

Supporting Growth

South Area

Drury Local Package Detailed Business Case

Version 1.0

9 November 2020



Drury Local Package Detailed Business Case

Document Status

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Revision Status

Version	Date	Reason for Issue
0.1	4 July 2019	Internal review of draft
0.2	23 July 2019	IQA check-in review: Strategic Case
0.3	8 April 2020	Interim IQA – Economics Case
0.4	30 June 2020	Update to address Interim IQA comments
0.5	28 August 2020	Draft for approval
1.0	7 September 2020	Issue for IQA
1.1	November 2020	Updated Issue for IQA

Disclaimer

This is a draft document for review by specified persons at Auckland Transport and Waka Kotahi New Zealand Transport Agency. This draft will subsequently be updated following consideration of the comments from the persons at Auckland Transport and Waka Kotahi 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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Appendices

Appendix A: Options Assessment Report

Appendix B: Transport Assessment

Appendix C: Cost Report

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Appendix D: Urban Design Evaluation

Appendix E: Design Report

Appendix F: Engagement Summary

Appendix G: Property Acquisition Strategy

Appendix H: Route Protection Strategy.

Appendix I: Risk Register

Appendix J: Drury Local Project Evidence

Appendix K: Drury Local Key Performance Indicators

Acronyms and abbreviations

Acronym/Term	Description
AA	New Zealand Automobile Association
ADT	Average Daily Traffic
AFC	Auckland Forecasting Centre
AT	Auckland Transport
ATAP	Auckland Transport Alignment Plan
AUPOIP	Auckland Unitary Plan - Operative in Part
BAU	Business as usual
BCR	Benefit Cost Ratio
BJW	Bremner Road, Jesmond Road and Waihoehoe Road
CFAF	Corridor Form and Function
CO2	Carbon Dioxide
DA	Developer Agreement
DBC	Detailed Business Case
Development ready	Bulk infrastructure is in place to service development, including three waters, transport, and social infrastructure
DLP	Drury Local Package
DoC	Department of Conservation
DSIs	Deaths and serious injuries
DTIP	Drury Transport Infrastructure Programme
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

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Acronym/Term	Description
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
ha	hectare
HIF	Housing Infrastructure Fund
IBC	Indicative Business Case
IOs	Investment Objectives
IQA	Investment Quality Assurance
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
N-S	North-South
NZUP	New Zealand Upgrade Programme
OIM	Owner Interface Manager
OP	Ōpāheke Road/Ponga Road
Partners	Collectively refers to Auckland Transport, Waka Kotahi NZ Transport Agency, manawhenua and Auckland Council
PBC	Programme Business Case
PBIOs	Problems, benefits and investment objectives
PM10	Air quality – Particulate matter
PT	Public transport
RASF	Roads and Streets Framework
RLTP	Regional Land Transport Plan
RMA	Resource Management Act 1991
RTN	Rapid Transit Network

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Acronym/Term	Description
RPTP	Regional Public Transport Plan
SEA	Significant Ecological Area
SGA	Supporting Growth Alliance
SH1	State Highway 1
SH22	State Highway 22
SHA	Special Housing Area
SiDRA	Intersection modelling software
TDM	Travel Demand Management
Te Tupu Ngātahi	Supporting Growth Alliance
TFUG	Transport for Future Urban Growth
THAB	Terraced Houses and Apartment Buildings
The Council	Auckland Council
The Programme	The Supporting Growth Programme
TOD	Transit Oriented Development
Waka Kotahi	Waka Kotahi New Zealand Transport Agency
VKT	Vehicle Kilometres Travelled
vpd	Vehicles per day

1 Executive Summary

1.1 The case for route protection in Drury

The purpose of this Detailed Business Case (DBC) is to identify a transport system that will support Auckland’s planned greenfield growth over the next 30 years and develop a case for route protecting corridors within the Drury-Ōpāheke growth area. Route protection is important as it provides property owners, businesses and the community with increased certainty on where infrastructure will be in the future, so people can make informed decisions about their land.

The Southern growth area is approximately 20km south of Auckland’s central city and is approximately 30 km in length. It includes the large future urban areas of Ōpāheke-Drury and Drury West where there are live-zoned areas currently under development.

Growth in the overall south area is expected to cater for a population of 356,000 people by 2048+, in comparison to 193,000 in 2016¹. The bulk of the South’s growth is anticipated to occur within the Drury-Ōpāheke growth area, increasing from a current population of just over 3,300 to a population of around 62,000 by 2048+. Provision of employment opportunities is expected to rise from 2000 in 2016 to 11,300 in 2048+.

A latest land use forecast I-11.5 (used for this DBC) shows that there is an increase (from I-11.4 used in the Indicative Business Case (IBC)) in the in both the Drury West and Drury East area, likely attributed to the greater certainty that the Drury-Ōpāheke structure plan has provided, namely identifying where centres are, and consequently, where there will likely be higher household density.

The main takeaway for Drury Local is that the combination of structure plan and development forecasts shows that growth will be substantial both in the South and the Drury area specifically. Therefore, this reinforces the need to route protect in the area to ensure the delivery of a fit-for-purpose transport network that caters for the expected demand.

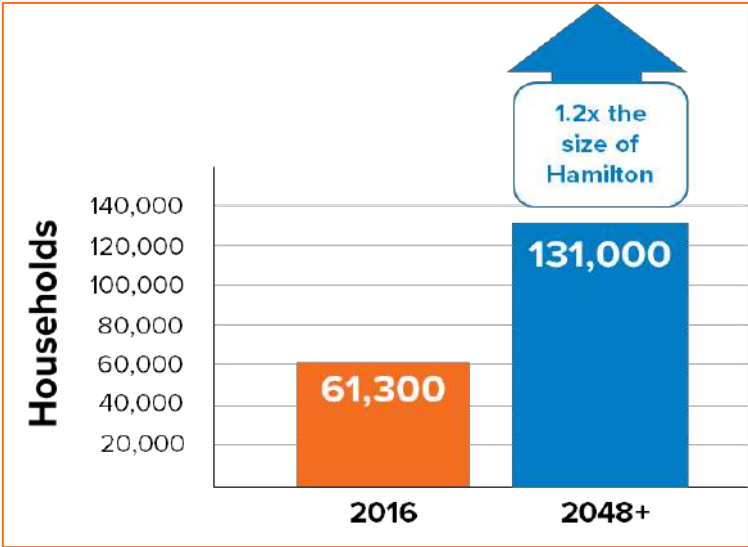


Figure 1-1 Anticipated household growth comparison in the South - 2016 and 2048+

¹ MSM Model I11.5

1.2 Scope of Project

The Drury local package includes six projects:

- SH22 Arterial upgrade
- Waihoehoe Frequent Transit Network (FTN) Arterial/Arterial upgrade
- Jesmond Road FTN Arterial upgrade
- Bremner Road FTN Arterial upgrade
- Ōpāheke/Ponga Arterial upgrade
- Ōpāheke North-South (N-S) FTN Arterial upgrade

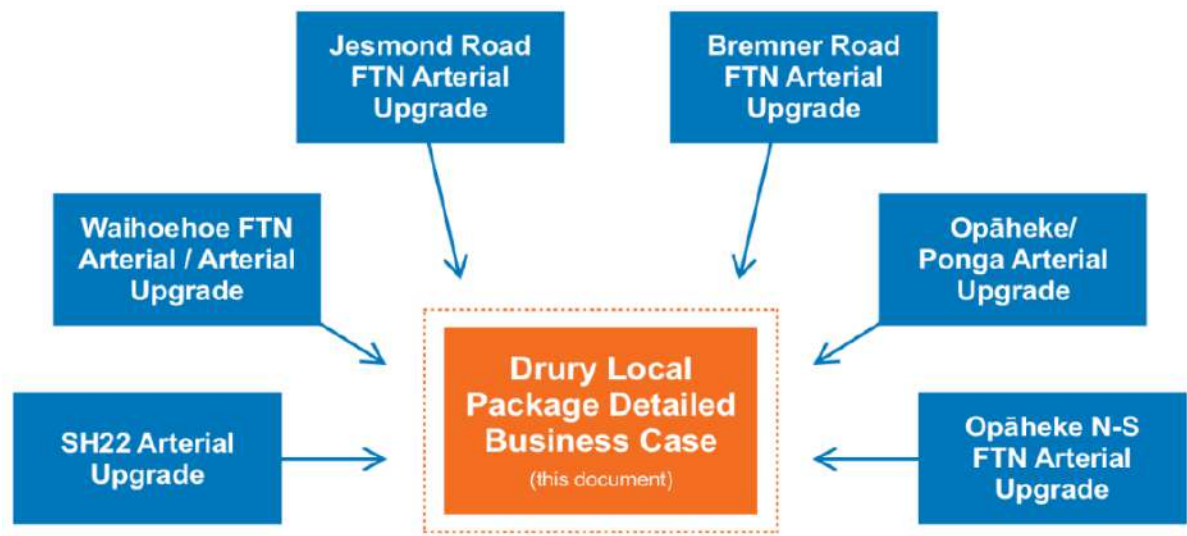


Figure 1-2 Drury Local Package

1.3 Problems/benefits of investment

It is critical that the transport system supports and shapes the proposed growth. For the Drury Local package, the following issues are likely to be most prominent if investment does not occur:

- Access to employment and social amenities will be compromised by congestion and lack of viable alternatives due to over-reliance on State Highway 1 (SH1).
- This over-reliance on a single strategic route will also cause reliability, resilience, safety, and productivity issues.
- The ability to contribute to transformational mode shift will be challenged if investment in additional capacity for public transport (PT), walking, and cycling is not made.
- The quality of the urban form of areas adjacent to State Highway 22 (SH22) will be compromised if local and strategic trips continue to use the same routes.

Table 1-1 below sets out the specific problems for each of the package projects.

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Table 1-1 Drury Local problem statements

Project	Problems
Existing roads to be upgraded/FTN – - Jesmond Road, - Bremner Road, - Waihoehoe Road and - Ōpāheke/Ponga Road	PS1: The current form and function of Jesmond Road, Bremner Road, Waihoehoe Road and Ōpāheke/ Ponga Road will not support the imminent urbanisation of the Drury Local area, resulting in poor access and urban form outcomes
	PS2: The lack of safe and attractive multi-modal access to the proposed strategic PT network will limit access to economic and social opportunities for those living and/or working in the Drury area
SH22 upgrade from Oira Road to Drury interchange Note: Long-term capacity issue will be solved by Pukekohe Expressway project	PS1: The current form and function of SH22 will not support the imminent urbanisation of the Drury Local area (incl. the town centre), resulting in poor accessibility and urban form outcomes
	PS2: Urbanisation of the Drury local area combined with high speeds, a high number of accesses and increasing traffic volumes on this section of SH22 will lead to an increased risk of deaths and serious injuries (DSIs) and intersection crashes
	PS3: Failure to integrate the removal of the SH function with the timing and form of urban development will result in a compromised urban form and movement function
New Ōpāheke N-S FTN/ Arterial – between Drury and Papakura	PS1: The lack of north-south arterial connections through the Drury-Ōpāheke growth area will limit connectivity of communities with existing and proposed centres and employment areas
	PS2: Rapid growth and the lack of attractive N-S travel choices in the Drury-Ōpāheke area will limit access to economic and social opportunities

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Addressing the project-specific problems contributes to positive alignment with one or more of the programme wide investment themes (shown in Figure 1-3) that centre around supporting growth and access, and investing in safety, place and environment.

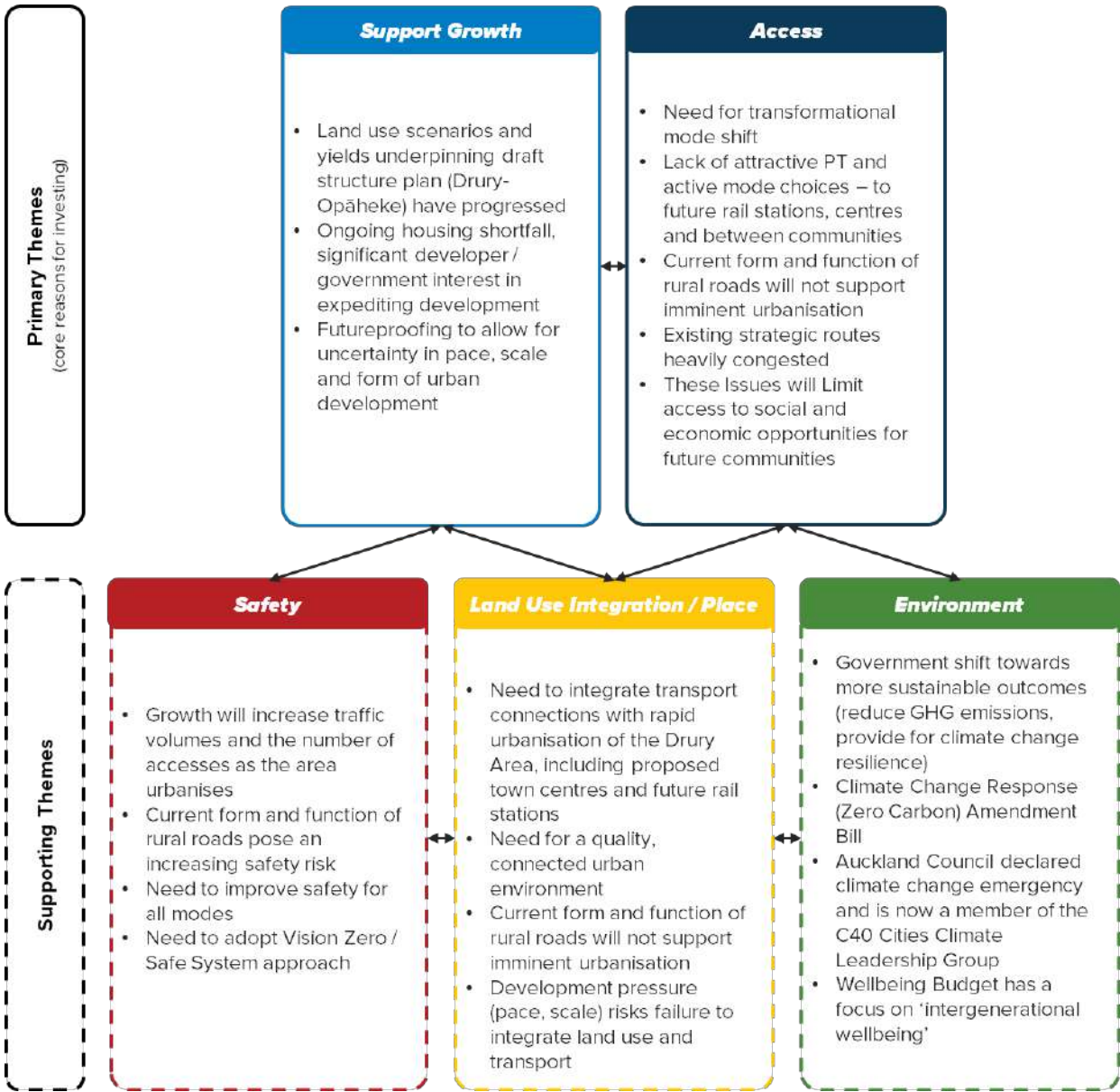


Figure 1-3: Primary and supporting investment themes

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1.4 Solution proposed

The preferred options for each of the package projects are summarised briefly in Table 1-2 and Figure 1-4 below.

Table 1-2 Drury Local preferred options

Package project	Preferred option
Jesmond Road FTN Arterial Upgrade	Option A (generally widening to the west). Preferred due to the reduced social and cultural impacts.
Bremner Road FTN Arterial Upgrade (central)	Preferred alignment is consistent with Plan Change 6 arrangements. Generally widening to the south at the Ngakaroa Stream and SH1 motorway bridges to minimise environmental impacts.
Bremner Road East	Option B2 was identified as the preferred in stage one primarily due to the transport benefits and reduced costs. Option B – widen to the South – was the preferred due to lesser social impacts on existing sites and to better integrate with the bridge widening to the south over SH1.
Waihoehoe Road West FTN Arterial Upgrade and Waihoehoe Road East Arterial Upgrade	Waihoehoe Road West, Option A (generally widening to the north) is the preferred option for greater flexibility for the rail network under Waihoehoe Bridge. Waihoehoe East the preferred option is a combination of Option A and B. - West of Cossey Road - widen generally to the north of the existing road corridor - East of Cossey Road - widen generally to the south of the existing road corridor.
Ponga Road	Widening to the south (Option B - Figure 9-48) was identified as the preferred option due to reduction of heritage and ecological impacts through greater avoidance of mature trees on the northern side of the corridor.
Ōpāheke Rural	Option A (generally widening to the north-east). Preferred due to reduction of property impacts on both residential, open space and utilities.
Ōpāheke/Settlement Intersection	Option D to upgrade the active mode facilities with a southern roundabout at the Ōpāheke Road/ Settlement Road intersection.
Ōpāheke N-S FTN Arterial	Option A, the middle alignment, due to ease of integration with existing roads, the reduced flooding impacts, and support for and integration with future land use along the corridor.
SH22	A preference for a combination of options A B and C to minimise the effects on both sides of the corridor: - Reduced impact on significant ecological areas, overland flow paths and artificial wetland to the north west - Reduced impact on Ngakoroa Stream in the north and Ngakoroa Reserve located to the south east of the corridor. - Allow areas of suspected instability to be avoided where possible - It will help to minimise sight distance issues on Great South Road by widening to the west at this point and avoid suspected land instability west of Oira Road.

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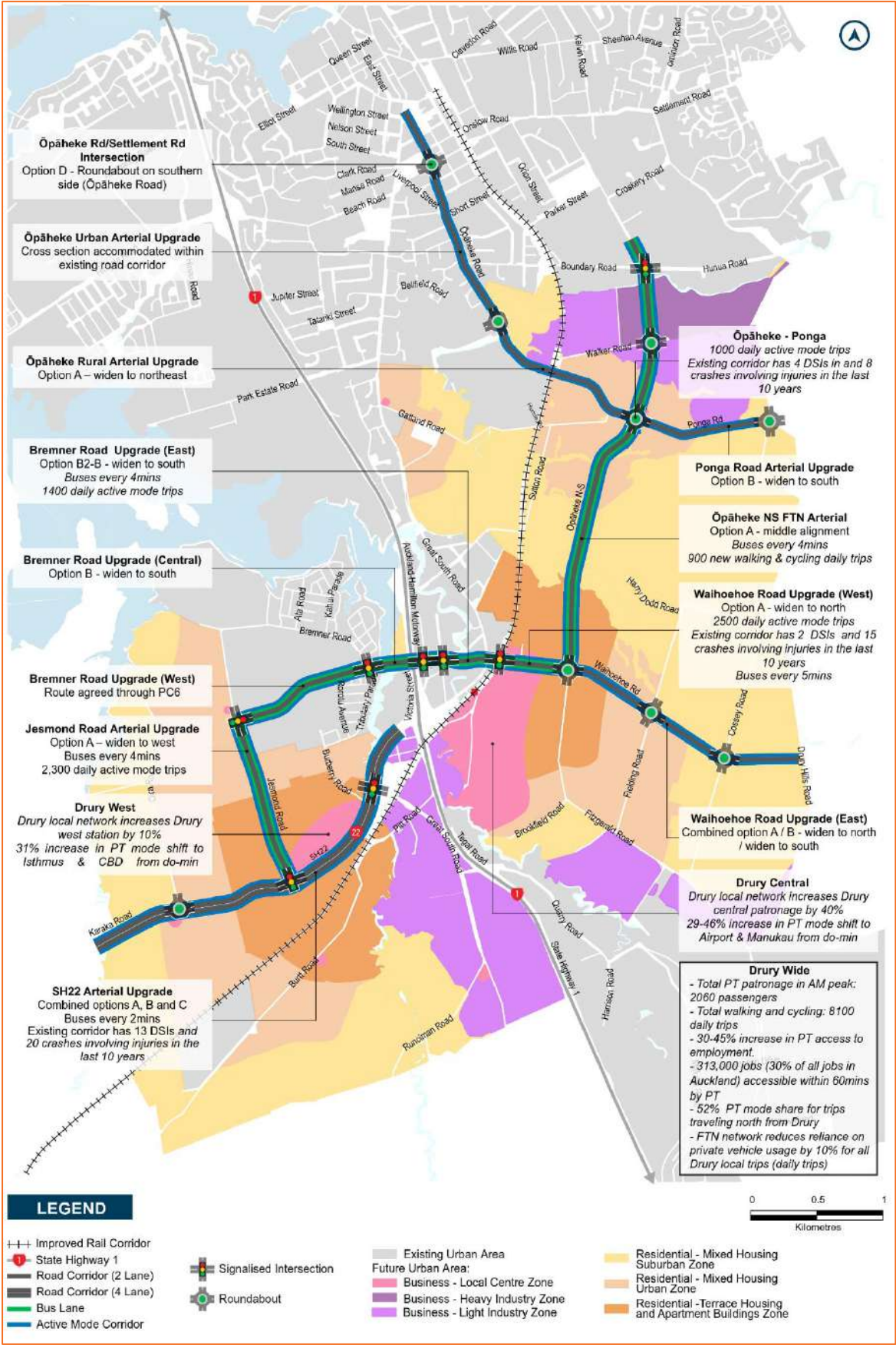


Figure 1-4 Package outcome summary

1.5 Outcomes the package will achieve

At a high level, the Drury Local Package delivers well against the investment themes with sound improvement in the provision of quality public transport and active mode networks/facilities, contributing to positive safety and mode share outcome. Key outcomes include:

Support growth and a more sustainable, quality urban form in Drury

- Reduction of daily traffic flows by 10%
- 2,700 dwellings within walking catchment and 43,000 dwellings within cycling catchment of Drury town centre
- FTN network improves human health by reducing emissions

Achieve transformational mode shift to public transport and active modes

- Northbound PT mode share from Drury is more than 50% in the morning peak
- Local walking / cycling mode share within Drury is more than 30% for local trips

Significantly reduce the risk of DSIs

- Corridor design aligned with Vision Zero (AT) and Road to Zero (Waka Kotahi)
- Daily traffic on Drury corridors reduced by 10%

Improve transport choice and network resilience

- 82,000 population within walking catchment of FTN bus stops
- Significant reduction of PT passenger time spent in congestion
- FTN network has the potential to enable buses every 4-5min



1.6 Recommended Staging Strategy

Given the role of the Route Protection DBC is to identify a transport system to support the next 30+ years of growth, there is inherent uncertainty in relation to the recommended network and the proposed staging strategy. Understanding the implications of these scenarios, and consequently outlining the recommended staging for implementation is integral to understand the property liability, the consenting and route protection strategy. Key principles for staging have been developed that seek to assist in delivering the desired transport and land use outcomes. These principles include:

- Integrating land use and transport to support:
 - Place making
 - Influencing travel, particularly reducing the need to travel, and inducing a mode shift away from single-occupant cars;
 - Maintaining accessibility to unlock socio-economic opportunities
- Providing safe and attractive travel choices
- Providing network resilience and value for money

The key influencers for the recommended staging strategy include:

- Future Urban Land Supply Strategy 2017
- Plan changes
- Travel and mode shift targets

The principles and triggers identified above result in a staging strategy that requires the majority of the package to be implemented within the first decade. The recommended package is flexible, and due to the “staging principles”, can be updated appropriately to changing futures and demands. Figure 1-5 summarises the recommended Drury Local staging.

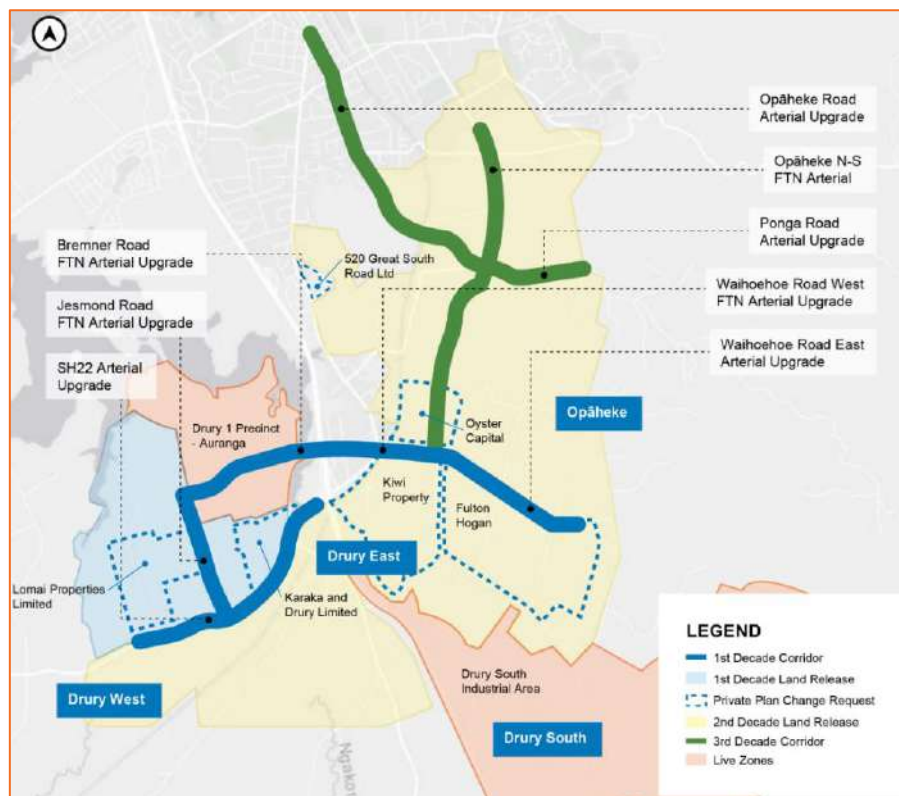
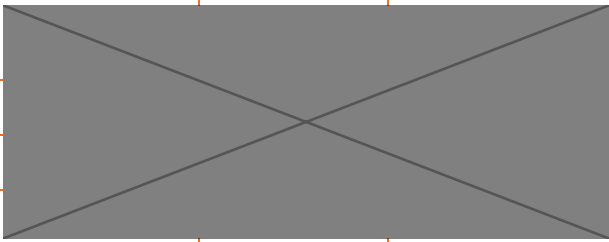


Figure 1-5 Recommended staging approach

1.7 Costs and benefits

A summary of the costs, benefits and benefit cost ratios (BCRs) for each of the individual projects and the total Drury Local package are shown in the table below. The BCRs includes fare revenue to consider the net costs to Government. Individual project BCRs range between 0.5 and 1.6, with a package BCR of 1.1. With the revised evaluation assumptions coming active with a lower discount rate and longer evaluation period this would increase to 1.7.

Table 1-3 Drury Local BCR

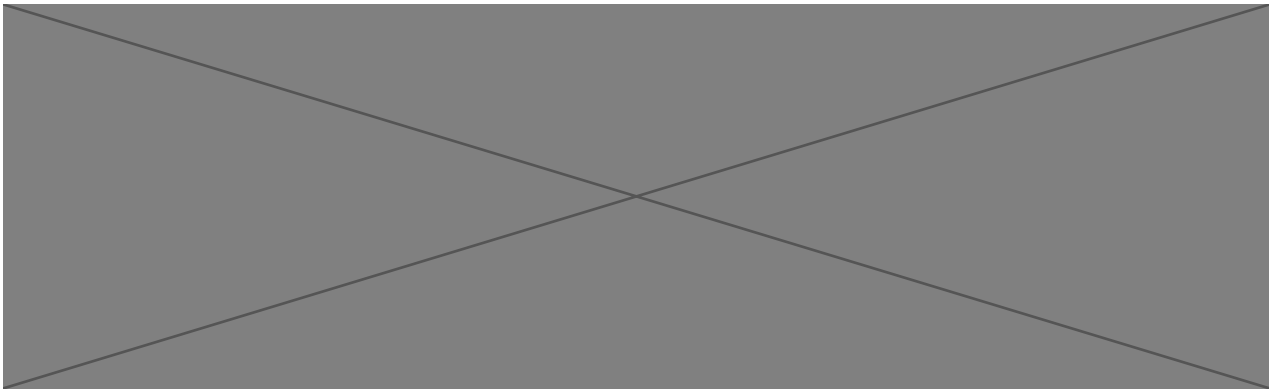
Projects	PV total benefits, \$M PV	PV total net costs, \$M PV	PV Fare Revenue, \$M PV	National BCR	Government BCR
Bremner, Jesmond and Waihoehoe				0.8	0.9
SH22				0.5	0.5
Ōpāheke NS				1.6	1.6
Ōpāheke/Ponga				0.7	0.7
Drury Local Package	1042	1058	64	1.0	1.1

1.8 Property and Route Protection

Route protection using NoR is the recommended mechanism for all projects identified in the Drury package. The DBC seeks to progress the recommended upgrades to the next phase, which includes post-lodgement. Route protection provides a range of benefits to Waka Kotahi and AT. However, the process of route protection raises a range of associated opportunities and risks that result in a complex set of issues with multiple moving parts. Not the least of these is the significant property liability/costs that could occur in response to the route protection, and the inherent uncertainty in the cashflow of this liability.

The NoR process has property cost implications associated with it. Typically, the acquisition process is initiated once there is a committed and funded project identified within the RLTP. This process of engagement is typically initiated as part of the design investigations and subsequent NoR.

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1.9 Key risks and opportunity

A Risk and Opportunity Management Plan has been developed and endorsed by the Te Tupu Ngātahi governance team. The risk management process is consistent with AS/NZS ISO 31000:2009 and is consistent with typical risk management processes undertaken by [REDACTED]. Key overarching risks and opportunities at a Programme-wide level include:

- Affordability and availability of funding.
- Property impacts of route protection as a result of longer lapse times sought on designations.
- Lack of certainty around land use form and timing.
- Level of detail inadequate to sufficiently enable the nature and scale of effects of an individual project.
- Development pressure from land owners in the Future Urban Zone (FUZ) area undermines outcomes sought.
- Opportunity to retain flexibility in corridors

1.10Way forward – priorities and recommended approach

The investment decisions sought for the package include approval of preferred corridors, approval of lodgement of a Notice of Requirement (NoR) and approval for partial property investment

Route protection for most of the corridors (route protection of discrete areas only for Ōpāheke Road urban), and therefore lodging the relevant NoR, is generally of high priority in order to protect the land required for the proposed network, while providing certainty to landowners, businesses, stakeholders and the community. This is particularly important in the Drury-Ōpāheke area where zoned land areas are being increasingly developed, FUZ land is being live zoned and/or a number of private plan changes have been lodged with and accepted by the Council, signalling a desire for expedited growth of the FUZ by developers.

It is recommended that NoRs D1 to D5 are packaged into a single application for lodgement since the urgency of route protection of the corridors is generally high. The packaging of NoRs provides an opportunity to improve efficiencies in the NoR process, streamlining statutory timeframes and avoiding unnecessary duplication.

Project	Notice (and requiring authority)
State Highway 22 (SH22) Urban Arterial	NoR D1 (Waka Kotahi) – alteration to designation 6707
Jesmond Road FTN Arterial Upgrade	NoR D2 (AT)
Bremner Road FTN Arterial Upgrade	
Waihoehoe Road West FTN Arterial Upgrade	
Waihoehoe Road East Arterial Upgrade	NoR D3 (AT)
New Ōpāheke North-South FTN Arterial	NoR D4 (AT)
Ponga Road Arterial Upgrade	NoR D5 (AT)
Ōpāheke Road (rural) Arterial Upgrade	
Ōpāheke Road (urban) Arterial Upgrade Designating discrete areas outside the existing road corridor only	

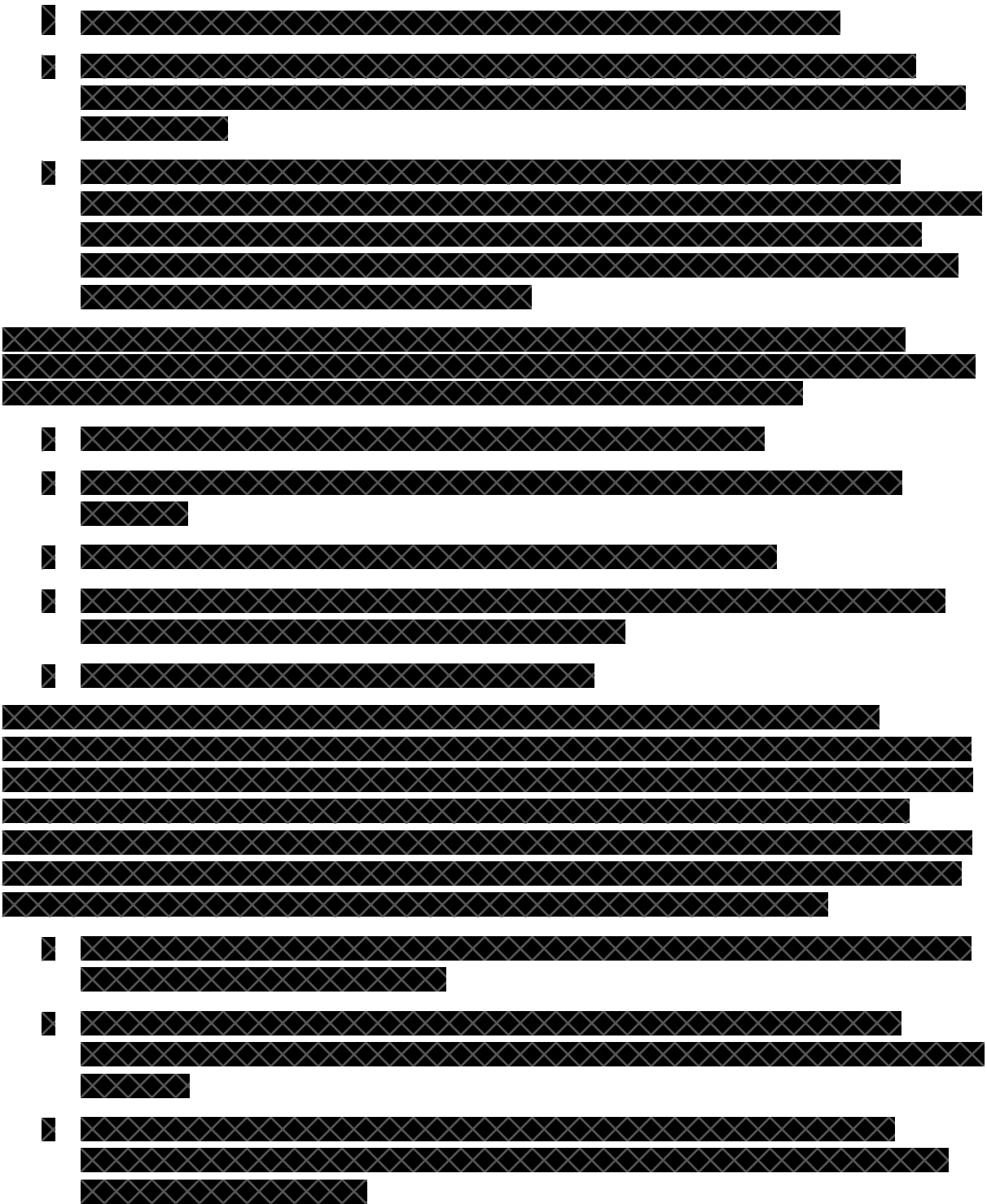
This business case for route protection seeks the following approvals:

- Approval of the recommended Drury Local network upgrades
- Approval for lodgement and route protection of the recommended Drury Local network upgrades
- Approval of funding release for post lodgement activities
- Acknowledgement of forecast contingent property liability arising from route protection of the recommended Drury Local network upgrades

Device Type	Percentage of Respondents
Smartphone	100%
Tablet	98%
Laptop	95%
Desktop Computer	92%
Smartwatch	88%
Smart TV	85%
Smart Speaker	82%
Smart Home Security System	78%
Smart Thermostat	75%
Smart Doorbell	72%

-
- | Group | Bar 1 (Solid Black) | Bar 2 (Cross-hatch) | Bar 3 (Diagonal Lines) |
|---------|---------------------|---------------------|------------------------|
| Group 1 | 85% | 95% | 75% |
| Group 2 | 100% | 90% | 65% |
| Group 3 | 95% | 10% | - |

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PART A – The case for change

2 Introduction

2.1 Purpose of this report

This Detailed Business Case (DBC) identifies key elements of the transport network for the Drury Local Package in the future urban area of Drury-Ōpāheke. This work follows on from the outcomes identified at both the Programme Business Case (PBC) and Indicative Business Case (IBC) stages and further investigates and confirms a fit-for-purpose strategic network in the Drury-Ōpāheke growth area. This DBC will address the following:

- Revisit the Indicative Business Case (IBC) assumptions, evidence and main-findings
- Establish, test and confirm the preferred option
- Identify the arrangements needed for delivery and route protection

It is important to note that the purview of this DBC is limited to outlining the case for route protection only of the projects within it.



Figure 2-1 Drury-Ōpāheke growth area

2.2 The Supporting Growth Programme for the South

The Supporting Growth Programme (the Programme) as described in the IBC was established to identify a transport system that will support Auckland’s planned greenfield growth over the next 30 years. Te Tupu Ngātahi (the Supporting Growth Alliance) will carry out the planning phase for route protection of these corridors.

2.3 The Southern Growth area

The Southern growth area is approximately 20km south of Auckland’s central city and is approximately 30 km in length. This area makes up the largest proportion of future urban areas in Auckland (45%). It includes the large future urban areas of Takaanini, Ōpāheke-Drury, Drury West, and Pukekohe-Paerata, identified in Figure 2-3 with the corresponding Supporting Growth Alliance (SGA) packages for the South. There are live-zoned areas currently under development in both Drury West and Pukekohe-Paerata.

The main assumptions and findings established at the IBC stage for the South included:

- Growth in the overall south area was expected to rise from 61,000 dwellings in 2016 to 131,000 in 2048+. This is expected to cater for a population of 356,000 people by 2048+, in comparison to 193,000 in 2016²
- The bulk of the South’s growth is anticipated to occur within the Drury-Ōpāheke growth area, increasing from a current population of just over 3,300 to a population of around 62,000 by 2048+.
- Provision of employment opportunities is expected to rise from 2000 in 2016 to 11,300 in 2048+



Figure 2-2 Drury household growth rate

² MSM Model I11.5

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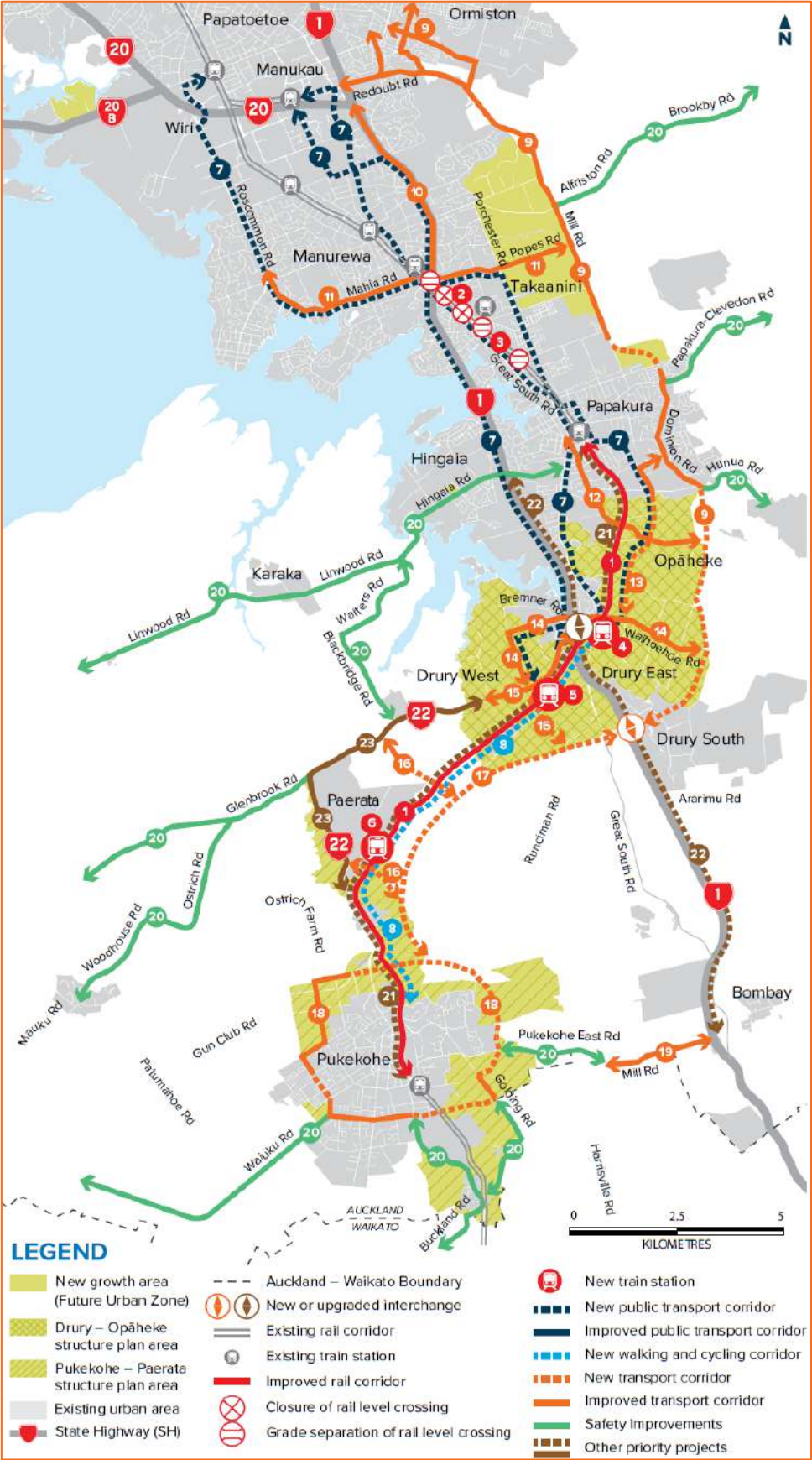


Figure 2-3: Southern growth area – indicative strategic transport network

2.4 Business case change history

Figure 2-4 provides a snapshot of the Business Case history. It summarises the recommended network for each Business Case stage, the urbanisation growth assumptions and the applicable regulatory and planning policies influencing decisions made. It should be noted that the drivers for transport intervention has not changed, and are continuously supported by:

- Growth in the South: the expected increase in household growth in the South has gradually increased throughout the Business Case planning horizon
- Regulatory and planning policies support the mode neutral approach to transport interventions

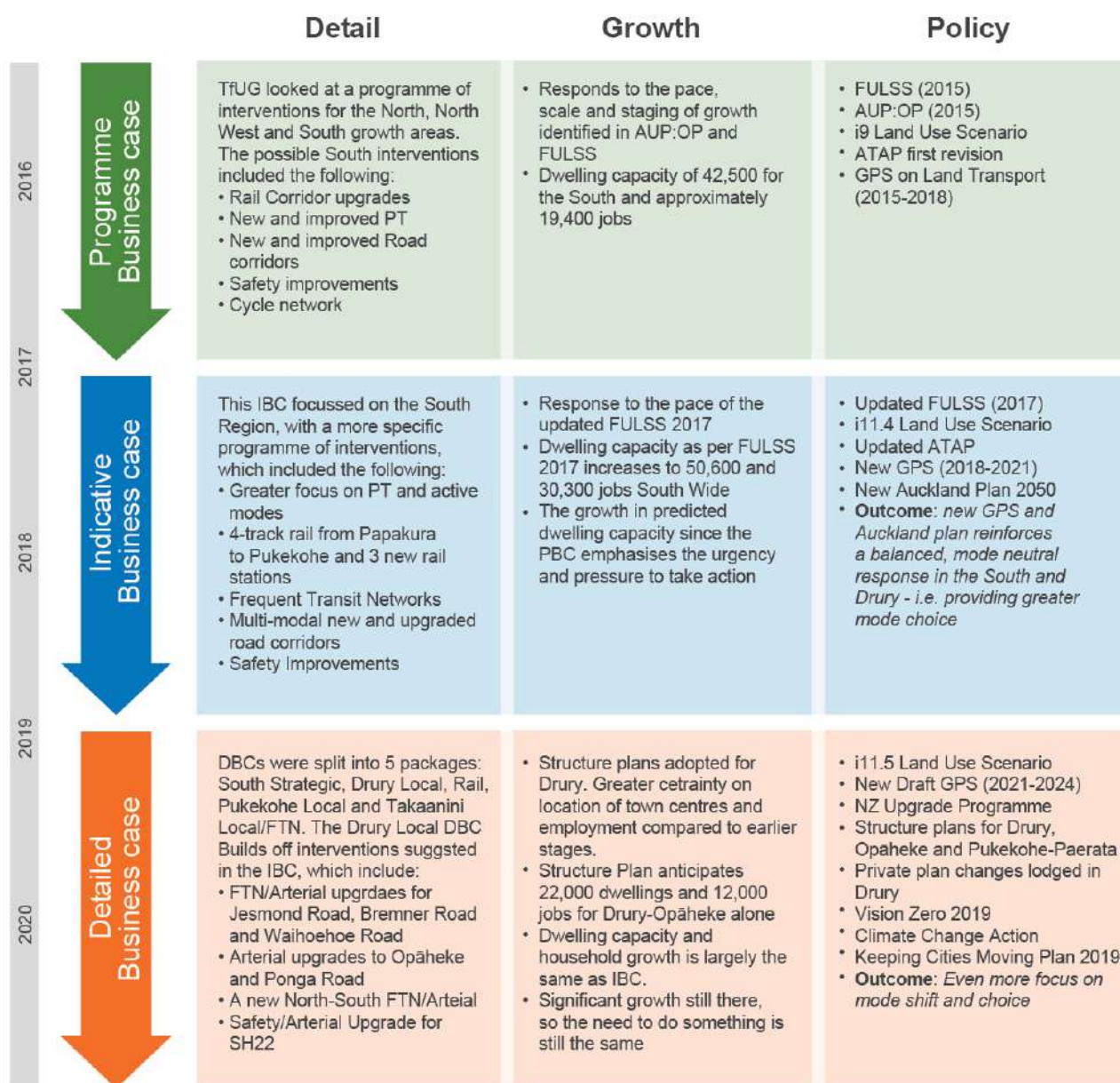


Figure 2-4 History of this business case

Drury Local Package Detailed Business Case

2.5 South Detailed Business cases

The South indicative strategic transport network has been broken down into five packages to enable the level of analysis and detail required for a DBC, and address the different timing requirements of individual projects.

A range of criteria were used to ensure the DBCs and any subsequent route protection process are appropriately packaged and prioritised, including:

- Alignment with the route protection strategy set out at the IBC stage.
- Urgency – this is driven by several factors including development pressure, council structure planning, or other projects impacting on the proposed intervention.
- Place shaping is under pressure from development – imminent development pressure in several areas may compromise the ability to lead a quality compact urban form. Protection of projects in these areas is likely to enable land use and lead the urban form within an area.
- Relationship with other elements – for example where option development and/ or route protection as a package is sensible or necessary.
- Opportunities to drive sustainable urban mobility – via prioritisation of projects that contribute to provision of transport choice.
- Contribution to Programme outcomes – the extent to which a project contributes to the overall programme benefits including mode share, accessibility, resilience etc.
- Potential economic benefits to be obtained.
- Potential for value capture

Figure 2-5 summarises the five DBC packages.

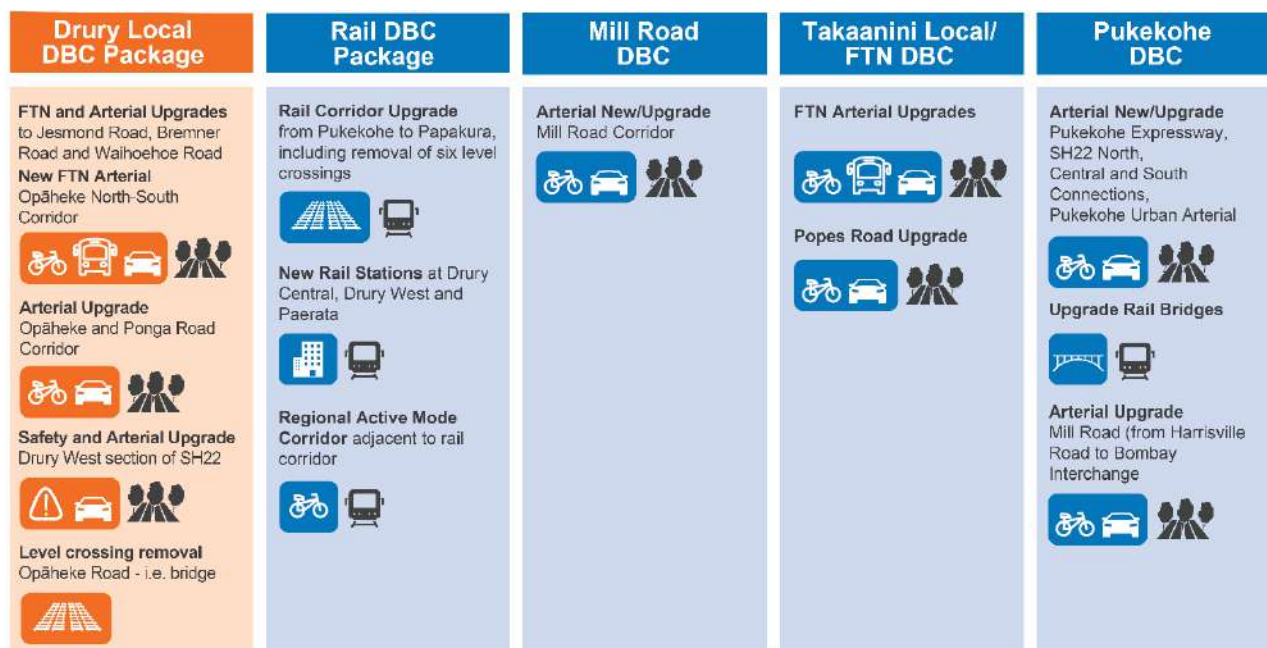


Figure 2-5 South DBC Packages

2.6 Drury Local DBC Scope

There are six projects, within the Drury Local DBC Package, identified in Figure 2-6. The investment decisions sought for the package include:

- Approval of preferred corridor
- Approval of lodgement of a Notice of Requirement (NoR)
- Approval for partial property investment

This will be focused on interventions where pre-implementation is to occur within the next decade and therefore the investment case needs to be made to invest in the lodgement of the route protection mechanism and the resultant financial implications of property liability (and potential purchases). A subsequent investment case prior to implementation would be required (Refer to the Management Case, Section 12).

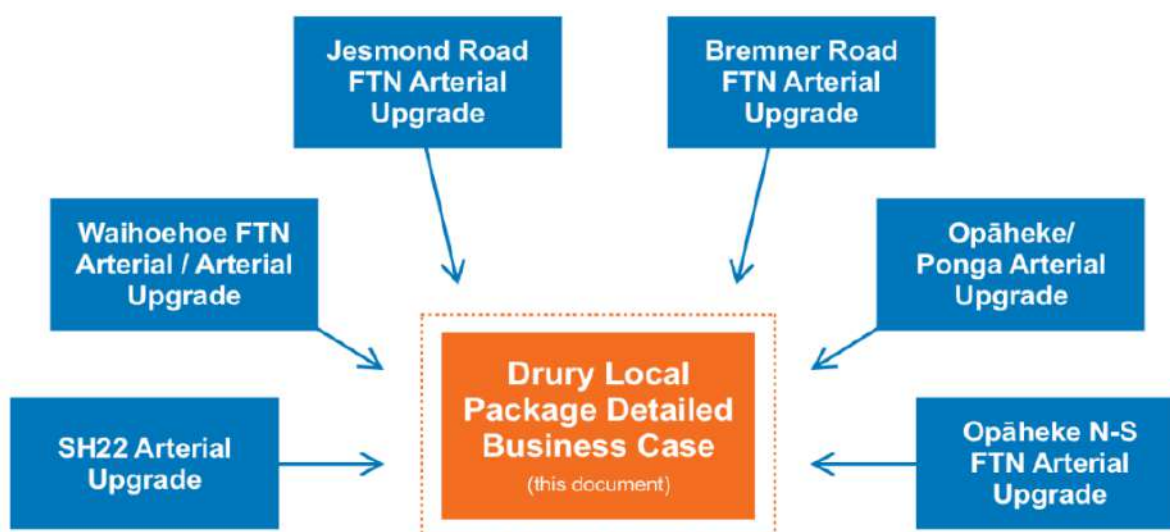


Figure 2-6 Drury Local Package

Given the number and range of projects across the entire Supporting Growth programme and the difference in likely timing of implementation (between 3-30+ years), three broad DBC types have been identified:

- **Type A: Detailed Business Case for corridor confirmation** – Identification of a preferred corridor; however no further work required as no investment being sought.
- **Type B: Business Case for route protection** – Identification of a preferred corridor with sufficient design to inform the assessment of effects and lodge a NoR Investment in pre-implementation and resultant property costs sought.
- **Type C: Detailed Business case 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.

All projects within the Drury Local Package fit within the “Type B: Business Case for route protection”.

2.6.1 Route protection

The principal task for the infrastructure components of the programme is to protect the transport corridors through route protection to support Auckland's projected growth over the next three decades. Route protection is important as it provides property owners, businesses and the community with increased certainty on where infrastructure will be in the future, so people can make informed planning decisions.

The process of prioritising the route protection of the preferred network requires an assessment of a range of factors that can be grouped into the following three categories:

- Strategic importance – which components represent anchor projects that provide early opportunities to deliver on liveability objectives?
- Urgency – which preferred network components need to be advanced as a matter of priority and why?
- Complexity/risk profile – how difficult/straightforward will it be to achieve route protection?

Balanced against the benefits of route protection are the costs. These include increased expenditure on land (in circumstances where early purchase is required) for Auckland Transport (AT) Waka Kotahi New Zealand Transport Agency (Waka Kotahi) and the risk of potential planning 'blight' (adverse social and economic impacts associated with the lack of development on a protected corridor). These factors along with the different route protection mechanisms are discussed further in the Commercial case.



