed, with this DBC forming part of the overall south transport network. The proposed investment will enable the ultimate outcomes sought through a well-planned integrated transport network. If investment does not occur, there will be:

- **Poor land use integration** – the project is within an existing constrained urban area leading to competing modal priorities resulting in both poor urban and transport outcomes. There is a chance now to better plan and provide for the future.
- **Reduced safety** – current active mode facilities on the network is limited and fragmented leading to perceived and actual safety risks in particular the urbanising corridors of Popes Road and Croskery Road. This will only get worse as growth occurs and exposure increase.
- **Reduced climate change outcomes and low carbon transport mode shift is compromised** – The actual and perceived safety risks for active modes along the corridors makes it unattractive and discourages its uptake. The lack of a high-quality public transport system further contributes to this with a reliance on private vehicle use.
- **Reduced reliability and limited mode choice** – buses currently experience a poor level of service including poor reliability and will only be exacerbated as growth occurs. Proposed growth areas have limited travel choices if no investment is made to urbanise and upgrade key corridors to cater for public transport and active modes.
- **Limited growth** – it is highly likely that future growth may not be realised as the infrastructure to enable and support this is not in place.

3.1 Why route protect?

Route protection is the first critical step for ensuring the transport improvements required can be provided. The purpose of route protection is to identify and appropriately protect the land corridor necessary to enable future construction, operation and maintenance of the preferred option.

The level of protection appropriate is a balance of the degree of control or restriction on the use of land (prior to infrastructure development) and the potential costs that such protection may impose on both existing landowners and road controlling authorities.

The benefits of route protection are that it:

- **Provides certainty and direction for future land use integration** such as intensification around stations and public transport routes facilitating transportation benefits and good urban outcomes.

- **Provides a way for future financial investment while retaining flexibility** on the detailed development of the infrastructure, enabling it to respond to the pace, scale and location of the future growth.
- **Allows for major infrastructure to be implemented at the right time** enabling urban growth/ development and behaviour change.
- **Reduce future cost risk** through early acquisition or notices of requirement which can potentially reduce some land costs.
- Prevents land from being developed in a manner which makes projects more expensive, compromised outcomes or worse, the project is no longer feasible. This is particularly important with the recent NPS-UD and the MDRS which will allow greater intensification to happen in existing brownfield areas such as that surrounding the project areas.

Route protecting is often a suitable approach for areas that are presently rural and planned for urbanisation whereby acquisition of urbanised properties will not be required to secure the land. In these instances, the opportunity exists where this approach yields the clearest and most significant transport and urban form/growth benefits.

Thus, there is **greater opportunity in the Greenfields** to maximise the transport benefits and support development before land value increases further.

3.1.1 Challenges of route protecting in the brownfield

Unlike other areas within the Te Tupu Ngātahi programme, many of the projects in this DBC are within built-up environments, especially for the proposed Great South Road FTN and parts of the Takaanini FTN. Route protecting in such an environment presents complexities that are not usually experienced within the Greenfields, such as:

- It does not directly facilitate urban growth/ development as this has already occurred. Albeit redevelopment and densification can and will occur whereby the proposals still provide transport benefits. However, the typical approach in calculating benefits and in assessing the affordability of a transport project do not account for the liveability benefits associated with urban design or account for the cost savings that could occur with route protection. Therefore, monetised project benefits are typically at a lower scale but with more significant impacts than greenfield areas.
- Greater impacts than would typically be experienced in the Greenfields given urbanisation has already occurred. Thus, a balance needs to be struck between the outcomes sought and the impacts and careful consideration is required when assessing different corridor options in the brownfields.

3.1.2 What does this mean for the DBC?

The route protection requirements for Te Tupu Ngātahi Programme projects are generally determined by designs selected from generic components based on transport form and function requirements as determined through the Options Assessment process. This approach aims to provide for the outcomes sought and an appropriate degree of future design flexibility noting the long-term nature of the Programme.

Applying this approach to the brownfield areas within this DBC i.e the Great South Road FTN and Takaanini FTN will lead to the challenges and complexities mentioned above. As such, a more bespoke approach has been adopted to reduce the scale of the impacts but still achieve the investment objectives set out.

Details on the approach undertaken are further discussed in the **Economic Case** and in **Appendix C: Options Assessment Report** and **Appendix L: Route Protection Strategy**.

4 What has changed since the IBC?

4.1 Summary of changes

Table 4-1 provides a summary of the key changes since the preparation of the South IBC and the preparation of this DBC. The table also provides a summary of how the DBC responds to these changes.

Table 4-1 : Summary of Key Changes since the South IBC

Changes Since IBC	DBC Response
Policy and strategic alignment	
New/ updated policy - Ministry of Transport Outcomes Framework - Updated GPS 2021 with a focus on climate change objectives and improving freight connections.	There is a greater focus on projects that provide mode shift and are designed with climate change resilience and intergenerational wellbeing as key. The problems and objectives identified in this DBC are aligned with these outcomes, particularly around mode shift and environmental sustainability.
Road to Zero/ Vision Zero New Zealand's road safety strategy for 2020- 2030 sets out a path to achieving Vision Zero where no one is killed or seriously injured. This is guided by the Safe System approach. AT's Vision Zero for Auckland aims for no deaths or serious injuries on the transport system by 2050.	Safety was an outcome sought from the IBC and will continue to be a focus for the DBC. Although the outcomes sought from the DBC is not centred around safety, the decisions and options assessed will consider safety at the forefront.
AT's Future Connect Formally released as a system planning tool in 2021, Future Connect sets out Auckland's long-term transport network plan for the next 10-years. It identifies strategic networks for all modes of transport essential to the movement of goods and people.	This business case considers the strategic network set out within Future Connect. However, given the long-term nature of the DBC and with Future Connect only considering the next decade, the outcome of this business case is expected to drive the long-term network as agreed with relevant stakeholders.
National Policy Statement for Urban Development 2020 (NPS-UD) The NPS-UD seeks to guide the development of well-functioning urban environments in New Zealand.	The objectives of this DBC consistent with the objectives and policies of the NPS-UD. The provision of FTN corridors will positively contribute to well-functioning urban environments and enable an increase in development capacity by providing transport infrastructure integrated with the FUZ.
Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 This is designed to improve housing supply in New Zealand's five largest cities by speeding up the implementation of the NPS-UD and medium density homes. This requires Auckland council to adopt the 'Medium Density Residential Standards' (MDRS).	The DBC has considered this change in legislation especially during optioneering as it may have an impact on the urban form as well as the outcomes sought.
Annual Budget 2022/2023 Mayoral Proposal	This annual budget was created as part of the response to the longer-term challenge of climate change. The proposed packages have a focus on transport choice with the intention of 1 million Aucklanders living within 500m of new or improved bus services. This includes a new FTN route to run along Mahia Road and Roscommon Road which was previously proposed under the IBC.

	The DBC continues to identify this as part of the overall strategic network but no additional work will be done as part of this DBC.
Indicative GPS 2024 At the time of writing, the indicative GPS 2024 is out for consultation. The focus of GPS 2021 remains as focus areas in 2024 with varying degrees of changes in emphasises. These changes include: - Climate change – now ‘Emission Reduction’ and elevated to be the overarching focus. - Better travel options – now ‘Sustainable urban development’ with a priority focus in urban areas. - New priority, ‘Maintaining and operating the system’ – focus in maintaining existing infrastructure. - New priority, ‘Resilience’ – reflect investment in resilience and in response to National Adaptation Plan. Safety and freight remain as priority areas in the indicative GPS 2024.	The outcomes sought within the DBC remain aligned with that sought under the indicative GPS.
COVID-19	
The impact of COVID-19 on the transport system has three key impacts: - Resilience of public transport operations - Change in funding levels and type - Flexibility in working and the increase in working from home	While COVID-19 has had a direct and immediate impact on public transport and transport demand, it is expected in the longer-term such as that assessed in this DBC, transport demands will return to projected levels. In addition, the normalising of work from home opportunities will have an impact that aligns with the longer-term aspirations for reduced travel demand. Given the long-term nature of this DBC, no specific changes to land use and travel demand assumptions due to COVID-19 are considered necessary.
Climate Change	
The Climate Change Response (Zero Carbon) Amendment Act 2019 supports the contribution to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5-degree Celsius pre-industrial levels. In addition, it allows New Zealand to prepare for, and adapt to, the effects of climate change. Toitū Te Taiao – Waka Kotahi Sustainability Action Plan sets out the environmental sustainability and public health commitments for the land transport sector. This has a long-term outcome of net zero land transport Greenhouse gas (GHG) emissions by 2050. Te Tāruke-ā-Tāwhiri – Auckland’s Climate Plan has a target to reduce the region’s transport emissions by 64 percent by 2030. This will require future facilities to be highly efficient and emit fewer emissions. The Transport Emission Reduction Pathway (TERP) lays out the steps to get there.	The South IBC was built on the premise of: Transport and land use integration - to provide a transport network supporting land use development and good urban form. Prioritising mode choice – specifically focusing on rapid transit, improved public transport reliability and services and creation of a well-connected active modes network. The result is a recommended transport system that actively reduces the reliance on private vehicles and shifts trips to low carbon alternatives. This is one of the key levers identified to mitigate transport-based emissions. Land use integration and mode choice is at the centre of this DBC with the outcome sought to influence and reduce vehicle demand through providing for a high-quality public transport network.
Transport Emission Reduction Plan New Zealand’s emission reduction plan, setting the direction for the next 15 years. One of the key actions	As mentioned above, mode choice is at the core of this DBC. The project directly responds to the key transformation area of ‘Reduce reliance on cars and support people to walk, cycle and use public transport’

is to reduce reliance on cars and support people to walk, cycle and use public transport. This will target a reduction in total kilometres traveling by light fleet by 20% by 2035 through improved urban form and providing better travel options. The TERP sets out how Auckland will reach the regional 64% reduction by 2030.	through providing for bus priority and active mode facilities. This will lead to an increase in the performance and attractiveness of public transport and thus increase public transport patronage.
Policy and strategic alignment	
Plan Change 78: Intensification The proposed plan change responds to the NPS-UD and MDRS to enable greater intensification. This is currently open for submission at the time of writing.	As mentioned above, the DBC has considered both the NPS-UD and the MDRS especially during the optioneering process. Thus, in line with the proposed plan change.
Growth and Land Use	
Assumptions and uncertainties Changes in land use forecast assumptions updated to be consistent with the regional model Uncertainties in the land use and growth in the area especially in the FUZ areas Draft of the Future Development Strategy (FDS) has recommended the removal of the Takaanini and Ōpaheke-Drury FUZ.	The DBC considers changes in the land use assumptions and utilises the most current land use assumptions available. Since the completion of the IBC, there has been updates to the growth scenarios used for the Auckland area which is reflected in this DBC. The version i11.6 used is consistent with the regional modelling and no significant changes have been identified when compared with the previous version i11.4 used in the IBC. The Takaanini growth area is staged to be development ready in the second half of decade three (2043-2047) in FULSS. In addition, the FULSS has identified there are flooding and geotechnical challenges for the area that requires further investigation. As such, given the long-term nature of this DBC, these uncertainties could change the forecast and predictions in growth and how it occurs. There is further uncertainty given the draft FDS proposing the removal of the Takaanini FUZ. These has been considered and taken into consideration as part of the optioneering process.
Transport Projects	
Changes to the IBC South indicative transport network: • SH1 FTN • Mill Road	Since the completion of the IBC, the south indicative transport network has had changes. This includes the SH1 FTN where special vehicle lanes are currently being investigated instead. Its final form and function is currently unknown. Mill Road has been rescoped under NZUP and will deliver a two-lane corridor focussed on safety improvements by 2028 instead of four lanes. The changes to these two projects will have networkwide implications that have been considered as part of this DBC when considering the options.
Great South Road Corridor Single Stage Business Cases (SSBC) Two separate SSBCs are being completed for the Great South Road corridor as part of Connected Communities, namely for the north and the south.	There are overlaps between this DBC and the Great South Road Corridor SSBCs currently being undertaken. This DBC will give consideration to the preferred option from the SSBCs to ensure there is alignment.

5 Investment Case

At the IBC phase, problem statements, benefits and investment objectives (PBIOS) were identified for the South growth area.

The South IBC identified key issues that will occur due to the growth in the South and the inability of the transport network to cope. These issues were consolidated into two main problems relating to capacity and integration and route protection. These issues include:

- A mismatch between local jobs to the skills of the people living in the area and population increases demand for commuter travel outside of the South area. This is further exacerbated by the imbalance between the number of households and jobs available.
- Limited mode choice in the South reinforces private car use.
- Strategic network resilience risk associated with two main strategic routes, SH1 and NIMT. Over-reliance on these connections compromises its ability to efficiently move people and goods.
- Poorly integrated land use limits opportunities to positively contribute to the liveability, quality urban environment and compromise the land use outcomes sought.
- Transport and policy outcomes are not achieved, i.e. mode shift away from private vehicles towards low carbon modes.
- South Auckland's growth potential is limited.

At the commencement of this DBC, six investment areas (access, integration, travel choice, resilience, safety and climate change) were carefully considered to maximise land use and transport integration to align with the Ministry of Transport (MoT) Transport Outcomes Framework and the GPS 2021. As part of this process, the problem statements were developed to reflect the changes since the IBC and the focus of this business case.

The investment case for each project within this DBC is presented separately in the following sections. It is noted that the projects within this DBC are not directly dependent or linked to each other, they are however important as they complete the overall South network as identified in the IBC. Together, they have the potential to reap the full benefits of an integrated and connected transport system for the South.

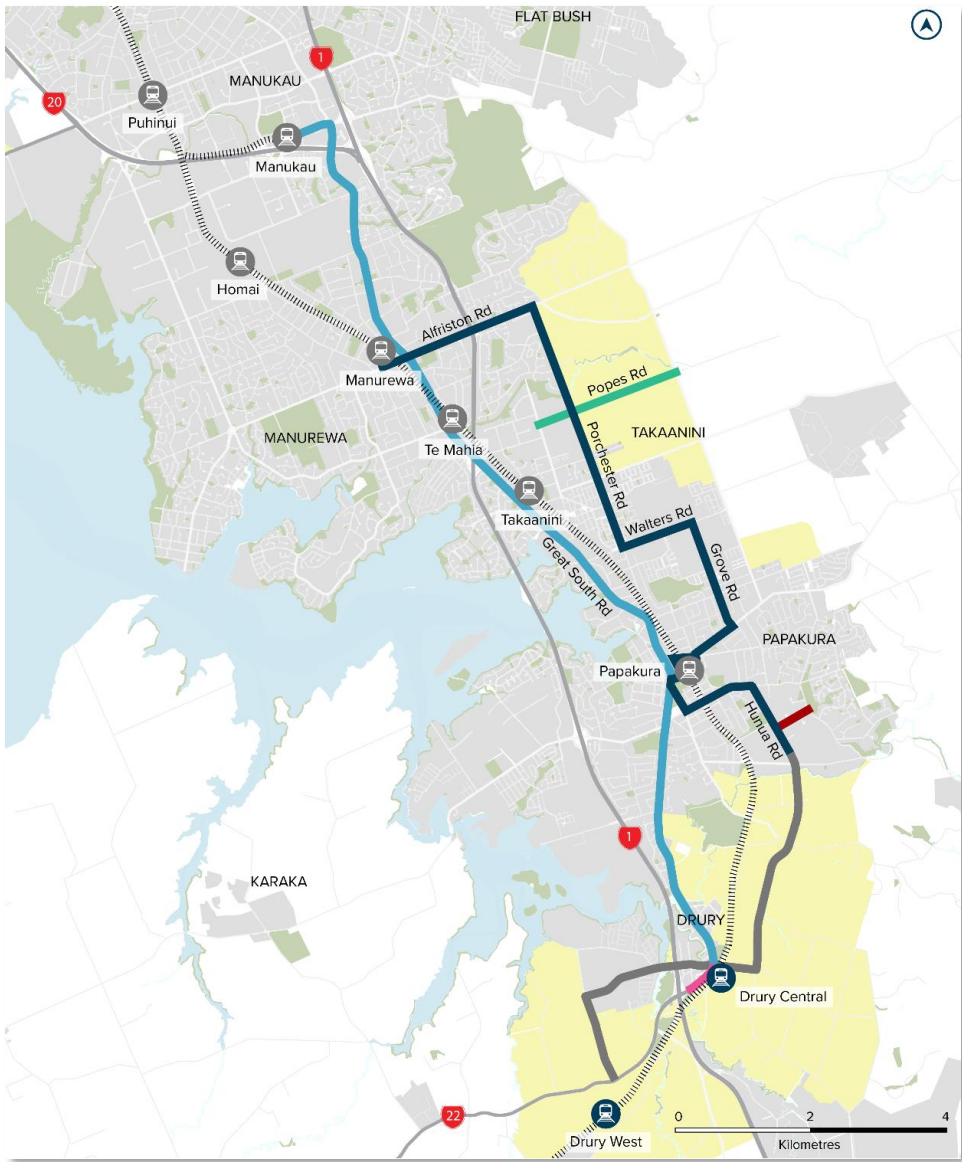


Great South Road and Takaanini FTN

Strategic Case

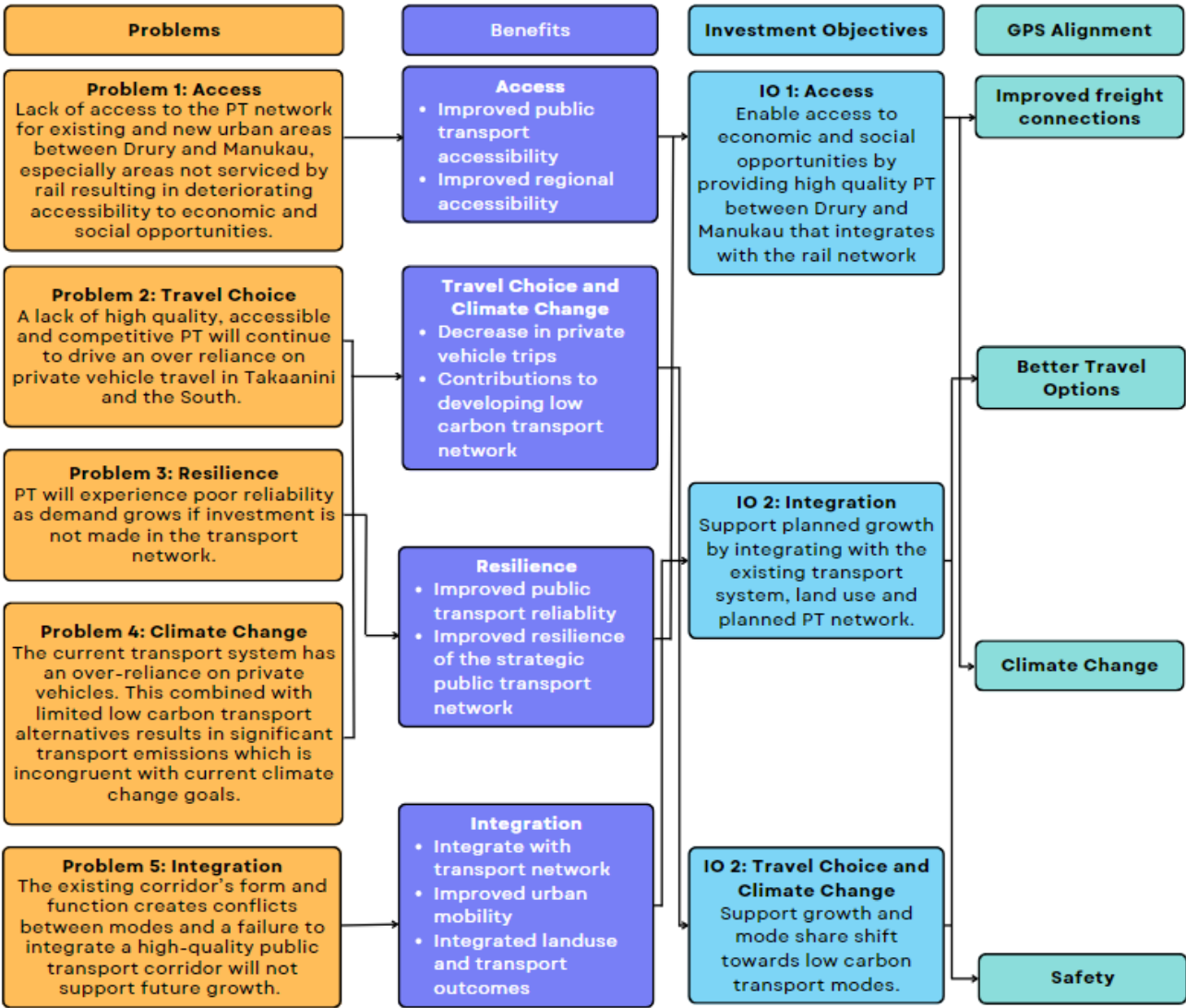
STRATEGIC CASE: GSR and Takaanini FTN

Two frequent transit networks route on Great South Road and through Takaanini to support the rail network



Project Background & Existing Environment

- The Great South Road FTN is an end-to-end service running from Drury Central Station through to Manukau. Majority of the corridor is within an existing built-up environment which could undergo further intensification. A frequent service currently runs along here, however it currently experiences low reliability and is under utilised.
- The Takaanini FTN will run between the Drury West Station through to Manurewa Station. It will provide a frequent service for the community east of the rail line and the Drury community. Part of this route will traverse through built-up environment.



Project Specific Benefits

- A public transport network that is reliable, attractive and enables greater economic and social opportunities.
- Support the rail network providing additional public transport resilience and travel choice.
- Provision of walking and cycling facilities contributes to a low carbon transport network encouraging mode shift and uptake.
- Integration with the transport network and land use that will enable the planned growth and urban mobility encouraging a connected and prosperous community.

STRATEGIC CASE: GSR and Takaanini FTN

PROBLEM 1: ACCESS

“Lack of access to the PT network for existing and new urban areas between Drury and Manukau, especially areas not serviced by rail resulting in deteriorating accessibility to economic and social opportunities. “

Evidence

This problem focuses on the lack of access to the PT network which consequently leads to limited access to economic and social opportunities. The main cause is missing transport connections to key destinations especially for areas outside of the catchment for rail.

Fig 1 shows the walking catchment areas for the existing rail and frequent bus service at 800m and 400m, respectively. As indicated, the existing services are within the built-up brownfield areas and there are areas especially in new urban areas where there is a lack of access to these networks. Ultimately, this will limit the access to employment and social opportunities by public transport within a reasonable and accepted travel time of 45mins .

Fig 2 shows access to employment from the Takaanini FUZ and Takaanini Town Centre area during the morning peak period with the current planned AT network in 2048. This includes a new connector service through the FUZ area to the Manurewa and Takaanini train stations. This shows:

- Employment access within 45 minutes by public transport during this time for the FUZ residents is limited to the areas of Manukau, Manurewa and Papakura.
- This expands to a much greater area to Papatoetoe in the north and to Drury in the south from Takaanini Town Centre where there is access to a rail station.

Accessibility to social opportunities will be further limited for residents of the FUZ area outside of the peak periods, where the frequency and number of services decreases.

Thus, as expected, areas that have greater access to the rail network and/ or a frequent bus service have greater accessibility as indicated by the accessibility plot from the Takaanini Town Centre. Within 60 minutes by public transport, someone could reach as far as the CBD as opposed to someone from the FUZ area that will still remain within the South. This also highlights the importance of providing for PT through areas that are not serviced by rail as without the proposed connector service through the FUZ area, accessibility will be even worse by public transport.

In addition, the 2018 Census data indicates the top destinations for work or school for those living in Takaanini is Manukau Central, Wiri West, East Tamaki, Penrose and the Auckland Airport. As shown above, areas not well serviced by rail will take over 45 minutes to reach these areas with the exception of Manukau Central restricting access to employment opportunities.

Furthermore, the social deprivation index shown in **Fig 3** indicates there is socioeconomic inequality between the communities within the project extent. The majority of the communities experiences higher levels of deprivation (indicated by the low social deprivation score). Generally, those that live in deprived areas have limited access to a vehicle, thus have limited access to health care, employment and other social opportunities. Other travel options such as a high-quality public transport network, therefore, becomes crucial to enhance accessibility and consequently wellbeing for those in the community.

What if we do nothing?

- Access to social and economic opportunities will be compromised.
- Continued lack of travel choice which will necessitate driving leading to other consequences including that of congestion and emissions.

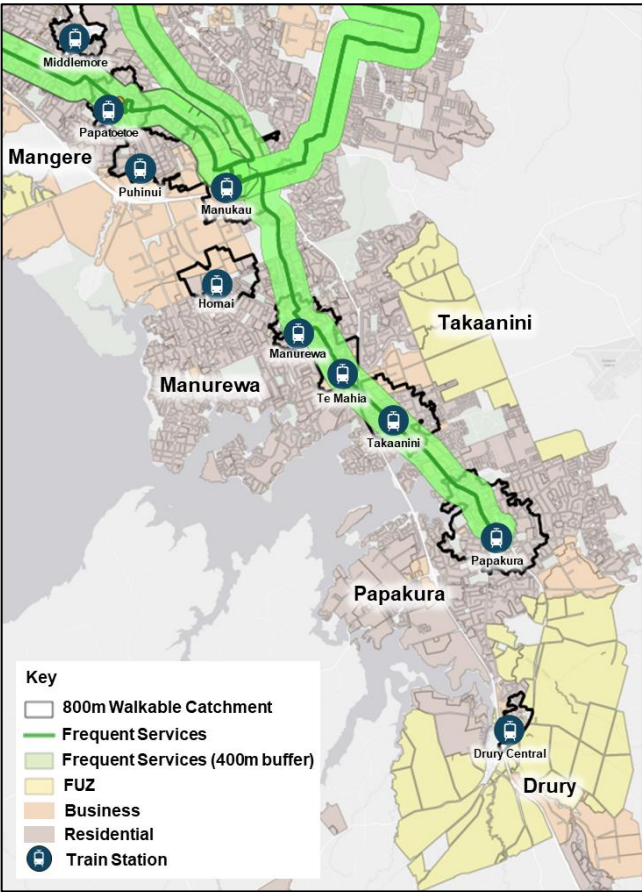


Fig 1 – Catchment area for existing rail and frequent bus services

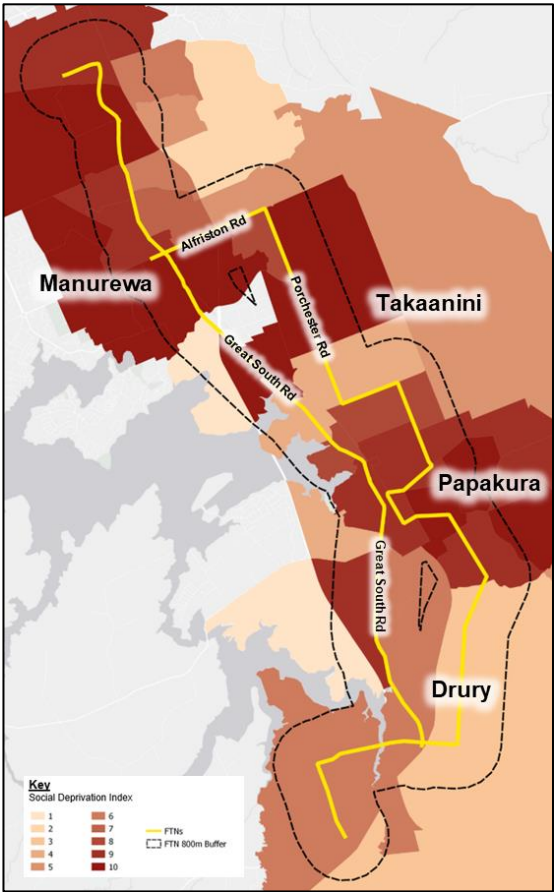


Fig 3 - 2018 Census Deprivation Data

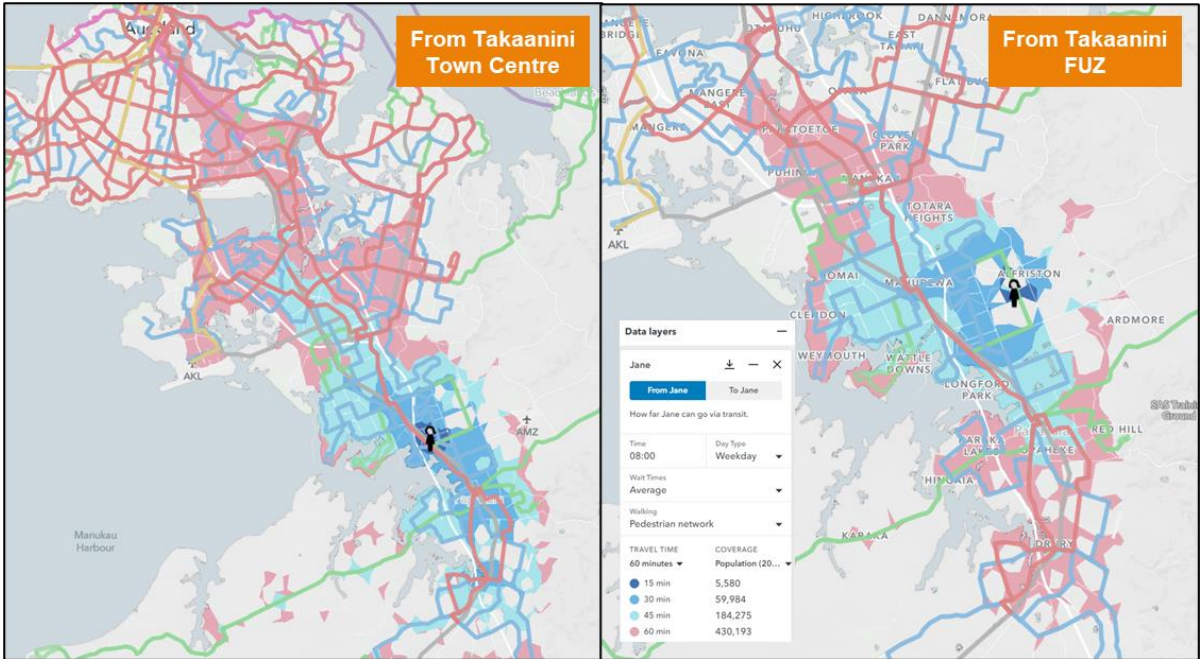


Fig 2 – Public transport accessibility in 45 mins in the morning peak period from Takaanini FUZ and Takaanini Town Centre in 2048 with the current proposed network

STRATEGIC CASE: GSR and Takaanini FTN

PROBLEM 2: TRAVEL CHOICE

“A lack of high quality, accessible and competitive PT will continue to drive an over reliance on private vehicle travel in Takaanini and the South. ”

Evidence

There is currently a lack of bus priority measures along the corridors in the South including that of Great South Road. As shown in **Fig 1**, there are limited bus priority measures such as special vehicle lanes even along corridors with frequent services. As such, the lack of provisions forces buses to merge and compete with other vehicles for road space and consequently leads to poor travel times and reliability.

AT’s Network Operating Plan (NOP) sets out the strategic intent of how the roads and streets should operate for the different modes to provide for the movement of people, goods and services. For a frequent transit network, the aspirational user experience or Level of Service (LOS) is B or C. This is measured through the travel speed/ delay and/or the travel time reliability . **Fig 4** shows the existing LOS along Great South Road which shows there are sections that experiences high congestion and poor performance with LOS at D to F.

This shows the current performance is well below the desired LOS for the network influencing the quality and attractiveness of buses. This issue will only be exacerbated further with the expected growth and increased intensification. In addition, modelled travel time (**Fig 2**) indicates travel by public transport along Great South Road is up to 81% slower than driving during the peak periods. This further contributes to the lack of attractiveness of using public transport for travel.

This inevitably leads to an over reliance on private vehicle use which is reflected in the 2018 journey to work census data. **Fig 3** shows a sample of communities east of the rail in the South. This indicates:

- The most dominant mode of transport is by car either as a driver or passenger, at 75% or more for all three areas.
- There is low public transport mode share at only up to 12% with buses making up only 4% all travel.

This is also reflected in the low bus patronage on Great South Road. Data for November 2022 indicates current patronage is well below the seated capacity with occupancy sitting below 50% along most of the route during peak periods.

What if we do nothing?

Failure to prioritise provisions for public transport will continue to drive an over reliance on vehicle use and limit travel choices for the community. In addition, the lack of long-term sustainable transport choice will be detrimental to the climate change objectives set out within the GPS where increased emissions may be expected with more vehicles on the road.

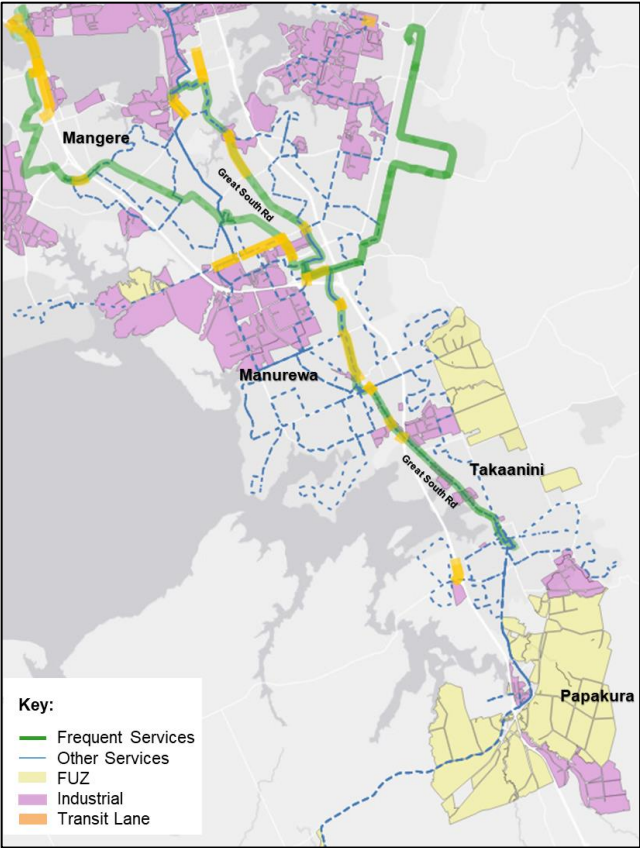


Fig 1 – Existing transit lane and bus routes¹

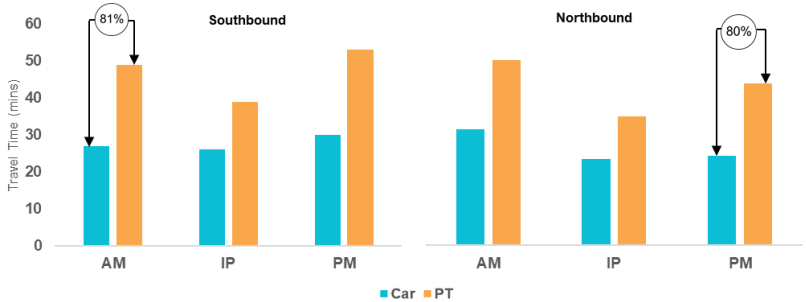


Fig 2 – 2018 Modelled travel time for Great South Road between Drury and Manukau for car and public transport²

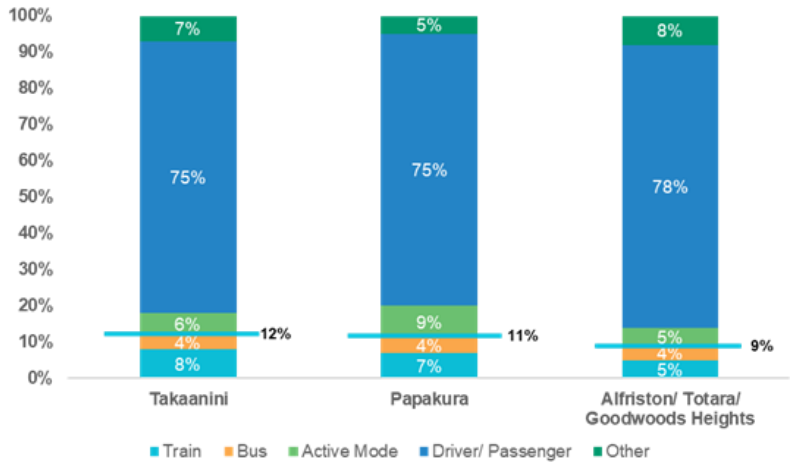


Fig 3 – 2018 Census mode share data

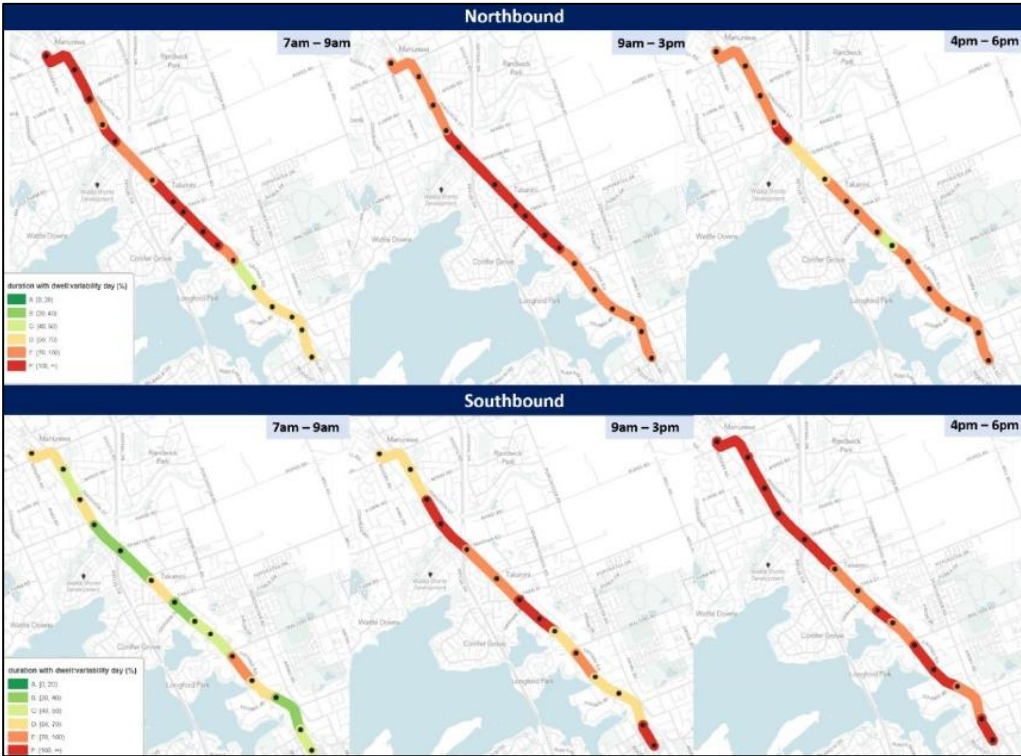


Fig 4 – Great South Road LOS (Source: GSR South Technical Report)

¹Bus route and transit information opened from AT GIS Open Data Source.
² MSM Model data

STRATEGIC CASE: GSR and Takaanini FTN

PROBLEM 3: RESILIENCE

“Public transport will experience poor reliability as demand grows if investment is not made in the transport network. ”

Evidence

Growth in and around the South will increase demand for all modes of travel. Vehicles and buses will experience congestion in the network especially during the peak periods. This coupled with the lack of priority for public transport and missing travel links as noted through Problems 1 and 2 will result in poor travel time reliability and susceptibility to network incidents.

As noted in Problem 2 above, the existing public transport already experiences poor reliability. This has also been identified under Future Connect where sections of Great South Road and Alfriston Road experiences LOS F either in speed or reliability (**Fig 1**). This will only get worse with growth as more vehicles compete for road space.

Fig 2 shows based on the predicted growth, an increase of up to 7 min in travel time in 2048+ for public transport along Great South Road between Drury and Manukau is expected even with the proposed transport network in the South (the ‘Do Minimum’ scenario for assessment purposes).

Fig 3 shows the expected congestion on the South network during the peak commuter peak periods for the 2048+ growth ‘Do Minimum’ scenario. As depicted in red and black, in both peak periods, there are areas that experience high levels of congestion. These are key arterial corridors which are vital in the efficient movement of people and is of importance for public transport. At over 80% vehicle to capacity ratio, the network will be impacted significantly by any disruptions such as breakdowns or accidents. This will have a flow on effect that will permeate through to the whole network and any public transport travelling along these corridors will be at risk of poor travel time reliability.

Additionally, the uncertainty of Mill Road could mean the role of Great South Road and Porchester Road becomes more significant as there are limited north-south corridors in the South (refer to Section 2.3) and more traffic is diverted onto these corridors. As a result, public transport reliability could be impacted with the increased traffic volume.

Furthermore, as growth occurs, demand for rail will also increase. **Fig 4** shows the modelled rail demand in 2048+ if four-tracking does not occur. It shows demand will exceed the seated capacity reducing its attractiveness and reliability. As such, increased public transport resilience is required which will support the rail and provide the community more choices.

What if we do nothing?

- All motorists will experience poor reliability, resilience, and productivity
- Increased user frustration and decrease in customer satisfaction for all users
- Loss in opportunity that will enable a shift towards low carbon transport modes

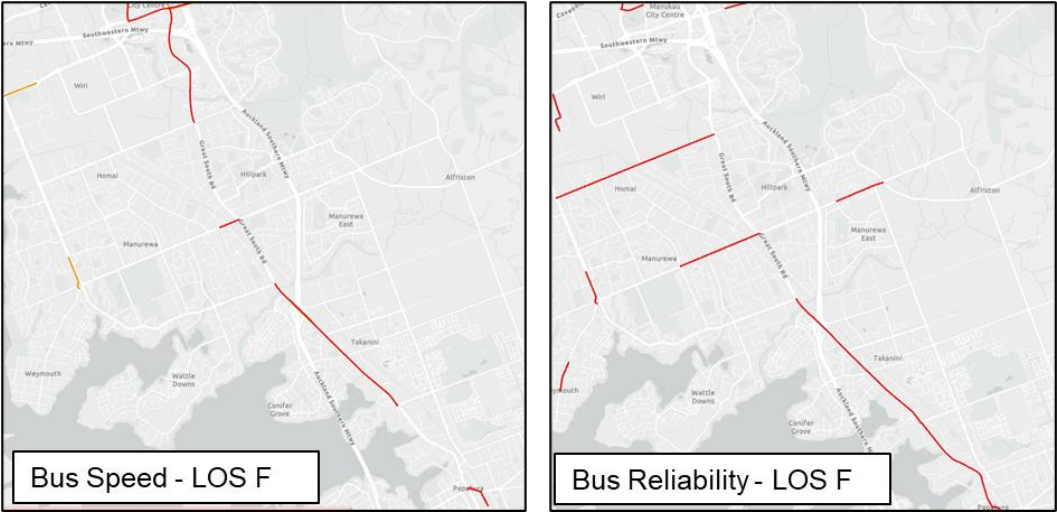


Fig 1 – Bus Travel Speed and Reliability Level of Service (Source: Future Connect)

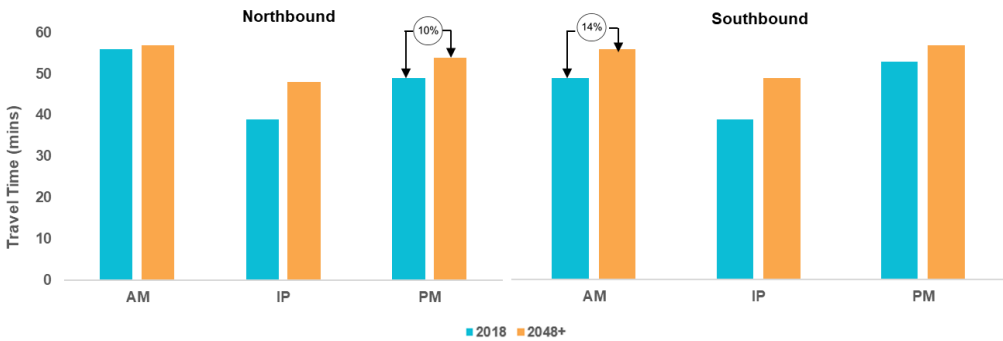


Fig 2 – Bus Travel Speed and Reliability Level of Service (Source: Future Connect)

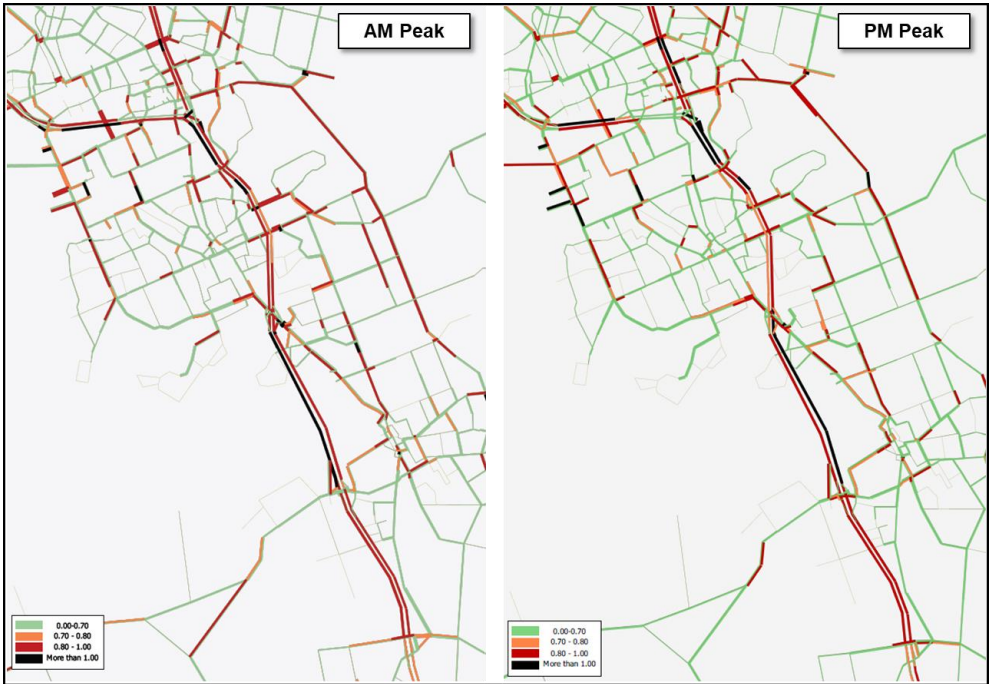


Fig 3 – Do Min 2048+ V/S Ratio Plots

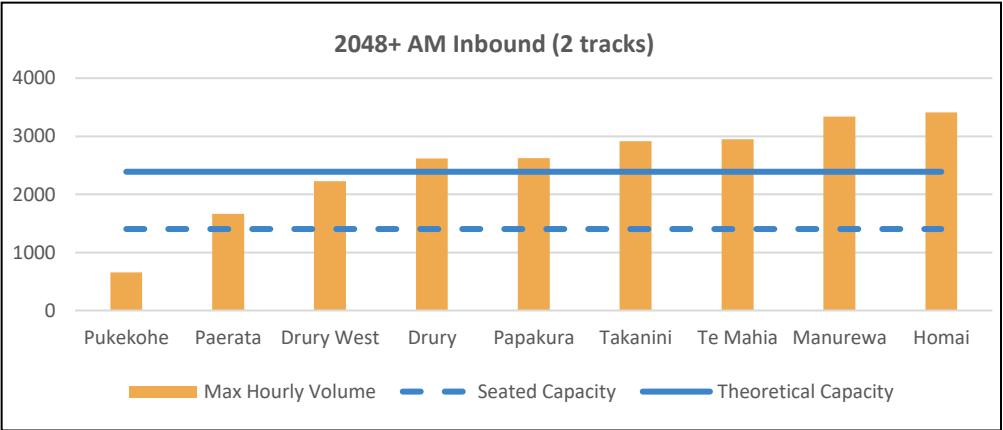


Fig 4 – Rail Capacity Vs Demand (Modelled Data)

**Theoretical capacity influences the ‘attractiveness’ of the service in the model which has an impact on the travel time by rail . Note that the model doesn’t limit the amount of passengers able to take train hence the volume shown exceeds the capacity.*

STRATEGIC CASE: GSR and Takaanini FTN

PROBLEM 4: CLIMATE CHANGE

The current transport system has an over-reliance on private vehicles. This combined with limited low carbon transport alternatives results in significant transport emissions which is incongruent with current climate change goals.”

Evidence

This problem is intertwined with Problem 2 which discusses in detail the existing over-reliance on private vehicle use caused by the lack of high-quality public transport. To intensify this further is the limited low carbon transport choices available such as, that of cycling.

The existing cycle network is fragmented and often does not provide direct connection between key destinations such as, a rail station. This is depicted in Fig 1 where there is no cycle connection to the Takaanini, Te Mahia and Papakura train stations except along Great South Road. As such, this makes cycling unattractive for commuting purposes.

In addition to the above, the anticipated growth in the south is expected to increase the vehicles kilometres travelled as per that shown in Fig 2. The increase in VKT does not necessarily mean that there will be an increase in the carbon dioxide emissions due to the vehicle fleet being electrified. It does however indicate there is still a great reliance on vehicle use and if the fleet does not electrify as fast as anticipated then it will be counterproductive towards the climate change goals. Thus, alternative modes need to be provided to supplement the current transport network in the South as there is minimal incentive for future residents to choose to cycle or use public transport for work or social purposes.

Further, given the low socio-economic community, there is an opportunity now to provide an affordable sustainable alternative travel choice. E-scooters and E-bikes are generally less costly than a private vehicle and presents a much lower physical barrier than a bike but allows the user the convenience to go much further.

What if we do nothing?

Therefore, the inability to fund and prioritise low carbon transport modes will result in consequential transport emissions, missed opportunities to provide for healthier communities and promote sustainable travel. This is inconsistent with the climate change directives set out.

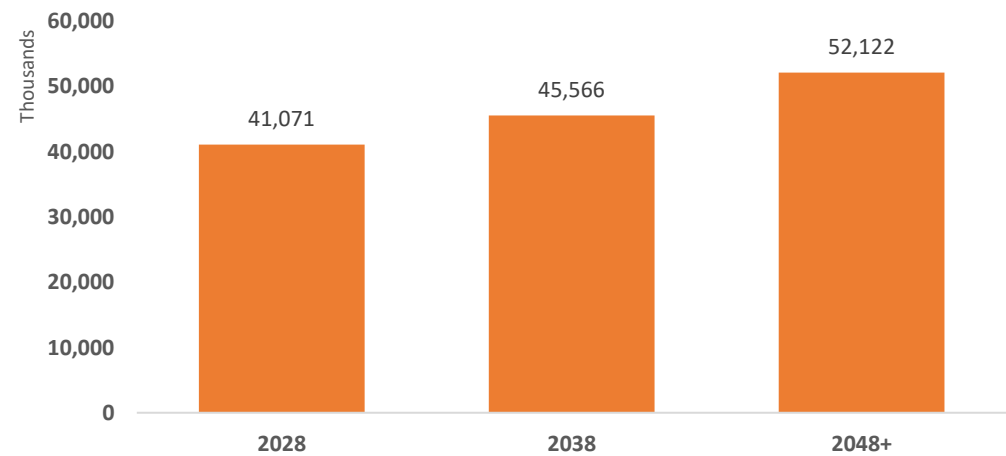


Fig 2 – VKT in the Auckland Region

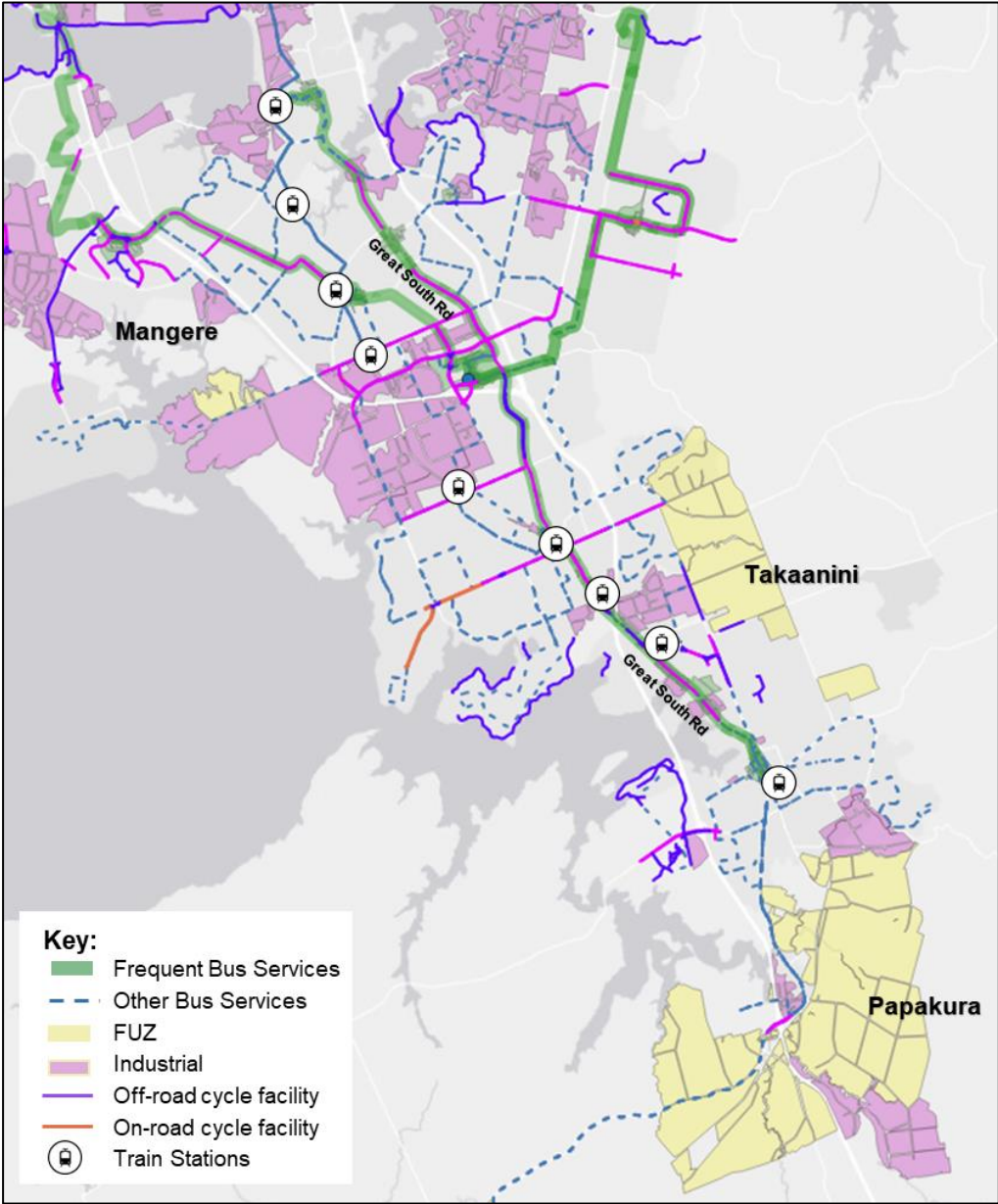


Fig 1 – Existing bus and cycle network in the South

STRATEGIC CASE: GSR and Takaanini FTN

PROBLEM 5: INTEGRATION

“The existing corridor’s form and function create conflicts between modes and a failure to integrate a high-quality public transport corridor will not support future growth.”

Evidence

The above problems evidence the need for investment for a high-quality public transport corridor. However, there lies challenges within the existing corridors where there is limited space and competing modes.

The existing Great South Road is classified under Future Connect as a primary arterial, frequent transit network and a regional cycle route. The surrounding land use varies from residential to Town Centres (see **Fig 1**) including the Takaanini Town centre which is characterised by on-street car parking and commercial accesses.

This has led to competing modal priorities and the right solution within the existing corridor which have meant provision for bus priority for efficient movement has been difficult to implement through certain sections. An example is shown in **Fig 2** which shows provision for dedicated cycle facilities in both directions, car parking and general traffic lanes. To support a high-quality bus service (either bus lanes, indented bus stops, and/or priority at intersections) will mean either changes to the existing road cross-section, e.g. removal of parking, changes to lane widths and/or removal of the median or require property purchase to widen the corridor.

Thus, integration between land use and the transport network must be considered as we plan for the future growth while the opportunity presents itself especially through the future growth areas. Otherwise, the challenges seen along Great South Road will surface resulting in poor urban outcomes. Arguably, the majority of the Great South Road corridor within the scope of this project is in the brownfield as depicted in Problem 1 and therefore the opportunity to prevent development that could otherwise preclude the required transport infrastructure is already lost. However, this is not to say changes are not needed or that route protection should not occur. As demonstrated by the above problem statements, the current frequent bus service running along Great South Road experiences poor reliability and inherently leads to other consequences such as limited access and over reliance on private vehicles. Further intensification can occur especially given the recent changes of the MDRS as well as Plan Change 78. Without integrating a high-quality public transport while the opportunity presents itself will lead to poor mode shift and climate change outcomes.

Buses have the ability to move people in a sustainable and space efficient way where one bus can take 33 cars off the road. A high-quality bus corridor has the potential to transport 10,000 people per hour, per direction . Thus, integrating a high-quality public transport corridor will support the future growth and drive the behaviour change sought as intensification occurs.

What if we do nothing?

- Accessibility for the existing and future communities in the South is compromised
- Urban environment and urban form is compromised
- Movement of people and goods continues to be impeded

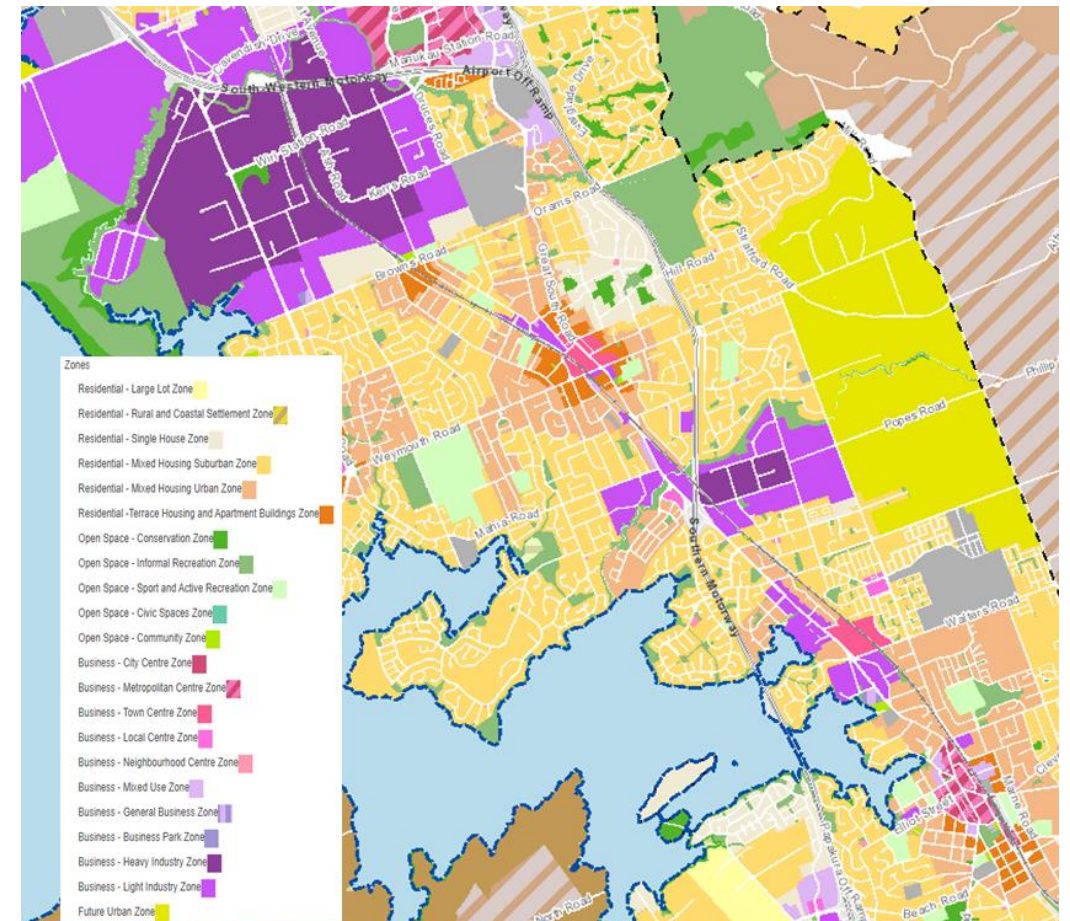


Fig 1 – Land use in the South



Fig 2 – Example of competing modes - 317 Great South Road (Source: Google Maps)



Popes Road

Strategic Case

STRATEGIC CASE: POPES ROAD UPGRADE

Urbanisation and upgrade of Popes Road to provide primary walking and cycling facilities as the area develops



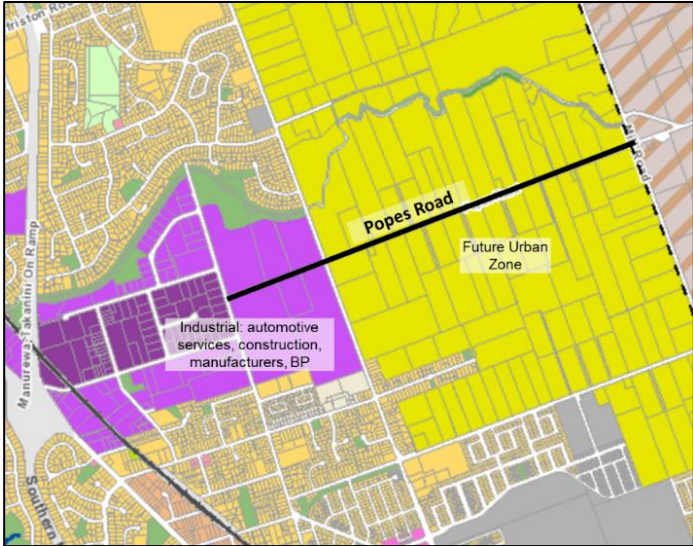
No footpaths and no dedicated cycling facility



From 2,000 vehicles today to an estimated 6,000 - 16,000 vehicles per day in the future.



Currently, the industrial section is part of the Overdimension route. This will be elevated to Level 2 and the section in the FUZ will be Level 3 indicating its increased significance in the future.

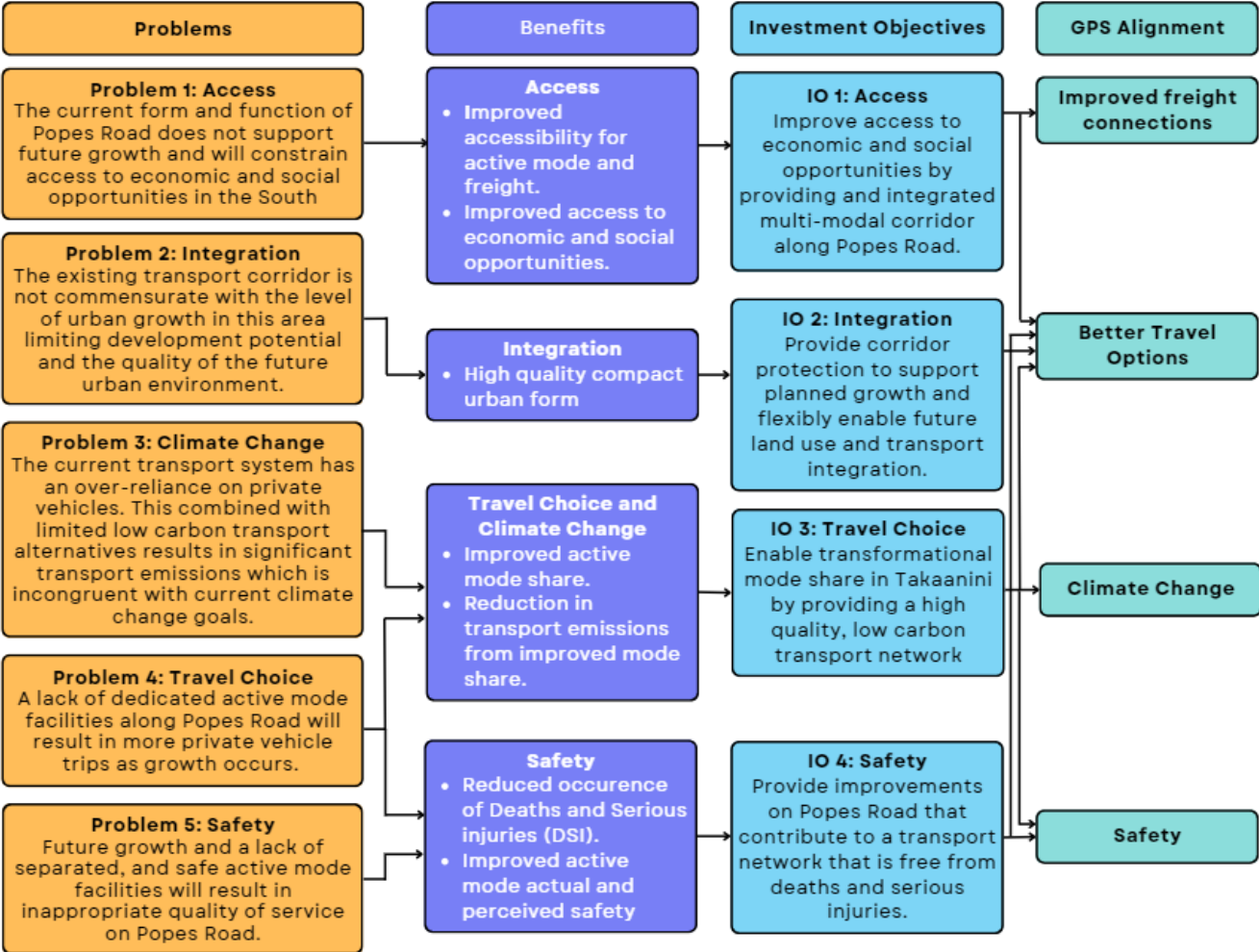


Project Background & Existing Environment

- Popes Road was identified as an extension of the Rangī Road viaduct as part of the IBC. This was seen as a key east-west and industrial connection to the north-south Mill Road strategic arterial. The Rangī Road viaduct will no longer be part of the network as identified through the Takaanini Level Crossings DBC.
- The corridor forms an east-west connection for all modes between Mill Road and Takaanini School Road. It remains a key freight connection to the industrial area.
- The corridor is currently rural in nature with a single lane in both directions. There is no active modes facilities along the length of the corridor.
- Posted speed limit is currently 60km/hr through the industrial section and changes to 80km/hr through the FUZ section to Mill Road.

Project Specific Benefits

- Improved accessibility for active mode users from the FUZ, encouraging active mode uptake. In particular, for residents from the FUZ travelling to the businesses within the industrial zone as well as key rail stations.
- Contributes to improved active mode safety outcomes along the corridor, particularly for vulnerable users.
- Better integration with the industrial area and proposed land use will create a less hostile environment for active mode users.



Industrial Section



FUZ Section



Key Considerations

- There is uncertainty surrounding the proposed Takaanini FUZ area. The recently released draft Future Development Strategy (FDZ) suggests this could be downzoned. This needs to be considered in the future during implementation as it will impact the corridor's form and function.
- Land use changes significantly along the corridor, the land use along the western section is an existing industrial zone. This changes to rural land use west of Porchester Road which runs through the Takaanini FUZ. The two sections are illustrated above.

STRATEGIC CASE: POPES ROAD UPGRADE



ACCESS

The current form and function of Popes Road does not support future growth and will constrain access to economics and social opportunities in Takaanini

Evidence

- There are no active mode facilities along the length of the corridor.
- Rural high-speed (speed limit of 80km/hr) nature of the corridor does not encourage active mode uptake.
- One of the main east-west connections between Mill Road and Porchester Road (strategic arterials) servicing the FUZ.

What if we do nothing?

- There remains no active mode facilities and do not support low carbon access. This includes public transport where the lack of facilities to access bus stops will limit its use when services are provided for as the area develops.
- The above limits access for residents in the FUZ to access social and economic opportunities such as the businesses with the industrial area.
- Continued reliance on private vehicles for short and long trips.
- Poor urban form outcomes.

SAFETY

Future growth and a lack of separated, and safe active mode facilities will result in inappropriate quality of service on Popes Road.

Evidence

- Currently there are no dedicated active mode facilities on Popes Road, meeting none of the key criteria for quality-of-service measurements.
- **1 fatal crash** involving a pedestrian have occurred on Popes Road between 2018 and 2022.
- Four serious injury crashes and 10 minor injury crashes have occurred in the same period with a large proportion occurring at the intersection of Porchester Road/ Popes Road

What if we do nothing?

- A lack of safe and dedicated active mode facilities puts cyclists and pedestrians at risk of injury as they travel along a hostile road environment.
- The intersection of Popes Road/ Porchester Road is a high-risk intersection. This will only get worse with increase in traffic volumes.
- The current personal risk rating is High along the FUZ section. This will only get worse with the expected increase in traffic volume as the risk of exposure increases.
- Active mode demand will be suppressed if no safe facilities are provided.

CLIMATE CHANGE

The current transport system has an over-reliance on private vehicles. This combined with limited low carbon transport alternatives results in significant transport emissions which is incongruent with current climate change goals.

Evidence

- Currently, 75% of Takaanini residents use a private vehicle to travel to work based on 2018 Census survey. There are currently no bus routes and no active mode facilities on Popes Road to support alternative modes of transport and support emissions reductions.

What if we do nothing?

- If no viable low carbon transport alternatives are provided, the trend of private vehicle use will continue in the future further increasing the Vehicle Kilometres Travelled (VKTs) and potential increase in carbon emissions.

TRAVEL CHOICE

A lack of dedicated active mode facilities along Popes Road will result in more private vehicle trips as growth occurs.

Evidence

- Popes Road is within the cycling catchment to the Takaanini Industrial employment zone and runs through the middle of the Takaanini FUZ. Thus, in a prime location to support active mode uptake.
- Currently no provisions for active modes along the length of the corridor.
- As a multi modal corridor, the corridor currently offers limited mode choice for travellers.

What if we do nothing?

- According to research, the key factors in promoting cycling to work are enhancing safety measures, expanding cycling infrastructure, decreasing traffic congestion, and fostering considerate behaviour among motorists.
- Therefore, with no provision for active mode facilities, travel by active modes will continue to be unattractive, further encouraging travel by private vehicle.

INTEGRATION

The existing transport corridor is not commensurate with the level of urban growth in this area limiting development potential and the quality of the future urban environment.

Evidence

- There is a lack of clear and legible access along the existing corridor. Even the industrial zone with a speed limit of 60km/hr has a rural feel with swales and no footpath. This current configuration results in poor urban form and limits access to and between adjacent land uses.

What if we do nothing?

- The consequences of a lack of integration between land use and transport could contribute to increased separation, limiting safe opportunities for pedestrians and cyclists to cross safely between destinations and a sense of severance. This would be exacerbated without safe crossings at intersections and midblock crossings providing access to key destinations such as the Takaanini Industrial area.



Croskery Road

Strategic Case

STRATEGIC CASE: CROSKERY ROAD UPGRADE

Upgrade of Croskery Road between Dominion Road and Hunua Road to provide walking and cycling facilities.



No cycling facilities. Expected to be a key cycling connection in the future, categorised as a 'Major' cycle route in Future Connect



From 3,000 vehicles to 12,000 vehicles per day



Currently a Level 2 route and will remain in the future.

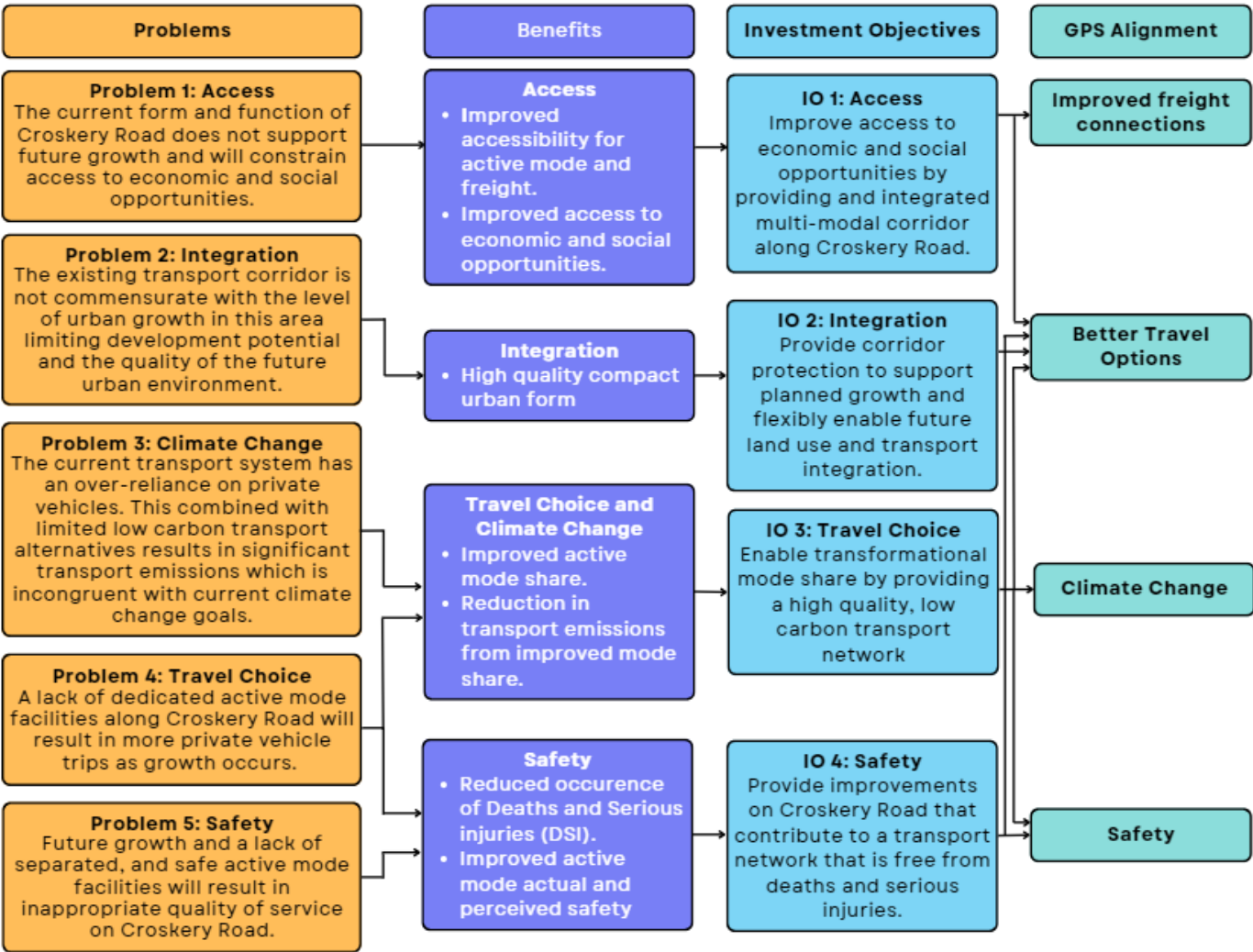


Project Background & Existing Environment

- The corridor is a key East-West connection between Hunua Road and Dominion Road. It connects to the future Mill Road via Dominion Road and the proposed Takaanini FTN corridor.
- The Drury-Opaheke structure plan indicates Croskery Road as a key route, increasing its significance and function in the future.
- Adjacent land use is primarily industrial and the speed limit is 50 km/hr.
- Currently has a single lane in each direction and foot paths on each side. No dedicated cycling facilities along the length of the corridor.

Project Specific Benefits

- Provision for cycling facilities improves accessibility for south growth areas to access the industrial area.
- Contributes to the development of a low carbon cycle network in South Auckland supporting area wide mode shift by completing a key link in the network.
- Contributes to improved active mode safety outcomes along the corridor.
- Integration with the transport network and land use will contribute to a corridor with high quality urban form.



Key Considerations

- Upgrade of the Dominion Road/ Croskery Road intersection have been excluded as it is considered the Mill Road project will decide on its final form. The Hunua Road intersection is considered as part of the FTN projects instead.
- Wetlands for stormwater treatment would result in land take, as such alternative methods are considered such as, vegetated berm/ infiltration trench within the road corridor.



Existing Croskery Road Environment

STRATEGIC CASE: CROSKERY ROAD UPGRADE



SAFETY

Future growth and a lack of separated, and safe active mode facilities will result in inappropriate quality of service on Croskery Road.

Evidence

- Currently there are no dedicated cycling facilities on Croskery Road, meeting none of the key criteria for quality-of-service measurements.
- No active mode crashes have been reported in the last five years along Croskery Road. This is reflective of the industrial nature of the corridor where there is limited attractors currently.

What if we do nothing?

- A lack of safe and dedicated active mode facilities puts cyclists and pedestrians at risk of injury as they travel along an unattractive road environment with a high percentage of heavy vehicles.
- As Croskery Road becomes more significant on the network, the increase in traffic volume and its use increases its risk exposure especially for active modes.

CLIMATE CHANGE

The current transport system has an over-reliance on private vehicles. This combined with limited low carbon transport alternatives results in significant transport emissions which is incongruent with current climate change goals.

Evidence

- Currently, over 70% of residents in the South use a private vehicle to travel to work based on the 2018 Census.
- There is currently limited options on Croskery Road to encourage alternative modes of transport and support emissions reductions.

What if we do nothing?

- If no viable low carbon transport alternatives are provided, the trend of private vehicle use will continue in the future further increasing the Vehicle Kilometres Travelled (VKTs) and potential increase in carbon emissions.

ACCESS

The current form and function of Crokery Road does not support future growth and will constrain access to economics and social opportunities.

Evidence

- There are no dedicated cycling facilities and narrow footpaths along the majority of the corridor, this is illustrated in the adjacent image of a typical section of the corridor.

What if we do nothing?

- No active mode links to support low carbon access to the area.
- Continued reliance on private vehicles for short trips.

TRAVEL CHOICE

A lack of dedicated active mode facilities along Croskery Road will result in more private vehicle trips as growth occurs.

Evidence

- Crokery Road is identified as a key part of the cycle network to connect between Mill Road and Hunua Road.
- It also lies within the industrial employment zone, thus suitable for surrounding residents to cycle to.
- Currently, cyclists are forced to travel alongside heavy vehicles and parked cars making this an unattractive option.

What if we do nothing?

- According to research, the key factors in promoting cycling to work are enhancing safety measures, expanding cycling infrastructure, decreasing traffic congestion, and fostering considerate behaviour among motorists.
- Therefore, with no provision for active mode facilities, travel by active modes will continue to be unattractive, further encouraging travel by private vehicle.

INTEGRATION

The existing transport corridor is not commensurate with the level of urban growth in this area limiting development potential and the quality of the future urban environment.

Evidence

- The current lack of active mode facilities and safe crossings along Croskery Road creates a hostile environment for active mode users, subsequently limiting access to adjacent land use and resulting in a poor urban form that will not support the level of urban growth expected in the future.

What if we do nothing?

- The consequences of a lack of integration between the planned urban growth i.e. the Opaheke-Structure Plan would limit opportunities to provide for a safe environment for increased active mode users.
- Lack of integration with planned upgrades along Hunua Road and Dominion Road would leave cyclists in a vulnerable position as they are unable to safely connect between the two strategic corridors.

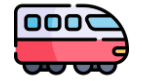


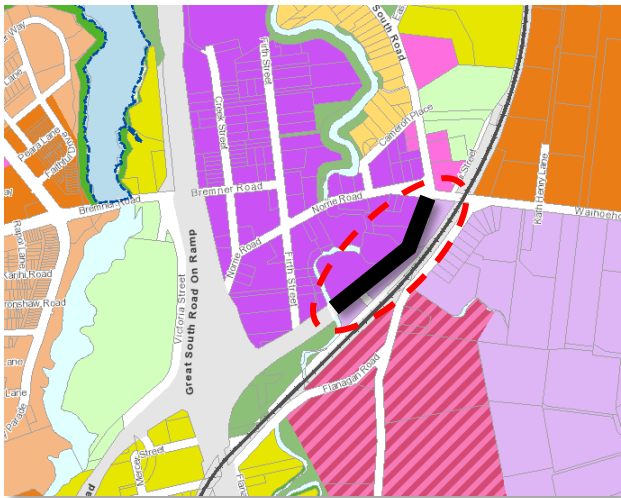
Great South Road Between Waihoehoe Road and Drury Interchange

Strategic Case

STRATEGIC CASE: GSR (Between Waihoehoe Road and Drury Interchange)

Upgrade of Great South Road between Waihoehoe Road and Drury Interchange to four lanes with active mode facilities.

-  Limited footpaths on the southern side. No cycling facilities.
-  Adjacent to the proposed Drury Central station
-  From 3,000 vehicles to 19,000 vehicles per day
-  Existing overweight/overdimension freight route

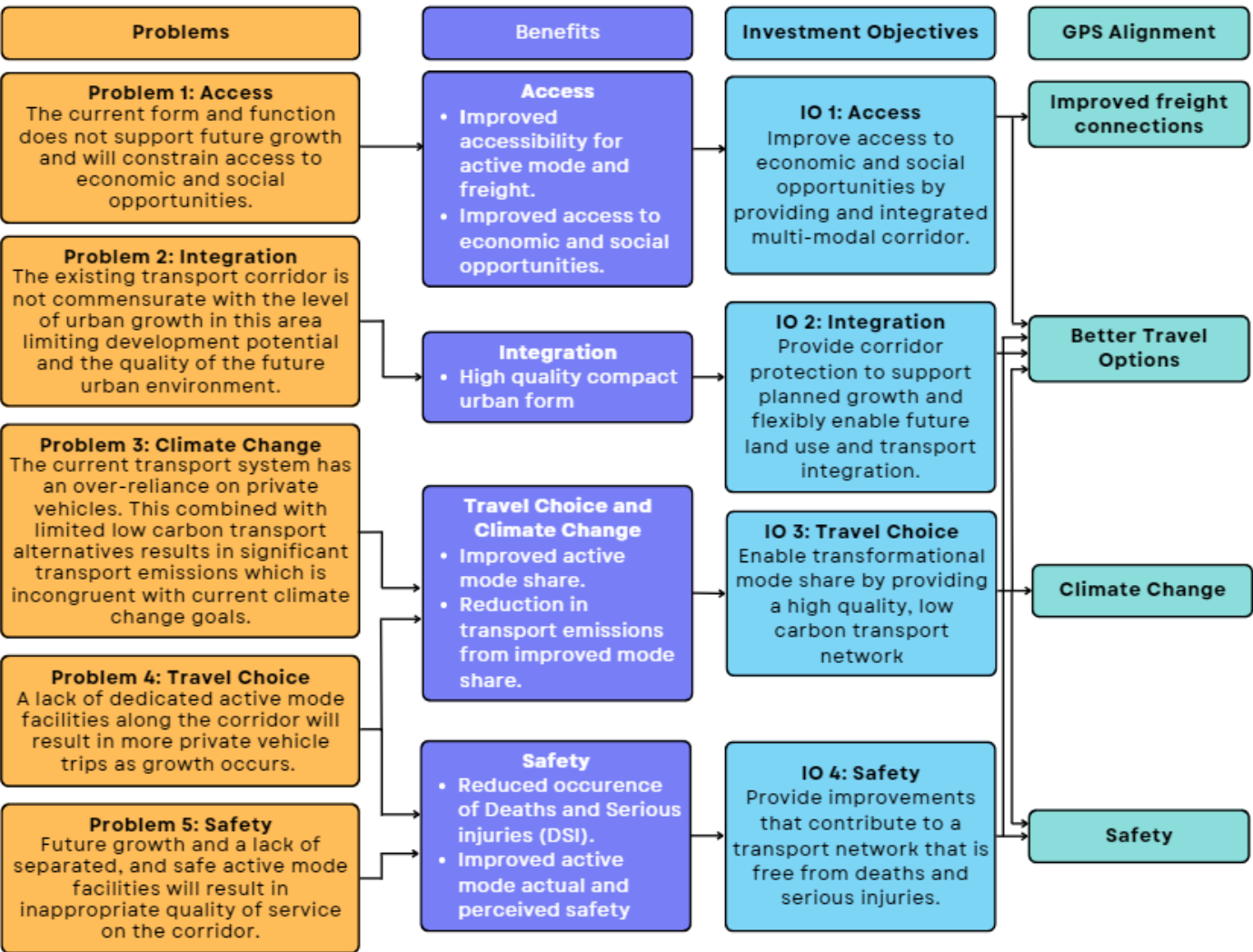


Project Background & Existing Environment

- The corridor interfaces with a number of adjoining projects including the Papakura to Drury Interchange, Drury Central Station, upgrade of the Great South Road / Waihoehoe Road intersection as part of the Drury Arterials Network. It is an important motorway access as it is a direct connection on to the Papakura to Drury interchange.
- Provides a single lane in both directions. No dedicated cycling facilities and limited footpath along the corridor.
- Posted speed limit is currently 50 km/hr and adjacent land use is primarily industrial.

Project Specific Benefits

- Provision of walking and cycling facilities improves accessibility and continuity for active mode users to social and economic opportunities around Drury.
- Contributes to the development of a low carbon network in the South and supports area wide mode shift as well as contribute to improved safety outcomes along the corridor.
- Improved access for the community by upgrading to four lanes from the existing two lanes. This provides direct access on to SH1 and has the potential to become a bottleneck on the network as growth occurs.
- Integration with the transport network and land use will contribute to a corridor with high quality urban form.



Key Considerations

- The corridor is within a built-up environment with a number of adjoining projects that are underway or planned for the future including the Drury Central Station.
- There is an existing two-lane bridge over the Hingaia Stream with narrow footpaths on the eastern side and is below the flood plains.



Constrained two-lane bridge over the Hingaia Stream

STRATEGIC CASE: GSR (Between Waihoehoe Road and Drury Interchange)



SAFETY

Future growth and a lack of separated, and safe active mode facilities will result in inappropriate quality of service on the corridor.

Evidence

- Currently there are no dedicated cycling facilities, meeting none of the key criteria for quality-of-service measurements.
- **One serious and two minor injury crashes** have occurred in the period between 2018 and 2022. One minor injury crash involved a cyclist who was struck by a vehicle.
- The existing personal and collective risk rating of the corridor is Medium High.

What if we do nothing?

- A lack of safe and dedicated active mode facilities puts cyclists and pedestrians at risk of injury as they travel along a hostile road environment.
- With greater numbers of vehicles predicted on this corridor in the future, the safety risks will only be exacerbated, particularly for active modes.

CLIMATE CHANGE

The current transport system has an over-reliance on private vehicles. This combined with limited low carbon transport alternatives results in significant transport emissions which is incongruent with current climate change goals.

Evidence

- Currently, over 70% of residents in the South use a private vehicle to travel to work based on the 2018 Census.
- There is currently limited options on the corridor to encourage alternative modes of transport and support emissions reductions.

What if we do nothing?

- If no viable low carbon transport alternatives are provided, the trend of private vehicle use will continue in the future further increasing the Vehicle Kilometres Travelled (VKTs) and potential increase in carbon emissions.

ACCESS

The current form and function of the corridor does not support future growth and will constrain access to economics and social opportunities.

Evidence

- There are limited footpaths and no dedicated cycling facilities along the corridor. This is illustrated in the adjacent image of a typical section of the corridor.
- With the expected growth in the future, the existing two-lane corridor will constrain access to economic and social activities especially as the corridor is a key direct access onto SH1.

What if we do nothing?

- Reduced people moving capacity limiting access to social and economic opportunities for those in Drury.
- Limits accessibility by active modes to the planned Drury Central Rail station. Consequently, limiting public transport uptake.

TRAVEL CHOICE

A lack of dedicated active mode facilities along the corridor will result in more private vehicle trips as growth occurs.

Evidence

- The corridor is suitable for active modes due to it being adjacent to the planned Drury Central Station.
- It currently has limited footpaths and no provisions for cyclists. As a multi modal corridor, the corridor currently offers limited mode choice for travellers. Hence, the significant percentage of residents using private vehicles to travel to work.

What if we do nothing?

- According to research, the key factors in promoting cycling to work are enhancing safety measures, expanding cycling infrastructure, decreasing traffic congestion, and fostering considerate behaviour among motorists.
- Therefore, with no provision of active mode facilities, travel by active modes will continue to be unattractive, further encouraging travel by private vehicle

INTEGRATION

The existing transport corridor is not commensurate with the level of urban growth in this area limiting development potential and the quality of the future urban environment.

Evidence

- The current lack of active mode facilities and safe crossings creates a hostile environment for active mode users, subsequently limiting access to adjacent land use such as the planned Drury Central Rail station and resulting in a poor urban form that will not support the level of urban growth expected in the future.

What if we do nothing?

- The consequences of a lack of integration between land use and transport could contribute to increased separation, reduced opportunity for pedestrians and cyclists to cross safely between destinations and a perception of severance. This would be exacerbated without crossings at intersections and midblock crossings providing access to the residential development adjacent to the corridor.
- Lack of integration with the adjoining projects would result in a lack of continuous facility leaving active mode users in a vulnerable position.

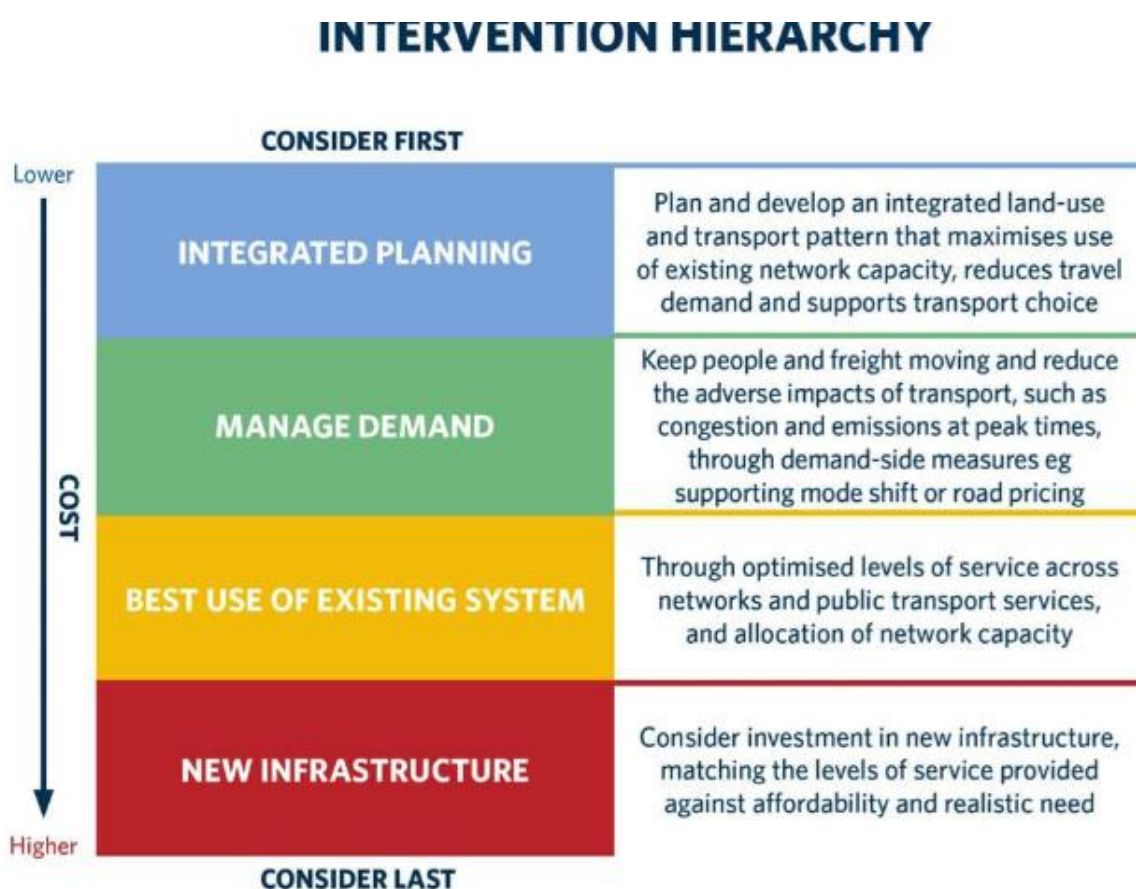
6 Guiding Principles for the South

The DBC has been shaped by a number of key principles and these have been applied throughout the identification and development of the recommended option.

The South IBC followed the intervention hierarchy as shown in **Figure 6-1** when developing the South Indicative Transport Network. This focused on integrating transport and land use first followed by managing demand and making use of the existing system. Lowest in the hierarchy was the consideration of new infrastructure. These intervention principles have been continued and built upon in the development of this DBC.

In addition to the above, the Waka Kotahi Board position on the approach to urban areas is to actively support, enable and encourage quality, mixed-use, compact urban development that efficiently uses land, reduces travel distances and lowers reliance on private vehicles to enhance people's lives.

Figure 6-1: Transport intervention hierarchy (Source: Waka Kotahi)



With the Great South Road FTN being within an existing urban environment, the optioneering process gave consideration to supporting the adjacent land use and managing demand through enabling greater rail capacity to encourage mode shift. Although new infrastructure and some areas of the corridor require widening, these have been recommended to provide a step change in transport choice and in enabling access for the community.

6.1 Te Tupu Ngātahi Urban Design Framework

The development of the DBC has relied strongly on the principles of the Te Tupu Ngātahi Urban Design Framework (UDF). This document provides measurable guidance for land use and transport integration throughout each phase of the programme delivery. The UDF takes a systems approach to how urban areas are organised and understood and pulls these apart in layers spanning history, the natural environment and the built form. The DBC has used the design principles for each of these system layers to understand how the transport networks contribute to the urban system as a whole. Each of the principles describe what ‘good looks like’ and what to aim for in the design of transport networks that contribute positively to new or planned communities, environments, corridors and the social and economic vitality of Auckland. This framework has also provided spatial definition to some of the themes such as sustainability and integration.

6.2 Land use integration

The consideration of land use integration is seen throughout the development of the PBC and IBC and is also a key consideration of this DBC. This will continue as the project moves from route protection to implementation in the future.

The land use integration that has been considered and/or discussed with relevant stakeholders such as Auckland Council, Auckland Transport and Waka Kotahi include:

- **Understanding existing and future land use** – specific discussions have occurred which delved into the potential change in land use for the Takaanini Industrial area. This is situated next to Great South Road which has a proposed FTN and is just north of the Takaanini Train Station which is ideal for transit-orient development to support intensified growth. Currently, there are no plans to change its land use and the options considered will support all land use shall any changes be considered later.
- **Uncertainty of the Takaanini FUZ area** - The Takaanini growth area is staged to be development ready in the second half of decade three (2043-2047) in FULSS. The area has also been identified to have flooding and geotechnical challenges creating uncertainty around when and if the area will be developed and whether there could be changes to the surrounding land use. The area has since been downzoned under the Draft Future Development Strategy recently released, however this is still to be confirmed. Given the risk of this eventuating is high, the DBC considers alternatives shall this eventuate.
- **Potential impacts of the NPS-UD and the MDRS** – this has the potential to change the urban form of the existing corridor which is considered as part of the optioneering process.
- **Opportunities and challenges with residual land** resulting from the proposed options especially where a new corridor is proposed.
- **Understanding potential impacts on existing facilities and assets** – considered as part of the MCA process and potential mitigation effects are considered.
- **Opportunities and complexities route protecting in the brownfield** – much of the Great South Road FTN corridor is within a built-up environment with existing infrastructure. Route protecting in such an area would be challenging and impactful. The optioneering process carefully considers this to provide a recommended option that balances the outcomes sought and the impacts identified.
- Key route refinement decisions such as impacts on competing land uses were considered. This allowed the impacts of transport infrastructure on the existing land uses to be carefully balanced.

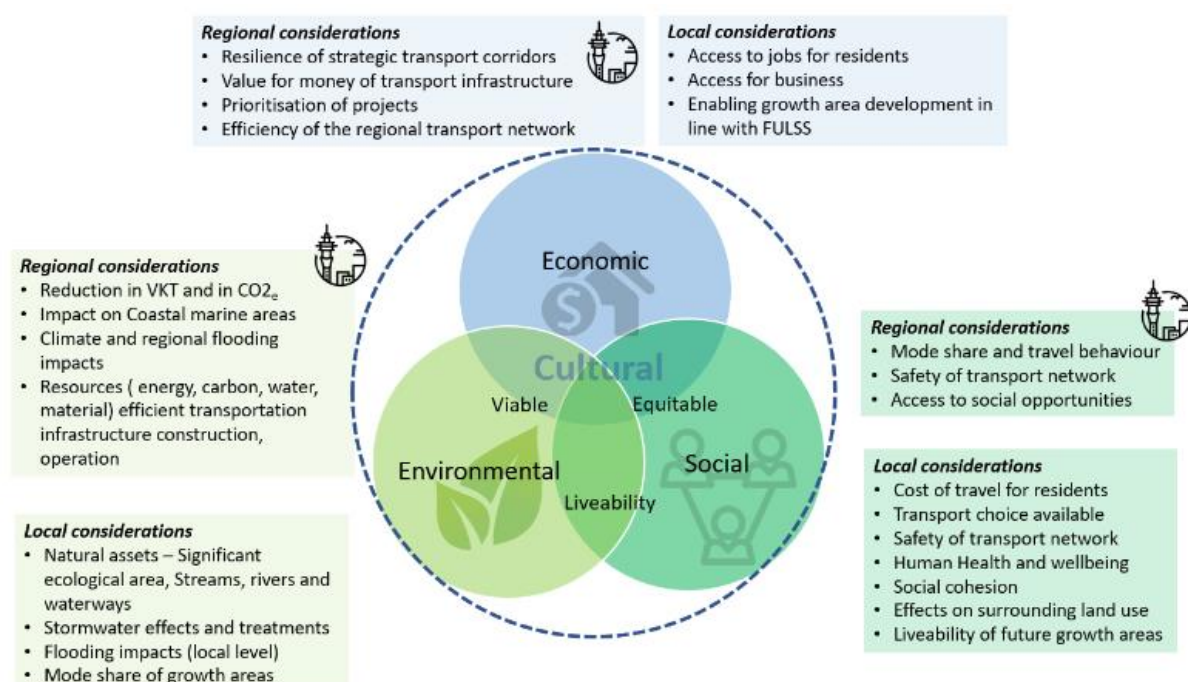
These considerations led to a recommended option which achieves the desired transport outcomes, supports land use integration and placemaking opportunities. Specific land use integration outcomes and opportunities are detailed throughout the DBC and supporting appendices.

6.3 Sustainable outcomes

Sustainability is an overarching principle of this DBC and reflects the core principles of the GPS 2021 to ensure the land transport system is both economically and environmentally sustainable. The Te Tupu Ngātahi Programme has identified four factors that work in partnership to achieve sustainable outcomes as shown in **Figure 6-2**. These pillars of sustainability include:

- Natural Environment: Conserve and enhance the natural environment
- Social: Meet the social and health needs of Aucklanders
- Economic: Foster jobs, growth and economic productivity
- Cultural: Celebrate Auckland's unique cultural identity

Figure 6-2 : Sustainability Principles



A combination of these factors provides the pathway to achieving a thriving, equitable and restorative outcomes. The Te Tupu Ngātahi UDF supports the application and measurement of these concepts.

The outcomes can be achieved at both the local and regional level. The application to this DBC is shown in **Table 6-1**.

Table 6-1 : Sustainability applications in the DBC

Sustainability Factor	Measures	Application to DBC
Cultural	Extent and effects on sites and places of cultural heritage value to Manawhenua and built heritage.	Regular Manawhenua engagement and feedback including site visits, particularly in the development and assessment of options.
Environmental	Responding to climate change by providing a transport system that supports a reduction in emissions, is responsive to flooding impacts and limits impacts on our key natural assets such as wetlands and ecological habitats.	- Appropriate stormwater treatment and suitable treatment and attenuation. - Priority focus on providing for active modes as part of the recommended option. - Identification of location and quality of wetlands, streams and ecological areas during constraint mapping to inform option selection. - Assessment of reduction of emissions on whole of life basis in the economic analysis for the recommended programme. - Protect and restore the environment across the construction, operation and maintenance of the infrastructure.
Social	Transport has key role to improve people's wellbeing and liveability of places.	- Social cohesion and human health are specific MCA assessment criteria, so impacts are considered through the optioneering process. - The DBC has a priority in improving transport choice especially in walking and cycling and public transport. This is also reflected through the modal priority assessments and in the investment objectives.
Economic	Access to jobs and business and enabling growth. At the regional level this includes resilience of the network, value for money and prioritisation.	- Investment objective and its associated KPIs for the DBC specifically measure improvement in access. - The optioneering assessment explicitly considers the Takaanini Industrial area which is a large employment zone. - Through option development, the future cross-section has considered: <u>Flexibility</u> – the ability to provide for green infrastructure and opportunity to reallocate the available space to provide for what is needed in the future <u>Maintaining the transport outcomes</u> – seeking to balance the land requirements with outcomes achieved i.e. does the additional land provide a step change in outcomes or can the outcomes be maintained with a reduction in cross section and thus less property impacts. - These have been tested with stakeholders and trade-offs clearly discussed to achieve a balanced outcome.

Many of the specific considerations are included as part of the investment case suite of KPI's and measures such as access to jobs, measures of resilience and emission modelling. However other

aspects have been considered more broadly as part of a project option assessment process such as during multicriteria analysis (MCA), constraint mapping and option development. Cultural aspects have been considered for all three factors and regular dialogue has been undertaken with Manawhenua throughout the project and especially during the option development process.

6.4 Climate change response

With a role in development of future infrastructure in Tamaki Makaurau, Te Tupu Ngātahi Supporting Growth has a role in influencing future vehicle kilometres travelled (VKT). Te Tupu Ngātahi is responding to the dual challenges of growth and VKT reduction by encouraging mode shift through each stage of its development processes.

Aotearoa New Zealand has made international commitments to reduce GHG emissions, which the Climate Change Response Act 2002 and the Climate Change Response (Zero Carbon) Amendment Act 2019 directly respond to. These commitments (and the need for climate action) are driving changes to the social, political, and legislative environment. Transport emissions are a central focus as ongoing changes to legislation and policy on GHG emissions mitigation (and adaptation) continue to evolve in response to the international commitments. Therefore, Te Tupu Ngātahi seeks to apply a good practice approach to climate change mitigation.

6.4.1 Transport Emission Reduction Pathway (TERP)

The TERP released in 2022 provides the pathway to a more liveable Auckland where there are more sustainable forms of transport options that are safe, affordable and accessible for everyone. Through achieving this it aims to reduce transport emission across the region by 64%. Eleven transformation areas have been identified. Of relevance to this DBC are:

- **Supercharge walking and cycling:** safe, attractive, and accessible pedestrian environments. Provide anyone who wants to cycle with the opportunity to do so.
- **Massively increase public transport patronage:** Increase the performance and attractiveness of the public transport network. Improve the accessibility of the public transport network.

The project directly responds to the TERP through providing for bus priority along the corridors. This improves bus travel time reliability leading to public transport uptake as the services becomes more attractive. The project responds to walking and cycling through provision of separated walking and cycling facilities along the corridors making active modes a safe and attractive travel option.

6.4.2 Considering greenhouse gas emissions

Te Tupu Ngātahi is considering and responding to climate change through its role in route protecting the indicative strategic transport network to support Auckland's growth. Its role in influencing climate outcomes is shaped by three broad categorisations of greenhouse gas (GHG) emissions ("carbon").