3 Why is investment needed?

This section summarises why investment in route protection is needed given that scale of growth set to occur in the Drury Local area.

Auckland is New Zealand's largest city and the economic heart of the nation and has the highest congestion. This congestion is limiting growth, travel choices and impacting on the economic productivity of the country. Growth is predicted to further exacerbate these issues. As it stands, in Future Urban Zoned (FUZ) areas like the South, the existing transport system is already congested and is unsuitable to support planned growth. Investment to improve the network will help to address the following:

- **Land use integration**– substantial growth has been identified in Drury, with some areas already being developed. A planned approach to growth and investment is essential to ensure land use is well integrated with the transport network to enhance liveability, sustainability and improved choice for customers.
- **Improving access** – Mitigating congestion and improving transport options and choice will improve access to key social and economic opportunity centres, and improve economic performance locally and nationally. Without intervention the interpeak 'severely congested' levels are forecast to increase by 35% and interpeak business to business connectivity will reduce by 15%.
- **Value for money interventions**– investing with the pace of development and growth means transport networks can be route protected in advance, as opposed to retrospectively making them fit the existing urban form, likely incurring larger property costs and disruption.
- **Quality urban form and growth**- As stated above, transport investment integrated with the anticipated growth will help to shape urban form, e.g. investment in transport that is supportive of intensification in town centres like frequent transit network (FTN) and rail. Without investment, there is the risk of sub-optimal or less efficient urban land development.
- **Safety & Vision Zero** - The land use change from rural to urbanised area will increase safety risks such as active mode conflict with vehicles if this is not addressed through future upgrades and investment. Given these additional transport demands, a number of improvements will be required to minimise safety risks

3.1 Investing in Drury

It is critical that the transport system supports and shapes the growth proposed. For the Drury Local package, the following issues are likely to be most prominent if investment does not occur:

- Access to employment and social amenities will be compromised by congestion and lack of viable alternatives resulting from over-reliance on State Highway 1 (SH1). This over-reliance on a single strategic route will also cause reliability, resilience, safety, and productivity issues.
 - The ability to contribute to transformational mode shift will be challenged if investment in additional capacity for public transport (PT), walking, and cycling is not made.
 - The quality of the urban form of areas adjacent to State Highway 22 (SH22) will be compromised if local and strategic trips continue to use the same routes.
-

Drury Local Package Detailed Business Case

Table 3-1 sets out the specific problems, benefits, and investment objectives (PBIOs) developed for the Drury Local package. The evidence and development of the PBIOs specific to each project within the package are provided in **Appendix J: Drury Local Project evidence**.

Table 3-1 Problem statements

Project	Problems
Existing roads to be upgraded/FTN - Jesmond Road, Bremner Road, Waihoehoe Road and Ōpāheke/Ponga Road	PS1: The current form and function of Jesmond Road, Bremner Road, Waihoehoe Road and Ōpāheke/ Ponga Road will not support the imminent urbanisation of the Drury Local area, resulting in poor access and urban form outcomes
	PS2: The lack of safe and attractive multi-modal access to the proposed strategic PT network will limit access to economic and social opportunities for those living and/or working in the Drury area
SH22 upgrade from Oira Road to Drury interchange Note: Long-term capacity issue will be solved by Pukekohe Expressway project	PS1: The current form and function of SH22 will not support the imminent urbanisation of the Drury Local area (incl. the town centre), resulting in poor accessibility and urban form outcomes
	PS2: Urbanisation of the Drury local area combined with high speeds, a high number of accesses and increasing traffic volumes on this section of SH22 will lead to an increased risk of deaths and serious injuries (DSIs) and intersection crashes
	PS3: Failure to integrate the removal of the SH function with the timing and form of urban development will result in a compromised urban form and movement function
New Ōpāheke N-S FTN/ Arterial – between Drury and Papakura	PS1: The lack of north-south arterial connections through the Drury-Ōpāheke growth area will limit connectivity of communities with existing and proposed centres and employment areas
	PS2: Rapid growth and the lack of attractive N-S travel choices in the Drury-Ōpāheke area will limit access to economic and social opportunities

4 What has changed since the IBC?

This section sets out the key contextual changes since the IBC was undertaken in 2018-2019, and the impacts of these changes on the indicative strategic transport network. These include:

- Approval of the Drury-Ōpāheke and Pukekohe-Paerata Structure Plan and substantial Private Plan Changes have been lodged with Auckland Council (the Council) in Drury area.
- Changes in the policy and regulatory context

4.1 Land use planning and development context

4.1.1 Structure Plan - Changes in land use planning and growth context

Drury-Ōpāheke and Pukekohe-Paerata Structure Plans

As per the Auckland Unitary Plan (AUPOIP) requirements for urbanising Future Urban Zoned land, the Council has completed Structure Plans for the Drury-Ōpāheke³ and Pukekohe-Paerata⁴ areas (see Figure 4-1 for extents). Draft Structure Plans were released for engagement in April 2019, and were subsequently finalised and adopted in September 2019, forming the basis of any Council-initiated Plan Changes to 'live zone' land in the area for development.

The Structure Plans provide the most advanced ideas to date on the general land use pattern for the Ōpāheke-Drury and Pukekohe-Paerata areas, including locations of centres, residential and industrial areas, environmentally sensitive areas (e.g. streams), parks, and other physical and social infrastructure.

Together, the Structure Plan areas are projected to accommodate over 35,000 dwellings, 17,000 jobs, and a population of over 96,000. The Structure Plans followed the proposed land release sequencing set out in the Council's Future Urban Land Supply Strategy (FULSS) in 2017. This sequencing proposes that areas are to be urbanised / made development-ready at the following dates:

- Paerata and Drury West Stage 1 (outside existing live-zoned areas) – 2018-2022;
- Pukekohe – 2023-2027; and
- Drury West Stage 2 and Drury-Ōpāheke (Drury East) – 2028-2032.

While the FULSS remains the Council's current position (the 2017 document remains unchanged), there is significant pressure on these proposed development timeframes. Several private plan changes have been lodged and are documented below in subsection 4.12. The Government's New Zealand Upgrade Programme (NZUP) and the Drury Transport Infrastructure Programme (DTIP) investigations (discussed in subsections 4.2.3 and 4.2.4 below) both seek to expedite the projects necessary to support an accelerated rate of land release.

³ [Draft Opāheke-Drury Structure Plan](#) – Auckland Council, April 2019.

⁴ [Draft Pukekohe-Paerata Structure Plan](#) – Auckland Council, April 2019.

Drury Local Package Detailed Business Case

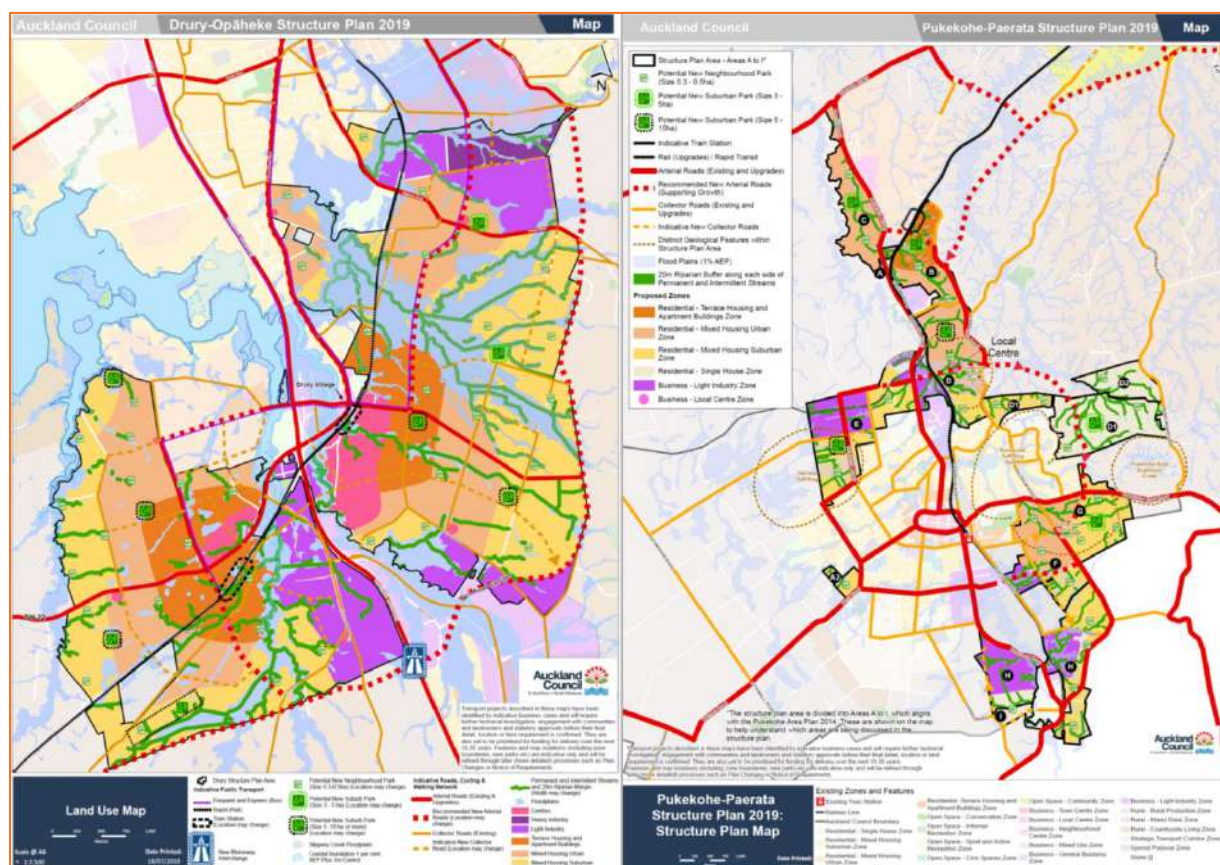


Figure 4-1 Structure Plans – Drury-Ōpāheke and Pukekohe-Paerata

Impacts of the approved Structure Plan

- The Structure Plan for Drury reinforces the IBC transport upgrade recommendations. Growth yields from the Structure Plan are at the upper end of the range of scenarios considered in the IBC.
- While FULSS remains the Council's current staging position, there is significant pressure on 'fast-tracking' the proposed development in Drury – therefore further reinforcing the case for Route Protection in Drury to achieve the desired outcomes.

Integrated Transport Assessment

In fulfilment of the AUPOIP requirements for Structure Plans, Te Tupu Ngātahi on behalf of AT prepared an Integrated Transport Assessment (ITA) to support the two Structure Plan areas. This document adopts the Structure Plan land use scenarios, proposes a transport network to service that land use (heavily based on the IBC network, and with collector roads added), and provides an assessment of the performance of the proposed transport network under the Structure Plan land use scenario over time (using 2028 and 2048 model years). It also provides high-level staging strategies.

The ITA recognises that strategic transport decisions and land use planning are the most significant influences on travel demand. The opportunities identified to influence travel demand through the ITA and Structure Planning process are summarised as follows:

- Land use integration – The land use scenario provided by Council has sought to influence travel demand by including a significant quantum of employment land, identifying a hierarchy

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of centres, providing for transit-oriented development (TOD) by co-locating major centres and other high trip-generating activities (such as the Catholic School site in the case of Drury West) with rail station locations, and enabling density around PT nodes. Increased local employment generally helps to substantiate a relative reduction in outbound travel demand, and a modal shift for both inbound and outbound trips. Furthermore, increased density around PT routes will support the efficient provision of PT services, which in turn is necessary to induce mode shift.

- Transport network design – The transport network needs to be conducive to a reduction in travel demand and a mode shift away from single-occupant private vehicles. From a network design perspective, this means ensuring that the overall urban form and configuration of transport corridors are walkable, cyclable, able to support efficient PT provision, and conducive to the use of micro-mobility modes (e.g. e-bikes and e-scooters). Networks need to provide connectivity to key destinations including centres and employment, schools, retail and dining destinations, social and community facilities, and mixed-use residential areas.

Of relevance to this package DBC, the key parts of the IBC network elaborated on in the ITA include the following:

- Drury rail station locations
- Road access configuration around the Drury Central and Drury West centres
- Potential additional crossings of the North Island Main Trunk Line (NIMT).

Impacts of the approved Structure Plan ITA

- In the context of the business case process, the ITA substantially adopts the majority of the IBC networks.

- Accordingly, while further detailed investigation of IBC projects through the DBC remains essential, the ITA can be seen as an intermediate step in the business case process for selected projects.

4.1.2 Plan changes and live-zoned areas under development in Drury

Development at different stages continues within the live-zoned Ōpāheke 1 (Bellfield), Drury 1 (Auranga), Drury South (Stevensons and Classic Homes), and Franklin 2 (Wesley) live-zoned Precincts. Since the IBC, Plan Change 6 (Auranga B1) has become operative in part, which has resulted in an expansion of the live-zoned area and boundaries of the Drury 1 Precinct. The Precinct now encompasses a 168ha area (up from 85ha) and is estimated to yield 2,600 dwellings (up from 1,300) and has necessitated changes to the Bremner Road alignment which are reflected in SGA's Drury Local DBC.

Several Private Plan Changes have also been received by Council in the time since the IBC, including during the development of the DBC.

A private plan change was lodged for Auranga B2 by Karaka and Drury Limited and Ma Development Enterprises (MADE) mid 2020. This plan change seeks to rezone 33ha of FUZ in Drury West, south of the existing development, to town centre and residential uses. At the time of writing this report the plan change has not been accepted by the Council and has no statutory weighting.

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Four private plan changes covering a large area in Drury East/South were submitted to the Council by developers with interest in the area at the end of 2019. These Private Plan Change requests have been accepted by AC and are currently undergoing through the public consultation and submissions process. The Plan Changes were requested by (see Figure 4-2):

- Drury South Crossing – Stevensons (amending Drury South Industrial Precinct provisions)
- Drury Centre - Kiwi Property
- Waihoehoe - Oyster Capital; and
- Drury East - Fulton Hogan.

Additionally 2 private plan changes have been submitted in Drury West:

- Auranga B2 (Karaka and Drury Limited)
- Waipupuke (Lomai Properties)

Kiwi Property, Oyster Capital and Fulton Hogan submitted their plan changes together as a package in Drury-east. All four plan changes were accepted by the Council and are anticipated to be notified in August 2020. Despite being accepted, at the time of writing this report, none of the proposed plan changes have any statutory weighting. Additionally, Proposed Plan Change 22 was notified in March 2019, and proposes the addition of two sites to Schedule 12 of the Plan (Sites and Places of Significance to Manawhenua) of relevance to the DBC: Ōpāheke – Headland (at the confluence of Hingaia Stream and Ngakoroa Stream to the South) and Te Pou a Rangiwhiwhi – Drury Creek Recreation Reserve.

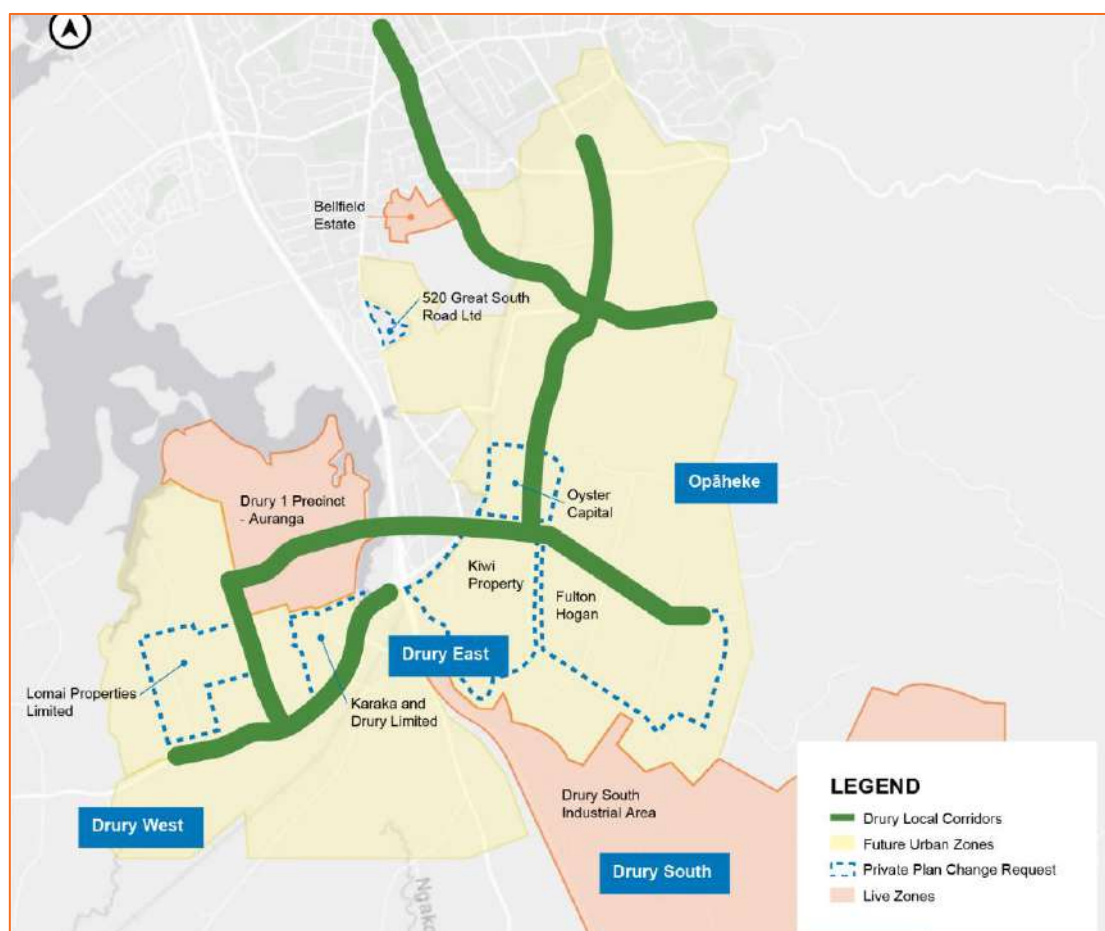


Figure 4-2 Private plan change requests in Drury-Ōpāheke

Impacts of the Private Plan Changes

The proposed plan changes give real and sustained pressure to Council to potentially enable out of sequence growth in Drury. The acceptance of these plan changes by Council indicates their willingness to allow this acceleration of growth. It is anticipated the lodgement and acceptance of further private plan changes will follow, seeking expedited live-zoning of FUZ land in the area. This in turn increases the urgency to route protection for future-proofing these corridors in line with the longer-term growth outlined in Drury.

4.1.3 Increasing development yields and model updates

As was the case between the PBC and the IBC, new growth forecasts have been produced by the Auckland Forecasting Centre (AFC) during the development of the DBC. The latest scenario is known as land use scenario i11.5.

Compared with the previous growth forecast, the South as a whole is expected to experience a slightly lower proportion of regional household growth in the 2048 model year (a reduction in 2048 households of approximately 5%), with growth correspondingly increasing in other parts of the region, notably the central isthmus as there has been a shift to utilising more brownfield land for development.

In the full buildout scenario (referred to by SGA as the 2048+ scenario), yields are broadly similar to the previous scenario (in fact 2% higher across the south). As evidenced by Figure 4-3, by 2048+ the anticipated number of households in the South is expected to grow to the size of 1.2x the size of Hamilton, thus the key message is there is still a considerable need to invest in transport infrastructure in the South. This is further reinforced when looking at Drury, as Figure 4-4 identifies that most of the growth in the South occurs within the Drury Local growth area.

A comparison of I-11.4 (IBC) and I-11.5 forecasts (used for this DBC) in Figure 4-5 shows that there is an increase in both the Drury West and Drury East area, likely attributed to the greater certainty that the Drury-Ōpāheke structure plan has provided, namely identifying where centres are, and consequently, where there will likely be higher household density. The overall increase in households in I11.5 is 1800, to a total of 23,400.

The main takeaway for Drury Local is that the combination of structure plan and development forecasts shows that growth will be substantial both in the South and the Drury area specifically. Therefore, this reinforces the need to route protect in the area to ensure the delivery of a fit-for-purpose transport network that caters for the expected demand.

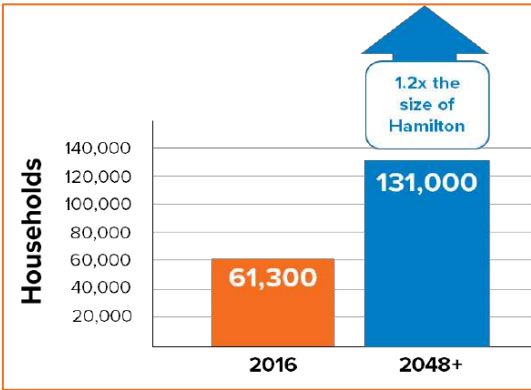


Figure 4-3 – 2016 and 2048+ (i-11.5 development yields) growth comparison for the South

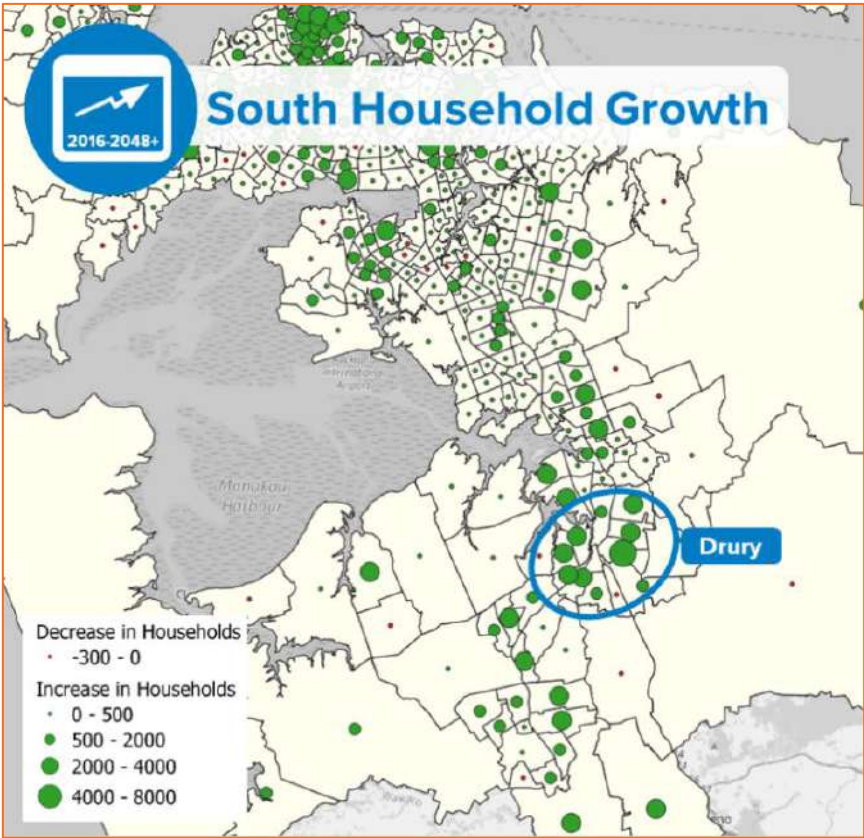


Figure 4-4 South Household growth comparison of 2016 and 2048+

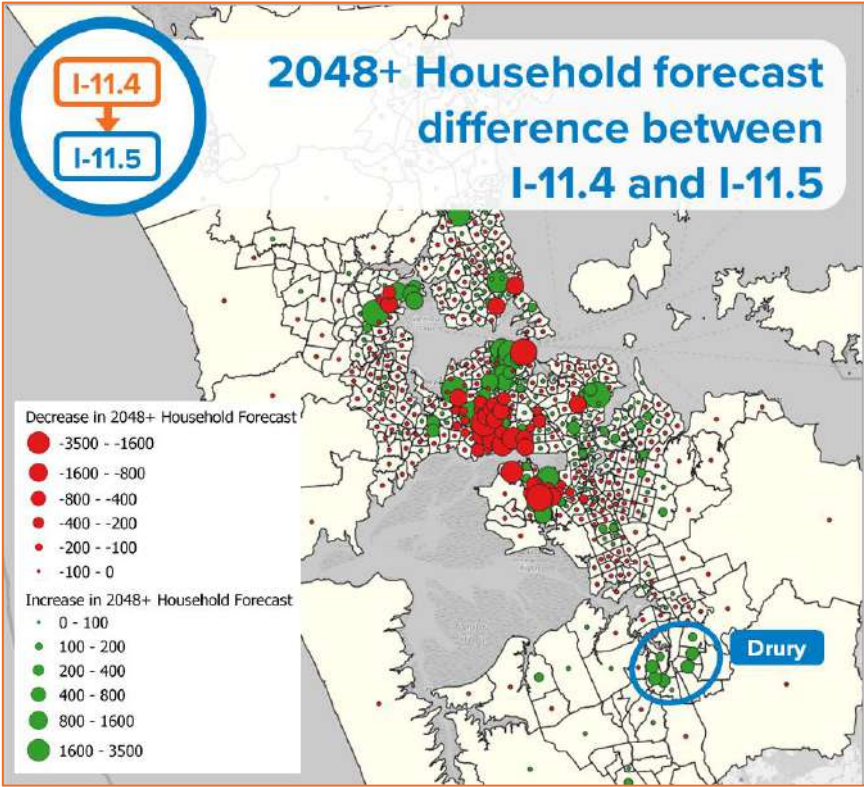


Figure 4-5 Household forecast difference between I-11.4 and I-11.5

Implications of new development yields and model updates

The combination of structure plan and development forecasts show that regardless of the adjustment in growth predictions from the IBC, the growth will still be substantial; both in the South and the Drury area specifically. This confirms the IBC recommendations for Drury, and reinforces the need to route protect to enable the future delivery of a fit-for-purpose transport network that caters for the increased expected demand.

4.1.4 Environmental Context

Since the IBC and prior to the DBC, the following environmental constraints were identified:

- Through the Structure Planning process for Drury-Ōpāheke and Pukekohe-Paerata, previously undisclosed landscape analysis has identified seven volcanic features including tuff rings, shield volcanoes, and explosion craters in the Pukekohe-Paerata area, some of which have no protection in the AUPOIP; and
- Updated flooding data prepared by Healthy Waters (Council) has been obtained. This gives a clearer understanding of the hydrology constraints of the study areas.

This information therefore comprised the known contextual information at the start of the DBC process, but was built upon by specialists throughout the process (for example further stormwater modelling has taken place through the option development process).

4.1.5 Implications of the new information/changes

Overall the long-term growth in Drury remains largely unchanged, but still reinforces the need for investment to cater for the anticipated growth. Section 4.1.2 emphasizes the urgency to act now, with several private plan changes signalling developer interest in accelerating the growth in Drury. Development at different stages continues within the live-zoned Drury precincts, emphasising the urgency of this Drury Local transport package to respond now.

Moreover, the adoption of the Drury-Ōpāheke structure plan in 2019 has provided greater certainty for the location of key land uses, namely centres and employment areas. This reinforces the appropriateness for the Drury Local network, which addresses both east-west and north-south movements, connecting residential areas with the identified centres in Drury West and East. In conjunction with the forecasted growth summarised in section 4.1.3, now more than ever the need to route protect is emphasised in a way that responds to both the pace, scale and form of the expected growth.

4.2 Policy/regulatory changes

Key policy settings underwent significant change in the 2017-2018 period through updated or new versions of key documents including the Government Policy Statement (GPS) on Land Transport, the Auckland Plan, Auckland Transport Alignment Project (ATAP), and the Future Urban Land Supply Strategy (FULSS). Further changes to the policy environment since the IBC are covered in the following subsections.

4.2.1 Changes in environmental legislation

Transport-related emissions represent approximately 20% of New Zealand's greenhouse gas footprint⁵. For the Auckland region, transport emissions are the biggest contribution to our regional footprint at 35%⁶. A range of recent changes to legislation and policy settings have signalled a new emphasis on climate change resilience/mitigation and sustainable development at both a central and local government level. In particular:

- The Climate Change Response (Zero Carbon) Amendment Bill⁷ was introduced to the House of Representatives in May 2019 and is currently in its Select Committee phase. The purpose of the Bill is to set out a framework by which New Zealand can develop and implement climate change policies contributing to the global effort under the Paris Agreement to limit global average temperature increase to 1.5 degrees Celsius above pre-industrial levels. It also includes reporting requirements to Ministers from 'lifeline utilities' on their risk exposure and mitigation measures to the physical impacts of climate change;
- Auckland Council's declaration of a Climate Change Emergency and Membership of the C40 Cities Climate Leadership Group, which signals intent to incorporate climate change considerations into work programmes and decisions.

Impacts of new environmental legislation

Investment in the upgrade of Drury Local corridors with the intention of delivering better accessibility and mode choice (thus avoiding the present reliance on low occupancy vehicles (LOV)) provides an important component to realising the regional emissions benefits of an integrated network. This shows alignment with and a positive contribution towards the changes in environmental policy.

4.2.2 Government Policy Statement

GPS on Land Transport 2018⁸ has been further embedded into government policy and decision-making since the IBC was prepared. This specifically identifies environmental performance (in terms of both greenhouse gas emissions (GHG) and adverse effects on the local environment and public health) as a strategic priority for transport investment.

- The Climate Change Response (Zero Carbon) Amendment Bill will bring into effect national carbon budgets for New Zealand, which each sector of the economy, including transport, will need to respond to by significantly decreasing emissions. The investment objectives of mode shift and enabling transit-orientated development to support this direction.
- Auckland Council's Low Carbon Action Plan is due to be replaced by Auckland's Climate Action Framework, but both prioritise GHG emissions reduction in the transport sector through improving cycling, bus and rail infrastructure.

⁵ <https://www.transport.govt.nz/multi-modal/climatechange/>

⁶ <https://at.govt.nz/media/1980587/aucklands-road-transport-emissions-a-new-dialogue-final-may-2019.pdf>

⁷ <http://www.legislation.govt.nz/bill/government/2019/0136/latest/LMS183736.html#d6806171e2>

⁸ <https://www.transport.govt.nz/assets/Uploads/Our-Work/Documents/c6b0fea45a/Government-Policy-Statement-on-land-transport-2018.pdf>

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- GPS 2018 prioritises GHG emissions reduction and a shift to active modes, PT and low emission vehicles which is well aligned to the investment objectives of this DBC. Good urban form is recognised as important and this aspect is key for Drury Local.
- Wellbeing Budget priorities include a Just Transition to a climate-resilient, low emissions economy, supporting Physical and Mental Wellbeing for all New Zealanders, and lifting Maori and Pacific skills and opportunities. The objectives of this business case support the connectivity of local and regional communities through provision of efficient and low carbon transport systems and therefore contribute to the wellbeing budget outcomes.

4.2.2.1 Transitioning from GPS 2018 to GPS 2021

GPS 2021 is currently in draft form for engagement and feedback. The draft GPS continues the strategic direction of GPS 2018, but provides stronger guidance on what the Government seeks from land transport investments. The strategic priorities of Climate Change (formerly Environment) and Safety have been updated to reflect recent policy work, such as emission reduction targets and the development of Road to Zero. Access has been separated into Better Travel Options and Improving Freight Connections. Value for money is expressed as a principle that applies to all investments, rather than a strategic priority per se. All these changes strengthen the alignment with SGA outcomes sought.

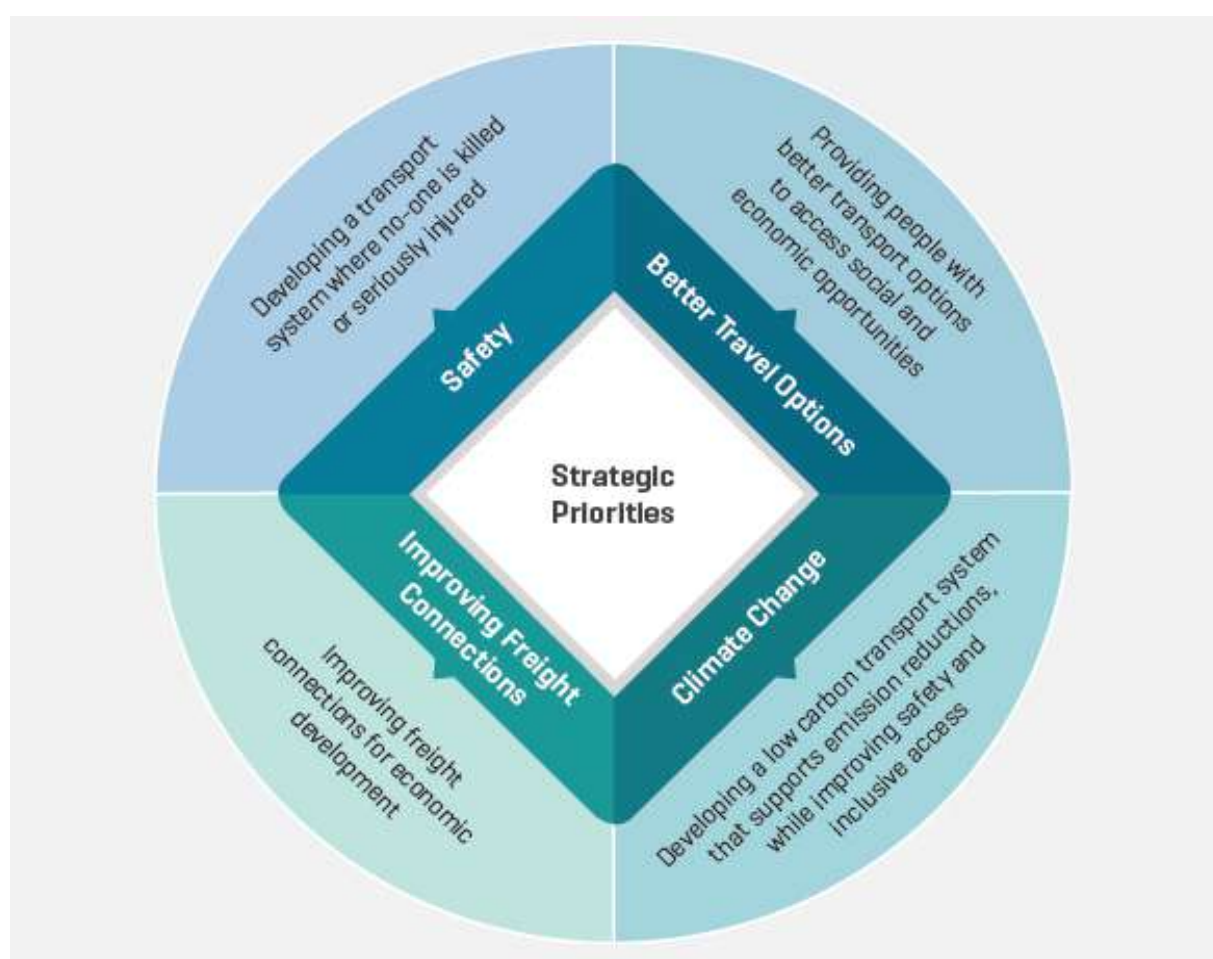


Figure 4-6 Strategic direction of draft GPS 2021

Impacts of the draft 2021 GPS

The incoming 2021 GPS supports a more mode neutral and results focused approach, enabling GPS investments to be funded from more than one activity class to provide the best transport solution. The Drury Local Package focus on FTN and multimodal corridors fit for incoming urbanisation will deliver well on three of the strategic priorities. There is also an expectation of investments to support Government commitments to ATAP, Road to Zero and the New Zealand Rail Plan.

4.2.3 New Zealand Upgrade programme (NZUP)

NZUP was announced in early 2020 and expedites some \$6.8 billion in capital investment in transport infrastructure through Crown funding separate to the National Land Transport Programme (NLTP) (which is funded through the National Land Transport Fund (NLTF)). This includes several projects within or closely related to SGA's route protection scope in the Southern growth area, including:

- The Papakura-to-Drury section of the SH1 Papakura-to-Bombay project;
- Mill Road Corridor;
- Papakura-to-Pukekohe (P2P) rail electrification; and
- New rail stations in the south, including Drury West and Drury Central.

Impacts of NZUP

Expediting station development in Drury aligns well with the accelerated rate of land release and pace of development and plan changes occurring in the growth area. Station development is also supplementary of the FTN network planned for Drury-Ōpāheke.

4.2.4 Drury Transport Infrastructure Programme (DTIP)

DTIP is an ongoing joint programme between the Government and Auckland Council to determine the optimal timing, staging, funding and sequencing of the delivery of the preferred transport network for Drury. In particular, the programme seeks to determine the transport infrastructure required to support existing enabled development capacity in Drury West, and enable expedited urbanisation of specific landholdings in Drury East. Projects included in the scope of DTIP analysis include:

- Mill Road corridor;
- **Ōpāheke north-south arterial;**
- SH1 Papakura-to-Drury;
- **Drury arterials – including the east-west arterial (Bremner Road), upgrades of Waihoehoe Road and Jesmond Road;**
- **SH22 improvements;**
- Papakura-to-Pukekohe rail electrification and four-tracking;
- Rail stations at Drury Central, Drury West, and Paerata;
- Great South Road upgrade; and
- Walking and cycling infrastructure.

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This programme directly aligns with the investment opportunities in the Drury Local package, with the corridors that are included as part of this package bolded above. This seeks to expedite the projects necessary to support an accelerated rate of land release occurring in the Drury-Ōpāheke growth area.

4.2.5 Vision Zero

Developed in 2019, Vision Zero extends the existing safe system approach to stop the human sacrifice of mobility, placing safety at the forefront of the future transport system for all modes by designing safe places for people.

Vision Zero has a goal to eliminate transport Deaths and Serious Injuries (DSIs) by 2050 (in line with the Auckland Plan 2050) based on 13 strategic priorities. The Drury Local package plays a key role in providing opportunity to plan and design system improvements that embed Vision Zero principles, and specifically contribute to the Vision Zero priorities highlighted below in Table 4-1.

Table 4-1 Vision Zero strategic priorities

Vision Zero Strategic Priority	
SP1	Reducing transport DSIs, especially for vulnerable transport users
SP2	Providing a safe transport environment by increasing investment in safe infrastructure, technology and speed management
SP3	Supporting safe transport user behaviour through education, training, enforcement and travel demand management
SP4	Creating safe and healthy streets through safe active modes including access to PT schools and town centres
SP5	Ensuring Māori participation and representation in governance decision-making and leadership
SP6	Expanding Te Ara Haepapa Māori designed and led programmes including sustainable funding pathway and development of a monitoring and evaluation framework
SP7	Delivering safe end-to-end PT journeys
SP8	Providing Vision Zero leadership, capability, policies, safety management tools and systems
SP9	Ensuring safety is equitable regardless of age, ethnicity and socio-economic status
SP10	Increasing public awareness of successful Vision Zero principles and practice
SP11	Embedding Vision Zero in land use planning, placemaking and design
SP12	Integrating safety into procurement, vehicle fleets and workplace health and safety
SP13	Establishing better data, monitoring and research into systemic causes of road trauma and its prevention

4.2.6 Regional Public Transport Plan 2018-2028

A new Regional Public Transport Plan (RPTP) has been published by AT since the IBC. This document describes the planned PT services for the next ten years and defines improved default levels of service for each service category in the PT network (for example a revision in the aspirational level of service (LOS) for frequent services from 15-minute to 10-minute minimum headways).

4.2.7 Wellbeing Budget

The 2019 'Wellbeing Budget'⁹, which reframes Government spending in terms of the impact on wellbeing. This includes identifying the long-term, inter-generational effects of policies and spending, and a broader range of success measures including the natural resources, people and communities in addition to financial measures.

The objectives of this business case support the connectivity of local and regional communities through provision of efficient and low carbon transport systems and therefore contribute to the wellbeing budget outcomes.

4.2.8 Alignment and implications of the new policies

Overall the strategic context has seen changes since the IBC, and the relevance of these documents to this DBC is summarised below. As mentioned previously, the Auckland Plan, ATAP, and the FULSS are unchanged since the IBC, therefore are not summarised in this section (see **Section 2 of IBC**). However, most notably updates to the GPS 2021 since the IBC show stronger alignment with the Drury Local project:

- Supporting a mode neutral approach under the GPS strategic priority of 'Better Travel Options, enabling investments to provide the best transport solution, closely aligning with the investment objectives of this DBC.
- This DBCs focus on better travel choice via a Frequent Transit Network (FTN) with supplementary active mode networks, aligns with the GPS strategic priority of Climate Change (formerly Environment). This focusses on emission reduction targets, therefore supportive of investment away from LOV dominance which traditionally exacerbates emissions.
- The GPS strategic priority of 'Safety' and development of Road to Zero strongly aligns with the Drury Local investment objectives, as the primary objective is to upgrade the unsuitable, and often unsafe rural roads to cater for the incoming urban growth. This includes the provision of appropriately designed and maintained cycle infrastructure

Other policy alignment includes:

- DTIP – influencing the staging of Drury projects adjacent to areas of expedited urbanisation in Drury, emphasizing the urgency of route protection and investment.

⁹ <https://treasury.govt.nz/publications/wellbeing-budget/wellbeing-budget-2019>

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- NZUP - has wider SGA implications. Expediting the development of Drury train stations is notable as it is a key connection for the Drury FTNs, which work in a complimentary nature to encourage mode-share for both Drury and the South.
- Climate Change response zero carbon amendment act 2019 and Auckland's Climate Action Framework. DRURY - *Environment – FTN active mode focus. IBC was more focussed on car corridors. (Same for GPS alignment)*
- Vision Zero – reinforces the planned upgrades of the Drury Locals corridors, particularly a key focus for appropriate form and function of the corridor/intersections that responds to the urbanisation/growth in Drury-Ōpāheke

Table 4-2 below summarises the key changes since the IBC and alignment with the project.

Table 4-2 Key changes since the IBC

Changes since IBC	Area of influence			Impact on Drury DBC
	Land use	Developer interest	Policy / regulatory changes	
Drury Structure Plan	✓			• The Structure Plan for Drury reinforces The IBC transport upgrade recommendations. Growth yields from The Structure Plan are at The upper end of The range of scenarios considered in The IBC. • While FULSS remains the Council's current staging position, there is significant pressure on 'fast-tracking' The proposed development in Drury – therefore further reinforcing The case for Route Protection in Drury.
Developer Plan Changes lodged in Drury	✓	✓		The combination of structure plan and development forecasts show that regardless of the adjustment in growth predictions from the IBC, the growth will still be substantial; both in the South and the Drury area specifically. This reinforces the need to route protect to enable the future delivery of a fit-for-purpose transport network that caters for the increased expected demand.
New environmental legislation			✓	Increased emphasis on climate change resilience/ mitigation and sustainable development emphasises further the mode-neutral approach to transport interventions.
GPS 2021 (draft)			✓	Reinforces mode neutral and results focused approach.
NZUP	✓		✓	Enables prioritisation of development at Drury by fast-tracking growth-enabling transportation infrastructure required.
Vision Zero			✓	Embedding Vision Zero within the form and function of the Drury Local corridors, to respond to the land use changes/needs

5 Drury Local Package projects

The Drury Package proposes an arterial network to support the expected future growth in Drury-Ōpāheke. The Drury Package comprises six separate projects which together form the strategic transport network. The network includes provision for general traffic, walking and cycling, and frequent PT. Overall, the Drury Package aims to improve connectivity within and through the Drury-Ōpāheke area, providing high quality, safe and attractive transport environments.

This section describes the extent and intent of each project as well as the desired outcomes for the Drury Local package. A summary of each project is provided in the following sections.

5.1 Jesmond Road project

The general location and extent of the Jesmond Road Upgrade/FTN project is shown in Figure 5-1 below (highlighted in blue).

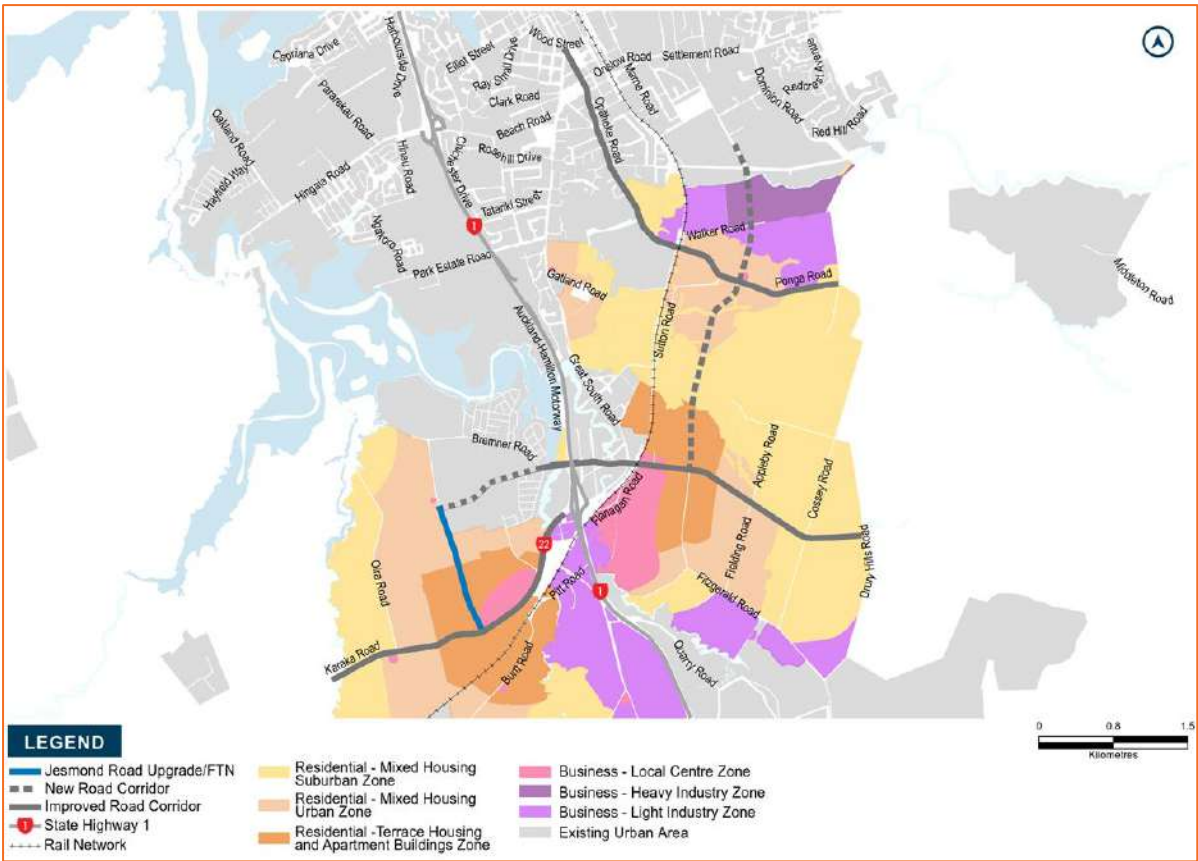


Figure 5-1 Location of Jesmond Road Upgrade/FTN project within the Drury Local Package

The Jesmond Road Upgrade/FTN project reflects an option identified as part of the IBC:

- Upgrade of the existing Jesmond Road between the existing SH22 intersection and the connection to the realigned Bremner Road

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The functional intent of the project is to provide north-south connectivity through the centre of the Drury West future urban area, and to form part of the Southern FTN connecting to the rail network at Drury West Station. The extent of Jesmond Road upgrade is between SH22 and the realigned Bremner Road, with the southern extension to Drury West station incorporated as part of the Pukekohe DBC, as shown in Figure 5-1.

The intent of the upgraded arterial connection is to support current and future residents of the Drury growth areas through improved multimodal transport provision including walking and cycling, PT and private vehicles. Leading from section 3.1, a key problem identified for the existing corridor was the suitability of the form of the Jesmond Road with imminent urbanisation. Figure 5-1 shows the expected land-use as per the Drury-Ōpāheke Structure plan. In its current form, the rural condition of Jesmond Road is inadequate to service the land use and scale of growth anticipated along this corridor, namely the lack of PT and active mode infrastructure.

Additionally, the ITA prepared by SGA in support of the Draft Drury-Ōpāheke Structure Plan articulated the same general purpose for the project, with importance ascribed to the PT role of the corridor both as an FTN and as a connection/access to the proposed Drury West rail station.

5.2 Bremner Road project

The general location and extent of the Bremner Road upgrade/FTN project is shown below in Figure 5-2 .

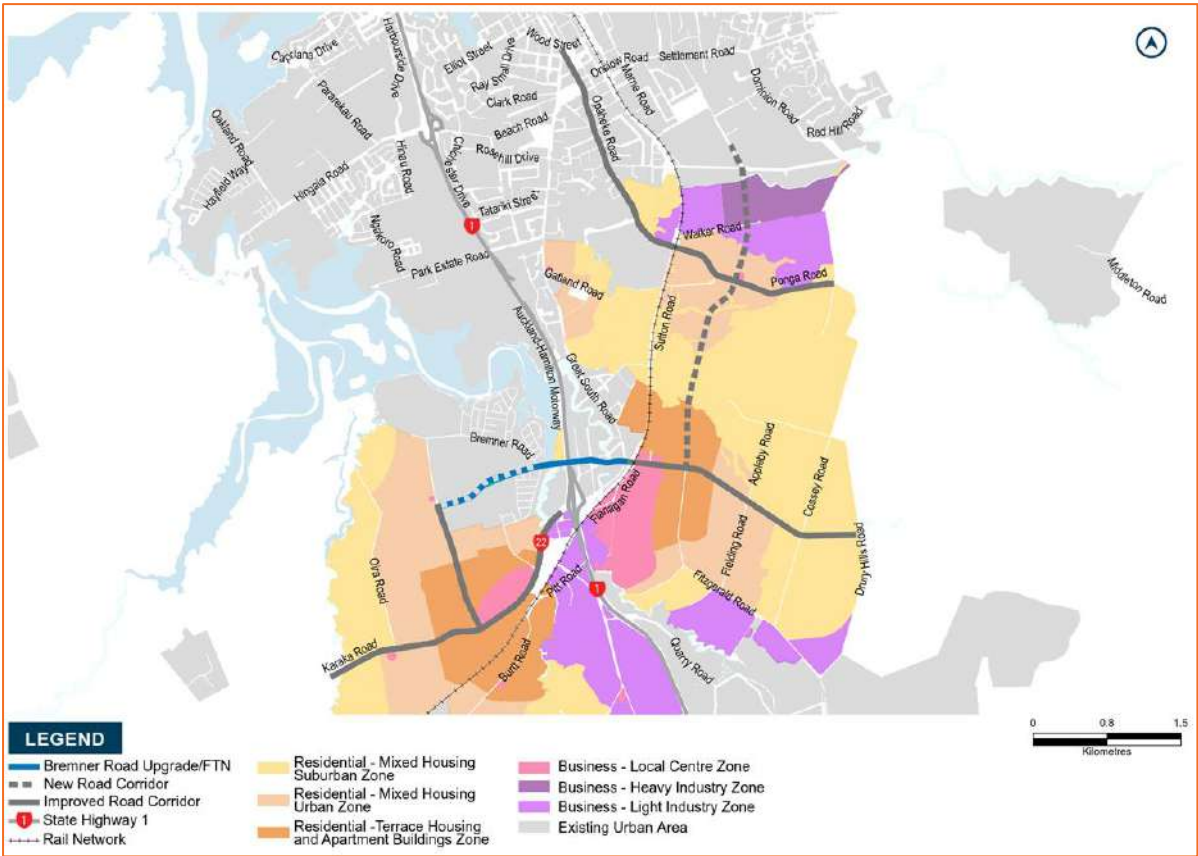


Figure 5-2 Location of Bremner Road Upgrade/FTN project within the Drury Local Package

The Bremner Road upgrade/FTN project advances the corresponding option identified in the IBC - an east-west connection between Jesmond Road and the Waihoehoe Road/Great South Road intersection. The IBC indicative option included:

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- A realigned western section of Bremner Road traversing the Plan Change 6 (Auranga) development area, with the alignment dependent on landowner/developer agreements negotiated through the Plan Change 6 process.
- Upgrade of the existing section of Bremner Road approximately between the Ngakoroa Stream and Firth Street;
- A new or upgraded section between the Bremner/Firth Street intersection to the Waihoehoe Road/Great South Road intersection; and
- New/upgraded crossings of the Ngakoroa Stream (being provided through Plan Change 6), SH1 (a key interface with the SH1 Papakura-to-Bombay project), and the Hingaia Stream (currently a one-way bridge on Norrie Road).

The functional intent of this option is to provide more direct east-west connectivity across the Drury area to link areas of residential development with the existing and planned centres, the Drury Central Rail station and local employment opportunities, and to form part of the southern FTN. The intent of the upgraded arterial connection is to support current and future residents of the Drury growth areas through improved multimodal transport provision including walking and cycling, PT and private vehicles. Leading from section 3.1, a key problem identified for the existing Bremner Road was the suitability of the form of the corridor with imminent urbanisation, in which Figure 5-2 shows the expected land-use as per the Drury-Ōpāheke Structure plan. In its current form, the rural condition and current alignment (to the north) of Bremner Road is inadequate to properly service the land use anticipated in the area, namely the indirect connection and lack of PT and active mode infrastructure.

5.3 Waihoehoe Road project

The general location and extent of the Waihoehoe Road Upgrade/FTN project is shown below in Figure 5-3.

The Waihoehoe Road Upgrade/FTN project advances the option of upgrading Waihoehoe Road identified in the IBC. The functional intent for the project as outlined in the IBC is to provide linkages to the Drury Town Centre, residential areas, and connections to local employment.