1. **Enabled carbon:** The emissions from individuals and private organisations that are enabled through the planning and implementation of national systems, like Waka Kotahi's strategic network or Auckland's Transport's local transport network. This concept evokes considerations of the systems-level decisions that 'set the scene' for carbon emissions from individuals and organisations interacting with the system – e.g. thinking about climate impacts at a systems level,

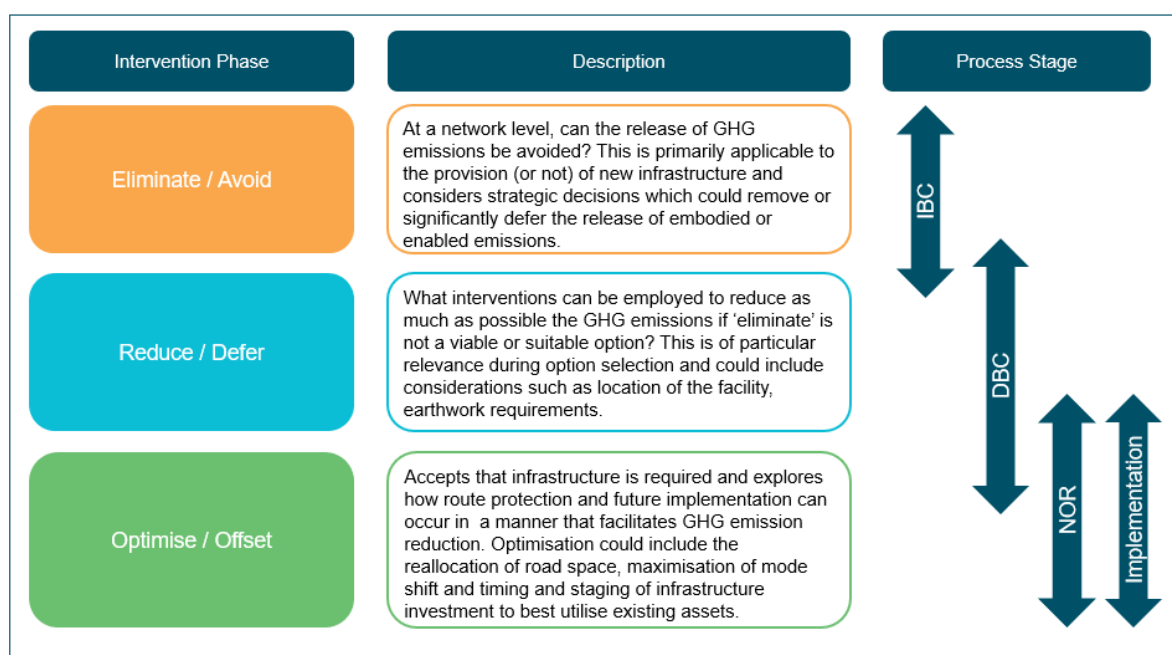
- regional level and national level. Te Tupu Ngātahi uses Vehicle Emissions Prediction Model (VEPM) modelling to consider enabled emissions through Vehicle Kilometres Travelled (VKT).
2. **Construction carbon:** The quantum of carbon from the creation, movement and installation of construction materials. Construction carbon emissions can be measured using emissions factors which translate material quantities into tCO₂e, e.g. tonnes of concrete used into tonnes of carbon dioxide equivalent. Waka Kotahi's Beta Preliminary Emissions Estimation Tool (PEET) is being used to consider construction (including embodied) emissions through the DBC and Notices of Requirement (NoRs) processes.
 3. **Land use changes:** The GHG emissions arising from land use changes (i.e. +/- emissions from various land use types such as forestry). Te Tupu Ngātahi can influence better land use through compact urban form, avoiding high sequestering land-uses and encouraging sequestration activity.

6.4.3 Te Tupu Ngātahi intervention framework

Te Tupu Ngātahi has developed an intervention framework (mechanisms & tools) for considering climate change at different stages of the route protection process. The intervention framework is intended to be the basis to interrogate and evaluate the planned networks or projects to identify opportunities for emissions reduction – primarily at the route protection stage that is the focus of the Te Tupu Ngātahi programme. It is a best practicable approach to develop confidence that opportunities have been maximised to reduce GHG emissions at every step of the process. This means considering whole of life emissions (which include emissions associated with the construction of the infrastructure, and with its use, and eventual disposal) at each stage of infrastructure development decisions– from network, to project, to project element.

The intervention approach for considering and responding to climate change at different stages of the business case and route protection process is organised around the *Eliminate – Reduce – Optimise* intervention framework (**Figure 6-3**).

Figure 6-3: Eliminate - Reduce - Optimise framework



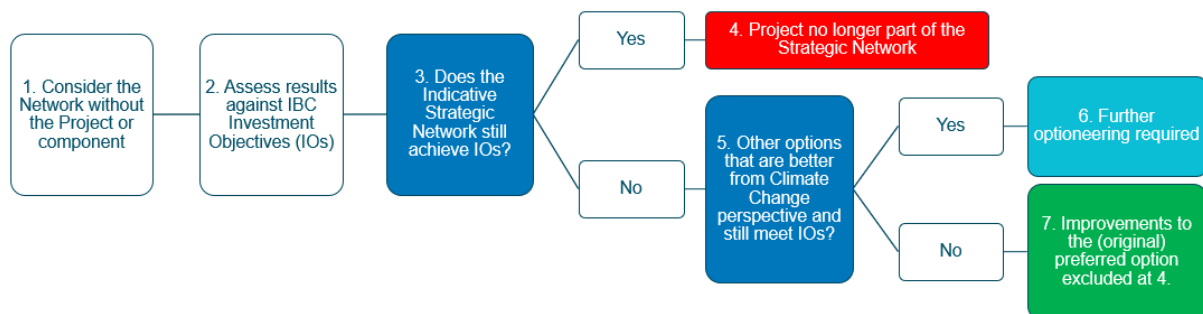
As part of the DBC, each project was taken through the three stages to understand what decisions could be made to further improve the emission reduction outcomes. Opportunities for reducing impacts were subsequently used in the DBC optioneering process and additional optimisation measures were identified as part of the next steps for each project.

Full information for each corridor is included in **Appendix B: Climate Change Response**.

6.4.4 Climate response implementation methodology

The Eliminate – Reduce – Optimise framework requires considering construction and enabled emissions in both an integrated and sequential way. This means exploring the practical interventions as they apply to whole of life emissions at each stage of infrastructure development decisions and at all levels of engagement – i.e. a network and project view. It also requires sequencing the considerations to prioritise the decisions that will most materially affect carbon outcomes.

Figure 6-4 : Climate response implementation methodology



6.5 Managing Future Flexibility

For each of the projects, the DBC has undertaken sufficient design detail and assessment to confirm the footprint required, balancing land requirements and future flexibility. Examples of how flexibility has been managed is summarised in **Table 6-2**.

Table 6-2: Management of flexibility

Item	How flexibility has been managed
Road space allocation / reallocation	The cross sections provide sufficient space for individual modal elements. However, how this might ultimately be allocated will be confirmed at a later date as part of the implementation DBCs.
Intersections	Where possible and especially in the FUZ, design has allowed for flexibility in the intersection type. Whether this is signals or roundabout could be confirmed at a later stage. In the Brownfields, a balance has been struck between future flexibility and land requirements considering operational, safety and constraints. It is expected that in some instances the intersection form could be confirmed during the NoR process and may be added as part of the condition set.
Stormwater treatment	Each corridor has had stormwater analysis undertaken to understand the stormwater treatment and attenuation requirements including impacts from future climate change. This has informed the footprint for stormwater measures including identification of wetlands.
Management of greenhouse gas (GHG) emissions	A number of factors will encourage mode shift in time with development to support the management of GHG emissions associated with future growth: • Flexibility for programme staging to allow re-prioritisation of projects to best to respond to mode shift targets such as funding and changing land use occurs. • Flexibility in road space allocation provides opportunities to realise future design changes or use of materials to best support low carbon infrastructure throughout the lifecycle of the project.
Bridges	Where corridors anticipate a bridge replacement will be required, sufficient space has been allowed for in the designation to support construction of the bridge.

7 Strategic Case Summary

In summary, the Strategic Case provides background context and rationale for investing in the improvements for high-quality public transport through the Takaanini and South growth area and key connections projects that completes the ISTN.

Specifically, the strategic case:

- Provides relevant strategic context, alignment with strategic direction and summarises work previously undertaken
- Details the short-term problems, outcomes, and alignment with longer term investment objectives
- Summarises evidence that shows support of the problems, and
- Sets out benefits, investment outcomes, measures, baselines, and targets.

Through the above, the Strategic Case confirms the need to invest to support the growth in the south to provide and promote:

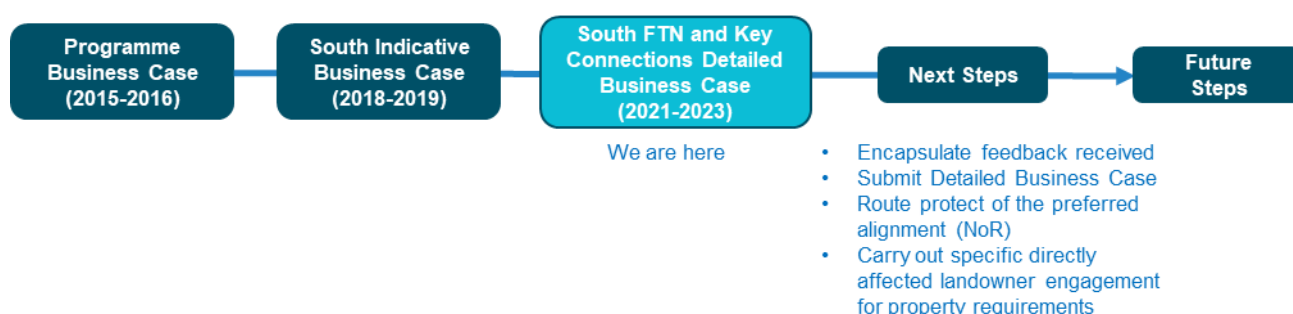
- A public transport network that is reliable, attractive and enables greater economic and social opportunities.
- An integrated transport network that enables planned growth and urban mobility encouraging a connected and prosperous community.
- The uptake of public transport and active modes.
- A network that is free from death and serious injuries especially for corridors that are to be urbanised as growth occurs.

8 Partner and stakeholder engagement

This section summarises engagement undertaken with Partners, key stakeholders, and the community by Te Tupu Ngātahi for the DBC.

The engagement undertaken to support the DBC is a continuation of previous engagement that took place during the PBC and IBC phases as shown in **Figure 8-1**.

Figure 8-1: Engagement process



The purpose of engagement in this DBC was to provide information on preferred routes and to gather feedback on these to inform the emerging preferred.

An advertising and social media campaign raised awareness of the engagement with the wider community and directed people to the online interactive engagement platform to provide feedback. Briefings were held with key stakeholders, advocacy groups and local boards.

Engagement with partners, stakeholders and landowners will be ongoing throughout the NoR process.

A summary of who we engaged with is included in **Table 8-1**. A full engagement summary report is included in **Appendix E: Engagement Summary**.

Table 8-1 : DBC Engagement Summary

Who we engaged	How we engaged
Partners	• Southern Manawhenua table – ongoing twice monthly hui with Manawhenua and the project team • Auckland Council Partnership Forum – twice monthly meetings to update Council on Te Tupu Ngātahi projects (including the Takaanini project). • KiwiRail – Partnership Forums

Who we engaged	How we engaged
Elected Members Local Board areas: • Otara-Papatoetoe • Manurewa • Papakura • Franklin	• Memos – various memos distributed to elected members of the four applicable local board areas, the mayor, all applicable Ward Councillors and Local Members of Parliament to update them on the project and community engagement. • Presentations – in-person project updates to the Manurewa Local Board, Papakura Local Board and Otara-Papatoetoe Local Board • Written updates - Franklin Local Board • Email – interactions with elected members with informal email updates as community engagement progressed In general, there was overall support from elected members. Papakura Local Board is particularly engaged, given elected members understanding of the importance of the Great South Road corridor and the Papakura Commercial Projects Group membership.
Business Associations • Manukau • Manurewa • Takaanini • Papakura • Pukekohe	• Direct communications – informative emails sharing full details of the proposed FTN routes. • 1:1 session with Papakura Business Association and Takaanini Business Association Both Takaanini Business Association and Papakura Business Association sit on the Papakura Commercial Project Group - online presentation to the PCBG on Wednesday, 14 June 2023.
Papakura Commercial Projects Team	• Online presentation to the group providing updates regarding the project. The group is Chaired by Leigh Auton and its membership comprises local board members, Papakura and Takanini Business Association members and local business representatives.
Key stakeholders	• Schools – phone call and information email provided to all schools in the vicinity of both proposed routes requesting information be placed in school newsletters. • Direct communication – social clubs, recreational clubs, and places of worship were contacted as advocacy stakeholders. • 1:1 session – held with the Auckland Transport Freight Working Group on 3 April 2023. • Informative emails, Hive campaigns and direct communication with Kāinga Ora regarding the South FTN routes.
Community	• Flyer – a community flyer drop to 8,000 households and businesses along the proposed routes to socialise the project and encourage feedback. • Media advertising – comprehensive media campaign using different channels such as print, social and radio. Focussed on ethnic and community-based media • The Hive – Our online engagement platform with project information and a place to submit feedback through a place for the public to place online feedback, e.g. Have your say / Find out More Webpage / organisation email campaigns. • Email campaigns – numerous email campaigns sent out to let subscribers know of key dates across the formal consultation period.

Who we engaged	How we engaged
	• Community open days – seven community information events from 2 March to 6 May 2023 across the three council ward areas • School and tertiary engagement - a dedicated student survey to gather feedback regarding public transport in next 20-30 years. • Auckland Council People's Panel survey - a survey was conducted to collect feedback about transport in South Auckland. The participants of survey participants were residents who live in Local Boards: Mangere-Otahuhu Otara-Papatoetoe Manurewa, Papakura, and Franklin.
Developers	• Meetings – the project team met with several developers across 2022 and 2023 with respect to their proposed development and the FTN proposals.
Utilities	• Meetings - Te Tupu Ngātahi met with Vector, First Gas, Transpower, and Watercare to discuss the interface between projects and utilities on a programme wide basis throughout 2022. Conversations will continue in 2023.

8.1 Summary of Feedback

The Te Tupu Ngātahi approach to protect land now for future transport options was supported by the majority, of the community feedback respondents. Partner, key stakeholder and community feedback was generally supportive of the FTNs.

Over 1300 responses were received to survey questions and were in general supportive of bus lanes and safe active mode facilities. Examples of the survey questions and responses are shown in **Figure 8-2**. Full details may be found in **Appendix E: Engagement Summary Report**.

Figure 8-2 : Survey questions and responses

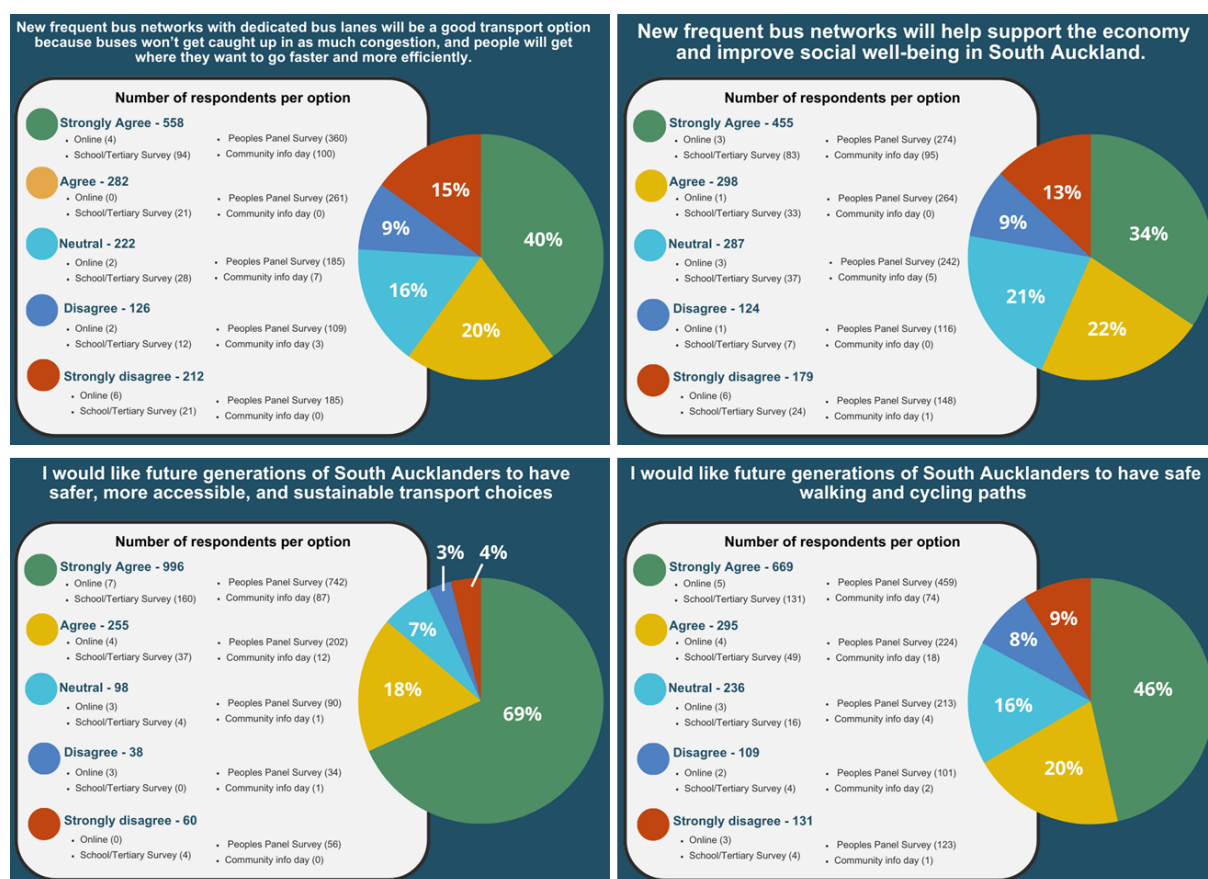


Table 8-2 summarises the key themes drawn from public feedback and our responses to the feedback we received.

Table 8-2 : Key feedback themes

Key theme	Comments	What we have done
Strong support for the two FTN routes	- Majority of people supported the FTNs as they provide connectivity to major parts of the city. - People supported having multi-choice public transport options on these routes. - They will encourage more people to use buses and make public transport more appealing - They will reduce traffic and congestion on the roads - Dedicated bus lanes will help people get where they want to go faster and save them time - It would make travelling in bus safer.	- We note the support and will continue planning to support future growth by working to protect the land required for future transport networks. - We will continue our work to help ensure improved and more sustainable transport mode choice for Aucklanders.
Safe and dedicated walking and cycling infrastructure	- Feedback supports dedicated facilities for walking and cycling - It would be safer for people who cycle to work/school/university	We will continue our work planning for dedicated active mode infrastructure to make Tāmaki Makaurau safer and more accessible for people travelling on foot and on bikes.

Key theme	Comments	What we have done
	- The idea of a walkable city is supported. - Freight Working Group (FWG) supported separated walking and cycling modes. - People raised concerns about how the roads are not safe for cyclists, dedicated cycle lanes would be safer for people who prefer cycling as a mode of transport	Our planning provides dedicated active mode facilities separated from public transport and general traffic, including freight.
The Takaanini rail station and the Takaanini retail and shopping town centre need to be integrated into the proposed FTN route using Arion Road.	Several stakeholders commented that: - Takaanini train station needs to be near the major economic hub, not the residential area. - People commented that there is no transport hub in Takaanini. The buses need to stop at the main shopping area in Takaanini. - By using Arion Road in the proposed FTN route would help with economic growth	- We acknowledged the feedback and provided more specific details about the strategic nature of the FTN route. - We are working with Auckland Transport's Metro team to connect them with the stakeholders who provided feedback.
That the networks need to integrate with the Strategic Freight Network (SFN).	Feedback from the FWG and NZ heavy Haulage Association that the new networks, specifically the Great South Road FTN, is an important strategic network for freight.	- We acknowledged the feedback and provided more specific details about the strategic nature of the FTN route and the importance of the Greta South Road corridor as a Strategic Freight Network. - We presented to the FWG on 3 April 2023 outlining the proposed FTN routes and how the routes integrated into the Strategic Freight Network.
Parking	There were two pieces of differing feedback regarding parking. One theme was in support of the removal of parking in favour of a more efficient public transport network. Another theme is that removing parking for businesses would have a detrimental effect on the accessibility to businesses along Great South Road, and, therefore, a detrimental effect on the economy.	- We acknowledged the feedback, provided more project details, and explained how the bus routes would help improve connectivity. - We explained how the project is planned to make Auckland future-proof with different transport options like dedicated walkways, cycleways, and connectivity to major train stations and bus stops.
Reliable and increased frequency of public transport	- People expressed that public transport needs to be reliable and buses need run to timetable. - Need to increase the frequency of bus service so that buses are on time	- We explained that FTNs operate on a schedule of at least every 15 minutes, in both directions, from 7am to 7pm, seven days a week. - We are planning improvements, like dedicated bus lanes, that mean buses won't get caught up in the same congestion as general traffic. - We will continue to work to protect the land required to operate the proposed FTNs in the future.
No need for dedicated bus lanes	Dedicated bus lanes create more traffic because there will be fewer lanes for general traffic.	We explained that FTNs would encourage more people to use public transport because they will get people where they want to go faster and more efficiently.

Key theme	Comments	What we have done
	- Not many people use buses, so there is no need for dedicated bus lanes. - Creating one more lane for buses will make the walkway skinnier, and it is dangerous	We showed the proposed cross-section and explained that footpaths and cycle facilities will be dedicated and separated from public transport, freight and general traffic.
Affordable and cheap public transport	People supported the idea of continuing subsidised public transport, making it affordable for more people to use buses and trains	We have passed comments regarding the cost of public transport to Auckland Transport.
Better connectivity	- Some people said that public transport doesn't provide great connectivity. Some people need to take multiple buses to reach one destination. - There is should better connectivity between bus and train stations	We explained how the proposed FTNs would improve connectivity by integrating and connecting with town centres and rail stations, providing commuters with a choice of travel options.



Economic Case

9 Economic Case

This section describes the development of the recommended option and includes:

- Establishment of the Do Minimum
- Option development, assessment, and selection process
- Assessment undertaken on the recommended option, and
- Overall outcomes of the recommended option.

More detailed option assessment is contained in **Appendix C: Option Assessment Report**,

9.1 Do Minimum Option

The project has followed the principles of the Te Tupu Ngātahi programme wide approach for the definition of the Do Minimum. The Do Minimum is defined as the least effort to maintain the existing system, including maintenance and operation of the existing system.

The Do Minimum assumptions include:

- Four tracking between Papakura and Pukekohe in 2048 and 2048+; whereas two tracking in 2038;
- Three new stations at Maketuu, Ngaakoora and Paeraataa (Drury Central, Drury West and Paerata) in 2038, 2048 and 2048+;
- The upgrade of Bremner, Jesmond, Waihoehoe and SH22 for the years 2038, 2048 and 2048+ as defined in the Drury Local Business Case;
- The North-South Ōpāheke arterial is considered only in 2048+ and taken out from earlier years;
- Pukekohe Expressway and full-length Mill Road upgrade is assumed in 2048 and 2048+;
- The closure of the Spartan Road and Manuroa level crossings and replacement with new active mode bridges, and the grade-separation of Taka Street, Walters Road, and Manuia Road for the years 2038, 2048 and 2048+ as defined in the Takaanini Level Crossings DBC.

More information is provided in **Appendix G: Transport Outcomes Report**.

9.2 Option development and assessment methodology overview

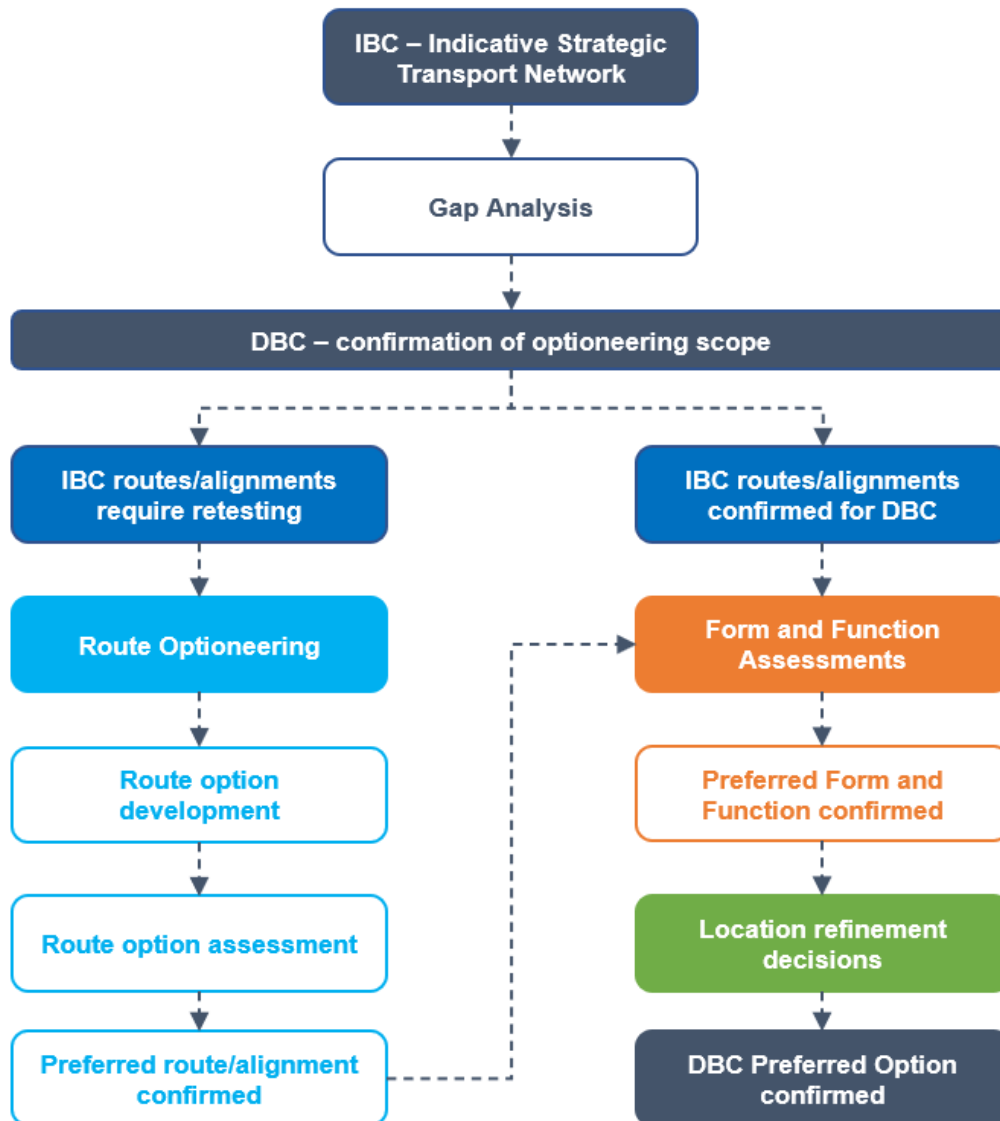
The general optioneering process is summarised in **Figure 9-1**. The process adopted was developed to be fit-for-purpose and is informed by the previous stage of assessment (i.e. the PBC informed the options for the IBC and the IBC informed the options for the DBC). The result of the optioneering process was to confirm an emerging preferred option to be developed into the recommended option for route protection.

The option assessment methodology is summarised in the rest of this section with subsequent sections providing separate summaries for each of the projects. The summary of each project is structured in such a way that they may be read as stand-alone from each other. For a full description of the process refer to **Appendix C: Options Assessment Report**.

The following definitions are used within this section:

- **Route optioneering** – this is referring to the location of the infrastructure within the study area i.e., the corridor which the FTN will run through.
- **Form and Function assessment** – assumes the specific corridor has been confirmed. Optioneering is then refined to localised widening option or minor alignment variation to avoid identified constraints.

Figure 9-1 : Option Development and Methodology



9.2.1 Preliminary Analysis

The preliminary analysis was undertaken for the Takaanini DBCs as a whole given there are interdependencies between the FTN and level crossings. The key steps in the preliminary analysis are summarised in **Table 9-1**.

Table 9-1 : Preliminary Analysis Stages

Step	Description
Gap analysis	Prior to commencing the DBC option development and assessment, a gap analysis of the South ISTN, specifically the components that relate to the Takaanini DBC Package was undertaken. The review checked to see whether anything had changed since the IBC including policy direction and statutory documents (for example, Plan Changes and / or National Policy Statements). This identified any gaps or issues that required further consideration during the DBC phase. This also informed whether the IBC recommended option should be subject to further optioneering given the changes that have taken place, or whether the assessment during the IBC phase was proportional to the scale of potential effects.
Land use assessment	The future land use was assessed to understand the transport requirements to best service the intended land use as well as identification of opportunities to enhance land use and transport integration. This was used as an input into the general constraint mapping process and later aided in the optioneering process.
Constraint mapping	Constraint mapping was undertaken to understand the potential constraints and included the following areas: • Property • Ecology • Urban design • Cultural • Landscape and visual • Archaeology/ built heritage • Stormwater and flooding • Planning/ land use/ social cohesion • Other infrastructure such as rail and national grid Constraints were mapped in GIS and their significance recorded.

9.2.2 DBC Option Development and Assessment

The preliminary analysis identified whether the IBC recommended option for each project required reconsideration in light of any changes. It also identified whether the IBC option assessment had sufficiently considered all alternatives. Further consideration was then given to the nature and significance of identified constraints, gaps and the land use context at the option development and option assessment stage. The outcome of the preliminary analysis determined whether the project proceeded to corridor optioneering or directly to route refinement as per that shown in **Figure 9-1**.

9.2.2.1 Route Optioneering

For Route Optioneering, options developed focussed on the location of the infrastructure with the cross-section assumptions based on that set out within the IBC. The option assessment was fit for purpose and included either a full MCA assessment with Subject Matter Expert (SME) input/ and or a project team option assessment. The preferred option was then taken forward to route refinement.

As noted in Section 2.7, the Takaanini Level Crossings DBC was undertaken in parallel which have interdependencies with this DBC. The preferred option within this DBC influences the Takaanini Level Crossings DBC due to the primary role of the FTNs being to connect and support the rail. Whether the FTN utilises a specific corridor influenced the outcomes for the level crossings corridors. The outcome of the level crossings options assessment also has a bearing on the Route Refinement options

assessment for the FTN as the projects are within the same Takaanini transport network. Thus, could impact the form and function of the corridors.

9.2.2.2 Form and Function Assessment

. As part of the route refinement process, corridor and intersection assessment were undertaken. Different options for each corridor were explored and assessed by the Project Team, and specialists where required. Different approaches to option development and assessment were adopted for the different projects to allow a more in-depth where required. This included splitting the project corridors into different segments to allow for a fit for purpose assessment.

These are detailed separately in the following sections as well as within **Appendix C: Options Assessment Report**.

Corridor Form and Function Assessment (CFAF)

The Corridor Form and Function (CFAF) process was used for the purpose of defining a desired cross-section for the corridors. The CFAF has been designed by Te Tupu Ngātahi to provide a consistent methodology to define the desired corridor form and function requirement and ensure all modes are considered. It is based on the AT Roads and Streets Framework (RASf) guidance which considers both 'place' and 'movement' significance. As part of this process SMEs were consulted for endorsement allowing for high engagement and design efficiency.

Full details of the RASf and CFAF assessment may be found in **Appendix G: Transport Outcomes Report**.

Intersection Assessment

In parallel to the CFAF, a process was undertaken to identify the likely future intersection form and function of intersections for the emerging preferred. The purpose of this process was to identify the indicative intersection controls and subsequent footprint implications. It is noted that the final decision on the form and control of the intersections could be modified when further land use certainties are known at time of implementation

Further details of the assessment may be found in **Appendix G: Transport Outcomes Report**.

9.2.2.3 Location refinement

Following the identification of a preferred form and function for each part of the Project, the final step of the optioneering process was to identify and refine the footprint for each part of the Project. This step required the application of evaluative planning judgment in a workshop setting, considering factors such as:

- Opportunities to avoid or reduce impacts on known environmental and cultural features, values, and/or constraints.
- The need to set for designation boundaries which to be set ensuring ensure that reasonable access to and use of adjoining properties and buildings can be maintained.
- Any advantages or disadvantages associated with requiring land that relate to its ownership status or zoning/planning controls.
- The need for designation boundaries to provide for the construction, operation, and maintenance of the Project.

9.2.2.4 Emerging preferred option development

Following on from the above, the emerging design was developed and included the consideration of:

- Vertical alignment.
- Horizontal alignment.
- Property access – in particular driveway access for existing corridors.
- Stormwater requirements including location for future wetlands.

Full details of the design process for each project are detailed in **Appendix H: Design Report**.

The sections following describe the optioneering process undertaken for each of the FTN corridors and key connections. It is intended that these may be pulled out and read separately,



Great South Road FTN

Option Development and Assessment

10 Great South Road FTN – Option Development and Assessment

The Great South Road FTN runs from Drury to Manukau. It provides key connections between town centres and metropolitan centres. Great South Road also supports rail by providing access to train stations and additional capacity and resilience in the event the rail line is full or closed.

10.1 Preliminary Analysis

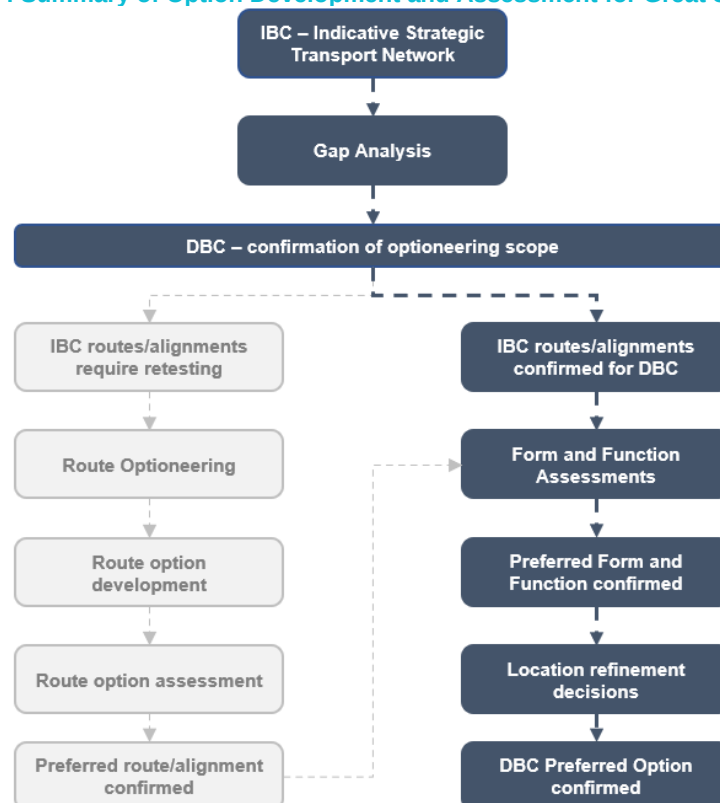
The gap analysis has identified:

- Private Plan changes in the area and the changes in policy i.e., NPS-UD provides a greater degree of certainty regarding future proposed land use.
- There could be a conflict with the Connected Communities project in the Manukau to Papakura section of Great South Road. At the time of writing this project is on hold.,
- The project should proceed straight to **form and function assessment**, i.e., no further route optioneering is required, and will be confined to the existing Great South Road corridor.

10.2 Option Development and Assessment Overview

Figure 10-1 summarises the option development and assessment process for the Great South Road FTN.

Figure 10-1 : Summary of Option Development and Assessment for Great South Road FTN



10.3 Form and Function Assessments

10.3.1 Corridor Form and Function Assessment

The Corridor Form and Function (CFAF) process was used for the purpose of defining a desired cross-section. As part of this process, SMEs were consulted for endorsement allowing for high engagement and design efficiency.

The assessment has indicated the following proposed cross-sections along the length of the corridor (Figure 10-2 10-2) with the exception of Manurewa Town Centre, Papakura Metropolitan Centre and the Takaanini Interchange. This is due to:

- The Great South Road bus route does not directly run through the Manurewa Town Centre or Papakura Metropolitan Centre. The bus route diverts from Great South Road and ties into the subsequent stations behind these two centres.
- Widening of the corridor through Town Centres will also impact the urban fabric of the existing, established centres. Hence, any work to be undertaken will be within the road reserve and no route protection will be required.
- This being a route protection business case and no physical changes are proposed at the Takaanini Interchange. This is due to the State Highway 1 viaduct running over the Takaanini Interchange and the existing columns/ piers make changes to the road outside of the existing road reserve complex. This will not preclude modifications to the existing lane arrangements in the future if required i.e. HOV lanes or bus lanes.
-

Figure 10-2 : Indicative cross-sections for Great South Road FTN



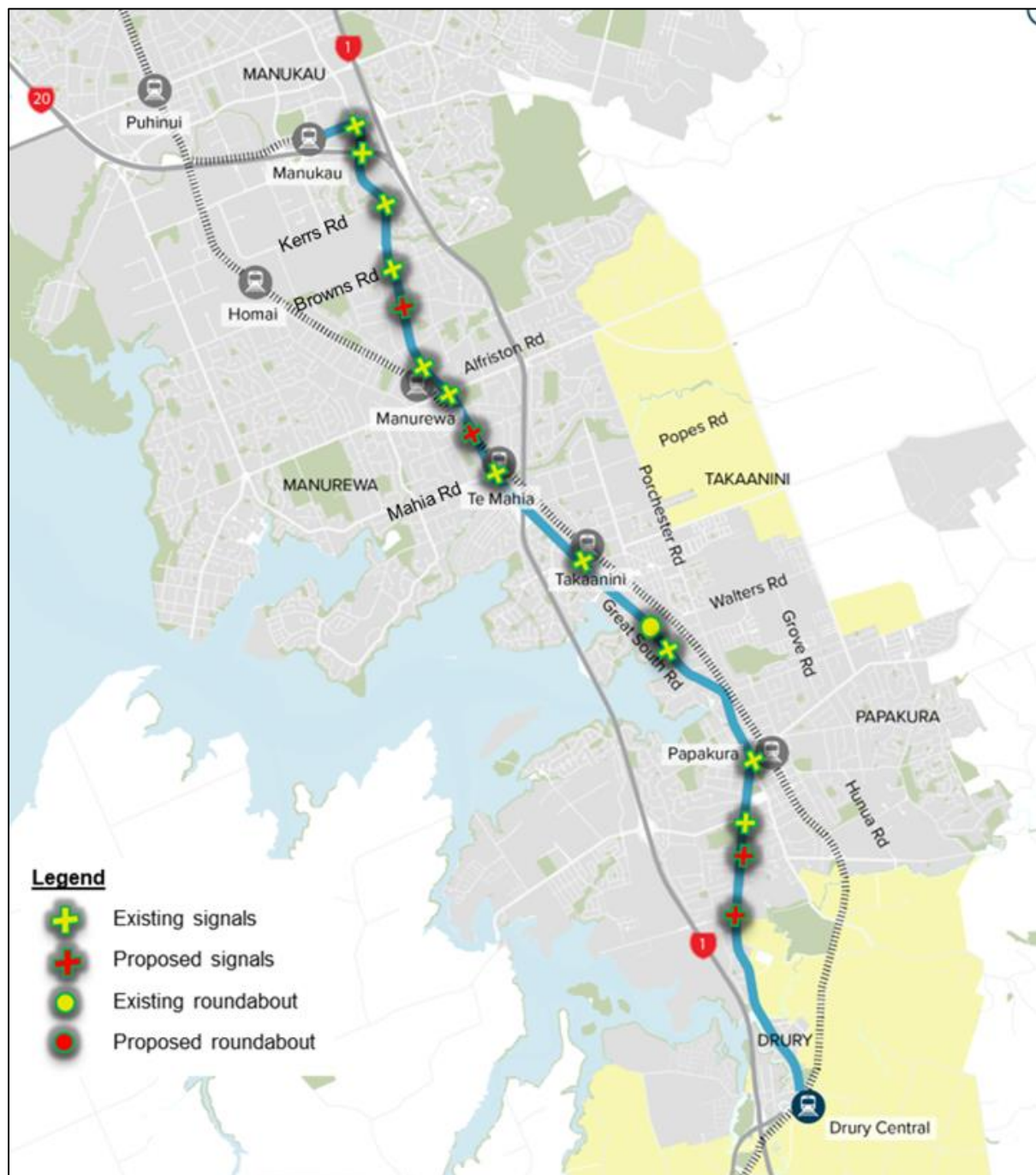
Details of the CFAF assessment may be found in **Appendix G: Transport Outcomes Report**.

10.3.2 Intersection Form Assessment

In parallel to the CFAF, a process was undertaken to identify the likely future intersection form and function of intersections for the emerging preferred. The purpose of this process was to identify the indicative intersection controls and subsequent footprint implications. It is noted that the final decision on the form and control of the intersections could be modified when further land use certainties are known at time of implementation.

Figure 10-3 shows the intersections analysed as part of this DBC and their recommended form. Further details of the assessment may be found in **Appendix G: Transport Outcomes Report**.

Figure 10-3 : Intersections along the GSR FTN

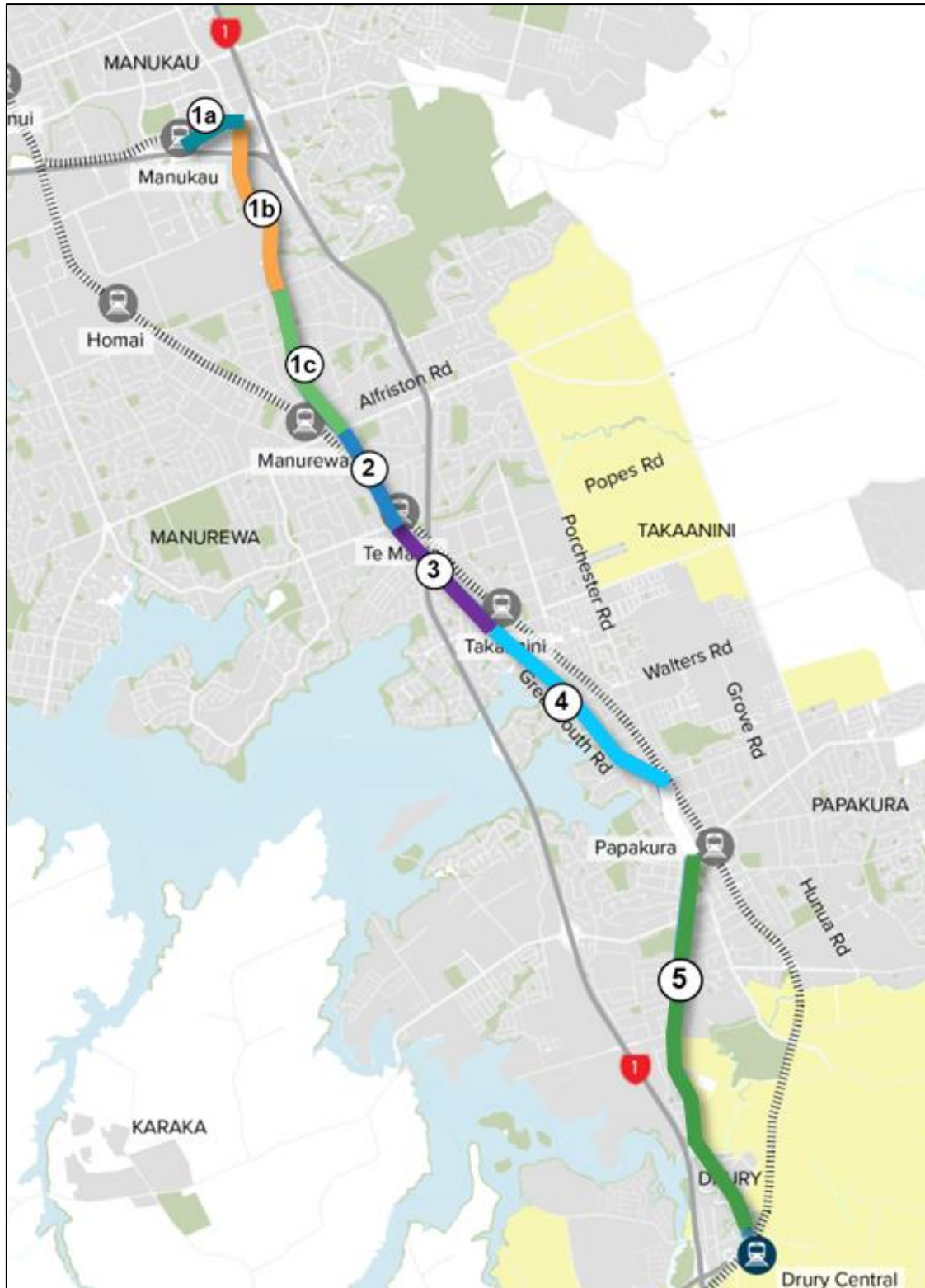


10.4 Application of desirable corridor form and function

The corridor and intersection form and function specifies the desirable requirements for the emerging preferred option. This allowed the project team to understand the impacts of the proposal and allow design refinements to be undertaken with consideration of the constraints.

With the length of the corridor being over 15km in length and varied in land use and characteristics throughout, it was segmented into sections to allow a more localised assessment. This allowed a fit for purpose assessment for each of the sections. The sections are shown in **Figure 10-4**.

Figure 10-4 : Sections of the Great South Road Corridor



The following observations are made in applying the desired form and function to provide the optimal transport solution:

- There will be significant third-party land requirements along the corridor, with over 1,300 properties directly affected along its 15.5km length. This, in large part, resulted in high costs and effects not justified by the Project's level of strategic benefit;
- The application of a generic cross-section did not account for local contextual constraints, and the wide range of present-day road configurations along Great South Road – in short, some sections have the necessary width already, while others require significant third-party land;
- The application of a generic cross-section also triggers land requirements even where third-party land is not required to meet the desired transport functions – for instance where reconfiguration of the corridor layout requires additional stormwater treatment not otherwise required. This is a significant contributor to the aforementioned third-party land requirements; and
- The nature of transport demands is relatively tidal in a number of sections of the corridor, meaning that there are opportunities to meet the investment objectives with a less impactful cross-section configuration. This is discussed in greater detail in **Appendix G: Transport Outcomes Report**.

Given the above, a reassessment of the form and function for the corridor was undertaken for specific sections to understand the relative costs and benefits of alternative form and function options.

A summary of the outcome of applying the desired form and function is shown in **Table 10-1**.

Table 10-1 : Outcome of application of desired form and function

Section	Sufficient Width for proposed form and function?	Reassessment?	Comment
1a: Manukau Station Rd	Y	Y	The desired form and function require relocation of kerb lines resulting in third party land requirements, ~50 properties.
1b: GSR: Manukau Station Rd to Browns Rd	Y	Y	Reassessment will be focused on alternative cross-section to reduce land take.
1c: GSR: Browns Rd to Northcrest Way	N	Y	Substantial impacts, >600 properties impacted, and anticipated low economic efficiency with the desired form and function.
2: GSR: Weymouth Rd to Mahia Rd	N	Y	Sections are anticipated to provide the greatest benefits on a per km basis.
3: GSR: Mahia Rd to Takaanini Station	Y	N	Unlike Section 1a and 1b, the third-party land requirement has been due to tie in works and batters. A reduced cross-section of 26.5m will be applied to reduce this impact. Thus, no reassessment. Note a small section of 4 will be reduced down to three lanes to tie into the Papakura Town Centre.
4: GSR: Takaanini Station Rd to Subway Rd	Y	N	
5: GSR: Wellington St to Waihoehoe Rd	N	Y	Substantial impacts, > 300 properties and anticipated low economic efficiency with the desired form and function.

10.4.1 Form and Function Reassessment

In a broad sense, the assessment considered four approaches as shown in **Table 10-8**.

Table 10-2 : Approaches of form and function reassessment

No	Approach
A	Prioritise a transport mode (e.g. full bus lanes or active mode improvements but not both)
B	Remove an element from cross-section (e.g. bus lanes in one direction only)
C	Existing road reserve already sufficient to accommodate all desired cross-section elements (i.e. >26.5m)
D	Apply full four-lane FTN arterial cross-section

There are numerous cross-section options that fit within the above approaches with varying degrees of effectiveness in achieving the outcomes sought. As this is a route protection business case, it is not intended to explore or assess all the different cross-sections. Instead, it intends to propose a solution within one of the approaches that aligns with the project objectives. In choosing a cross-section within an approach, it does not preclude a different cross-section to be implemented at a later stage shall things change. The intention is to provide a view on the impacts required under one of these approaches to inform route protection requirements.

It takes a more detailed targeted approach in understanding the transport requirements for the constrained sections.

10.4.1.1 Transport Assessment and Options

A transport assessment was undertaken to establish the minimum transport requirements for each section of the corridor that were to be reassessed. This included understanding the modal priorities as part of the Road and Streets Framework assessment (RASf) which is detailed within **Appendix G: Transport Outcomes Report**. Subsequently, options for each section were developed in response to the requirements.

10.4.1.2 Section 1a: Manukau Station Road

SECTION 1A: MANUKAU STATION ROAD



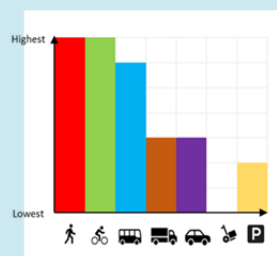
EXISTING CONTEXT

- Road reserve is greater than 30m – sufficient width to accommodate the desired form and function.
- Existing large median berm/planting strip and roadside berm.
- Limited cycle facilities.



TRANSPORT ASSESSMENT & REQUIREMENTS

- Public transport and active modes are top modal priorities
- Corridor accesses the Manukau bus station, 16 buses per peak hour per direction. Bus lanes will be of benefit.
- High number of attractors adjacent to the corridor including the Manukau City Centre and Manukau Institute of Technology. Thus, provision for active modes is important.



OPTIONS

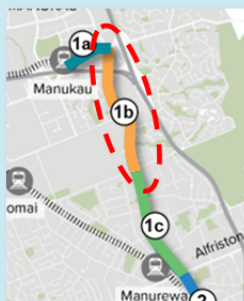
The preferred option is **Approach C**. This will convert kerbside lanes to bus lanes and roadside berms to separated active mode facilities. It is noted that there are pinch points that may require localised narrowing of the active mode facilities.

This is the preferred option given similar benefits will be provided without the added disruption to the road users and the anticipated impacts.

Item	Approach C: Existing road reserve sufficiently wide	Approach D: Full Road space reallocation/ application of future form and function
Description	 • Retain existing kerblines and convert kerbside lanes to bus lanes. • Convert berm area to separated active mode facilities.	 • Reallocate road space to provide for separated active mode facilities and to achieve optimal outcome.
Pros	• Achieves desired LOS for public transport • Minimum construction disruptions	• Achieves the desired LOS for public transport and active modes
Cons	• Active mode LOS is less desirable at constrained locations	• Temporary and permanent land acquisition required. • Greater construction disruption
Indicative Property Impact	None	19, including a large wetland requiring acquisition of a significant area of off street car parking in Manukau.

10.4.1.3 Section 1b: Great South Road – Manukau Station Road to Browns Road

SECTION 1B: GREAT SOUTH ROAD – MANUKAU STATION ROAD TO BROWNS ROAD



EXISTING CONTEXT

- Road reserve is greater than 30m – sufficient width to accommodate the desired form and function.
- Existing separated shared use paths on both sides of the corridor along most of the corridor.
- Existing bridge over the southern motorway.
- Surrounding land use is predominantly residential and commercial.



TRANSPORT ASSESSMENT & REQUIREMENTS

- Public transport and active modes are top modal priorities.
- High trafficked volume road with 14 buses per peak hour per direction. Bus lanes will be of benefit.



OPTIONS

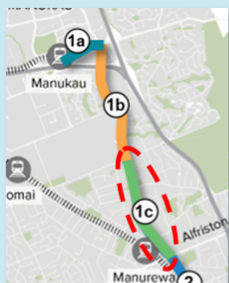
The **preferred option Approach C**. This will convert kerbside lanes to bus lanes and convert the berm area to separated active mode facilities. It is noted that there are pinch points that may require localised narrowing of the active mode facilities.

This is the preferred option given similar benefits will be provided without the added disruption to the road users and the anticipated impacts or cost.

Item	Approach C: Existing road reserve sufficiently wide	Approach D: Full Road space reallocation/ application of future form and function
Description	 • Retain existing kerblines and convert kerbside lanes to bus lanes. • Convert berm area to separated active modes facilities.	 • Reallocate road space to provide for separated active mode facilities and to achieve optimal outcome.
Pros	• Achieves desired LOS for public transport • Minimum construction disruptions • Low cost	• Achieves the desired LOS for public transport and active modes
Cons	• Active mode LOS is less desirable.	• Temporary and permanent land acquisition required. • Greater construction disruption
Indicative Property Impact	None	33

10.4.1.4 Section 1c: Great South Road - Browns Road to Northcrest Way

SECTION 1C: GREAT SOUTH ROAD – BROWNS ROAD TO NORTHCREST WAY



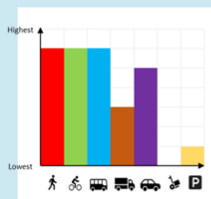
EXISTING CONTEXT

- Road reserve is approximately 20m wide. This is insufficient to provide for the desired form and function cross-section.
- There is an existing northbound bus lane.



TRANSPORT ASSESSMENT & REQUIREMENTS

- Top modal priorities are public transport and active modes.
- This section of Great South Road is part of the regional cycle route.
- Modelling undertaken suggests delays are predominantly experienced in the northbound direction during the peak periods. The level of service in the southbound direction is expected to be at LOS C for buses which meets the outcomes sought under the Auckland Network Operating Plan.



OPTIONS

The preferred option is **Approach B** and provide northbound bus lanes with separated active mode facilities.

This is the preferred option as it will achieve the objectives without the anticipated impacts. It will provide benefits for public transport in the northbound direction where congestion is expected. There is not a prevalent need for a southbound bus lane given it is still anticipated to perform at an adequate level of service. Note that this could be confirmed at implementation as to which side the bus lane is to be implemented. The option also provides a level of service for active modes in line with the requirements of a regional cycle route.

Item	Approach A: Prioritise a transport mode	Approach B: Remove an element from cross-section	Approach D: Apply-four lane FTN arterial cross-section
Description	• Bus lanes in both directions, shared use path on both sides. No berm.	• Bus lanes provided in the northbound direction with separated active mode facilities. No berm	• Bus lane in each direction with separated active mode facilities. Median and berm provided.
Pros	• Transport requirements fit in road reserve • Achieves desired LOS for PT	• Transport requirements fit in road reserve • Less preferred for PT but still LOS C • Less desirable for active modes, but still separated facilities	• Best outcomes for all modes • Provides for urban amenity such as trees and vegetations • Future flexibility
Cons	• No vegetation/planting • Third party land requirements • Shared use path not preferred	• Less improvement for public transport than other options • No vegetation/planting • Third party land requirements	• Highly disruptive during construction • Significant number of impacted properties
Indicative Property Impact	<200	<100	>400

10.4.1.5 Section 2: Great South Road – Weymouth Road to Mahia Road

SECTION 2: GREAT SOUTH ROAD – WEYMOUTH ROAD TO MAHIA ROAD



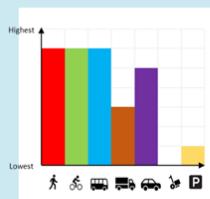
EXISTING CONTEXT

- Road reserve is approximately 20m wide. This is insufficient to provide for the desired form and function cross-section.
- Existing on road cycle lanes in each direction.
- Surrounding land use is predominantly residential and commercial.



TRANSPORT ASSESSMENT & REQUIREMENTS

- Public transport and active modes are top modal priorities.
- High trafficked volume road with 10 buses per peak hour per direction.
- Modelling undertaken suggests delays are predominantly experienced in the northbound direction during the peak periods. The level of service in the southbound direction is expected to be at an acceptable LOS C for buses which meets the outcomes sought under the Auckland Network Operating Plan. This suggests a bus lane in the northbound direction will be of most benefit.



OPTIONS

The **preferred option is Approach B** and provide northbound bus lanes with separated active mode facilities.

This is the preferred option as it will achieve the objectives without the anticipated impacts. It will provide benefits for public transport in the northbound direction where congestion is expected. There is not a prevalent need for a southbound bus lane given it is still anticipated to perform at an adequate level of service. Note that this could be confirmed at implementation as to which side the bus lane is to be implemented. The option also provides a level of service for active modes in line with the requirements of a regional cycle route.

Item	Approach A: Prioritise a transport mode	Approach B: Remove an element from cross-section	Approach D: Apply four lane FTN arterial cross-section
Description	 • Bus lanes in both directions, shared use path on both sides. No berm.	 • Bus lanes provided in the northbound direction with separated active mode facilities. No berm.	 • Bus lane in each direction with separated active mode facilities. Median and berm provided.
Pros	• Transport requirements fit in road reserve • Achieves desired LOS for PT	• Less preferred for PT but still LOS C and improvement for northbound buses • Less preferred for active modes, but still separated facilities	• Best outcomes for all modes • Provides for urban amenity such as trees and vegetations • Future flexibility
Cons	• No vegetation/planting • Third party land requirements • Shared use path not preferred	• No vegetation/planting • Third party land requirements	• Highly disruptive during construction • Significant number of impacted properties
Indicative Property Impact	<150	<120	>200

10.4.1.6 Section 5: Great South Road – Wellington Street to Waihoehoe Road

SECTION 5: GREAT SOUTH ROAD – WELLINGTON STREET TO WAIHOEHOE ROAD



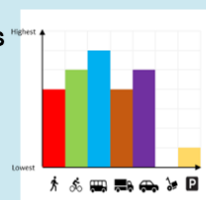
EXISTING CONTEXT

- Road reserve is approximately 23 - 27m wide. This is insufficient to provide for the desired form and function cross-section.
- Building have been setback through parts of this section of the corridor for future widening.
- No cycle facilities.
- Alternative regional cycle route (Southern Path) parallel to SH1.
- Parts of the corridor south of Park Estate Road is adjacent to FUZ.
- Surrounding land use is predominantly residential and commercial.



TRANSPORT ASSESSMENT & REQUIREMENTS

- Public transport and active modes are top modal priorities.
- High trafficked volume road with 10 buses per peak hour per direction.
- Modelling undertaken suggests delays are predominantly experienced in the northbound direction during the peak periods. The level of service in the southbound direction is expected to be at LOS C for buses which meets the outcomes sought under the Auckland Network Operating Plan. This suggests a bus lane in the northbound direction will be of most benefit.



OPTIONS

The preferred option is **Approach B** and provide northbound bus lanes with separated active mode facilities.

This has given consideration to the fact that frontages have already been secured in the past for a 30m corridor. However, the need for earthworks, accesses and stormwater treatment has resulted in a greater width required thus impacting the buildings. Consequently, there is an increase in impacts and costs that significantly outweighs the benefits. As the transport assessment has indicated, there is not a prevalent need for a southbound bus lane given it is anticipated to perform at an adequate level of service. Thus, on balance Approach B will be the recommended approach.

The DBC also recognises that there are uncertainty surrounding Ōpāheke N-S, Mill Road and rail upgrades which will see Great South Road taking on a more prominent role on the network if these do not eventuate. While the performance of Great South Road will decrease as a result (a worst case increase to ~18,000vpd without Ōpāheke N-S and Mill Road), it is not proposed to adopt these scenarios as a basis for justifying route protection given it will undermine the case for other projects within the ISTN which includes the corridors in question. In addition, the most significant benefit in all scenarios are from a northbound bus lane which remains in the preferred option. Thus, the intervention that will provide the greatest return.

Item	Approach A: Maintain existing kerb lines	Approach B: Remove an element from cross-section	Approach D: Apply-four lane FTN arterial cross-section
Description	• Bus lanes in both directions, shared use path on both sides. No berm.	• Bus lanes provided in the northbound direction with separated active mode facilities. No berm.	• Bus lane in each direction with separated active mode facilities. Median and berm provided.
Pros	• Transport requirements fit in road reserve • Achieves desired LOS for PT	• Less preferred for PT but still LOS C and improvement for northbound buses • Less preferred for active modes, but still separated facilities • PT	• Best outcomes for all modes • Provides for urban amenity such as trees and vegetations • Future flexibility
Cons	• No vegetation/planting • Third party land requirements • Shared use path not preferred	• No vegetation/planting • Third party land requirements	• Highly disruptive during construction • Significant number of impacted properties
Indicative Property Impact	<150	<120	>200

10.4.2 Summary of Form and Function Approach

Table 10-3 provides a summary of the recommended approach for each section of the Great South Road FTN.

Table 10-3 : Summary of approach for each Great South Road FTN corridor

Section	Existing width	Approaches considered				Key reasons for preferred approach
		A	B	C	D	
1a	>30m	N/A	N/A	Preferred	Discarded	- Existing road width sufficient – no/minimal third-party land requirements. - Avoids property impacts associated with Approach D (e.g. stormwater treatment). - Achieves desired level of service for public transport, and maintains/improves level of service for active modes.
1b	>30m	N/A	N/A	Preferred	Discarded	
1c	20m	Discarded	Preferred	N/A	Discarded	- Achieves a northbound bus lane which is the direction of highest anticipated travel demand. - Ensures separated facilities for active modes. - Lesser third-party land requirement than other approaches.
2	20m	Discarded	Preferred	N/A	Discarded	
3	30m	N/A	N/A	Preferred	Discarded	- Note some variation within section 4 – hence both approach B and C preferred. - Existing road width sufficient – no/minimal third-party land requirements. - Achieves desired level of service for public transport, and maintains/improves level of service for active modes.
4	20-30m	N/A	Preferred	Preferred	Discarded	
5	<27m	Discarded	Preferred	N/A	Discarded	- Achieves a northbound bus lane which is the direction of highest anticipated travel demand. - Ensures separated facilities for active modes. - Lesser third-party land requirement than other approaches.

10.5 Preferred Option

The overall preferred option for the Great South Road FTN was developed based on the emerging preferred form and function for each section and the identified intersection upgrades through the intersection assessments.

A comparison between the initial form and function option and the emerging preferred is shown in **Figure 10-5**.

It is noted that in choosing the 'emerging preferred' option does not preclude implementation of an alternative cross-section to be implemented in the future if the environment changes. There are, however, cost and risk implications that needs to be carefully considered.

Figure 10-5 : Great South Road Emerging Preferred Option

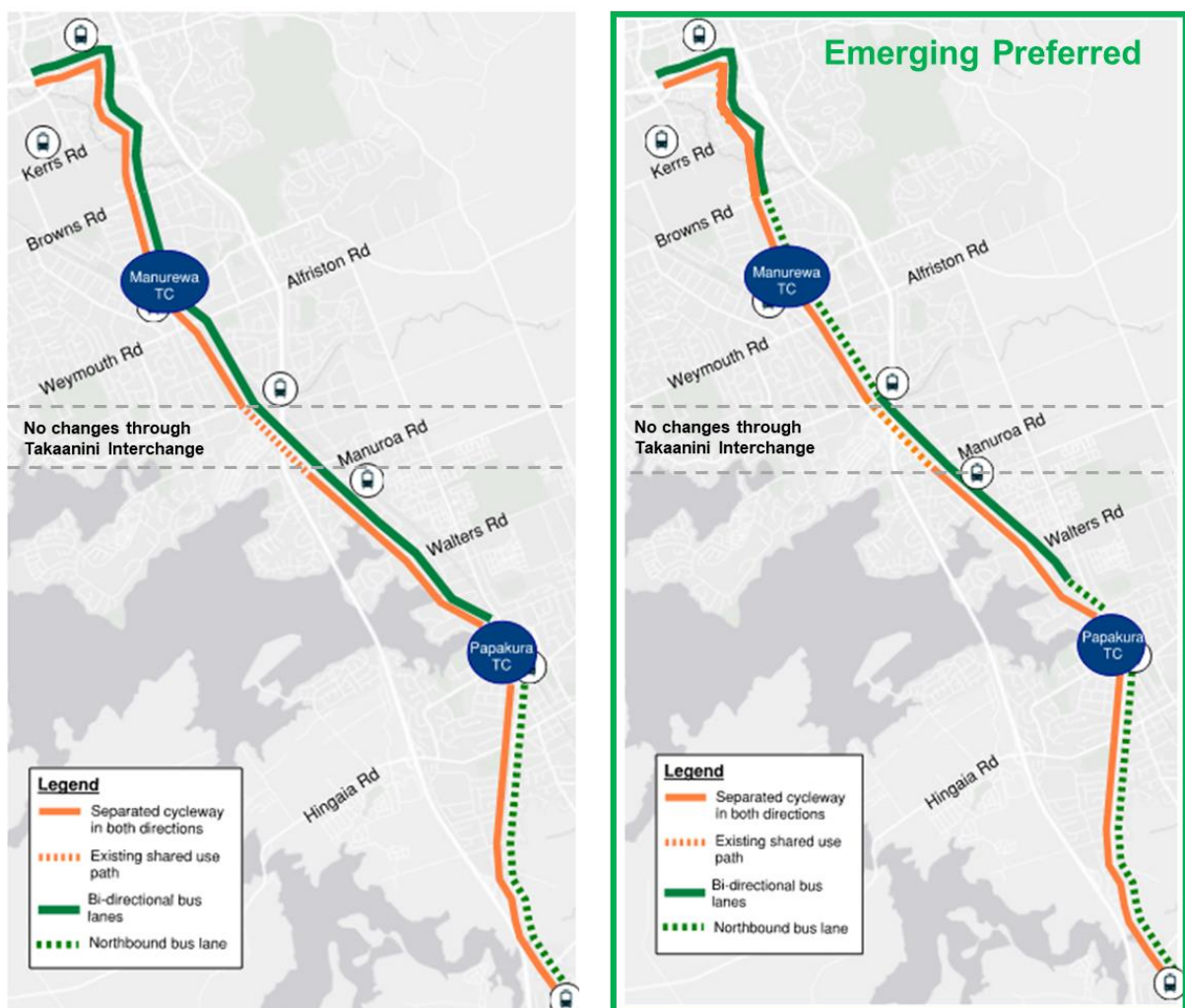


Table 10-4 shows a high-level comparison between the two and indicates:

- The emerging preferred option balances the impacts and outcomes sought with similar transport benefits between the two options:
 - Bus travel time benefits are the same between the two options in the northbound direction. In the southbound direction, the emerging preferred option will still provide travel time savings when compared with the Do Min. However, this is slightly less than the greenfield approach.
 - Active mode facilities are similar with separated facilities provided along most of the corridor for the emerging preferred. It retains the existing separated shared path in the northern section of Great South Road.
- Although the desirable form and function provides for future flexibility and performs well against amenity outcomes (urban form, 'green corridor' etc.) it is also anticipated to have much greater impacts with approximately 1,300 properties affected as opposed to 170 for the emerging preferred. A higher reputational risk is accompanied with the higher number of properties impacted as well. In addition, the expected benefits will be well short of the expected impacts such that the economic efficiency will be very low.

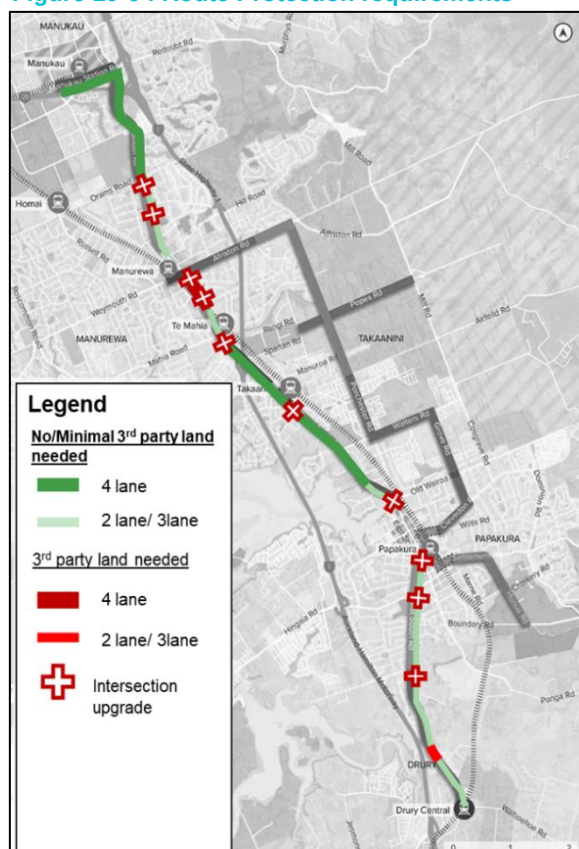
Table 10-4 : Comparison of Emerging Preferred

	Option description	Emerging Preferred	Application of desirable form and function
	Key points	Includes (more) road space reallocation NB bus lanes only in some areas and retention of existing shared use paths	Significant third-party land requirements in some sections Balanced between transport outcomes and flexibility
Outcomes	Public transport	-Up to 6 mins travel time savings in the NBD direction -Up to 8 mins travel time savings in the SBD direction between Manurewa to Manukau due to intersection upgrades - Increase in travel time of up to 1 min in the SBD between Papakura and Drury due to the introduction of new signals	-Up to 6 mins travel time savings in the NBD direction -Up to 9 mins travel time savings in the SBD direction between Manurewa and Papakura
	Active modes	Majority of the corridor will have separated active mode facilities and retains the existing shared path.	Separated active mode facilities through the entire corridor except for the Takaanini Interchange.
	General traffic/ freight	May see some disbenefit for general traffic as general traffic lanes are being converted to bus lanes.	May see some disbenefit for general traffic as general traffic lanes are being converted to bus lanes.
	Quality urban form	Berm space is limited in some sections, limiting urban amenity.	Sufficient flexibility for amenities to be implemented.
	Social outcomes	Overall improvement for the community with improved accessibility to key social and economic areas.	Enhanced accessibility to key social and economic areas. Greater urban outcomes.

	Option description	Emerging Preferred	Application of desirable form and function
	Resilience	Less resilient as less lanes are available but an improvement overall.	Better resilience with more lanes on the network.
Enviro	'Green corridor' opportunity	Possible in some areas	Basic
	VKT reduction potential	Y – removing a general traffic lane in some locations. Care to be taken if additional lanes are used for general traffic in off peak periods	Y – care to be taken if additional lanes are used for general traffic in off peak periods
Costs	Capital cost	<\$300m	Up to \$2 bn.
	Property impact	~170	~1,300
	Economic efficiency	VL (0.5)	VL (<1.0)
	Reputational risk	Lower with the significantly lower property impacted.	High reputational risk given the high number of properties impacted

The sections requiring route protection as indicated by the emerging preferred are shown in **Figure 10-6**.

Figure 10-6 : Route Protection requirements



In summary, **applying the desired form and function** in a brownfield environment will:

- Provide for future flexibility, urban amenities and optimal outcomes but have **significant impacts (approximately 1,300 properties affected)**.
- Provide **only modest benefits in the low hundred million**. This outweighs the investment required, expected to be approaching \$2bn.

The **emerging preferred option balances the trade-off between impacts and the outcomes sought**. This approach:

- **Targets priority areas** for route protection including intersection upgrades to maximise transport benefits and minimise impacts.
- **Meets the functional intent** of the corridors and meet the investment objectives in providing for high-quality public transport and active modes to support mode shift.



Takaanini FTN

Option Development and Assessment

Takaanini FTN – Option Development and Assessment

The purpose of the Takaanini FTN is to support the rail network with the service running from Drury West Station to Manukau Station. Note: The Drury West Station to Hunua Road section of this FTN has already been route protected.

10.6 Preliminary Analysis

The gap analysis identified further option assessment of the Takaanini FTN was required due to:

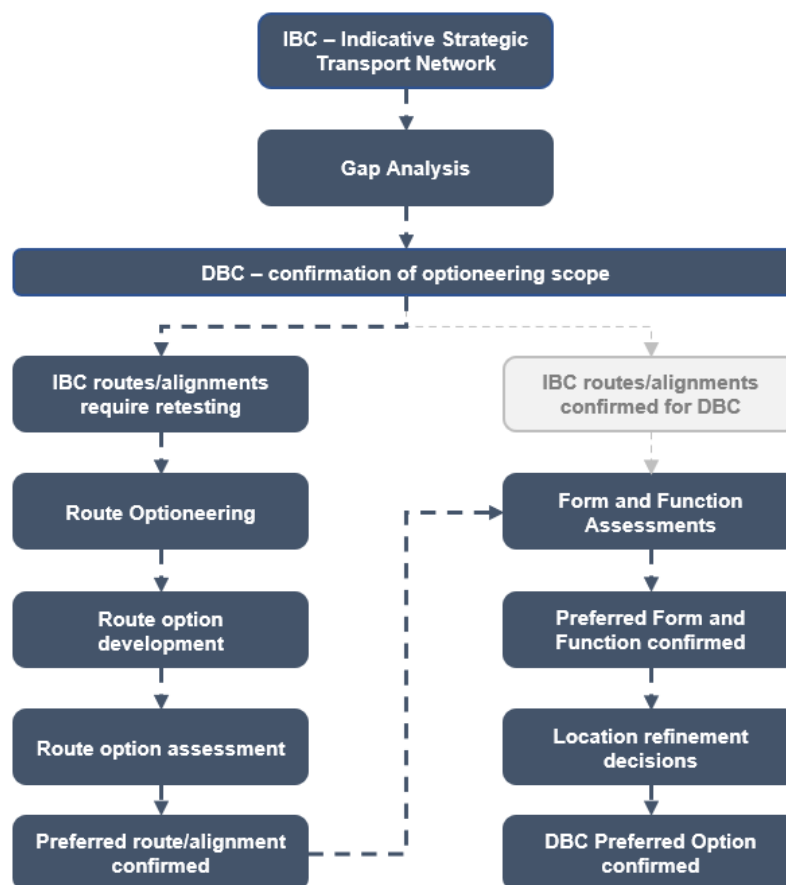
- IBC option was dependent on the Rangi Road/ Spartan Road corridor being in the network.
- SMEs no longer supported a route/ service that connected to the Puhinui Station as per the IBC.
- The Mahia Road and Roscommon Road corridors identified in the IBC are being progressed separately by Auckland Transport.

Thus, corridor optioneering was undertaken for the Takaanini FTN to confirm route alignment prior to route refinement.

10.7 Option Development and Assessment Overview

Figure 10-7 summarises the option development and assessment process for the Takaanini FTN.

Figure 10-7 : Summary of Option Development and Assessment for the Takaanini FTN



10.8 Route Optioneering

The corridor optioneering process was undertaken in three main phases as summarised in **Figure 10-7**:

- **Early Assessment Sifting Tool (EAST) assessment:** undertaken to support an initial coarse screening of alternatives/ options.
- **North – South corridors assessment:** MCA assessment of the longlist north-south corridor options. The outcome influences the decision for the east-west corridors.
- **East-West corridors assessment:** MCA assessment of the remaining east-west corridors following on from the north-south corridors assessment.

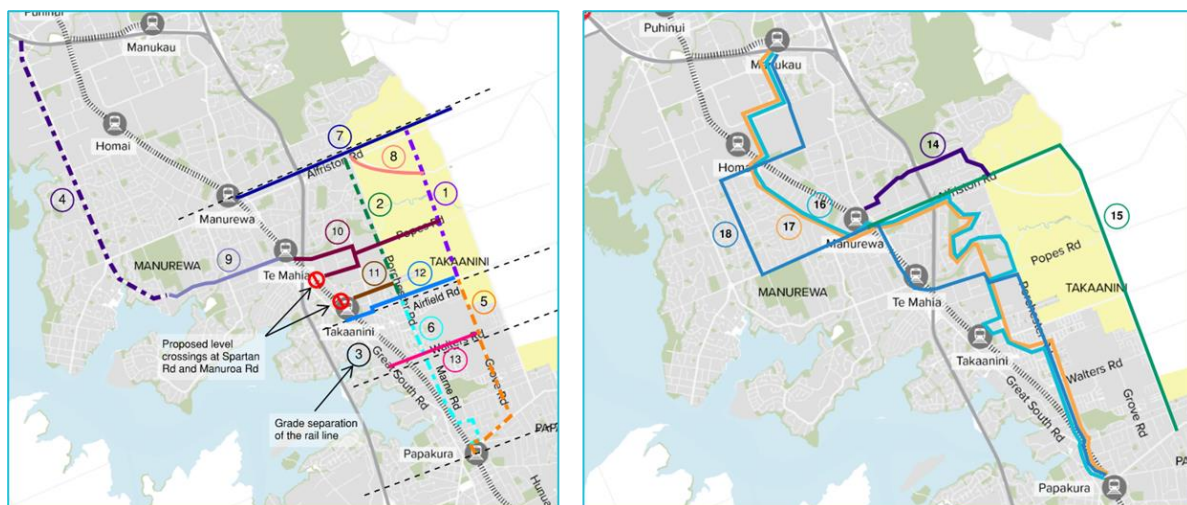
The emerging preferred north-south and east-west corridors will form the overall emerging preferred option for the Takaanini FTN.

The following sections provides a summary of the assessment undertaken with full details provided in **Appendix C: Options Assessment Report**.

10.8.1 Early Assessment Sifting Tool (EAST)

The Waka Kotahi Early Assessment Sifting Tool (EAST) was used to support an initial coarse screening of alternatives/ options. Eighteen options were considered for assessment as per that shown in **Figure 10-8**.

Figure 10-8: EAST Tool options



The assessment indicated:

- 10 options to be taken forward for further assessment.
- The options discontinued either did not address the investment objectives for the project or are part of a separate project.

Full details of the assessment may be found in **Appendix C: Options Assessment Report**.

10.8.2 North-South corridor assessment

The following section details the assessment undertaken for the north-south corridors for the Takaanini FTN.

10.8.2.1 Initial assessment

This assessment focussed on the longlist north-south corridor options progressed via the EAST assessment. These are as per that shown in **Figure 10-9** and are:

- **Option 1.1:** between Airfield Road and Papakura via Porchester Road and Marne Road.
- **Option 1.2:** between Alfriston Road and Airfield Road via Porchester Road.
- **Option 2.1:** between Airfield Road and Papakura via Grove Road and a 'new' road.
- **Option 2.2:** between Alfriston Road and Airfield Road via Wastney Road and 'New Road' through the FUZ.

For the purpose of assessment, a 30m road corridor has been assumed. It is noted that although there are four options under consideration, the emerging preferred will be a combination of two options, one above and below Airfield Road to form a north-south corridor that connects between Papakura in the south and Manukau in the north.

Figure 10-9 : North-South corridor options



The assessment criteria and scores for each option are summarised in **Table 10-5. Appendix C** provides details of the full assessment.

Key outcomes from the assessment:

North of Airfield Road

- **Option 1.2** performs well against the investment objectives although not as favourable as Option 2.2 given that Option 2.2 will better support the growth as it better services the Takaanini FUZ. It scores highly adverse for ecology based on an assumed widening and potential impact on high

value wetlands. However, route refinement will likely improve the score and is preferred over Option 2.2 due to it being an existing infrastructure.

- **Option 2.2** performs the best against the investment objectives. However, it scores highly adverse for stormwater and ecology. This is due to a new road being proposed within peat soil conditions which will be challenging from a stormwater perspective and impact low to high value wetlands in the area. In addition, the uncertainty of the Takaanini FUZ means there is uncertainty in the expected catchment of the FTN.

South of Airfield Road

- **Option 1.1** scores favourably against the investment objectives given that it services an existing residential catchment. It scores highly favourable against social cohesion as it will provide and improve connectivity between areas anticipating intensified residential development to community facilities. However, option scores highly adverse for natural hazards due to likely settlement of existing properties as a result of earthworks.
- **Option 2.1** scores poorly against investment objective 2, integration as the proposed alignment runs through the existing Bruce Pullman Park. This will have a negative impact as it does not integrate or align with the intended land use. It also scores moderately adverse against urban design as it will cause severance to the Bruce Pullman Park and the Holy Trinity Catholic Primary School.

Table 10-5 : Summary of North-South corridor assessment

Criteria	Scoring			
	South of Airfield Road		North of Airfield Road	
	Option 1.1	Option 2.1	Option 1.2	Option 2.2
IO 1: Access				
IO 2: Integration				
IO 3: Travel choice and climate change				
Historic Heritage				
Land Use Futures				
Urban Design				
Land Requirement				
Social Cohesion				
Human Health and Wellbeing				
Landscape / Visual				
Stormwater				

Ecology				
Natural Hazards				
Transport System Integration				
User Safety				
Construction Impact				
Construction Disruption				
Construction costs/risks				

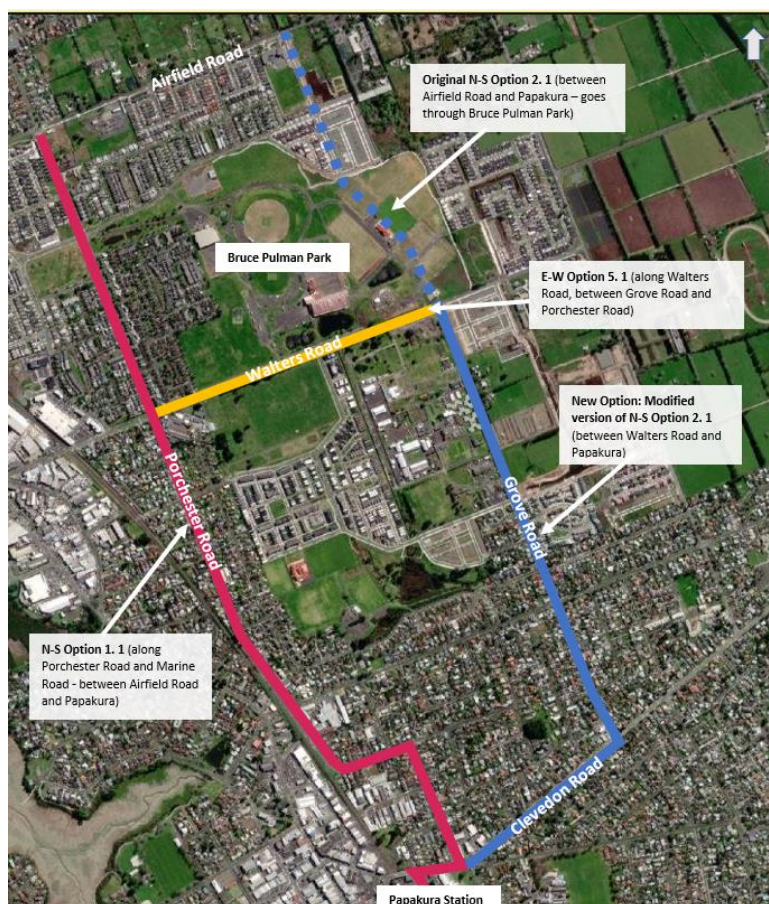
Thus, the initial assessment identified **Option 1.2 as the preferred option north of Airfield Road** as it utilises existing infrastructure and hence less impact anticipated when compared with Option 2.2. In addition, given the uncertainty of the Takaanini FUZ, Option 1.2 will service an existing community regardless of the development of the FUZ.

The negative scoring of **Option 2.1** has largely been attributed to the option cutting through Bruce Pullman Park. Feedback from specialists have indicated the scoring would change if the assessment only considered the corridor up to Walters Road i.e. the option will not severe Bruce Pullman Park. As such, the team considered a modified option should be assessed to fairly ascertain the preferred option.

10.8.2.2 Further North-South assessment

Figure 10-10 shows the modified option considered for assessment. As shown, Walters Road would form part of the preferred option shall the modified **Option 2.1** become the emerging preferred. Similarly for the northern part of Porchester Road (Option 1.1).

Figure 10-10 : Modified Option 2.1



The assessment criteria and scoring of the assessment is shown in **Table 10-6**. The key outcomes from the assessment:

- **The modified Option 2.1** scores more favourably against the investment objectives and transport criteria than Option 1.1 as the option will provide existing residential areas to high quality public transport which it currently lacks.
- As noted above, Option 1.1 scores highly adverse against natural hazards which is not anticipated with the modified Option 2.1.

Table 10-6 : Further North-South Assessment Summary

Criteria	Scoring	
	Option 1.1	Modified Option 2.1
IO 1: Access		
IO 2: Integration		
IO 3: Travel choice and climate change		
Historic Heritage		

Land Use Futures		
Urban Design		
Social Cohesion		
Human Health and Wellbeing		
Landscape / Visual		
Stormwater		
Ecology		
Natural Hazards		
Transport System Integration		
User Safety		
Construction Impact		
Construction Disruption		
Construction costs/risks		

Thus, **modified Option 2.1 forms** part of the emerging preferred option.

10.8.2.3 Summary of North-South Corridor Assessment

The north-south corridor assessment has indicated:

- The preferred option is Porchester Road (Option 1.2) in the section between Airfield Road and Alfriston Road. This utilises the existing infrastructure and thus anticipated to have less impacts and is preferred given the uncertainty of the Takaanini FUZ.
- The preferred option in the section between Papakura and Airfield Road is Grove Road (modified Option 2.1). As such, Walters Road forms part of the emerging preferred to connect through to Porchester Road.

The emerging preferred option from the north-south corridor assessment is as per that shown in **Figure 10-11**.

Figure 10-11 : N-S Emerging Preferred Option



10.8.3 East-West Corridor Assessment

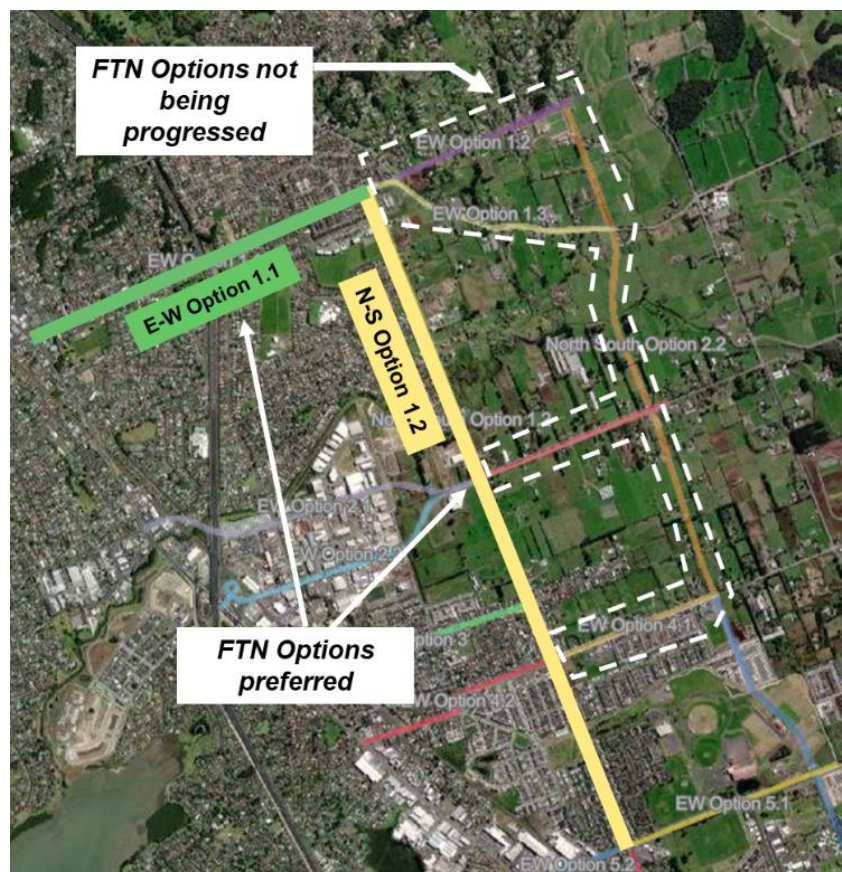
At the outset of option development, 11 options were considered as potential east-west options (see **Figure 10-12**).

Figure 10-12 : East-West corridor options



The outcome of the north-south corridor assessment influences the East-West options. With Option 1.2 along Porchester Road being the preferred, options east of the Porchester Road falls away as shown in **Figure 10-13**.

Figure 10-13 : East-West corridors not progressed for assessment



Hence, the assessment was undertaken on the remaining options:

- **Option 1.1:** Alfriston Road between Porchester Road and Great South Road
- **Option 2.2:** Popes Road and Spartan Road between Porchester Road and Great South Road
- **Option 3:** Manuroa Road between Porchester Road and Great South Road
- **Option 4.2:** Airfield Road between Porchester Road and Great South Road
- **Option 5.1:** Walters Road between Grove Road and Porchester Road
- **Option 5.2:** Walters Road between Porchester Road and Great South Road

Note that Option 5.1 already forms part of the emerging preferred, however an assessment was undertaken to ensure there were no highly adverse impacts that needs to be considered.

The assessment criteria and scores for each option are summarised in **Table 10-7. Appendix C** provides details of the full assessment.

Key outcomes from the assessment:

- **Option 1.1** performs the best against the investment objectives, land use futures and transport system integration as it will provide for the existing residential community and integrate well with the existing environment. However, it scores highly adverse for land requirement given the established residential community.
- **Option 2.2** is anticipated to only have low positive impacts against the investment objectives given the industrial land use, thus catchment is limited. The option scores highly adverse against ecology due to the potential impact on mature exotic and native trees as well as moderate value floodplains.
- **Option 3** scores similarly to Option 1.1 in terms of investment objectives with the exception of investment objective 1 as it is anticipated to have a smaller catchment as such enabling access to less people. Similar to Option 1.1, significant land requirements anticipated thus the low score. Option also scores highly adverse for natural hazards due to the soft soil conditions resulting in the risk of settlement and groundwater management required.
- **Option 4.2** scores similarly to Option 3 with respect to investment objectives and for similar reasons. Likewise, it scores highly adverse for natural hazards due to the ground conditions and its associated risks.
- **Option 5.1** is anticipated to have low positive impact against the investment objectives. However, it is also anticipated to have the least adverse impacts when compared with the other options.
- **Option 5.2** scores similarly to Option 5.1 with respect to the investment objectives. However, it scores highly adverse against natural hazards due to the soft soil conditions and its associated risks.

Table 10-7 : Summary of East-West Corridor Assessment

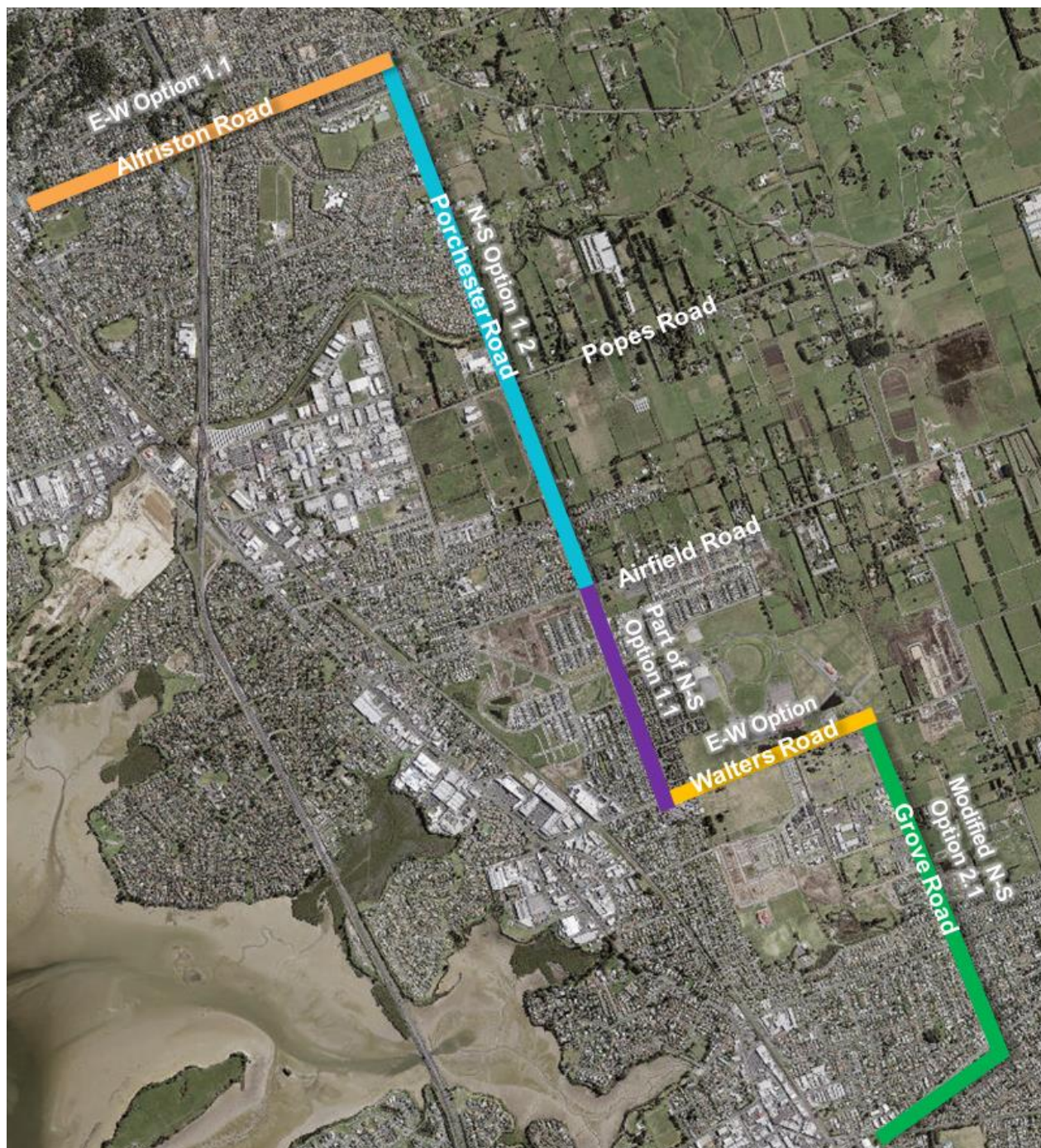
Criteria	Scoring					
	Option 1.1	Option 2.2	Option 3	Option 4.2	Option 5.1	Option 5.2
IO 1: Access						
IO 2: Integration						
IO 3: Travel choice and climate change						
Historic Heritage						
Land Use Futures						
Urban Design						
Land Requirement						
Social Cohesion						
Human Health and Wellbeing						
Landscape / Visual						
Stormwater						
Ecology						
Natural Hazards						
Transport System Integration						
User Safety						
Construction Impact						
Construction Disruption						
Construction costs/risks						

The assessment has indicated **Option 1.1 is the emerging preferred option** as it best responds to the investment objectives by providing a connection through to the Manurewa Station. Further, it is not anticipated to have high adverse impacts on the natural environment as some of the other options. **Option 5.1** also forms part of the emerging preferred resulting from the north-south corridor assessment.

10.8.4 Emerging Preferred Option

The emerging preferred option for the Takaanini FTN is shown in **Figure 10-14**.

Figure 10-14 : Takaanini FTN emerging preferred option



10.9 Form and Function Assessment

The following sections details the route refinement process undertaken for the emerging preferred option. Form and function assessment considers the refinement of alignment variations to avoid identified constraints where possible. As part of the route refinement process, corridor and intersection assessments were undertaken which are detailed below.

10.9.1 Corridor Form and Function Assessment

The Corridor Form and Function (CFAF) process was used for the purpose of defining a desired cross-section. As part of this process SMEs were consulted for endorsement allowing for high engagement and design efficiency.

The assessment has indicated the following proposed desired future cross – sections (**Figure 10-15**):

- **Alfriston Road:** Four lanes with bus lanes in each direction and separated walking and cycling facilities (26.5m width). Bus lanes are proposed on Alfriston Road given the high number of buses through the corridor (12 – 26 per hour). It is also a key east-west connection as well as a connection to the State Highway resulting in high traffic volume.
- **Remainder of the route (Porchester Road to Hunua Road):** Two lanes with separated walking and cycling facilities (20m/24m width) No bus lanes are proposed as the expected number of buses will be around 6 per hour and traffic volumes are relatively lower, with an anticipated LOS C.

Details of the CFAF assessment may be found in **Appendix G: Transport Outcomes Report**.

Figure 10-15 : Indicative cross-sections for Takaanini FTN



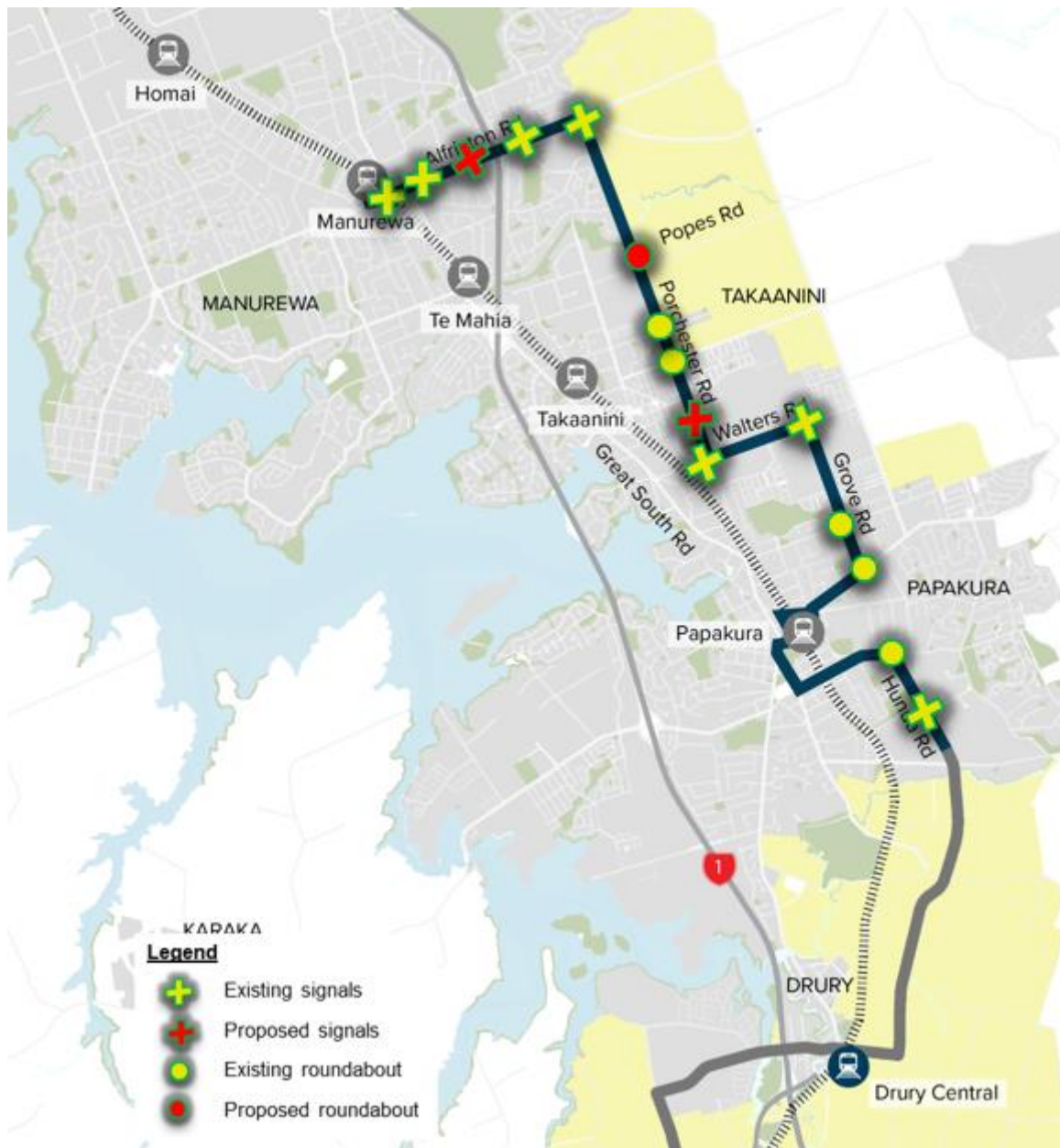
10.9.2 Intersection Form Assessment

In parallel to the CFAF, a process was undertaken to identify the likely future intersection form and function of intersections for the emerging preferred. The purpose of this process was to identify the indicative intersection controls and subsequent footprint implications. It is noted that the final decision on the form and control of the intersections could be modified when further land use certainties are known at time of implementation.

Figure 10-16 shows the intersections analysed as part of this DBC and its recommended form.

Further details of the assessment may be found in **Appendix G: Transport Outcomes Report**.

Figure 10-16 : Intersections Assessed for the Takaanini FTN



10.9.3 Application of Desired Form and Function

The corridor and intersection form and function specifies the requirements for the emerging preferred option to be further designed. This allowed the project team to understand the impacts of the proposal and allow design refinements to be undertaken with consideration of the constraints.

An initial constraints analysis was undertaken to understand the corridor width which indicated whether widening would be required given the desired form and function. Where widening is required, a principles approach was applied. This provided guidance as to which side of the corridor to widen given the constraints. Full details of this may be found within **Appendix C: Options Assessment Report**.

Applying the desired form and function will:

- Result in significant impact along Alfriston Road, approximately 428 properties over the shortest length. Albeit the majority of these are anticipated to be partial purchases, this will still incur a significant cost and reputational risk.
- The cost for Alfriston Road is anticipated to be quite substantial given the large number of impacted properties ,428. This is likely to outweigh the benefits resulting in a low benefit cost ratio and consequently a low funding priority. Thus, likelihood of implementation could be low and the benefits of route protection is therefore, limited.

Given the above, a reassessment of the form and function for Alfriston Road was undertaken to understand whether there are alternative options.

10.9.4 Form and Function Reassessment

In a broad sense, the assessment considered three approaches as shown in **Table 10-8**.

Table 10-8 : Approaches of form and function reassessment

No	Approach
A	Prioritise a transport mode (e.g. full bus lanes or active mode improvements but not both)
B	Remove an element from cross-section (e.g. bus lanes in one direction only)
C	Existing road reserve already sufficient to accommodate all desired cross-section elements (i.e. >26.5m)
D	Apply full four-lane FTN arterial cross-section

There are numerous cross-section options that fit within the above approaches with varying degrees of effectiveness in achieving the outcomes sought. As this is a route protection business case, it is not intended to explore or assess all the different cross-sections. Instead, it intends to propose a solution within one of the approaches that aligns with the project objectives. In choosing a cross-section within an approach, it does not preclude a different cross-section to be implemented at a later stage shall things change. The intention is to provide a view on the impacts required under one of these approaches to inform route protection requirements.

It takes a more detailed targeted approach in understanding the transport requirements for the constrained sections.

10.9.4.1 Transport Assessment

The transport assessment has indicated:

- 2048+ model indicates the vehicle capacity ratio along Alfriston Road between Hill Road and Magic Way in both directions is above 80% during the peak periods. This suggests congestion on the corridor and bus performance will be impacted.
- Between Magic Way and Porchester Road, congestion is experienced in the eastbound direction due to the signalised intersection at Porchester Road and Alfriston Road.
- Modal priority assessment indicates active modes and public transport have the highest priority along Alfriston Road.
- Alfriston Road is an important east-west connection in the transport network with the closest east-west connection to the south being the proposed Manuia Road connection, approximately 2.1km away. Alfriston Road also provides access to the Hill Road/ SH1 interchange via Claude Road resulting in high traffic volume. (See **Figure 10-17**).