The westernmost section of the Waihoehoe Upgrade (west of the proposed North-South arterial) is also proposed to form part of the FTN linking to the Southern Line of Auckland's rail network. The intent of this upgraded arterial connection is to support current and future residents of the Drury growth areas through improved multimodal transport provision including walking and cycling, PT and private vehicles. Leading from section 3.1, a key problem identified for the existing corridor was that the current form and function of Waihoehoe Road is inadequate for the scale of growth anticipated along this corridor. Figure 5-3 shows the expected land-use as per the Drury-Ōpāheke Structure plan. In its current form, the rural condition of Waihoehoe Road is inadequate to service the land use and scale of growth anticipated along this corridor, namely the lack of PT and active mode infrastructure.

The ITA by SGA in support of the Draft Drury-Ōpāheke Structure Plan articulates the same purpose for the project.

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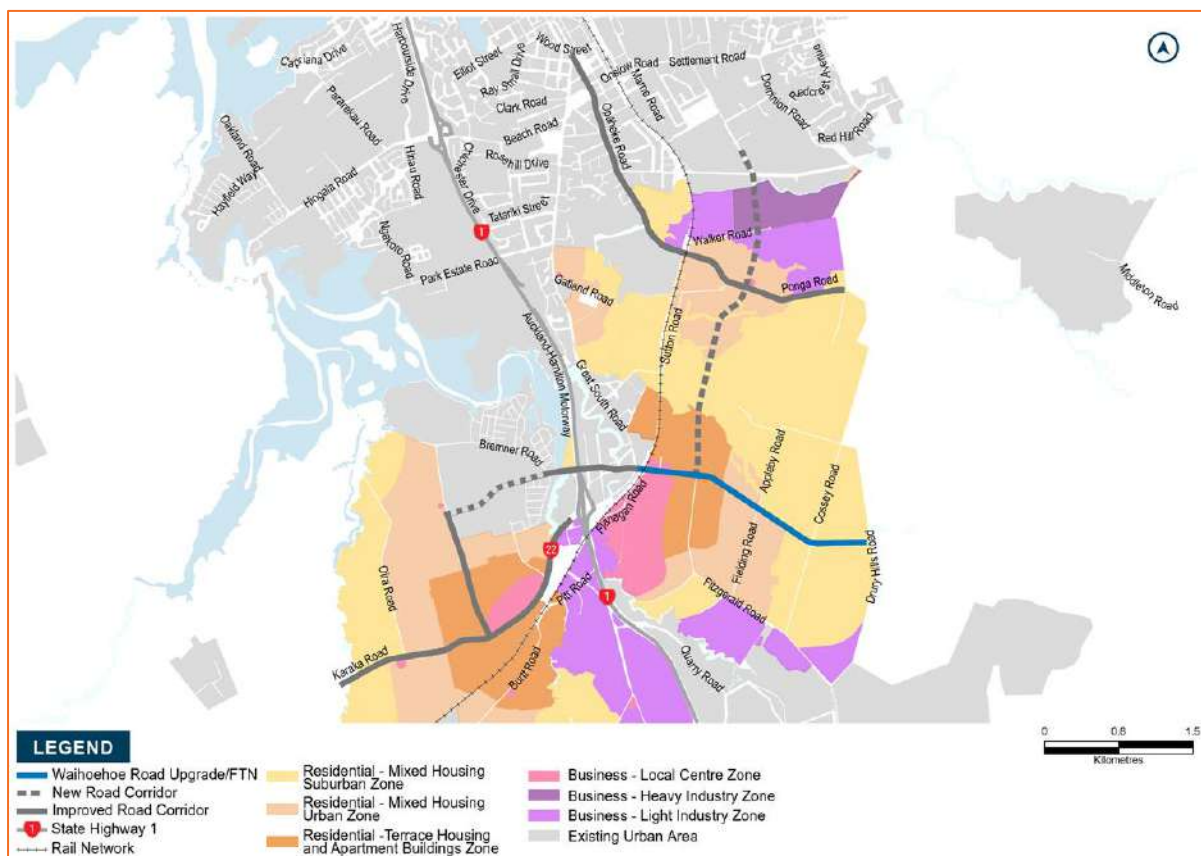


Figure 5-3 Location of Waihoehoe Road Upgrade/FTN project within the Drury Local Package

5.4 Ōpāheke Rural / Ponga Road Project

The general location and extent of the upgrade of the Ōpāheke/Ponga Road corridor is indicated in the Figure 5-4 below.

The Ōpāheke and Ponga Road Upgrades reflect the option identified as option AR7 in the IBC:

- *Upgrade Ōpāheke and Ponga Road – Great South Road to Mill Road.*
- *Grade-separation of the rail line on Ōpāheke Road*

The functional intent of the project as outlined in the IBC is a multimodal corridor that provides access to the proposed Mill Road corridor, FUZ in Papakura and employment areas to the north. It connects a town centre (northern end), neighbourhood centre and industrial area (southern end), with residential throughout.

The Ōpāheke / Ponga Road corridor is not identified as a part of an FTN corridor in the IBC's recommended FTN options, but the IBC does note the importance of rail grade-separation to more efficiently and support PT.

The ITA prepared by SGA¹⁰ in support of the Draft Drury-Ōpāheke Structure Plan articulated the same general purpose for the project as noted in the IBC.

¹⁰ Drury-Ōpāheke and Pukekohe-Paerata Structure Plan – Integrated Transport Assessment and Addendum 2019

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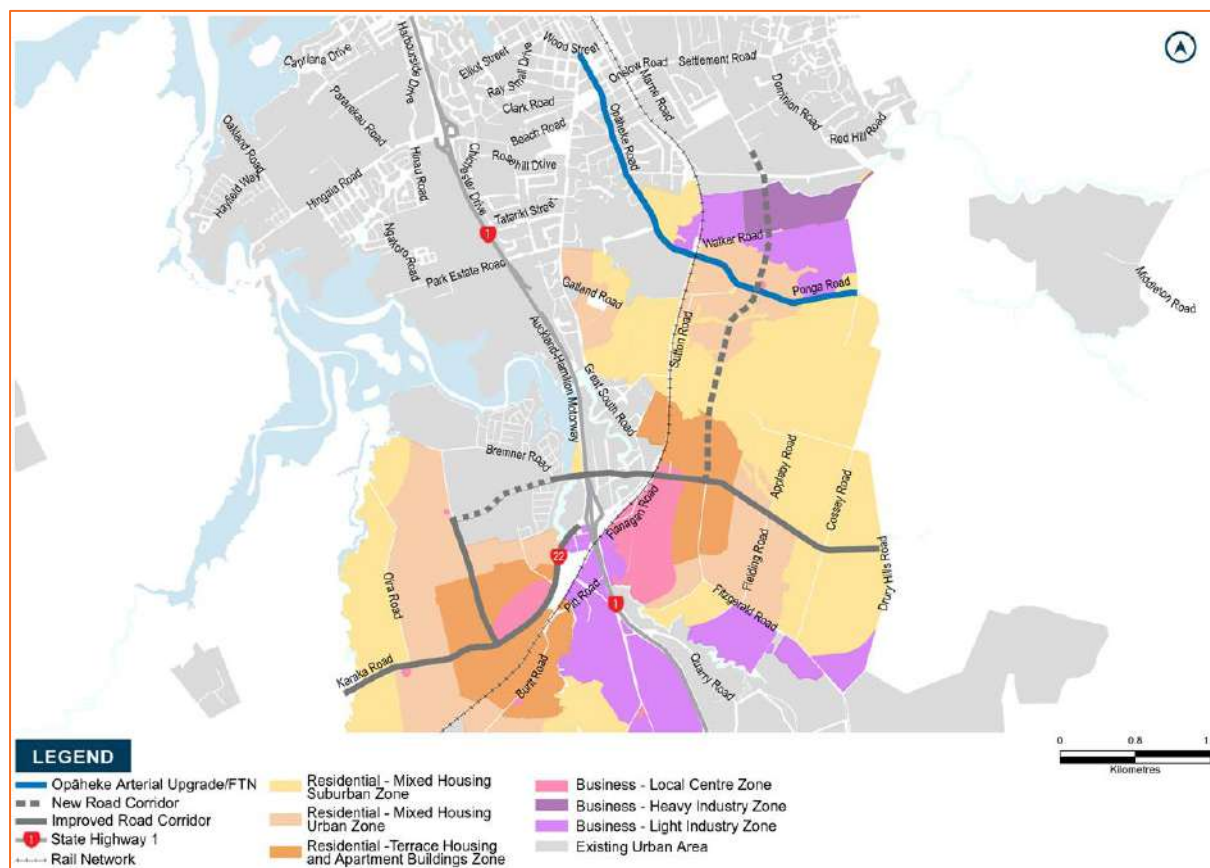


Figure 5-4 Location of Ōpāheke/Ponga Road Upgrade project within the Drury Local Package

5.5 New North-South arterial through Ōpāheke.

The general location and extent of the proposed new north-south (N-S) arterial road through Ōpāheke is indicated in Figure 5-5 below. This project advances the corresponding option identified as part of the IBC recommended network. The recommended IBC option comprised a new north-south road running between Waihoehoe Road and Hunua Road.

The functional intent of this project as documented in the IBC is as follows:

- Provide a north-south link through the development area and, provide connections to the Papakura industrial area to the north and the planned Drury town centre to the south;
- The connection is proposed to form part of the FTN, enabling frequent PT routes to efficiently service the development area and connect to the rail network;
- By providing an additional north-south corridor, the project also enables Great South Road to accommodate an FTN route as there will no longer be reliance on a single north-south arterial to provide for all modes; and
- It should also be noted that the functional intent distinguishes this link from the proposed Mill Road corridor to the east. The Mill Road corridor is intended to provide a north-south strategic (i.e. higher capacity/speed, limited access and intersections) connection around rather than through the development area to provide network resilience by supplementing SH1 between Manukau and Drury.

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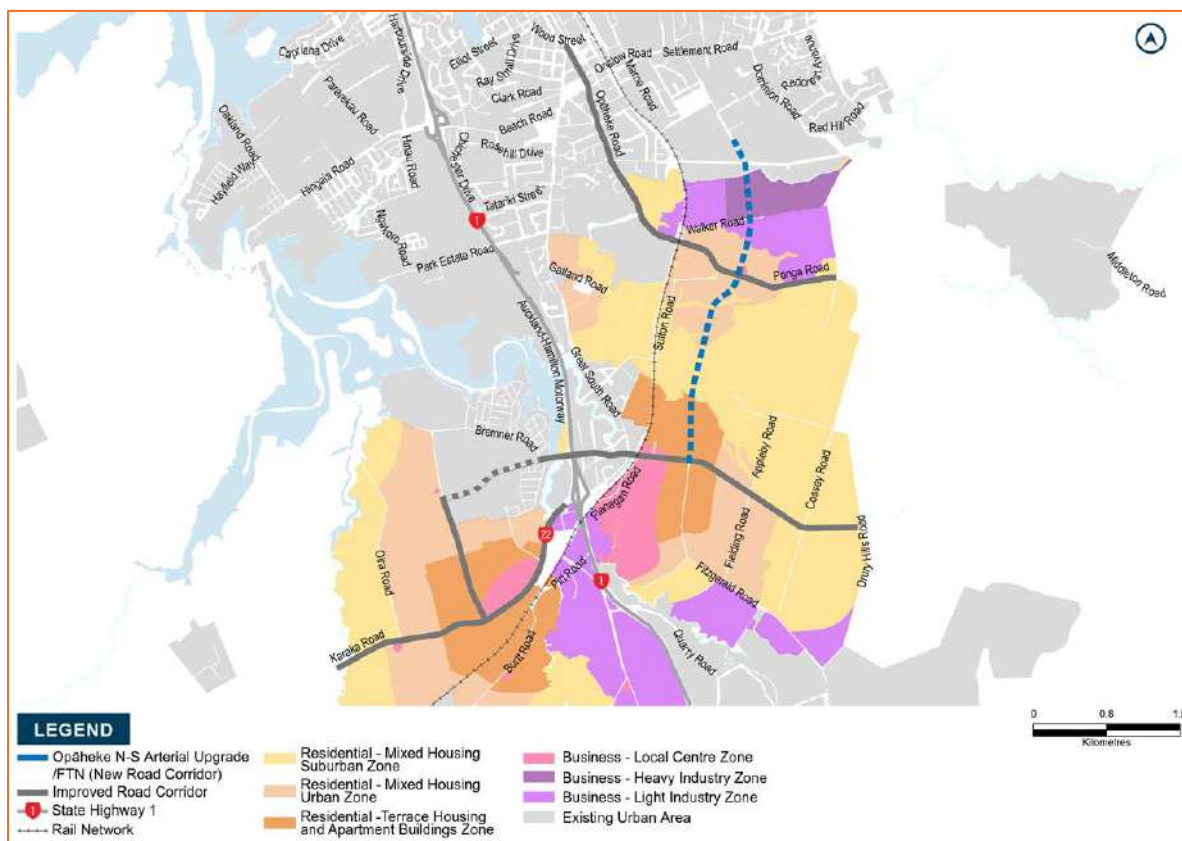


Figure 5-5 Location of Ōpāheke N-S Arterial FTN project within the Drury Local Package

This new arterial connection will provide for a variety of transport modes including walking and cycling, PT and private vehicles to support current and future residents of the Drury growth areas. As it stands, there lacks a more local focussed north-south connection for the Drury growth area, meaning without investment, and as growth occurs, added demand and stress is put on other north-south corridors, such as Great South Road (GSR), Mill Road and SH1.

5.6 SH22 between Drury Interchange and FUZ edge (Drury West)

The general location and extent of the upgrade of the SH22 project is indicated in the Figure 5-6 below.

The projects that make up the Drury Local package are all new projects, with the exception of this proposed upgrade to the Drury West section of SH22 (between Oira Road and the SH1 Drury interchange). Over the past few years, Waka Kotahi has been investigating improvements along that corridor through the Safe Network Programme, including consultation with the community. This identified that a range of improvements are needed along the corridor, which should be delivered in a staged way to support both short-term and long-term growth. As a result, the Safe Network Programme is currently in the funding application process for short-term safety improvements including a roundabout at the intersection of SH22 and Glenbrook Road. Meanwhile, in 2018 as part of the South IBC process, the community was engaged to gain feedback on longer-term options for urban upgrades and the related Pukekohe Expressway (providing an alternative to SH22). Following analysis of feedback and technical investigations, an indicative study area for long-term upgrades in the urban section of SH22 was approved mid-2019 and now comprises the proposed upgrade to the Drury west section of SH22 (between Oira Road and the SH1 Drury interchange).

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Therefore, the SH22 project advances the corresponding option identified as part of the IBC recommended network. That option recognised the need for capacity and safety improvements on the SH22 corridor to the east of Oira Road, as well as the need for the corridor to provide for the urbanisation of the Drury West area.

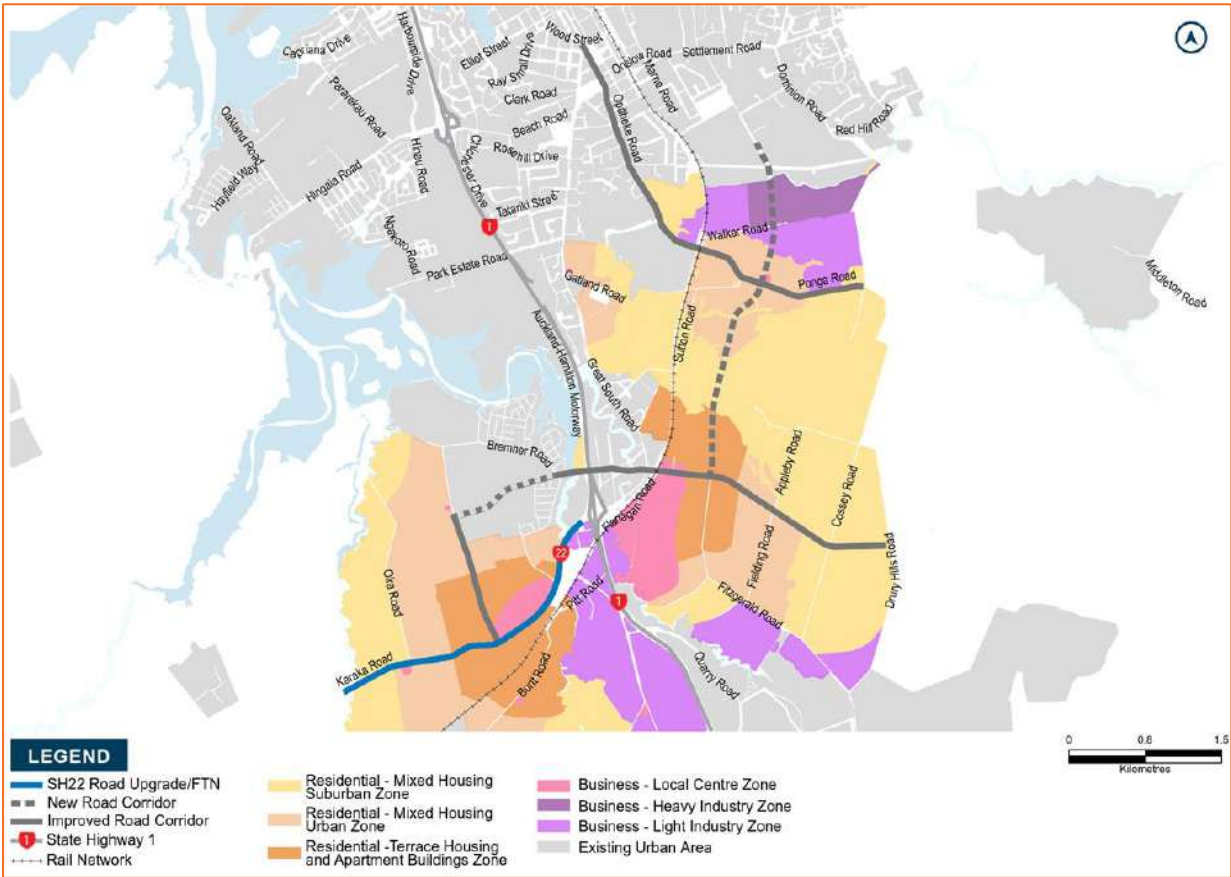


Figure 5-6 Location of SH22 Upgrade project within the Drury Local Package

The project includes upgrades to the existing SH22 corridor between Woodlyn Drive and the Drury Interchange, where the FUZ area has been zoned by the Council to include a Drury West township. The form and function of the existing road is deemed to be inappropriate for this urban context, both in terms of safety and the infrastructure provided, e.g. no active mode facilities. This upgrade will provide walking and cycling connections and better accommodate freight and general traffic to support current and future residents.

The ITA further underlined the importance of this section of the SH22 corridor in the context of the urbanisation of the surrounding area, and the proposed rail upgrades and new rail stations. Both documents identify the proposed Pukekohe Expressway as a project required to fulfil future strategic functions and enable the urbanisation of SH22 in the long term.

This project overlaps with the SH22 Safe Networks Programme which is seeking to identify and implement short-term safety upgrades along the SH22 corridor between SH1 and Paerata.

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5.7 Related projects

This section outlines how this package of works fits within the broader proposed IBC network for the South, including the other packages for which DBCs are being prepared in parallel (see Figure 2-5 above for a description of each of the 5 packages). Table 5-1 below describes the interrelationship of particular SGA projects, highlighting the level of dependency for the Drury Local Package. Figure 5-7 exemplifies the spatial context of these projects in relation to the Drury corridors.

Furthermore, other non-SGA projects that are related to and coordinated with this package of works are detailed in Table 5-2 and Figure 5-8.

Table 5-1: Inter-relationship between other SGA projects in the South and projects within this package of works

Package	Project(s)	Inter-relationships with Drury Local Package	Dependency
Rail DBC package (proceeding in parallel)	Additional rail capacity between Pukekohe and Papakura	Additional capacity on the rail (including grade separated crossings) improves the viability of the Drury Local FTN routes connecting to the stations. Improves connectivity and transport choices within and beyond Drury growth area	Critical Dependency
	New rail stations	The viability of both the Drury Local FTN and cycling network are dependent on good connections to economic and social opportunities, both within and beyond Drury. Connection to the rail network with new rail stations at Drury West (located adjacent to Jesmond Road and SH22) and Drury Central (located adjacent to Bremner Road and Waihoehoe Road) will improve accessibility through more attractive and connected multimodal transport choices.	Critical Dependency
	Regional Active Mode corridor between Drury and Pukekohe	Walking and cycling paths along the road upgrade projects in the Drury Local package will connect to this regional active mode corridor . Together these projects will help support a transformational mode shift towards walking and cycling in the South.	Supports / complements the project
Mill Road	Mill Road Corridor	The Waihoehoe Road and Ōpāheke/Ponga Road upgrade projects are being coordinated with and will connect to the proposed Mill Road corridor project. Mill Road provides a strategic (people and freight) movement function, and alternative to SH1. This improves resilience of the network. The additional N-S arterial through Ōpāheke provides a further north-south connection further improving the resilience of the network, however the function is to provide for more local trips within Drury, avoiding using Mill Road.	Supports / complements the project
Pukekohe	New Pukekohe Expressway	The proposed Expressway is key to transitioning to the more urban focused functionality of SH22 ; supporting the urban context of Drury West. The prime function of the Expressway will be to provide the strategic and freight transport movements between Drury and Pukekohe (currently carried on SH22).	Supports / complements the project
	Pukekohe Expressway Northern Connector	The most northern connector directly connects both SH22 and Jesmond Road with the Drury West Rail station. This will provide an integral connection between the Drury West centre and station, improving access and connection to more attractive and connected multimodal transport choices.	Critical Dependency
Takaanini Local/FTN DBC package	Takaanini FTNs	The FTN network upgrades proposed on Jesmond , Bremner and Waihoehoe will connect into this broader FTN network, providing more attractive and connected transport choices within and beyond Drury	Critical Dependency

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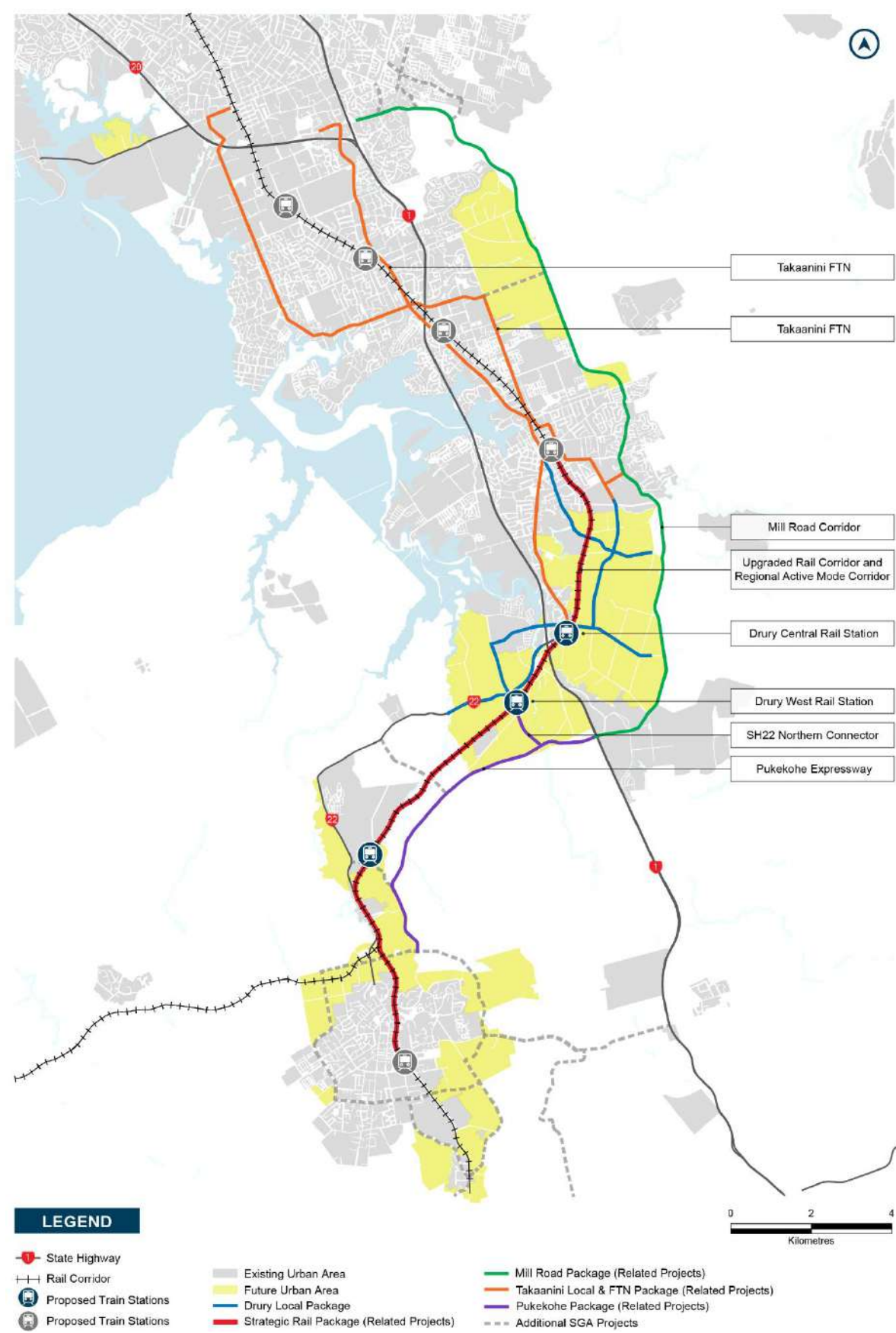


Figure 5-7 SGA projects (IBC Network) with an interrelationship with the Drury Local Package

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Table 5-2 Non-SGA transport projects inter-related to Drury package of works

Projects	Inter-relationship and Influences on Drury Local	Dependency
SH1 Papakura-to-Bombay (P2B)	The P2B project was identified as part of the recommended South IBC network but is now being delivered by Waka Kotahi. Of key relevance to this package, Stage 1 includes an upgrade to the existing Drury interchange, which connects to and is interdependent with the SH22 upgrade project. There is also a direct inter-relationship with the Bremner Upgrade/FTN project , as P2B will necessitate an upgrade/replacement of the existing Bremner Road crossing of SH1.	Critical Dependency
SH22 Drury-to-Paerata (Safe Network Programme)	The Safe Network Programme is in the funding application process for short-term safety improvements in the SH22 area Upgrades on SH22 between SH1 and Oira Road are being considered as part of this Drury Local package. Evidence from the Safe Network Programme DBC around safety problems and long-term capacity issues on SH22 has been used to support this Drury Local DBC.	Critical Dependency
Papakura-to-Pukekohe rail electrification	Rail electrification will remove the need for passengers to change trains at Papakura, increasing the attractiveness of PT in the South . This directly enhances the FTN connections (Bremner, Jesmond, Waihoehoe, NS) to the stations, improving connectivity and transport choices within and beyond Drury growth area. This project is part of the Government's commitment to emission reduction, reliability and resilience and critical to urban development in the South.	Critical Dependency
Wiri-to-Quay Park Third Main Line	Will support overall growth of Southern growth area as well as improve network reliability and resilience. This directly enhances the FTN connections (Bremner, Jesmond, Waihoehoe, NS) to the stations, improving connectivity and transport choices within and beyond Drury growth area.	Critical Dependency

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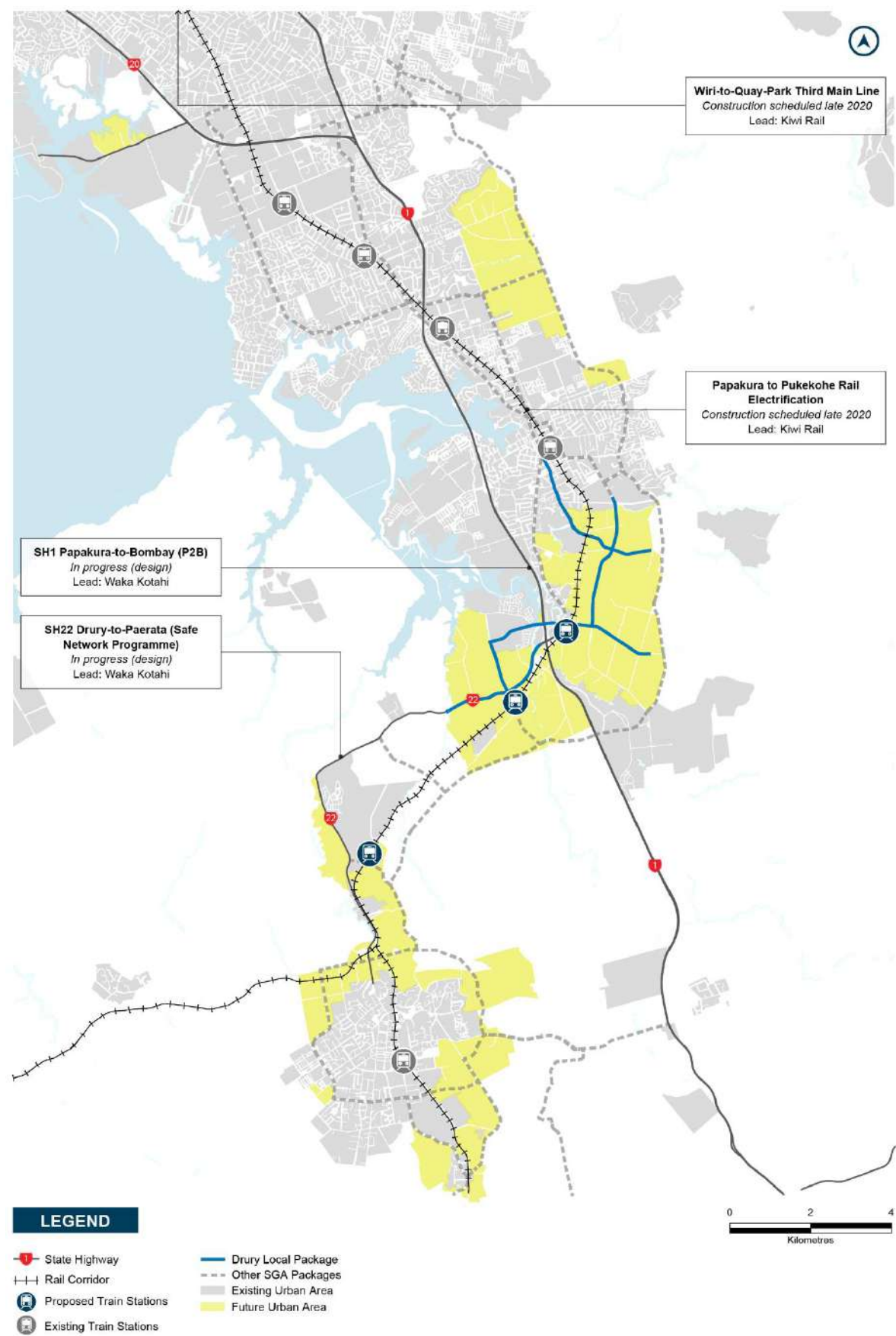


Figure 5-8 Location of other non-SGA projects in the vicinity of this package of works

6 Drury Local package investment case

This section:

- Outlines the package level investment story for this study area; summarised using the investment themes that are common across the south, supported by project-specific evidence in **Appendix J: Drury Local Project Evidence**
- Summarises the project specific benefits and investment objectives across the package
- Outlines how this package of projects aligns and contributes to the overall Programme benefits sought.

6.1 Investment themes

Deriving from the IBC recommended network, five separate packages were identified for the Southern growth area to progress at the DBC stage. These packages, and their contributing projects, have unique problems to be addressed, and for the most part have been grouped according to similar problems. However, to achieve a level of programme wide consistency, five common programme wide investment themes were developed.

The idea underpinning these themes is that addressing the project-specific problems contributes to positive alignment with one or more of these themes, thus reinforcing the need to invest. These themes are shown in Figure 6-1 below, and centre around the core themes of support growth and access, and the supporting reasons for investing of safety, place and environment.

As an overview, the primary reasons for investing are around the need to:

- Provide transport solutions that **support and enable growth** expected in the Southern growth area, and
- **Improve access to economic and social opportunities** for existing and future communities in the South, by supporting a **transformational mode shift** away from use of LOVs, reducing an over-reliance on existing strategic transport corridors, and better aligning the form and function of existing roads with the planned urban form.

The supporting themes for investing are around the need to:

- **Integrate transport solutions with Council's aspirations for land use and urban form**, including the desire for a quality, connected urban environment that supports a transformational mode shift;
- **Address existing and increasing safety risks** on transport corridors as the area urbanises;
- Support the Government's policy shift towards **more sustainable outcomes**, including a reduction in GHG emissions and improved climate change resilience (which again supports the need for a transformational mode shift).

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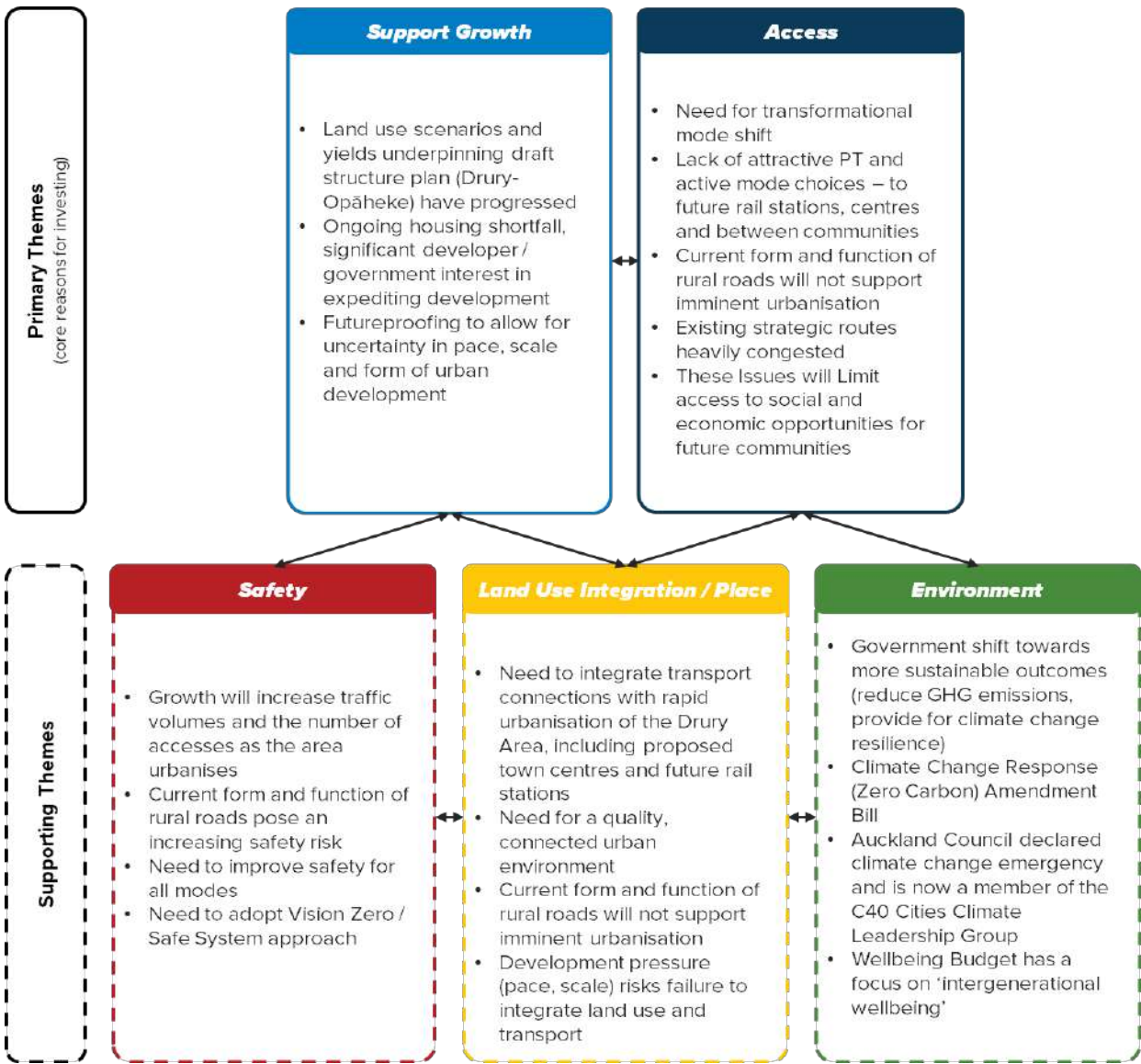


Figure 6-1: Primary and supporting investment themes

6.1.1 Theme: Supporting growth – including enabling and responding to the pace and scale of growth

Growth context

As discussed in Section 4.1, significant growth is planned for south Auckland, which contains the largest proportion (45%) of Auckland’s future urban areas.

Section 4.1 describes how the land use scenarios and dwelling yields underpinning the South Structure Plans have advanced since the IBC stage. The Structure Plans applied yields at the higher end of the IBC estimates. Additionally, updates to Region-wide modelling (I-11.5 forecasts) are largely the same, with an increase of 2% across the South. Notably, there an increase in both the Drury West and Drury East area, which aligns with the higher structure plan yields in comparison to the IBC.

There is also significant developer interest in the area (developer commitments are discussed at a high-level in 4.1.2, with numerous private plan changes in development and a very high level of developer interest). In particular, there is general developer interest in accelerating growth in Drury.

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Since the Structure Plans were adopted in late 2019, it is also expected that Council will make quick progress towards live zoning.

These elements combined mean there is substantial urgency to move forward with option refinement and subsequent route protection in the Southern growth area.

Route protection

The urgency for route protection in the Southern growth area is driven by the rate and scale of committed developments, including Special Housing Areas (SHA), the rapid release of land planned by the Council and pressure from developers who are proposing to submit plan changes ahead of the Council's Structure Plans. Approximately 4,000 of the total 6,700ha (60% or equivalent to 30,000 households) of land identified in FULSS 2017 is planned for release within the next 10 years with the implementation of the transport system to support the growth staged over the next 30 years. This is significantly accelerated from FULSS 2015 which identified 1200 of the 5 300ha (23%) to be released in the first decade.

Failure to protect the network ahead of the development plans risks a combination of prohibitively expensive acquisition costs, a lack of certainty around private development investment, and a loss in the ability to influence good urban form.

6.1.2 Theme: Access

Poor access in the context of growth

There is currently poor access to and within the Southern growth area, and within the Drury Local area specifically. This includes a lack of active mode provision, few train stations, and limited strategic connections (both by road and PT) resulting in heavy congestion and high car dominance on a rural road network. In the Drury Local area, there is a lack of attractive PT and active mode choices to future rail stations proposed at Drury West and Drury Central, proposed centres and between communities. The current form and function of rural roads such as SH22, Jesmond Road, Bremner Road and Waihoehoe Road will not support imminent urbanisation in these areas.

These issues will limit access to social and economic opportunities for future communities, and growth will compound these access issues where the private car remains the only genuine choice. Investment in more sustainable modes will result in a reduction in car journeys and provide true multi-modal access in south Auckland.

Evidence for these issues is provided in the technical reports appended to this package DBC.

Contributing to transformational mode shift

The Transport for Urban Growth (TFUG) PBC set ambitious targets for morning peak mode share for non-car modes. One of the Programme's investment objectives was to 'Enhance Auckland's liveability and connectivity through achieving a morning peak mode share for walking, cycling, and PT in all future urban areas of 45% by 2043'. This aspirational target is comprised of approximately 30% by PT, and the remainder by walking or cycling.

Based on 2013 census data, 92% of all commuter trips in South Auckland are made by LOVs (car, truck, van, motorcycle, other) with 5% on PT and 3% via active modes. There is therefore a considerable gap between the aspirational mode split and current mode split.

The PBC indicated that the full proposed Southern programme could be expected to achieve an AM peak mode share for PT of 19-25%. Further option development and assessment at the IBC phase refined this outcome across the South to 38% (for external, peak direction, peak hour trips). This

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compares very favourably to the 19-25% predicted for the PBC network and exceeds the Programme target set during the PBC phase. This mode share figure is broken down in the IBC by area as follows:

- 20% PT mode split from Takaanini
- 34% PT mode split from Ōpāheke-Drury
- 47% PT mode split from Drury West, and
- 37% PT mode split from Pukekohe.

These numbers are reported in the IBC at a package level, i.e. they represent the total impact of investing in the full South programme. It is not proposed to break these numbers down further to the individual project level at the DBC phase as to best see the benefit gained from the corridors is to look at them in conjunction with one another, as they contribute to a network of interventions.

However, updated South-wide modelling and assessment will be conducted to further refine and confirm these numbers.

Discussion on car dominance

The current car dominance seen in South Auckland is likely to be driven by other modes not meeting needs because of the existing rural nature, and consequently:

- Limited strategic walking or cycling corridors currently
- Existing walking and cycling network is generally limited to the existing urbanised areas
- Limited and (perceived to be) unreliable PT services (bus and rail), and
- Ingrained car-centric behaviour.

As discussed, there is considerable anticipated growth in and around Drury, and the form of the rural corridors are unsuitable for urban conditions. For example, the form of the rural corridors will not safely cater for increased populations and consequently increased demands. Furthermore, the existing network will not sustainably support this growth. As land is released for development, it is critical the transport system enables a significantly higher proportion of trips to be made by PT, walking and cycling. Limited mode choice for mobility and access therefore leads to over reliance on car travel to access opportunities.

Over reliance on car travel is undesirable as:

- It will not solve our congestion problem or support growth
- It will lead to poor urban form (car-oriented development)
- It will add more greenhouse gases to the environment (assuming expected domination of petrochemical fuel engines)
- It is less efficient at moving people than PT and undermines an effective and attractive PT system
- It can lead to social isolation and health impacts
- It can cause adverse safety outcomes as private vehicles are an inherently dangerous mode of transport, and
- Those without a car cannot get around. This is most likely to affect the already vulnerable segments of the community including youth, the elderly and those with lower incomes.

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It is therefore undesirable and unaffordable to build a network that can accommodate all trips by private car, and this is at the forefront of option refinement during this DBC.

Other access issues relevant to this package

As detailed in the appended technical reports, the 'access' related problems identified for the Drury Local Package largely relate to:

- The form and function of the currently rural roads not supporting the imminent urbanisation of the area – with resulting connectivity issues
- The lack of safe and attractive multi-modal access to the proposed strategic PT network
- The lack of north-south arterial connections through the Ōpāheke growth area, limiting connectivity of communities with centres and employment areas.

6.1.3 Theme: Land use integration/ place

The need for effective land use and transport integration was foreshadowed in the South IBC and the key principles remain relevant for this DBC, as summarised below.

Promoting a quality urban form

If managed properly, the transport system can provide strong leverage for promoting land use outcomes and achieving a good quality urban form. Land use planning optimally should include land use design to support the uptake of PT and active modes. Factors that influence good urban form include:

- Rapid PT networks
- Strong pedestrian networks and connections
- Safe and dedicated cycle provision
- Shared spaces, especially in main streets, and
- Reductions in speed.

A transport system dominated by infrastructure for LOVs will generally promote peripheral low-density urban developments that are reliant on access by private car. Furthermore, incremental upgrades to existing dominant car infrastructure (like in Auckland), reinforces current behaviour. Figure 6-2 provides examples of transport integration and urban form in different parts of Auckland. New Lynn shows evidence of a lower LOV mode share than elsewhere, despite being retrofitted into an existing car-dominated area. This shows that the opportunity for behaviour change and land use change are greater when TOD is specifically designed for and implemented early.

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

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

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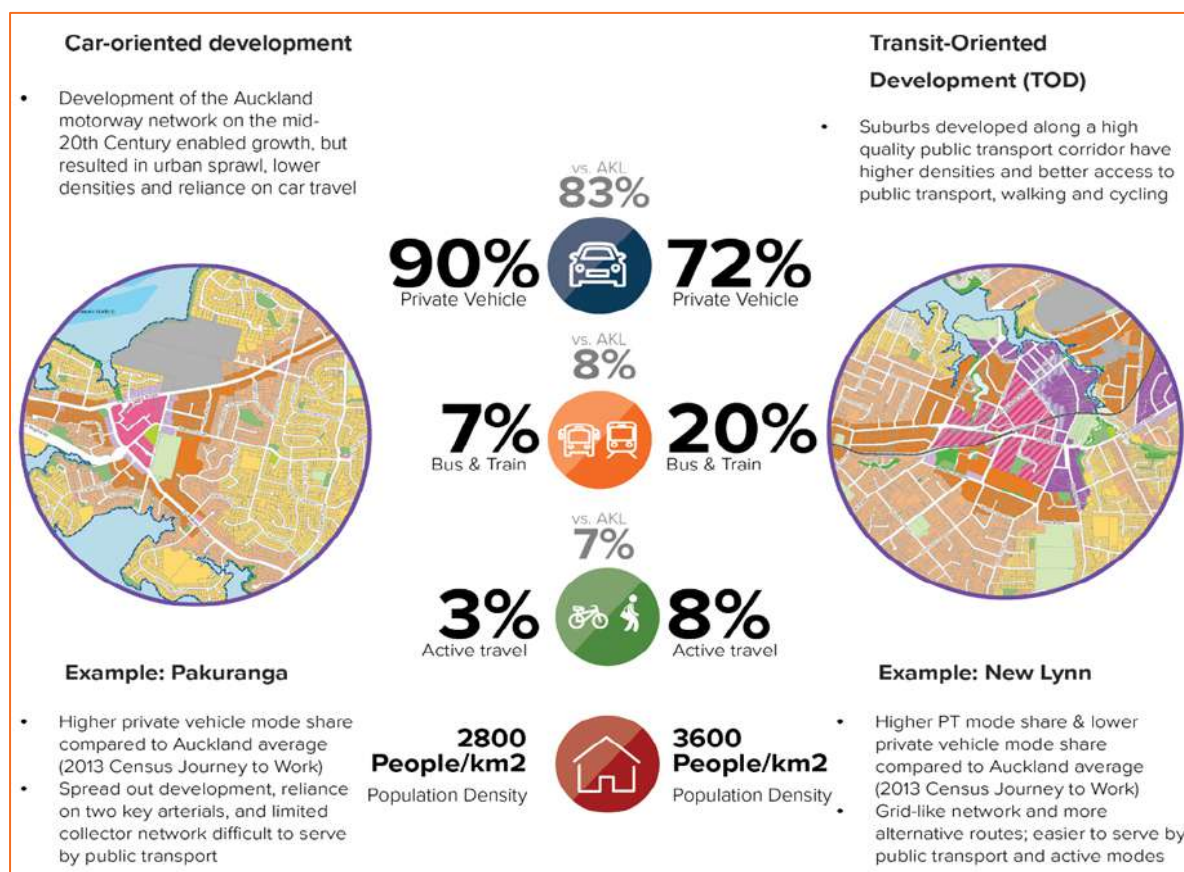


Figure 6-2 Urban form examples in Auckland

Integrating transport and land use

A lack of integrated land use and transport planning will limit the ability of the transport system to positively contribute to liveability and a quality, connected urban environment in the growth areas. If transport and land use are not integrated well, the transport system could promote land uses that do not support the land use outcomes sought for Auckland in the Auckland Plan and AUPOIP.

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

Without an integrated approach to transport and land use planning such as TOD and mechanisms to drive high occupancy modes, there will be lost opportunities and further car dominance leading to poor environmental outcomes.

As detailed in the appended technical reports, the 'land use integration/place' related problems identified for the Drury Local Package largely relate to:

- The current form and function of existing arterial connections not supporting or aligning with the pace, scale and form of the imminent urbanisation of the area, resulting in poor urban form outcomes.

From a Drury specific perspective, 4.1.2 emphasised the urgency to keep pace with the developer interest and lie zoned areas. The risk of urgency for transport/land-use integration may be evidenced by Plan Change 6, in which the Bremner Road realignment runs through. Since the IBC, Plan Change

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6 (Auranga B1) has become operative in part, requiring further negotiations and added complexity to ensure development accommodated the width and form of the corridor for SGA. To date, the options being developed for the Bremner Road Upgrade/FTN incorporate the latest Auranga B1 design as approved under Plan Change 6. This is discussed further in 9.2.4.

6.1.4 Theme: Environment

Section 4.2.1 describes the changes in environmental policy and increased emphasis on this area since the IBC was prepared. This further supports the GPS 2018 strategic priority of 'Environment' and will require an increased focus in this DBC on both climate change vulnerability and resilience in new growth areas, and the urgent need to reduce carbon emissions both via transformational mode shift and through innovations in construction. Climate change in particular is a stronger focus for the Draft GPS 2021.

Without an active focus on long-term risks to the network from physical climate change and the associated losses and disruption accounted for over an asset's useful life, economic damage and community impact is locked in. This is also true for transport systems, where mode shift is not actively enabled then decades of emissions are locked in, effectively amplifying the destructive impacts of climate weather events in years to come.

The investment in Drury Local provides an important component to realise the regional emissions benefits of an integrated network, whilst addressing local flooding risks and other environmental impacts.

6.1.5 Theme: Safety

Safety is one of the four strategic priorities in the GPS 2018 as well as the draft GPS 2021. The GPS supports investment in safety improvements on state highways and local roads. It supports targeting investment at roads and roadsides that will have the greatest impact on reducing DSIs. The GPS supports investment to the highest risk parts of the network through increased investment in primary safety system treatments that reduce the risk of head-on and run-off road crashes, intersection crashes, and harm to vulnerable road users.

As a GPS Strategic priority, along with the Road to Zero, safety is key investment themes within the Southern growth areas too. Safety is at the forefront of all project, although its prominence is different in different areas depending on identified safety issues.

For the Drury Local Package, the safety theme is particularly relevant to the SH22 project, where an existing safety problem exists and an increasing safety risk has been identified as the area urbanises (refer **Appendix J: Drury Local Project Evidence**).

Additional specific evidence for the locally-tailored problems has been included in the package level technical notes appended to this report.

6.2 Programme-wide benefits mapping

Figure 6-3 maps the project level benefits back to the IBC and PBC level benefits. This exercise demonstrates that the key benefit themes of liveability, connectivity, and economic growth have been carried through to the DBC level, thus maintaining the investment story and line of sight back to the PBC.

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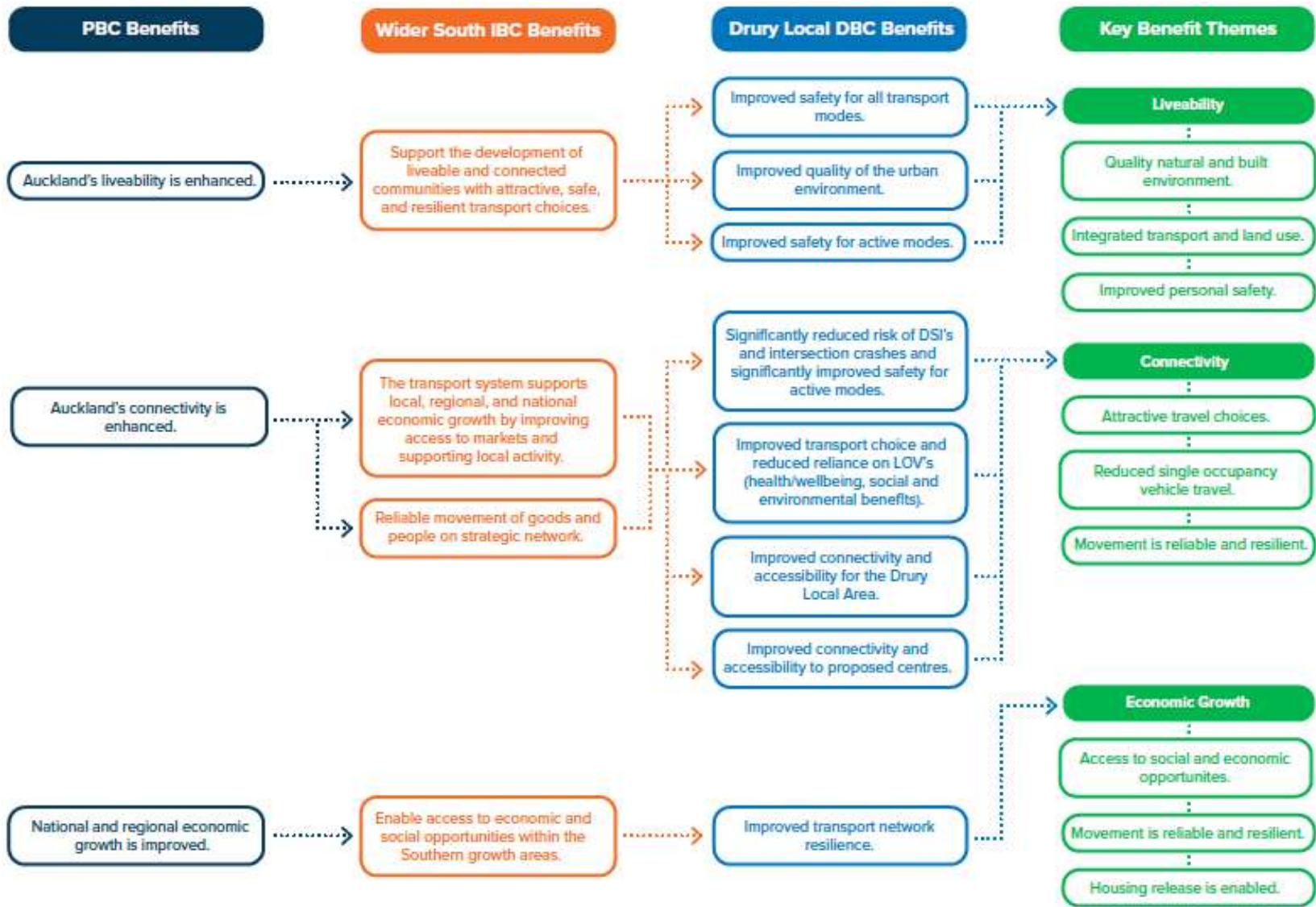


Figure 6-3: Mapping of benefits by theme

6.3 KPIs and measures

Programme-wide work is underway to develop a 'bank' of Key Performance Indicators (KPIs) and measures that link back to the benefits. There will also be a set of programme-level targets to which this project will contribute.