GSR - Claude



Claude - Porchester

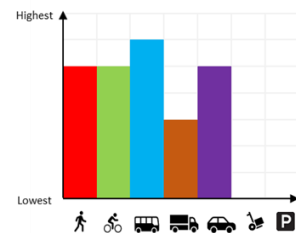
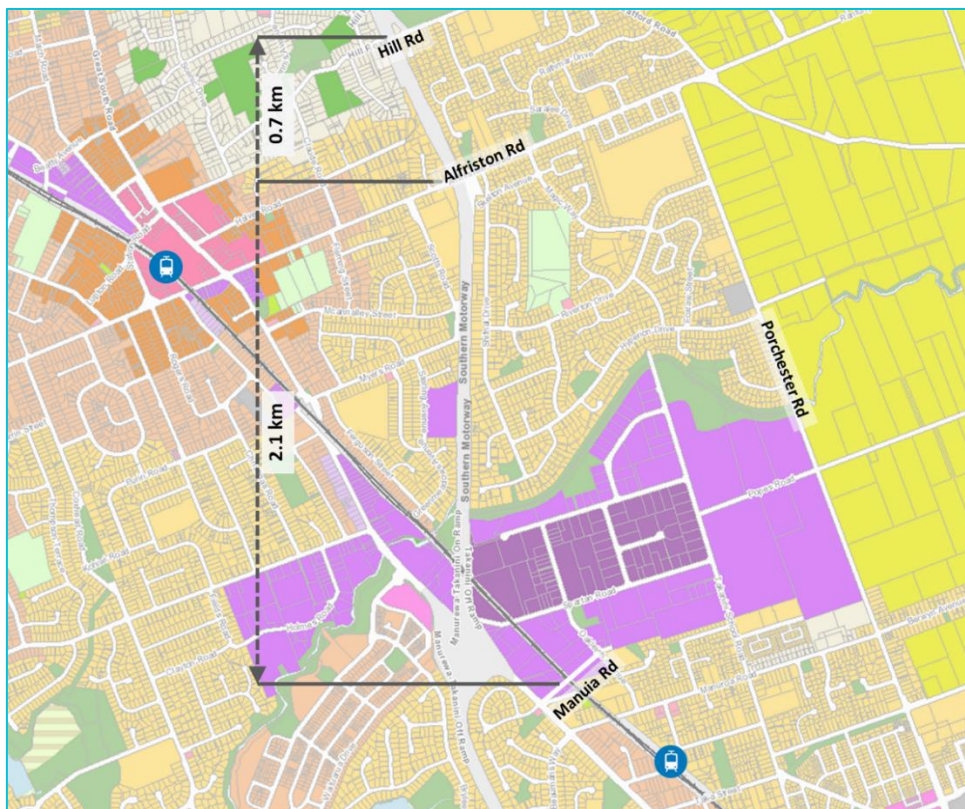
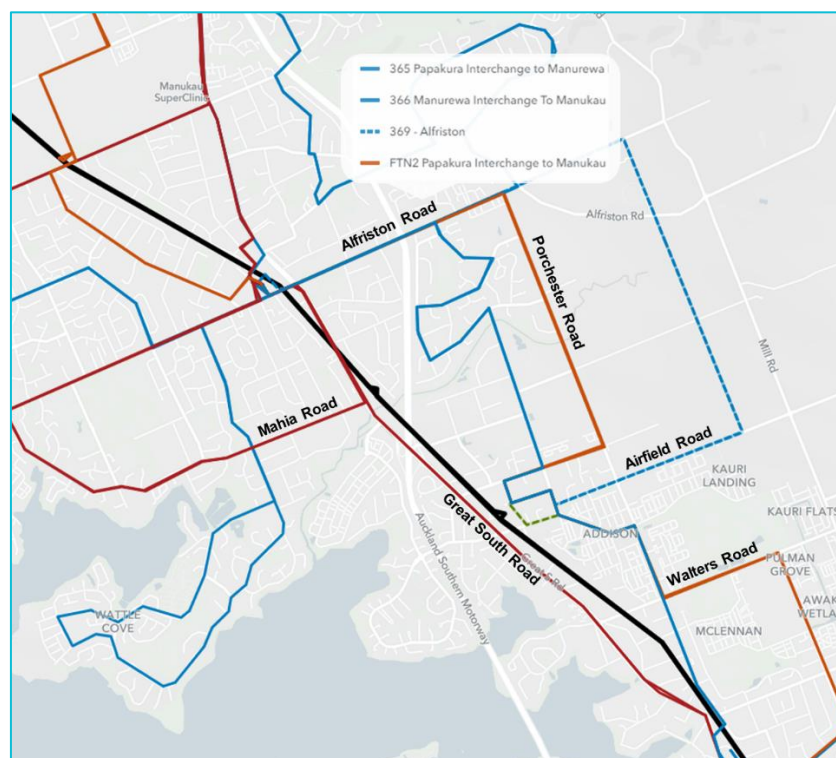


Figure 10-17 Distance between east-west connections in Manurewa/ Takaanini



- Alfriston Road is also particularly important for public transport as it provides access to the Manurewa Station with a number of services converging along this corridor resulting in 12 to 26 buses anticipated in the peak hour (see **Figure 10-18**).

Figure 10-18 : Bus Routes in 2048 (AT's Remix)



Based on the above, the assessment suggests the minimum transport requirements are:

- Bus lanes required in both directions along Alfriston Road except between the section of Magic Way and Porchester Road.
- Eastbound bus lane required between Magic Way and Porchester Road.
- Active mode facilities need to be provided for along the corridor.

10.9.4.2 Cross-section options

The following cross-sections are considered in response to the transport assessment and are summarised in **Table 10-9**.

Table 10-9 : Cross-Section Options for Alfriston Road

Items	Approach A: Prioritise transport mode	Approach B: Remove an element from cross-section	Approach D: Desired form and function
Description	Bus lanes in both directions, shared use path on both sides. No berm.	Bus lane provided in the eastbound direction with separated active mode facilities. No berm.	Bus lane in each direction with separated active mode facilities. Median and berm provided. Future flexibility.

Items	Approach A: Prioritise transport mode	Approach B: Remove an element from cross-section	Approach D: Desired form and function
Public transport	Similar to approach 3 greenfield approach, however bus stop will be compromised with the limited road side space.	Improvements for buses in one direction only.	Provides the best level of service of all options.
Active modes	Shared use path is not preferred and a departure will be required.	Good level of service for active modes but lack of berm reduces the level of service.	Provides the best level of service of all options.
General traffic/freight	Operations remains similar to existing.	Operations remains similar to existing.	Flush median allows for safe turning.
Quality urban form	All modes are 'squeezed' into the road reserve.	All modes are 'squeezed' into the road reserve.	Provides for vegetation and other amenities.
Social outcomes	Improvement in social outcomes as there is benefits to active modes and buses.	Improvement in social outcomes as there is benefits to active modes and buses.	Best outcome for the community as it provides the best urban and transport outcomes.
Resilience	Additional lanes provide additional resilience.	Least resilient of all options.	Additional lanes provide additional resilience
'Green corridor' opportunity	No opportunity	No opportunity	Yes, there is future flexibility
VKT reduction potential	Potentially with mode share shift.	Potentially with mode share shift.	Greater possibility of mode share shift with the best facilities provided.
Indicative Capital cost	>\$100M	\$50M - \$100M	>\$200M
Property impact	<100	NONE	428
Economic Efficiency	VL (<1.0)	VL – L (<1.0-1.0)	VL (<1.0)
Reputational risk	Medium as some properties are still required.	Low given no properties are required.	High reputational risk with the large number of properties impacted.

As anticipated, Approach D will provide the best outcome but also is anticipated to have the greatest impact. On balance and in accounting for the transport assessment, a hybrid of Approaches A and D is recommended, as follows:

- An eastbound bus lane with separated active modes, **Approach B is provided on Alfriston Road between Porchester Road and Magic Way**. This achieves the project objectives in improving for active modes and providing for a high-quality public transport. LOS is expected to be at C for both

directions during the peak periods. In addition, bus volumes drop along this section as buses turn down Magic Way.

- **Approach D is provided for the remainder of Alfriston Road.** Albeit, the anticipated impacts, this section provides the greatest benefits for the FTN route, it is an important east-west connection on the network and is a vital public transport link. Even without the development of the Takaanini FUZ, Alfriston Road is still anticipated to carry many buses in the peak hour to service the area to the north.

It is noted that alternative cross-section could be considered during implementation for Approach B. This could be a cross-section that has separated active mode facilities with vegetation that improves the urban amenity across the corridor. Dynamic lanes are a potential option but is typically a short to medium term solution, thus not considered as part of this business case. In addition, this is not recommended given the large number of accesses along the corridor. However, should things change in the future, this could be considered as part of the optimisation programme.

10.9.4.3 Preferred Option

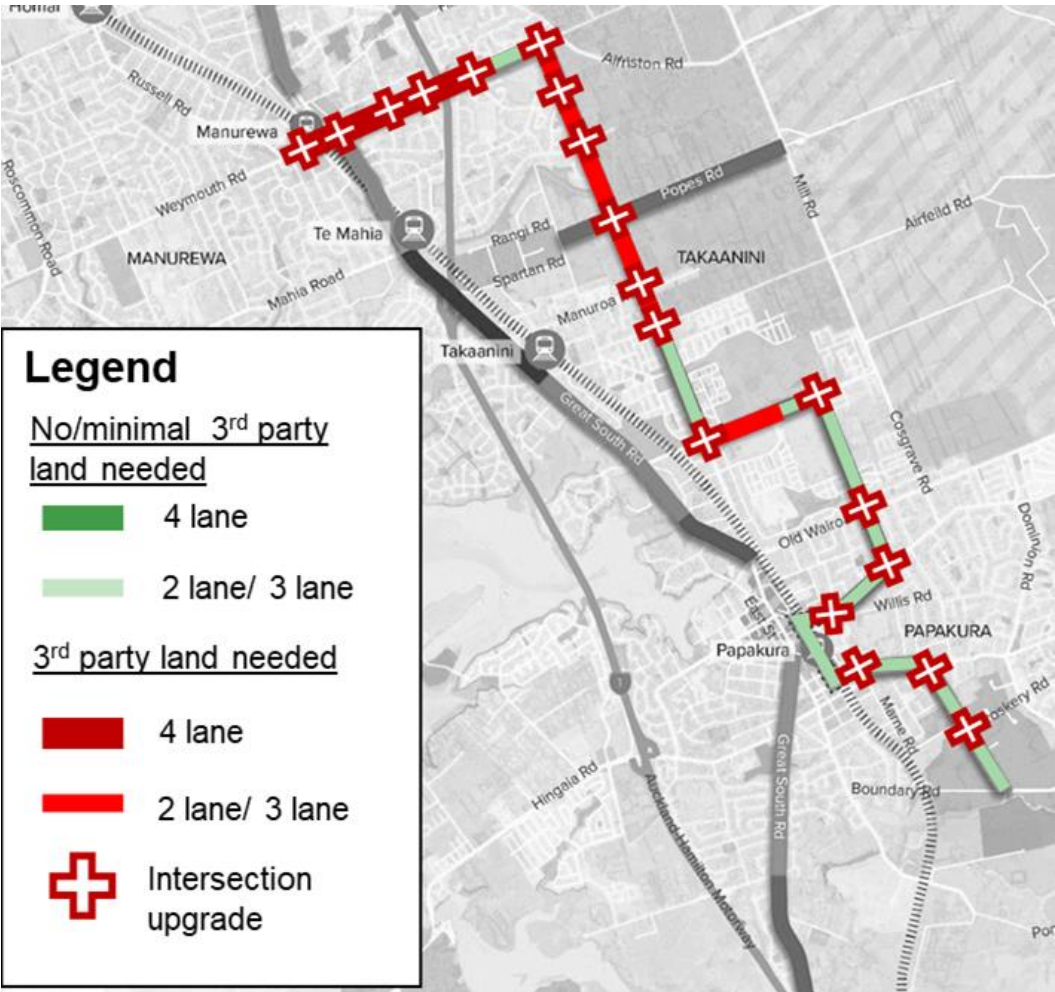
The preferred is shown in **Figure 10-19** with **Figure 10-20** identifying where third party land is required to achieve the preferred option along the corridor.

It is also noted that, given the uncertainty of the Takaanini FUZ, the section along Porchester Road requiring widening to provide a 24m cross section could be reduced to 20m with minimal/ no third-party land required. This will still provide for the desired transport outcomes and achieve the project objectives.

Figure 10-19 : Takaanini FTN Preferred Option



Figure 10-20 : Third party land requirements for Takaanini FTN





Popes Road

Option Assessment and Development

Popes Road – Option Development and Assessment

The urbanisation and upgrade of Popes Road is to primarily provide for walking and cycling facilities as the area develops and to support access from Mill Road to the Takaanini Industrial Area. The corridor is between Mill Road and Takaanini School road as shown in **Figure 10-21**.

Figure 10-21 : Popes Road Corridor Extent



10.10 Preliminary Analysis

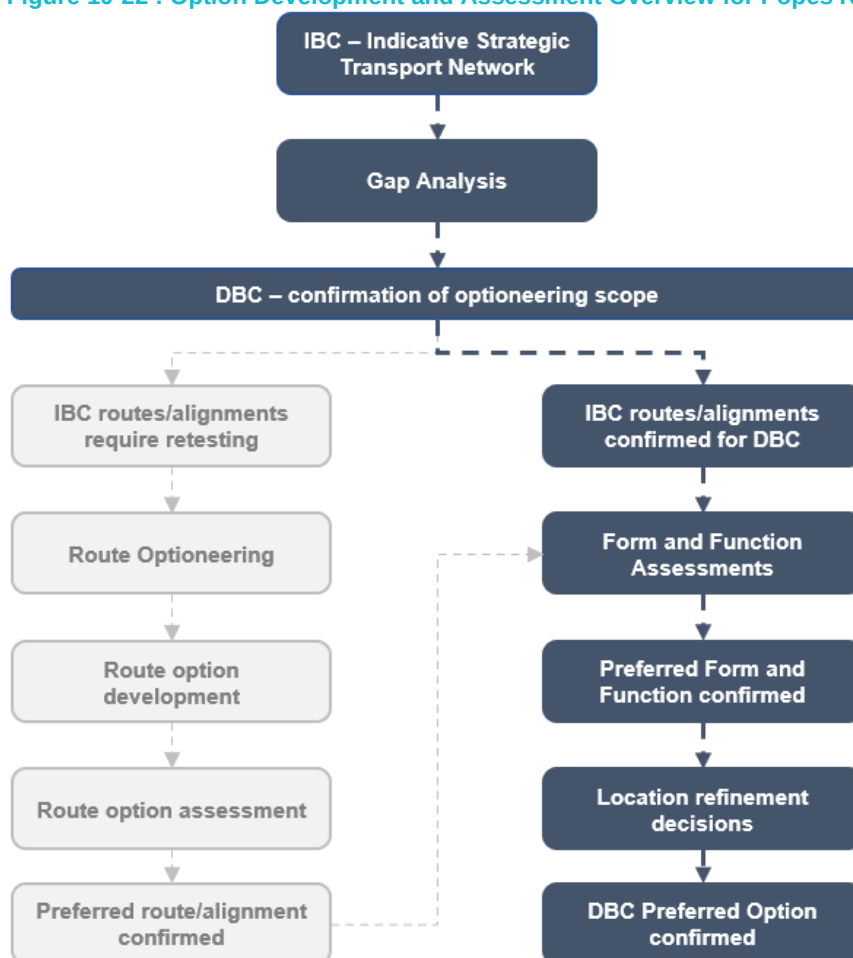
The gap analysis recommended further consideration of the viability of the Rangī Road bridge given the embodied carbon and potential construction complexity. Given that Popes Road was identified as an extension of the Rangī Road viaduct as a key east-west connection to and beyond the industrial area, re-consideration was given to the strategic importance of Popes Road if Rangī Road is no longer in the network.

Thus, Popes Road proceeded to form and function assessment following on from the outcome of the Level Crossings DBC options assessment.

10.11 Option Assessment Process

Figure 10-22 summarises the option development process for Popes Road.

Figure 10-22 : Option Development and Assessment Overview for Popes Road



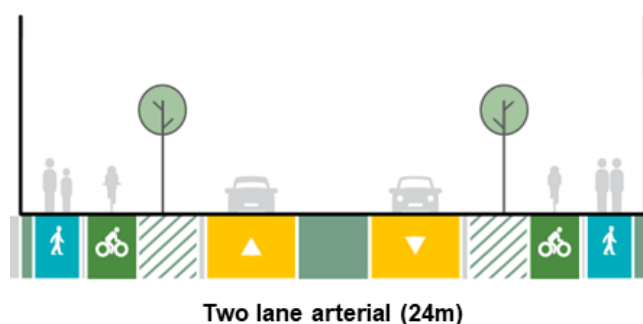
10.11.1 Corridor Form and Function Assessment

The Corridor Form and Function (CFAF) process was used for the purpose of defining a desired cross-section.

The Rangi Road viaduct will no longer form part of the strategic network as identified through the Level Crossings DBC. This meant Popes Road is no longer expected to carry as much traffic as was previously identified in the IBC. It will no longer have a regional role in the transport network providing through movement connection through the Takaanini Industrial zone. It does however still remain a key east-west connection to the Takaanini industrial zone and for the Takaanini FUZ to the strategic corridor, Mill Road. Hence, a key part of the south network is to improve access, provide travel choice and contribute towards climate change outcomes as growth occurs.

The assessment has indicated the proposed cross-section shown in **Figure 10-23**.

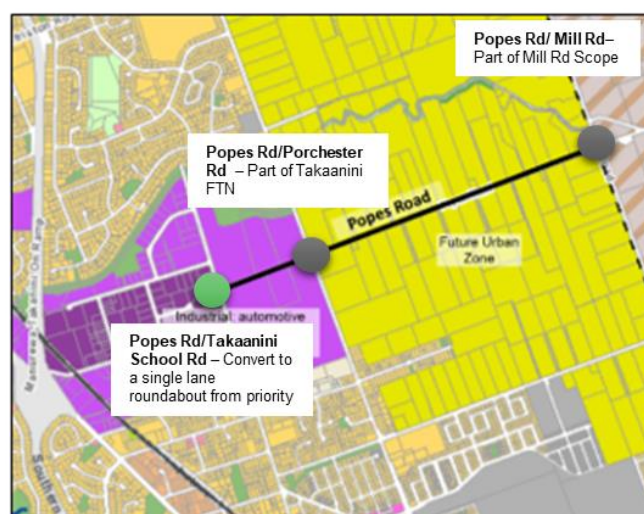
Figure 10-23 : Indicative cross-sections for Popes Road



10.11.2 Intersection Form Assessment

In parallel to the CFAF, a process was undertaken to identify the likely future intersection form and function of intersections for the emerging preferred. The purpose of this process was to identify the indicative intersection controls and subsequent footprint implications. It is noted that the final decision on the form and control of the intersections could be modified when further land use certainties are known at time of implementation.

Figure on the right shows the intersections analysed as part of this DBC.



Further details of the assessment may be found in **Appendix G: Transport Outcomes Report**.

10.11.3 Option Refinement

The corridor and intersection form and function specifies the requirements for the emerging option to be further designed. The design considered included the consideration of:

- Vertical alignment
- Horizontal alignment
- Property access – in particular driveway access for existing corridors
- Stormwater management

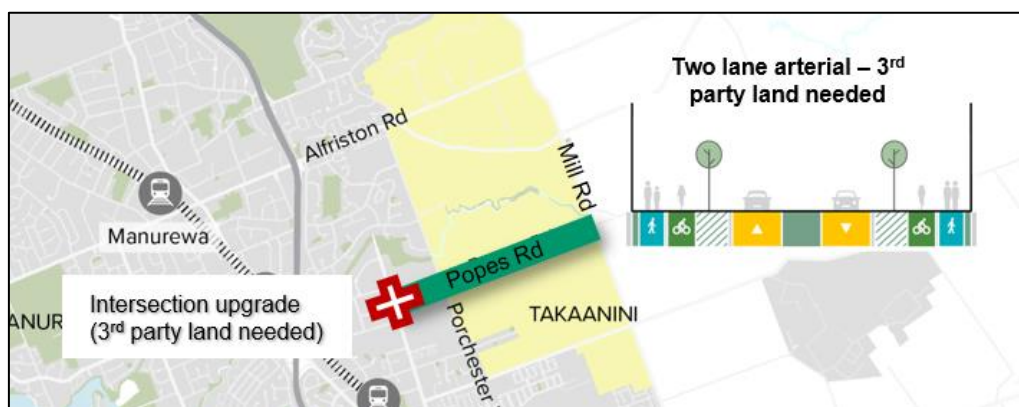
Full details of the design process, assumptions and decisions are detailed in **Appendix H: Design Report**.

The design confirmed third party land is required for the desired 24m cross-section as there is an existing 5m conveyance channel within the road reserve to be retained.

10.11.4 Preferred Option

The preferred option is to upgrade Popes Road to a two lane 24m arterial corridor with separated active mode facilities. The intersection of Popes Road/ Takaanini School Road to be converted to a single lane roundabout. **Figure 10-24** shows the preferred option.

Figure 10-24 : Popes Road preferred option



34 property acquisitions are anticipated with the preferred option.

It is worth noting that there are risks and uncertainties surrounding Popes Road's role on the network:

- **Mill Road project-** Popes Road will form part of the Level 3 freight network (indicates Popes Road is a connection between strategic freight areas) if Mill Road is completed as agreed with AT freight SMEs and the freight working group.
- **Alfriston Road Plan Change in the area north of Popes Road –** This is unconfirmed at this stage however, if this eventuates AT considers the existing Level 1B freight route (high freight connection/ movement) on Alfriston Road will instead be Popes Road. This further elevates Popes Road's status on the freight network.
- **Future Development Strategy (FDS)/ Takaanini FUZ –** The draft FDS has identified the Takaanini FUZ to be removed adding uncertainty to the development in this area. Thus, its role in providing for the FUZ and development pressures as a driver for route protection may or may not eventuate.

Depending on the resolution of the above matters, the strategic significance of the Popes Road route as part of an east-west route connecting to Great South Road and SH1 via the proposed Manuia Road rail crossing (proposed as part of the TLC Project) may increase. This in turn may require further work to determine any future route protection requirements to provide a freight connection between Popes Road and Manuia Road. Given the above uncertainties, this work has not been undertaken as part of this DBC but potential routing options are explored in **Appendix D: Popes Road Freight Role Memorandum**. It is recommended that this is considered further in future work when the implications of the above uncertainties become clearer.

Given the draft FDS, the urgency for route protection in the section of Popes Road through the FUZ may change. The route protection strategy responds to this by having a separate NoR in the event that the Takaanini FUZ is downzoned. The NoR may be easily split out from the remainder of the Project and abandoned/ surrendered as appropriate.



Croskery Road

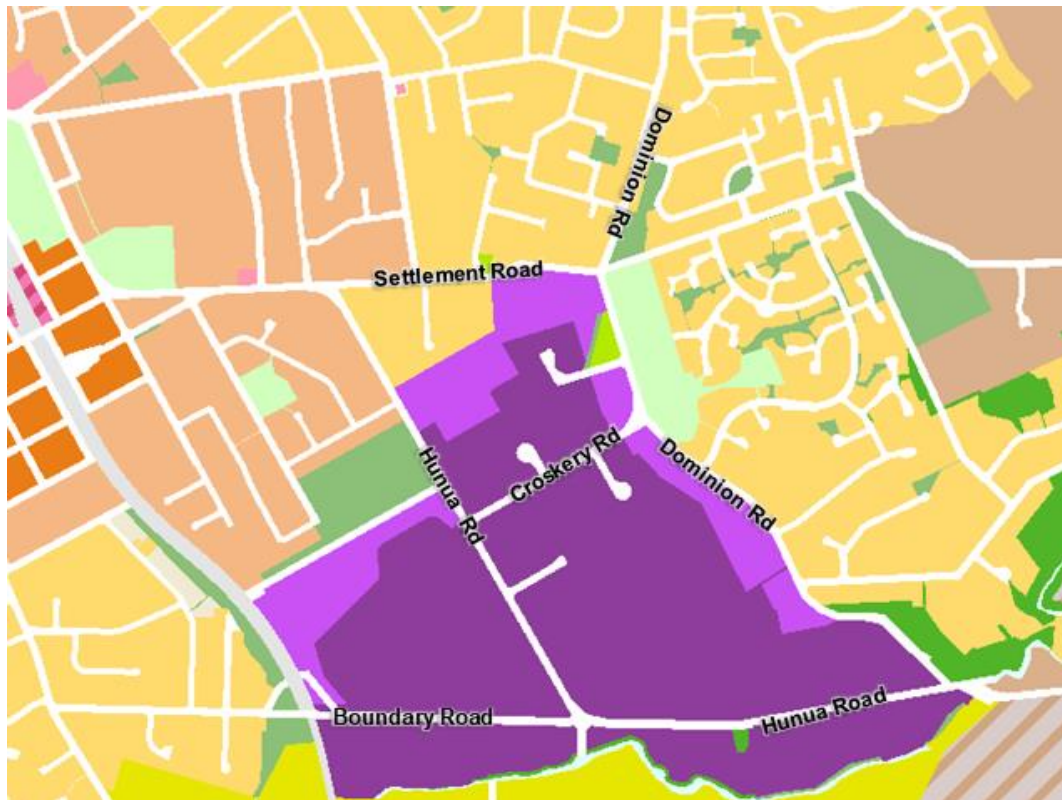
Option Development and Assessment

Croskery Road– Option Development and Assessment

The urbanisation and upgrade of Croskery Road is to primarily provide for walking and cycling facilities. The corridor is a key East-West Connection between Hunua Road and Dominion Road. It connects to the Takaanini FTN and the future Mill Road via Dominion Road.

Figure 10-25 shows the extent of Croskery Road.

Figure 10-25 : Croskery Road Corridor Extent



10.12 Preliminary Analysis

The Croskery Road upgrade draft design was previously developed under the Drury Arterials project in April 2020. The corridor was not progressed for route protection with the rest of the Drury Arterials project and now forms part of this DBC.

The design at the time has identified a two-lane corridor that followed the existing road geometry both horizontally and vertically. It assumed the corridor tied into the intersection of Dominion Road which will be upgraded as part of the Mill Road project and the intersection with Hunua Road. All other intersections along the corridor will be kept as per the existing. The proposed design is shown in **Figure 10-26**.

The design also indicated wetlands were required as part of the design which would likely require designation and property purchase.

Figure 10-26 : Drury Arterials Design of Croskery Road

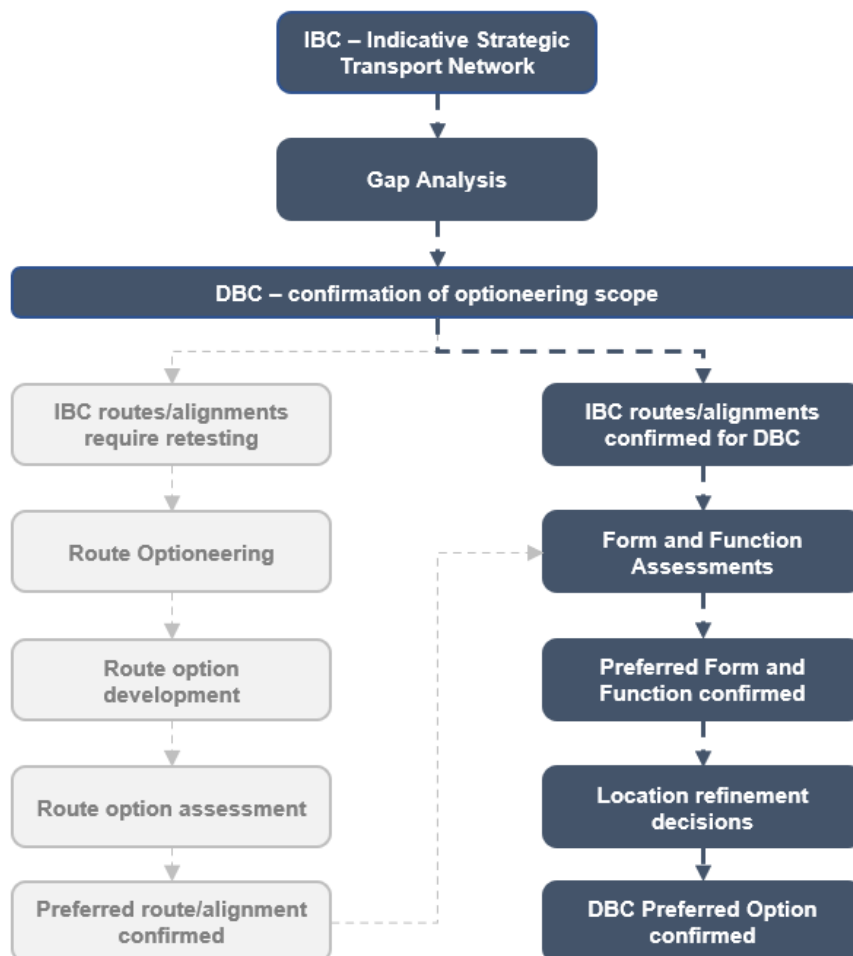


The preliminary analysis therefore had recommended a comprehensive review of the recommended option, in particular the stormwater design as these elements were to be outside of the road reserve.

10.12.1 Option assessment process

The option assessment process followed is as shown in **Figure 10-27**.

Figure 10-27 : Route refinement process for Croskery Road

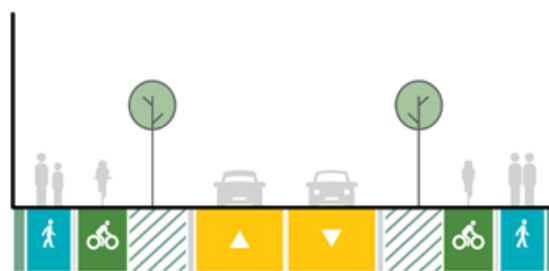


10.12.2 Corridor Form and Function Assessment

The corridor functions as a collector that provides access to existing businesses and from a capacity point of view is assumed to not have a significant volume increase over time. Therefore, the typical section indicated by the Drury Arterials team is considered appropriate as it provides a single lane in each direction with active modes on both sides of the corridor. Hence, no further assessment is required. It is important to note Croskery Road is mostly used by heavy vehicles. The 20m cross section looks to bring the kerb line inwards and this may impact the operation/performance of the heavy vehicles which could lead to localised road widening. If the existing kerb line is to remain in place, the operational risk would be mitigated.

The proposed cross-section is shown in **Figure 10-28**.

Figure 10-28 : Proposed Croskery Road cross-section



10.12.3 Intersection Assessment

No intersection improvements have been proposed. The working assumption is that the Mill Road project would take precedence of the final form of the eastern intersection and no changes are proposed to the other intersections along the route. The intersection of Hunua/ Croskery Road intersection is assessed as part of the Takaanini FTN.

10.12.4 Option Refinements

A corridor width analysis was undertaken which indicated the road reserve varies between 20m to 25m along the corridor. This is sufficient width for the proposed 20m cross-section.

An alternative stormwater approach was considered in the form of a vegetated berm/ infiltration trench could be used instead of the previously identified wetlands. In more constrained areas, other methods could be explored.

Full details of the design process could be found in **Appendix H: Design Report**.

10.12.5 Preferred Option

The emerging preferred option is to upgrade Croskery Road to a two lane 20m arterial road with active mode facilities. Stormwater management will be provided via vegetated berm/ infiltration trench on each side of the road. No land take has been identified to be required. Thus, no route protection required.

It is however noted that further consideration needs to be given to utilities, soil and pavement conditions and services during the next phase of design.



Great South Road Between Waihoehoe Road and Drury Interchange

Option Assessment and Development

Great South Road – Between Waihoehoe Road and Drury Interchange

The corridor interfaces with a number of adjoining projects including the Papakura to Drury Interchange, Drury Central Station, upgrade of the Great South Road / Waihoehoe Road intersection as part of the Drury Arterials Network. It is an important motorway access as it is a direct connection on to the Drury interchange.

Figure 10-29 shows the extent of the corridor.

Figure 10-29 : Project Extent



10.13 Preliminary Analysis

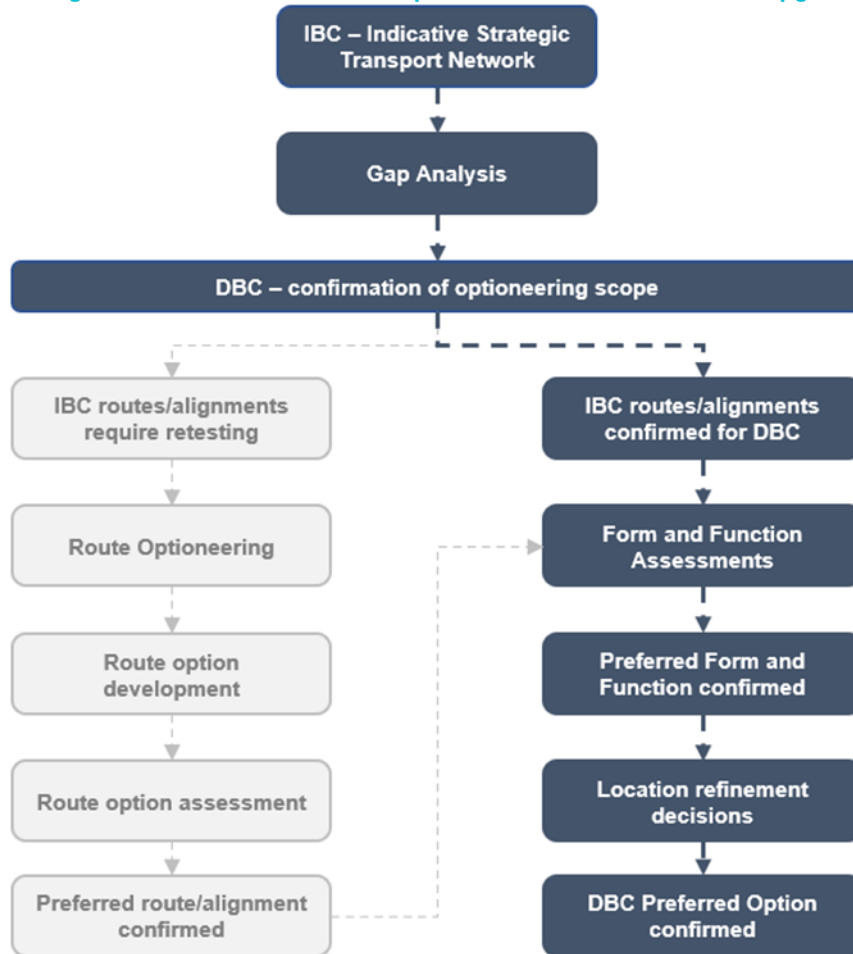
There is a range of activities occurring in the area including several funded projects underway including the Drury Central Station and the Papakura to Drury interchange. This small section of the corridor has not been considered as part of any of these projects. However, there is a need to understand the form and function of the corridor to provide for continuity between the adjoining projects as well as ensuring the future outcomes.

Thus, the project was recommended to route refinement for further assessment.

10.14 Option Assessment process

The option assessment process followed is as shown in **Figure 10-30**.

Figure 10-30 : Route refinement process for Great South Road Upgrade



10.14.1 Corridor Form and Function Assessment

The Corridor Form and Function (CFAF) process was used for the purpose of defining a desired cross-section. The assessment has indicated the proposed cross-section shown in **Figure 10-31**.

Figure 10-31 : Indicative cross-section for Great South Road between Waihoehoe Road and Drury Interchange



Full details of the assessment may be found in **Appendix G: Transport Outcomes Report**.

10.14.2 Intersection Form Assessment

No intersections assessment was required as part of the assessment as the adjacent intersections are part of existing projects.

10.14.3 Option Refinements

Existing road reserve width and constraints were analysed as part of the design refinement process. The following physical constraints were identified:

- Two-lane bridge over the Hingaia Stream – a new bridge or bridge widening will be required.
- Approaches to the bridge are below the flood plain – vertical lift will be required which will impact on existing driveways.
- 1.2m diameter watermain pipe running on the eastern side of Great South Road – likely to require protection or relocation.

The design also considered the interfacing projects:

- Great South Road/ Waihoehoe Road intersection recommendation.
- Papakura to Drury Design for the Drury interchange, including tie-in to Great South Road.
- Drury Central Station.

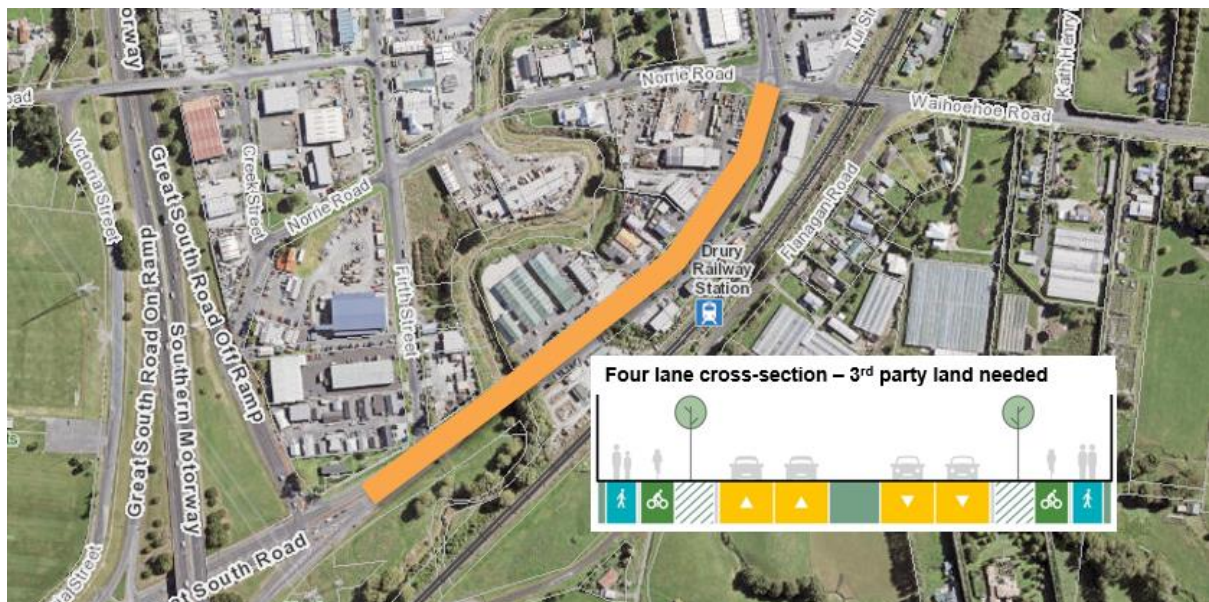
Full details of the design process can be found in **Appendix H: Design Report**.

10.14.4 Preferred Option

The emerging preferred option is to upgrade this section of Great South Road to a four-lane arterial with active mode facilities including the upgrade of the existing bridge over the Hingaia Stream. This will provide continuity along the interfacing projects and corridor especially for active mode users.

The preferred option will require third party land and route protection is recommended (refer to **Figure 10-32**).

Figure 10-32: Preferred option for Great south Road between Waihoehoe Road and Drury Interchange



Four property acquisitions are anticipated with the preferred option.

Further consideration needs to be given to integrating with the future Drury Station during detailed design.



Recommended Option

11 Recommended Option

The recommended network option is shown in **Figure 11-1**.

Figure 11-1 : Recommended Option

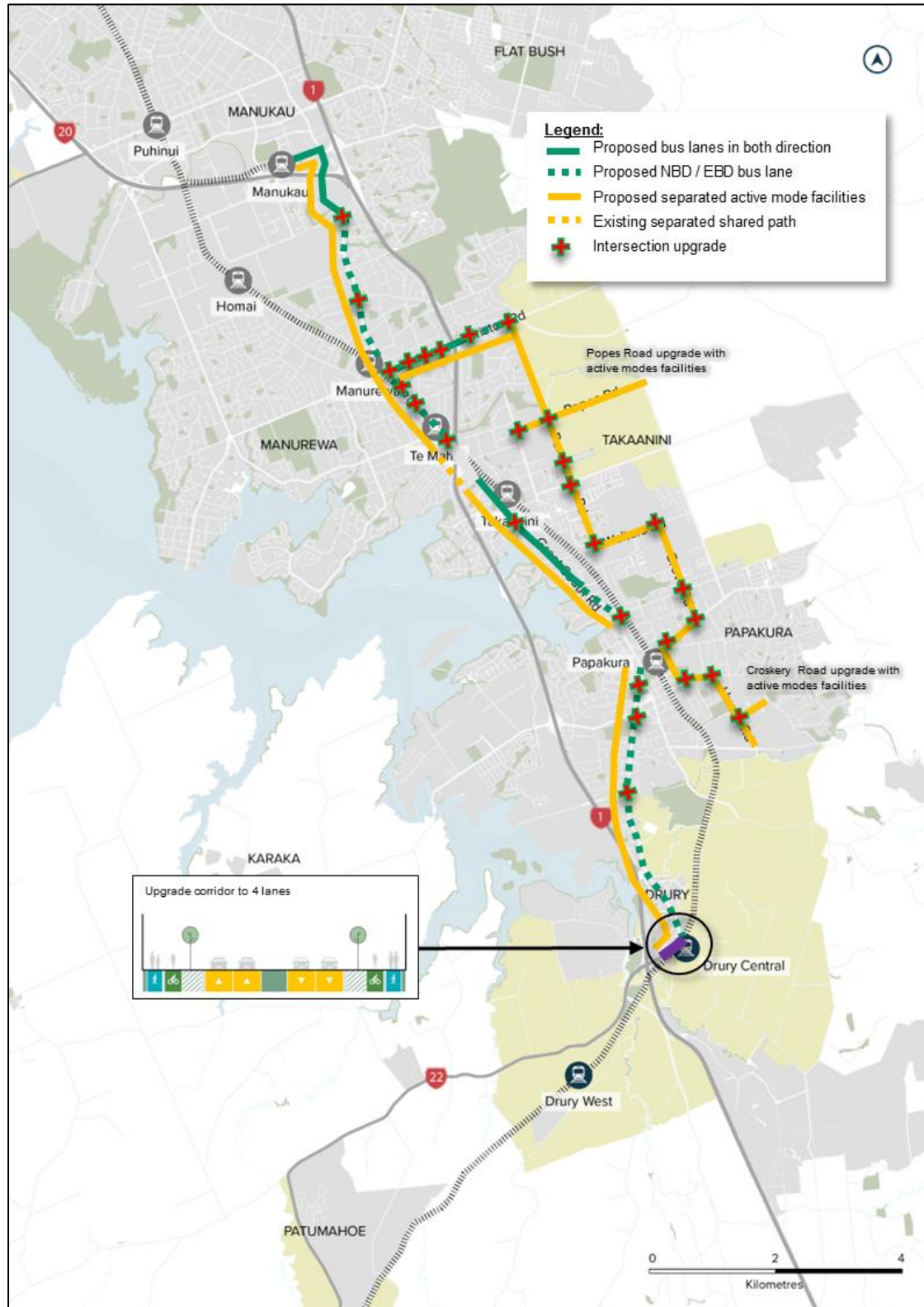
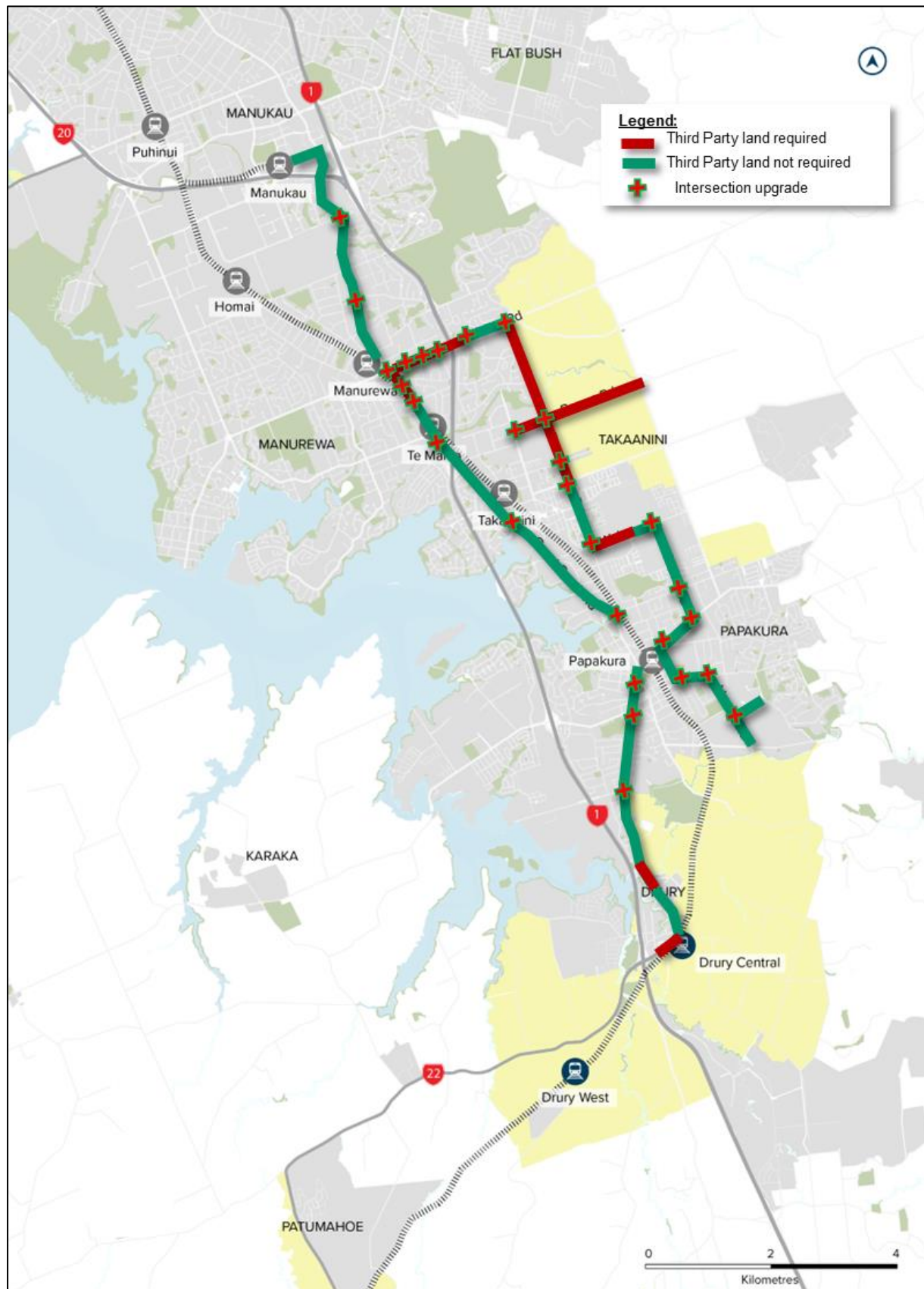


Figure 11-2 provides a summary of where third party land is required for the proposed upgrades.

Figure 11-2 : Location of where third party land is required



Overall, the recommended option provides a transport network that supports:

- Long term development of a low carbon transport system to support future growth and facilitate mode shift from private vehicles to public transport and active modes to reduce greenhouse gas emissions.
- Urbanisation and intensification of adjacent land uses, particularly high density housing.
- Increased reliability for public transport. Support the rail by providing access to train stations and additional capacity and resilience in the event the rail line is full or close providing travel choice for the community.
- Safety through applying Road to Zero safety principles, separated cycle facilities and well-designed intersections.

The outcomes will be achieved by targeted investments in:

- Implementation of active mode facilities on all corridors.
- Implementation of dedicated bus lanes to support the operation and patronage of frequent transit network route.
- Strategic corridors to support growth as it occurs to promote the uptake of alternative modes and manage impacts on the existing transport system and urban areas.

11.1 Key Performance Indicator Outcomes

The key outcomes for the recommended transport package is shown in **Figure 11-3**. Additional detailed information on overall outcomes are included in **Appendix G : Transport Outcomes Report**.

Figure 11-3 : Recommended Option Transport Outcomes

Overall investment outcomes for the South FTN recommended transport network (2048+)				
Outcomes achieved	Alignment			
Access	 Employment accessibility 30 min by PT	Manurewa ↑ 4% Takaanini ↑ 12%	Papakura ↑ 1%	 177,000 jobs accessible within 30 minutes by active modes
Reliability	 Up to 11 mins travel time saving on the GSR FTN (peak period)	 Up to 9 mins travel time saving on the Takaanini FTN (peak period)	 Improvement in PT travel time reliability. Reduction in travel time spread to 18 minutes on GSR FTN and to 12 minutes on the Takaanini FTN.	
Safety /Integration	 ↑ 27km New and improved cycle network	 80 DSIs estimated to be saved over 40 years	↑ 29km of new and improved network with enough space to improve street amenity appropriate for the place and built form	
Travel Choice	↑ 19km New bus lanes to support the FTN network	 ↑ 2,800 average daily patronage increase across the FTN network	 ↑ 2,900 additional walk-km daily ↑ 1,400 additional cycle-km daily	
Climate Change	 ↓ 54,800 less vehicle kilometres travelled daily	 2,250 tonnes reduction of CO ₂ per year. 89,800 tonnes reduction of CO ₂ over 40 years.	 Stream crossings designed to accommodate 1 in 100 year flooding to respond to climate change.	

The DBC recommended package provides transport benefits by:

1. Supporting the realisation of further benefits of existing interventions through investment in high-quality public transport to support the rail and increase public transport and active mode share.
2. Delivering additional transport benefits for the existing community in the south by enhancing travel choice and accessibility.

This recommended package is a holistic package of interventions to support the South. Whilst individual projects may vary in their performance when considered in isolation, they are complementary and connected with each other. Each individual addresses specific issues but also plays a wider network role in extending an active mode or public transport network. Together, they provide transport choices and improve reliability for the community.

Additional commentary on the key investment theme outcomes is summarised in **Table 11-1**:

Table 11-1 : Investment theme commentary

Investment theme	Commentary
Access	177,000 jobs may be accessed by active modes within 30 minutes. - The proportion of employment accessibility by PT within 30 minutes increases by 12% for those in Takaanini, 4% for those in Manurewa.
Reliability/ Resilience	- Upgrades to existing bridges such as the Hingaia stream bridge achieves a 1 in 100-year flood event. This helps support the overall sustainability and resilience goals. - Additional capacity and PT resilience is provided with the proposed FTNs. - Up to 11 minutes travel time savings may be achieved with the Great South Road FTN and 9 minutes for the Takaanini FTN during the peak periods.
Mode Choice	- There is 23% (1% increase) in active mode share with the recommended option. - There is 31% in PT mode share with the recommended option. This is not materially different from the Do Min as the Do Min network includes CRL and rail 4-tracking which does the heavy lifting for PT. Although there is no substantial change, the FTN provides a very different function to the rail, it serves the local and shorter trips allowing more travel choice for an already PT deprived community. It also provides an alternative shall the rail not operate.
Safety	- While the number of previous active mode DSIs are relatively low, the conflict risk for these users will increase in the future as there are more vehicles and active mode users on the network. The recommended option can significantly reduce this by providing dedicated facilities. - DSI reduction of 80 is anticipated over 40 years with the recommended option with corridor improvements and as high-risk intersections are upgraded. 27km of separated active mode facilities is provided with the recommended option.
Integration	The recommended option includes over 20km of new urban street scape space which will provide enough space for street furniture/ street lighting.
Climate Change Response	- The recommended network is estimated to achieve a reduction in CO2 emissions of 2,250 tonnes per year in 2048+ compared to the Do Minimum scenario. - Conserve and provide opportunities to enhance the natural environment and cultural heritage including wetlands, SEA's streams and vegetation stands.

11.2 Sustainability outcomes

The concept of sustainability is in synergy with Te Ao Māori (Māori worldview) and the interconnectedness and interrelationship of all living and non-living things. The development of the recommended option has been undertaken holistically and is based around the three principles of social, environmental and economic sustainability.

The overarching sustainability principles were introduced in **Section 6.3** and are shown again in **Figure 11-4** below.