Table 6-1 sets out the draft KPIs from the benefits bank that map back to the package benefits. Further work is required to determine if this is the full set of KPIs and how these will be used in option assessment.

Table 6-1 Draft package KPIs

Benefit	KPI	Measure
Improved safety for all transport modes	Reduction in DSIs	- All modes DSIs - Active modes DSIs - Rural road DSIs
	Actual risk - Quantitative	Number of high-risk intersections and road corridors addressed % / KMs of vehicle travel on roads with personal / collective risk rating below Medium
Improved quality of the urban environment	Active modes provision	KMs of new and improved transport network with enough active mode crossings / corridor width appropriate to the known place function, built form and movement function
	Amenity of the street	KMs of new and improved transport network with enough space for street furniture/lighting and tree planting appropriate to the known place function and built form
	FTN impact on traffic volumes	Change in traffic volumes (% / No)
	Change in human health	Reduction of NO2 Reduction of PM10
	Change in human emissions	Reduction of CO2 Reduction in fuel consumption
Improved connectivity and accessibility for the future urban areas of Auckland	Access to Jobs	Jobs within 30 and 45 mins by Car and PT in AM peak (% / No.)
	Access to Local / Town Centre	Catchment within 800m walk and 3km cycle of Local / Town Centres (% / No.)
	Access to Schools	Catchment within 400m walk and 2km cycle of Primary and Secondary Schools (% / No.)
Improved transport choice	Provision of high-quality active modes network	% / KMs of new and improved cycle network achieving required QoS
	Provision of PT	KMs of new connector and FTN PT services
	Quality of PT network	% of passenger kms travelled in peak congestion (>90 v/c) in AM peak % / KMs of bus routes achieving required bus priority measures

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	Affordability / Cost of Travel	No. / % of households with improved cost of travel by PT compared to Car during AM peak
	PT Travel time improvement	Journey time savings (mins) along Drury Local corridors
Reduced reliance on low occupancy vehicles	Mode share (local and regional trips)	% Active mode share for local trips in AM peak % PT mode share for non-local trips in AM peak
	New PT users	Number of new PT boardings on frequent bus in BC area during AM peak Number of new PT boardings on rapid transit in BC area during AM peak Number of new PT boardings on ferry in BC area during AM peak
	New Cycle users	Number of new daily cycle movements on key corridors in BC area
	Access to PT network	Catchment (population and/or jobs) within 500m walk of FTN stops (% / No.) Catchment (population and/or jobs) within 2km cycle of FTN stops (% / No.)
		% of AM peak period trips to City Centre by PT
	Access to active mode network	Catchment within 500m cycle of QoS1 & QoS2 (% / No.)
		Active travel daily trip distance per capita
Improved network resilience for the most critical connections	Availability of alternatives to strategic connection	Every strategic network connection has an appropriate alternative to key destinations
	Performance of critical connections - Strategic road network - Strategic freight network	% of vehicle kilometres travelled in peak congestion (>90% v/c) in AM peak % of freight vehicle kilometres travelled in peak congestion (>90% v/c) in Inter peak

6.4 Project specific investment objectives

Project specific investment objectives are outlined in the technical reports. This section summarises all of the objectives at a package level. Table 6-2 below summarises how the project-level objectives link to the primary and supporting package level themes described in section 2.5.

The benefits and problems were considered together to develop the project-specific investment objectives (IOs) listed below.

For the road upgrade projects (Bremner, Jesmond and Waihoehoe Roads), two common IOs were developed to reflect the common problem and benefits statements. These IOs are focused around:

- Supporting growth by upgrading the form and function of these rural roads and achieving a more sustainable, quality urban form by improving connectivity to/through the Drury area; and
- Addressing the problem of lack of safe and attractive travel choices, and delivering benefits for transport choice, safety and connectivity/accessibility by providing high quality, safe and attractive PT and active mode facilities on these transport routes.

For the SH22 upgrade project, three IOs were developed to respond to the three problems statements for this project. These IOs focus on:

- Solving the form and function problem and support growth by improving connectivity and accessibility along this future urban section of SH22
- Addressing the safety problem on this section for LOVs and also providing a safe connection for active modes
- Seeking to solve the complex issue of integrating transport and land use along this section, and supporting a more sustainable, quality and connected urban form.

For the new N-S arterial project, the IOs are focused on:

- Solving the N-S connectivity problem and enabling quality urbanisation in the growth area by providing a new N-S arterial connection that connects proposed centres; and
- Addressing the problem of lack of attractive travel choices (in the context of rapid urbanisation), and delivering the benefits for transport choice and network resilience by providing a safe and attractive multi-modal connection between Drury and Papakura.

Project specific evidence for each project is provided in Appendix J: Drury Local Project Evidence.

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Table 6-2 Project level objectives and linkages to package level themes

Project	Problems	Benefits	Investment Objectives	Primary themes		Supporting package level themes		
				Support growth	Access	Safety	Land use integration	Environment
Existing roads to be upgraded/FTN - Jesmond Road, Bremner Road, Waihoehoe Road and Ōpāheke/Ponga Road	PS1: The current form and function of Jesmond Road, Bremner Road, Waihoehoe Road and Ōpāheke/ Ponga Road will not support the imminent urbanisation of the Drury Local area, resulting in poor access and urban form outcomes	Improved transport choice and reduced reliance on LOVs (health/wellbeing, social and environment benefits)	IO1: Support growth and a more sustainable, quality urban form in Drury by improving connectivity to/through the Drury and Ōpāheke area	✓	✓		✓	✓
		Improved quality of the urban environment						
	PS2: The lack of safe and attractive multi-modal access to the proposed strategic PT network will limit access to economic and social opportunities for those living and/or working in the Drury area	Improved connectivity and accessibility for the Drury Local area	IO2: Achieve a transformational mode shift for trips to key destinations in Drury (incl. rail stations, centres and the strategic north-south PT network) by providing high quality, safe and attractive PT and active mode facilities on Jesmond Road, Bremner Road, Waihoehoe Road and Ōpāheke/ Ponga Road		✓	✓		✓
		Improved safety for all transport modes						
SH22 upgrade from Oira Road to Drury interchange <i>Note: Long-term capacity issue will be solved by Pukekohe Expressway project</i>	PS1: The current form and function of SH22 will not support the imminent urbanisation of the Drury Local area (incl. the town centre), resulting in poor accessibility and urban form outcomes	Improved connectivity and accessibility for the Drury Local area	IO1: To support imminent growth and the planned town centre in Drury by improving connectivity and accessibility along this section of SH22	✓	✓		✓	
		Significantly reduced risk of deaths and serious injuries and intersection crashes, and significantly improved safety for active modes	IO2: Significantly reduce the risk of DSIs from private vehicle crashes and to provide a safe connection for active modes along this section of SH22			✓		
	PS3: Failure to integrate the removal of the SH function with the timing and form of urban development will result in a compromised urban form and movement function	Improved quality of the urban environment	IO3: Support a more sustainable, high quality, connected urban form along this section of SH22 that responds to the timing, scale and form of urban development	✓	✓		✓	✓
New Ōpāheke N-S FTN/ Arterial – between Drury and Papakura	PS1: The lack of north-south arterial connections through the Drury-Ōpāheke growth area will limit connectivity of communities with existing and proposed centres and employment areas	Improved connectivity and accessibility to activity centres	IO1: Enable quality urbanisation in the Drury-Ōpāheke growth area by improving N-S arterial connection between proposed centres	✓	✓		✓	
		Improved transport network resilience	IO2: Improve transport choice and network resilience by providing a safe and attractive multi-modal transport connection between Drury and Papakura					
	PS2: Rapid growth and the lack of attractive N-S travel choices in the Drury-Ōpāheke area will limit access to economic and social opportunities	Improved transport choice and reduced reliance on LOVs (health/wellbeing, social and environment benefits)			✓	✓		✓

7 Sustainable outcomes signposting

The Figure below summarises key sustainability outcomes targeted through the Drury Local Package.

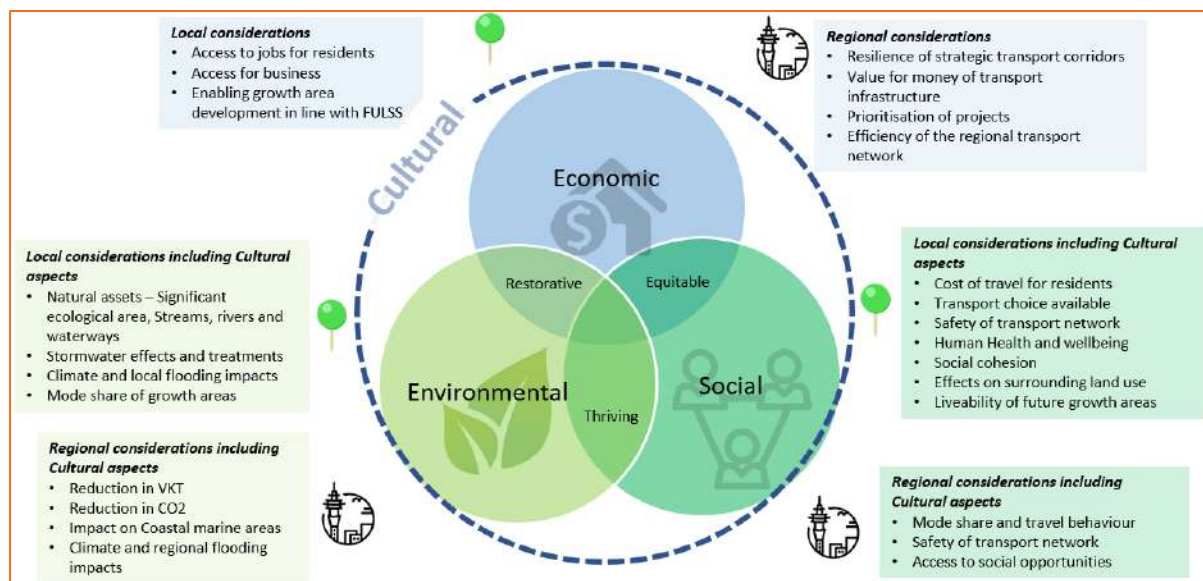


Figure 7-1 Sustainable outcomes

A combination of elements contributes to the Drury Local sustainability story, which adds to the reasons supporting investment in the package. Throughout this DBC key contributing sections/elements include:

Table 7-1 Sustainability outcomes

Sections		Sustainability Alignment
Investment Themes	6.1	Alignment with SGA Investment themes – as discussed in section 6.1, addressing the project-specific problems contributes to positive alignment with one or more of these programme wide themes. In essence, the investment themes are underpinned by achieving more sustainable transport outcomes and benefits (social, economic and environmental) for Drury, and the wider Southern growth area. Section 9.3.1 outlines how investment in the Drury Local Package (DLP) corridors aligns with these themes.
	9.3.1	
Investment Objectives (IOs) and Key Performance Indicators (KPIs)	9.4.1	Alignment with IOs influences the identification of preferred options. Project IO's were developed to address the identified problems in Drury due to the anticipated growth/urbanisation. A lot of the sustainability outcomes for Drury Local derive from the alignment with and the focus of the IO's, which are measured through KPIs.
	9.4.3	

Options Assessment	Multi Criteria Analysis (MCA) Framework	9.1.4.1	The assessment of options against certain criteria (9.1.4.1), and the further identification of and non-scored opportunities, highlights sustainability thinking behind the options assessment (9.2). MCA framework underpinned by the fair assessment of the four well-beings - Cultural, Social, Environment and Economic – with strong alignment to sustainability principles
	Jesmond Rd	9.2.1.4	MCA Assessment – qualitative assessment of the well-beings and investment objectives to identify the preferred option
	Bremner Rd Central	9.2.2.4	MCA Assessment – qualitative assessment of the well-beings and investment objectives to identify the preferred option
	Bremner Road East	9.2.3.4	MCA Assessment – quantitative (scored) assessment of the well-beings and investment objectives to identify the preferred option. Additional qualitative analysis was undertaken to weigh the costs/benefits of flooding impacts, costs, and impact on existing environments between emerging preferred options.
	Waihoehoe Rd	9.2.5.4	MCA Assessment – qualitative assessment of the well-beings and investment objectives to identify the preferred option
	Ponga Rd	9.2.6.4	MCA Assessment – qualitative assessment of the well-beings and investment objectives to identify the preferred option
	Ōpāheke Rural	9.2.7.4	MCA Assessment – qualitative assessment of the well-beings and investment objectives to identify the preferred option
	Ōpāheke Urban	9.2.8.2	Identified width constraints required a qualitative assessment of whether it was appropriate for a departure from the standard SGA cross-section and instead upgrade to an arterial within the existing corridor width. The assessment weighed the impacts on the existing environment, costs, and transport benefits.
	Ōpāheke NS	9.2.9.4	MCA Assessment – quantitative (scored) assessment of the well-beings and investment objectives to identify the preferred option
	SH22	9.2.10.4	MCA Assessment – qualitative assessment of the well-beings and investment objectives to identify the preferred option
Package option outcomes and benefits		9.4.2	This section discusses the impact of the DLP network on both local and regional social, environmental, and economic outcomes. Discussed from this triple bottom line perspective, as well as presenting the KPI story and IO alignment of the Drury Local package.
		9.4.3	

8 Partner and stakeholder engagement

This section summarises engagement undertaken with partners, key stakeholders, and the community by Te Tupu Ngātahi for the Drury Local business case between 2019 and 2020. The information gathered through engagement is used to collate key themes and inputs, and to varying degrees is used to inform any design refinement – more so for post-lodgement and the NoR design process. Figure 8-1 below exemplified how the feedback from the community has been used to build knowledge, to understand risk, and to refine the design of the Projects. For further detail, refer to **Appendix F: Engagement Summary**.



Figure 8-1 Engagement feedback loop

Engagement for the DBC implemented a multi-faceted approach which involved using different channels to contact different groups and individuals at different times. This included, but was not limited to:

- partner, industry and stakeholder briefings and meetings
- Manawhenua Hui
- targeted mailouts to landowners who received information packs including letters, maps of draft preferred options, project information sheets, feedback forms, information sheets on route protection and the notice of requirement process

The approaches for the different groups engaged with is summarised further in the proceeding sections.

8.1 Engagement History

To date, Te Tupu Ngātahi has been through various phases of development and engagement, as summarised in. This DBC phase of engagement feeds off of this base established in previous stages.

Table 8-1 Te Tupu Ngātahi engagement history

Project Stage	Timing	Engagement summary
Programme Business Case (PBC)	2015 - 2016	- Engagement with stakeholders and potentially affected parties has been ongoing since the development of the PBC in 2015. The PBC stage included engagement with partners, including Manawhenua. - Workshops, meetings and events were held with Manawhenua, Local Boards, communities and a wide range of stakeholders, to understand the issues, opportunities and community aspirations in each area.
Indicative Business Case (IBC)	2018/19	- The purpose of IBC engagement was to build on the PBC and to receive feedback and input from partners, stakeholders and the general public on the short-listed options being considered for the four business case areas. - Engagement was undertaken via information days, workshops and meetings to develop an IBC for the entire South growth area.
Detailed Business Case (DBC) / Notice of Requirement (NoR)	2019 - 2020	- The engagement and communication in the DBC built on the engagement undertaken during the earlier PBC and IBC stages of the Project - Engagement with stakeholders, developers, and landowners was undertaken to prepare the DBC and NoRs. - Engagement was undertaken in two stages. An initial feedback stage that sought to share information and seek feedback via website content, letters, e-updates, emails, phone calls, information sheets and online community engagement platform i.e. Social Pinpoint. A further engagement stage was undertaken subsequent to this that focused on understanding property impacts and sharing our indicative designation areas with landowners.

8.2 Partner Engagement Summary

Throughout the route refinement assessment process for the Drury Local projects, a range of consultation and engagement was undertaken with Project partners (Auckland Transport, Waka Kotahi, Auckland Council and Manawhenua). They were involved in the evaluation of the options and provided important feedback at workshops and hui. The various workshops and more detailed outcomes are described in **Appendix A: Options Assessment**, with notable influences of preferred option selection summarised in sections 9.2.1 to 9.2.10 below.

8.2.1 Auckland Transport and Waka Kotahi

AT and Waka Kotahi are a part of the Project Team contributing to the options assessment - through the role of the Owner Interface Manager (OIM), Te Tupu Ngātahi has consistently updated and sought input on each stage of the business case and NoR process. Inputs range from technical guidance and requirements, approvals and updates.

Additional meetings were held with Project Team members and specialists to discuss options and any issues to be addressed. Specific workshops were also held with internal stakeholders from AT and Waka Kotahi to discuss the assessment and options.

During the initial workshops the Project Team provided AT and Waka Kotahi attendees with an overview of the assessment process and the options for assessment for each of the corridors. The Project Team sought feedback and insight from attendees to assist with decision making. During the second, third and fourth workshops, the Project Team presented the emerging preferred recommended options, discussed previous feedback received and sought further feedback.

8.2.2 Auckland Council

Three workshops specific to the Drury Local options assessment were held with the Council.

During the initial workshops the Project Team provided Council attendees with an overview of the assessment process and the options for assessment for each of the corridors. The Project Team sought feedback and insight from the Council with respect to land use integration matters to assist with decision making. During the second and third workshops, the Project Team presented the emerging preferred options and sought further feedback from the Council. In addition to the specific workshops for the options assessment, a programme-wide Auckland Council Integration Meeting is held regularly to ensure collaboration and integration with the Supporting Growth programme and the Council's land use planning function. Where required, the options assessment was also discussed at these meetings.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



[REDACTED]

8.3 Stakeholder Engagement Summary

The project team talked to stakeholders such as Transpower, Watercare and First Gas to make sure our plans aligned with any infrastructure planning; with the Ministry of Education (MoE) to discuss potential new school locations; with Heritage NZ Pouhere Taonga to discuss the management of key sites. Additionally, the project team talked with developers about their plans for urban growth.

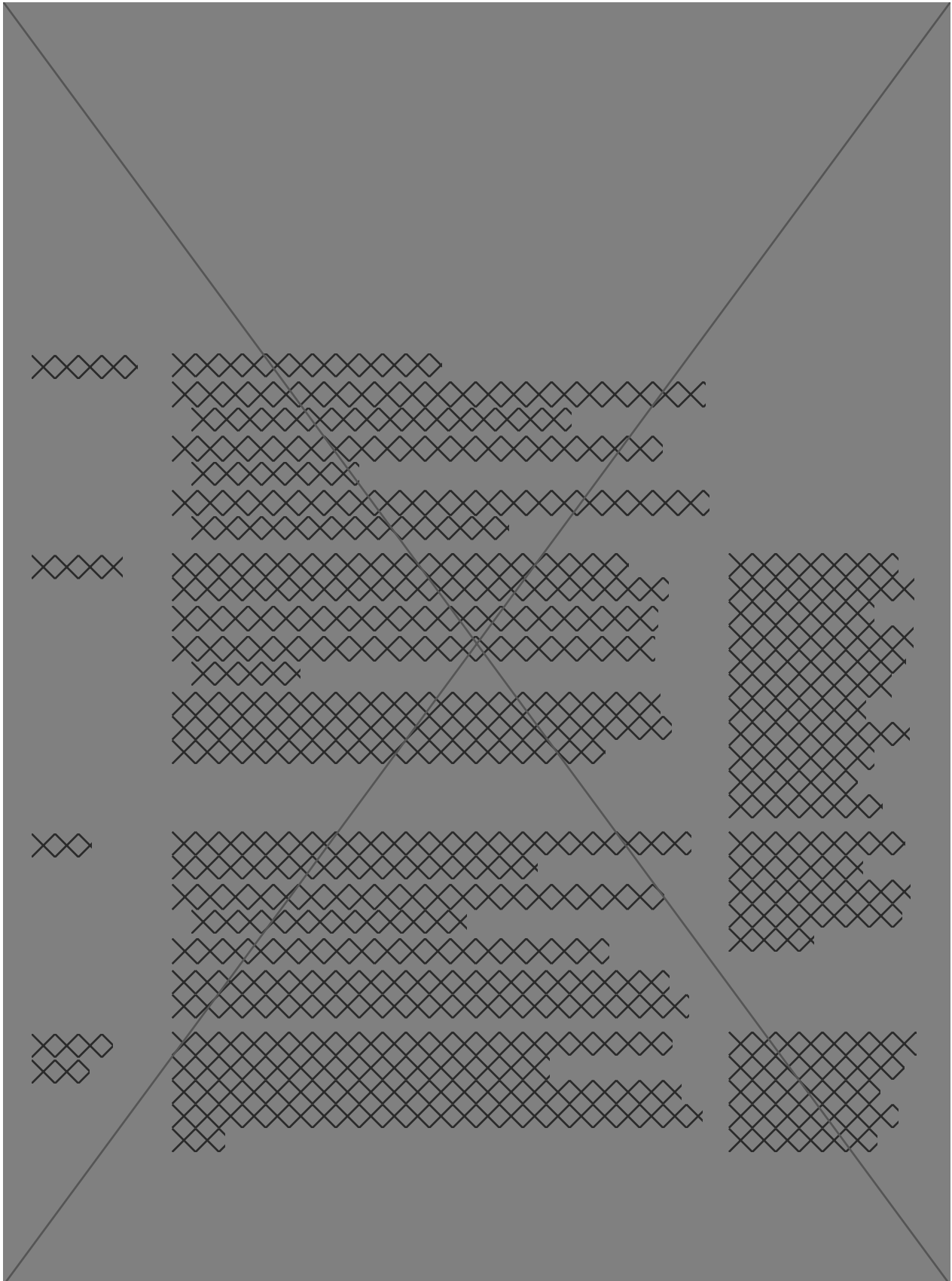
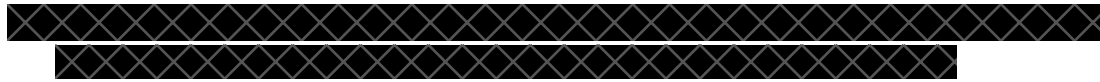
The Project team also canvassed the views of stakeholders such as Bike Auckland, Infrastructure NZ, Generation Zero, the Automobile Association (AA), Fire and Emergency NZ (FENZ) and the Road Transport Forum.

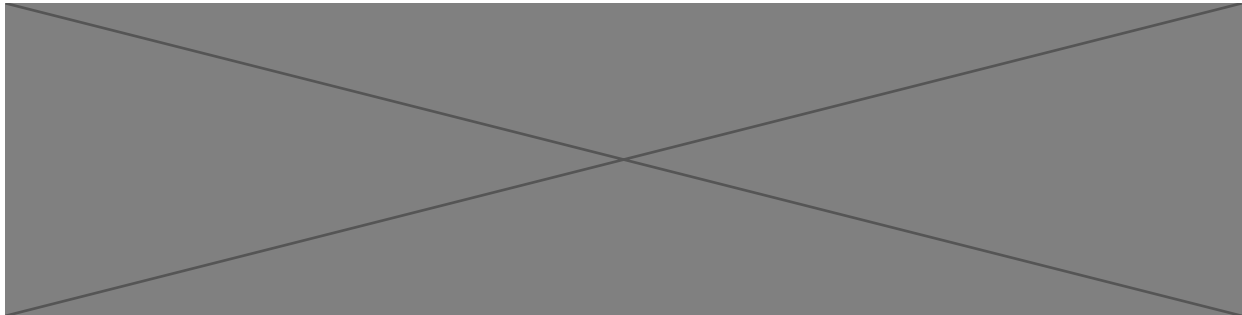
Te Tupu Ngātahi undertook engagement of these parties at between 2018 to 2020. The following lists key stakeholders engaged with for Drury Local, with a wider list expanded upon in **Appendix F: Engagement summary**. Details on the outcomes of these conversations are summarised in Table 8-2 below.

[REDACTED]



- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]





Te Tupu Ngātahi undertook a more direct approach in our engagement with developers who may be impacted by the Project alignments. The purpose of this was to ensure we had a greater understanding of their land holdings and to establish relationships for ongoing engagement, noting that these discussions enabled agreement on road widths and locations.

Some developers with interests in the Projects area, rather than property directly impacted by the transport networks, have also been engaged with. This engagement is continuing at the time of writing this DBC.

Engagement with developers was led by developer 'relationship owners' from within Waka Kotahi and within the Te Tupu Ngātahi team. This focused on how their land is potentially impacted by the proposed alignments.

8.4 Community Engagement Summary

In June and July 2019, during the initial stages of the Drury Local DBC process, letters to landowners were sent out to inform landowners of the Southern Indicative strategic network, identifying that their property was within the study area for a new transport corridor. Landowners were invited to meet with Te Tupu Ngātahi and discuss potential implications.

In December 2019 and January 2020, the Supporting Growth Programme sought feedback from landowners within the proposed Drury Local projects area on the draft preferred options for SH22 Arterial Upgrade, Jesmond Road FTN Arterial Upgrade, Bremner Road FTN Arterial Upgrade, Waihoehoe Road West FTN Arterial Upgrade and the Ōpāheke N-S FTN Arterial Upgrade. Letters were sent out to landowners in proximity to each of the corridors and the route refinement options. Landowners were given the opportunity to provide feedback on the draft preferred options which was then considered in finalising the preferred network and contributed to design refinement to further minimise impacts where possible.

Landowner engagement on the Waihoehoe Road East Arterial, Ponga Road Arterial and Ōpāheke Road Arterial corridors was due to be undertaken in April 2020, however due to government restrictions during the Covid-19 Pandemic this engagement was postponed, and engagement methods reconsidered. In May 2020 public engagement was launched and an opportunity to provide feedback on the preferred options for Waihoehoe Road East Arterial, Ponga Road Arterial and Ōpāheke Road Arterial was provided.

Feedback was sought from the public through Social Pinpoint using interactive tools such as surveys and interactive mapping. The feedback received is summarised below.

8.4.1 June-July Feedback 2019

The themes were dependent on the landowners' individual circumstances and future plans in relation to their properties. Responses ranged from support, ambivalence, acceptance that the area is changing, future opportunities to strong opposition.

- **Access**: questioning how this will be impacted, and how it will be restored;
- **Loss of Amenity**: Concerns with impacts on lifestyle if houses and living spaces are closer to upgraded or new roads that are significantly busier and alter the current rural lifestyle amenities;
- **Loss of Value**: Concerns of impacts on property value prior to designation, ability to sell prior to an unknown construction date with a designation, reliability of market value if land is acquired and value of property if a new road or busier road is closer to the house.
- **Site Acquisition/Land Development**: Response to potential land acquisition was varied some open to this whilst others vehemently opposed, most concerned about restrictions on future plans (development, value, saleability and lifestyle), most wanted to understand the process and potential timing.
- **Alignment Concerns**: Many landowners questioned the alignments, whether they were most suitable or had some concerns over it.
- **Change of sense of place**: Many particularly in the more rural areas have moved to the area for future retirement and or a quiet rural lifestyle, many have voiced concerns over the changes this project and zoning changes will have on their vision of the future
- **Uncertainty**: Many expressed frustrations at the lack of detail and certainty of timing that we were able to provide and questioned why we were engaging with them when we didn't have any detail to share.

8.4.2 December Feedback 2019

The feedback from landowners generally related to alignment concerns, loss of property, loss of amenity, and timing for construction. There was support for the proposed widening of roads to accommodate walking and cycling however landowners were concerned with ensuring widening of the road was equitable and land from both sides of the road was taken.

8.4.3 May-June Feedback 2020

The key themes raised by landowners related to property (acquisition/loss of value/access), alignment of the proposed new roads and impact to property boundaries. Timing for construction of the projects was raised frequently in relation to property impacts. Specifically queries regarding timing of property acquisition and ongoing tenure of property was a concern.

A summary of the key themes and feedback split by corridors is summarized in Table 8-3 below.

Table 8-3 Summary of engagement key themes for each corridor

Corridor	Key Themes	Summary of Feedback
Jesmond, Bremner and Waihoehoe West	Alignment Property Acquisition, access, loss of value and boundary)	Engaged with 22 landowners within the indicative designation boundary for the Jesmond Road, Bremner Road and Waihoehoe West FTN upgrades. The main issues related to timing for construction, property acquisition and alignment. The project team considered the feedback and made a couple of minor adjustments to the road alignment to accommodate landowner requests.
Waihoehoe East	Alignment concerns Property (acquisition, loss of value, boundary)	Engaged with 6 landowners within the indictive designation boundary for the Waihoehoe Road East Arterial upgrade project. The main issues related to timing for construction, property acquisition and alignment. The project team considered the feedback and concluded no further changes to the proposed alignment were required.
Ōpāheke and Ponga Road	Environment concerns (noise etc.) Alignment Concerns Property Boundary and Acquisition	Engaged with five landowners within the draft designation boundary for the Ponga Road and Ōpāheke Road Arterial Upgrade projects The main issues raised during the landowner meetings related to timing for construction, property acquisition and alignment A number of landowners raised the potential of construction impacts on trees in the area. The project team were able to note the location of these valued trees in the community and where possible will explore opportunities for retaining these trees during the detailed design stage.
Ōpāheke NS Arterial	Property (Loss of amenity and Acquisition)	Engaged with 3 landowners within the draft designation boundary for the Ōpāheke North-South FTN Arterial project. The main issues raised during the landowner meetings related to property acquisition and loss of amenity. In relation to the design, there were no matters for the project team to consider .
SH22	Property Acquisition, and boundary) Development/ re-development Construction	Engaged with four landowners within the indicative designation boundary for the SH22 upgrade project. The main issues raised related to property, acquisition, construction and re-development. We also received feedback on the road alignment. The rationale for the alignment of the road was discussed. The project team considered the feedback and concluded no further changes to the proposed alignment were required.

9 Economic Case

This section describes the option development process, assessment undertaken to identify the recommended network and the overall outcomes of the recommended network. A summary of the recommended option for each project is included in this section including a high-level assessment of how the projects will operate as a key part of the transport system. More detailed assessment of individual options is contained in the **Option Assessment Report** appended to this document (**Appendix A**), which also forms the basis of the Alternatives Assessment which will be included in the Assessment of Environmental Effects (AEE) in the subsequent route protection phase of the projects identified. This Options Assessment has included detailed assessment of corridor needs to determine the recommended corridor form and function, followed by an iterative geometric design process.

9.1 Scope of Options Development and Assessment Process

As outlined in Section 2.5 projects within Supporting Growth Programme have been developed to different levels of design detail depending on the timing of implementation, uncertainty and consenting strategy. These types are detailed in the Strategic Case and outline that all projects within the Drury Local Strategic Case Package are 'Type B: Business Case for route protection'. The optioneering process and development of the recommended network have therefore been developed to be fit-for-purpose. Figure 9-1 summarises the process of developing options for consideration and determining the Drury Local recommended network, using the methodologies discussed above. These steps are discussed in the sections 9.1.1 to 9.1.5.

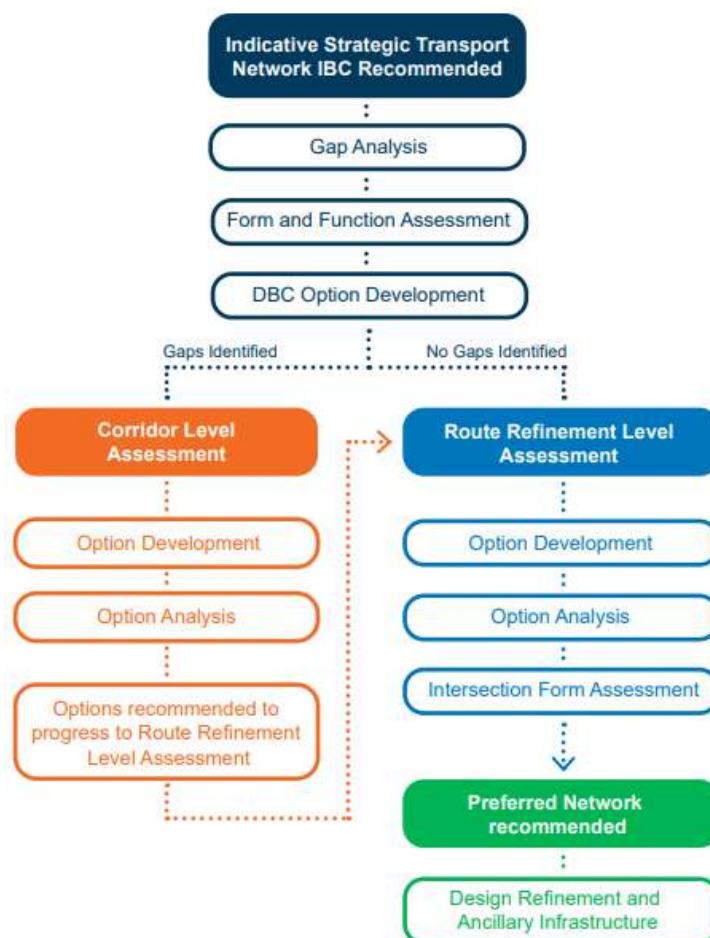


Figure 9-1 Overview of DBC Option Assessment process

9.1.1 Gap Analysis

A gap analysis and background review was undertaken to ensure an understanding of how the Indicative Strategic Transport Network (from the IBC) was identified, ensure the level of detail required to inform the future Resource Management Act (RMA) process is satisfied, identify if anything had changed since the IBC including policy direction, statutory and planning documents (for example, plan changes and structure plans described in section 4), and to identify gaps or issues that require further consideration during the DBC phase.

From this gap analysis recommendations were made on the approach to developing options for each project. If it was considered that the IBC did not sufficiently investigate alternatives proportional to the scale of potential effects, or additional information warranted further investigation, additional optioneering would be required through a corridor assessment.

In the case of the Drury Local Indicative Strategic Transport Network, the gap analysis concluded that adequate consideration of alternative corridors was undertaken at the IBC phase and that any new information or changes since the IBC did not require additional optioneering through corridor assessment.

As such, the route refinement process was adopted to provide an appropriate level of optioneering into the DBC phase. Additionally, in terms of strategic context, advancements in land use planning and growth projections have confirmed the urgency of investment in Drury Local is still there.

The undertaking of this gap analysis coincided with a form and function assessment for each Drury Local corridor, summarised in the following section. In conjunction with one another, the conclusions of these assessments fed directly into option development, outlined in section 9.1.3.

9.1.2 Form and Function Assessment

At a programme level, a corridor form and function assessment tool has been developed to support consistent decision making. The intent of the tool is to encourage well-rounded thinking about both the place and movement function of corridors and avoid focus being placed on a single element, for example the role of the corridor in moving general traffic.

The key principles of the assessment process include:

- Surrounding place, land use, and corridor movement purpose must be considered first.
- PT, high occupancy vehicle, walking, and cycling needs are given highest priority for corridor space, particularly for commuter and short local trips respectively.
- Cycle priority is influenced by primary or secondary route classification:
 - Primary routes provide connections to more significant spatial destinations, e.g. centres and train stations.
 - Secondary routes provide more supplementary connections to the primary routes, needed to complete a successful network.
- General traffic is considered only once all other modes have been assessed and should only be provided with two lanes up to an approximate daily flow of 15,000 vehicles per day or less than 1,500 vehicles per hour each lane in the peak periods. Four general traffic lanes should only be considered when
 - a. daily flow exceeds 15,000 vehicles per day; and

- b. where the LOS for two general traffic lanes is less than LOS C in the interpeak; and
 - c. where it can be demonstrated that bus/ HOV lanes have been considered first; and
 - d. where it can be demonstrated that two general traffic lanes will not be appropriate
- The 'target' LOS for general traffic is LOS C in the interpeak. LOS D or E in the peak is considered acceptable and may encourage mode shift for journeys at these times.

The output of the assessment is a *desired* cross section for the corridor being assessed. The Te Tupu Ngātahi recommended cross-sections outlining the desired widths of each facility has been derived from discussions with AT, Waka Kotahi and Roads and Streets Framework (RASf) guidelines. The outcome of this assessment is whether 2 or 4 lanes needs to be route protected for. The desired generic SGA cross-section for 2 lanes (24m cross section) and 4 lanes (30m cross section) is exemplified in Table 9-1 and Table 9-2 below.

This decision on the desired Corridor form and function (CFAF), and consequent cross-section, is then socialised with the project owner (AT or Waka Kotahi) and approval obtained to proceed to design.

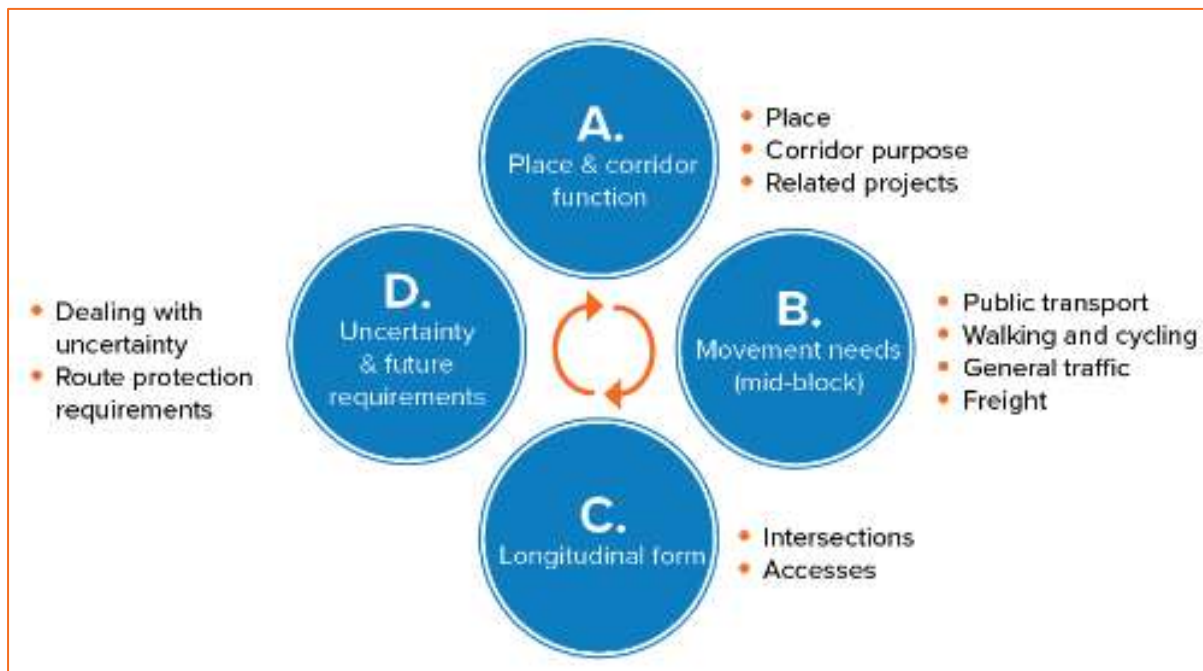


Figure 9-2: Corridor assessment principles

The form and function assessment process is detailed in **Appendix B: Transport Assessment Report**. Figure 9-3 summarises the form and function assessment recommendations for projects in the Drury Local Package. The form and function assessment has been very contextually influenced, looking at a whole of network solution to best cater for the Drury growth, which has produced a connected FTN, aligning with centres and stations. High level reasoning behind this is summarised in Table 9-1 and Table 9-2.

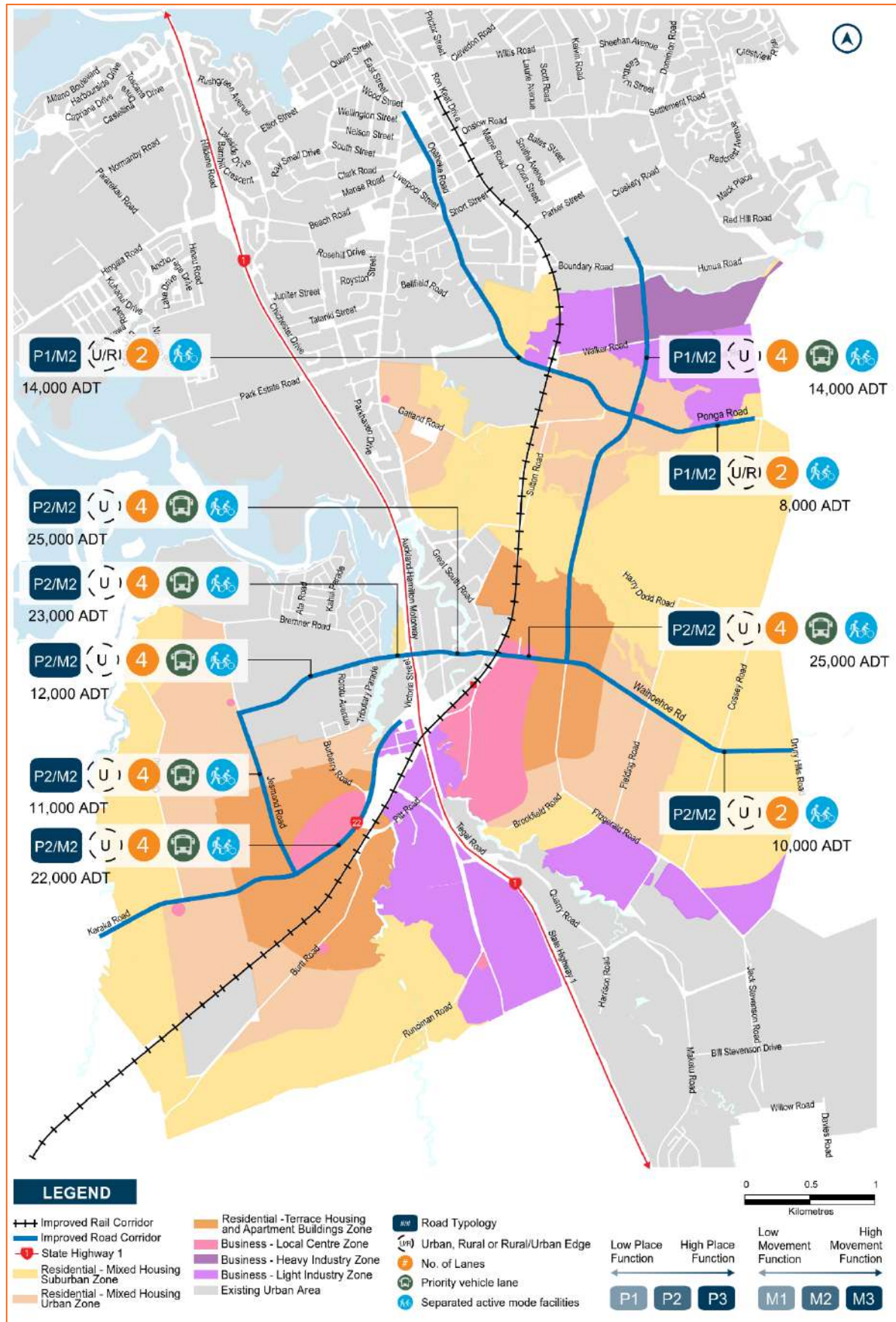


Figure 9-3: Drury Local Form and Function assessment

The recommended form and function for Drury Local corridors is outlined in Table 9-1 and Table 9-2:

Table 9-1: Drury 4 Lane Arterial Corridors

4 Lane Arterials		
Project	Place / Movement	Cross section
Jesmond Road FTN Upgrade	Jesmond Road is proposed to be upgraded to an arterial road with an FTN function providing links to the surrounding strategic road network. Future land use adjacent to the corridor anticipates medium-to-high density residential, with the corridor providing a north-south connection to the town centre and Drury West station.	Predicted flows: 11,000 average daily traffic (ADT) Four lanes including bus priority lanes (part of FTN PT spine) Separated cycle lane and footpath – part of the primary cycle network.
Bremner Road FTN Upgrade	Bremner Road is upgraded to an arterial road with an FTN function, providing east-west connectivity with local employment opportunities, existing and planned centres, by creating a PT and active mode spine to connect Drury West and Drury Central. Surrounding land use consists of industrial, residential and rural, and connects to the Drury central station.	Predicted flows: 25,000 ADT Four lanes including bus priority lanes (part of FTN PT spine) Separated cycle lane and footpath – part of the primary cycle network.
Waihoehoe Road West FTN	Waihoehoe Road (West) is upgraded to an arterial road with an FTN function, forming a key east-west link by connecting two strategic north-south corridors (GSR and N-S Arterial) and Drury Central station. This provides a sub-regional movement function. Future land use plans for a town centre at the western end and medium/high density residential at eastern side.	Predicted flows: 25,000 ADT Four lanes including bus priority lanes (part of FTN PT spine) Separated cycle lane and footpath – part of the primary cycle network.
Ōpāheke North-South FTN	Ōpāheke North-South FTN is upgraded to an arterial road with an FTN function, establishing a North-south corridor that will supplement Mill Road and Great South Road. This connects the existing Papakura Industrial area in the north with the planned Drury Town Centre and medium-to-high density residential in the south.	Predicted flows: 14,000 ADT Four lanes including bus priority lanes (part of FTN PT spine) Separated cycle lane and footpath – part of the primary cycle network.
SH22 Upgrade	The present day SH22 has a sub-regional/strategic function, however, the future function will be district level owing to Pukekohe Expressway supplanting its strategic function. This allows for the urbanisation of the Drury West area that is more suited to the intended upgrades of the corridor, which will focus on safety. SH22 connects to a future planned for town centre near Jesmond Road; but is otherwise surrounded by mix of med/high density residential, with some industrial uses.	Predicted flows: 22,000 ADT Four lanes - initially for general traffic, but over time 2 lanes dedicated to priority vehicle lanes. Separated cycle lane and footpath – part of the primary cycle network.

Table 9-2: Drury 2 Lane Arterial Corridors

2 Lane Arterials		
Project	Place / Movement	Cross section
Waihoehoe Road East	Waihoehoe Road (East) is upgraded to an arterial road, providing an East-west link connecting two strategic north-south corridors (N-S Arterial and Mill Road), but no PT priority is provided due to 'low' expected traffic volumes. Future land use adjacent to the corridor anticipates low to medium density residential on both sides, with the corridor providing access from these residential areas to the Drury Central Station.	Predicted flows: 10,000 ADT 2 lanes due to flows and land use. Paths for active modes – part of the secondary cycle network.
Ponga Road	Future low-density residential zoning (mixed housing suburban, and mixed housing urban) runs adjacent to the corridor. This link provides a connection to the Papakura Town Centre.	Predicted flows: 8,000 ADT 2 lanes due to flows and land use Separated cycle lane and footpath – part of the secondary cycle network but connects to the primary network.
Ōpāheke Road	The northern section of Ōpāheke Road has existing urbanised land-use, constraining corridor space available to upgrade. The upgrade to 2 general traffic lanes with active mode provision has been influenced by the space available, existing residential land use leading towards the Papakura town centre and station and the predicted flows.	Predicted flows: 14,000 ADT 2 lanes due to flows, existing land use and space constraints. Separated cycle lane and footpath – part of the primary cycle network.

9.1.2.1 20m v 24m cross section

Each corridor within the Drury Programme was assessed to determine the most appropriate cross section width to be taken forward in the Drury DBC. Te Tupu Ngātahi has developed a series of generic cross sections to simplify and standardise the DBC and route-protection process, with two-lanes resulting in a 24m cross-section and four-lanes resulting in a 30m cross-section. The cross sections include:

- spacing for segregated active modes and pedestrians;
- medians;
- buffers for property boundaries;
- berms, to provide space for bus stops, pedestrian and cycling conflict etc.; and

- traffic lanes.

As mentioned, as a general wider principle for the programme it is expected that each two-lane project will apply a 24m cross section unless it meets the criteria to consider a departure. The criteria are based on four principles:

- minimising significant impact on existing properties/access.
- avoiding significant physical or environmental constraints.
- consider only where the additional value of the 24m cross section would be of limited value to both Transport and Place function.
- retain consistency in corridor cross section where there are no future opportunities to upgrade.

However, the use of 20m corridors may be acceptable in more constrained circumstances that meet specific assessment criteria. Site-specific consideration and judgement will still be required where constraints and requirements are in conflict.

Nevertheless, in corridors that are not constrained by either property in existing urbanised areas (e.g. the rural section of Ōpāheke Road) or other physical factors, the 24m cross-section provides a more desirable upgrade, with greater benefit gained. This includes positive transport outcomes such as safety benefits for active mode user's due to greater separation from vehicles because of wider berms, and consequently, higher frequency of bus stops, as the berms will allow off-line stops. In summary, the 24m cross-section is the default for two lane corridors because of these benefits, apart from exceptional circumstances and constraints.

9.1.3 Option Development

As identified in Figure 9-1, option development leads from conclusions established following the IBC gap analysis (9.1.1) and the form and function assessment (9.1.2). From these, recommendations were made on the approach to developing options for each Drury Local project. The gap analysis identified whether the IBC recommended option for each project considers any new information relating to that option. For example, land use changes, new growth projections, any issues identified through engagement with stakeholders, etc. and whether the IBC recommended option analysis has sufficiently considered alternatives proportional to the scale of potential effects.

Where projects did not achieve the above, additional optioneering would be required through a corridor assessment to achieve the level of optioneering detail required to progress route protection. Where projects achieved the above, additional optioneering was undertaken through route refinement.

The gap analysis concluded that for the Drury Local projects adequate consideration of alternative corridors was undertaken at the IBC phase and that any new information or changes since the IBC did not require additional optioneering through corridor assessment. As such, the route refinement process was adopted to provide an appropriate level of optioneering into the DBC phase.

- For existing roads that are proposed to be upgraded, the route refinement process investigated which side of the road to widen.
- For Ōpāheke North-South which is a proposed new road, route refinement investigated an alignment within or adjacent to the corridor recommended at the IBC.
- The route refinement process for Bremner Road east included two stages.

- The first stage investigated alternatives to the large bridge structure as recommended through the IBC. This also included the layout and location of intersections of the adjoining local roads.
- Once the general layout was decided, the second stage investigated which side of the existing roads to widen.

For road widening there were three options: widening one side or the other or widening both sides. Depending on the level of potential effects, constraints or opportunities identified during the assessment it was recognised that the three options may be further refined to include a combination of widening on either side of the existing road corridor.

As noted in previous sections, the form and function tool was used to determine the desired cross-section. The desired cross section was applied to the options to be investigated. Option development considered the local constraints and opportunities and identified where the desired cross section may not be achievable. This process was iterative between the project team, allowing for compromises to be made where necessary.

9.1.4 Option Assessment

9.1.4.1 MCA Framework and Assessment Process

There were two approaches to the using the MCA Framework - scoring the options, or a qualitative assessment of the options. Both approaches used the same MCA framework criteria.

Scoring of the options was undertaken where it was thought it would assist in differentiating between the options and where (in places) the options developed went outside of the corridor assessment at the IBC.

For the projects involving widening of an existing road, a qualitative approach was used. This focussed the assessment on the constraints, opportunities or features that would influence which side of the road was widened - recognising that the options considered could be refined to involve a combination of widening on either side of the existing road corridor.

Where appropriate, scoring and qualitative analysis was completed by the subject matter experts and discussed at several MCA workshops. The localised MCA assessment framework is summarised in Table 9-3.

Subject matter experts were also asked to identify opportunities.

The topics and criteria of the MCA assessment framework were selected to be inclusive of a broad range of sustainable development aspects across cultural, social, environmental and economic areas.

The assessments captured where impacts were able to be avoided, and where there were enhancement opportunities in next stages of the project, as well as where mitigation measures for unavoidable impacts would be necessary.

Table 9-3: MCA Assessment Framework

Well being	MCA topic	Criteria
Investment Objectives	Investment Objectives / Transport Outcomes	Varied depending on Investment Objectives, for example, connectivity, network integration, PT safety and attractiveness, active mode safety and attractiveness and resilience
Cultural	Heritage	Heritage
Social	Socio-economic impacts	Land use futures
		Urban design
		Land Requirement
		Social cohesion
		Human Health and Wellbeing
Environmental	Natural Environment	Landscape/visual
		Stormwater
		Ecology
		Natural Hazards
Economic	Transport	Transport system integration
	Construction impacts	Construction impacts on utilities/ infrastructure
		Construction Disruption
	Cost & Construction Risk	Construction costs and risk
	Transport Opportunities	Behavioural Change/Future Technology Opportunities
	Urban Development Opportunities	Existing economic opportunities

Additional (and important) inputs considered as part of the MCA criteria, described in Table 9-4.

Table 9-4: Other inputs in MCA Framework

Criteria	Description
Stakeholder and community feedback	Stakeholder feedback for each option identifying scale / validity of objections; identified preference/proposed changes to options etc. Feedback provided by other key partners/ stakeholders.
Policy analysis	Options alignment with the strategic policy framework including the AUPOIP and Auckland Plan where it assisted in differentiating between options
Indicative costs	High level indication of costs (including construction and property purchase) where it assisted in differentiating between options
Mana Whenua	A qualitative assessment including: - Identification / assessment of cultural issues (Customary practice / Te Taiao (Air, Land, water, Taonga) / Maori communities and wellbeing / Maori land) associated with an option. - Optioneering commentary including testing criterion scoring for an option. - Other matters related to an option associated with the Manawhenua position.

9.1.4.2 Overview of Route Refinement Process

The route refinement options were assessed to establish the emerging preferred network for Drury. The assessment used the MCA Framework developed for the Supporting Growth Programme, adapting it to suit the Drury context and options being addressed at the route refinement stage. The route refinement process is shown in Figure 9-4.



Figure 9-4 Route Refinement Assessment Process

9.1.4.3 Intersection assessment

In addition to the corridor form and function, an intersection form and function assessment has been undertaken to determine a suitable footprint required for route protection. Figure 9-5 outlines this process of deciding on the typology, where an intersection is required.

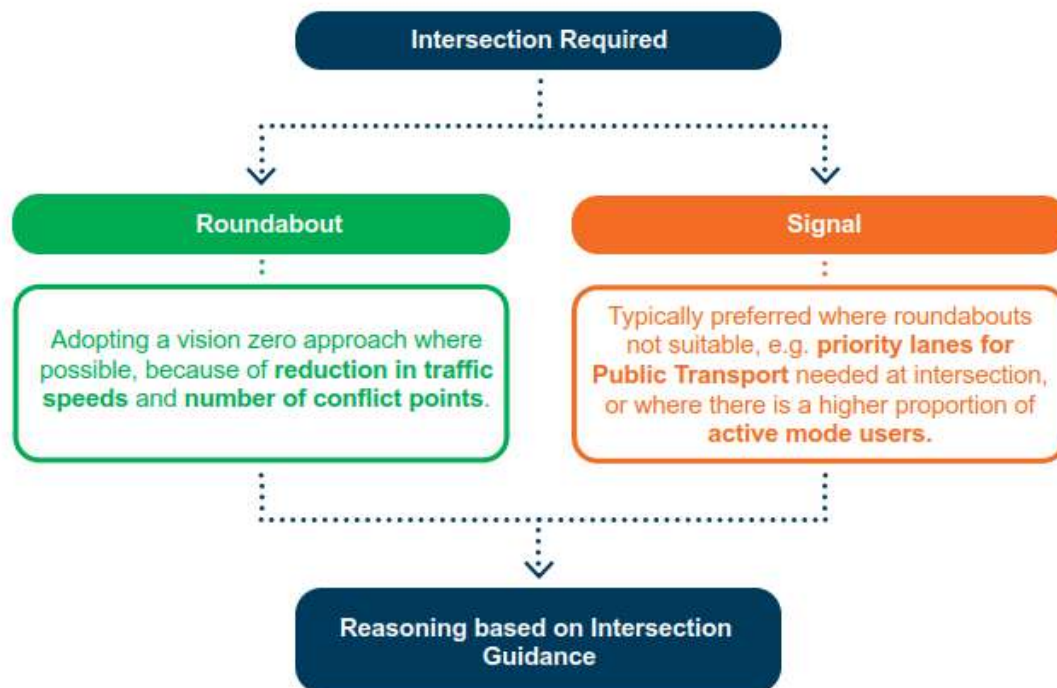


Figure 9-5: Intersection typology decision-making

The gaps for potential intersections were based on the 2048 network and assessing where new and existing roads will meet. Considerations for intersections in Drury included:

- Ensuring access was maintained as much as possible, but not in a way that precluded efficient movement along the corridor, particularly for PT and active modes
- Adequate consideration of modal needs at intersections, for example priority intersection requirements for FTN and safe and efficient crossing opportunities for active modes
- Intersection size (determined by SiDRA modelling), particularly in more constrained existing urban areas
- Ensuring each intersection had sufficient space for queuing length and the LOS is acceptable

Where an intersection is viewed as required, SGA guidance is used to determine whether this would be a roundabout or a signal to inform the route protection strategy. The guidance considers a number of factors including operational performance, safety, road environment and different road users. The guidance adopts a 'Safe System' approach and recommends roundabouts as the first choice for at-grade intersections due to the safety benefits for vehicular traffic resulting from slowing down through traffic and reducing the number of conflict points. However, where roundabouts are not considered appropriate, signalised intersections are then analysed.

For either intersection typology chosen, design features are also considered to ensure that the intersection meets the needs of different users safely and effectively and responds to the site-specific

factors. These factors are summarised in Figure 9-6. The rationale and intersection decision-making are further discussed in **Appendix B: Transport Assessment Report**. A summary of the decisions made are discussed for each corridor as part of the option assessment in section 9.2. For further discussion, refer to **Appendix B: Transport Assessment Report**.

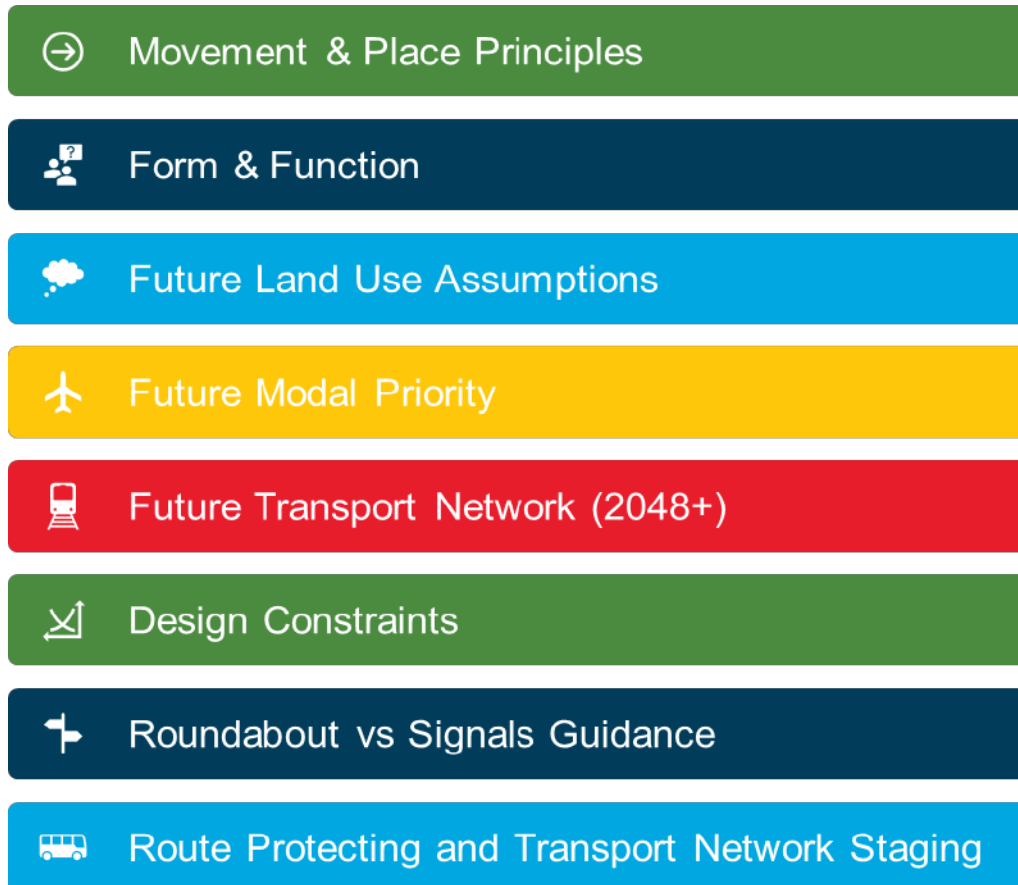


Figure 9-6 Intersection considerations

9.1.4.4 Approach to Stormwater Infrastructure

The additional land required to construct, operate and maintain the transport network with regard to stormwater infrastructure is dependent upon the type of stormwater management devices chosen for each corridor. In order to determine the type and location of stormwater infrastructure a design process was undertaken. This process is summarised below:

1. Identification of stormwater management devices used for each corridor The type of stormwater management devices identified for use was based on a number of factors including the surrounding land-use, form of the transport route, road hierarchy and how connectivity to any adjacent properties is to be provided. This approach is summarised in Table 9-5.

Table 9-5 Stormwater System Design Approach Summary

Stormwater Design Environment	Treatment	Conveyance	Attenuation	Diversion
Existing Urban	Proprietary treatment devices or treatment wetland/pond	Pits and pipes	Above ground devices, attenuation wetland/pond or underground tanks	N/A
Future Urban¹	Proprietary treatment devices or treatment wetland/pond	Pits and Pipes	Above ground devices, attenuation wetland/pond or underground tanks	Cut-off channels as required
Rural	Treatment swales or treatment wetland/pond	Conveyance channels	Attenuation swale or wetland/pond	Cut-off channels as required
<i>Note: ¹ Assuming direct access from future residential to the main corridor are restricted. To align with the overall project objective, developable land adjacent to the corridors within this environment should be maximised.</i>				

2. Identification of a need for flood attenuation and wetland locations identified

- The following approach was generally taken to determine the need for, and location of attenuation devices such as stormwater wetlands, noting that stormwater attenuation devices tend to be most efficient where sited at a centralised location to capture larger catchments:
 - Assess the downstream flood risk
 - Estimate the runoff from maximum probable development (that is, maximum expected impervious areas within the transport corridor)
 - Design of a primary (10-year) network to cater for the runoff
 - Location and sizing of primary (10-year) attenuation devices if required to address lack of capacity in a downstream network or reduce primary network sizes
 - Identification of secondary (100-year) flow paths and floodplains
 - Location and sizing of secondary (100-year) attenuation devices to reduce floodplain and overland flow path extents.
- If it was determined that a stormwater wetland was required, the location of the wetland was identified by ensuring the wetland was placed suitably off-line at a low point along the alignment and close to the corridor for easy access and maintenance. Also required was an outlet structure to discharge to a nearby natural stream.
- Where environmental constraints had been identified by technical specialists through the route refinement options assessment, these were also considered.

9.1.5 Options scope and assessment process summary

The bespoke option process for each project is shown in Table 9-6. The options were assessed either through the Supporting Growth MCA. This was either a scored or qualitative assessment. Further details on the options assessment process can be reviewed in **Appendix A: Options Assessment Report**. Section 9.2 summarises the options at route refinement level, which led to the recommended network.

Table 9-6: Approach to DBC Optioneering

Project		Option Development		Option Assessment		Options
		Corridor Assessment	Route Refinement	MCA Qualitative	MCA Scored	
Jesmond Road FTN Upgrade			✓	✓		Option A (west), Option B (east) and Option C (centre)
Jesmond to Bremner link (proposed road through Auranga development)						No options assessment required. ¹¹
Bremner Road Central FTN (Ngakoroa Stream)			✓	✓		Option A (north), Option B (south), Option C (centre)
Bremner Road East FTN (SH1 crossing)	Stage 1a		✓		✓	Option A (upgrade existing roads) Option B (short bridge, Firth at grade) Option B1 (medium bridge, Firth at grade) Option B2 (medium bridge, Firth at grade and intersection with Creek Street) Option C (long bridge, Firth blocked (rerouted), intersection at Creek) Option D (long bridge, Firth under, no access from Bremner) Option D1 (long bridge, Firth under, intersection at Creek)
	Stage 2		✓	✓		Option B2: B2 A (north), B2 B (south), B2C (centre)
Waihoehoe Road West FTN			✓	✓		Option A (north), Option B (south), Option C (centre)
Ponga Road			✓	✓		Option A (north), Option B (south), Option C (centre)
Ōpāheke Road (rural section)			✓	✓		Option A (northeast), Option B (southwest), Option C (centre)
Ōpāheke Urban	Corridor					No options assessment required for widening of the corridor as the upgrade generally fits within the existing corridor
	Settlement Rd Intersection		✓	✓		Route refinement of the Ōpāheke Road / Settlement Road intersection (a pinch point) was required. Option A – signalised intersection with active modes Option B – roundabout in centre of existing intersection Option C – roundabout on eastern side (Settlement Road) Option D – roundabout on southern side (Ōpāheke Road)

¹¹ Alignment was agreed through Private Plan Change 6.

Project	Option Development		Option Assessment		Options
	Corridor Assessment	Route Refinement	MCA Qualitative	MCA Scored	
Ōpāheke North-South FTN		✓	✓	✓	Option A (central), Option B (east), Option C (west)
SH22 Upgrade		✓	✓		Option A (northwest), Option B (southeast), Option C (centre)

9.1.6 Travel Demand Management (TDM)

As detailed in earlier work such as the wider South IBC, influencing travel behaviour is a critical part of each phase of option development. As a project moves progressively through to more detailed development phases, the ability to influence travel behaviour reduces. This is shown in Figure 9-7.

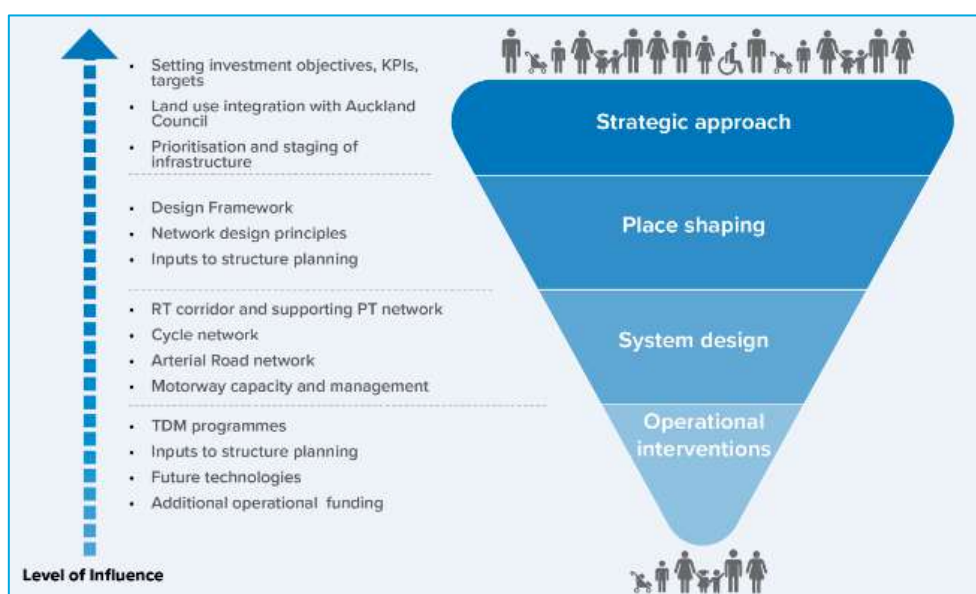


Figure 9-7 Travel Demand Management approach

Within previous phases of work, and the wider South IBC, TDM was predominately focused on the 'Strategic approach' and the 'Place shaping capabilities' of the preferred network. This included the use of a high-level design framework, and consideration of alignment options. A detailed overview of the strategic approach and the place shaping elements can be found in **Appendix B: Transport Assessment**. This includes wider land use implications within the context of the South Area.

Given that the project assessment is now at the DBC stage, the TDM options for these areas have focused on 'System design' and 'Operational interventions' as shown Figure 9-7. Based on the high-level TDM interventions outlined in the South IBC, a finer grain assessment of measures has been undertaken and is detailed further below.

The measures are quantitatively assessed based on likely effectiveness in each area (linked back to the effectiveness measures as identified in the IBC). This DBC is focussed on the identification of the components of the future transport system that requires route protection to be enabled. This by definition is therefore the physical infrastructure. However, the TDM has been progressed to level to ensure that the transport system is 'right sized' and considers the assumed TDM measures.

9.2 Options Assessment

This section summarises the outcomes of the option assessment process outlined in section 9.1 for each of the Drury Local projects. This includes discussion about the functional intent of the corridor, a description of the developed options, the influential contextual factors that helped to differentiate between the options assessed, what the preferred option is and also outlines the investment objective alignment of the preferred option. The detailed option assessment process is summarised in more detail in **Appendix A**.

9.2.1 Jesmond Road FTN Arterial Upgrade

9.2.1.1 Form and Function discussion

Deriving from the IBCs intention for Jesmond Road, and discussed earlier in section 5.1 the purpose of the Jesmond Road arterial upgrade is to form a north south link connecting to Drury West Train Station, forming part of the frequent transport network proposed for the Drury-Ōpāheke area to support the future urban growth. The corridor provides greater accessibility via a north south link that connects Bremner Road to the Drury West Train station and town centre, forming a key PT and active mode spine through Drury west. As shown in Figure 9-8, Jesmond Road has a medium place and medium movement function (P2/M2), based on the RASF Assessment. The connection is expected to have 11,000 vehicles per day (vpd) by 2048. The form of this corridor includes 4 lanes, with 2 dedicated to Public Transit, given the FTN purpose and integration with Bremner Road to provide a connected and seamless FTN link that connects urban areas with the Drury West train station. The other 2 lanes are for general traffic. Due to both the anticipated and existing land use connections, the form of the corridor will include segregated paths for active modes, especially as Jesmond Road has been identified as part of the primary cycle network.

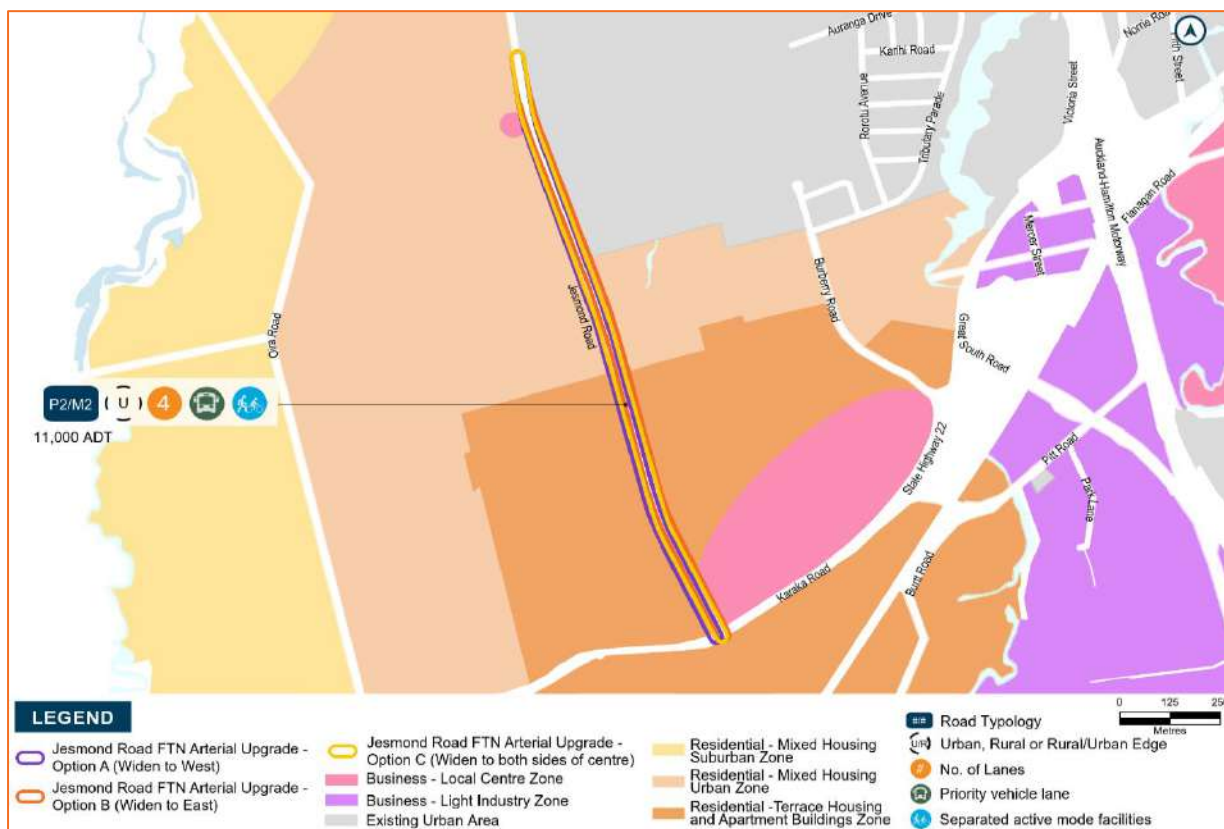


Figure 9-8: Jesmond Road FTN Arterial Upgrade Route Refinement Options

9.2.1.2 Options Assessed

The IBC identified the existing Jesmond Road as the preferred option for this north-south movement in Drury West. A gap analysis undertaken concluded that adequate corridor assessment was undertaken at the IBC phase, therefore the Jesmond Road corridor was to be taken forward to route refinement. Route refinement for Jesmond Road FTN Arterial Upgrade included specialist assessment of three options from the intersection with SH22 to the intersection with proposed Jesmond to Bremner link through the Auranga development. Figure 9-9 outlines the options that were assessed for Jesmond Road FTN Arterial Upgrade in the DBC Route Refinement stage. As per the recommended programme wide cross-section outlined in 9.1.2, the 4 lane corridor will occupy a width of 30m, extending 10m beyond the existing road corridor of 20m.

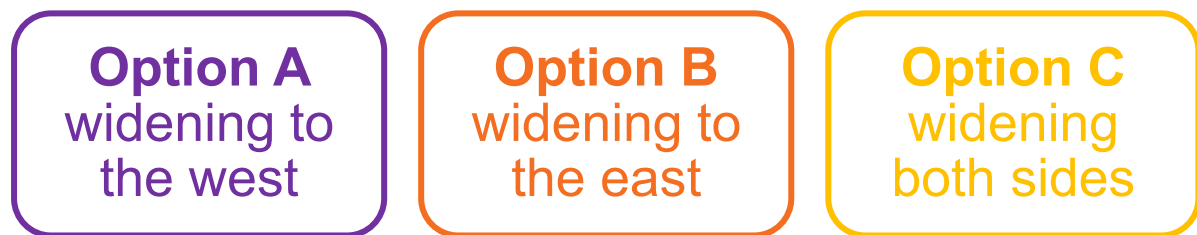


Figure 9-9: Jesmond Road Route Refinement Options

9.2.1.3 Factors of Influence

Whilst all MCA criteria was considered, the more section specific considerations for Jesmond Road during the option assessment process include:

- Integration with Bremner Road to achieve a seamless FTN link
- Reduce impacts on MoE land (future school site)
- Reduce impacts on Housing New Zealand Build (now Kaianga Ora) land dedicated for social housing
- Reduce impacts on heritage site (Te Aroha Cottage)
- Interface with Auranga live zoned properties
- Minimise impact on the local community (residents and businesses) including property impacts

Figure 9-10 spatially identifies these factors, giving context on the positioning of each option against these features. Mitigation or avoidance of constraints and/or positive interface with the surrounding environment (including property, other corridors and projects) influenced which alignment was taken forward as the preferred option. Discussion on the extent of the impact, and which option alignment best addresses these factors, is summarised in section 9.2.1.4 and Table 9-7 below. For more detail, refer to **Appendix A: Options Assessment Report**.

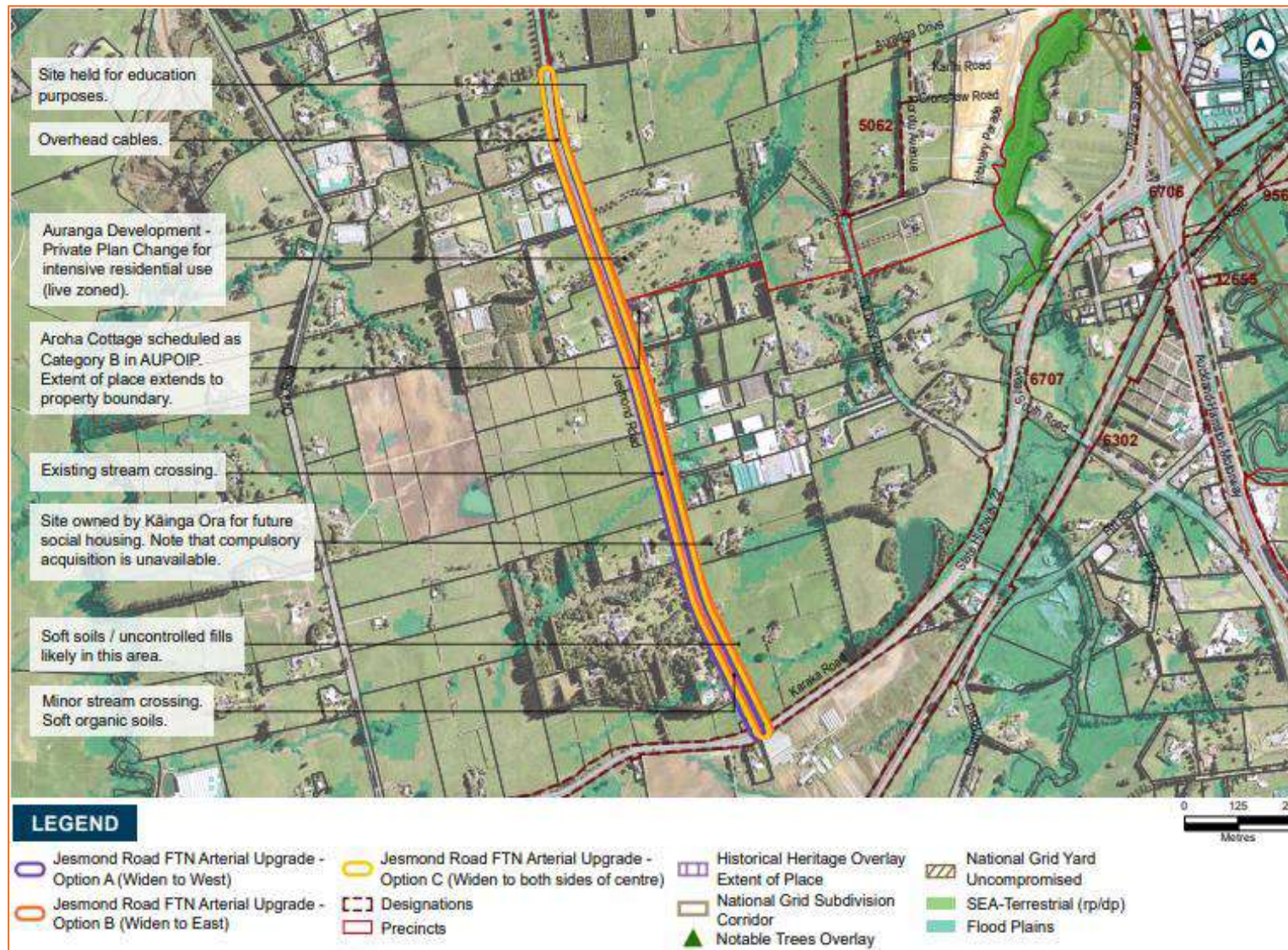


Figure 9-10 Jesmond Road factors of influence and constraints

9.2.1.4 Assessment Summary

The outcomes of the options assessment, highlighting key trade-offs, are summarised in Table 9-7.

Table 9-7 Jesmond Road Assessment Summary

Jesmond Road Frequent Transport Network Arterial Upgrade		
Option	Commentary	Preferred Option
A – Widen to the West	- Best avoids heritage sites (Aroha Cottage) Extent of Place and building as much as possible (acknowledging that the land owner is open to relocating) - Best supports future and existing land uses that serve the community (MOE, Kainga Ora and heritage site) as it requires the least amount of land where these services are located. - This option is also likely to have less overall property impacts as many joint right-of-ways and accesses to rear properties can be avoided with this option, and less properties requiring full acquisition - Widening to the west avoids live zoned property at the northeast of Jesmond Road (Auranga development) and does not decrease the footprint for development (with residential development presumed to occur in the near future). This land would also likely be more expensive.	✓
B – Widen to the East	- Greater impact on Historic Heritage extent of place (Te Aroha Cottage) - Greater land requirements for both MoE and Housing NZ sites - Greatest impact on live zoned properties	
C – Widen both sides	- Positive urban design opportunity to integrate with adjacent land use due to smaller embankments - Widening on both sides is more complex for temporary traffic management during construction - Greater impact on Historic Heritage extent of place (Te Aroha Cottage) - Greater land requirements for both MoE and Housing NZ sites - Impacts live zoned properties.	

The identification of the preferred alignment options for Jesmond Road allowed for confirming the desired intersection forms appropriate for the two intersections along this corridor. guidance summarised in 9.1.4.1 has informed this process, with decisions summarised below in Table 9-8.

Table 9-8 Jesmond Road intersection form

Intersection		Form		Modal Priority			Justification/Constraints/Triggers	Preferred Intersection Form
Name	Arms	Lanes	Speed	PT	Active Mode	Freight		
Jesmond Rd / Bremner Rd Intersection	Jesmond (existing) ↓	2	<50k m/h	Low	Med		- PC6 agreement constrains footprint. - FUZ land-use (mixed-use and schools) increases active mode modal priority	Signalised Intersection
	← Bremner	4	50km /h	FTN	High	Low		

Intersection		Form		Modal Priority			Justification/Constraints/ Triggers	Preferred Intersection Form
Name	Arms	Lanes	Speed	PT	Active Mode	Freight		
	Western Collector ➔	2	Low	Low	Med		High-quality bus priority and expected future school trips	
	Jesmond Upgrade ⬆	4	50km /h	FTN	High	Low		
Jesmond Road / SH22 intersection included within the SH22 Corridor. See Section 9.2.10								

9.2.1.5 Preferred option for Jesmond Road FTN Arterial Upgrade

The preferred option is a result of the considerations summarised in the sections above and detailed in **Appendix A: Options Assessment Report**. In summary, Option A (generally widening to the west) is the preferred option and is shown in Figure 9-11. In comparison to Options B and C, the more notable advantages of this option are the reduced social and cultural impacts, because for the most part, impacts on the environment and economic are negligible in difference between A, B and C. The advantages include lesser impacts on notable factors of influence outlined in section 9.2.1.3, including avoidance of live zoned property providing for immediate housing supply, other properties, heritage sites, and both MoE Kainga Ora land. This option reduces impact on these properties and maintains the area of land available at these sites for community facilities (school and social housing).

The lesser impact on property reduces the overall project costs that would be associated with property acquisition. Other than that, costs were not a differentiator for option selection. Additionally, widening to just the one side also reduces the complexity of temporary traffic management during construction, thus preferred over option C.

As discussed, property impact was a key consideration, and this was raised as a key concern in feedback from landowners (In December 2019 and January 2020) on the draft preferred option for the Jesmond Road corridor. Therefore, despite preference for Option A – generally widening to the west – as it best avoids property impact, design refinement considered the direction of widening at the southern extent of Jesmond Road, at the intersection with SH22, with the alignment shifting to the east to reduce property impacts here.



Figure 9-11: Jesmond Road FTN Arterial Upgrade Preferred Option

This option aligns strongly with the investment objectives, as summarised in Table 9-9. In particular, the Jesmond Road FTN Arterial Upgrade is supportive of IO2 - addressing the need to provide for facilities that are more appropriate for the imminent urbanisation in the Drury West growth area.

Error! Reference source not found. summarises the indicative land requirement for Jesmond Road (note the designation boundaries are indicative only, refer to **Appendix A: Options Assessment Report** for further detail).

Table 9-9 Jesmond Road investment objective alignment

Investment Objective Alignment

IO1 Support growth and a more sustainable, quality urban form in Drury by improving connectivity to/through the Drury West Area.

The overall Jesmond Road corridor upgrade is supportive of this objective, providing a key linkage for the Drury West area to key destinations: Drury West town centre at the SH22/Jesmond Intersection, Drury West train station, and the wider network connections via rail and FTN, such as Manukau, Puhinui, and beyond. The form and function of this enhances connectivity for multiple modes, forming part of the primary cycle network and FTN, unlocking *safe and sustainable choices and improving connectivity to/through the Drury area to support current and future residents*. Evidence suggests these factors are integral to supporting sustainable, quality urban form.

IO2 Achieve a transformational mode shift for trips to key destinations in Drury (incl. rail stations, centre and the strategic north-south PT network) by providing high quality, safe and attractive PT and active mode facilities on Jesmond Road

The form of this corridor supports IO2 through the provision of high quality, safe and attractive PT and active mode facilities, evidenced in Figure 9-11. As discussed above, this is integral to supporting the anticipated growth and land-use adjacent to the corridor, to encourage mode shift and avoid reliance on LOVs.

9.2.2 Bremner Road FTN Arterial Upgrade (Central) Options Assessment

The Bremner Road FTN Arterial Upgrade has been split into three sections for options assessment: Jesmond to Bremner link (through Auranga development), Central and East, exemplified in Figure 9-12. This section describes the assessment of the section of Bremner Road that runs from the Ngakoroa Stream crossing to SH1.

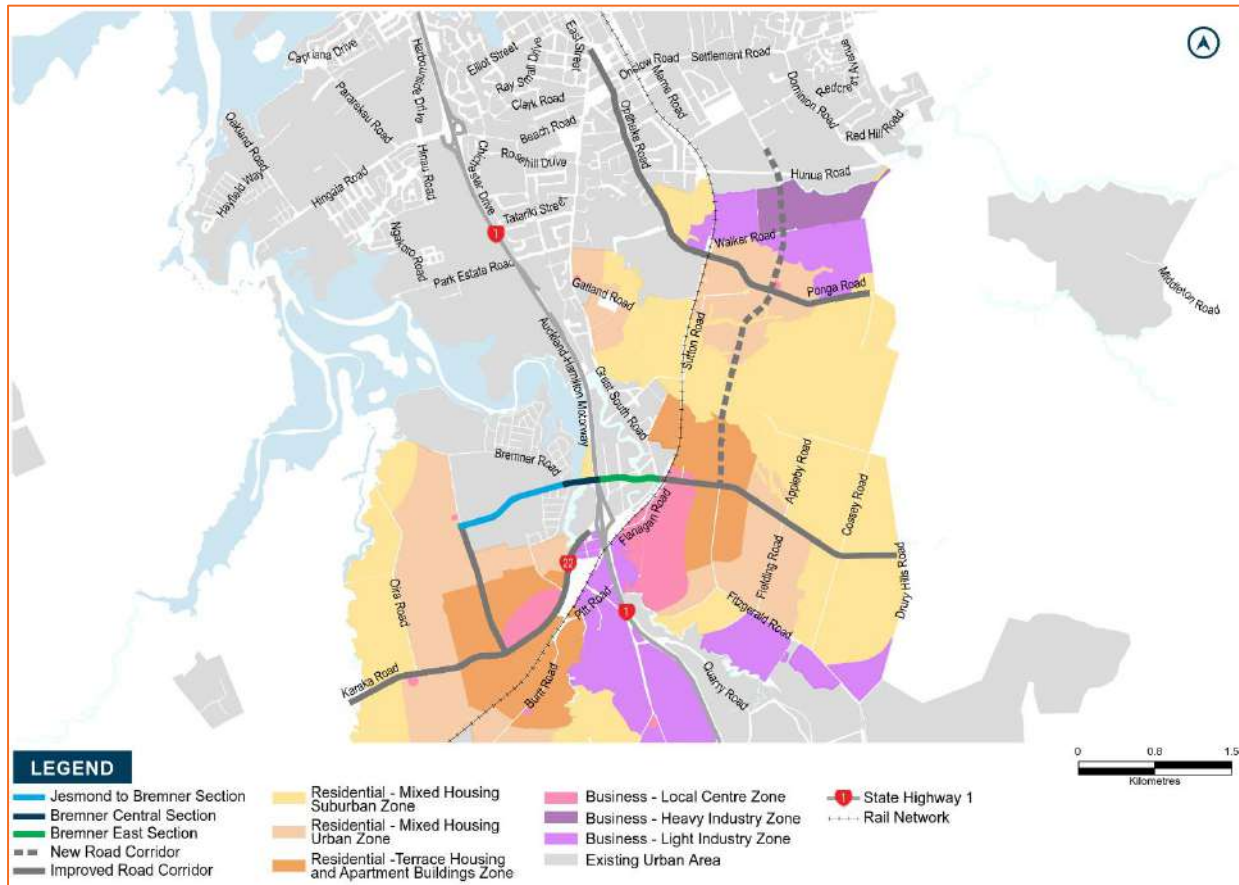


Figure 9-12 Bremner Road FTN Arterial Upgrade assessment sections

9.2.2.1 Form and function assessment

Deriving from the IBCs intention for Bremner Road, and as discussed earlier in 5.2, the functional intent for the entire length of the Bremner Road FTN Arterial Upgrade is to form part of the frequent transport network proposed for the Drury-Ōpāheke area to support future urban growth. The function of the road provides strategic east-west connectivity for the existing and future land use comprising of a mix of significant destinations and residential development along the length of the corridor. The connection will also reduce through traffic movement on local roads which should reduce congestion and make both local and arterial roads safer and more efficient. Thus, despite, being split into sections for assessment, the functional intent of this section should contribute to the wider corridor context and functionality, otherwise the FTN connection becomes disjointed and ineffective.

As shown in Figure 9-13, Bremner Central has a medium place and medium movement function (P2/M2), based on the RASF Assessment. The connection is expected to have 23,000 vpd by 2048. The form of this corridor includes 4 lanes, with 2 dedicated to Public Transit, which aligns with the Bremner East section to connect Drury Central Train station with the Drury township with frequent PT. The other 2 lanes are for general traffic. Due to both the anticipated and existing land use

connections, the form of the corridor will include segregated paths for active modes, especially as Bremner Road has been identified as part of the primary cycle network.

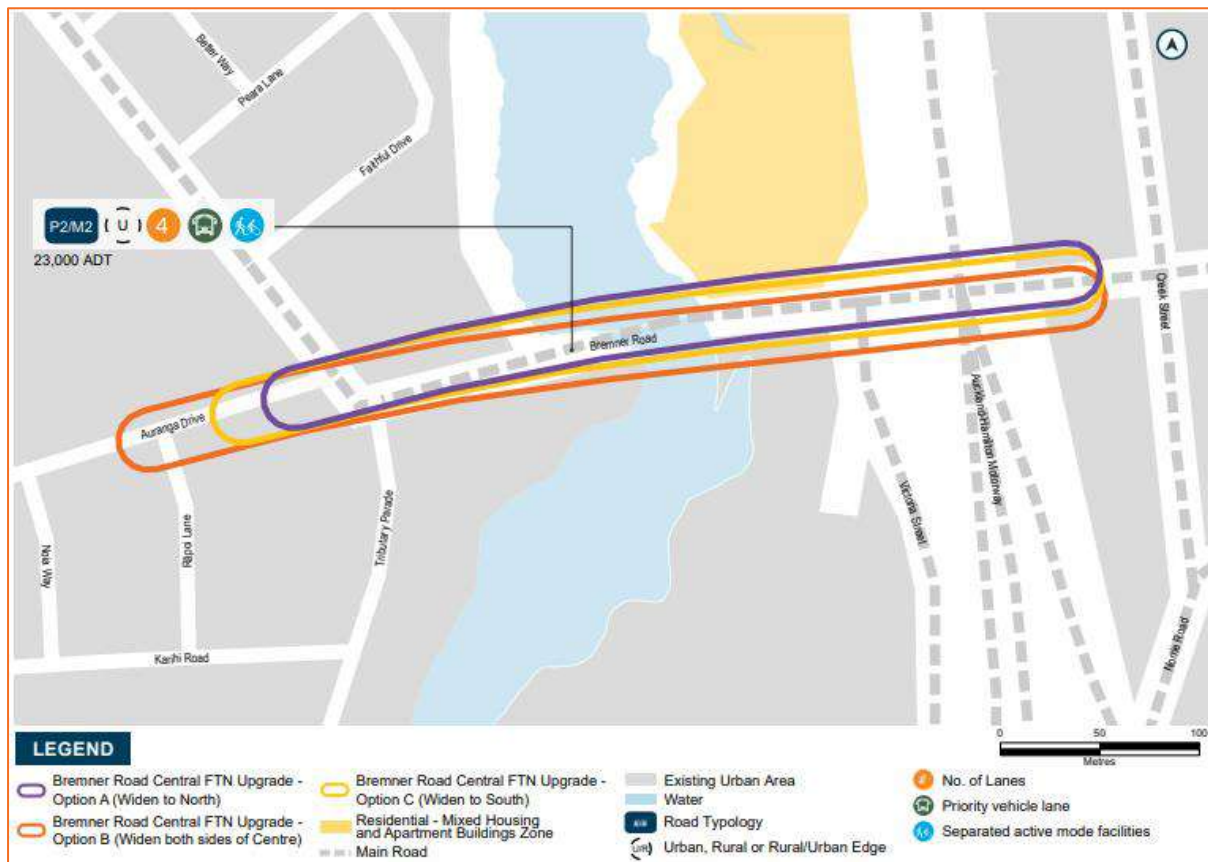


Figure 9-13 Bremner Central FTN Arterial Upgrade Route Refinement Options

9.2.2.2 Options Assessed

The IBC identified this existing section of Bremner Road, in conjunction with the Jesmond to Bremner link in the west (Auranga Road 1) and east (Norrie Road) as the preferred option for this east-west movement in Drury West. A gap analysis undertaken concluded that adequate corridor assessment was undertaken at the IBC phase, therefore the Bremner Road Central corridor was to be taken forward to route refinement. Route refinement for the Central section of Bremner Road included specialist assessment of three options (Figure 9-13 above and Figure 9-14). As per the recommended programme wide cross-section outlined in 9.1.2, the 4-lane corridor will occupy a width of 30m, extending 10m beyond the existing road corridor of 20m

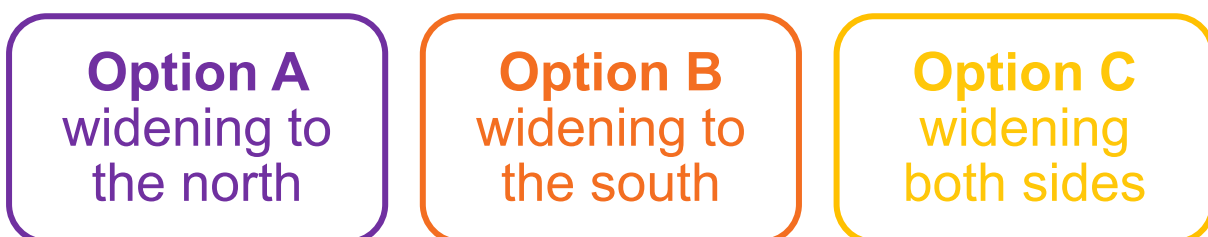


Figure 9-14 Bremner Central FTN Arterial Upgrade Route Refinement Options

9.2.2.3 Factors of Influence

Whilst all MCA criteria was considered, the more section specific considerations for Bremner Road during the option assessment process include:

- Optimisation of intersection form and network resilience
- Work with property specialist to reduce property impacts (access and acquisition)
- Reducing impacts on Significant Ecological Areas and the coastal marine area
- Reduce impacts on archaeological features and built heritage (note avoiding the northern scheduled site means that southern site likely cannot be avoided and needs further archaeological investigation if impacted)
- Interface with the Auranga section of Bremner Road and the imminent development

Figure 9-15 spatially identifies these factors, giving context on the positioning of each option against these features. Mitigation or avoidance of constraints and/or positive interface with the surrounding environment (including property, other corridors and projects), influenced which alignment was taken forward as the preferred option. Discussion on the extent of the impact, and which option alignment best addresses these factors, is summarised in section 9.2.2.4 and Table 9-10 below. For more detail, refer to **Appendix A: Options Assessment Report**.

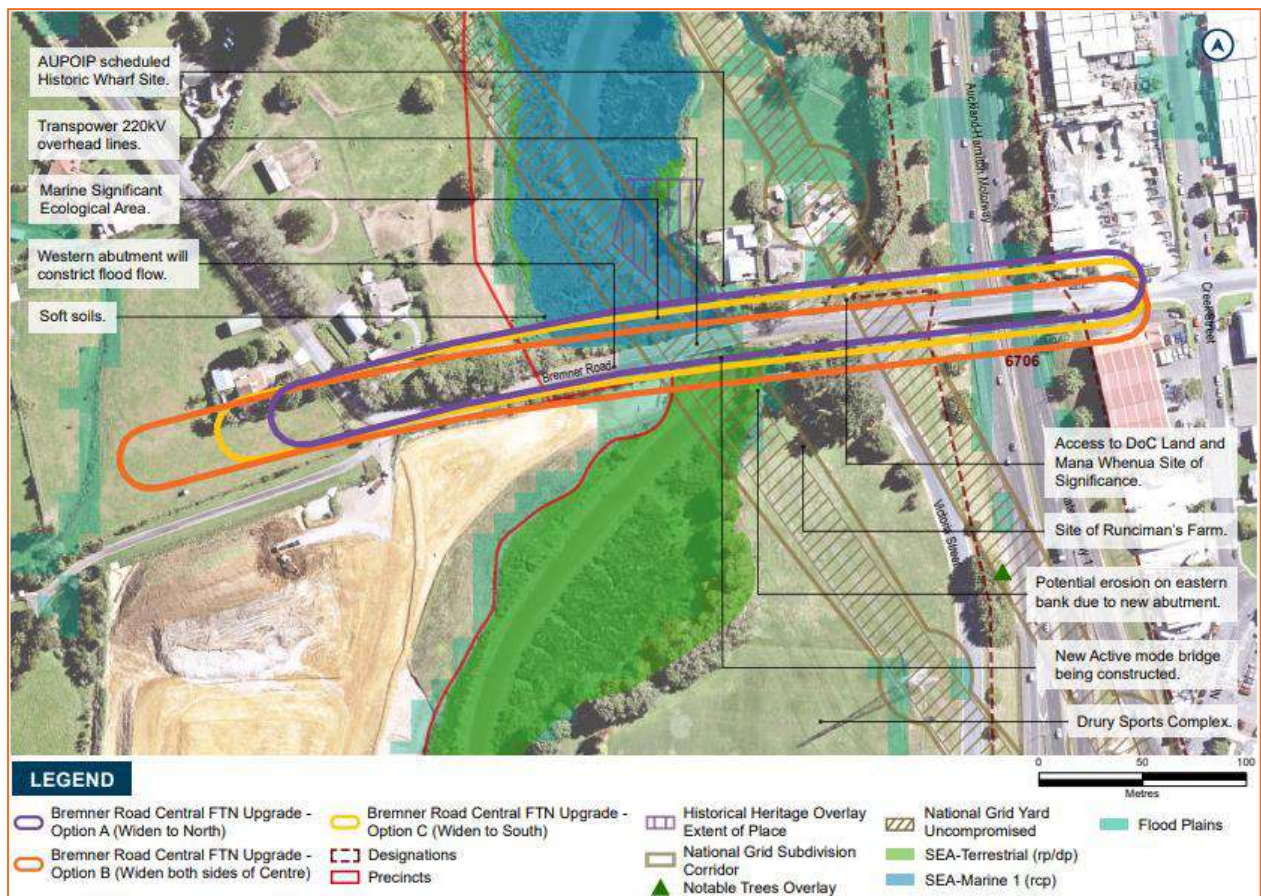


Figure 9-15 Bremner Central FTN arterial upgrade constraints

9.2.2.4 Assessment Summary

The outcomes of the options assessment, highlighting key trade-offs, are summarised in Table 9-10.

Table 9-10 Bremner Central FTN Arterial Upgrade Assessment Summary

Bremner Road (Central) Frequent Transport Network Arterial Upgrade		
Option	Commentary	Preferred Option
A – Widen to the North	- This option would impact on the scheduled item of historic heritage at 51 Bremner Road - Greater property impact - Larger impact on vegetation and habitat in the coastal marine area.	
B – Widen to the South	- This option reduces impacts in the coastal marine area in line with policy direction of the NZCPS and AUPOIP - This option has the least impact on Significant Ecological Areas – Marine 1, and Terrestrial, preferred by mana whenua. - Has potential to impact heritage sites (on the northern side) - This option has less property effects overall as it is not likely to impact the houses at [REDACTED] - This option provides for a better interface with Auranga development. - Option B has a greater impact on the reserve land and the Drury Sports Complex, but access would be managed	✓
C – Widen both sides	- Impacts on the scheduled item of historic heritage at 51 Bremner Road - Greater property impact - Impacts on walking and cycling bridge - Impact on vegetation and habitat in the coastal marine area. - Complexity of bridge construction staging and traffic management	

The identification of the preferred alignment options for Bremner Road (Central) allowed for confirming the desired intersection forms appropriate for this corridor. Guidance summarised in 9.1.4.1 has informed this process, with decisions summarised below in Table 9-11.

Table 9-11 Bremner Road (Central) intersection forms

Intersection		Form		Modal Priority			Justification/Constraints/Triggers	Preferred Intersection Form
Name	Arms	Lanes	Speed	PT	Active Mode	Freight		
Bremner Upgrade / Bremner Old Intersection	Bremner Upgrade ↔	4	50km/h	FTN	Med	Med	- Signalised intersection already agreed in PC6 and under construction. - Proximity to floodplain and Ngakoroa Stream (Significant Ecological Area).	Signalised Intersection
	Bremner Old ↓	2	<50 km/h	Low	Low	Low		
	New Collector ↑	2	<50 km/h	Low	Low	Low		

9.2.2.5 Preferred option for Bremner Road Central

Option B (generally widening to the south is shown in Figure 9-16. The advantages of Option B include lesser impacts on notable factors of influence outlined in 9.2.2.3, including the reduced impact on properties, avoidance of archaeological sites and better interface with Auranga development. The lesser impact on property reduces the overall project costs that would be associated with property acquisition. Other than that, costs were not a differentiator for option selection. Additionally, due to the lesser impact on the Marine 1 Significant Ecological Area, this option was preferred by mana whenua. There were no evident differentiators between the three options with regard to social, urban design, landscape and visual, health and wellbeing, stormwater and flooding, natural hazards and utilities.



Figure 9-16 Bremner Central FTN Arterial Upgrade Preferred Options

This option aligns strongly with the investment objectives, as summarised in Table 9-12. In particular, the Bremner Road FTN Arterial Upgrade (Central) is supportive of IO2 - addressing the need to provide for facilities that are more appropriate for the imminent urbanisation in the Drury growth area.

Table 9-12 Bremner Central FTN Arterial Upgrade investment objective alignment

Investment Objective Alignment
IO1 Support growth and a more sustainable, quality urban form in Drury by improving connectivity to/through the Drury West Area. The overall Bremner Road corridor is supportive of this objective, providing a more direct east-west linkage for the wider Drury area to key destinations, including Drury Central train station and centre. The form and function of this enhances connectivity for multiple modes, forming part of the primary cycle network and FTN, unlocking <i>safe and sustainable choices and improving connectivity to/through the Drury area to support current and future residents</i>. Evidence suggests these factors are integral to supporting sustainable, quality urban form, especially in contrast to the existing road which will no longer be appropriate as the Drury area urbanises. The new section of Bremner Road will also shorten the local connection between Drury West and Drury East.
IO2 Achieve a transformational mode shift for trips to key destinations in Drury (incl. rail stations, centre and the strategic north-south PT network) by providing high quality, safe and attractive PT and active mode facilities on Bremner Road The form of this corridor supports IO2 through the provision of high quality, safe and attractive PT and active mode facilities, evidenced in Figure 9-16. As discussed above, this is integral to supporting the anticipated growth and land-use adjacent to the corridor, to encourage mode shift and avoid reliance on LOV's.

9.2.3 Bremner Road FTN Arterial Upgrade (East) Options Assessment

9.2.3.1 Form and function assessment

Section 9.2.2.1 describes that the Bremner Road FTN Arterial Upgrade has been split into three sections for options assessment: Jesmond to Bremner link, Central and East. This section describes the section of Bremner Road that runs from the SH1 crossing to a tie in with Great South Road. This also includes the potential upgrade of Creek Street, Firth Street and Norrie Road.



Figure 9-17 Bremner Road FTN Arterial – East Section existing alignment

This section ties in with the functional intent of the corridor, seeking to provide east-west connectivity and forming part of the frequent transport network proposed for the Drury-Ōpāheke area. As shown in Figure 9-17, Bremner East has a medium place and medium movement function (P2/M2), based on the RASF Assessment. The connection is expected to have 25,000 vpd by 2048. The form of this corridor includes 4 lanes, with 2 dedicated to Public Transit, which aligns with the Bremner Central section, connecting the Drury West Train station with the Drury township with frequent PT. The other 2 lanes are for general traffic. Due to both the anticipated and existing land use connections, the form of the corridor will include segregated paths for active modes, especially as Bremner Road has been identified as part of the primary cycle network.

9.2.3.2 Options Assessed

As exemplified by the process in 9.1 the Gap Analysis recommended investigating alternatives to the large bridge structure crossing the Hingaia Stream and floodplain. The first stage of route refinement looked at these alternatives which also led to different configurations of the intersections and layout of the adjoining local roads (stage 1a). Once the general layout was recommended (stage 1b), further route refinement was undertaken to decide which side of the existing roads to widen (stage 2).