Figure 11-4 : Sustainability principles

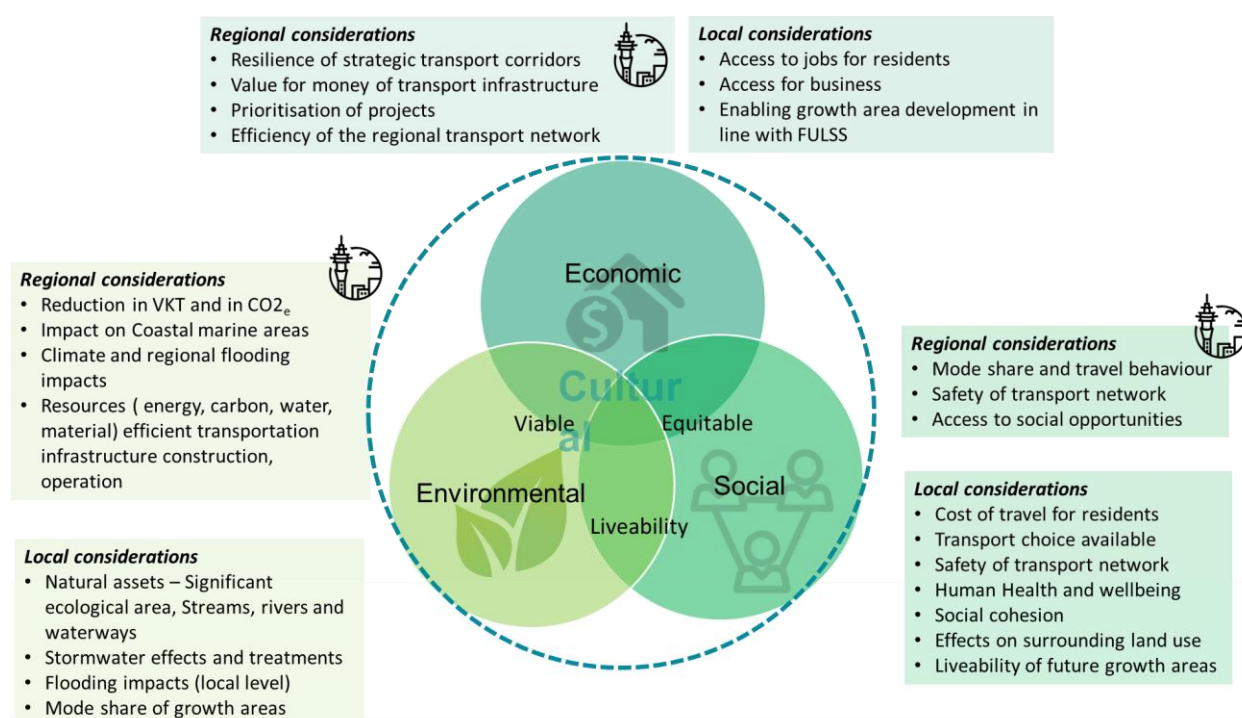


Figure 11-5 and **Figure 11-7** details how the recommended programme delivers against these three principles to support a strong culture, better community outcomes and create liveable communities.

Figure 11-5 : Environmental outcomes

Environment Outcomes

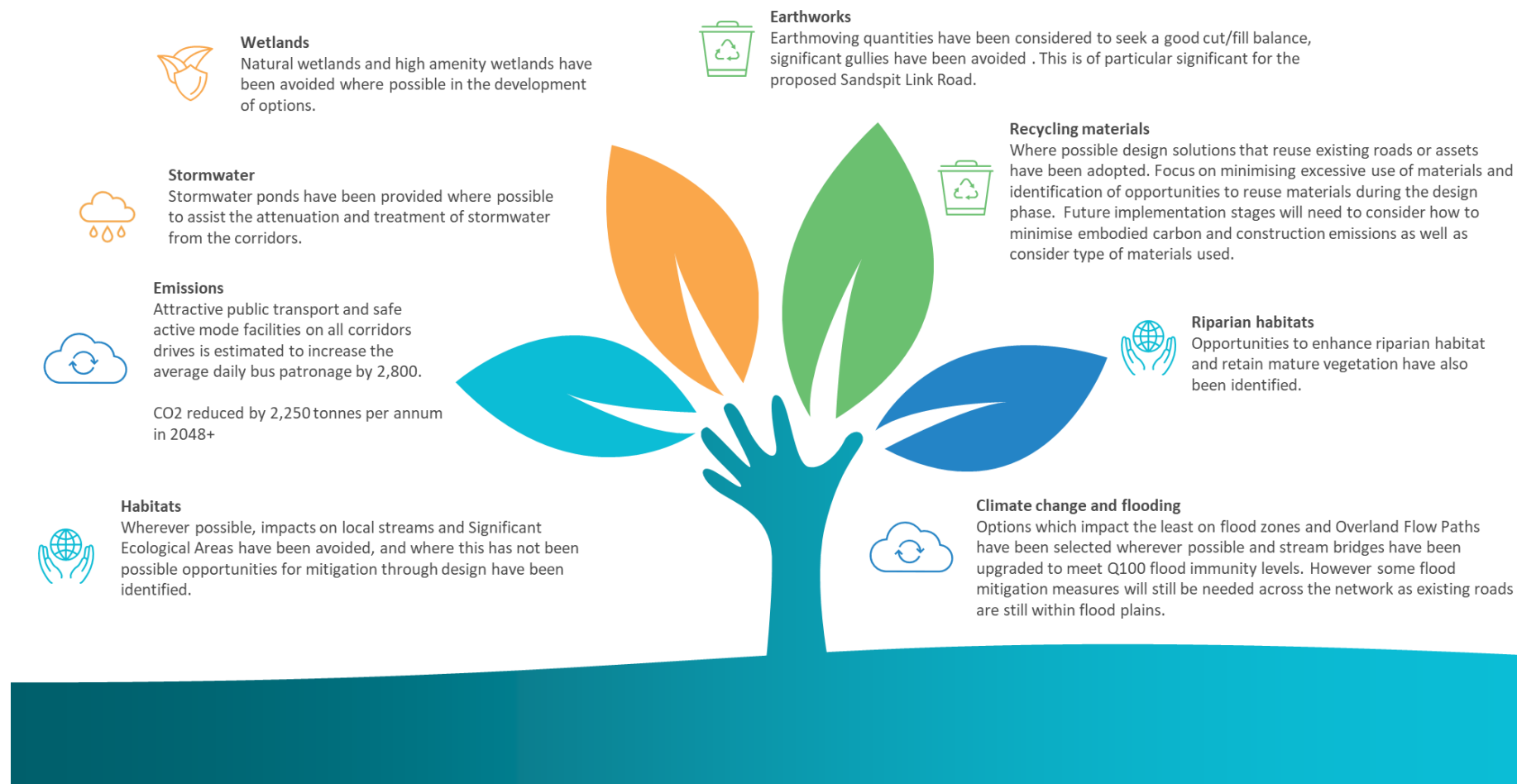
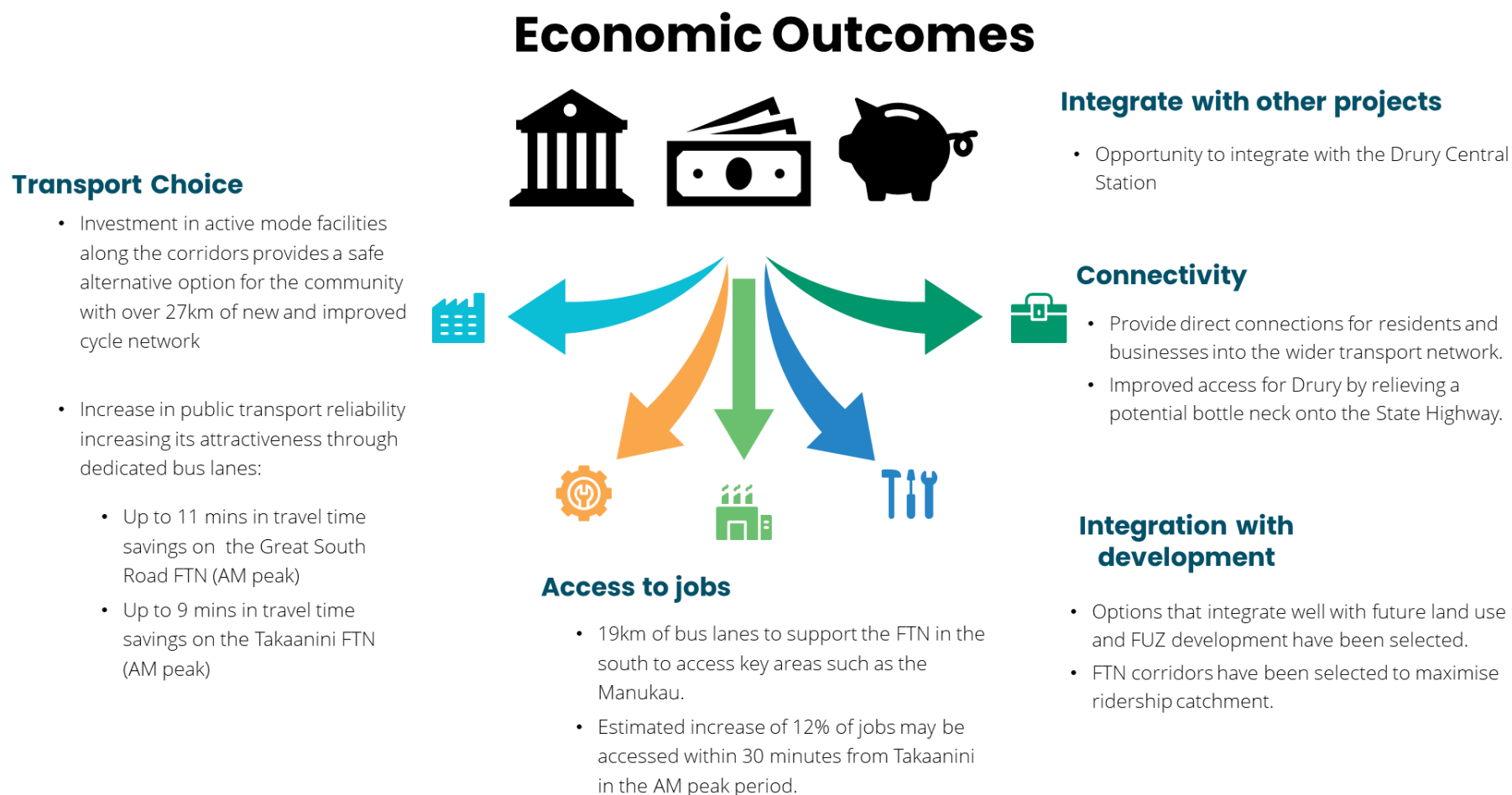


Figure 11-6 : Social outcomes



Figure 11-7 : Economic Outcomes



11.3 Supporting measures

If all the transport infrastructure projects identified in the Te Tupu Ngātahi programme were successfully delivered this would not guarantee or optimise the outcomes sought from the programme. This is due to the wide range of other necessary elements, including pre-condition to investments, that also need to be implemented and monitored to ensure the successful overall outcome of the programme.

These elements can be broadly summarised into three areas, being Urban System Integration, Transport System Optimisation and Other Transport, as shown in **Figure 11-8**.

Figure 11-8 : Additional contributory elements



It is critical that each of these elements are delivered in parallel and in collaboration with this programme of transport interventions to optimise and deliver the full range of outcomes sought. For example, if the projected land use is not delivered, the planned transport system will be sub-optimal, underutilised and critical elements such as mode-shift targets will not be met.

Specific complementary measures are summarised in **Table 11-2**. Management of these measures are discussed further in the Management Case.

Table 11-2 : Supporting measures for the recommended option

Supporting measure	Measure	Application
Urban system integration	Ongoing land use and transport integration	This programme of transport interventions is intrinsically linked to the urban system including land use, urban form and place quality, density and proximity and employment self-sufficiency. Te Tupu Ngātahi recognises this with place making and liveability outcomes a key focus area, alongside alignment with the future pace, location and scale of the proposed growth.

Supporting measure	Measure	Application
		It is therefore critical that these urban system integration outcomes are delivered alongside and at the appropriate timing for the transport interventions recommended. Land use integration discussions will need to happen with identified government partners such as Eke Panuku as well as third party developers to maximise opportunities to best connect developments with the transport network.
Transport System Optimisation	Travel Demand Management	The IBC identified a wide range of Travel Demand Management initiatives to ensure demand pressure on the transport system of Auckland's growth is appropriately managed. These measures are a combination of locally driven interventions and whole of region measures, which make coordination and collaboration across the multiple parties required challenging.
	Increased bus frequencies	The FTN corridors will require operational funding to increase bus services and the overall attractiveness of the service. If this does not occur, the public transport mode shift will not be realised.
	Fleet Management	Whilst mode shift is preferable to reduce emissions, there is also a role for better fleet management. This will include wider government-led initiatives to support the uptake of electric vehicles and buses to reduce emissions. Emission modelling in 2048+ includes an assumption of ~66% of the total fleet being electric and this is a major contributor to reduction in emissions. Therefore, this is a very important measure to support the overall reduction in emissions and maximise outcomes.
Other Transport	Implementation of key projects	The preferred option relies on a number of other transport projects being in place to support the preferred option and realise the desired outcomes. Examples of this include: • Completion of Mill Road • Completion of Ōpāheke North-South arterial

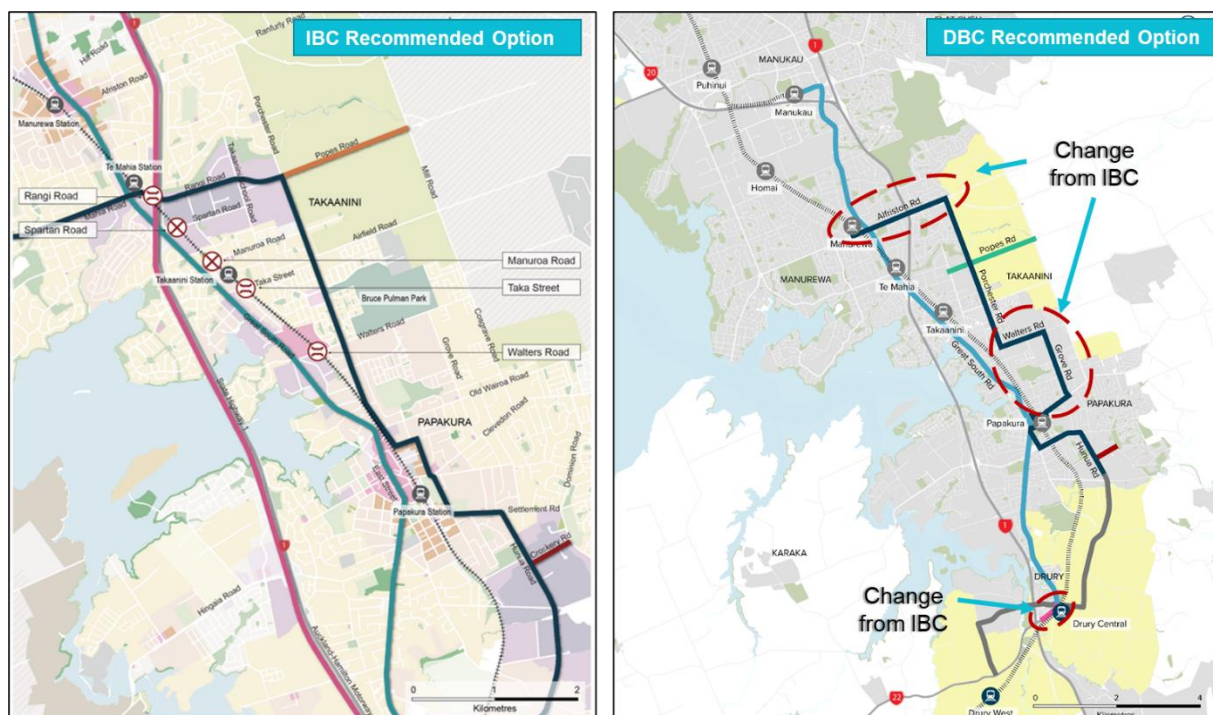
11.4 Differences to the IBC

The recommended option is mostly aligned with the IBC network with changes mostly related to the Takaanini FTN. The changes are:

- **Great South Road FTN** – Alignment remains but only sections of the corridor will have bus lanes in both directions.
- **Takaanini FTN** – Instead of running via Porchester from Papakura then Rangi Road through to Mahia and Roscommon, it will instead go via Clevedon Road from Papakura then Grove Road, Walters Road, Porchester Road and Alfriston Road to end at Manurewa Station.
- **Popes Road** – this will now be a two lane arterial instead of the four lanes previously identified.
- **Great South Road between Waihoehoe Road and Drury interchange** – This was not included within the IBC but was identified as a gap in the network. The DBC has recommended it to be upgraded to four lanes with active mode facilities.

Figure 11-9 shows the change in the network between the IBC and DBC.

Figure 11-9 : Comparison of the IBC recommended option to the DBC recommended option



11.5 Staging Assessment

Given the long-term nature of this route protection DBC, there is some uncertainty as to the final land use and timings for supporting infrastructure upgrades. The following sections discuss the resilience of the proposed network to these external uncertainties.

11.5.1 Proposed staging

For the purpose of the DBC, an assumed staging of projects has been identified based on a set of staging principles:

- Time implementation of the South FTN network in a pragmatic approach with other AT projects in the network such as intersection upgrades, localised safety improvements.
- Provide a meaningful improvement to walking and cycling and public transport in the short to medium term to support the existing urban areas and portions of new growth already underway.
- Programme public transport and active mode facilities and services from the outset of urban development to support a shift to more sustainable travel.
- Prioritise PT and active mode facilities that support attractive access to the rail stations.
- Consider potential interrelationships between transport projects to achieve overall outcomes.
- Consider staging of elements of a project to match likely development stages and system needs, whilst also considering pathways to achieve the full-build elements.
- Consider the needs to support place-function, not solely movement function.
- Provide safe travel by all modes.
- Staging that can respond to the timing, scale, and form of urban development as defined by the Future development Strategy work.
- Providing multimodal access to meet MOT inclusive access objective.
- Identify opportunities that reduce interruptions during construction.

- Identify opportunities where other projects help alleviate traffic pressure on the corridor which is to be upgraded.

The approach to staging for the South FTN and key connections project is different from other projects in the Te Tupu Ngātahi programme, given that the South FTN network is largely in the urban environment whilst other projects in the programme are serving greenfield growth.

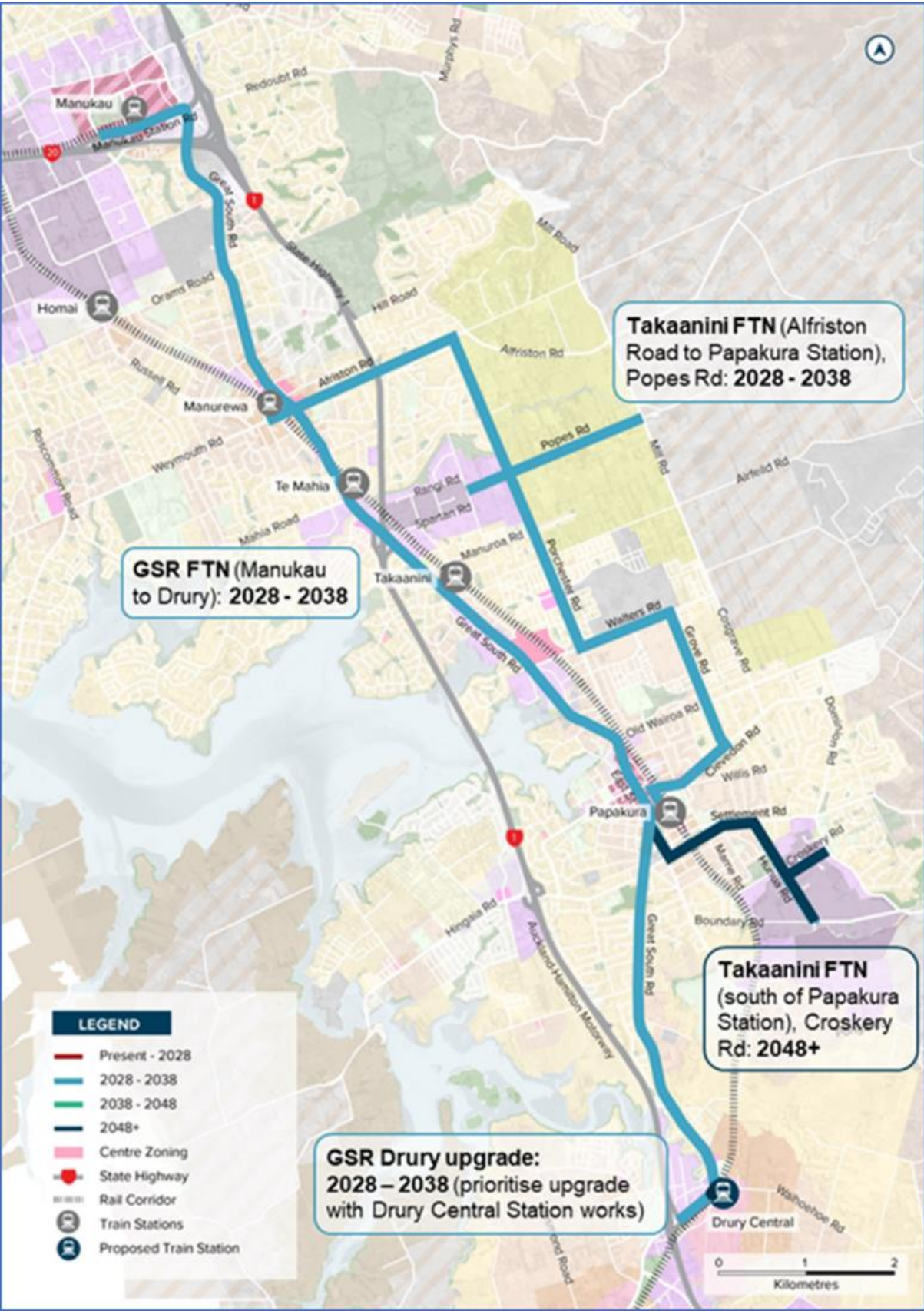
At a high level, the key components of each stage are set out in **Table 11-3**.

Table 11-3 : Key components of each stage

Stage and indicative timing	Transport Network
2028-2038	GSR FTN will be implemented within this period predominantly to enable the effective connection for existing communities to key locations such as the Manukau Metropolitan centre, rail stations and Town Centres. The southern section of GSR will respond to the growth in Ōpāheke-Drury. The northern sections of the Takaanini FTN and Popes Road are proposed in this period to support climate change and mode shift targets sooner rather than later. GSR Drury upgrade should be prioritised to be upgraded with Drury Central Station works.
2038-2048	No proposed infrastructure during this period.
2048+	Includes Croskery Road and the rest of the Takaanini FTN driven by the completion of the Ōpāheke N-S arterial.

The proposed staging is shown in **Figure 11-10**.

Figure 11-10 : Proposed staging



11.5.2 What happens if the timing of land use or other key projects changes?

The timing of growth is subject to inherent uncertainty in timing. Since the FULSS, it was recognised there are geotechnical and flooding challenges for the Takaanini FUZ area that requires further investigation. The release of the draft FDS has proposed the removal of the Takaanini FUZ and partial removal of the Ōpaheke-Drury FUZ. While this is not yet confirmed, this DBC has considered what this may mean for the staging.

The projects within this DBC mainly traverses through already urbanised areas where the proposals are not solely to cater for the future growth areas. Rather, a large element is in resolving some of the existing transport issues. The upgrades to these corridors (including third-party land requirements) are primarily for public transport and active mode users in both the existing communities and the growth areas. Thus, even without the growth areas, there are merits in the projects being implemented in the proposed staging instead of a later date.

Table 11-4 sets out considerations of changes to land use and key project timing, considering both delay and acceleration to land use development and provides commentary on how this might influence staging of infrastructure.

Table 11-4 : Resilience of the proposed network to land use changes

Change	Commentary
Takaanini FUZ develops earlier than anticipated OR is further delayed/ does not eventuate	With growth in the Takaanini FUZ area developing earlier than anticipated, the timing of the northern section of Takaanini FTN and Popes Road will remain as 2028 – 2038. This FUZ area is currently staged to be development ready in the second half of decade three (2043-2047) in FULSS. If this is brought forward, then the current staging allows for the PT infrastructure to be in place from the onset of development. With growth in the Takaanini FUZ area delayed further or if it does not eventuate, the timing of the northern section of Takaanini FTN and Popes Road will remain as 2028 – 2038. These corridors will continue to serve the existing brownfield area adjacent to the route and provide key access to Manurewa Station. The timing of Popes Road is expected to not change as it will provide access from the east, Mill Road to the developing Takaanini industrial area.
Ōpaheke-Drury FUZ develops earlier than anticipated OR is further delayed/ does not eventuate	Part of the Drury FUZ area is already live zoned, and with growth in the area developing earlier than anticipated, it is expected that there may be a need for the southern section of Takaanini FTN (south of Papakura Station) to be brought forward, contingent on whether Ōpaheke N-S arterial is also brought forward. This will ensure the infrastructure is in place to provide a reliable PT network and accommodate the growth in the area. With growth in the Ōpaheke-Drury FUZ area being deferred or removed, the implementation of Ōpaheke N-S arterial may be impacted which will then impact the timing of the southern section of Takaanini FTN. However, there is the possibility where Ōpaheke N-S arterial is implemented despite the status of the FUZ area. In this case, the southern section of the Takaanini FTN continues to provide a PT route connecting Papakura to Drury.
Growth in Takaanini industrial area develops earlier than anticipated	With growth occurring in the Takaanini industrial area earlier than anticipated, there may be a need to bring the implementation of elements of Popes Road forward. This is contingent on the development of Mill Road and the wider strategic freight network. The key infrastructure required would be the intersection upgrades at Popes Road/ Porchester Road intersection and the Popes Road/ Takaanini School Road. These intersection upgrades will provide safer outcomes given that there would be an increase in heavy vehicle movement earlier than anticipated.

Change	Commentary
Growth in Takaanini industrial area is delayed	With growth in the Takaanini industrial area being delayed, the implementation of Popes Road can be delayed, however, will still be recommended to be timed with the delivery of Mill Road and the development of the Takaanini FUZ.
Implementation delay of infrastructure supporting Drury East area (i.e. Drury Central Station, Waihoehoe Road etc)	With delay of the implementation of key infrastructure, there is still an opportunity to maintain the current proposed timing (2028-2038) of the corridor upgrade of Great South Road, Drury. This corridor upgrade will continue to accommodate the growth and development in the Drury Centre, Drury East and Waihoehoe Precinct areas.
Implementation delay of four-tracking of the rail line	Four-tracking of the southern rail line is timed for 2038. If this is further delayed, the current timing of the FTN routes will accommodate some of the PT movement while construction of the four-tracking gets underway.
Four-tracking of the rail line is accelerated	Great South Road FTN route may be required to be brought forward to reduce any rail disruptions where bus replacements may be required.
Implementation delay of Mill Road	The uncertainty of the form, function and timing of the strategic Mill Road corridor may result in delayed implementation of this corridor. The current proposed implementation timing of Great South Road FTN will accommodate for people movement between Papakura and Drury until Mill Road is implemented.
Implementation of Mill Road is accelerated	If Mill Road South (Drury to Papakura) is implemented earlier, then there is an opportunity to Great South Road FTN (Drury to Papakura) sooner. As soon as Mill Road South is operational, works can commence on Great South Road FTN (Drury to Papakura) as traffic is expected to be alleviated of Great South Road during this time.
Implementation delay of Ōpaheke N-S arterial	Delayed timing of Ōpaheke N-S arterial will be accommodated by the current proposed implementation timing of Great South Road FTN as this will continue to provide for people movement between Papakura and Drury. There will be even less pressure on the timing of the southern section of Takaanini FTN (south of Papakura Station) as this will tie into the Drury FTN on the Ōpaheke N-S arterial.
Implementation delay of Takaanini grade-separated bridges	There is an inter-dependency of the grade-separation bridges and Alfriston Road. Simultaneous construction of both the Alfriston Road bridge and the grade-separation bridges should be avoided to ensure there is sufficient east-west connectivity in the network.

As rail is the key PT infrastructure in the South, disruptions to the rail line will impact commuters significantly. The FTNs being in place has the opportunity to offset some of the impacts. Thus, the staging of the FTN is to be timed prior to the construction of four tracking (if timing changes) and be developed in line with key stations to maximise mode shift opportunities.

11.5.3 Priority Opportunities

In the event where funding became available the below opportunities should be considered. These opportunities will depend on the infrastructure changes in the wider network:

- Works along **Alfriston Road** could be accelerated. This is a key east-west connection which provides for the Takaanini area. It should be noted that there would be significant works and property impacts relating to this project, however, Alfriston Road is a key part of the Takaanini network.

- Works along the section of **Manukau Station Road** and **Great South Road (north of Browns Road)** can be accelerated as this is relatively low-cost project which is expected to serve a high number of buses.
- Corridor upgrade of **Great South Road, Drury** can be accelerated as this is an opportunity to integrate with other projects and 'close the gap'.
- Works along **Great South Road** through the **Takaanini** area could be accelerated as this is a critical part of the network for the local community where there are existing PT reliability issues.

Appendix N – Staging Considerations provides further details as to each project and the interdependency on other projects and land use development. The proposed network is considered to be robust to external land use changes.

12 Economic Case

This section summarises the economic analysis. This DBC is for the purpose of route protection, rather than imminent implementation. The appraisal has therefore been targeted at this decision (to progress to route protection), rather than at the more detailed assessment that could be expected for an implementation decision.

This economic evaluation has been undertaken in accordance with the Waka Kotahi NZ Transport Agency Monetised Costs and Benefits Manual (MBCM), version 1.5.

Appendix K: Economics Assessment sets out the full methodology, assumptions, scenario testing, incremental analysis, and sensitivity analysis undertaken. For economic assessment purposes the DBC has been split into the following:

- Full recommended transport package
- Great South Road FTN
- Takaanini FTN
- Great South Road upgrade between Waihoehoe Road and Drury interchange

12.1 Key assumptions

The key assumptions assumed in the economic analysis are shown in **Table 12-1**.

Table 12-1: Key economic assumptions

Assumption Type	DBC Assumptions
Base date	1 July 2022
Time zero	1 July 2023
Analysis period	40-year analysis period and sensitivity tested for 60 years
Travel time benefits	Assessment of base and congested (CRV) travel time benefits from MSM models.

Assumption Type	DBC Assumptions
Vehicle operating costs	Assessment of base running vehicle operating costs (VOC) from the MSM models.
Discount rates	Discount rate 4% applied to all annual benefits and costs, but sensitivity tested for 3% and 6%.
Transport reliability benefits	Assumed as 8% of the base travel time benefit, as a standard approach.
Public transport reliability	Public transport reliability benefits are estimated as 80% of public transport user benefits in the commuter peaks and 40% in other periods.
Emissions	CO ₂ benefits are calculated from VEPM 6.3 emission rates.
Walking and cycling benefits	Estimated based on trip demand and travel cost matrices from SAMM, using the same method as used for public transport benefits in MSM, and using the same approach as South DBCs.
WEBs	WEBs calculated for 2048+, in accordance with the MBCM, then applied using an adopted percentage uplift to the conventional benefits. The analysis is done for three principal types of WEBs – agglomeration, imperfect competition, and labour market impact.

12.2 Cost

This section summarises the project construction and property costs prepared for the economic analysis. Indications of operational and maintenance costs have also been given. The estimates and appraisal have been developed with available information for the purpose of informing a decision whether to invest in route protection.

Detailed information is included in **Appendix J: Cost Report**

12.2.1 Capital Cost

Cost estimates (expected cost P50) and property costs for each individual project are outlined in **Table 12-2**.

It is worth noting the following key cost assumptions:

- **Type A project, Croskery Road**, do not require land and is therefore not being progressed to route protection.
- Property pricing undertaken by AT. This does not include Auckland Council property as when AT is acquiring land under the Public Works Act (PWA) it is doing so on behalf of Auckland Council.

Table 12-2 : Capital Costs

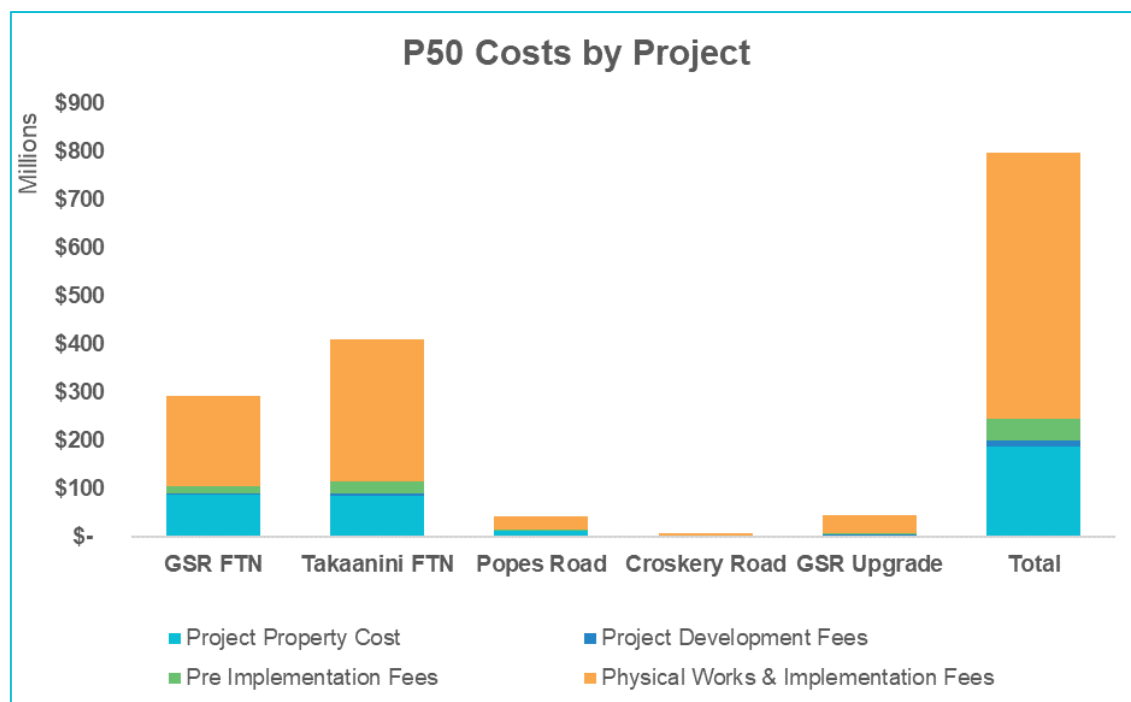
Project	P50 Cost incl Property Cost (Undiscounted, \$M)	P50 Property Cost (Undiscounted \$M) ²
Great South Road FTN	\$291.87	\$87.55
Takaanini FTN	\$410.04	\$85.62
Croskery Road upgrade	\$8.12	-
Popes Road upgrade	\$42.00	\$12.0
Great South Road between Waihoehoe Road and Drury interchange	\$44.94	\$3.80
Total	\$796.97	\$188.97

The P50 estimated costs includes the following costs:

- Property acquisition and temporary occupation.
- Project development.
- Pre-implementation.
- Physical works and implementation.

A breakdown of these cost components is shown graphically in **Figure 12-1**.

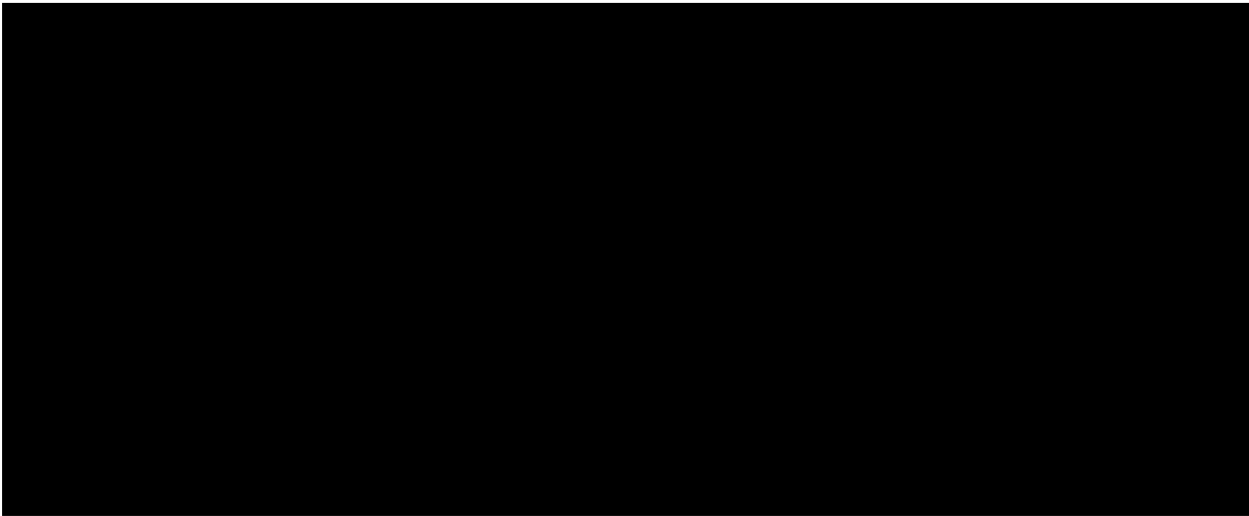
Figure 12-1 : P50 cost estimates by project (undiscounted)



² Includes temporary occupation costs

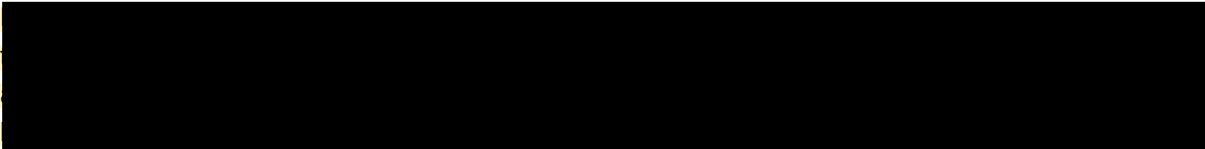
12.2.2 Operation and maintenance costs

Operating and maintenance costs associated with the projects are shown in Table 12-3. The following descriptions describe how these costs were assessed.



General Road Maintenance

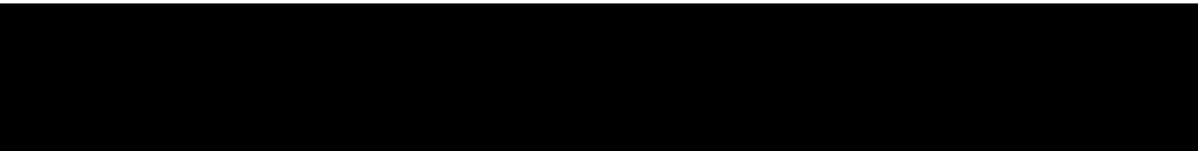
Maintenance of road and transport corridors will vary significantly depending on a number of factors.



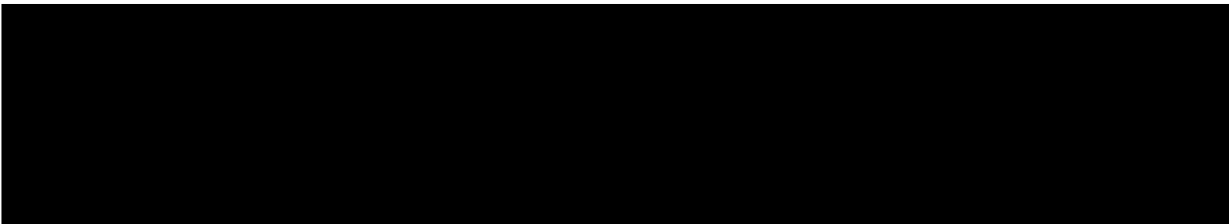
Road Resurfacing



Bridge Maintenance



12.2.3 Public transport operating costs



12.2.4 Project costs for economic assessment

The project costs used in the economic assessment are shown in Table 12-4.

Table 12-4 : NPV Project Costs, \$M

Projects	PV Capital Cost incl Property Cost (\$M)	PV Maintenance Cost (\$M)	PV PT Operating cost (\$M)	PV Total Net costs (\$M)
GSR FTN	178.6	2.4	38	219.0
Takaanini FTN	239.4	1.2	27	267.6
Croskery Road	22.8	0.3	0	23.1
Popes Road	3.8	0	0	3.8
GSR Upgrade	35.7	0.8	0	36.5
Total	480.3	4.7	65	550

12.3 Benefits

The key economic benefits generated by the recommended option is summarised in Table 12-5.

Table 12-5 : Recommended option economic benefits

Item	NPV Benefits (\$M) ³		
	GSR FTN	Takaanini FTN	South FTN DBC
Traffic – Travel Time Benefits	-18	-13	-31
Traffic – Congestion Benefits	-9	-5	-14
Traffic – Trip Reliability	-1	-1	-2
Traffic – Vehicle Operating Costs	-1	7	5
Traffic – Resilience	0.2	0	0
Active Modes	13	109	122
Crash savings	10	21	31

³ The reported benefits for GSR FTN includes the quantified benefits for the GSR Gap. Likewise, the reported benefits for Takaanini FTN includes the quantified benefits for Popes Road and Croskery Road. The South FTN DBC benefits report the quantified benefits from all South FTN DBC project elements.

Item	NPV Benefits (\$M) ³		
	GSR FTN	Takaanini FTN	South FTN DBC
PT - Travel Time Benefits	73	59	132
PT – Reliability	39	32	70
PT - Health benefits	8	7	15
CO ₂	3	3	6
PV total net benefits excluding WEBs	116	218	334
WEBs Benefits (15%)	17	33	50
PV Benefits Including WEBs	134	251	384

Key observations:

- A major portion of the benefits are comprised of PT benefits which is reasonable given that the majority of the South FTN DBC recommended network involves PT improvements, i.e. approximately 21 kilometres of bus lanes across both FTN routes.
- There are also significant benefits for active mode users which is also reasonable given the addition of a footpath on Popes Road and the upgraded active modes facilities in the South FTN DBC recommended network, i.e. approximately 54 kilometres of new and improved cycle facilities.
- The bulk of the active modes benefits, particularly the walk benefits, are associated with the Takaanini FTN BCR given that addition of footpaths on Popes Road in combination with the new active mode facilities on the Takaanini FTN route, improving access for those in the Takaanini FUZ.
- The South FTN DBC recommended network causes disbenefit to general traffic, which is reasonable given the reallocation of some existing general traffic lanes into bus lanes or active mode facilities.
- A small amount of flood resilience benefits from the GSR Gap project was estimated. This amount is reasonable given the underlying model assumptions of which links are assumed in the future reference network. The GSR Gap resilience models assumed that several alternative connections into Drury East were in place, such as the Ōpāheke north-south arterial, the direct motorway link (between SH1 interchange and Creek Road), the Drury South interchange, Mill Road South, and the Brookfield Quarry link, giving more route choice in the area to avoid the bridges assumed to be impacted by flooding.

12.4 Benefit Cost Ratio (BCR)

The base estimate BCRs with and without wider economic benefits (WEBs) are shown in **Table 12-6**. Overall, the recommended option (South FTN DBC) is expected to achieve a BCR of 0.6 without WEBs and 0.7 with WEBs.

Table 12-6 : BCR excluding WEBs

Item	PV total benefits (\$M PV)	PV total net costs (\$M PV) ⁴	BCR excluding WEBs	WEBs (\$M PV)	BCR including WEBs
GSR FTN	116	256	0.5	17	0.5
Takaanini FTN	218	294	0.7	33	0.9
South FTN DBC	334	550	0.6	50	0.7

The evaluation is based on the standard evaluation methods for transport infrastructure, which is typically dominated by transport benefits such as that of travel time savings. It excludes non-monetised benefits that would also arise from 'urbanisation' or account for such elements such as liveability and urban amenities. The purpose of the projects is either to support mode shift towards a low carbon transport mode e.g. the FTNs or in providing basic infrastructure (active mode facilities) to facilitate growth in a sustainable manner (Croskery Road and Popes Road). These either:

- Generate traffic disbenefits where road space has been reallocated away from the private vehicle for buses; or
- Have a high cost but relatively small transport benefits, primarily walk and cycle benefits.

This has attributed to the overall low BCR for the combined package of work (South FTN DBC) of 0.6 which is noted to be less than 1.

Despite the lower BCR, the recommended transport package is still needed to respond to the planned growth and the existing issues experienced within this brownfield area and is a key part of the wider southern area package of transport interventions required to meet growth projects and deliver the wider transport system outcomes. This collectively has benefits that exceed costs as indicated by the BCR of 1.5 in the South IBC. This will enable wider transport outcomes to be achieved, in particular a mode shift push in the right direction. Further, the focus of the DBC is on route protection and thus, no value engineering of the preferred option was undertaken. This could be done at the latter stages to potentially reduce the cost and improve the economic efficiency

12.5 Range of BCR Estimation

The BCR range estimation is split into analysis framework and parameter and land use sensitivity tests, as shown in **Table 12-7**. The analysis framework includes discount rate and analysis period, parameter sensitivity includes WEBs, cost, and active mode, traffic and PT benefits variability, and land use sensitivity includes allocating benefits to different years. A sensitivity test was also undertaken where the values from the latest MBCM (version 1.6) were adopted. Full details are included in **Appendix K: Economics Assessment**.

Key conclusions on the sensitivity tests were noted as follows:

⁴ The reported costs for GSR FTN includes the costs for the GSR Gap. Likewise, the costs for Takaanini FTN include the costs for Popes Road and Croskery Road. The South FTN DBC costs include costs from all South FTN DBC project elements.

- The core BCRs for GSR FTN and Takaanini FTN are 0.5 and 0.7, respectively, without WEBS, and would change to 0.5 and 0.9 if WEBS are included. As a combined package, the BCR for the South FTN DBC is 0.6 without WEBS and increases to 0.7 with WEBS.
- Sensitivity testing on many of the assumptions or parameters used in the analysis indicates that the BCRs obtained are relatively insensitive to changes in these and the results can therefore be considered robust. The sensitivity test results are summarised in Table 12-7.
- The lower bound on the BCR range for GSR FTN was from the reduced PT benefit test and the test with a 6% discount rate and 40-year analysis period, whilst the lower bound on the BCR ranges for Takaanini FTN and the combined South FTN DBC were from the FDS impact test.
- Across all sensitivity tests except for the test with the latest MBCM values, the BCR for the GSR FTN is expected to lie between 0.3 and 0.7, the BCR for the Takaanini FTN is expected to lie between 0.5 and 1.1, and as a combined package, the BCR for the South FTN DBC is expected to lie between 0.4 and 0.9.
- It is noted that the PT benefits may be understated as the PT resilience benefits from the FTN project elements were not quantified. Likewise, the benefits attributed to the GSR Gap may be understated given its potential to provide improved connectivity and resilience if other alternative connections into Drury East are not implemented as assumed.
- Although the transport economic benefits may be modest, the proposed schemes should be seen as facilitating the land use development of the South growth area to help to meet the longer term needs for housing and employment as the Auckland region continues to grow.
- The upper bounds on the BCR ranges were from the test adopting the latest MBCM (version 1.6). These were reported separately from the other sensitivity tests to allow for the BCR ranges to have better comparability with other Te Tupu Ngātahi appraisals that did not perform this test. It should be noted that the latest MBCM is intended to be applied to business cases that commence on or after 14 April 2023; the South FTN DBC commenced prior to this date and hence the BCR calculated using the latest MBCM was only reported as a sensitivity test.

Table 12-7: BCR Range Summary

Type of Sensitivity Test	BCR Range		
	GSR FTN	Takaanini FTN	South FTN DBC
Analysis framework	0.3 – 0.7	0.6 – 1.1	0.5 – 0.9
Parameter and land use sensitivity	0.3 – 0.6	0.5 – 0.9	0.4 – 0.7
Latest MBCM	0.7	1.4	1.1

12.6 Investment prioritisation method

The Waka Kotahi Investment Prioritisation Method for the 2021 – 24 National Land Transport Programme (NLTP) has been used to understand the potential investment prioritisation of the DBC.

Factor	Rating
GPS Alignment	High – Very High Give close effect to the GPS in particular, the recommended option has a strong focus on safety, mode shift and better access to social and economic opportunities. This is provided through real transport choice and design improvements. The mode shift focus fundamentally supports the development of a low carbon transport network for the existing community as well as for future growth. The recommended package provides 19km of new dedicated bus lanes with an estimated average daily increase of 2,800 in bus patronage across the two FTNs. In the AM period, it is estimated there is ~12% increase in jobs accessed by PT within 30 minutes for those in Takaanini. In addition, the recommended network provides for 27km of new and improved cycle network further promoting active mode uptake.
Efficiency	BCR 0.6 (VL)
Scheduling	High The preferred option has a high interdependency rating. Non-delivery of the route protection will lead to significant increase in implementation costs and reduce outcomes achieved by the projects once implemented. It also forms part of the wider South transport network. Without it, the full benefits may not be realised.
Priority order	7



Financial Case

13 Financial Case

This section outlines the Financial Case for both route protection and implementation of the recommended option. The Financial Case is based on several variables as long-term route protection has not been previously widely undertaken. The types of uncertainty include:

- Level of third party (developer) funding, as this requires negotiation, agreement and must be undertaken on a case-by-case basis.
- Change in quantum of property acquisition required.
- 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.

The following analysis is based on the staging assumed in the Economic Case as set out in **Appendix N - Staging Considerations**.

It is also noted that the graphs assume the 'likely' escalation of 10% per annum for property and 2% per annum for construction costs unless otherwise stated.

Note that Croskery Road upgrade has not been recommended to proceed to route protection as works are expected to be contained within the road reserve.

13.1 Whole of life costs

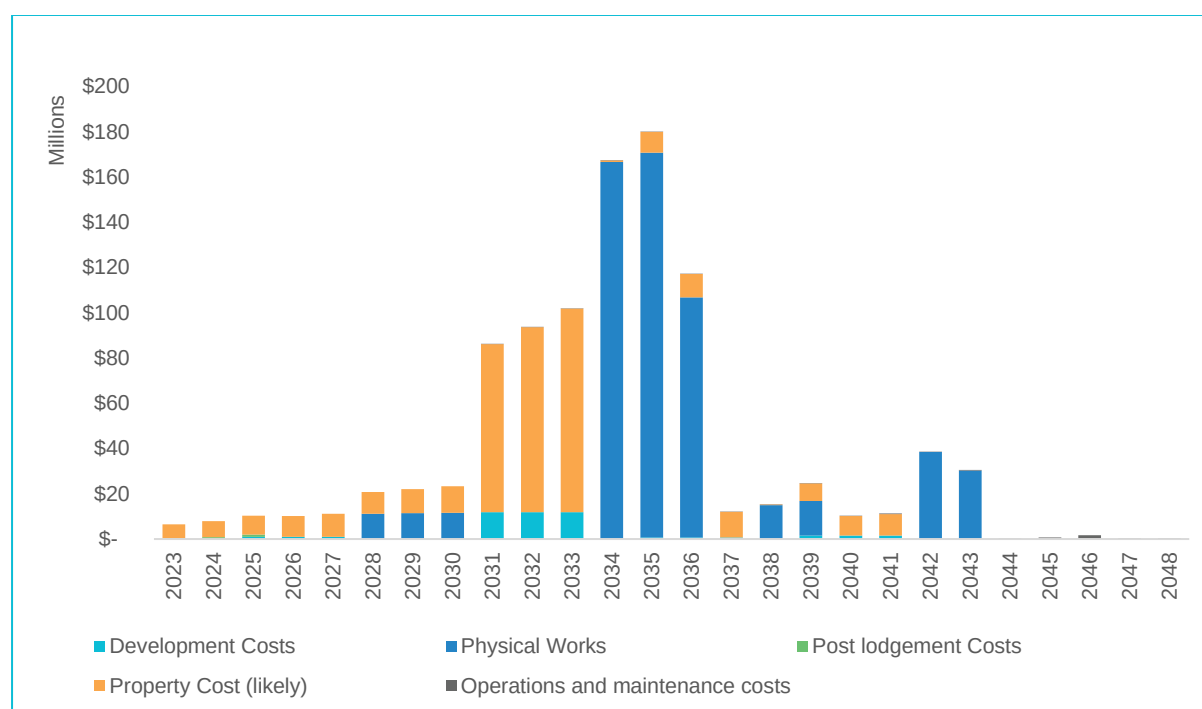
The financial implications for Waka Kotahi and Auckland Transport can be summarised into the following categories:

- **Cost of route protection** (Post lodgement costs, early property acquisition and property implementation costs).
- **Implementation costs** (Project development, pre-implementation, project implementation).
- **Operations and Maintenance costs**.