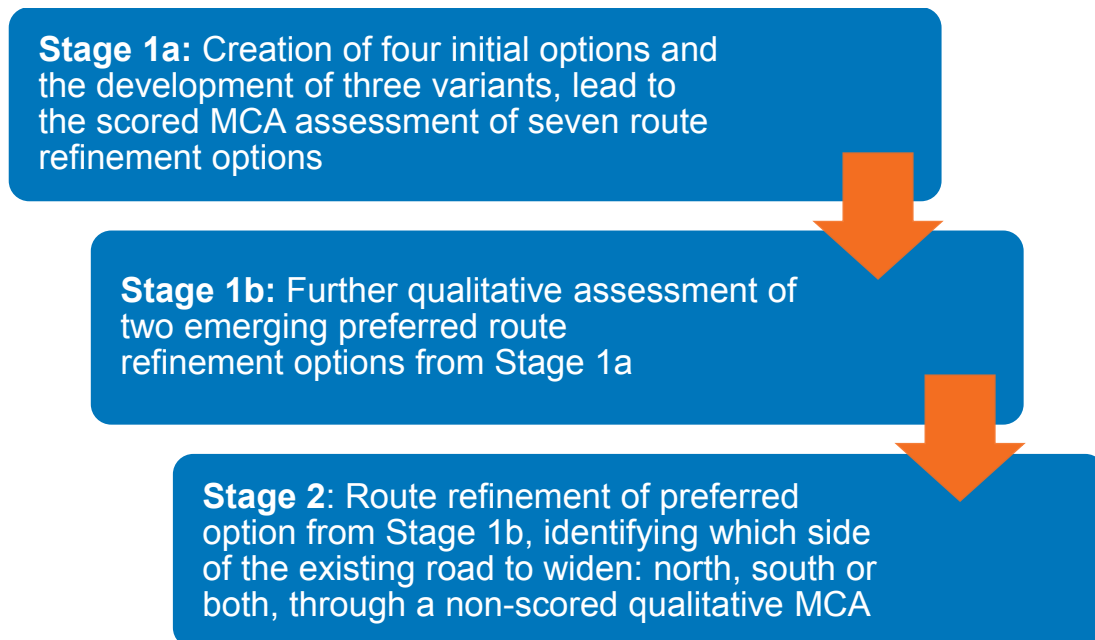


Figure 9-18 Assessment stages for Bremner East

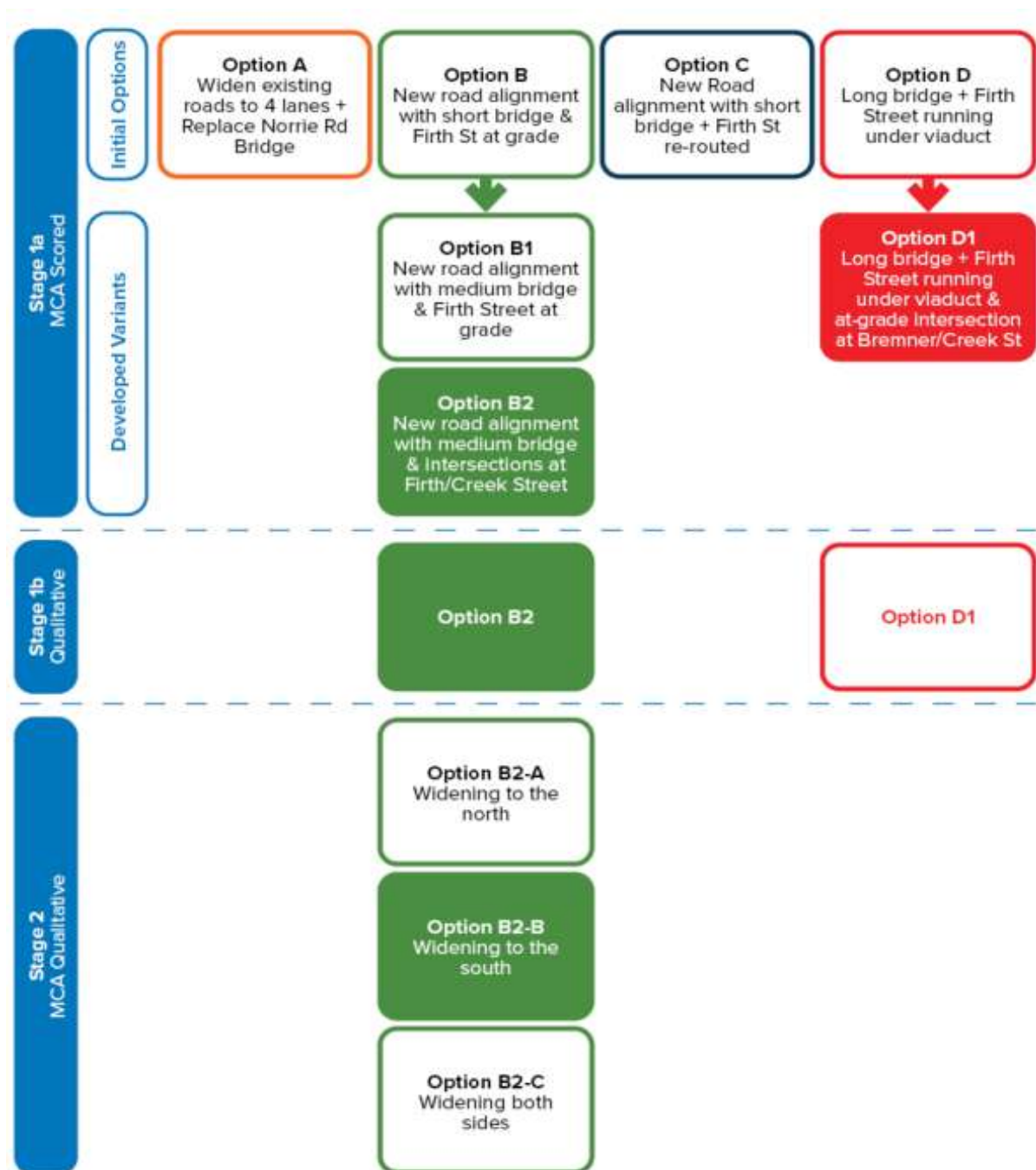


Figure 9-19: Summary of the Bremner Road East Options and Assessment Process ¹²

¹² For more detail on the options, see the **Appendix A: Options Assessment Report**.



Figure 9-20 Bremner East Options

9.2.3.3 Factors of Influence

Whilst all MCA criteria was considered, due to the additional level of assessment and complexity for Bremner East, these factors were of particular importance to the qualitative assessment in Stage 1b to differentiate between the two emerging preferred options.

Factors that needed further analysis related to:

- Transport:
 - Consideration of road closures/ creating cul-de-sacs
 - Optimisation of two closely spaced intersections (Option B2).
 - Optimisation of PT movements
 - Consideration of active mode ease of access / crossing
- Flooding:
 - The frequency and duration of flooding of Bremner Road/ Firth Street intersection for Option B2 (and the likely disruption of this)
 - Potential flooding impacts on upstream and downstream properties and likely mitigation required.
- Network resilience: a high-level estimate of the transport benefits of investing in a more resilient option (option D1).
- Costs: the cost difference between the options (including construction and property acquisition)

Following Stage 1 assessment, refinement of the preferred option included analysis of the following design recommendations:

- Optimise intersection form – T-intersection at Bremner/Creek Street.
- Reduce property impacts (access and acquisition)
- Reduce impacts on archaeological features and built heritage
- Refine the design to mitigate stormwater/flooding effects
- Likely relocation of Telecom mast.

Figure 9-21 spatially identifies the factors most prevalent for options B2 and D1, giving context on the positioning of each option against these features. Mitigation or avoidance of constraints and/or positive interface with the surrounding environment (including property, other corridors and projects), as well as consideration of the costs involved, influenced which alignment was taken forward as the preferred option. Discussion on the extent of the impact, and which option alignment best addresses these factors, is summarised in section 9.2.3.4 and Table 9-7 below. For more detail, refer to **Appendix A: Options Assessment Report**.

Option B2



Option D1



LEGEND

- Bremner Road East B2 & D1 (central)
- + Intersection
- Access Route to Light Industrial Area
- State Highway 1
- +++ Rail Network
- Historical Heritage Overlay Extent of Place
- Bridge Options:
B2: 90m
D1: 200m viaduct

Figure 9-21 Bremner East FTN arterial upgrade constraints

9.2.3.4 Assessment Summary - Stage 1

Following the initial Stage 1 workshop, the limitations of option A and C were evident due to the following factors:

- Option A – retention of dog leg did not optimise transport connectivity, impacting on PT attractiveness, active mode amenity, and congestion. Additionally, this option does not address flood impacts
- Option C – has the largest impact on stormwater and flooding and requires the greater land acquisition

However, B and D were seen to have potential, and therefore led to the development of sub-options B1, B2 and D1. A summary of the options assessment further described in Table 9-13 and Table 9-14 below.

Table 9-13 Bremner East Assessment Summary – Stage 1

Bremner Road (East) Frequent Transport Network Arterial Upgrade – Stage 1			
Option		Commentary	Preferred Option
B		• Provides a continuous and more seamless route to Great South Road for all road users due to a new east-west road connection between Creek Street and Firth Street as a result of closing Creek Street. • A well-connected public and private realm interface and place making opportunity resulted in a more positive urban design score. • However, greater land acquisition required for this option. • largest impact on stormwater and flooding as the mitigation required for the blocked passage of flood flows will require land take of property south of Norrie Road and openings will be required in the bridge abutments	
B1		• For the same reasoning as Option B, B1 scored positively against the investment objectives and urban design. • However, B1 was developed to reduce stormwater impacts, and has less significant impacts on stormwater (-2) and ecology (0) compared to option B, but still has flooding along part of the alignment.	
B2	Stage 1a	• This option does not require the additional connection between Creek Street and Firth Street whilst still scoring positively against the investment objectives. • Instead, two signalised intersections are provided, which has the potential to impact journey times. This can be mitigated by closing and forming a T intersection at Creek St to reduce delays and conflict points. • This layout contributes to positive scores for land use futures and urban design, due to the integration with residential, town centres and train stations, as well as integrating with the light industrial area and use. • Similar to B1, B2 doesn't have as significant impacts on stormwater (-2) and ecology (0), but still has flooding along part of the alignment.	✓

Bremner Road (East) Frequent Transport Network Arterial Upgrade – Stage 1			
Option		Commentary	Preferred Option
	Stage 1b	- After a qualitative assessment to differentiate between B2 and D1, this option was preferred for the following reasons: - Provides a direct and accessible corridor. The two closely spaced intersections can be optimised to reduce conflicts and provide priority for PT and walking and cycling. Opportunity for Creek Street intersection to be a signalised T. - The benefits of the additional resilience of option D1 are small compared to the additional cost of approximately £1.5m. - Opportunity to raise the road level to increase resilience. - Likely re-routing available in a flood event if a temporary south access can be gained via Creek Street, depending on flood levels. - Therefore, three route refinement options were developed and assessed for option B2 for Bremner Road East	✓
D		- This option has the most positive score for PT attractiveness due to the lack of intersections, but this results in an adverse score against IO1 due to no provision of direct access to the industrial area from Bremner Road, requiring vehicles to detour via Great South Road and then to Firth Street. - However, this option has the least adverse scoring for flood impacts, as the bridge is raised above the floodplain. - This option will require retained abutments and fill, as well as large land requirement and construction complexity.	
D1	Stage 1a	- This option provides a direct and continuous east-west connection, with one intersection, and access to the industrial area, so an additional east-west connection is not required. - This also contributes to direct and reliable PT and separated active mode facilities. - This option provides an increased level of flood protection for the road compared to the existing (completely out of the 100-year floodplain). - However, this is most expensive option because of the longer bridge structure and severs development to the north and south of the long bridge	✓
	Stage 1b	- After a qualitative assessment to differentiate between B2 and D1, this option was discounted for the following reasons: - This option was the most expensive option due to the longer bridge structure - The benefits of the additional resilience of option D1 are small compared to the additional cost of £1.5m. - This option would sever development to the north and south of the long bridge - This option would result in a change in amenity for businesses that would be operating under or adjacent to the bridge/flyover. - This option would require retained abutments and fill, as well as large land requirement and construction complexity.	

Preferred way forward for Bremner Road East – Stage 1

Following the assessment from stage 1, option B2 emerged as the preferred option. This is primarily due to this option scoring well against the investment objectives, providing a direct and accessible corridor for PT and active modes and reduced costs. Additionally, the resilience benefits gained through option D1 were small in comparison to the significant cost XXXXXXXXXX – thus cost was a key determining factor. Furthermore, whilst flooding impacts were more significant in comparison to option D1, there is the opportunity to mitigate this by raising the road level to increase resilience. Option B2 was taken forward as the preferred, and further route refinement was conducted in order to determine which side of the existing road to widen.



9.2.3.5 Assessment Summary – Stage 2

Stage 2 route refinement for the East section of Bremner Road included specialist assessment of three options Figure 9-22 and Figure 9-23. As per the recommended programme wide cross-section outlined in 9.1.2, the 4-lane corridor will occupy a width of 30m, extending 10m beyond the existing road corridor of 20m.

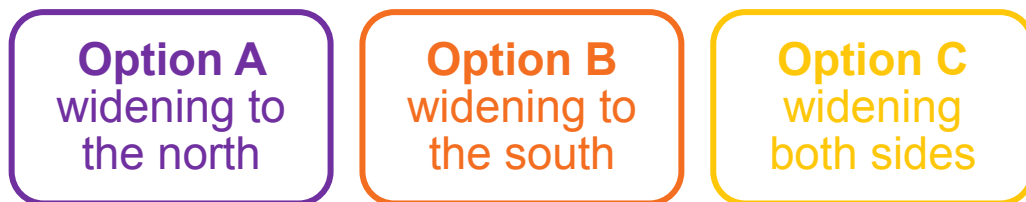


Figure 9-22 Bremner East FTN Arterial Upgrade Route Refinement Options

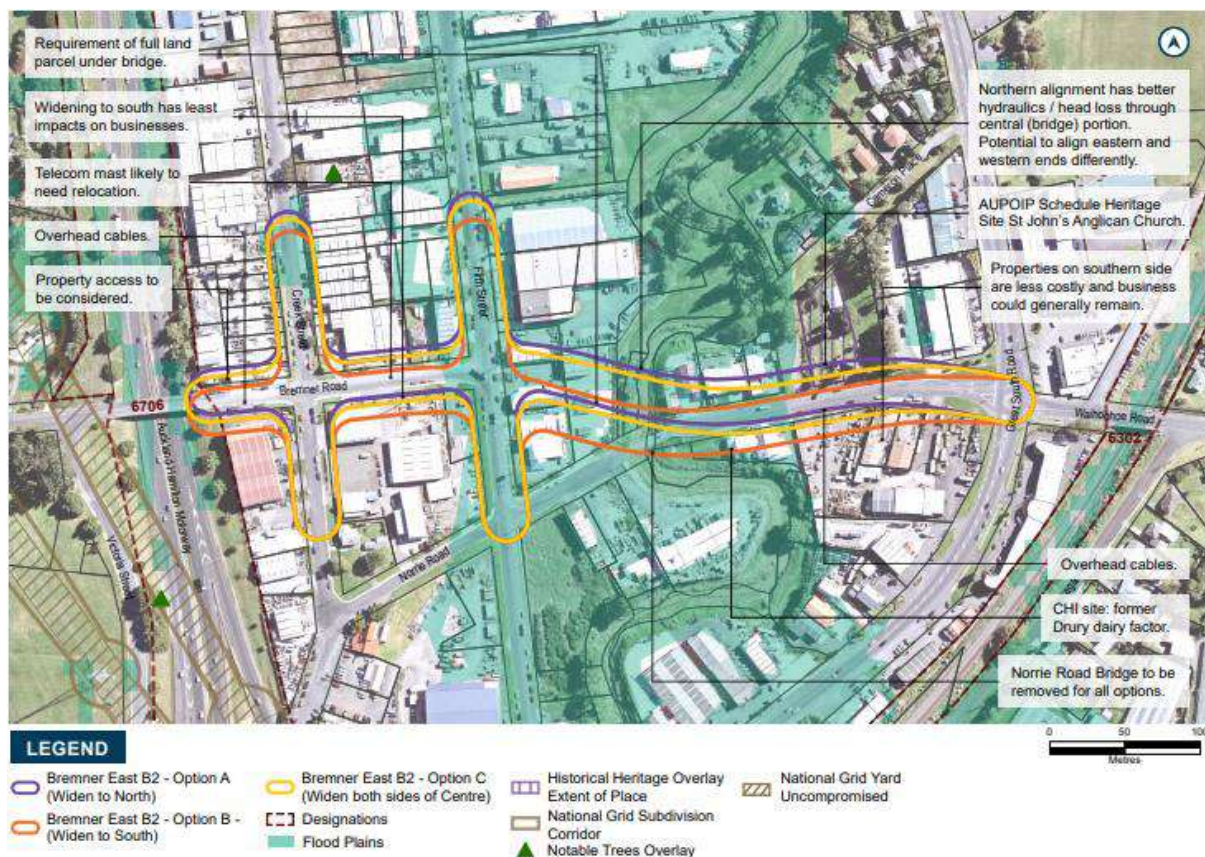


Figure 9-23 Bremner East FTN Arterial Upgrade Route Refinement Options and constraints

The outcomes of the options assessment, highlighting key trade-offs, are summarised in Table 9-14.

Table 9-14 Bremner East Assessment Summary – Stage 2

Bremner Road (East) Frequent Transport Network Arterial Upgrade – Stage 2		
Option	Commentary	Preferred Option
B2-A – Widen to the North	- This option impacts on a scheduled heritage item and gathering place for the community, St John's Anglican Church and Cemetery, potentially adversely impacting the graves and setting of church, and on church itself and users. - This option has larger property impacts overall. - Avoids relocation of the telecoms mast as there is an additional cost to relocate.	
B2-B – Widen to the South	- This option avoids impacts on [REDACTED] - Preserves the businesses, church and graveyard on north side of Norrie Rd - Has the least impact on Significant ecological areas (SEAs) (Marine SEA located on the north side and Terrestrial SEAs located on south side of the Ngakoroa Bridge).	✓
B2-C – Widen both sides	- This option has potential impacts on St John's Anglican Church Cemetery, at 9 Norrie Road, as well as impact on the unscheduled cheese factory at 12 Norrie Road. - This option requires complex staging for the Bremner Road section and complicates the SH1 over bridge construction. - Overall this option has larger property impacts	

Preferred option for Bremner Road East – Stage 2

Option B (shown in Figure 9-23) is the preferred option due to the reduced impact on property (including access and potential for redevelopment) and St John's Anglican Church, community who attend/use the church and removal of mature trees, and avoidance and mitigation of heritage sites. Although it is noted that to avoid impacts on the scheduled heritage site (St John's church), a heritage building on the Auckland Council's Cultural Heritage Inventory will be impacted. The lesser impact on property reduces the overall project costs that would be associated with property acquisition. Other than that, costs were not a differentiator for option selection. There were no evident differentiators between the three options with regards to business disruption, urban design, landscape and visual, health and wellbeing, and ecology.

Bremner Road East Intersection Assessment following assessment summary for stage 1 and 2

The identification of the preferred alignment following assessment in both stage 1 and stage 2 for Bremner Road (East) allowed for confirming the desired intersection forms appropriate for the four intersections along this corridor. Guidance summarised in 9.1.4.1 has informed this process, with decisions summarised below in Table 9-15.

Table 9-15 Bremner Road (East) intersection forms

Intersection		Form		Modal Priority			Justification /Constraints /Triggers	Preferred
Name	Arms	Lanes	Speed	PT	Active Modes	Freight		
Bremner Upgrade / Creek St Intersection	Bremner Upgrade ↔	4	50 km/h	FTN	High	Med	- Intersection density to Firth & Bremner Rd and SH1 too close for roundabout control. - High-quality bus priority east-west.	Signalised Intersection
	Creek St ↕	2	<50 km/h	Low	Med	Med		
Bremner Upgrade / Firth St Intersection	Bremner Upgrade ↔	4	50 km/h	FTN	High	Med	- Intersection density to Firth & Creek Rd & SH1 too close for roundabout control high-quality bus priority east-west. - Proximity to flood plain and bridges	Signalised Intersection
	Firth St ↕	2	<50 km/h	Low	Med	Med		
Great South Road / Bremner / Waihoehoe	Norrie Rd →	4	50 km/h	FTN	High	Med	- FUZ land-use (Town centre, light industry and residential) and proximity to train station increases active mode modal priority - proximity to railway bridge (+future 4 tracking) - High-quality bus priority North-South and East-West. - Proximity to Drury Central Station and connection with SH22 will make this intersection a high conflict zone between all modes (walking and cycling needs more protection). - Grade-separation of active modes considered but not suitable here due to town centre and high urban density - Potential ped signals just south for rail access hence operationally preferred to coordinate signals	Signalised Intersection
	SH22 ↕	4	50 km/h	Med	High	High		
	Waihoehoe Road ←	4	50 km/h	FTN	High	Med		

9.2.3.6 Preferred Option for Bremner Road East

As summarised above, Option B2 was identified as the preferred option in stage 1 which focussed on intersection and bridge configurations. This was preferred primarily due to the transport benefits and reduced costs – which were identified as notable factors of influence between options in section 9.2.3.3 for stage 1b. This was then assessed to determine which side of the corridor should be widened to accommodate the road upgrade in this section, in which Option B – widen to the South – was the preferred due to lesser social impacts on existing sites. The form of this is shown in Figure 9-24.



Figure 9-24 Bremner East FTN Arterial Upgrade preferred cross-section

This option aligns strongly with the investment objectives, as summarised in Table 9-16. In particular, the Bremner Road FTN Arterial Upgrade (East) is supportive of IO2 - addressing the need to provide for facilities that are more appropriate for the imminent urbanisation in the Drury growth area.

Table 9-16 Bremner East FTN Arterial Upgrade investment objective alignment

Investment Objective Alignment
IO1 Support growth and a more sustainable, quality urban form in Drury by improving connectivity to/through the Drury Area. The overall Bremner Road provides a more direct east-west link for the wider Drury area to key destinations, including the light industrial zoning, Drury Central centre and train station. The form and function of this enhances connectivity for multiple modes, forming part of the primary cycle network and FTN unlocking <i>safe and sustainable choices and improving connectivity to/through the Drury area to support current and future residents</i>. Evidence suggests these factors are integral to supporting sustainable, quality urban form, especially in contrast to the existing road, which will no longer be appropriate as the Drury area urbanises further. Option B2 has been chosen as the preferred option for multiple reasons, including scoring positively against investment objectives. The option provides a direct, continuous, and more seamless east-west route to Great South Road for all road users. The opportunity to make Creek Street intersection a signalised T enhances this alignment with IO1 further, especially enhancing the function of the road for active mode users. Additionally, this option does not sever the access to the existing light industrial area.
IO2 Achieve a transformational mode shift for trips to key destinations in Drury (incl. rail stations, centre and the strategic north-south PT network) by providing high quality, safe and attractive PT and active mode facilities on Bremner Road. The form of this corridor, and option B2, supports IO2 through the provision of multi-modal facilities and travel choices, connecting with the rest of the Bremner Road corridor to provide for seamless east-west connectivity – particularly for the FTN – through the Drury area through to Drury Central Rail Station, in which this connection improves connectivity to the wider south network. Despite having two closely spaced intersections, there is an opportunity to optimise the closing of Creek Street to form a T intersection, which includes benefits such as: • Reduction in conflicts for vehicles, pedestrians and cyclists - addressing safety • Provide priority for PT and walking and cycling – addressing attractiveness • Allows for a continuous active mode link – addressing both safety and attractiveness • Reduces delays at the intersection of Bremner Road / Creek Street – beneficial for PT

9.2.4 Bremner Road FTN Arterial Upgrade (Jesmond to Bremner link)

9.2.4.1 Form and function assessment

Section 9.2.2.1 described that the Bremner Road FTN Arterial Upgrade has been split into three sections for options assessment: Jesmond to Bremner link, Central and East. This section describes section that runs from Jesmond Road, through Auranga, and ties in with Bremner Central.

This section ties in with the functional intent of the corridor, seeking to provide east-west connectivity and forming part of the frequent transport network proposed for the Drury-Ōpāheke area. As shown in Figure 9-25, Bremner West has a medium place and medium movement function (P2/M2), based on the RASF Assessment. The connection is expected to have 12,000 vpd by 2048. The Drury 1 Precinct Plan proposes a 2-lane road for this section, which is likely to be in place prior to the implementation of the Drury Local Package. However, an agreement is in place with Auranga developers to provide sufficient land either side of this corridor for a 4-lane corridor to be implemented by AT in the future. This land is to be designated for as part of the Supporting Growth Programme. These 4 lanes, will have 2 dedicated to Public Transit which aligns with the Bremner Central section, connecting the Drury West Train station with the Drury township with frequent PT. The other 2 lanes are for general traffic. Due to both the anticipated and existing land use connections, the form of the corridor will include segregated paths for active modes, especially as Bremner Road has been identified as part of the primary cycle network.

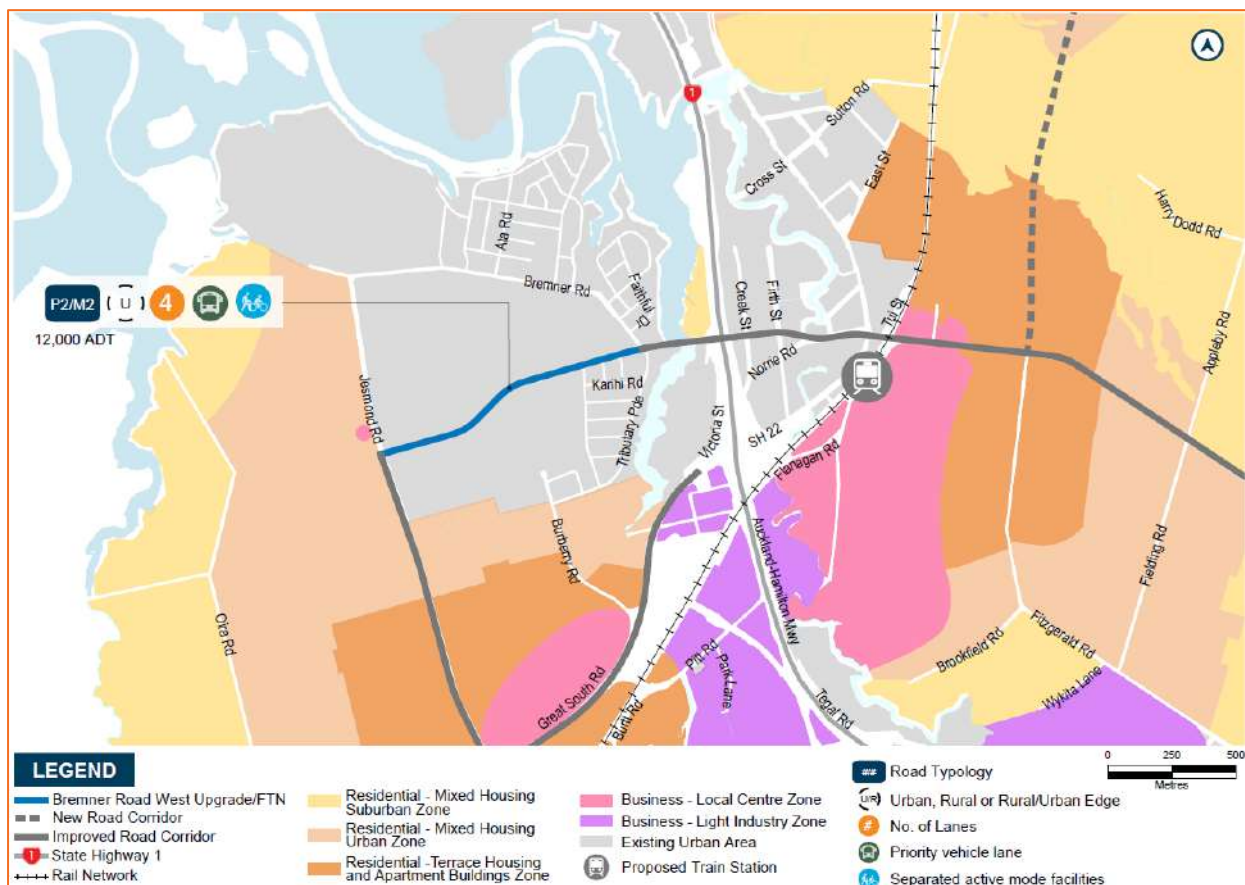


Figure 9-25 Bremner West FTN Arterial Upgrade

9.2.4.2 Background

The Jesmond to Bremner link traverses through the live zoned Drury 1 Precinct – Auranga Development. This precinct is part of Plan Change 6, which has been approved and is now operative. The alignment of the Jesmond to Bremner Link (Auranga Road 1) was agreed through mediation in the Private Plan Change 6 (Drury 1 Precinct) proceedings of which AT were party to. The “road 1” layout is shown in the precinct plan (Figure 9-26) with provisions relating to ensuring enough space for this road is route protected within the plan, including: *“Require subdivision to implement the collector roads and provide for the strategic transport connections by means of the **Future Collector Road (New)** and Collector Road (Possible Future Arterial Road) shown on Precinct Plan 2”*

Because this corridor is already defined through the Drury 1 Precinct Plan, further route refinement is not necessary. The developers of the Drury 1 Precinct (Auranga Development) plan to construct the eastern section of the Jesmond to Bremner link within the Precinct (Figure 9-27) as a 2-lane local road and have allowed land for a 28m corridor (Figure 9-28) for future upgrading by the AT. Although the operating corridor is protected through Drury 1 Precinct Plan, designating for the construction, operation and maintenance of the corridor will ensure a consistent approach to the network in all stages of its lifecycle. The benefit of confirming route protection with developers and through land owner agreements as per Plan Change 6 means that there should be limited submissions by landowners when this section is designated.

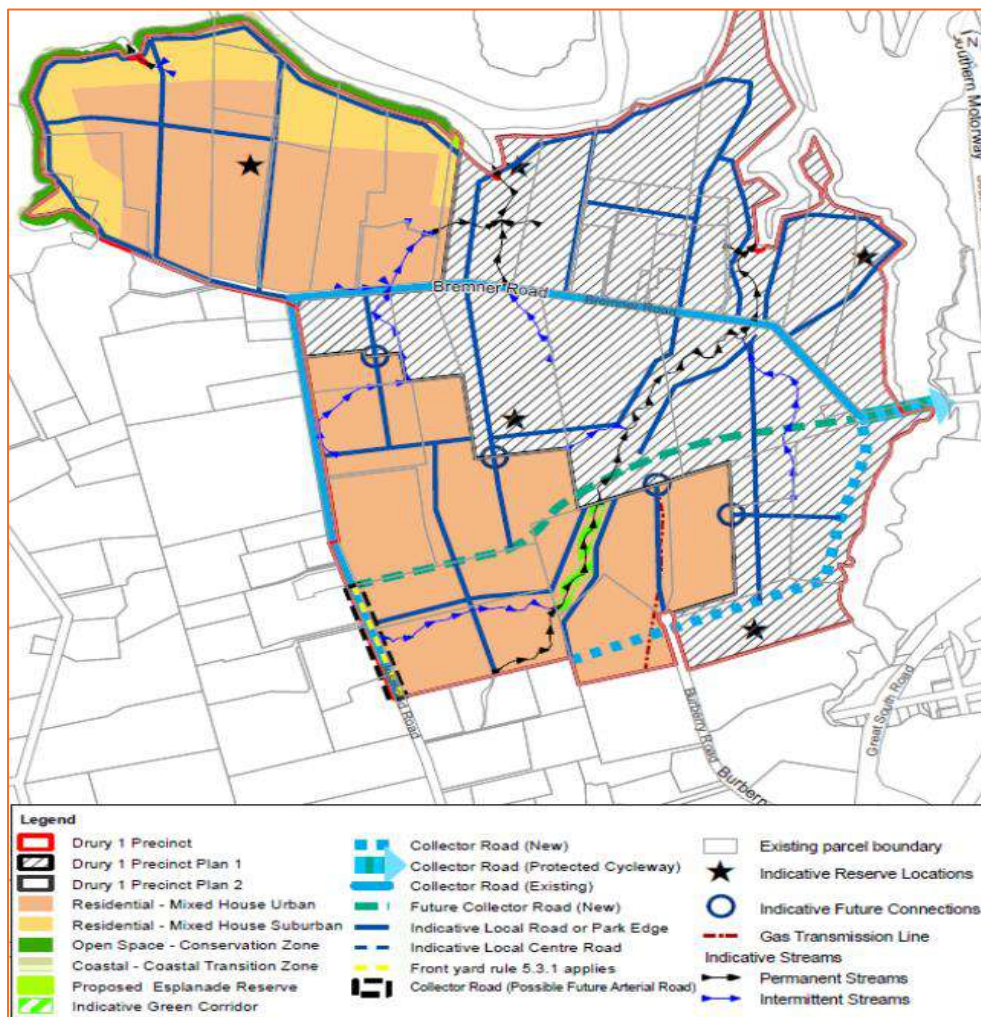


Figure 9-26 Plan Change 6 - Precinct 1

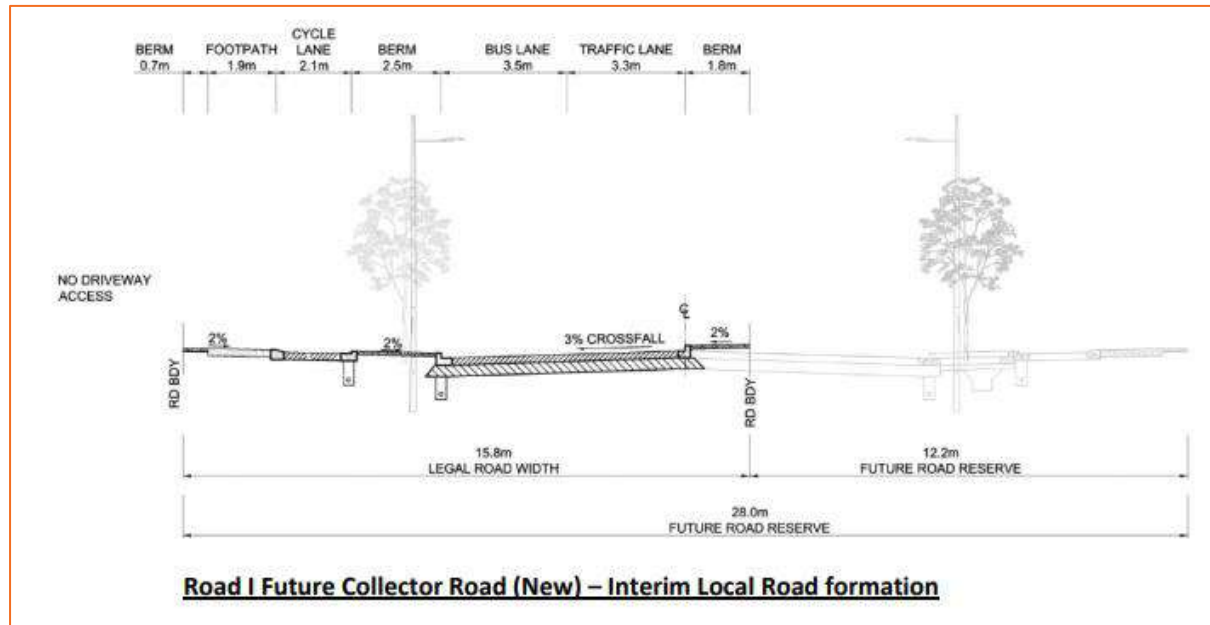


Figure 9-27 Auranga Interim Local Road

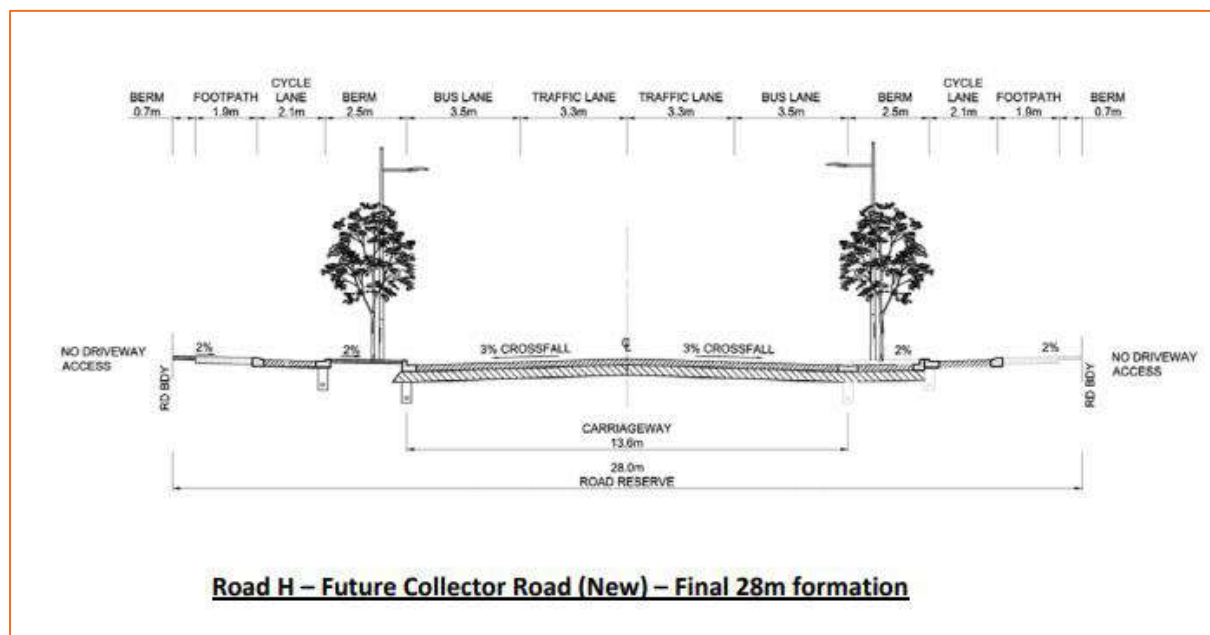


Figure 9-28 Auranga 28m Road Formation

9.2.4.3 Alignment with investment objectives

This link aligns strongly with the investment objectives, as summarised in Table 9-17. In particular, the Bremner Road FTN Arterial Upgrade (Jesmond to Bremner link) is supportive of IO2 - addressing the need to provide for facilities that are more appropriate for the imminent urbanisation in the Drury growth area.

Table 9-17 Bremner West FTN Arterial Upgrade investment objective alignment

Investment Objective Alignment
IO1 Support growth and a more sustainable, quality urban form in Drury by improving connectivity to/through the Drury West Area. Realignment of the Bremner West section through Auranga establishes a more direct east-west movement through the Drury West area, aligning better with the urban development in the area. This provides a vital link for the Drury FTN network, providing a seamless connection from Jesmond Road and beyond (Drury West Station) to the rest of the Bremner road corridor, and beyond to the Drury Central station and Waihoehoe Road. The overall Bremner Road corridor is supportive of this objective, providing a more direct east-west linkage for the wider Drury area to key destinations, including Drury Central train station and centre. The form and function of this enhances connectivity for multiple modes, forming part of the primary cycle network and FTN, unlocking <i>safe and sustainable choices and improving connectivity to/through the Drury area to support current and future residents</i>. Evidence suggests these factors are integral to supporting sustainable, quality urban form, especially in contrast to the existing road which will no longer be appropriate as the Drury area urbanises. The new section of Bremner Road will also shorten the local connection between Drury West and Drury East.
IO2 Achieve a transformational mode shift for trips to key destinations in Drury (incl. rail stations, centre and the strategic north-south PT network) by providing high quality, safe and attractive PT and active mode facilities on Bremner Road Ensuring that the final formation of the corridor provides for both priority bus lanes and active modes is integral to providing seamless and attractive facilities along the length of Bremner Road corridor. This supports IO2 through the provision of high quality, safe and attractive PT and active mode facilities, evidenced in Figure 9-29. As discussed above, this is integral to supporting the anticipated growth and land-use adjacent to the corridor, to encourage mode shift and avoid reliance on LOV's.



Figure 9-29 Bremner Road FTN/Arterial Upgrade Corridor - Preferred options

9.2.5 Waihoehoe FTN Arterial / Arterial Upgrade Options Assessment

9.2.5.1 Form and function assessment

Deriving from the IBCs intention for Waihoehoe Road, and as discussed earlier in section 5.3, the functional intent for the Waihoehoe Road FTN Arterial Upgrade is to provide a multimodal east-west link between the proposed Drury Central rail station, employment, industrial areas and residential areas. There is also potential for improvements to freight movements. Upgrading Waihoehoe Road to a multimodal arterial will support and enable access to the future residents along Waihoehoe Road. The Waihoehoe Road corridor has been split into two sections for options assessment based on the form and function assessment summarised in 9.1.2.

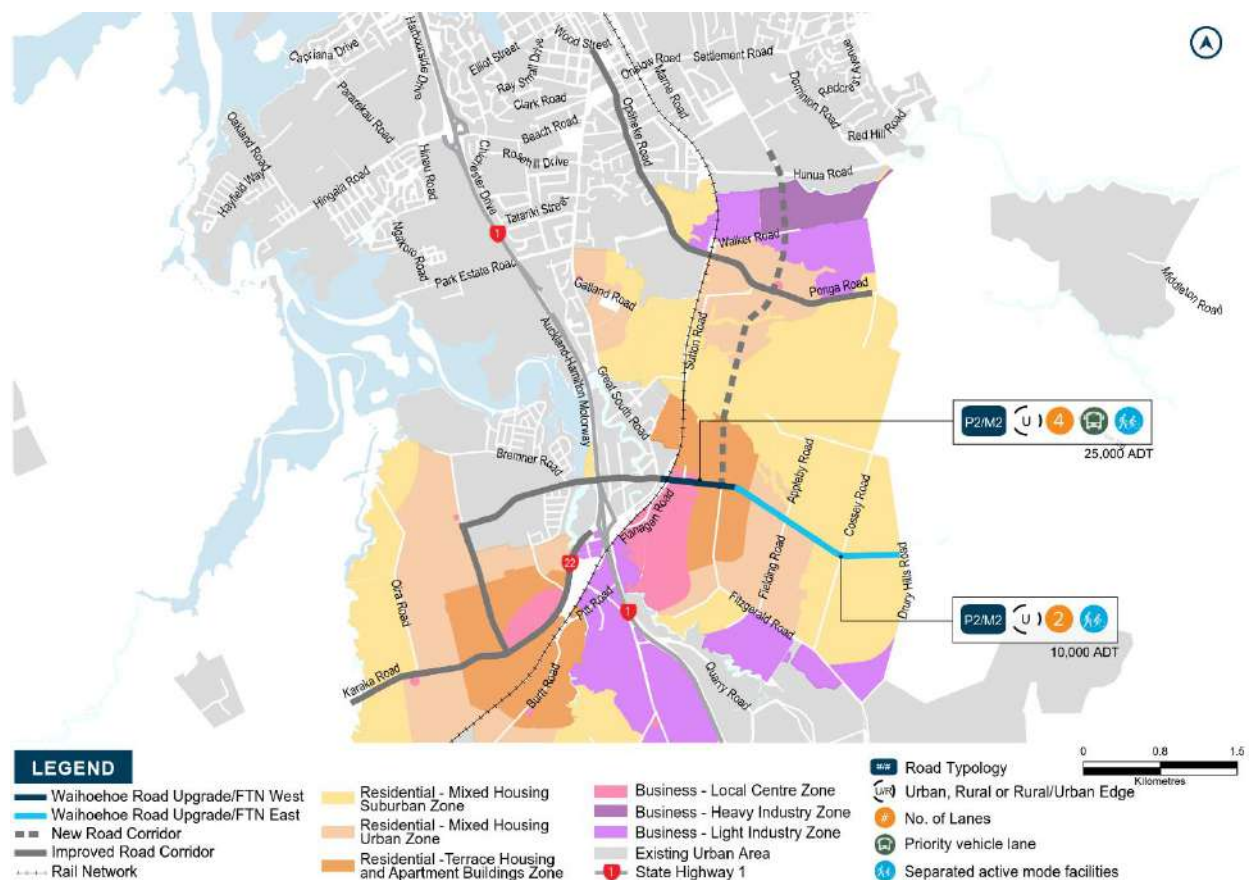


Figure 9-30: Waihoehoe Road Route Refinement Sections

Waihoehoe West FTN Arterial Upgrade

For Waihoehoe Road West, each option utilises the 30m typical cross section consistent with other Drury Local arterial routes. Waihoehoe West has a medium place and medium movement function (P2/M2), based on the RASF Assessment. The connection is expected to have 25,000 vpd by 2048. The form of this corridor includes 4 lanes, with 2 dedicated to Public Transit, given the FTN purpose and integration with Bremner Road and N-S Arterial, to provide a connected and seamless FTN link that connects urban areas with the Drury Central train station. The other 2 lanes are for general traffic. Due to the future and existing land use connections, the form of the corridor will include segregated paths for active modes, especially as Waihoehoe Road West is identified to form part of the primary cycle network. This corridor will be an important link for encouraging active modes to access to the train station and town centre.

Waihoehoe East Arterial Upgrade

For Waihoehoe Road East, each option utilizes the 24m typical cross section consistent with other arterial upgrades. Waihoehoe East has a medium place and medium movement function (P2/M2), based on the RASF Assessment. The connection is expected to have 11,000 vpd by 2048. The form of this corridor includes 2 lanes for general traffic to cater for lower traffic volumes. Due to the future and existing land use connections, the form of the corridor will include segregated paths for active modes, however, this section of Waihoehoe Road is identified as part of the secondary cycle network. Additionally, Waihoehoe Road East will connect with Mill Road via an at-grade roundabout (subject to confirmation with Mill Road study).

9.2.5.2 Options Assessed

The IBC identified the existing Waihoehoe Road as the preferred option for this east-west movement in Drury. A gap analysis undertaken concluded that adequate corridor assessment was undertaken at the IBC phase, therefore the Waihoehoe Road corridor was to be taken forward to route refinement. Route refinement for Waihoehoe Road West and East sections included specialist assessment of three options for each section. As per the recommended programme wide cross-section outlined in 9.1.2, the 4-lane corridor for Waihoehoe West will occupy a width of 30m, extending 10m beyond the existing road corridor of 20m. For the Waihoehoe East section the programme wide cross section for 2 lane arterials would occupy 24m, extending 4m beyond the existing road corridor of 20m. The options for both sections are shown in Figure 9-31, Figure 9-32 (Waihoehoe West) and Figure 9-33 (Waihoehoe East).

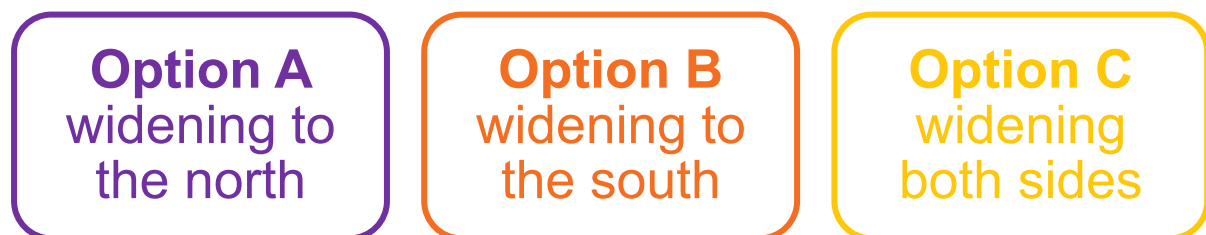


Figure 9-31: Waihoehoe West and East Route Refinement Options

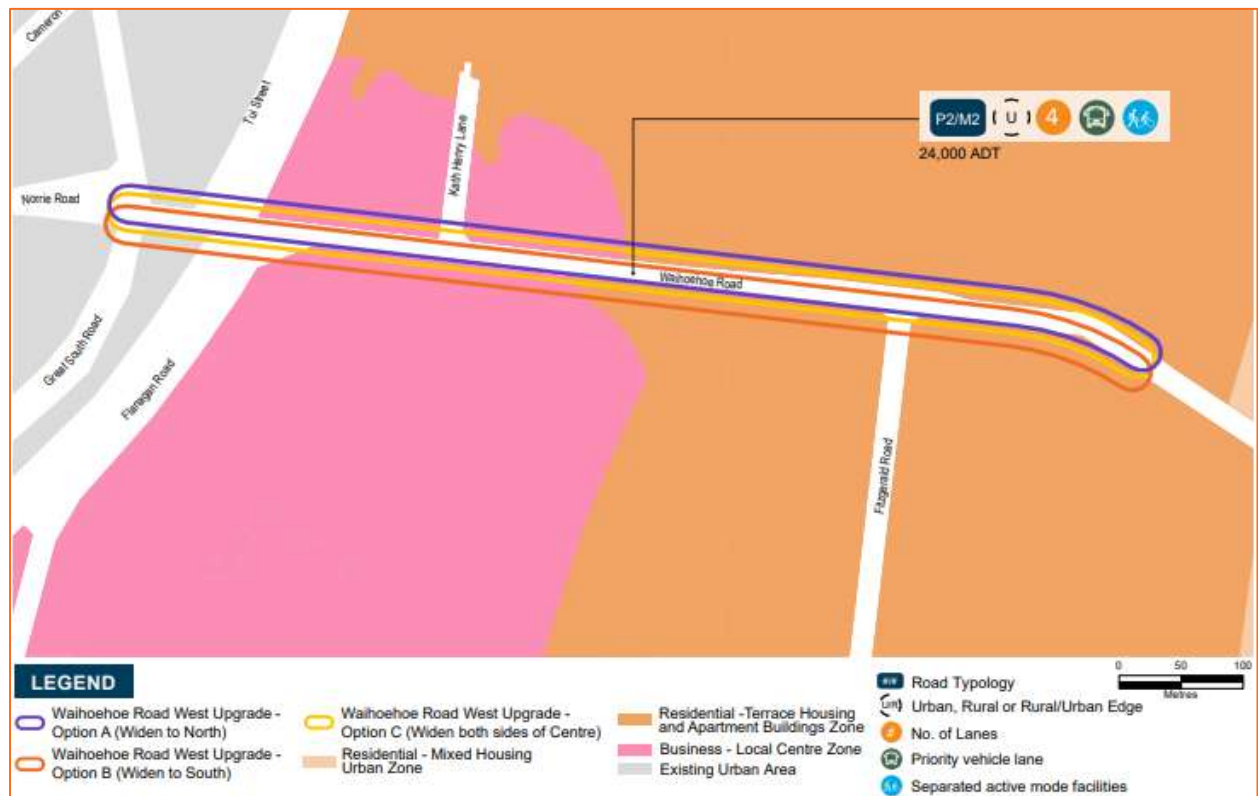


Figure 9-32 Waihoehoe Road West FTN Arterial Upgrade route refinement options

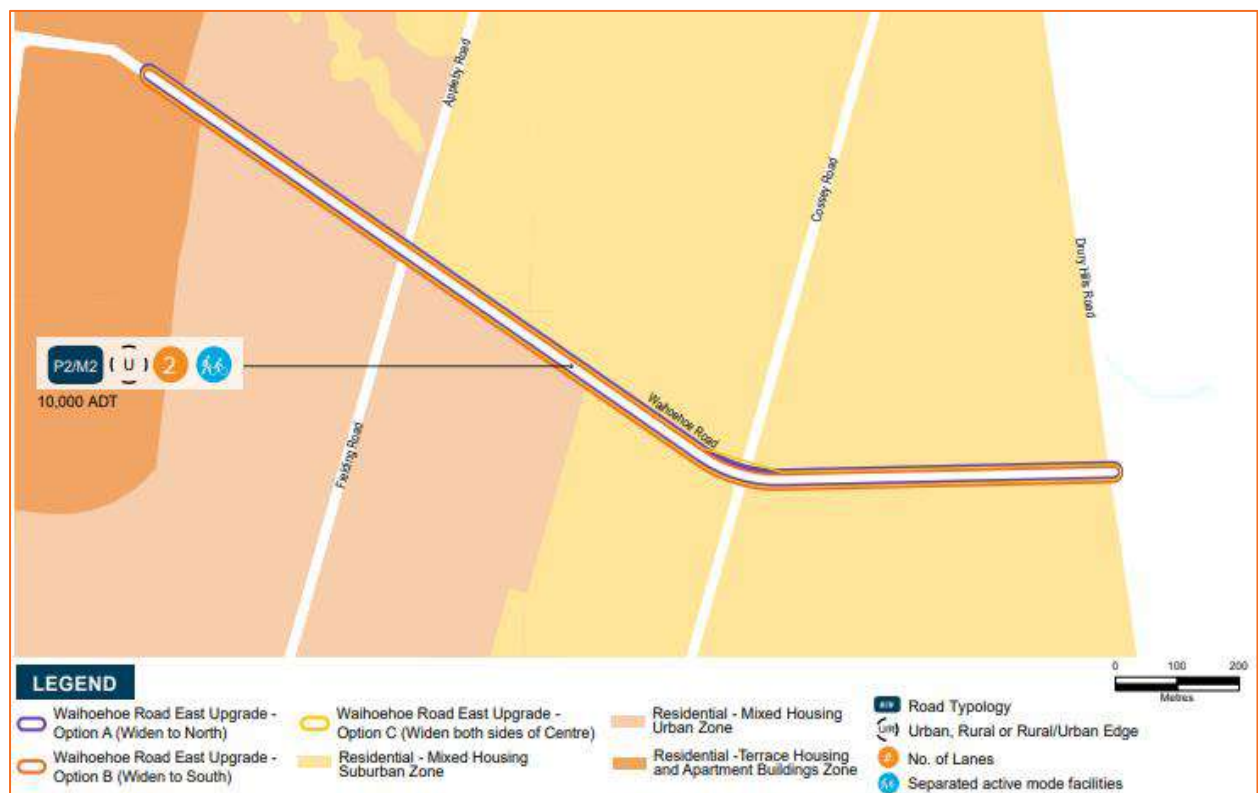


Figure 9-33 Waihoehoe Road East Arterial Upgrade route refinement options

9.2.5.3 Factors of Influence

Whilst all MCA criteria was considered, the more section specific considerations for Waihoehoe Road West Upgrade during the option assessment process include:

- Interdependency with location of the Drury Central Rail station – adjacent to Waihoehoe Bridge, consideration of enabling flexibility for rail network upgrades, and connecting FTN to the station.
- Ensuring Waihoehoe West and East tie in with each other
- Property impacts
- Tying in with Great South Road and the Bremner Road FTN upgrade (at Norrie Road)
- Tying in with the proposed Ōpāheke North South FTN Arterial
- Overhead Utilities along the southern side

Figure 9-34 spatially identifies these factors, giving context on the positioning of each option against these features. Mitigation or avoidance of constraints and/or positive interface with the surrounding environment (including property, other projects and corridors) influenced which alignment was taken forward as the preferred option. Discussion on the extent of the impact, and which option alignment best addresses these factors, is summarised in section 9.2.5.4 and Table 9-18 below. For more detail, refer to **Appendix A: Options Assessment Report**.



Figure 9-34 Waihoehoe Road west factors of influence and constraints

The section specific considerations for Waihoehoe Road East Upgrade during the route refinement process include:

- Tie in with Waihoehoe Road West FTN Arterial, and the proposed Ōpāheke North South FTN Arterial and the proposed Mill Road at the east
- Property impacts
- Medium voltage overhead lines along southern side
- First Gas designation and valve site (211 Waihoehoe Road)

Figure 9-35 spatially identifies these factors, giving context on the positioning of each option against these features. Mitigation or avoidance of constraints and/or positive interface with the surrounding environment (including property, other projects and corridors) influenced which alignment was taken forward as the preferred option. Discussion on the extent of the impact, and which option alignment best addresses these factors, is summarised in section 9.2.5.4 and Table 9-19 below. For more detail, refer to **Appendix A: Options Assessment Report**.

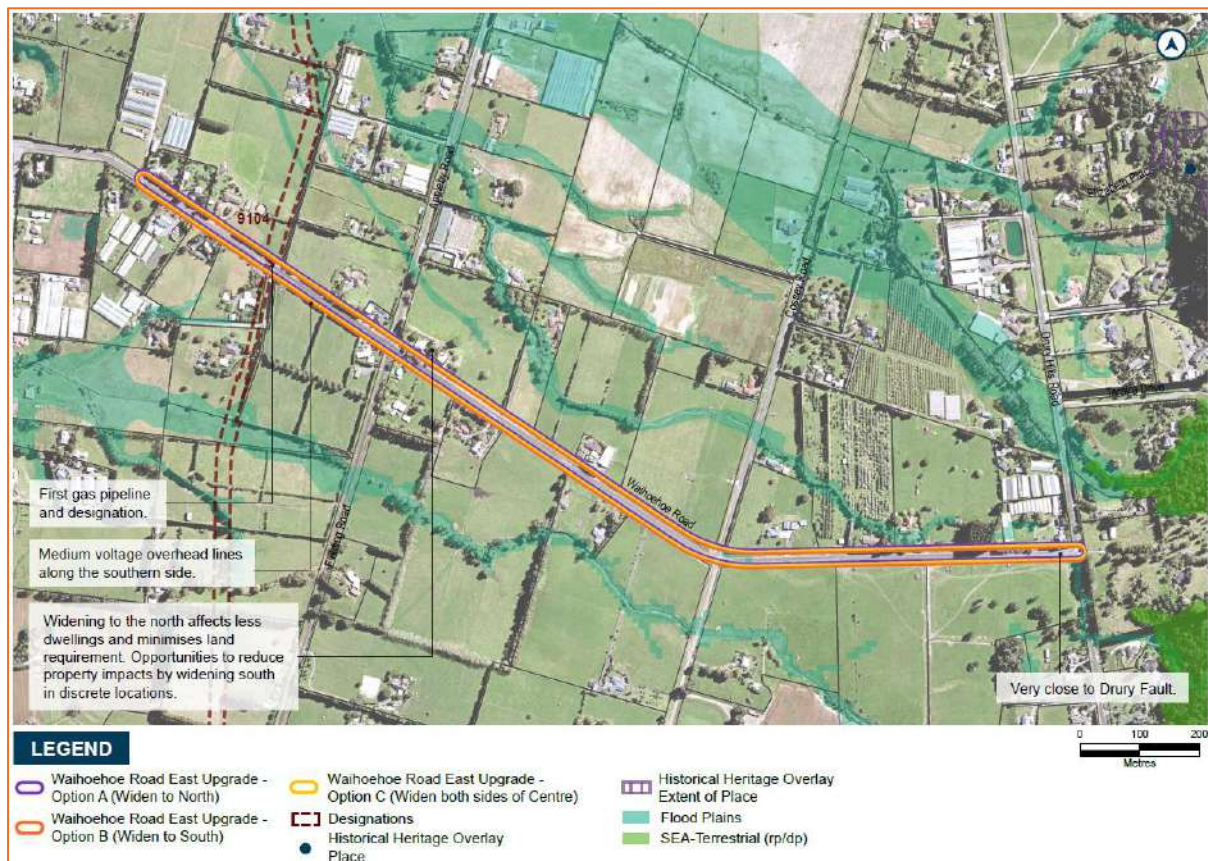


Figure 9-35 Waihoehoe Road East Upgrade factors of influence and constraints

9.2.5.4 Assessment Summary

The outcomes of the options assessments, highlighting key trade-offs, are summarised in Table 9-18 and Table 9-19.

Table 9-18 Waihoehoe Road West FTN Arterial Upgrade Assessment Summary

Waihoehoe Road West FTN Arterial Upgrade		
Option	Commentary	Preferred Option
Option A - widen to the north	- This option reduces overall property impacts, due to less properties requiring full acquisition - Widening to the north allows for greater flexibility for the rail network (potential station site and four tracking), providing more room for station connections and curvature of tracks under Waihoehoe Bridge - Has slightly less of an impact on overhead utilities located in the south	✓
Option B - widen to the south	- Full purchases of property would be required when widening to the south, with dwellings located directly adjacent to the existing corridor along the southern side - Widening to the south constrains the rail network as it brings the proposed station closer to Waihoehoe bridge. - This option has more impact on utilities located in the south	
Option C - widen both sides	- Full purchases of property would be required when widening both sides, as dwellings are located directly adjacent to the existing corridor along the southern side - Widening on both sides requires more complex temporary traffic management during construction, and closure of the bridge. - This option has more impact on utilities located in the south	

Table 9-19 Waihoehoe Road East Arterial Upgrade Assessment Summary

Waihoehoe Road East Arterial Upgrade		
Option	Commentary	Preferred Option
Option A - widen to the north	- Provides for a better geometry of a 60km/h curve - Option A alignment adjoins the larger parcels used for farming or grazing or where the improvements are set well back from the road, resulting in fewer impacted dwellings and less property acquisition - Is consistent with the preferred option of Waihoehoe Road West	✓ (west of Cossey Road)
Option B - widen to the south	- Reduced consistency with the tie in with the preferred option of Waihoehoe Road West - Requires an increased scale of property access modification work.	✓ (east of Cossey Road)
Option C - widen both sides	- Reduced consistency with the tie in with the preferred option of Waihoehoe Road West - Widening on both sides requires more complex temporary traffic management during construction.	

The identification of the preferred alignment options for Waihoehoe Road allowed for confirming the desired intersection forms appropriate for the four intersections along this corridor. guidance summarised in 9.1.4.1 has informed this process, with decisions summarised below in Table 9-20.

Table 9-20 Waihoehoe Road intersection forms

Intersection		Form		Modal Priority			Justification/ Constraints/ Triggers	Preferred Intersection Form
Name	Arms	Lanes	Speed	PT	Active Mode	Freight		
Great South Road / Bremner Road / Waihoehoe Road Intersection included within the Bremner East section. See Section 9.2.3.5								
Ōpāheke N-S Arterial / Waihoehoe Intersection	Ōpāheke N-S Arterial ↓↑	4	50 km/h	FTN	High	Med	• Proximity to Drury Central Station with high-quality bus priority east-west (interim) and north-east-west (long term).	Roundabout
	Waihoehoe Road (West)	4	50 km/h	FTN	High	Med		
	Waihoehoe Road (East)	2	50 km/h	Med	Med	Low		
Waihoehoe East / Appleby Road	Waihoehoe Road East ↔↔	2	50 km/h	Low	Med	Med	• Roundabout works better for single lane approaches as an overall design	Roundabout
	Appleby Rd ↓↑	2	<50 km/h		Low	Low		
Waihoehoe East / Cossey Rd Intersection	Waihoehoe East ↔↔	2	50 km/h	Low	Med	Med	• Roundabout works better for single lane approaches as an overall design	Roundabout
	Cossey Road ↓↑	2	50 km/h		Low	Low		

9.2.5.5 Preferred options for Waihoehoe Road West FTN Arterial Upgrade and Waihoehoe Road East Arterial Upgrade

For Waihoehoe Road West, Option A (generally widening to the north) is the preferred option, which is shown in Figure 9-36.

For the West section, the advantages of Option A include greater flexibility for the rail network under Waihoehoe Bridge, reduced impacts on property and overhead utilities, which results in this option being preferred.

For Waihoehoe East the preferred option is a combination of Option A and B Figure 9-36:

- West of Cossey Road - widen generally to the north of the existing road corridor
- East of Cossey Road - widen generally to the south of the existing road corridor.

Generally widening to the north (option A) at the western end is preferred as this alignment provides a consistent tie in with Waihoehe Road West FTN. Furthermore, the combination of A and B as the preferred option was chosen because there are lesser impacts on private properties. Property impacts are reduced as this alignment adjoins larger parcels used for farming or grazing or where the improvements are set well back from the road. The lesser impact on property reduces the overall project costs that would be associated with property acquisition. Other than that, costs were not a differentiator for option selection. This is also preferred from an engineering perspective, as it provides for a better geometry of a 60km/h curve.

Through the assessment, it was noted that for both West and East sections that there were no evident differentiators between the three options with regard to archaeology and built heritage, social, urban design, landscape and visual, health and wellbeing, stormwater and flooding, ecology and natural hazards.

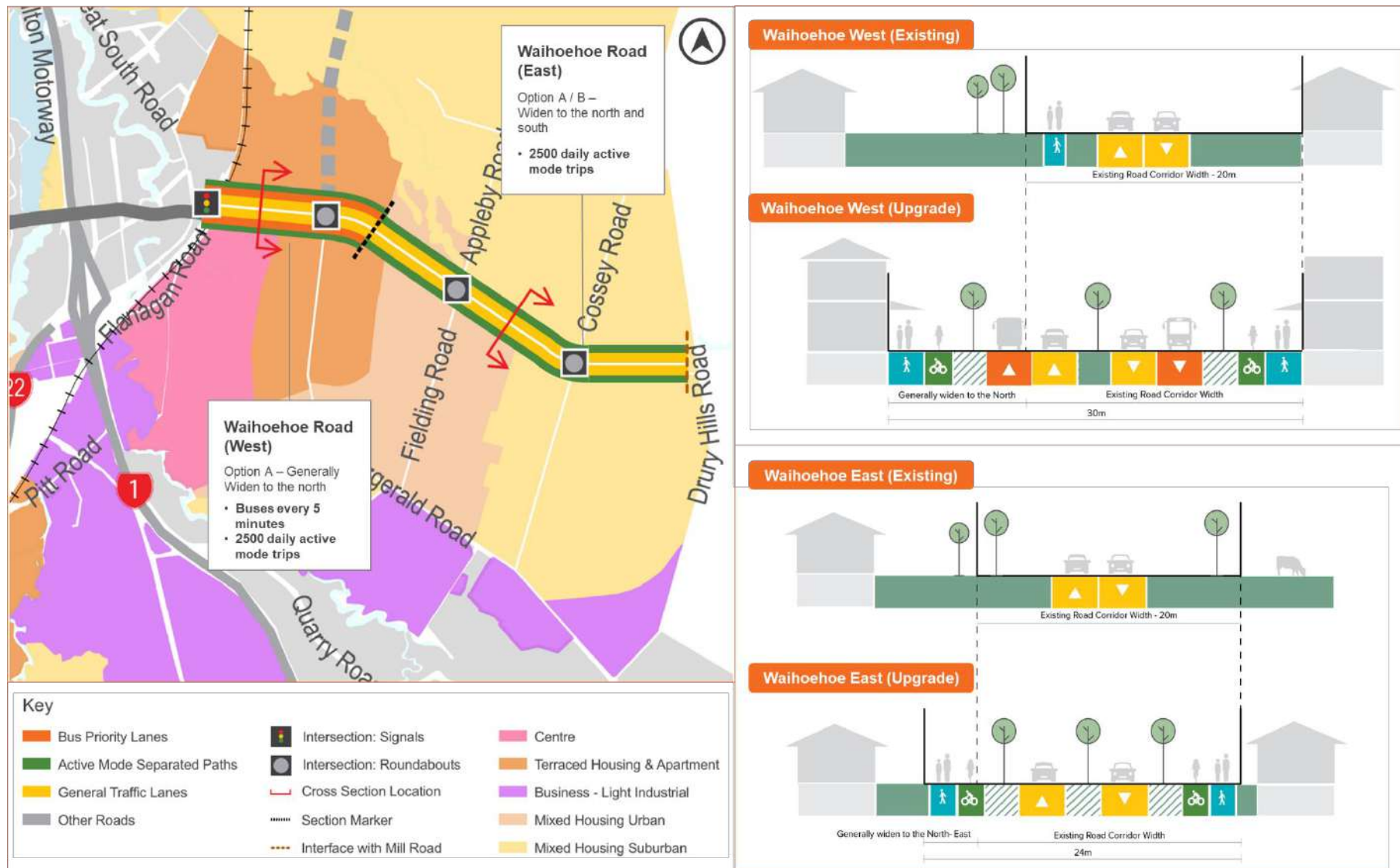


Figure 9-36 Waihoehoe West FTN Arterial Upgrade preferred cross-section

This option aligns strongly with the investment objectives, as summarised in Table 9-21. In particular, the Waihoehoe Road FTN Arterial / Arterial Upgrade (West and East) is supportive of IO2 - addressing the need to provide for facilities that are more appropriate for the imminent urbanisation in the Drury East growth area.

Table 9-21 Waihoehoe Road West FTN Arterial Upgrade and Waihoehoe East Arterial Upgrade investment objectives alignment

Investment Objective Alignment
IO1 Support growth and a more sustainable, quality urban form in Drury by improving connectivity to/through the Drury Area. The Waihoehoe Road corridor forms a strategically important east-west connection, supporting the urbanisation of the Drury West area, resulting in improved connectivity and urban form outcomes. Given the proposed locations of residential development and significant destinations to be located along the corridor, the form will need to provide for additional people-moving capacity and increase the demand for short trips more diverse transport demands. The proposed form and function supports this growth by enhancing connectivity for multiple modes, forming part of the primary cycle network and FTN – more so for Waihoehoe West rather than East, with the east providing a more supplementary function for the wider area.
IO2 Achieve a transformational mode shift for trips to key destinations in Drury (incl. rail stations, centre and the strategic north-south PT network) by providing high quality, safe and attractive PT and active mode facilities on Waihoehoe Road The form of this corridor supports IO2 through the provision of high quality, safe and attractive PT and active mode facilities, evidenced in Figure 9-36. As discussed above, this is integral to supporting the anticipated growth and land-use adjacent to the corridor, and this will reduce the reliance on LOVs which will in turn have benefits for health and wellbeing and the environment, including GHG savings. However, the nuances between options A, B and C's alignment with IO2 were not significant in determining the preferred option, although, Option A allowed for greater flexibility for the rail network, which can mean the delivery of better station facilities and rail network to better serve Drury, and the wider South area.

9.2.6 Ponga Road Arterial Upgrade Options Assessment

The Ōpāheke/Ponga corridor is broken into three sections for options assessment and is shown in Figure 9-38. This section will discuss the assessment of Ponga Road.

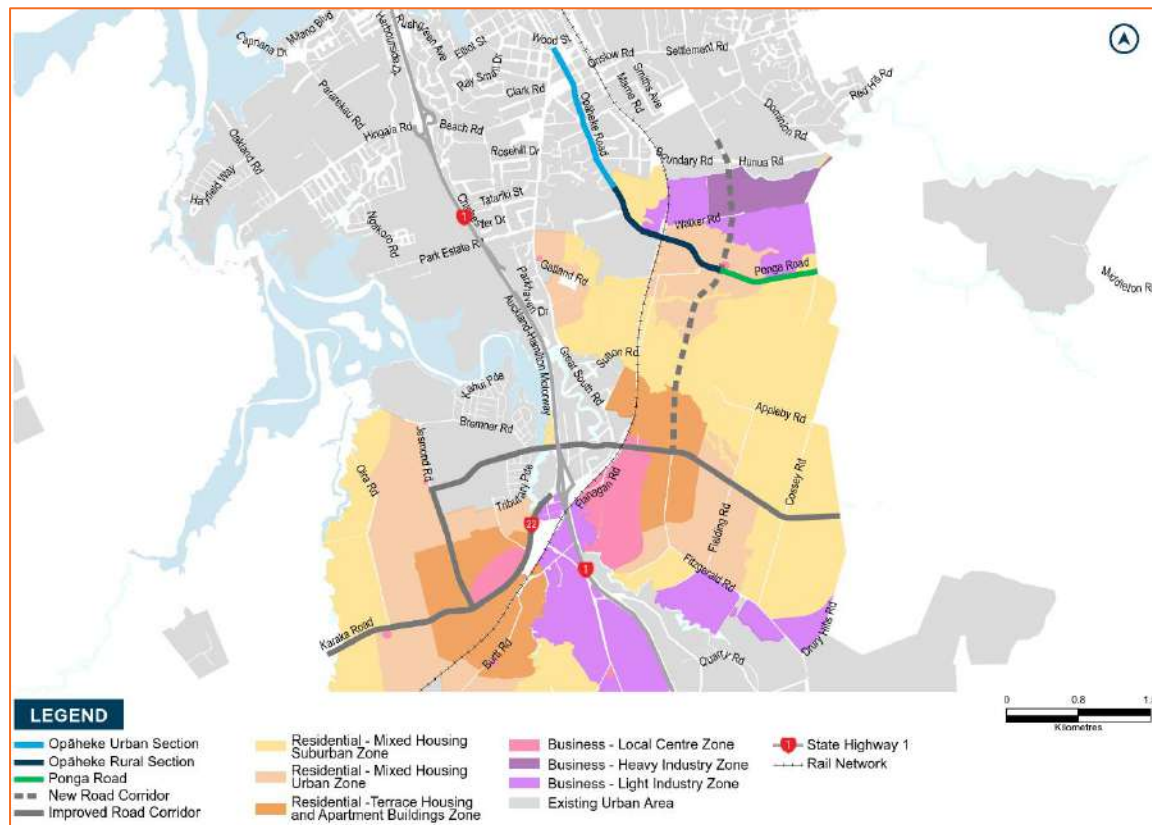


Figure 9-37 Ōpāheke/Ponga Arterial Upgrade assessment sections

The options assessment process for this corridor has distinct elements in each section (see Figure 9-38). Each of these elements have been discussed in independent sections (9.2.6 to 9.2.8).

	Ponga Road	Opāheke Rural	Opāheke Urban
Route Refinement Assessment	Route Refinement of Corridor only	Route Refinement of Corridor only	Settlement Intersection Only (corridor upgrade within existing 20m width)
Intersection Assessment	2 intersections	1 Intersection	
Rail Crossing Upgrade		Assessment of removal of NIMT level crossing	

Figure 9-38 Ōpāheke/Ponga Road Assessment Process Summary

9.2.6.1 Form and function assessment

Deriving from the IBCs intention for the Ōpāheke/Ponga Road corridor, and as discussed earlier in section 5.4, the functional intent for the Ōpāheke/Ponga corridor as a whole is to provide a link between two key strategic north-south roads within Drury, N-S Arterial / Hunua Road and the future extension of Mill Road, which will provide multi-modal access to wider regional destinations, therefore performing both through movement and development access roles.

As a whole (including the urban section), this corridor provides a critical east-west corridor for future residents in the Drury-Ōpāheke area, connecting to the wider Papakura area. The form of the Ponga Road section (see Figure 9-39 below) includes 2 lanes for general traffic, as it is expected to have 8000 vpd by 2048 and low numbers of bus services. As the corridor progresses, this 2-lane corridor ties in with the 2-lane form of both Ōpāheke Road sections. Ponga Road has a low place and medium movement function (P1/M2), based on the RASF Assessment. Due to the future and existing land use connections, the form of the corridor will include segregated paths for active modes. The Ponga Road sections is part of the secondary cycle network that ties into the primary network along Ōpāheke Road.

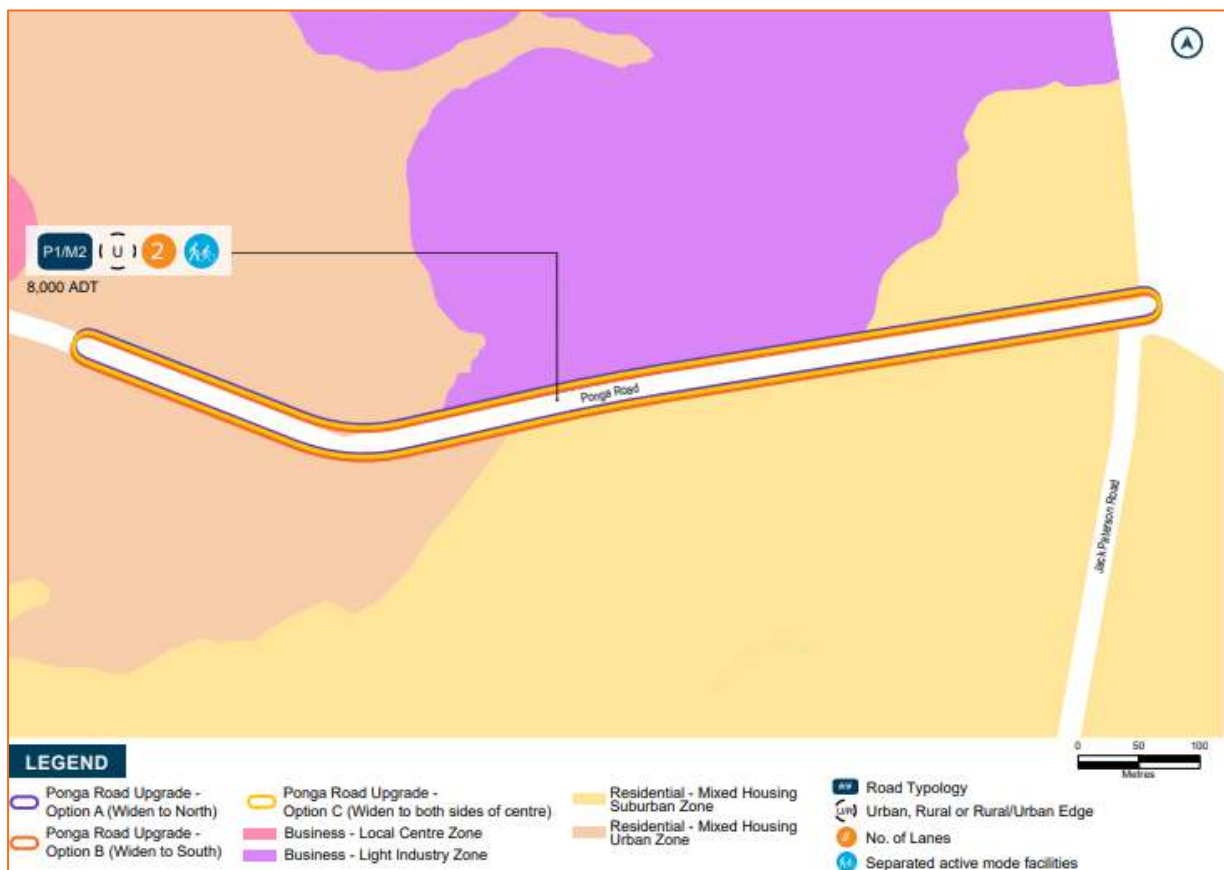


Figure 9-39 Ponga Road Arterial Upgrade route refinement options

9.2.6.2 Options Assessed

Route refinement for Ponga Road Arterial Upgrade included specialist assessment of three options from Ōpāheke Road to the future tie in of Mill Road (to be confirmed by the Strategic South DBC). Figure 9-40 outlines the options that were assessed for Ponga Road Arterial Upgrade in the DBC Route Refinement stage.

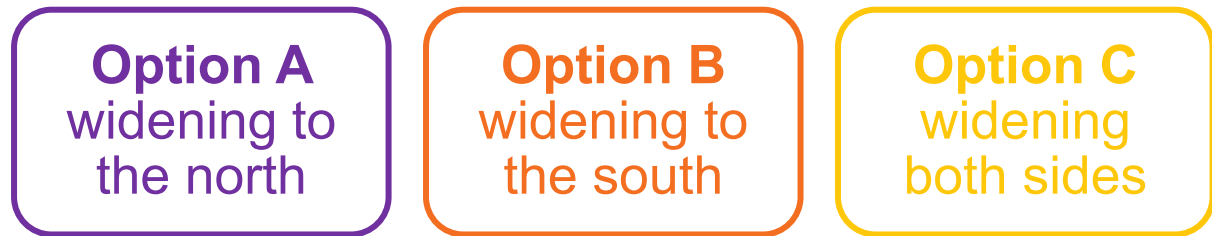


Figure 9-40: Ponga Road Route Refinement Options

9.2.6.3 Factors of Influence

Whilst all MCA criteria was considered, the section specific considerations for Ponga Road during the route refinement process include:

- Reducing impacts on mature trees – both significant for ecology and heritage
- Impacts on property.
- Heritage sites

Figure 9-41 identifies these factors spatially for Ponga Road, giving context on the positioning of each option against these features. Mitigation or avoidance of constraints and/or positive interface with the surrounding environment (including property, other corridors and projects) influenced which alignment was taken forward as the preferred option. Discussion on the extent of the impact, and which option alignment best addresses these factors, is summarised in section 9.2.9.4 and Table 9-22 below. For more detail, refer to **Appendix A: Options Assessment Report**.

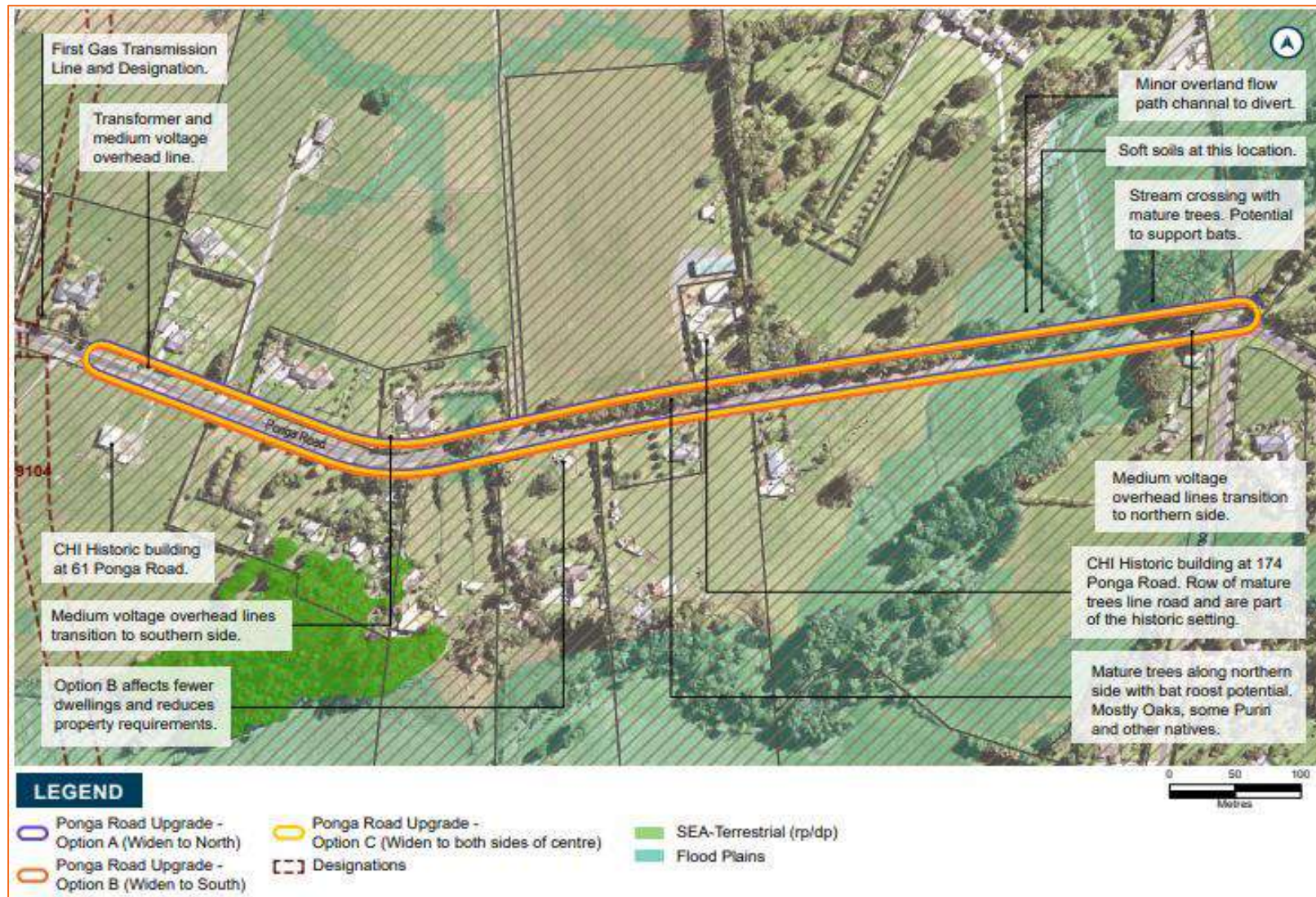


Figure 9-41 Ponga Road factors of influence and constraints

9.2.6.4 Assessment Summary

The outcomes of the options assessment, highlighting key trade-offs, are summarised in Table 9-22.

Table 9-22 Ponga Road Assessment Summary

Ponga Road Arterial Upgrade		
Option	Commentary	Preferred Option
Option A - Widen to North	- This option would impact on mature trees which contribute to heritage, ecological (trees may support roosting 'Threatened: Nationally Critical' long tailed bats) and amenity values. - This option will result in larger property impacts	
Option B – Widen to the South	- This option reduces property impacts resulting in less land acquisition. - This option reduces impact on mature trees on the northern side of the road corridor which contribute to ecological (trees may support roosting 'Threatened: Nationally Critical' long tailed bats), heritage and amenity values.	✓
Option C – Widen both sides	- This option would impact on mature trees which contribute to heritage, ecological (trees may support roosting 'Threatened: Nationally Critical' long tailed bats) and amenity values. - This option will result in larger property impacts - Temporary traffic management during construction more complex	

The identification of the preferred alignment options for Ponga Road allowed for the progression of confirming the desired intersection forms appropriate for the intersections along this corridor. Guidance summarised in 9.1.4.1 has informed this process, with decisions summarised below in Table 9-23.

Table 9-23 Ponga Road Intersection forms

Intersection		Form		Modal Priority			Justification /Constraints /Triggers	Preferred Intersection Form
Name	Arms	Lanes	Speed	PT	Active Mode	Freight		
Ōpāheke N-S Arterial / Ponga Intersection	Ponga Road (East-West) ← →	2	50 km/h	Med	Med	Med	- High-quality bus priority North-South. - Staging considerations as land transition between (semi-rural to FUZ)	Roundabout
	Ōpāheke N-S Arterial ↓ ↑	4	50 km/h	FTN	Med	Med		

9.2.6.5 Preferred option for Ponga Road

For the Ponga Road section, Option B (Figure 9-42) was identified as the preferred option. Advantages of this option include lesser impacts on the notable factors of influence outlined in 9.2.6.3, in particular the reduction of heritage and ecological impacts through greater avoidance of mature trees on the northern side of the corridor. Additionally, this alignment has less property impacts compared to the other options. The lesser impact on property reduces the overall project costs that would be associated with property acquisition. Other than that, costs were not a differentiator for option selection. There were limited determinants between the options with regard to social, urban design, landscape and visual, health and wellbeing, stormwater and flooding, natural hazards and utilities.

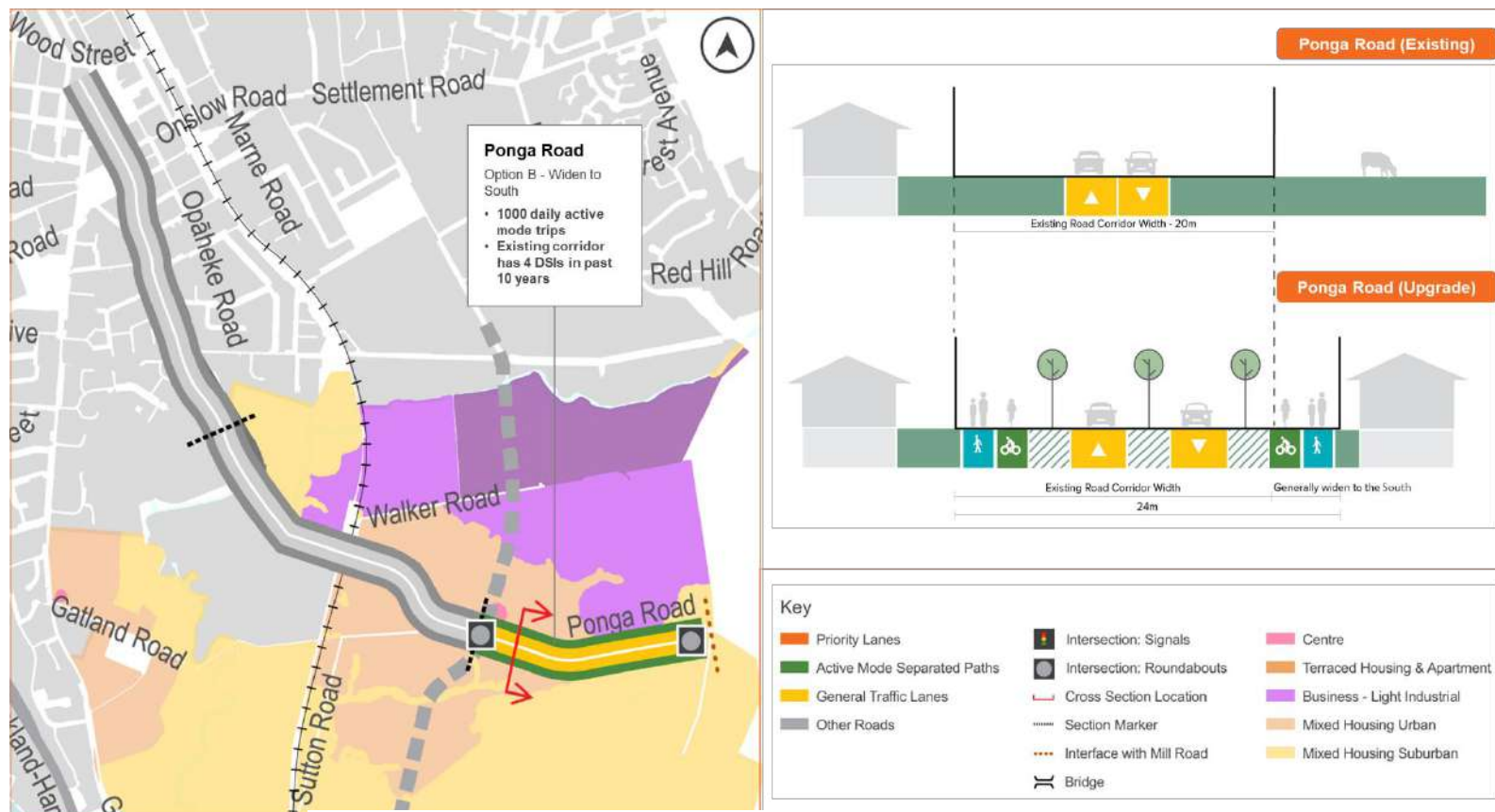


Figure 9-42 Ponga Road preferred option and cross section

This option aligns strongly with the investment objectives - summarised in Table 9-24. In particular, the Ponga Road Arterial Upgrade, and the entirety of the Ōpāheke/Ponga Road corridor, is supportive of IO2 - addressing the need to provide for facilities that are more appropriate for the imminent urbanisation in the Ōpāheke growth area.

Table 9-24 Ponga Road Arterial Upgrade investment objective alignment

Investment Objective Alignment
IO1 Support growth and a more sustainable, quality urban form in Drury by improving connectivity to/through the Ōpāheke Area. The Ponga Road section, and the wider Ōpāheke/Ponga corridor, provides a multimodal link between the Ōpāheke N-S Arterial and Mill Road, connecting the FUZ to Papakura centre and employment areas. Given the anticipated urbanisation in the area and centre connections, the form will need to provide for additional people-moving capacity and increase the demand for short trips more diverse transport demands.
IO2 Achieve a transformational mode shift for trips to key destinations in Drury (incl. rail stations, centre and the strategic north-south PT network) by providing high quality, safe and attractive PT and active mode facilities on the Ōpāheke/Ponga corridor The form of this corridor supports IO2 through the provision of high quality, safe and attractive active mode facilities, evidenced in the above figures. Priority lanes are not required as part of the cross section based on the form and function assessment, but a frequent bus route is proposed to use the corridor, providing wider PT access between the proposed Drury Centres/Train Stations and the existing centre/train station in Papakura. As discussed above, this is integral to supporting the anticipated growth and land-use adjacent to the corridor, and this will reduce the reliance on LOVs which will in turn have benefits for health and wellbeing and the environment, including GHG savings.

9.2.7 Ōpāheke Rural Arterial Upgrade

9.2.7.1 Form and function assessment

Section 9.2.6 described that the Ōpāheke/Ponga Road Arterial Upgrade has been split into three sections for options assessment: Ponga Road, Ōpāheke Rural and Ōpāheke Urban. This section describes the section Ōpāheke Rural section, which runs from Ponga Road to the edge of the FUZ, which ties in with the Ōpāheke Urban section.

As previously discussed, the corridor as a whole provides a critical east-west corridor for future residents in the Drury-Ōpāheke area, connecting to the wider Papakura area. The form of this section also includes 2 lanes for general traffic (Figure 9-43), as it is expected to have 14,000 vpd by 2048 and low numbers of bus services. This 2-lane form allows this section to tie into Ponga Road and the Ōpāheke Urban section. Ōpāheke Rural has a low place and medium movement function (P1/M2), based on the RASF Assessment. Due to the future and existing land use connections, the future form of the corridor will include segregated paths for active modes, with the Ōpāheke section being identified as part of the primary cycle network.

In addition to corridor upgrade considerations, Ōpāheke Road also has an at grade level crossing for which upgrades have been considered to improve east-west movements along the corridor.



Figure 9-43 Ōpāheke Road (Rural) Arterial Upgrade route refinement options

9.2.7.2 Options Assessed

Route refinement for Ōpāheke Road Rural Arterial Upgrade included specialist assessment of three options. Figure 9-44 outlines the options that were assessed for Ōpāheke Road Rural in the DBC Route Refinement stage.

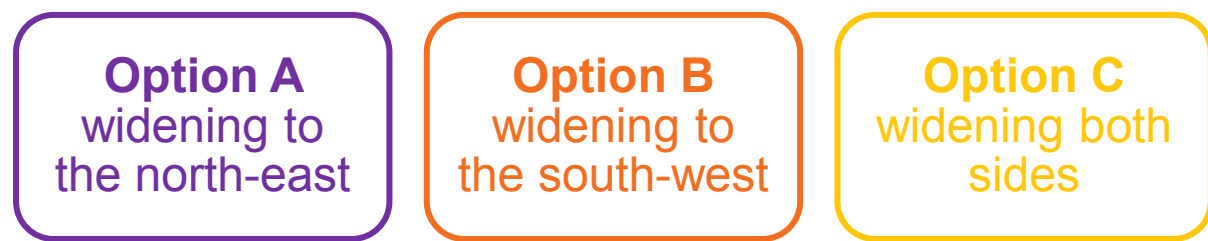


Figure 9-44: Ōpāheke Rural Route Refinement Options

9.2.7.3 Factors of Influence

Whilst all MCA criteria was considered, the more section specific considerations for the Ōpāheke Rural option assessment process included:

- Reducing impacts on of live-zoned property and SHA currently under development
- Minimising impact on Auckland Council recreational park land (Ōpāheke Reserve) and conservation zoned land
- Utilities, specifically the Counties Power Substation
- Avoidance of cultural heritage sites

Figure 9-45 spatially identifies these factors for Ōpāheke Road (Rural), giving context on the positioning of each option against these features. Mitigation or avoidance of constraints and/or positive interface with the surrounding environment (including property, other corridors and projects) influenced which alignment was taken forward as the preferred option.

Discussion on the extent of the impact, and which option alignment best addresses these factors is summarised in section 9.2.7.4 and Table 9-25 below. For more detail, refer to **Appendix A: Options Assessment Report**.

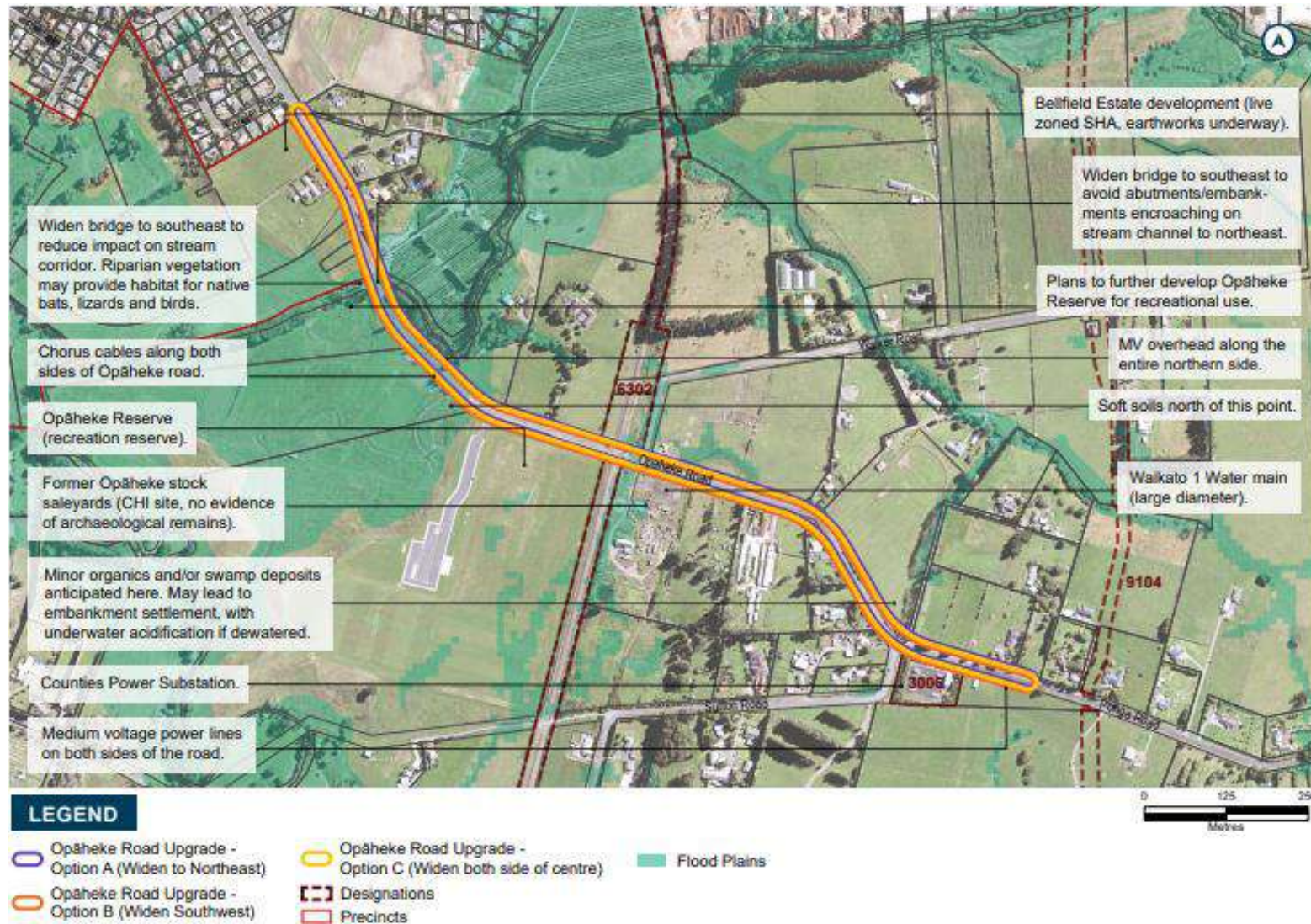


Figure 9-45 Ōpāheke Road factors of influence and constraints

9.2.7.4 Assessment Summary

The outcomes of the options assessment, highlighting key trade-offs are summarised in Table 9-25

Table 9-25 Ōpāheke Road Rural Assessment Summary

Ōpāheke Road Rural Arterial Upgrade		
Option	Commentary	Preferred Option
Option A - Widen to North-east	- This option reduces impacts on live-zoned property and SHA to the southwest that is currently under development. - Less impact on Auckland Council Parks land (recreational uses) and conservation zoned land - This option enables reduced impact on cultural heritage sites - This option enables reduced impact on utilities, specifically the Watercare Waikato 1 main and Counties Power substation. This option allows for sufficient space to mitigate the visual impact of the electric substation through urban design	✓
Option B – Widen to the South-west	- Greatest impact on heritage features. - Greatest impact on property including on live zoned SHA currently under development. - This option will result in larger property impacts - Relocation of the Watercare Waikato #1 main would be required - Relocation of the Counties Power Substation would be required.	
Option C – Widen both sides	- Impacts on heritage features. - Greater impact on property including on live zoned SHA currently under development. - Relocation of the Watercare Waikato #1 main would be required - Relocation of the Counties Power Substation would be required. - Temporary traffic management during construction more complex	

The identification of the preferred alignment options for Ōpāheke Road (Rural) allowed for confirming the desired intersection forms appropriate for the intersections along this corridor. Guidance summarised in 9.1.4.1 has informed this process, with decisions summarised below in Table 9-26.

Table 9-26 Ōpāheke Road (Rural) intersection forms

Intersection		Form		Modal Priority			Justification /Constraints /Triggers	Preferred Intersection Form
Name	Arms	Lanes	Speed	PT	Active Mode	Freight		
Ōpāheke Rd / Bellfield Development	Ōpāheke Road (East-West) ↔	2	50 km/h	Med	Med	Med	• Roundabout works better for single lane approaches as an overall design	Roundabout
	Bellfield Development ↕	2	<30 km/h	Low	Med	Low		
Ōpāheke N-S FTN Arterial / Ponga Road Intersection (ties in with Ōpāheke Rural) is included within the Ponga Road Arterial Corridor. See Section 9.2.6.4.								

9.2.7.5 Ōpāheke Road NIMT Rail Crossing

The Ōpāheke Road Arterial Upgrade includes an existing rail level crossing of the NIMT rail line. Table 9-27 set out this options assessment process and outcomes.

Table 9-27 Ōpāheke Road NIMT Rail Crossing Decision Tree Options Assessment

Decision #	Decision to be made	Decision / reasons	Recommended option
1	Does the Ōpāheke Road level crossing need to be removed, yes/no?	Yes –increasing frequency of rail services (12tph in the peak direction), urbanisation of the surrounding area result in an increased safety risk/conflict between modes, increased barrier down time etc.	There is a need to remove the level crossing at Ōpāheke Road.
2	Can the Ōpāheke Road level crossing be closed, yes/no? (i.e. is the future network sufficiently resilient to operate without it?)	No – 2048+ modelling shows significant increases in traffic volumes along Boundary Road Ōpāheke N-S FTN Arterial Hunua Road if the Ōpāheke Road crossing is closed – over 6,000vpd displaced. Buses will also be affected. There will also be a loss of general urban form connectivity.	A road crossing across the tracks will be required.
3	Can the Ōpāheke Road level crossing be grade-separated in the same location, yes/no? (or do multiple locations need to be assessed?)	Yes – grade-separation in the current location is possible. Multiple locations were not assessed.	Grade-separation preferred at the existing level crossing location.
4	What form will grade-separation take?	Road overbridge Tunnelling was ruled out due to increased cost/complexity of going under live rail tracks, potential to skew tracks and being located in a floodplain.	Road overbridge recommended.

9.2.7.6 Preferred Option for Ōpāheke Rural

For the Ōpāheke Rural section, Option A (generally widening to the north-east) was the preferred option, which is shown in Figure 9-46. The advantages of this alignment include lesser impacts on notable factors of influence outlined in 9.2.7.3, including the reduction of property impacts on both residential (live zoned and SHA) and open space (park and conservation land). The lesser impact on property reduces the overall project costs that would be associated with property acquisition. Other than that, costs were not a differentiator for option selection. Additionally, the impact on cultural heritage sites and utilities (Counties Power Substation) is also mitigated by widening to the north-west.

Moving the alignment north at this location also reduces impacts on the recently upgraded Ōpāheke Sports Fields and provides construction benefits of being able to construct the rail bridge offline (reducing traffic disruption during construction).

As a result of realigning Ōpāheke Road further to the north, access for the properties on the southern side of Ōpāheke Road would need to be re-routed. Two options were considered:

1. Utilise the existing Ōpāheke Road alignment providing a connection to the new alignment in the east
2. Provide a new connection to Walker Road in the north with access provided via Walker Road under the NIMT rail bridge.

Utilising the existing Ōpāheke Road alignment was discounted due to geometric and safety concerns of the angle of the connection to the new alignment and location of the connection on a corner. Therefore, providing a new link to Walker Road was recommended as it provided the access required and enabled a safe tie in with the proposed alignment.

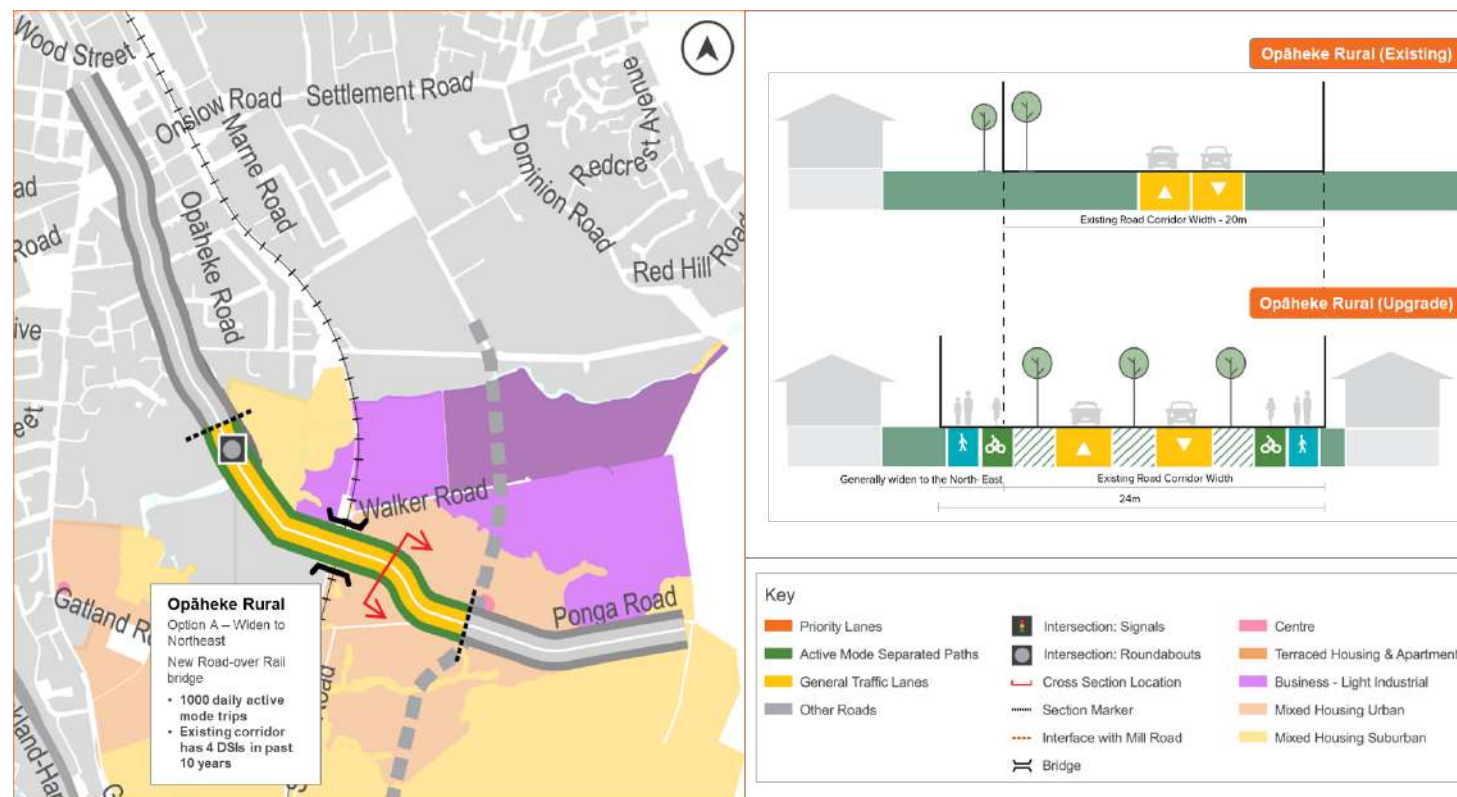


Figure 9-46 Ōpāheke Rural preferred option and cross section

The proposed upgrades align strongly with the investment objectives, as summarised in Table 9-28. In particular, the Ōpāheke/Ponga Arterial Upgrade is supportive of IO2 - addressing the need to provide for facilities that are more appropriate for the imminent urbanisation in the Ōpāheke growth area.

Table 9-28 Ōpāheke Urban Arterial Upgrade investment objective alignment

Investment Objective Alignment
IO1 Support growth and a more sustainable, quality urban form in Drury by improving connectivity to/through the Ōpāheke Area. The Ōpāheke Road Rural section and the wider Ōpāheke/Ponga corridor provides a multimodal link between the Ōpāheke N-S Arterial and Mill Road, connecting the FUZ to Papakura centre and employment areas. Given the anticipated urbanisation in the area and centre connections, the form will need to provide for additional people-moving capacity and increase the demand for short trips more diverse transport demands. However, the nuances between options A, B and C's alignment with IO1 were not significant in determining the preferred option. It should be noted that Option A (the preferred option) for Ōpāheke Rural allowed for lesser impact on existing and live zoned property, and in doing so better supporting planned growth in the area.
IO2 Achieve a transformational mode shift for trips to key destinations in Drury (incl. rail stations, centre and the strategic north-south PT network) by providing high quality, safe and attractive PT and active mode facilities on the Ōpāheke/Ponga corridor The form of this corridor supports IO2 through the provision of high quality, safe and attractive active mode facilities, evidenced in the above figures. Bus priority lanes are not required based on the form and function assessment. It should be noted that a frequent bus route is proposed to use the corridor, providing wider PT access between the proposed Drury Centres/Train Stations and the existing centre/train station in Papakura. The recommended upgrades supporting the anticipated growth and land-use adjacent to the corridor, and will reduce the reliance on LOVs which in turn will have benefits for health and wellbeing and the environment, including GHG savings.

9.2.8 Ōpāheke Urban Arterial Upgrade and Ōpāheke / Settlement Intersection

This section describes the section Ōpāheke Urban section upgrade assessment (between the edge of the FUZ to the east and Great South Road to the west).

As discussed in Table 9-6 the Ōpāheke Urban section did not undergo the standard option assessment process, as the 20m cross-section is deemed appropriate for this context. The Form and Function assessment identified that the Ōpāheke Urban section has a low place and medium movement function (P1/M2), based on the RASF Assessment. The connection is expected to have 14000 vpd by 2048. The form of this corridor therefore includes 2 lanes for general traffic, with no bus priority lanes needed due of low numbers of bus services. Due to the future and existing land use connections, the form of the corridor will include segregated paths for active modes.