The cashflow by project phase is shown in **Figure 13-1**. This demonstrates that the initial costs are route protection and development costs until 2033. Cost is dominated by implementation between 2034 and 2036 when both the FTN projects are staged to be constructed.

The individual cost components are discussed in the following three sub sections.

Figure 13-1 : Whole of life cashflow (base estimate, likely property, and construction, excluding contingency)



13.1.1 Cost of route protection

Route protection using NoR is the recommended mechanism for projects proceeding to route protection. The DBC seeks to progress the recommended upgrades to the next phase, which includes post-lodgement. Two key cost elements have been identified as being related to route protection.

13.1.1.1 Professional services – Post lodgement costs

The expected post lodgement cost is **\$2 million** excluding management costs. It is assumed this cost will be incurred following NOR lodgement in 2023. It is assumed 10% of costs will be in 2023 and the remaining split equally over 2024 and 2025.

This cost is already included as part of the Te Tupu Ngātahi programme risk cost and no additional funding is required to cover post lodgement for the NoRs.

13.1.1.3 Expected property costs of route protection

There is a potential property cost implication once the NoRs are lodged. While the vast majority (60% - 80%) of property purchase is typically anticipated in the three years prior to implementation of a particular project, this acquisition could occur prior to route protection being enacted, or during the route protection process.

The Te Tupu Ngātahi Programme Wide Property Strategy identifies several different potential acquisition profiles for forecasting the potential property acquisition cashflow:

- **Profile A: Designate and Acquire at Implementation** - This is the current process utilised by both Agencies. This assumes 20% of the acquisition programme occurs in the period from the NOR lodgement, with 80% occurring in the three years prior to implementation.
- **Profile B: Designate and Moderate Acquisition** - This assumes 40% of the acquisition programme occurs in the period from the NoR lodgement and 60% in the three years prior to implementation.
- **Profile C: Designate and High Early Acquisition** - This assumes 80% of the acquisition programme occurs in the period from the NoR lodgement and 20% in the three years prior to implementation. This responds to the Requiring Authority needing to purchase land that meets the criteria for early acquisition and market driven scenarios with developers advancing their subdivisions, with opportunities to facilitate the purchase of property in these latter cases, through mechanisms such as Infrastructure Funding Agreements.

Table 13-1 shows the profile for each project. The majority is considered likely to follow Profile A due limited full acquisitions. The Great South Road FTN has been assessed as profile B given the brownfield nature of the whole corridor.

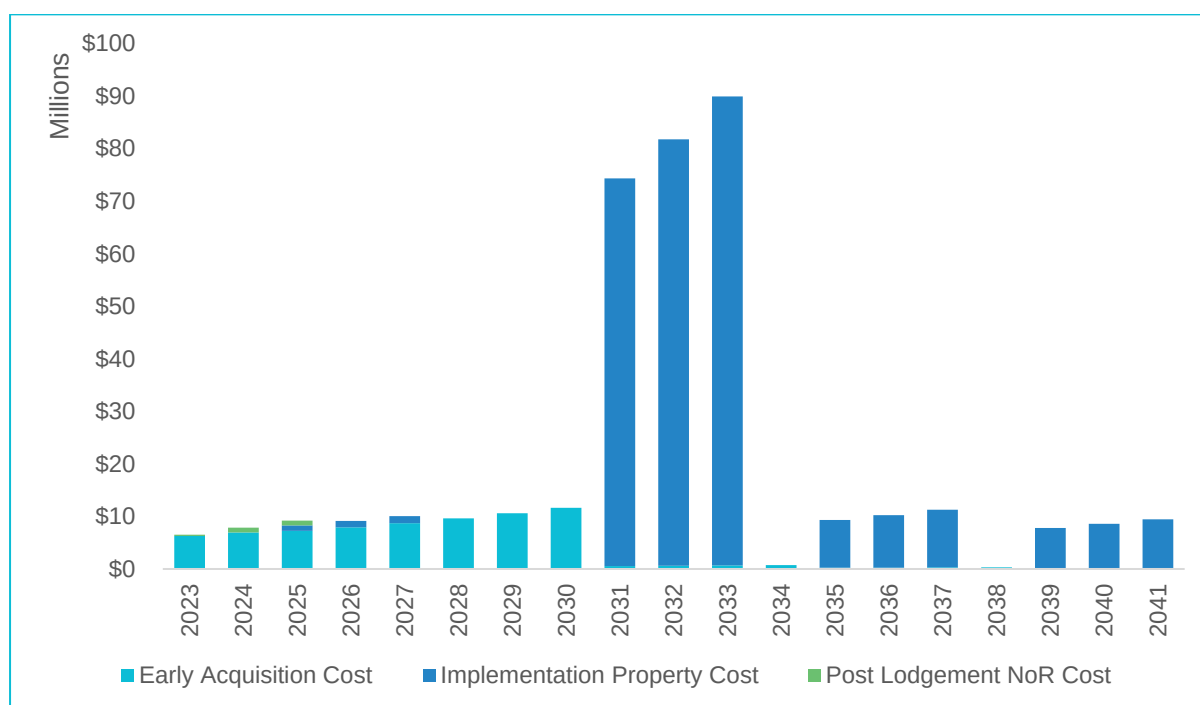
Table 13-1: Property acquisition profiles

Project	Profile
Great South Road FTN	B
Takaanini FTN	A
Popes Road Upgrade	A
GSR Upgrade	A

The overall cashflow associated with the cost of route protection is shown in **Figure 13-2** and illustrates:

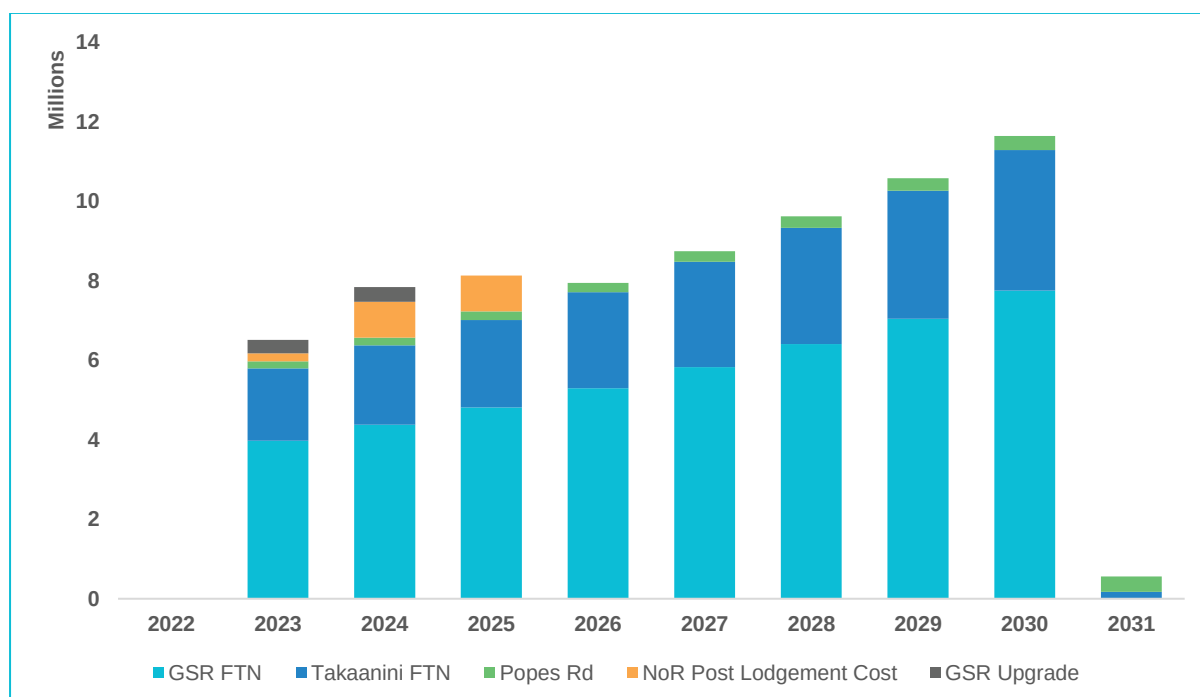
- The majority of the early property acquisition cost is expected to occur within the first 8 years.
- The route protection liability is front loaded within the next 10 years as most corridors are expected to be completed by 2038.

Figure 13-2 : Route protection cashflow (base estimate, plus likely escalation of 10%)



The cashflow for the 21/22 – 30/31 RLTP period is shown in Figure 13-3 and totals \$146 million for the shown scenario (base estimate plus 10% escalation including NoR costs). The total cost ranges from \$107 million (5% escalation) to \$201 million (15% escalation for the period depending on the level of escalation assumed.

Figure 13-3 : RLTP 21/22 - 30/31 period property cashflow by project (base estimate plus likely escalation of 10%)



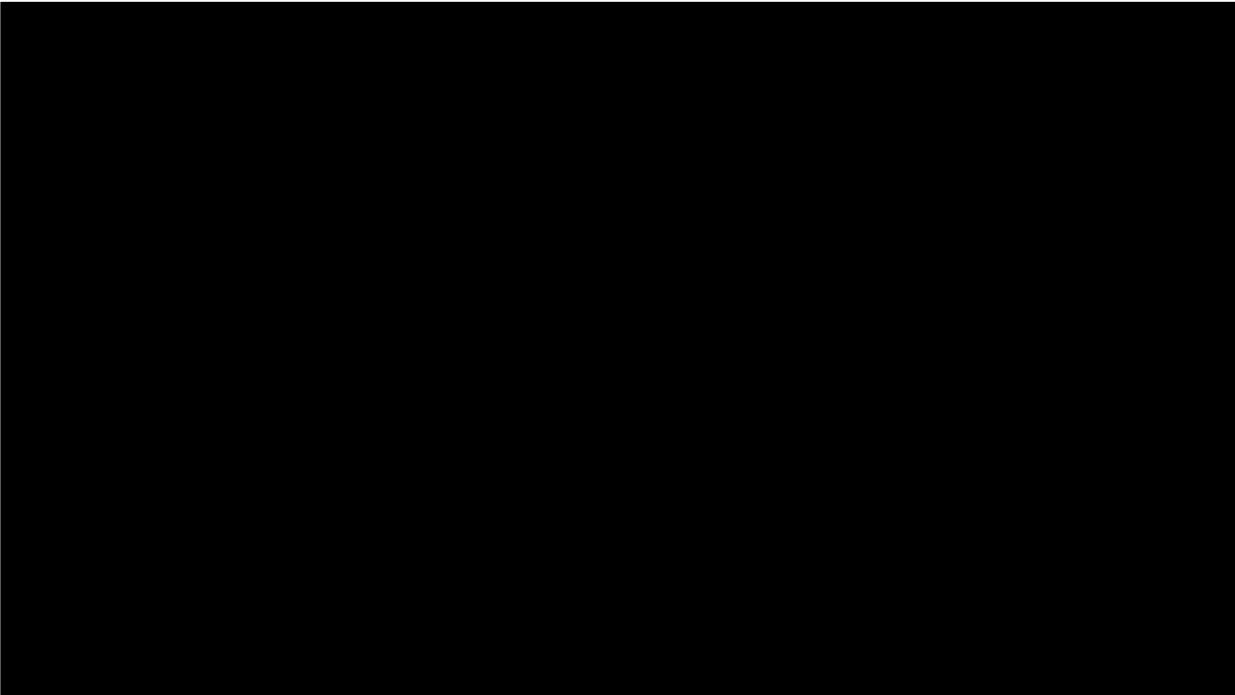
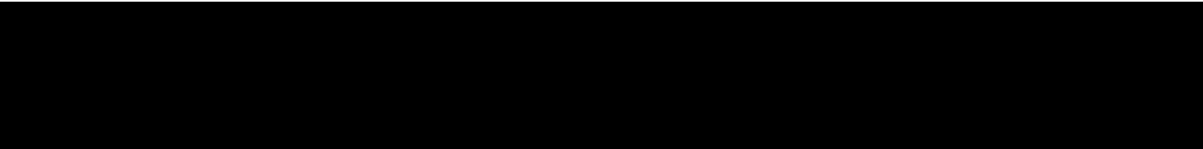
Given the nature of property prices, there is a high degree of uncertainty of property cost in the future. Three levels of property escalation have been considered for sensitivity purposes:

- Low – 5% escalation.
- Likely- 10% escalation.
- High – 15% escalation.

The ‘likely’ escalation has generally been assumed for reporting purposes. The overall route protection costs for these three scenarios are shown in **Table 13-2** as well as the percentage split across the three components. The early property acquisition as a result of the NORs (consisting of NOR post lodgement and the route protection liability) ranges from [REDACTED]

Table 13-2 : Full Cost of Route Protection costs

Scenario	NOR Post Lodgement (\$M)	Property Route Protection Liability (\$M)	Property Implementation (\$M)	Total cost for route protection (\$M)
Base Estimates, Low Escalation (5%)	\$2.0 (1%)	\$56.6 (23%)	\$183.2 (76%)	\$241.8
Base Estimates, Likely Escalation (10%)	\$2.0 (1%)	\$72.1 (19%)	\$303.8 (80%)	\$377.8
Base Estimates, High Escalation (15%)	\$2.0 (1%)	\$92.1 (15%)	\$500 (84%)	\$594.2



Note these reported property costs based on a route protection design and there is potential for these to reduce following a more refined design during the next stages.

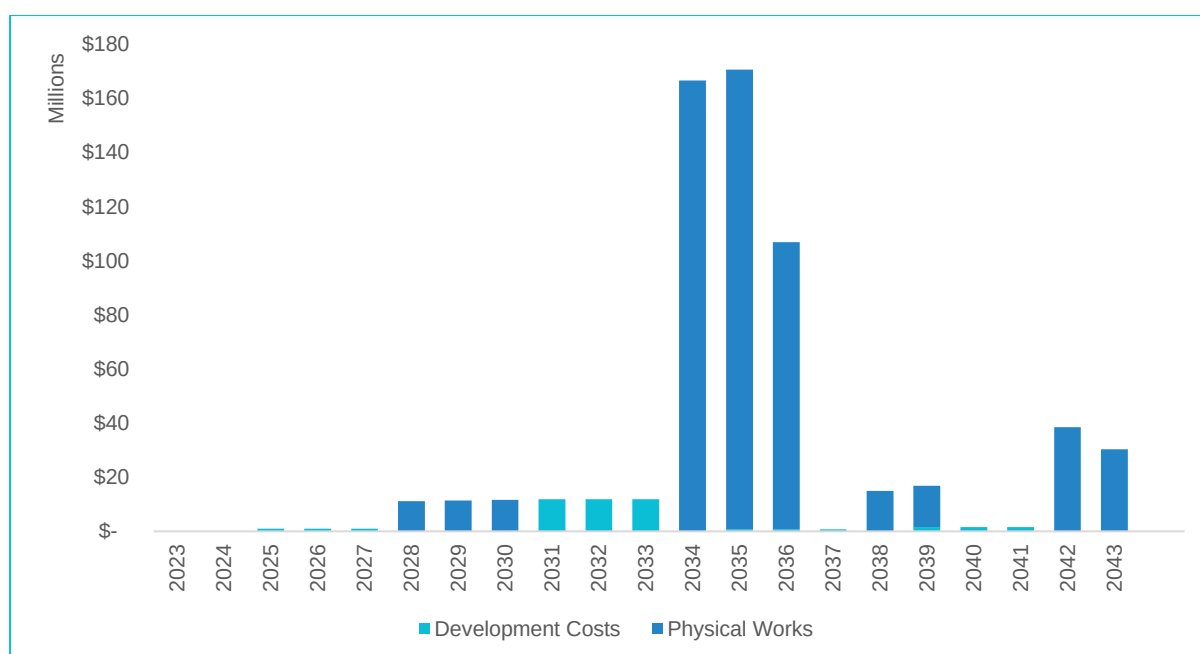
13.1.2 Implementation costs

The implementation costs include:

- Project development – including consultancy fees and Waka Kotahi and AT management costs.
- Pre-implementation costs – including consenting, design fees, site investigations, consultation and Manawhenua consultation.
- Project implementation costs associated with construction as well as other non-construction costs associated with supporting the construction. An allowance of 7% physical works costs have been allowed for non-construction costs associated with completion of the implementation phase. This is made up of 5% consultancy fees to allow for a traditional measure and value contract, plus an additional 1% for Waka Kotahi/ AT managed costs, and 1% for construction monitoring fees.
- A 'likely' construction escalation scenario of 2% have been adopted.

Figure 13-5 shows the project cashflow for the implementation costs with the assumed staging.

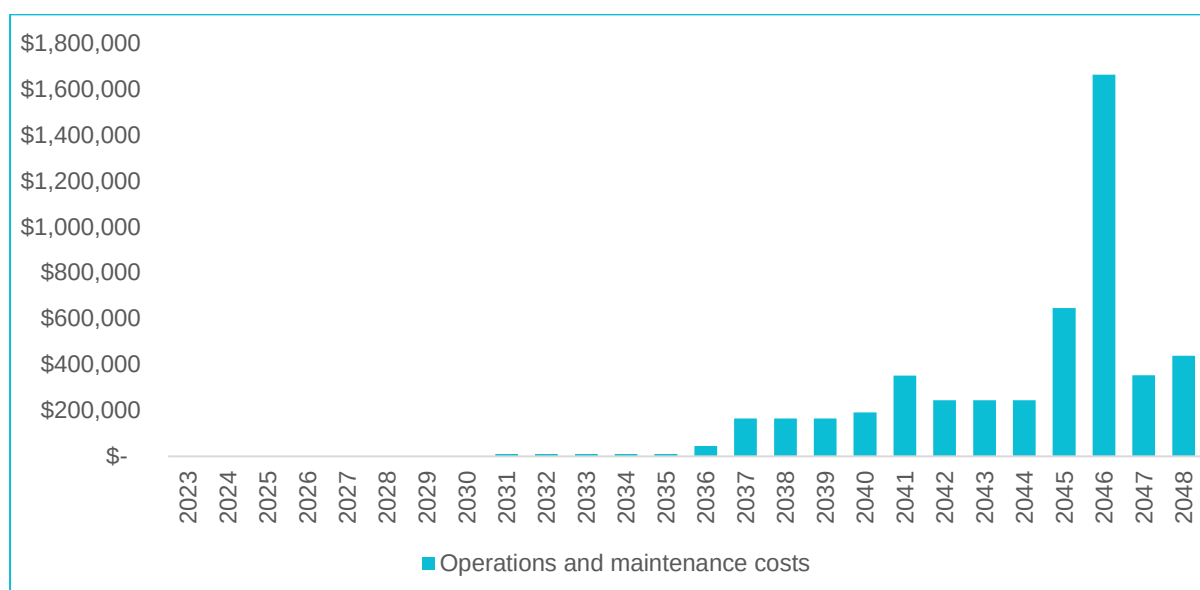
Figure 13-5 :Implementation costs cashflow (base estimates, likely construction escalation)



13.1.3 Operational costs

The operational costs were described in **Section 12.2.2** and these have been applied as an annual or one-off cost as appropriate. The spend profile for these costs is shown in **Figure 13-6** and as expected is weighted at the end of the assessment period once infrastructure is constructed.

Figure 13-6 : Operational spend profile



13.2 Funding

13.2.1 Funding sources

Potential funding sources are detailed in **Table 13-3**.

Table 13-3 : Potential funding sources

Funding source	Commentary
National Land Transport Fund (NLTF)	This is anticipated to be the main funding stream for the projects. For the 2018 – 21 NLTP, no specific funding is allocated to the projects. The Supporting Growth programme has funding allocated for pre and post lodgement activities. The NLTF funding is project to increase to between \$4.5b and \$5b in 2028. At similar allocation percentages (using population as proxy), Auckland's NLTF share could be somewhere between \$1.5b and \$1.7b in 2028.
Approved organisations' local share	Auckland Transport and Auckland Council are the most relevant organisations to contribute funds with the ownership resting with Auckland Transport.
Government grants	This is a long-term delivery programme and the nature of additional government funds will vary throughout time. But it is feasible that one or more of the projects may qualify for criteria under separate government funding. Examples of current funding streams include projects being delivered under NZUP funding. This DBC cannot assume any of this type of funding, but it is worth noting that the owners should be looking for opportunities to contest this type of future funding for the projects. This would obviously increase the affordability of the investment.

Funding source	Commentary
Other supplementary funding sources Refers to contributions that are additional to the NLTF, local share funding or Crown loans.	- Financial contributions towards the costs of improving network infrastructure (Developer Contributions). Note Auckland Council is undertaking a citywide assessment of Developer Contributions with a framework for Drury being consulted on at the time of the writing of this DBC. It is noted the intention is that a similar process will be rolled out for both green and brownfield growth Auckland Wide. This process aims to capture contributions based on a beneficiary style analysis. - Leasing temporary land requirement opportunities from Auckland Council. - Land acquisition opportunities from Auckland Council. Debt finance and Public Private Partnerships (PPPs). - Value capture / Beneficiary pays.

An analysis of the Regional Land Transport Plan (RLTP) 2021-2031 is detailed in **Table 13-4** and includes the following funding streams directly related to the recommended option.

Table 13-4 : Identified RLTP funding

Item	Description	Funding Status	Considered by RLTP if additional funding available
Supporting Growth Route Protection Programme	There are three funded line items for Supporting growth covering the programme, site investigations and post lodgement and property purchase.	Post Lodgement - \$64.5M Site investigations - \$28M Programme - \$40M Category 1 - committed	N/A

The post lodgement component of the NoRs is covered within this current funding allocation. No specific property purchase is currently allowed for. Preparation of this documentation does not in itself trigger the early property acquisition, this arises once the NoR is formally lodged.

13.2.2 Funding share

It is expected that all projects within this package of works will be delivered by Auckland Transport.

In addition to the owner allocation for funding, general assumptions have been made about potential contributions from third parties. The potential cost savings attributed to developer contributions have been based on the following high-level principles in **Table 13-5**. These are consistent with principles being adopted in the other Te Tupu Ngātahi workstreams including Warkworth and North assessments.

Table 13-5 :Assumptions for developer contribution and potential cost savings

Corridor Type	Developers % of Implementation costs	Developers % property costs	Commentary
Strategic infrastructure	0%	0%	Developers not expected to contribute to strategic infrastructure. <i>Applied to the Great South Road and Croskery Road upgrade as contribution likelihood is low.</i>
Greenfield 2 lane corridor	80%	50%	Developers need these roads to activate land use. Depending on timing it is anticipated to be able to negotiate for vesting of at least 50% of property on these routes. <i>This has been applied to the Popes Road upgrade.</i>
Greenfield 4 lane corridor	50%	50%	Assuming developers pay for the 2-lane part of these new corridors and AT pays for the upgrade to 4 lanes.
Brownfields 2 lane corridor	20%	25%	Developers will need the urbanisation upgrades of walking and cycling facilities etc to support developments. Depending on timing, opportunity for large developers to vest land as part of this process. <i>Applied to the Great South Road FTN, Croskery Road upgrade and the Takaanini FTN except for Alfriston Road.</i>
Brownfields 4 lane corridor	50%	25%	Widening will be required because of significant growth. Assumed developers would pay half of necessary intersection upgrades and associated localised widening. Developments will also be beneficiaries of the improved cycle and bus priority facilities. Complexity regarding timing and implementation of other strategic projects which would remove strategic traffic from these corridors and increase the % of development traffic. <i>This has been applied to Alfriston Road section of the Takaanini FTN.</i>

For assessment purposes, if the majority of the corridor runs through a brownfields area, this uses the brownfields principles unless noted above. In some cases, there may be changes to the percentage applied to reflect the likelihood of developer contribution.

The estimated funding split for the P50 costs is shown in **Figure 13-7** and **Figure 13-8**. This highlights that \$317M is likely to be required from the National Land Transport Fund (NLTF) which consists of the Waka Kotahi share plus the Auckland Transport FAR share. Auckland Transport's local contribution is estimated to be around \$304M.

There is good opportunity for the Auckland Transport share to be reduced through the ability to harness contributory funding from developers through developer contributions which is currently estimated to have an indicative value around \$176M of the P50 costs.

Figure 13-7 : Funding Split (P50 Costs)

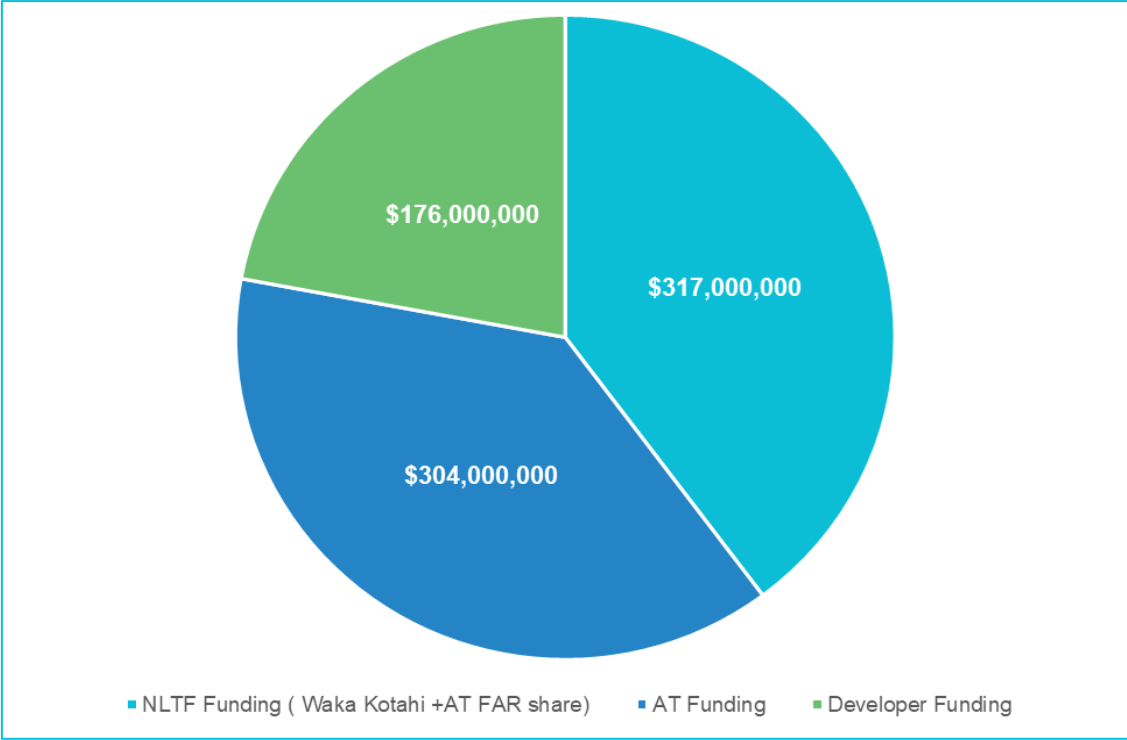
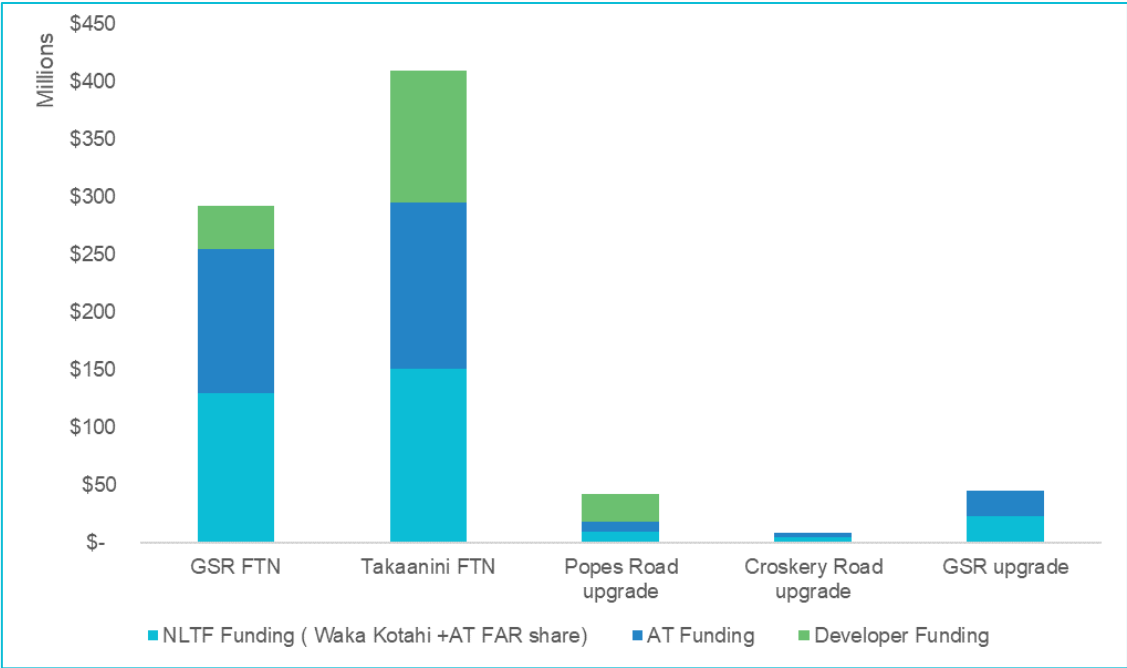


Figure 13-8 : Funding split for projects (P50 Costs)



13.2.3 First Decade route protection affordability

The provenance of the first decade (2022 – 2031) route protection liabilities have been discussed in **Section 12.1.1.2** and **Table 13-6** provides additional commentary on available funding for these liabilities.

Table 13-6 : First decade financial case summary (Base estimates, no contingency, likely property escalation)

Area	Forecast Cost (undiscounted \$M)	Potential Funding
Professional services – SGA post lodgement	\$2M	Covered by the risk allocation of the Te Tupu Ngātahi alliance under the RLTP Supporting Growth Programme funding.

13.3 Financial Case Summary

Table 13-7 summarises the first decade (2022-2031) and current funding allocation for the assumed staging. As highlighted by the table, funding is currently allocated for NoR lodgement, however, additional funding will be required during this RLTP cycle to offset property risk arising from NoRs.

Table 13-7 : First decade Financial Case Summary (Base estimates, no contingency, likely property escalation)

Element	Base Estimate (\$M)	Potential cost savings (\$M)	Resultant Costs (\$M)	Potential funding (\$M)	Funding required (\$M)
Professional services for NoR	\$2	\$0	\$2	\$2	\$0
Property implementation	\$77	\$11	\$66	\$0	\$66
Implementation	\$49	\$0 ⁶	\$49	\$0	\$49
Operations and maintenance	\$0.1	\$0	\$0.1	\$0	\$0.1

This is a transport investment package to support the South growth and the existing community. The current staging has been developed to support a mode shift towards public transport and active

⁶ Project delivered within the first decade is not anticipated to receive any developer funding.

modes sooner rather than later. Thus, providing the existing community alternative transport modes and increased accessibility to key destinations such as the Manukau Station.

As is shown by the RLTP funding, there is no funding allocated beyond obtaining the NoRs. A funding source is needed for the route protection of the recommended option to cover the likely property liability from the NoRs.

It is acknowledged that there is a cost to flexibility and route protection and the work undertaken to date for the DBC has concentrated on balancing the future needs of the corridors and desired design flexibility against the property requirements to facilitate the infrastructure particularly through the brownfields. Key considerations and opportunities to note:

- Throughout the option assessment process, a rigorous approach has been undertaken to consider reductions of corridor widths for the Great South Road and Takaanini FTNs. The recommended option balances the trade-off between impacts and outcomes through targeting priority areas for route protection.
- Specific analysis has been undertaken to understand which intersections should remain route protected for roundabouts compared with intersections that have clear operational or legibility requirements for signals. In this way, the additional footprints associated with roundabouts have been minimised.
- The DBC has not considered cross section reduction Popes Road given it is adjacent to the FUZ and the optimal cross-sectional width will best provide for the future growth.

13.4 Affordability scenarios

Given the current funding constraints, some consideration has been given to funding constrained scenarios for route protection. **Table 13-8** sets out three scenarios considered in light of the funding constraints.

Table 13-8 : Consideration of affordability scenarios for route protection

Scenario	Projects excluded	Rationale	Change in 1 st Decade property liability and route protection costs
Recommended route protection strategy	All NORs included.	As per the recommendation in the route protection strategy (Appendix L)	100% of post lodgement costs (~\$2M) 100% of financial risk from property (~\$70M)
Removal of one NoR	No route protection for Popes Road and section of Takaanini FTN adjacent to FUZ	Uncertainty of the Takaanini FUZ given the draft FDS	90% of post lodgement costs (~\$1.8M) 90% of financial risk from property (~\$62M)
Partial route protection only	Only route protect Alfriston Road, GSR upgrade and parts of GSR FTN.	Route project of high priority areas only	71% of post lodgement costs (~\$1.4M) 71% of financial risk from property (~\$50M)

Scenario	Projects excluded	Rationale	Change in 1 st Decade property liability and route protection costs
Delayed route protection	No route protection at this point in time		No post lodgement or property cost at this time.

It is important to note that a reduction in costs for the 10-year RLTP period does not mean that overall project costs are reduced. If route protection is not undertaken on projects by SGA as part of this phase, there is risk that significant rework is required to obtain route protection in the future. This has potential to increase project costs overall.

Property purchased in the next 10 years (required for the long-term implementation of projects) does not represent additional cost for the project in the long term, rather an advance of funding compared to the typical property purchase timing. It is likely this will reduce the overall project costs in the long term due to property escalation.

The recommended route protection strategy is considered the best option and provides the greatest benefits. Options for reducing the short-term costs (with longer term costs forecast to increase) have been considered if short term funding constraints preclude the recommended option.



Commercial Case

14 Commercial Case

This section sets out the proposed approach to development of each project in relation to the recommended system described in the economic and financial cases. The following sections describe:

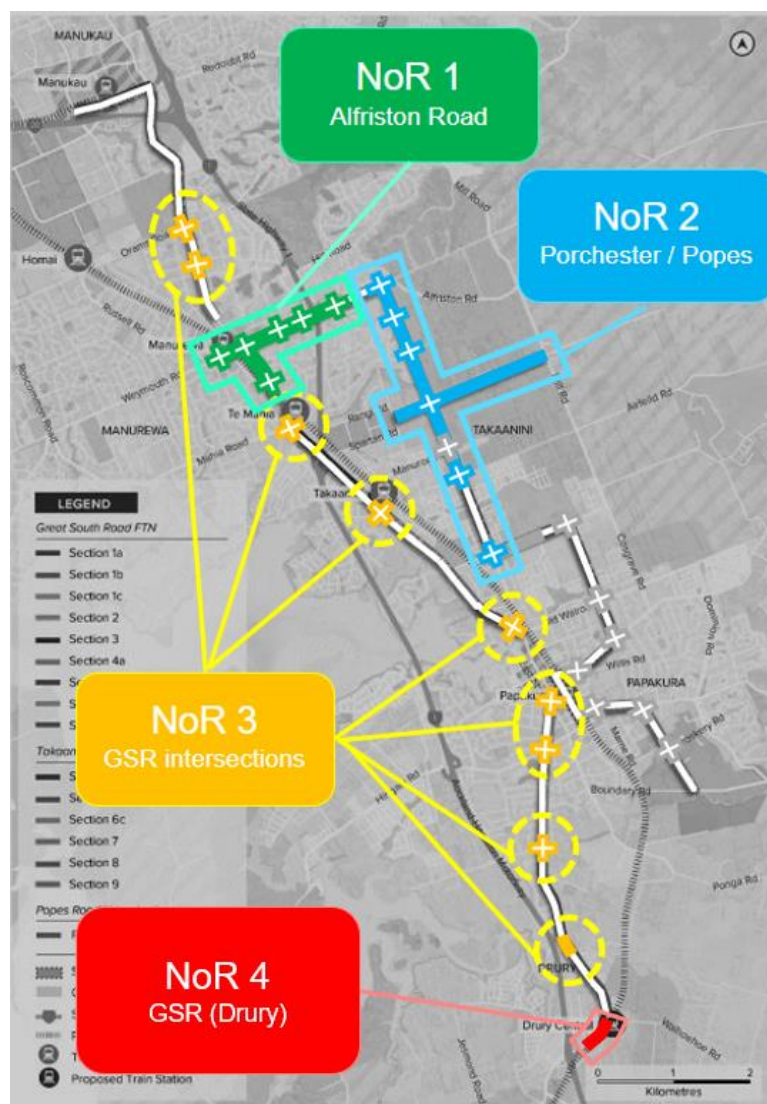
- Consenting / route protection strategy for each project.
- Property acquisition strategy for each project.
- Procurement strategy for the package.

14.1 Route protection approach

The Route Protection strategy has been developed to support the DBC and makes recommendations on the prioritisation, packaging, and preferred planning mechanism to secure route protection for the recommended network.

The proposed route protection strategy is shown in **Figure 14-1**.

Figure 14-1 : Route protection approach



Croskery Road will not proceed to route protection as it is anticipated all works will remain within the road reserve.

Table 14-1 provides a summary of the recommended route protection packaging. The management of the route protection processes is considered further in the Management Case of this DBC.

Table 14-1 : Route protection summary

NoR	Extent	Requiring authority	Probable lapse period	Rationale
1	Alfriston Road (section 6) west of Magic Way; and Great South Road (section 2) north of Myers Road.	AT	20 years	- Highest transport benefits / strategic significance. - Interdependencies between GSR and Alfriston where they form an intersection south of Manurewa – logical grouping. - The most significant property requirements are in these sections – elevated risk. - Requiring authority – falls within AT's remit. - Lapse period – 20 years provides for likely implementation timeframe.
2	Porchester Road (section 7, sans Manuroa intersection) and Popes Road.	AT	20 years	- Largely residential/greenfield surroundings – lower sensitivity than other locations, relatively localised property risks. - Both Porchester and Popes a response to urbanisation of same Takaanini FUZ. In the event that the Takaanini FUZ is downzoned in response to the FDS, this NoR may not need to proceed and could be easily split out from the remainder of the Project and abandoned / surrendered as appropriate. - Notwithstanding the above, the Popes Road urbanisation may still have a future interaction with the Mill Road corridor irrespective of the outcome of the Takaanini FUZ downzoning. Interdependencies between Porchester and Alfriston where they form an intersection – logical grouping. - Requiring authority – falls within AT's remit. - Lapse period – 20 years provides for likely implementation timeframe, recognising very long-term/uncertain nature of Takaanini FUZ.
3	Great South Road intersections and Otūwairoa / Slippery Creek Bridge (sections 1c, 3, 4, 5).	AT	20 years	- Relatively localised/small-scale property requirements. - Intersections in their totality deliver cumulative improvements to the GSR route – equally, there is potential to implement them in stages (meaning implementing one gives effect to designation for all). - Requiring authority – falls within AT's remit. - Lapse period – 20 years provides for likely implementation timeframe.

NoR	Extent	Requiring authority	Probable lapse period	Rationale
4	Great South Road (Drury)	AT	20 years	A standalone designation recognises that there are different drivers for this section of GSR to the remainder – namely the opportunity to integrate with three adjoining/concurrently planned NZUP projects – Drury Central Station, SH1 Drury Interchange, and Waihoehoe Road urbanisation.

A key consideration during the development of the route protection strategy was the ability to obtain long lapse dates through the NoR process. **Appendix L: Route Protection Strategy** provides further details about consideration of mechanisms.

14.2 Property Overview

14.2.1 Wider Te Tupu Ngātahi Context

The full property overview for the DBC is included in **Appendix I: Property Overview**.

It is important to note that whilst this property overview has been developed for a DBC, the DBC is for route protection purposes only and therefore the property implications are different to those of a project where implementation is imminent. There will be a subsequent Implementation Detailed Business Case to seek approval for implementation funding for individual projects, which will include more detailed analysis of the property issues. This DBC also forms part of the wider Te Tupu Ngātahi programme of works that has developed a Programme Wide Property Overview that outlines the principles for property acquisition for the entire programme. These will guide the development of the property approach with the key points being:

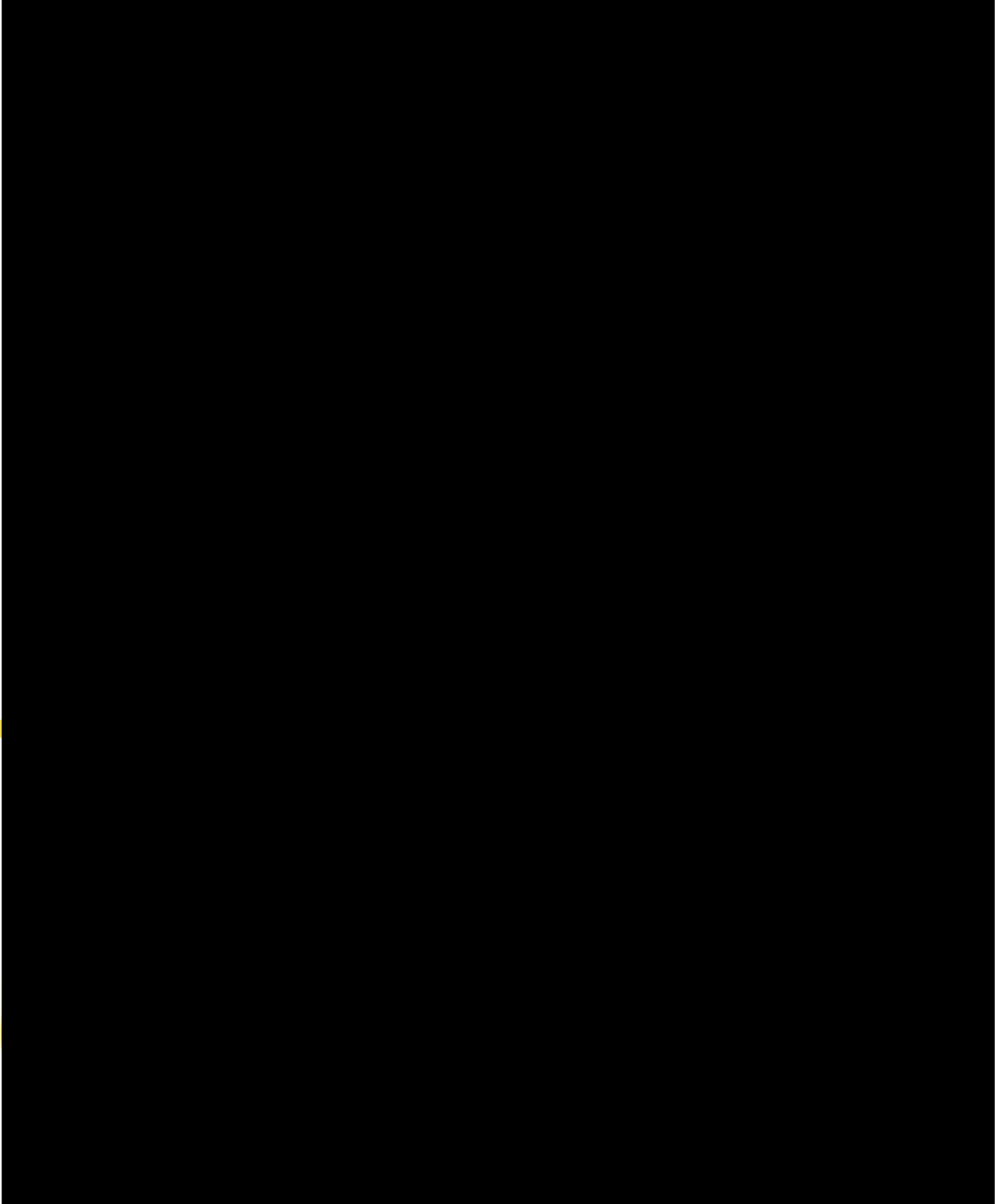
- The programme is about long-term affordability and property will be generally acquired closer to implementation. It is noted that the longer property purchase is delayed the more expensive property will become through property escalation and change of land use for FUZ zoning.
- There will be potential early property acquisition costs as soon as the NoR is lodged for each project.
- The Requiring authority will take the lead on property negotiations for that specific project, utilising the current processes of that organisation (Auckland Transport or Waka Kotahi).
- Advance Purchase Guideline processes will apply.
- Where there is opportunity for strategically important properties to be acquired, these should be taken.
- A programme wide property resource will look at opportunities for resultant value capture from residual land as part of the land use integration opportunities of the programme.

Early property acquisition costs are a critical issue once the identified projects are route protected and the Property Overview outlines the analysis and approach to providing as much certainty as possible to what this cost could be into the future.

This Preliminary Property Overview is a living document developed for the route protection business case phase. Given the long-term route protection, this Overview will need to be revisited, reviewed and updated each decade and more frequently in the lead up to project implementation, during

development of the detailed business cases and the design and advancement of the consenting and land acquisition programmes. The acquisition programme is dependent on detailed design and final land requirement plans being completed.

A total of 446 property interests have been identified for acquisition as outlined in **Table 14-2**.



⁷ Base estimate, P50 and P95 excludes temporary occupation costs

14.2.3 Key property risks and opportunities

Due to the long-term nature of the route protection approach, there are several risks and opportunities from a property perspective as shown below.

Table 14-4 : Key property risks and opportunities

Risks	Opportunities
Level of appreciation given uncertainty of timing. The very nature of the area, which is forecast to grow (and hence needs supporting transport infrastructure) means that property prices will likely increase as future zoning is realised. When this happens and to what extent development is permitted by these zoning changes will have a significant impact on the potential future value of property. This is an area that is challenging to predict with certainty.	Market appreciation With the level of market appreciation likely in the South, the earlier property is acquired for the transport infrastructure the cheaper it is likely to be (by potentially substantial orders of magnitude). It is acknowledged that this creates affordability and funding prioritisation challenges, but there is a real financial opportunity to save significant costs if cashflow can be found.
Plan Changes and Fast track consents The main risks arising from out of sequence development is that additional pressure will be put on the owners to develop adjacent infrastructure earlier to harness network wide benefits. In constrained areas there is an additional risk that new developments could occur too close to proposed infrastructure. If route protection is not achieved for the transport system imminently the opportunity may be lost to efficiently and effectively deliver the transport system and outcomes sought.	Developer agreements The main opportunity from Plan Changes or consents is the ability to work with the developer regarding land acquisition, corridor alignment and co-delivery. There are several significant developers in the area which provides an opportunity to achieve agreements to support the funding and implementation of the corridors as well as support their development aspirations. Property is an important part of these agreements.
Cashflow for early property acquisition given long term protection. Given the above timing issues, and what level of s185 claims there could be, confirming a value for early property acquisition is equally uncertain.	

14.2.4 Managing property risks

There is considerable uncertainty around the property costs given the size of this programme (and the wider Te Tupu Ngātahi programme). Therefore, to best manage this uncertainty and minimise the early property acquisition expenditure as much as possible until projects are implemented the following is proposed:

- **Joint governance from owners.** It is recommended that a joint owner approach to property be taken at a governance level to ensure the appropriate prioritisation of funding.
- **Appropriate resourcing.** This is a large programme of works over an extended period and appropriately resourcing will ensure best for programme outcomes are achieved.
- **Developer Agreement.** Focussing on getting early and comprehensive developer agreements in place could reduce the affordability burden from a property perspective.

- **Application of Betterment.** Strengthening the case early for this aspect of the valuation process and ensuring a consistent and common approach across all projects is critical to potential successful use of this tool.

Waka Kotahi and Auckland Transport have comprehensive processes and teams dedicated to the ongoing management of properties once purchased. It is assumed that these existing processes will be used to manage the properties. With only 3% of the properties being full purchases the ongoing management is considered achievable.

Potential ongoing management issues that will need consideration going forward are:

- **Commercial.** Where properties have multiple business tenancies or business operations that need relocating, the property cost estimates assume the freehold/unit title interests will be acquired early to mitigate business relocation costs and manage leases expiring.
- **Rural.** Rural land if acquired early might need ongoing maintenance. Leasing this land for grazing and other rural lifestyle uses could be considered.
- **Redevelopment.** Where large parcels of contiguous land are being acquired there could be opportunities to redevelop and sell residual land. This is detailed more in the next steps.

14.2.5 Wider Te Tupu Ngātahi property management

It is also important to outline that the Te Tupu Ngātahi Wide Property Strategy sets out several initiatives to effectively manage the significant acquisition programme of the route protection approach. These are currently being considered and this Property Strategy is consistent with the aspirations of these wider approaches if successful. It is important to note that these wider Programme Wide proposals are not yet agreed for implementation by the partners.

At the heart of these initiatives is a Strategic Property Fund.

There are some critical components to operate the fund successfully and these are summarised below.

- **The pre allocation of funding for strategic property purchases.** The current process does enable this to occur – however it requires AT Board approval and delegated approvals, and in the case of Waka Kotahi, approval from LINZ for individual property purchases on a case-by-case basis. This process would benefit from streamlining with delegated authorities in place with the respective organisations and a ring-fenced fund identified within the RLTP. This fund would be utilised for properties that are endorsed as ‘Early Acquisitions’. This fund may also be used to respond to developer integrations opportunities that occur in an ad hoc manner and can occur out of sequence in response to private led plan changes. This would enable a more nimble and efficient mechanism consistent with more commercial operations.
- **Dedicated Resources.** A dedicated Waka Kotahi and Auckland Transport resource to work through commercial deals and evaluate strategic purchase opportunities. This team will work with the OIM team on the identification, acquisition and enhancement of properties purchased through the fund. Without dedicated resource, the property approach required for a programme of this scale will potentially suffer and opportunities for considerable efficiencies (and enhanced outcomes) will be lost.
- **Governance:** The fund would need to be managed and administered by members of both organisations to ensure transparency of process. This group would oversee the expenditure of the fund and make recommendations to the acquiring entities approvals processes. The governance

group would be responsible for agreeing, setting, and delivering against the objectives of the fund as well as confirming the priority areas for investment.

- **Commercial Focus:** The fund will need to be managed with commercial acumen that could also identify commercial opportunities that may arise from an advanced property purchase strategy, such as aggregation of properties and alignment with/proximity to partner land holdings. While this may require changing current approaches, and potential policy and mandate, this presents the opportunity to substantially reduce the total cost of the property for this programme. To fully realise the opportunities there may be a need to work with partners such as Kāinga Ora.
- **Policy and Procedure Changes:** The fund would benefit from some changes including allowing residual land purchased by AT to be sold and reinvested in the Strategic Land fund, without returning to Auckland Council. Another key change could be the application of Funding Assistance Rate (FAR) for advance property purchases.

14.2.6 Property next steps

This programme is focussed on route protection. Uncertainty therefore remains for the exact timing of the property acquisition needs of the projects until implementation is confirmed. This results in risk and uncertainty associated with the scale and timing of early property acquisition of this programme. To manage this risk and uncertainty appropriately and proactively, it is recommended that during the projects development the following occurs:

- The Implementation DBC reconfirms the property cost and requirements as design confidence is further developed.
- Any changes in design avoid the need for minor land requirements.
- Value engineering is undertaken to minimise the land required for projects.
- Detailed property valuations are undertaken closer to implementation.
- Agreements with developers are progressed and 'locked in' as soon as possible to try and reduce the total property costs of the programme.
- Active management (including resourcing) of property programme with a view to reduce costs as much as possible, whilst also looking for opportunities to maximise value and cost savings when opportunities and funding allows.
- **Reach agreement with larger developers on the approach to property acquisition.** This would include agreement on the value and any other agreements reached (such as cost share for construction of portions of infrastructure). Whilst each agreement will be bespoke to the particular developer and issues associated with a particular project, agreements already reached across the Te Tupu Ngātahi Programme have seen developers agree to develop the collector portion of new road connections, with the road controlling authority responsible for the remaining 'arterial' road implementation and property costs. This type of approach will be used throughout the programme, where possible and presents an opportunity as the base property costs includes the cost of acquiring all the required land. Specific development opportunities include:
 - Alfriston Road Plan Change within the Takaanini FUZ (if approved).
 - Plan Change 78 will allow greater intensification in already urbanised areas especially along sections of the Great South Road FTN and Takaanini FTN
- **Willing buyer willing seller.** Where there are properties that hold strategic benefit to the programme and there is an opportunity for early purchase, consideration will be given to securing these properties earlier in the acquisition programme. It is considered that early acquisitions could reduce the overall property costs if acquisition occurs in earlier decades. The acquisition of this land would provide flexibility for the owners to implement the facility in a timely manner to support

land use and behaviour change. Importantly as the land holding is split among a few landowners, ownership of the land would enable other developers to implement parts of the network when required.

- **Compulsory process.** The remaining projects will go through the road controlling authorities' normal PWA compulsory approvals process. This will include the application of the AT's current Early Acquisition Guideline and Waka Kotahi's Advance Purchase Policy processes for any purchases prior to the typical three-year period prior to implementation.

14.3 Procurement Plan

The scope of works for Te Tupu Ngātahi is to undertake the works necessary to obtain the designations for the recommended network (i.e., route protection) and does not include obtaining resource consents. The timing and delivery model for the remainder of works needed to support resource consent applications should therefore be considered in pre-implementation.

Once a project has been through the pre-implementation phase it will be ready for implementation. This will include detailed design, consenting and physical works. The delivery model will need to consider factors, including:

- Scale.
- Complexity.
- Programme.

Given that this implementation phase is many years away for most Te Tupu Ngātahi projects, a detailed procurement strategy should be developed for each project at an appropriate time in advance and closer to the implementation of each project.

Some initial issues for consideration during the implementation phase are summarised in **Table 14-5**.

Table 14-5 : Implementation Procurement Strategy

Consideration	Projects
Scale and complexity	Depending on the timing for implementation, the upgrades of existing corridors could have some traffic management challenges due to the unavailability of alternative routes and / or existing traffic congestion issues. It is noted for all corridors that opportunities exist for embodied carbon material innovation during construction.
Timing and urgency	The latest Council development assumptions indicate development of the Takaanini FUZ is likely to take place in the latter half of the third decade. However, the project team is aware of the potential of the Alfriston Road Plan Change as such development could eventuate earlier than expected. Though the draft FDS has suggested the removal of the Takaanini FUZ, further adding to the uncertainty of timing.
Defined scope	For the local roads, the detailed design will be completed prior to awarding the construction contract, this will define the expected outputs and will involve lower tendering costs for prospective suppliers than other contract models. Local roads are considered business as usual projects for Auckland Transport.
Supplier market conditions	For Road upgrades, there are several suppliers available for this type and scale of work in Auckland which lends itself to traditional contracts for competitive delivery.

Consideration	Projects
	The contract method will need to balance the need for competition with the management of risk.
Client involvement, control and capability	Client control will depend on the delivery mechanism eventually chosen. But it is expected that the client will retain design control and site supervision for the arterial roads.
Tangible demonstration of value for money	Value for money will form part of the decision for delivery for all projects within the programme. Due to the competitive tender process for typical road upgrades, it is relatively straightforward to demonstrate value for money in the construction phase.

These approaches should be reviewed in detail during the Implementation DBC phase once more detail is understood, and a more definitive procurement approach can be made.

14.4 Required Services

Following the route protection level NoR approach described above, the remaining elements required to prepare this project for implementation include:

- Detailed design.
- Regional consents.
- Resource consents and management.
- Surveillance and quality assurance (MSQA).

Key matters to be considered are shown in **Table 14-6**:

Table 14-6 : Considerations for required services

Consideration	Projects
Scale and complexity	The upgrade of Great South Road between Waihoehoe Road and Drury interchange are expected to have challenging consenting conditions due to it being within the flood plains. Smaller design fees expected for the local roads. Standard service providers are likely to be suitable for most of these upgrades.
Funding	No projects in the recommended transport package have confirmed implementation funding.
Timing and urgency	Sections of the Great South Road FTN may be delivered first as works will be centred around the intersections.
Defined scope	Consent conditions to be secured before award of physical works contract.
Supplier market conditions	Auckland market can service this range of contracts and service requirements.
Client involvement, control and capability	Clients desire to retain control.
Non-cost success factors	Strong desire for the clients to achieve best practice environmental and stakeholder outcomes. Committed to addressing carbon reduction and maximising the opportunities to mitigate or where necessary adapt designs to best respond.
Tangible demonstration of value for money	Competitive tender for services recommended.

These considerations indicate that the works proposed range from small to large scale works.

It is recommended that the design, consenting and MSQA elements are packaged together. This reduces the additional time requirement associated with procuring each of these elements separately.

Overall procurement risk is low for most projects considering that with appropriate planning, there are skills, capability and client expertise to deliver these projects.



Management Case

15 Management Case

The following sections describe the arrangements that will be implemented for the successful delivery of the recommended option. It describes the delivery arrangement for each phase of the route protection and tests the project planning, governance structure, risk management, stakeholder management, benefits realisation, and assurance.

It is noted that the DBC sits within the wider context of the Te Tupu Ngātahi programme, and as such this management case draws on the overarching management case developed as part the wider programme.

There are two distinct phases for delivery:

- Route protection including preparation of NoR documentation for lodgement (4 packages)
- Post route protection management – post lodgement activities for NoR packages.

These are discussed separately in **Sections 15.1**, and 0 and below. Each section discusses the specific governance, key activities, roles and responsibilities, risks, and stakeholder engagement requirements applicable for that stage. This is followed by some additional overall programme management considerations.

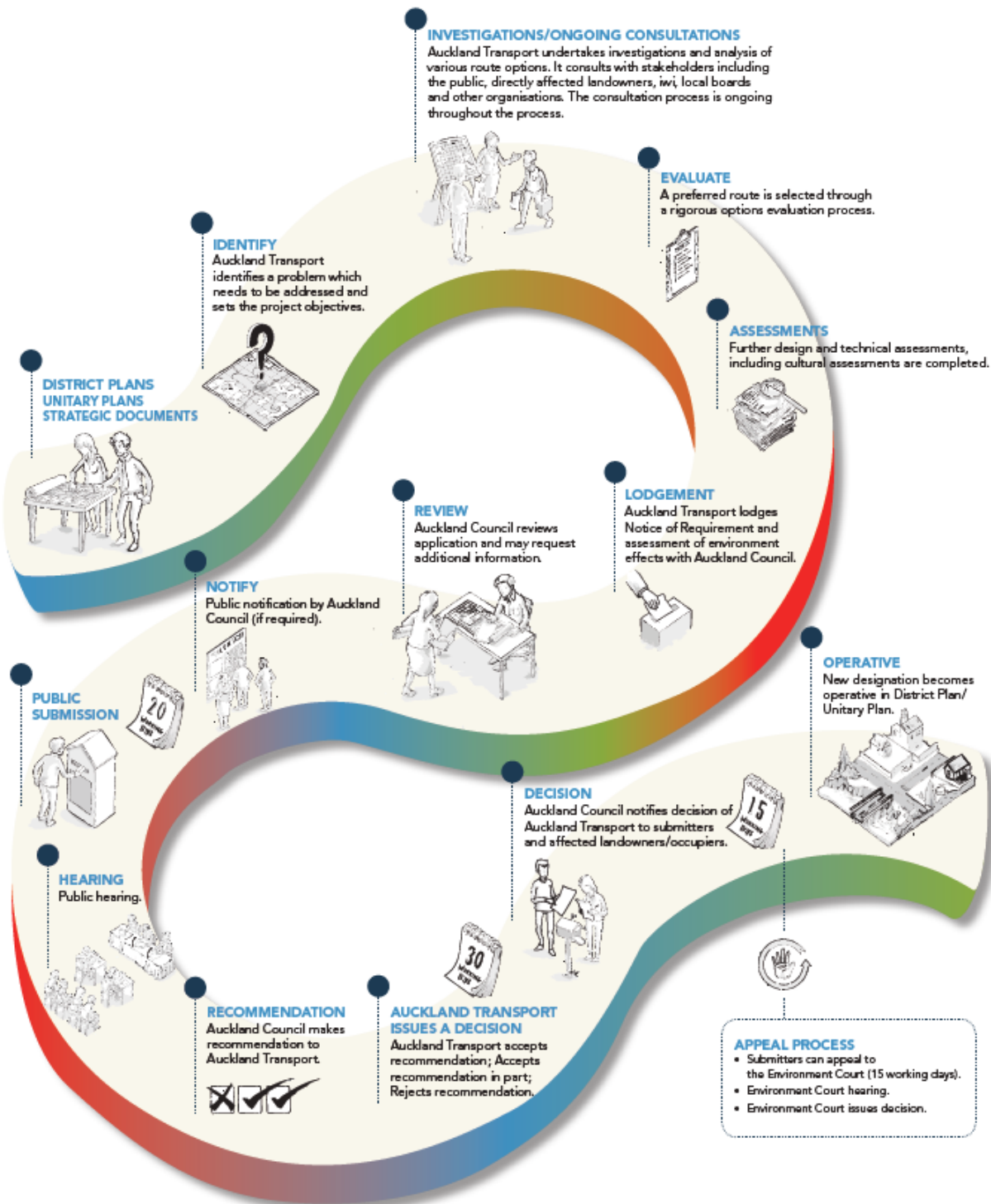
15.1 NoR Route protection management

It is noted there are multiple methods to achieve route protection and this section is based on obtaining a transport designation. This section covers the preparation and lodgement of NoR documentation and any post lodgement activities to confirm the operative designation. It concerns four projects within Takaanini to be delivered through four NoR packages.

15.1.1 Route protection process

The route protection process is shown in **Figure 15-1**.

Figure 15-1 : Route protection process

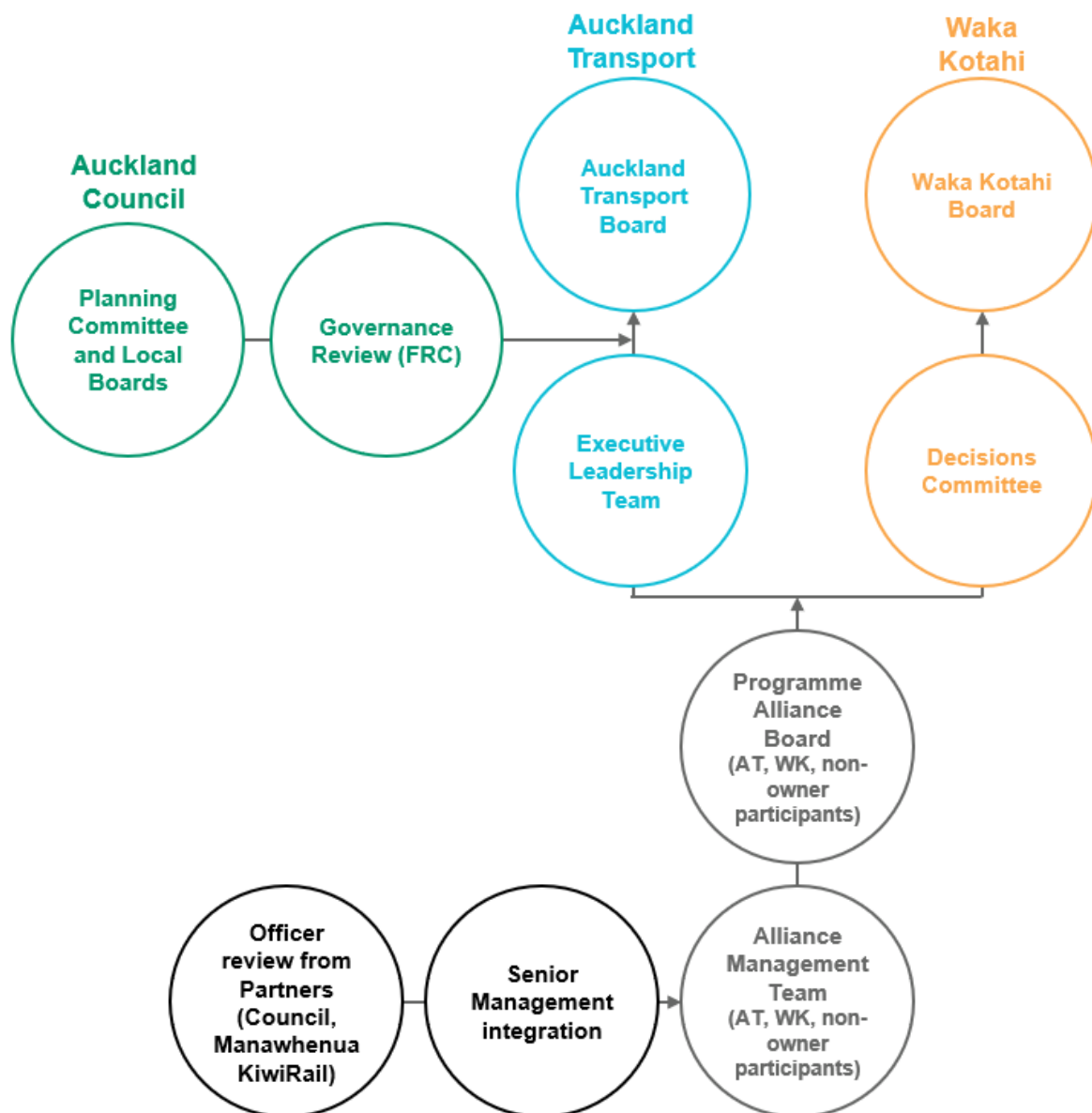


15.1.2 How is the route protection phase being governed?

Waka Kotahi and AT identified a collaborative Alliance model as the appropriate delivery mechanism to efficiently deliver this route protection. It is intended that the Alliance would also need to work collaboratively with owner and partner organisations in respect of wider land use, transport system planning and specific programme governance.

Governance in the context of the Alliance 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 the Alliance. This structure is summarised below in **Figure 15-2**.

Figure 15-2 : Te Tupu Ngātahi governance structure



The Alliance Board is ultimately responsible for approving Alliance deliverables for release. The Alliance Board does not replace the approval processes for AT or Waka Kotahi.

The outcomes sought from the Te Tupu Ngātahi alliance over the next five years are:

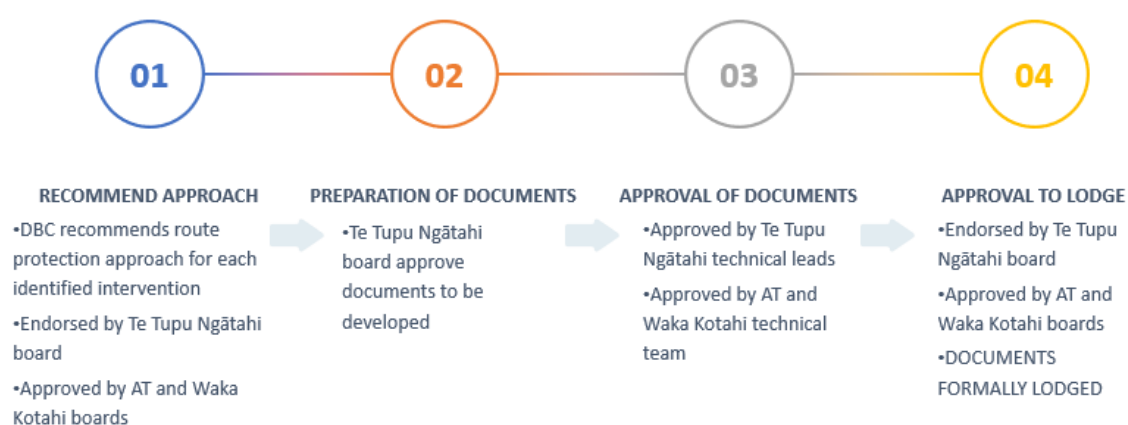
- Business cases that confirm the recommended transport network and enable investors to make decisions on whether first decade projects will proceed to the implementation phase or alternatively to route protect corridors for longer term projects.
- The preferred transport network for each growth area is route protected within five years.
- Efficiency of process – by protecting the recommended networks in each of the four growth areas together, efficiencies are sought through the business case and NoR processes.

While projects without a physical footprint are not within the scope of Te Tupu Ngātahi, these projects (including TDM and maximising land use opportunities) are critical in meeting programme objectives and wider policy directives and are recommended to progress in parallel with the route protection task.

15.1.3 Who decides and approves the route protection approach?

The decision to formally lodge for route protection will ultimately be made by both AT and Waka Kotahi boards. There are however several steps preceding this ultimate decision as outlined in Figure 15-3. The process also allows for multiple review and staged approvals of the documents as they are prepared.

Figure 15-3 : Route Protection approval process



15.1.4 How are different projects prioritised over others?

The benefits of route protecting each transport corridor varies subject to a range of matters, including:

- **Urgency** – development pressure including the lodgement of private plan changes, council structure planning, or the timing of related projects to the intervention.
- **Financial benefits obtained from protection** – route protection can reduce property and construction costs associated with a project. Benefits achieved are significant if protection is obtained prior to development but erodes 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.
- **Contribution to programme outcomes** – The extent to which a project contributes to the overall programme benefits including mode share, accessibility, resilience etc.

The Te Tupu Ngātahi management team regularly review the overall programme prioritisation (at least every six months) and any changes are recommended to the Alliance board for endorsement. There is approval to commence the pre-lodgement work in parallel to the development of the DBC and current expectation is that lodgement will occur in the latter half of 2023.

15.1.5 Property

The Te Tupu Ngātahi Programme Wide Property Strategy identifies an approach for the securing of strategic properties. Whilst the vast majority (60% - 80%) of property purchase is typically anticipated in the three years prior to implementation of a project, this acquisition could occur prior to route protection being enacted, or during the route protection process. The Te Tupu Ngātahi Programme Wide Property Strategy identifies several different potential acquisition profiles for forecasting the potential property acquisition cashflow.

Typically, the purchase and ongoing management of these property purchases will be undertaken by the purchasing entities business as usual (BAU) property teams. Both AT and the Waka Kotahi have well proven and tested property management processes and dedicated teams in place to manage these property purchases and then the ongoing management of these properties.

15.1.6 NoR Lodgement

The management of the NoR process is shown in **Table 15-1** below.

Table 15-1 : Management of the NoR process

Stage	Management
Lodgement	• The decision to formally lodge documents will be made by the AT and Waka Kotahi board for all projects as per current processes for both organisations. This includes the Alliance getting owner endorsement from technical leads within each owner as per the earlier described Quality Assurance process and any 'pre board' committees as required. • To ensure that the documents prepared are appropriate to the receiving authority (Council) regular (fortnightly) meetings have been established with the regulatory arm of Council to agree levels of detail and standard consent conditions prior to lodgement.
Hearing	• Once the decision is made to lodge, and documents are formally lodged; SGA will manage the interface with the receiving authority (Council) and the hearing processes on behalf of the specific requiring authority (AT or Waka Kotahi). • Leading into and during the hearings there is a need for fast decision making in respect to a number of key aspects, including conditions, submitter negotiations and requests from the hearings panel/court. • Both AT and Waka Kotahi have considerable experience in managing these dynamic situations and the SGA team will work closely with the requiring authority (AT or Waka Kotahi) to ensure that the required delegations and decision-making approval processes are in place prior to lodgement.

Stage	Management
Property agreements	Where the identified route protection mechanism does not include a designation process, such as a developer agreement, the following steps will be undertaken: • Te Tupu Ngātahi working closely with AT and/or Waka Kotahi property teams will provide technical advice to negotiations. • AT and/or Waka Kotahi will develop developer agreements. • AT and/or Waka Kotahi property teams will remain the ‘custodian’ of the agreement and ensure any conditions are undertaken and the agreement is monitored and actioned as required.

15.2 Management of projects not recommended to be route protected

The Route protection strategy includes a different approach for Croskery Road upgrades as required works is anticipated to fit within the existing road reserve. This project is recommended to proceed to an implementation business case. AT this point AT will confirm the details of upgrades required on this corridor.

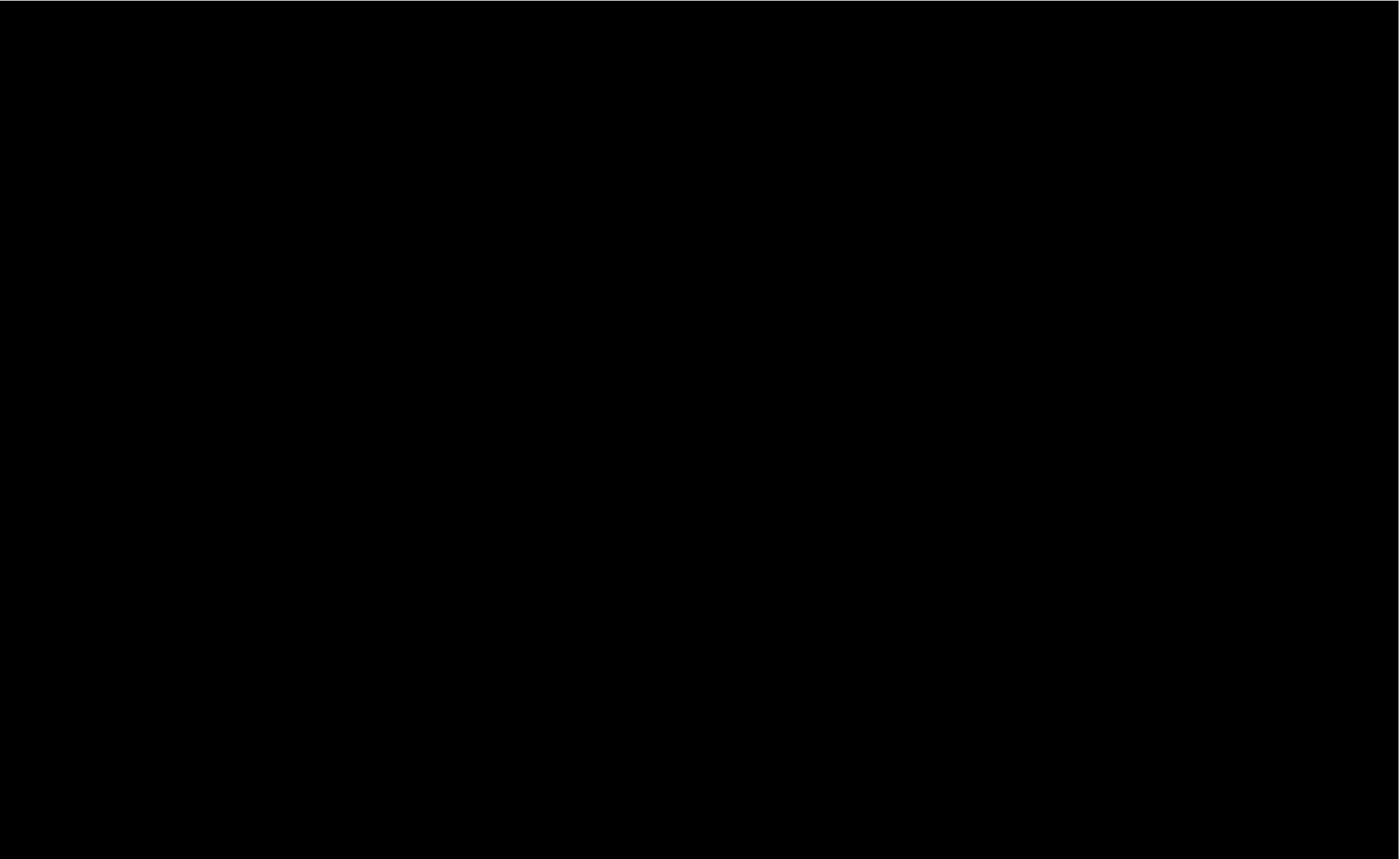
15.3 Risk and opportunity management

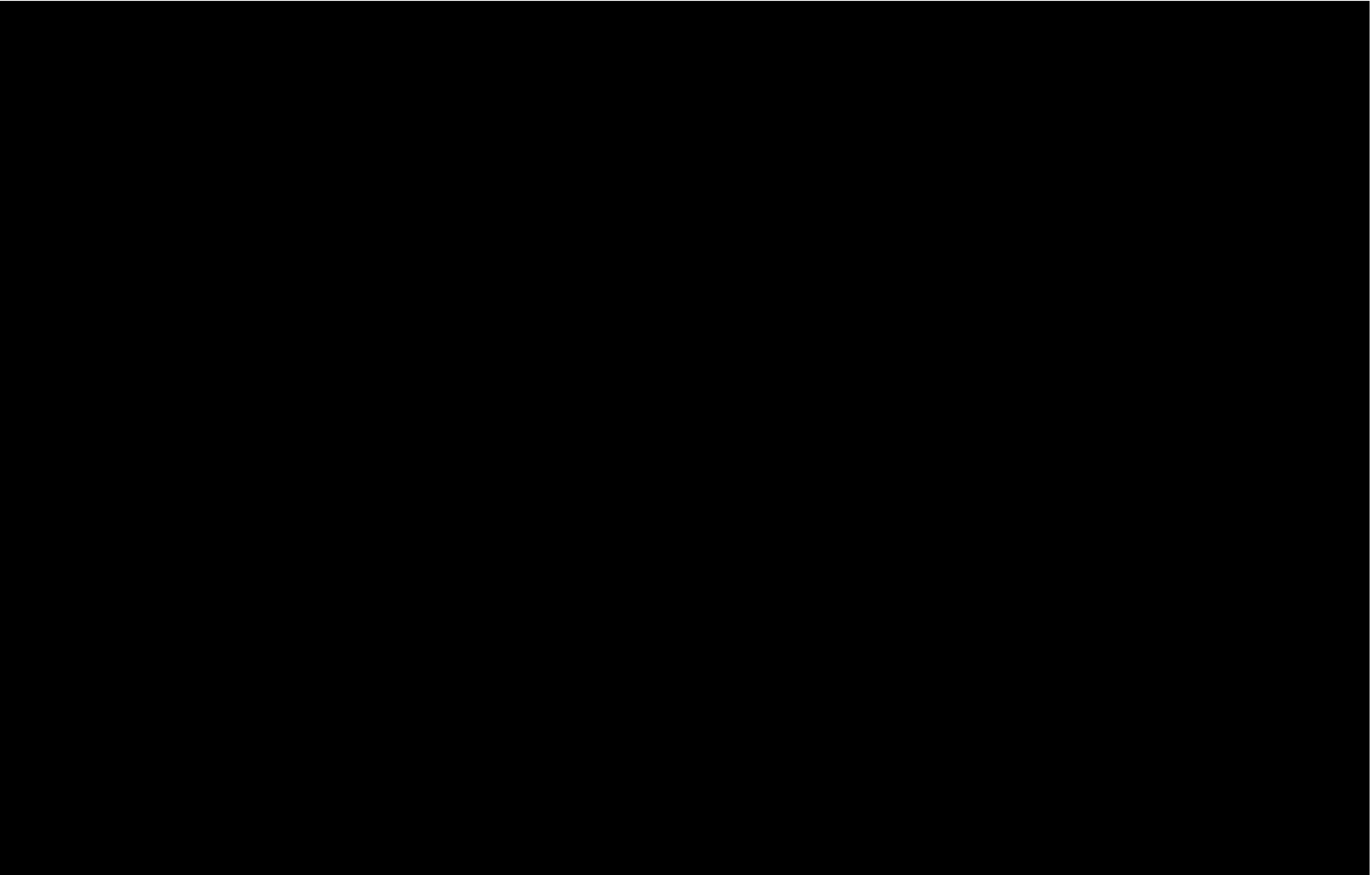
The Te Tupu Ngātahi programme is a large programme comprised of multiple projects and a range of policy and land use uncertainties which transpire into risks and opportunities. These must be managed to enable successful delivery.

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 Waka Kotahi.

A full risk report is included in **Appendix M: Risk Register** which includes details of the methodology undertaken to identify and manage risk for both the overall recommended transport package as well as individual project risks.

The key identified programme risks are shown in **Table 15-2**.



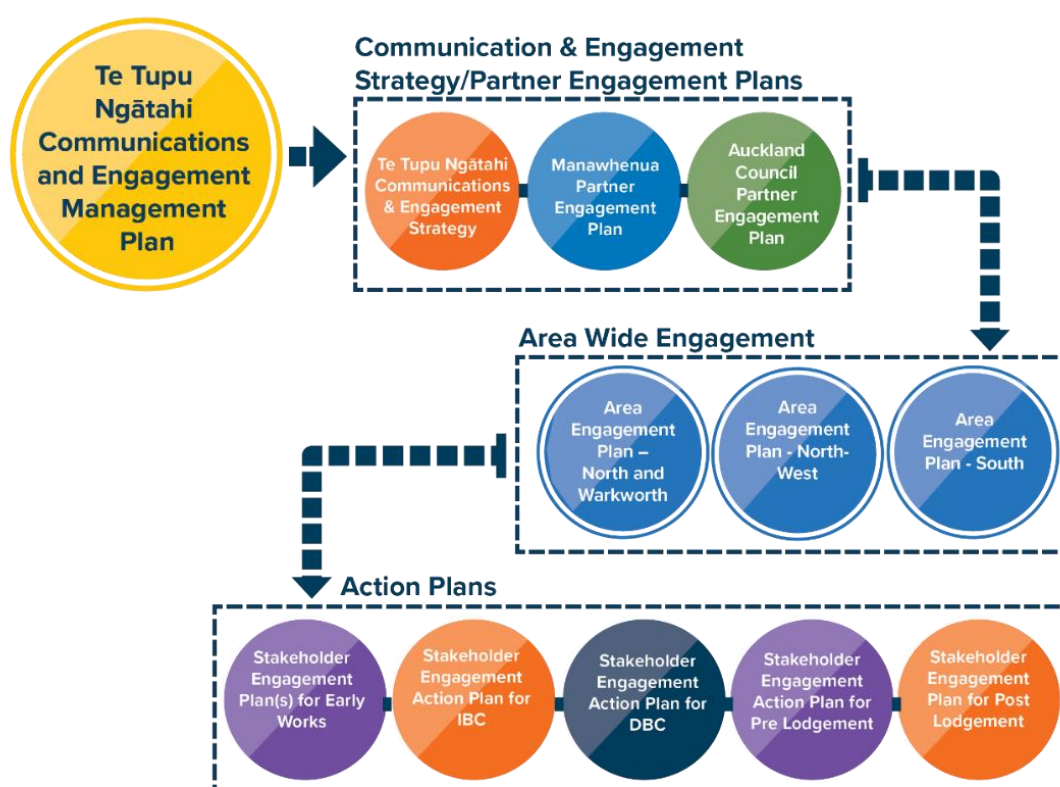


15.3.1 Engagement

Te Tupu Ngātahi has an extensive and ongoing engagement and consultation programme. The purpose of this plan is not solely to ‘consult’ with partners and stakeholders, but also to collaborate and empower others, particularly partner organisations who have their own roles and responsibilities in delivery of an integrated urban transport system and sustainable land use pattern (e.g., particularly the Council).

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 15-4**.

Figure 15-4 : Te Tupu Ngātahi communications and engagement



The focus of the engagement at a programme wide level during the preparation of the NoRs is detailed in **Table 15-3**.

Table 15-3 : Engagement during preparation of NoR

Theme	Programme Wide response	DBC specific response
Manawhenua	Regular hui to communicate progress and discuss specific project activities.	- Regular hui. - Discussions around impacts and mitigations on sensitive locations.

Theme	Programme Wide response	DBC specific response
Public engagement	• Continue to build understanding of wider Te Tupu Ngātahi progress and the process of route protection as set out in the Programme Wide Comms and Engagement Strategy • Continue one-on-one engagement with landowners / developers (e.g., meetings) regarding potential effects and opportunities for shared alignment in outcomes (e.g. through developer agreements) – particularly in areas where land is live zoned or is about to be. • Inform stakeholders about the processes for route protection (e.g., via e-updates, meetings and website information) and provide an opportunity for participation (i.e. submission on the NoR or similar as appropriate).	• Development of engagement plan for NoR preparation phase. • Particular regard will be given to the re-engagement strategy with landowners associated with the Great South Road and Takaanini FTN. • Initial land owner meetings will need to be held with property on projects which have had limited owner interactions to date.
Council engagement	• Critical ongoing discussion with the 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.	• Participation in Council land use forums. • Continued relationships with Council Plans and Places about future structure plans.
Stakeholders	• Provide information (and seek feedback) on staging and timing for the preferred network, including specific opportunities for sequencing of urban development (e.g., meetings with utility providers regarding integration of utilities within the future transport corridor). • Ongoing workshops and communications with Programme-wide stakeholders and stakeholder groups e.g., Development/Freight/Road Users Group, Active Modes/Public Transport Advocacy Group and Environmental/Social Impact Group	• Ongoing attendance at existing stakeholder forums.
Environment	• Further understand specific issues/ environmental/ urban development effects and opportunities in the preferred network to identify potential design responses and environmental management / mitigation (for route protection documentation)	• Will be considered as part of the preparation of AEE documentation.
Property	• Identify opportunities for AT and Waka Kotahi to undertake early property acquisition (e.g. willing buyer/willing seller arrangements. Note leading this process is outside the specific scope of work for Te Tupu Ngātahi.	• Information to be passed on by project team to appropriate owner organisation.
Decision makers	• Enable Te Tupu Ngātahi to inform decision makers on the risks and opportunities of potential route protection mechanisms for the preferred network.	• Regular update of risks and opportunities registers. • Project team to work with Owner Interface Managers to allow briefing into owner organisations.

15.3.2 NoR Post route protection management

This section covers the management of tasks after the designation has become operative.

15.3.2.1 Key tasks

During this phase of the programme the key tasks could include:

Table 15-4 : Key tasks post designation

Task	Commentary
Management of designations obtained in previous phase	This could include the management of conditions and the potential for monitoring lapse periods as required. The requiring authority for a project will be responsible for the management of a specific designation. Both AT and Waka Kotahi have existing and proven systems for the management of these designations and currently do this on a regular basis. The Te Tupu Ngātahi designations would be added to the respective requiring authority's current suite of designations to manage.
Scoping, procurement, and delivery of required implementation DBCs	The DBCs undertaken have been focused on the case for investment in the route protection of the identified preferred interventions. It is acknowledged that given this route protection focus, there will need to be a further investment 'gate' to confirm the case for investment in the implementation of the identified interventions when required in the future. This subsequent investment decision will require appropriate information. It is proposed that this sits within the business case framework as an Implementation Detailed Business Case (ImpDBC). The scope of each ImpDBC will be informed by the specific intervention but is anticipated to include: • Review of any changes in critical assumption since package DBC completed. • Further design development. • Safety Audit. • Parallel Estimate. • Consenting Strategy. • Confirmation of funding sources. • Inter-dependences with other projects and any critical triggers. • Procurement Strategy. • The scoping of this ImpDBC will be undertaken by the lead entity for the intervention and it is recommended that: • Scoping is undertaken at least three years prior to planned implementation. • The ImpDBC is completed at least one year prior to planned implementation, earlier if property issues are anticipated.

Task	Commentary
Scoping, procurement, and delivery of projects to implementation	Once a project has funding (through acceptance of ImpDBC) the next stage in the implementation of the project will include four stages as shown in the figure below.  Design Design development to allow construction to occur Consenting Secure the required resource and regional consents Implementation The procurement and construction of project Operations and Maintenance The ongoing management of asset delivered Depending on the project, there will be several different options to deliver each of these stages. For example, consenting, design and implementation could all be procured separately from one another, or in one collective contract (such as an Alliance). This will be very dependent on the project risks as defined in the ImpDBC. It is anticipated that the ImpDBC will include a procurement strategy that will outline in detail how each of these steps will be procured and managed. Both AT and Waka Kotahi have the systems and capability to successfully manage the procurement and delivery of each of these steps.
Purchasing and management of property acquisitions	Typically, most of the property purchase for a project is anticipated in the three years prior to implementation of a particular project. The Programme Wide Property Strategy also outlines the need for a dedicated Supporting Growth Strategic Property Fund for advanced property purchase and a dedicated team to drive this fund. Both AT and Waka Kotahi have well proven and tested property management processes and dedicated teams in place to manage these property purchases and then the ongoing management of these properties.
Land use and transport integration optimisation activities	Tasks could include continued input into future structure planning or progressing intensified land use development and Transit Oriented Development at stations. These tasks are likely to involve ongoing discussions with multiple organisations with the outcome to maximise land use and transport integration. Many of these have been identified in the next steps section of this DBC.

15.3.2.2 How will the programme of works be governed?

The Te Tupu Ngātahi scope finishes with the route protection of the identified transport corridors. Therefore, this next phase will be managed and governed directly by the project owners of Waka Kotahi and Auckland Transport. It is noted that a formal handover and knowledge transfer will need to occur between Te Tupu Ngātahi project team and the wider owner organisations to ensure the appropriate next steps are progressed.

These post designation activities are generally considered Business as Usual for the owners and it is expected that the owners would identify the relevant teams within the organisations to progress the tasks.

Given the scale of the overall Te Tupu Ngātahi programme there may be opportunity for the owner organisations to consider how they will resource and deliver the tasks. There are many different governance options, with three main governance 'themes':

- **Option 1: Individual Project BAU** – Each project would be delivered and governed by appropriate requiring authority (i.e., AT would govern and deliver arterial roads) in isolation.
- **Option 2: Complete Programme Approach** – Similar to current governance, AT and Waka Kotahi would jointly govern a programme approach and procure services together to deliver the next stages of the programme.
- **Option 3: Partial Programme Approach** – Similar to Option 2, however whilst governance would be combined, delivery would be undertaken by either AT or Waka Kotahi, reporting to a combined governance arrangement for say funding and prioritisation.

Any future joint governance arrangement will need to be considered and agreed by Waka Kotahi and Auckland Transport.

15.3.2.3 Risk and opportunity management

Both the AT and Waka Kotahi delivery systems and processes have risk management at their core. In terms of the key risks envisaged at this time for this stage of the programme, these are:

- Consistency of messaging to stakeholders and property owners.
- Availability of funding for implementation (and property funding).
- Land use including housing and business/ employment yields and co-investment in the public realm occurs at a pace and level that is generally consistent with levels assumed at the DBC.
- Appropriate width of designations obtained for latest transport system requirements.

These risks (and others identified closer to the time) during the scoping and the continued project development phases will need to be proactively managed to ensure the successful implementation of the projects moving forward.

15.4 Overall programme management

15.4.1 Prioritisation

Prioritisation of the overall programme is a critical component to ensuring the programme outcomes are delivered, as prioritising the programme incorrectly could in fact undermine the outcomes sought.

Each individual DBC has identified an assumed prioritisation at this time to best deliver the outcomes sought. It is acknowledged that this a programme to 'support growth' and is therefore intrinsically linked to the scale and pace of development that eventuates because of land use zoning and market forces. Therefore, each DBC and the overall prioritisation has identified triggers for implementation of the projects in the programme.

At the conclusion of the route protection process undertaken by Te Tupu Ngātahi there will be an overall programme implementation and prioritisation plan based on the information at that time and based on the key principles of scale and pace of development, mode share outcomes, placemaking and contribution to climate change response. Given this programme could take in the order of 30 years it is almost certain that circumstances will change that impact on the delivery and prioritisation of the programme.

15.4.2 Benefits realisation

Ongoing tracking and measurement are another important aspect of the programme to make sure the outcomes sought are delivered. This is particularly important for a programme of this scale and duration where there is likely to be considerable change in what occurs (such as pace and scale of land use) over this long period.

The DBCs have therefore been developed with a consistent programme wide Benefit Logic Map (BLM). Adopting a BLM approach ensures the benefits of each project align with strategic objectives and help deliver the programme-level benefits. The BLM also allows proposed outputs to be logically mapped to benefits (via outcomes), so that different scenarios can be compared based on their benefits impact. A single BLM for the programme will also:

- Allow subsequent time profiling of benefit realisation to inform prioritisation discussions, by sub-programme and programme.
- Allow more effective and consistent programme communications and stakeholder engagement.
- Minimise the amount of re-work when completing the benefits for the DBCs.
- Inform the consenting strategy.

The BLM will act as a reference document for validating each options' contribution to programme benefits. Analysing options in this way will immediately address the value for money strategic objective, by transparently demonstrating the:

- Contribution towards the desired GPS results (benefits).
- Return on the investment – expected benefits compared with expected cost.
- Reason for the decisions, especially where there is a cost benefit ratio lower than would normally be required for inclusion in the NLTP.⁸

In addition, value for money also requires investments to be made at the right time. Developing a benefit realisation profile based on when outputs are complete (i.e., when assets are commissioned) will allow resources to be focused on those activities that shift the benefits dial the most. Re-prioritising initiatives if strategic objectives change or external factors dictate - becomes a simple exercise of re-mapping the outputs and outcomes to the updated benefit set.

15.4.3 Optimising the outcomes from Te Tupu Ngātahi Programme

Specific measures to support the recommended network have been detailed in **Section 11.3**.

Table 15-5 outlines the proposed management to ensure that these complementary and necessary elements are also delivered.

⁸ Government Policy Statement on Land Transport, 2021, Section 3.2

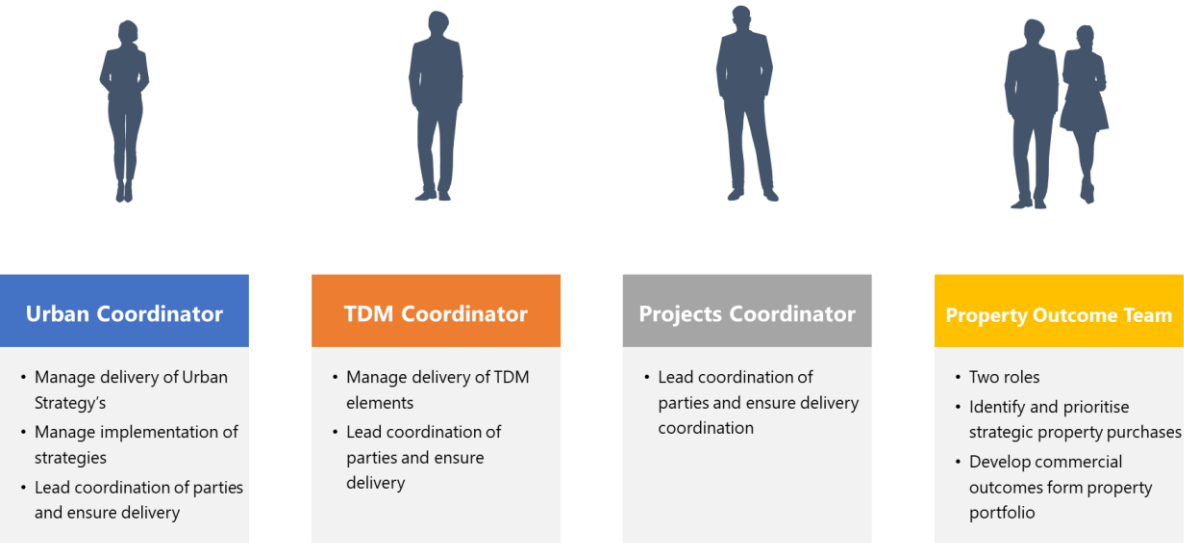
Table 15-5 : Proposed management for supporting measures

Element	Organisations	Proposed Te Tupu Ngātahi Management
Urban System integration	This is an incredibly complex arrangement as there are often competing needs and low cross-party coordination in planning and implementation activities. It is critical that common outcomes are sought, clearly communicated to all parties for alignment and that parties are held to account in the delivery of their particular aspect of the complete solution. There are multiple parties involved in these aspects, including: • Auckland Council (statutory & spatial planning, consent authority, civil & social infrastructure provider, local transport system specifier & operator, via CCO Auckland Transport). • Government departments (public facilities including schools and other facilities). • Developers (implement form and function ultimately). • Transport authorities (build stations and supporting infrastructure). • Kāinga Ora – an urban development agency to assist in delivering transport supportive urban outcomes. • Separation in metropolitan rail provision between public transport operators and infrastructure providers. • Council urban renewal agencies such as Eke Panuku in Auckland.	Develop an urban strategy for the South. All parties will be critical to its development, actions and active monitoring. It is proposed that as well as the current bodies tasked with urban outcomes, that a dedicated role is identified that is focused on the delivery, monitoring and implementing of the Urban Strategy.
Transport system optimisation	To be led by Waka Kotahi and Auckland Transport. Financial, technological and operational incentives are also needed to support mode shifts needed to address climate change and congestion.	Provide a dedicated TDM resource. It is proposed that a dedicated resource is tasked with ensuring the TDM elements identified are developed, implemented and monitored.
Other Transport	It is critical that there is cross organisation collaboration and alignment on the implementation of these 'other' projects so that the outcomes sought can be delivered by all projects. There are many competing needs and challenges to aligning multiple projects and careful planning and management of this integration is required. There will need to be coordination between: • Waka Kotahi (funding and state highway projects). • Auckland Transport (Local roads and public transport services). • KiwiRail (Rail infrastructure). • Developers (Key local transport links). • Kāinga Ora.	Part time programme coordinator role To ensure the coordinated delivery in a dynamic environment, a part time programme coordinator role is proposed to ensure the necessary level of coordination is achieved.

15.4.4 Ongoing programme management roles

It is proposed to manage identified roles through the establishment of a **Green Fields Action team**. This ongoing programme management team for the programme provides for a total of five roles as shown in **Figure 15-5**. This includes three roles to deliver optimised outcomes as detailed above and two additional roles for previously identified property tasks.

Figure 15-5 : Project management team roles



16 Conclusion and Next Steps

This DBC sets out the rationale for investing in route protection for the FTN and associated Key Connections. Based on the information provided throughout this document, the following approvals are sought:

1. Approval of the recommended transport package.

Approval and endorsement is sought for the recommended transport package which includes:

- Total of five recommended projects:
 - Two FTNs – Great South Road and Takaanini
 - Three upgraded arterial roads.

2. Approval of lodgement and route protection preparation.

- Approval for lodgement and route protection for 4 NoR packages. Funding is already available under the current NLTP with the post lodgement cost included as part of the risk provision for the Te Tupu Ngātahi Alliance.

It is noted that the preparation of NoR documentation is underway and documentation would be subject to standard review processes by Waka Kotahi and AT.

3. Acknowledgement of the potential early property acquisition and associated risk arising from route protection of the recommended transport package.

It is acknowledged that this business case is focussed on route protection and that there are funding implications associated with early property acquisition of this route protection.

This business case does not seek to resolve issues surrounding the funding required for the delivery of the recommended new infrastructure and services. For a range of reasons including forward revenue projections, there is significant uncertainty surrounding the ability to fund the programme using traditional funding mechanisms/ NLTF over the long-term.

Given this uncertainty and the potential long-term funding gap, it is recommended that route protection be completed at this time to provide:

- **Ability to plan infrastructure to support the community.** The very nature of route protection enables the provision of planned infrastructure rather than “responsive” infrastructure which typically results in infrastructure being retrospectively added and squeezed into available land that has already experienced growth-related development. This is already apparent within the brownfield corridors of this DBC. The DBC has demonstrated the substantial effects it would have along Great South Road and through Takaanini if an optimal transport solution is sought in a retrospective manner. Thus, route protection provides the owners with significant opportunity to front foot and respond to key issues such as climate change and other mitigation/ adaptation needs of the network. It also protects the ability to realise the step change in transport outcomes (mode shift and accessibility enhancements) which could otherwise be compromised as space is restricted.
- **Financial upside.** Financially, a small investment now is forecast to save many millions of dollars in property and implementation costs that makes financial sense. The DBC has identified over 2,000 properties could be impacted within the urbanised corridors when attempting to

accommodate everything into the limited space available. This will only be further exacerbated when six-storey apartments/ new townhouses are built under the MDRS. This further increases the funding gap for implementation potentially preventing project implementation. Thus, route protection requires some upfront expenditure (costs of obtaining NoR and early purchase of some property) but reduces overall cost of implementation and property purchase.

- **Ease of implementation.** Implementation will be considerably less difficult (and costly) with designations in place.
- **Ability to deal with unplanned growth.** While the growth in the Takaanini FUZ is planned in the next 20 years, private plan changes are likely to occur out of sequence. This is already happening with the potential of the Alfriston Plan Change. With designations in place, AT have set expectations on what infrastructure is required to support FUZ development.

The most significant risk for route protecting now is affordability due to the early property acquisition costs. This can be managed through Programme wide initiatives to address this issue including:

1. Having a property team focussed on the Te Tupu Ngātahi programme.
2. Developing an agreed position for the programme on the approach and application to betterment.
3. Developing and providing programme position on advanced property purchase.
4. Provide agreed programme positions outlined above to the Auckland Transport and Waka Kotahi boards for endorsement in the fourth quarter of 2023.

There is also the challenge of funding the implementation of the options identified given the constrained NLTF. Whilst not the focus of this business case, it is important that Auckland Transport and Waka Kotahi work together to resolve this long-term funding challenge. It is almost certain given the challenges facing the NLTF that alternative funding mechanisms are required. Whilst both organisations have experience with these, the scale of the wider Te Tupu Ngātahi programme is of a scale not undertaken before, providing unique challenges and opportunities for alternative funding models.

16.1 Next Steps

The following key next steps for Te Tupu Ngātahi in terms of route protection are:

1. Preparation of documentation for NoR
2. Approval to lodge the NoR
3. Lodgement of NoR
4. Post lodgement activities.

In a DBC this complex there have been a number of key activities that have been identified that need to be undertaken to either reduce residual risks, better manage uncertainty or unlock additional potential and opportunities for the projects. These activities will also support a handover to the owner organisations once the Te Tupu Ngātahi programme is completed.

These are documented in **Table 16-1**. Some fall outside the Te Tupu Ngātahi remit of route protection and in these instances, appropriate owners have been identified for the actions. These steps have been discussed with both Auckland Transport and Waka Kotahi to agree the best solution for ongoing management.

Table 16-1 : General next steps

Project	Next Step	Action	Owner/s	Dates
All	Land use and transport integration for non- structure planned areas. Opportunities as part of future structure planning processes to ensure further integration between the preferred transport network and land use.	- Owners to continue to work with Auckland Council in further iterations of the Spatial Land Use framework. - Owners to engage with Auckland Council in the structure planning process and preparation of Integrated Transport Assessments (ITAs). Consider instigating a recurring meeting to aid regular dialogue in the lead up to the commencement of the structure plan process.	Waka Kotahi/ AT With interim support from Te Tupu Ngātahi	Ongoing
All	Property Management of property acquisition	- Develop overall plan for property purchase. - Consideration of strategic advance purchases, agreeing developer agreements.	AT	Ongoing
All	Sustainability and Climate Change response. Organisations are developing strategies to respond.	- Climate change factors have already been incorporated in the DBC e.g., through the transport outcomes/investment objectives, option selection, measurement of emissions. - Te Tupu Ngātahi has developed a programme wide response to these broader issues and scope for NoR phase. Will continue to explore ways to mitigate greenhouse gas emissions through subsequent phases. - Owner organisations are currently developing their own tools to assess and review projects against climate change. It is recommended that the Te Tupu Ngātahi projects are included in owner climate change assessment programmes at the appropriate future gateways to realise the maximum opportunities for mitigation and adaptation.	Waka Kotahi/Auckland Transport	
All	Changes to the Resource Management Act Impacts on the Route protection strategy.	- NoR team will continue tracking these policy changes and will need to adapt the strategy if required. - Not expected to influence the “why” for route protection but might impact the “how”.	Te Tupu Ngātahi NoR team	Ongoing

Project	Next Step	Action	Owner/s	Dates
Popes Road	Future Design	There are a number of uncertainties surrounding Popes Road which influences its hierarchy on the network. Intersection upgrades needs to be assessed prior to implementation.	AT	Prior to implementation
GSR upgrade	Future Design	Future design should give consideration to integration with the Drury Central Station.	AT	Prior to implementation

Appendix Cover

Appendix A: Strategic Case (Not applicable for this DBC)

Appendix B: Climate Change Response

Appendix C: Alternatives Assessment

Appendix D: Technical Assessments

Appendix E: Engagement Summary

Appendix F: Transport Outcomes Report

Appendix G: Cost Report

Appendix H: Urban Design Evaluation

Appendix I: Design Report

Appendix J: Economics Assessment

Appendix K: Property Overview

Appendix L: Route Protection Strategy

Appendix M: Risk Register

Appendix N: Staging Considerations