As mentioned, due to the inherent constraints associated with an existing urbanised corridor, further investigation was undertaken to assess the suitability of adopting the standard Supporting Growth urban cross section (24m cross section) for this corridor. As summarised in 9.1.2.1 and further discussed in the **Appendix A: Options Assessment**, the assessment recommended a departure from a 24m cross section along the Ōpāheke Road (urban) corridor and a 20m cross section was adopted, as the associated benefits outweighed the disbenefits.

The benefits of the 20m cross-section include avoidance of scheduled heritage items, minimising land requirement of social and recreational areas, without compromising pedestrian and cycling connectivity. For the most part, greater width benefits are negligible when traded off against the impacts associated with greater land acquisition. Notable constraints to implementing a wider corridor include:

- There are significant property constraints along the length of the corridor.
- The cost for property acquisition if a 24m cross section was adopted is high at around \$25-30m, and the additional widening is not considered to deliver sufficient benefit to justify this investment.

Therefore, based on both of these assessments, the Ōpāheke Road Urban section will be upgraded to a 20m cross section which will improve the walking and cycling facilities along the corridor. This proposed 20m cross section will transition into a 24m cross section along the rural section of the Ōpāheke/ Ponga Road corridor.

As the proposed 20m cross section will fit largely within the existing road corridor, no further route refinement was required to determine which side of the road is to be widened. However, along the alignment a pinch point exists at the Ōpāheke Road / Settlement Road intersection where the proposed upgrade requires additional land outside of the existing road corridor. As such, options were developed and assessed for the intersection.

Therefore, the remainder of this report section focusses on the route refinement of the Ōpāheke Road / Settlement Road intersection which forms part of the Ōpāheke Road Urban corridor.

9.2.8.1 Options Assessed - Ōpāheke/Settlement Intersection

Route refinement for Ōpāheke Road Urban / Settlement Road intersection included assessment of four options:

- Option A – signalised intersection with active modes
- Option B – roundabout in centre of existing intersection
- Option C – roundabout on eastern side (Settlement Road)
- Option D – roundabout on southern side (Ōpāheke Road)

The four options for the Ōpāheke Road / Settlement Road intersection are shown in Figure 9-47.



Figure 9-47 Intersection treatment options

9.2.8.2 Assessment Summary - Ōpāheke/Settlement Intersection

The outcomes of the options assessment, highlighting key trade-offs, are summarised in Table 9-29. The assessment identified Options A and D as the emerging preferred options.

Following this MCA assessment and consideration of feedback received from project partners including manawhenua and the Council, these two options underwent further investigation. This focussed on design refinement of Option A to minimise impacts on the cemetery, any compromise on walking and cycling facilities, comparative cost and safety for all road users. For these options, this is also summarised in the Table 9-29 below, with cost comparison identified in Table 9-30.

Table 9-29 Ōpāheke Road Rural Assessment Summary

Ōpāheke Road Rural Arterial Upgrade			
Option		Commentary	Preferred Option
Option A - Signalised intersection with active modes	Initial MCA Assessment	- This option is likely to perform marginally less against IO2 because from a safety perspective signalised intersection are less safe for all road users. - Options A, C or D are preferred from a heritage/social perspective as they generally do not impact upon memorials or body plots - This option enables more future development potential of the Terraced Houses and Apartment Buildings (THAB) Zone both in land remaining and parcel shape - This option has the least property impact - Requires the least amount of civil works	✓
	Further Investigation	- In comparison to Option D, there are less cumulative costs (property, construction, P50 estimate), with a total of \$4.5 - In order to minimise impacts on the Papakura Cemetery to allow for a 3m buffer from body plots, further design was undertaken on Option A. This involved a compromise of the active mode facilities from the AT agreed 5.25m width – thus locking in a sub-standard facility - Lower level of safety for road users - Requires works within the Papakura Cemetery and proximity to body plots requires approval from Local Board and the Council - Takes slivers off the properties which looks to leave them not very viable for the owners for future development (in THAB zone).	
Option B – Roundabout in centre of existing intersection		- All the roundabout options are much safer for all users when compared with the signalised intersection - This option was discounted because the significant impacts on body plots in Papakura Cemetery.	
Option C – Roundabout on eastern side (Settlement Road)		- All the roundabout options are much safer for all users when compared with the signalised intersection - Option A, C or D are preferred from a heritage/social perspective as they generally do not impact upon memorials or body plots - This option and Option D impact the most on property - Residual developable area would be more triangular shaped parcels, reducing the development potential and support of the future land use - Unlikely to be an appropriate intersection treatment due to the sharp turn radius in the south-western quadrant	
Option D - Roundabout on southern side (Ōpāheke Road)	Initial MCA Assessment	- Option D is likely the most appropriate treatment of the four options, mainly linked to its superior safety benefit for all users and being more consistent with Vision Zero outcomes. - Option A, C or D are preferred from a heritage/social perspective as they generally do not impact upon memorials or body plots - This option and Option C impact the most on property	✓
	Further Investigation	- In comparison to Option A, this option costs more, with a total of \$9million - A roundabout, as proposed in Option D, provides improved safety for all road users at the intersection and would result in fewer crashes than a signalised intersection - Has minimal impact on the Papakura Cemetery - It does not compromise on, and allows enough room for a high quality, active mode upgrade for an area zoned for residential growth (THAB).	✓

Comparative costs of the two options are provided in the table below. Option A has a lower total cost of \$4.5 million compared to \$9 million for Option D.

Table 9-30 Comparative Cost of Option A and D

Cost Type	Option A (signals)	Option D (roundabout)
Total Costs	\$4.5 million	\$9 million

9.2.8.3 Preferred Option for Ōpāheke/Settlement Intersection

Whilst being the more expensive intersection treatment, Option D is the recommended way forward due to the following:

- It meets investment objectives (improves connectivity, mode shift, high quality active modes)
- Provides additional safety outcomes with a roundabout (reduces the number of potential conflicts).
- Has minimal impact on the Papakura Cemetery
- It does not compromise on, and allows enough room for a high quality, active mode upgrade for an area zoned for residential growth (THAB).

An opportunity recognised with this option was that it provides for more flexibility for any future upgrades on Settlement Road and connections to the Papakura rail station.

Through the assessment, it was noted that there were no evident differentiators between the four options with regard to landscape and visual amenity, health and wellbeing, stormwater, ecology and construction disruption.

A summary of the preferred options for all sections of the Ōpāheke/Ponga Corridor are shown in Figure 9-48.

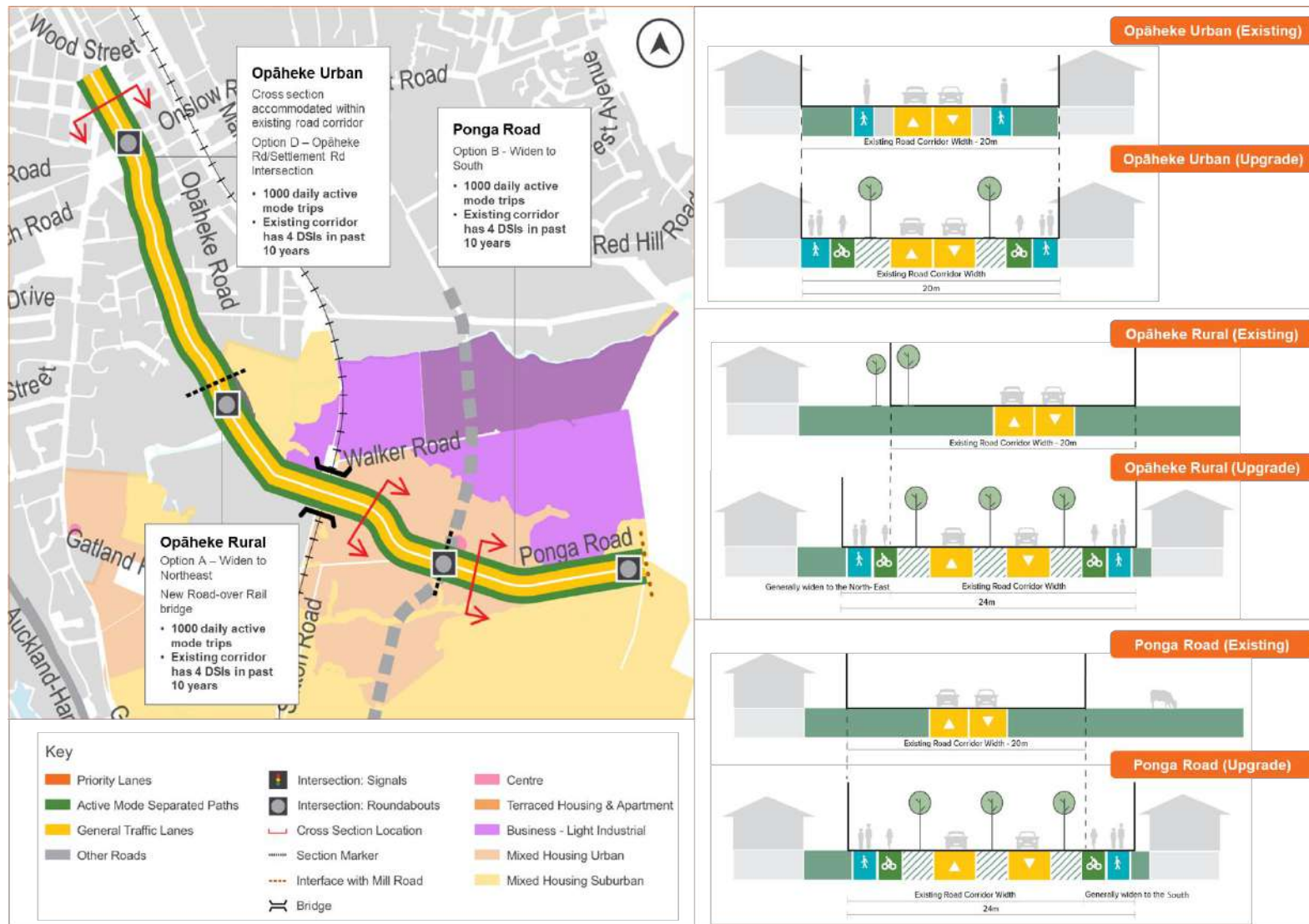


Figure 9-48 Opāheke/Ponga Corridor preferred options

This intersection option and upgrade of this section aligns strongly with the investment objectives, as summarised in Table 9-31. In particular, the Ōpāheke Urban Arterial Upgrade is supportive of IO2 - addressing the need to provide for facilities that are more appropriate for the imminent urbanisation in the Ōpāheke growth area. This is further reinforced by the preferred intersection option.

Table 9-31 Ōpāheke Urban Arterial Upgrade investment objective alignment

Investment Objective Alignment
IO1 Support growth and a more sustainable, quality urban form in Drury by improving connectivity to/through the Ōpāheke Area. The Ōpāheke/Ponga corridor as a whole provides a multimodal link between the Ōpāheke N-S Arterial and Mill Road, connecting the FUZ to Papakura centre and employment areas. Upgrading this urban section of Ōpāheke Road is a fundamental part of this connection. Given the anticipated urbanisation in the area and centre connections, the recommended upgrades will provide for additional people-moving capacity and increase the demand for short trips more diverse transport demands. For the intersection upgrade, the nuances between options A, B, C and D alignment with IO1 were not significant in determining the preferred option as they all showed positive alignment. However, in comparison to Option A, the property take with Option D is more supportive of future development within the THAB zone.
IO2 Achieve a transformational mode shift for trips to key destinations in Drury (incl. rail stations, centre and the strategic north-south PT network) by providing high quality, safe and attractive PT and active mode facilities on the Ōpāheke/Ponga corridor The recommended upgrades of this section supports IO2 through the provision of high quality, safe and attractive active mode facilities. As discussed, utilising the existing 20m corridor width does not impede on the provision of these facilities. Priority lanes are not required as part of the cross section based on the form and function assessment, but a frequent bus route is proposed to use the corridor, providing wider PT access between the proposed Drury Centres/Train Stations and the existing centre/train station in Papakura. As discussed above, this is integral to supporting the anticipated growth and land-use adjacent to the corridor, and this will reduce the reliance on LOVs which will in turn have benefits for health and wellbeing and the environment, including GHG savings. Furthermore, for the intersection upgrade, Option D provides the greatest safety benefits for all road users, and is more consistent with Vision Zero outcomes.

9.2.9 Ōpāheke N-S FTN Arterial Upgrade Options Assessment

9.2.9.1 Form and function assessment

Deriving from the IBCs intention for the Ōpāheke North-South arterial, and as discussed earlier in 5.5, the functional intent for the Ōpāheke North-South arterial is to increase connectivity and provide for good people-movement and PT function through the FUZ. The key benefits of this new connection include increased accessibility to a large range of transport choices, and increased people movement within the area to provide connections to employment, industrial areas, residential areas and rail stations. Additionally, the connection will support SH1 and the Mill Road Corridor by providing a new corridor to cater more for local north-south trips in Drury.

The Ōpāheke N-S Arterial has a medium place and medium movement function (P2/M2), based on the RASF Assessment. The connection is expected to have 14,000 vpd by 2048. The form of this corridor includes 4 lanes, with 2 dedicated to Public Transit, given the FTN purpose and integration with Waihoehoe Road, to provide a connected and seamless FTN link that connects urban areas with the Drury West train station. The other 2 lanes are for general traffic. Due to the future and existing land use connections, the form of the corridor will include segregated paths for active modes, especially as this corridor is identified to form part of the primary cycle network.

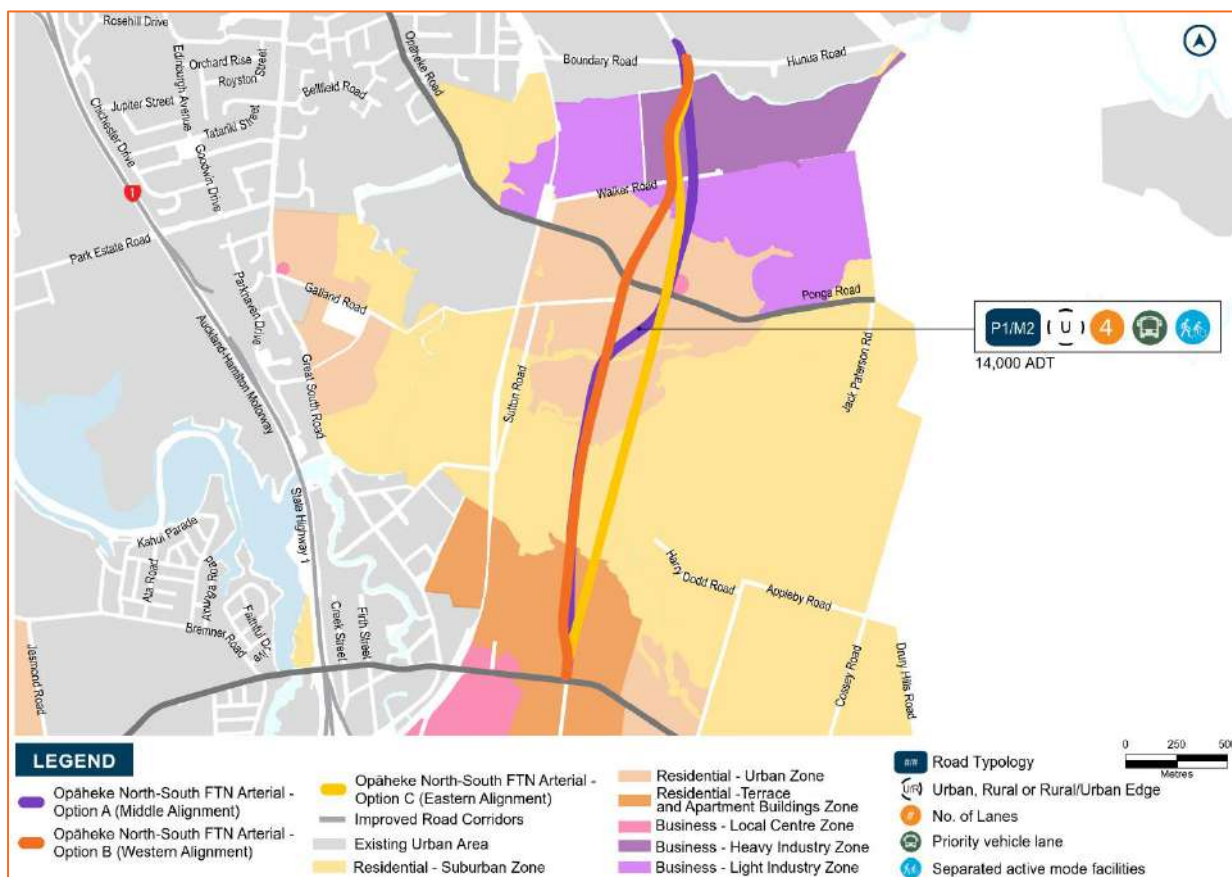


Figure 9-49: Ōpāheke N-S Arterial Form and Function Assessment

9.2.9.2 Options Assessed

The IBC identified Ōpāheke N-S as the preferred north-south corridor in Drury-Ōpāheke to support SH1 and Mill Road. A gap analysis undertaken concluded that route refinement be undertaken to address the environment constraints and potential level of effects within the corridor recommended by the IBC. Route refinement for Ōpāheke N-S FTN Arterial included specialist assessment of three options from Hunua Road in the north to Waihoehoe Road in the south. As per the recommended programme wide cross-section outlined in 9.1.2, the 4-lane corridor will occupy a width of 30m.



Figure 9-50 Ōpāheke N-S FTN/Arterial Upgrade route refinement options

9.2.9.3 Factors of Influence

Whilst all MCA criteria was considered, the more section specific considerations for the Ōpāheke N-S Arterial during the option assessment process include:

- Development of developable FUZ land, particularly between the road corridor and the railway line in the north
- Floodplain and multiple stream tributaries
- Impacts on existing roads
- Connection to proposed local centre along Ponga Road
- Impacts on utilities, in particular, the First Gas Transmission Line and designation and the Counties Power substation site and transmission lines.

Figure 9-51 spatially identifies these factors, giving context on the positioning of each option against these features. Mitigation or avoidance of constraints and/or positive interface with the surrounding environment (including property, other corridors and projects) influenced which alignment was taken forward as the preferred option. Discussion on the extent of the impact, and which option alignment best addresses these factors, is summarised in section 9.2.9.4 and Table 9-32 below. For more detail, refer to **Appendix A: Options Assessment Report**.

9.2.9.4 Assessment Summary

The outcomes of the options assessment, highlighting key trade-offs, are summarised in Table 9-32.

Table 9-32 Ōpāheke N-S Arterial Assessment Summary

Ōpāheke N-S Arterial		
Option	Commentary	Preferred Option
Option A - middle alignment	- This option crosses the flood plain at the narrowest point and avoids some of the effects of filling this area (e.g. culverts). - This option is more supportive of developable land adjacent to corridor - Reduces the number of tie ins required with existing roads. - This alignment integrates with the proposed local centre on Ponga Road. - This option reduces impact on the Counties Power Substation. - However, Option A has more complex construction due to interaction with gas transmission line (but all options cross this).	✓
Option B – Western alignment	- This option has a greater impact on stormwater and flooding requiring increased fill and culverts in the gully - Geotechnical constraints with the potential to impact on construction times. - Close proximity to electrical assets on the corner of Sutton/Ponga, - There is some impact on utilities. - Creates greater complexity for traffic management during construction.	
Option C – Eastern alignment	- This option does not support the balanced development of FUZ land on either side of the corridor. - Greater impact on stormwater and flooding requiring increased fill and culverts in the gully - Geotechnical constraints with the potential to impact on construction times. - This option crosses more tributary streams which would likely cause a minor increase in the requirement for access and environmental protection	

The identification of the preferred alignment for Ōpāheke N-S FTN Arterial allowed for confirming the desired intersection forms appropriate for the three intersections along this corridor. Guidance summarised in 9.1.4.1 has informed this process, with decisions summarised below in Table 9-33.

Table 9-33 Ōpāheke NS Arterial intersection forms

Intersection		Form		Modal Priority			Justification/Constraints /Triggers	Preferred Intersection Form
Name	Arms	Lanes	Speed	PT	Active Mode	Freight		
Ōpāheke N-S Arterial / Hunua Intersection	Ōpāheke N-S Arterial (south)	4	50 km/h	FTN	Med	Med	- Proximity to industrial activity, higher freight movements will like trigger more in-roundabout conflict with other lane-users. - Roundabout present major constraints. Would require significant realignment of Hunua Road (north leg) and impacts to properties. - High-quality bus priority North-South. - Special consideration should be considered land use context and gateway to strategic freight network.	Signalised intersection
	Hunua (north-east)	2	50 km/h	Med	Med	High		
Ōpāheke N-S Arterial / Walker Road Intersection	Ōpāheke N-S Arterial ↓↑	4	50 km/h	FTN	Med	Med	- High-quality bus priority North-South. - Provide east-west connectivity for existing properties and is part of the future collector network as indicated in the Drury-Ōpāheke Structure Plan.	Roundabout
	Walker Road (East-West) ←→	2	<50 km/h	Low	Med	Low		
Ōpāheke N-S Arterial / Ponga Road Intersection included within the Ponga Road Corridor. See Section 9.2.6.4.								
Ōpāheke N-S Arterial / Waihoehoe Intersection included within the Waihoehoe Road Corridor. See Section 9.2.5.4.								

9.2.9.5 Preferred option for Ōpāheke N-S FTN Arterial

Option A, the middle alignment, is the preferred option and is shown in Figure 9-52. The preferred option was chosen because advantages include lesser impacts on notable factors of influence outlined in 9.2.9.3, including fewer tie ins - therefore easier integration - with existing roads, the reduced flooding impacts, and support for and integration with future land use along the corridor. Additionally, during design refinement, the alignment was refined to reduce impacts on utilities including gas and power transmission lines, and is as follows:

- Alignment moved slightly to the east at the southern extent to reduce impacts on Counties Power transmission lines

- Alignment moved slightly to the east near the Counties Power substation to reduce impacts on this.
- Alignment moved slightly to the west at the northern extent to minimise some impacts on the Frist Gas transmission line
- Alignment moved to the west near the central section to reduce impacts on stream tributaries

Through the assessment, it was noted that there were no evident differentiators between the three options with regard to archaeology and built heritage, social, landscape and visual, health and wellbeing and ecology. Additionally, there were no other differentiators between options regarding project costs.

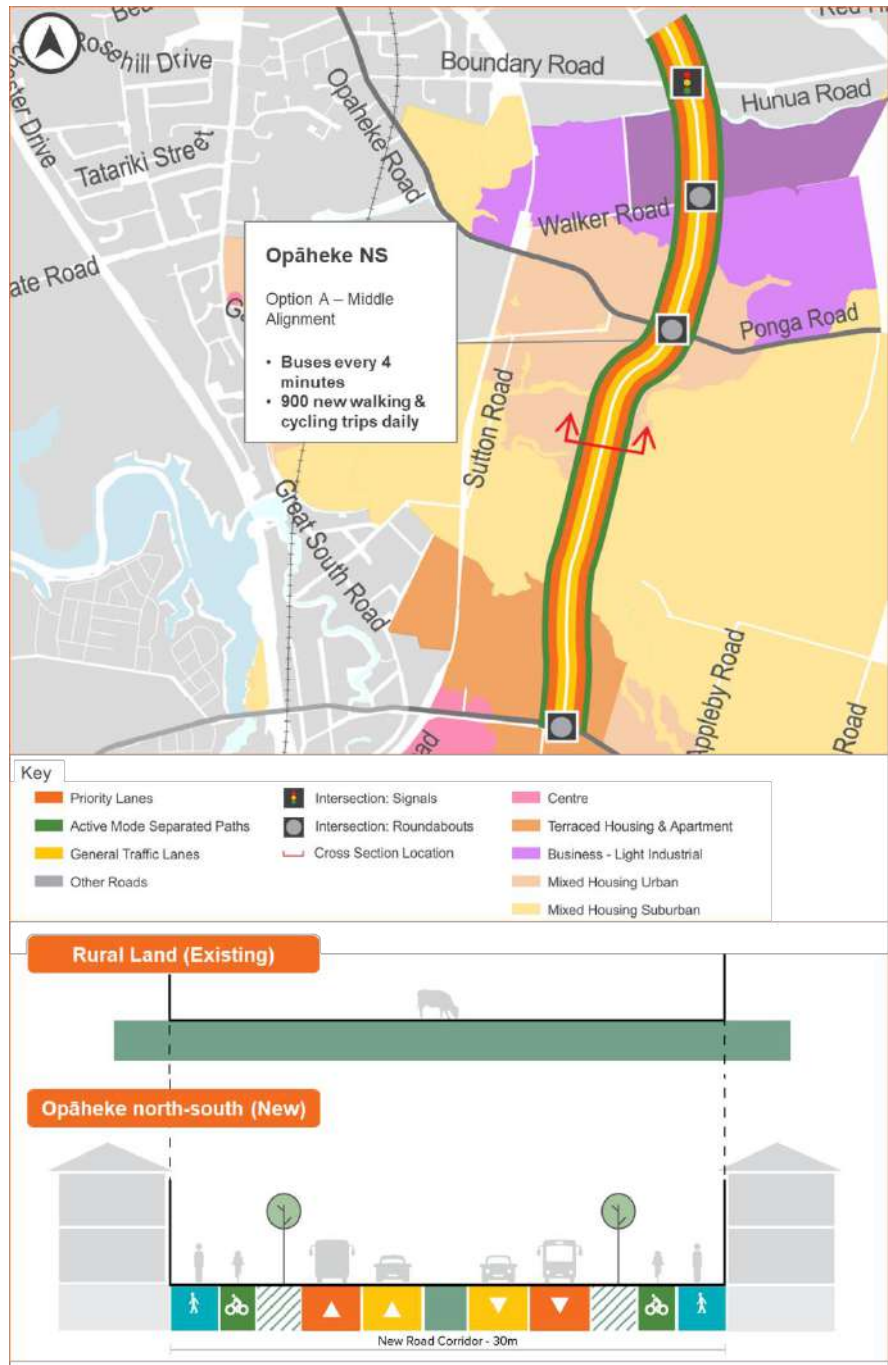


Figure 9-52 Ōpāheke N-S FTN Arterial Upgrade preferred option cross section

This option aligns strongly with the investment objectives, as summarised in Table 9-34. In particular, this option is supportive of IO2 - addressing the need to provide an alternative north-south arterial for the Drury-Ōpāheke growth area to allow for transport choice via multimodal facility provision, that is more appropriate for the imminent urbanisation.

Table 9-34 Ōpāheke N-S FTN Arterial Upgrade investment objective alignment

Investment Objective Alignment
IO1 Enable quality urbanisation in the Drury-Ōpāheke growth area by providing additional N-S arterial connection between proposed centres The Ōpāheke N-S arterial provides for another N-S connection, that more centrally connects Drury's centre, with employment areas in Papakura. This provides an alternative to SH1, more targeted to local travel needs between centres, supplemented by the FTN nature of the route. Option A is more supportive of urbanisation, both along the corridor and in the Drury-Ōpāheke growth area, by being more supportive of developable land, and tying in with the proposed local centre on Ponga Road.
IO2 Improve transport choice and network resilience by providing a safe and attractive multi-modal transport connection between Drury and Papakura The Ōpāheke N-S arterial increases the transport choice available for N-S movements in Drury, as with SH1 providing more regional movement, and with Mill Road only really providing for strategic general traffic. The Ōpāheke N-S arterial on the other hand supports network resilience by attracting more of the local Drury/Ōpāheke trips, with multimodal choice due to the FTN focus and provision of safe, segregated active mode facilities, forming part of the primary cycle network. However, the nuances between options A, B and C's alignment with IO2 were not significant in determining the preferred option

9.2.10 SH22 Arterial Upgrade Options Assessment

9.2.10.1 Form and function assessment

Deriving from the IBCs intention for this section of SH22, and as discussed earlier in section 5.6 the functional intent for SH22 Arterial Upgrade is in the present day to provide sub-regional/strategic movement, to reduce through traffic movement on local roads, which will help reduce congestion and make both local and arterial roads safer and more efficient. However, future function will be district level owing to Pukekohe Expressway supplanting its strategic function. It allows for the urbanisation of the Drury West area and improved safety. Staging with the implementation of Pukekohe Expressway means the form and function of the corridor shifts over time, initially providing 4 general traffic lanes, but it has the ability to provide 2 traffic lanes and 2 priority vehicle lanes for PT services and/or transit lanes. The connection is expected to have 22,000 vpd by 2048. Freight movements are to be actively encouraged and where there is competing land uses active management is required to ensure that freight movements receive the highest priority for road use. As shown in Figure 9-53, SH22 has a medium place and medium movement function (P2/M2), based on the RASF Assessment. Due to future land use accommodating a local/town centre near Jesmond Road and a mix of med/high density residential along the corridor, the form of the corridor will include segregated paths for active modes, with SH22 being identified as forming part of the primary cycle network.

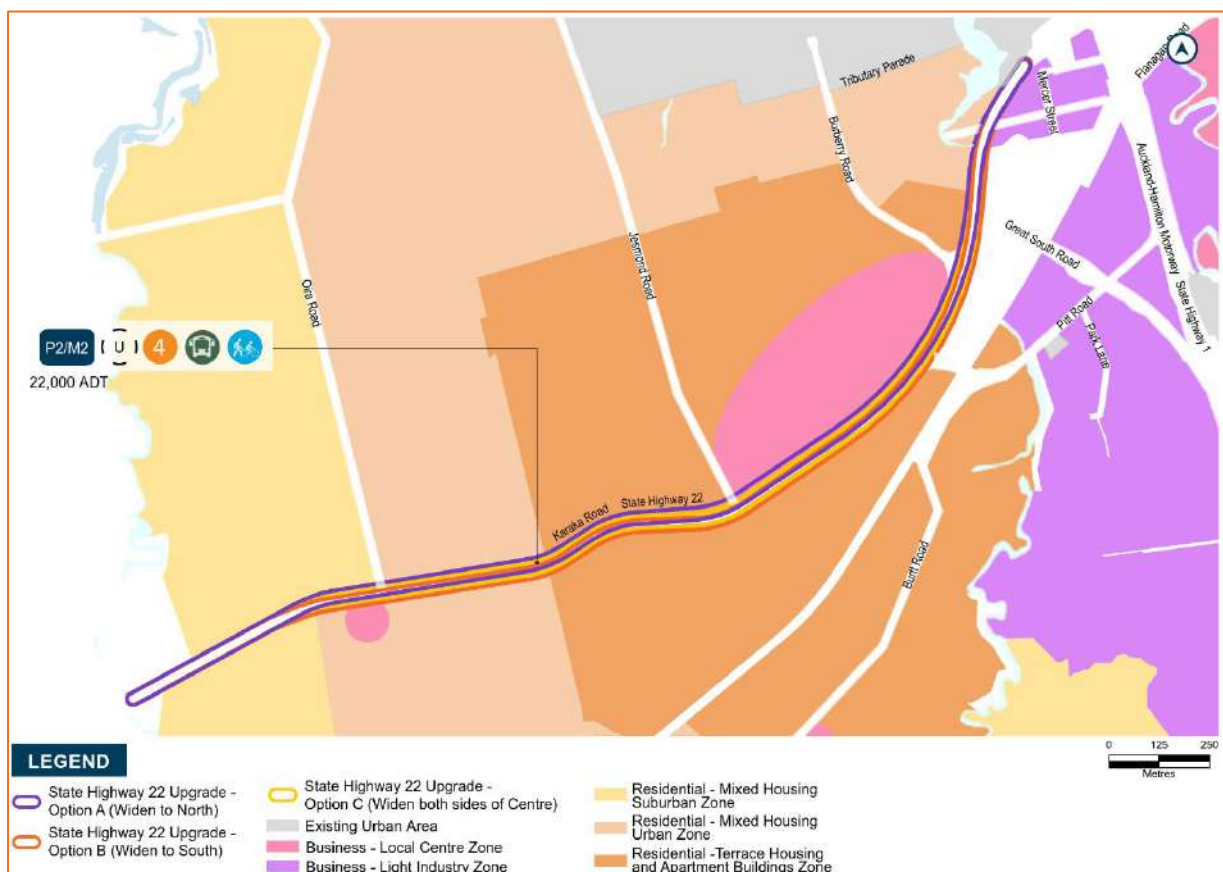


Figure 9-53: SH22 Form and Function Assessment

9.2.10.2 Options Assessed

DBC route refinement for SH22 Arterial Upgrade for the section of SH22 between the extent of the FUZ to the west and the SH1 Drury Interchange included specialist assessment of three options:

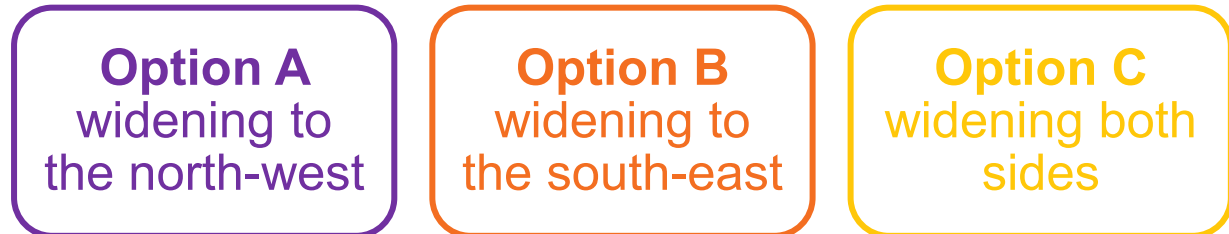


Figure 9-54 SH22 Arterial Upgrade route refinement options

9.2.10.3 Factors of Influence

Whilst all MCA criteria was considered, the more section specific considerations for SH22 during the option assessment process include:

- Terrestrial Significant ecological area at the Ngakoroa Stream
- Overland flow paths and streams
- Ngakoroa Reserve
- Connectivity to existing roads
- Reducing property impacts
- Suspected ground instability

Figure 9-55 spatially identifies these factors, giving context on the positioning of each option against these features. Mitigation or avoidance of constraints and/or positive interface with the surrounding environment (including property, other corridors and projects) influenced which alignment was taken forward as the preferred option or identifying any design refinement. Discussion on the extent of the impact, and which option alignment best addresses these factors, is summarised in section 9.2.10.4 and Table 9-35 below. For more detail, refer to **Appendix A: Options Assessment Report**.

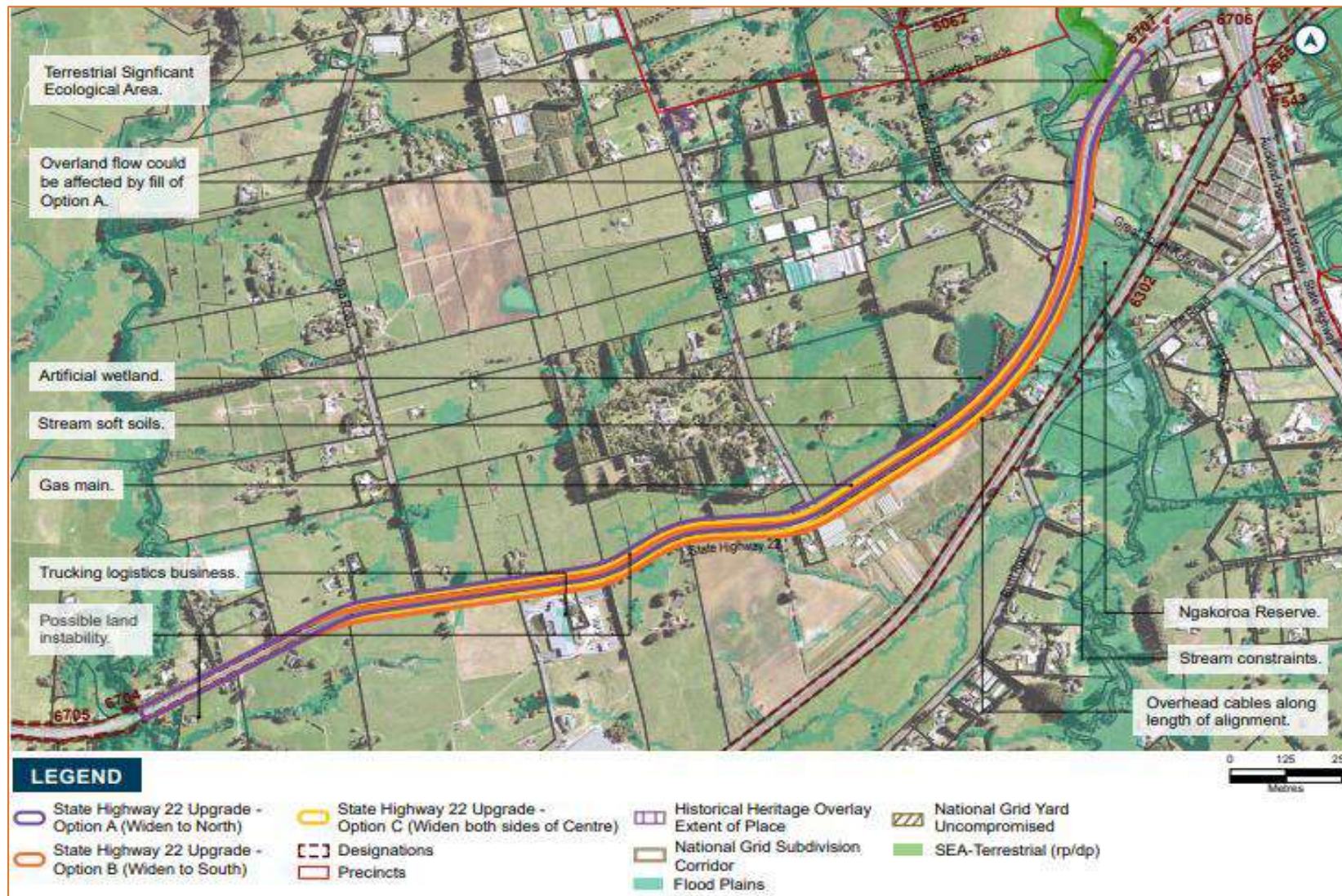


Figure 9-55 SH22 factors of influence and constraints

9.2.10.4 Assessment Summary

The outcomes of the options assessment, highlighting key trade-offs, are summarised in Table 9-35.

Table 9-35 SH22 Assessment Summary

SH22 Arterial Upgrade		
Option	Commentary	Preferred Option
Option A - Widen to the North-west	- Option A has the least impact on property, with the properties required being mainly partial acquisitions that are narrow in shape and adjacent to the State Highway. - This option potentially requires more earthworks due to steeper embankments - this option has slightly more impact on the overland flow paths and impacts on the significant ecological area.	✓
Option B – Widen to the South-east	- This option results in greater impact on the public reserve - This option has slightly more impact on the overland flow paths and impacts on the significant ecological area. - Land parcels are constrained adjacent to the rail corridor, limiting development potential.	✓
Option C – Widen both sides	- This option has the least impact on the flood plain areas - However, it has impacts on the significant ecological area, constrains land parcels are adjacent to the rail corridor, which limits development potential, and requires more complex temporary traffic management during construction.	

The preferred option included widening to the north for the western section of SH22, and widening to the south on the eastern section. The identification of the preferred alignment options for SH22 Arterial Upgrade allowed for confirming the desired intersection forms appropriate for the three intersections along this corridor. Guidance summarised in 9.1.4.1 has informed this process, with decisions summarised below in Table 9-36.

Table 9-36 SH22 Intersection Forms

Intersection		Form		Modal Priority			Justification/ Constraints/ Triggers	Preferred Form
Name	Arms	Lan	Speed	PT	Active	Freight		
Jesmond Rd / SH22 Intersection	Jesmond ↓	4	50 km/h	FTN	High	Low	- FUZ land-use (Town centre and residential) and proximity to train station increases active mode modal priority - High-quality bus priority North-South and East-West through intersection (Jesmond is part of the FTN, SH22 proximity to Drury West station, and Northern Connection has PT lanes connects to Drury West station) - Grade-separation of active modes considered but not considered suitable here due to typography and high urban density - Proximity to Drury West Station and connection with SH22 will make this intersection a high conflict zone between all modes (walking and cycling needs more protection).	Signalised Intersection
	SH22 ↔	4	50 km/h	Med	High	Med		
	Northern Connector ↑	4	50 km/h	High	High	Low		
SH22 / Oira Road	Oira Road ↓	2	50 km/h	Low	Low	Low	- Part of Safe Roads project – identified this intersection as being a roundabout - Local centre on south side of Karaka Road - Lower density residential adjacent to this intersection suggests a lower active mode demand, put still within cycling catchment of Drury West Town Centre	Roundabout
	Karaka Road ↔	4	50 km/h	High	Med	Med		
SH22 / Great South Road Intersection	Great South Road	2	50 km/h	High	Med	Med	- FUZ land-use (Town centre and residential) and proximity to train station increases active mode modal priority - Proximity to Drury West Station, town centre, light industry and connection with SH22 & SH1 will make this intersection a high conflict zone between all modes - Staging, future collector network and tension between bus priority, car, accommodating walking and cycling safely	Signalised Intersection
	SH22	4	50 km/h	High	Med	Med		
	New Collector	2	Low					

9.2.10.5 Preferred option for SH22

Following this assessment, the preferred option was determined to be a combination of the options widening varying sections of the corridor to both the north-west and south-east, which is shown in Figure 9-56. The benefits of this amalgamation enable impacts on various sensitive environmental factors to be reduced where possible. This alignment enables:

- Reduced impact on significant ecological areas, overland flow paths and artificial wetland to the north west
- Reduced impact on Ngakoroa Stream in the north and Ngakoroa Reserve located to the south east of the corridor.
- Allow areas of suspected instability to be avoided where possible
- It will help to minimise sight distance issues on Great South Road by widening to the west at this point and avoid suspected land instability west of Oira Road.

There were no major differentiators between options in regard to project costs. However, the options assessment included consideration of land requirement due to earthworks and contour differences. One of the contributing factors for discounting Option C outright was because a larger footprint was required due to earthworks resulting from widening on both sides of the corridor. Final cut and fill volumes will be confirmed following the detailed design – and will consider potential future contours of the surrounding developed land. This helped to identify preference for a combination of options A and B taken forward.

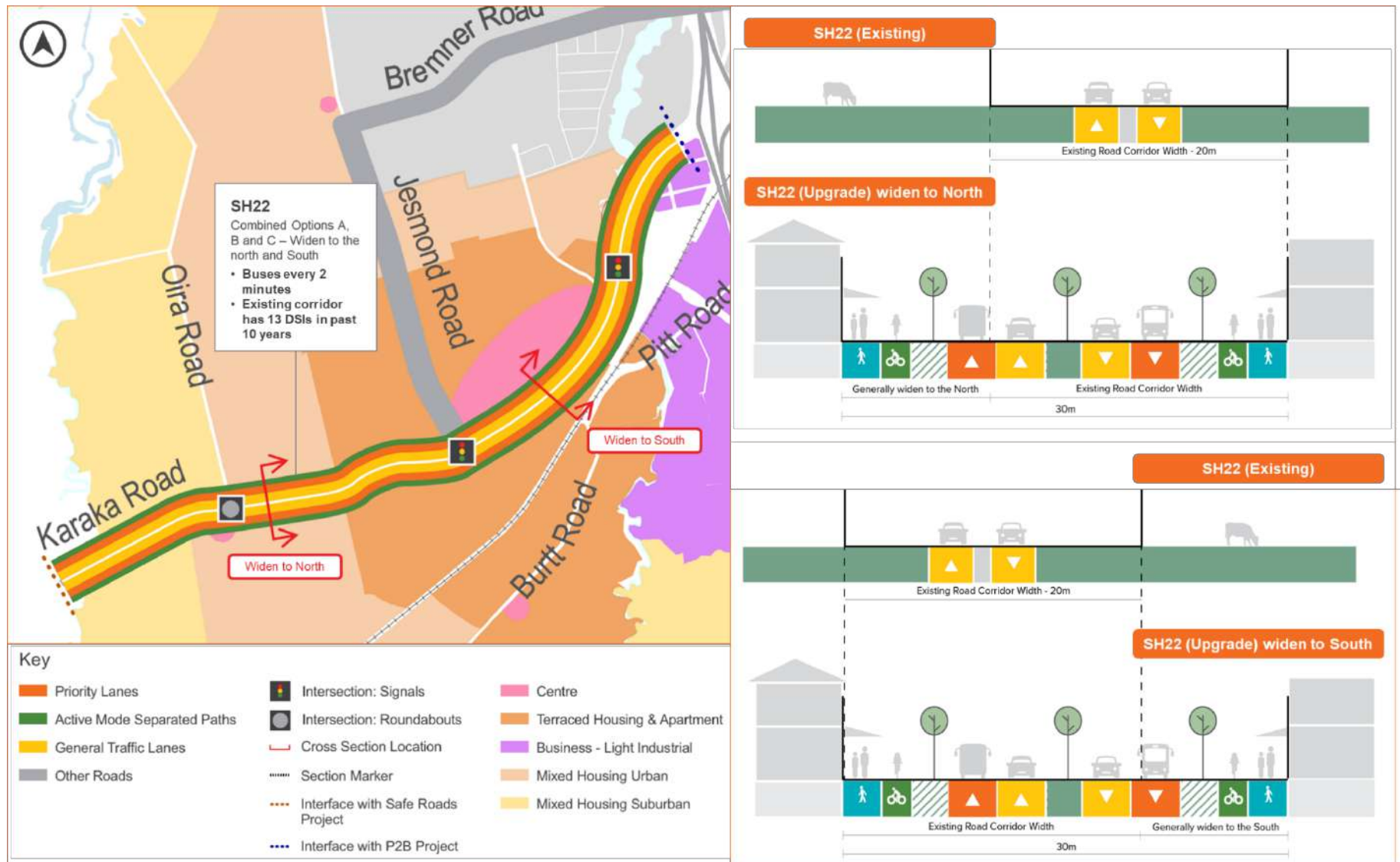


Figure 9-56 SH22 preferred option cross section - widen to the north and south

This option aligns strongly with the investment objectives, as summarised in Table 9-37. In particular, the SH22 Arterial Upgrade is supportive of IO2 and IO3 – addressing the safety issues that are existing and will be exacerbated with the imminent urbanisation by upgrading this section of SH22 to provide for facilities that are more appropriate to the expected growth.

Table 9-37 SH22 arterial upgrade investment objective alignment

Investment Objective Alignment
IO1 Support imminent growth and the planned town centre in Drury by improving connectivity and accessibility along this section of SH22 This section of SH22 forms an important connection for the Drury Local area as it urbanises. The current form is not supportive of the anticipated growth, with main concern being the need for capacity improvements. The benefits of the proposed form upgrade include reducing through traffic movement on local roads, which will help reduce congestion and make both local and arterial roads safer and more efficient. Additionally, this upgrade will provide walking and cycling connections and better accommodate freight and general traffic to support current and future residents. The SH22 upgrade is both a key gateway for localised trips (incl. rail stations, centre and strategic east-west movement) and key connection to SH1. With a proposed centre and train station near the Jesmond Road intersection, safe walking and cycling connections are key to provide for the diverse transport demand and reduce dependence on LOV's.
IO2 Significantly reduce the risk of DSI's from private vehicle crashes and to provide a safe connection for active modes along this section of SH22 It has been identified that the current inadequate form and function of this corridor will be exacerbated in the context of Drury's urbanisation, due to the high speeds and increased traffic volumes. The upgrade will enable safer access (additional segregated walking, cycling provision), resulting in full protection for vulnerable users, decrease in volumes on SH22 (compared to do nothing), reduced risk for death and serious injuries (DSI's). Furthermore, SH22 upgrade with the urbanisation Drury East and Drury West will also include reducing the vehicle speeds along SH22 to 50kph. The reduced speed will result in a reduced risk for death and serious injuries (DSI's). To further reduce speed along and improve safety along SH22, the key intersection controls will also be changed from priority control to signalised/roundabout intersections, resulting in reduced intersection crashes and conflict between users. Additionally, as the preferred option includes widening on both sides, primarily to avoid ecological impacts, it also allows for the minimisation of sight distance issues on Great South Road, therefore showing better alignment with IO2.
IO3 Support a more sustainable, high quality, connected urban form along this section of SH22 that responds to the timing, scale and form of urban development The upgrade of this road will occur to align with the anticipated urbanisation of the Drury West area, to ensure the road form meets the need of the land use context. The consequences of not doing so mean that the nature of the high vehicle speeds and a current lack of active mode provision will result in an unsafe and unattractive street environment, which in turn will preclude/deter the establishment of a compact, walkable urban environment with a town centre

9.3 Package assessment

The preferred options for each project, including their key outcomes are summarised in Figure 9-57. The recommended upgrades support the core investment criteria: **Supporting Growth** and **Enabling Access** for future communities. The recommended package also contributes to **Safety**, **Land use Integration** & **Environment** supporting investment. This section describes the Drury Package contribution against these investment themes and the recommended staging strategy.

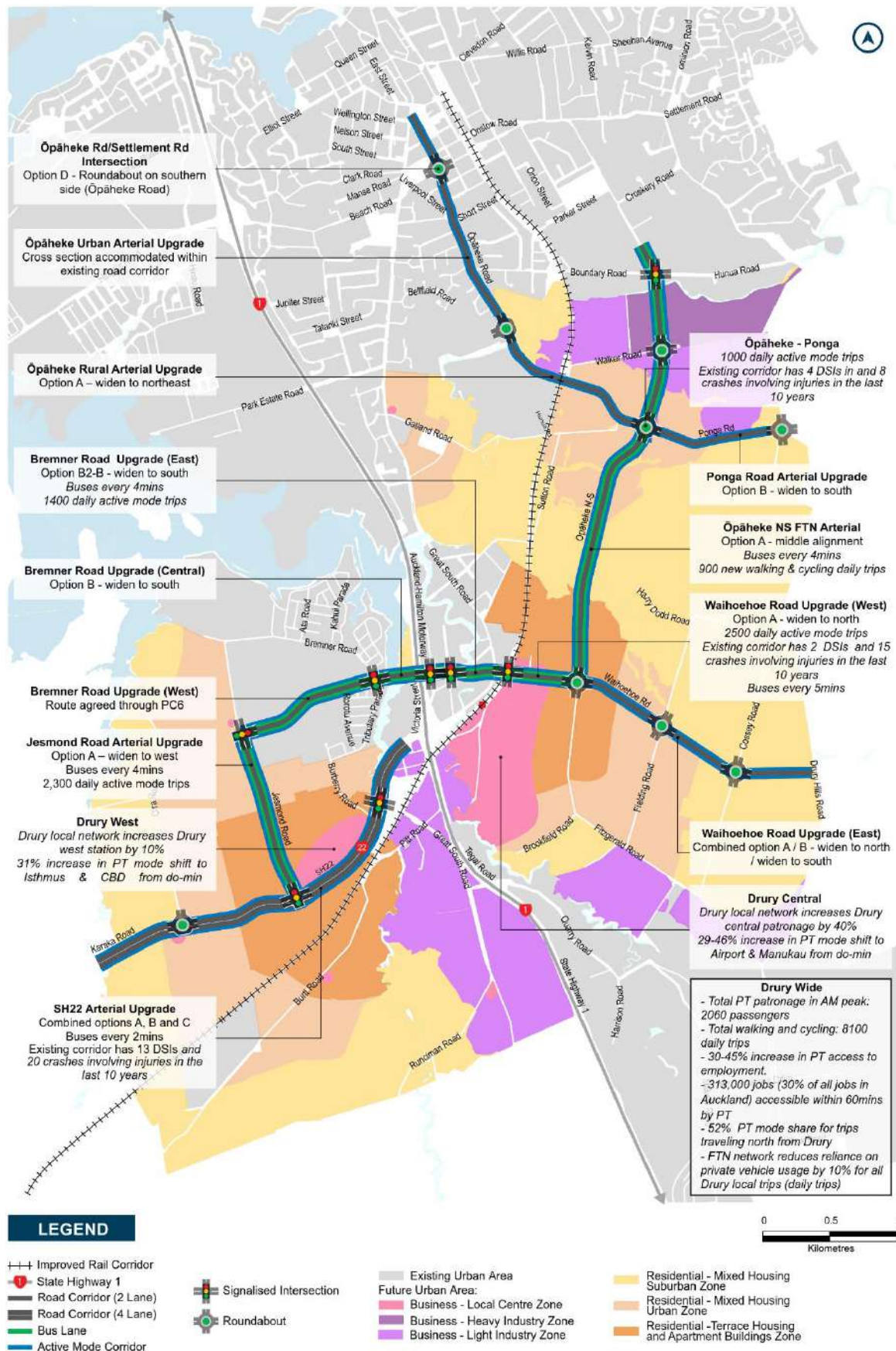


Figure 9-57 Package outcome summary

9.3.1 Package contribution to investment themes

The overall package has strong alignment with the primary and supporting investing themes (Figure 9-58). Key contributions against these are:

- **Supporting Growth:** The current Drury transport network is insufficient to support future growth. The recommended package allocates the space required to facilitate future journeys resulting from the planned growth in Drury.
- **Access:** The recommended network has significant allowance for bus lanes, providing both local (centre to centre) and regional (linkages to future stations) connections.
- **Safety:** The proposed form and function of these roads adopts a safe vision approach and appropriate corridor widths as the existing rural roads are not fit-for-purpose for future growth.
- **Land use integration:** The package has dedicated walking and cycling facilities, and bus facilities to integrate with future communities in Drury.
- **Environment:** The package enables reduced reliance on private vehicles, through improved transport choice contributing towards improved environmental outcomes.

Figure 9-58 elaborates how each project contributes to these themes.

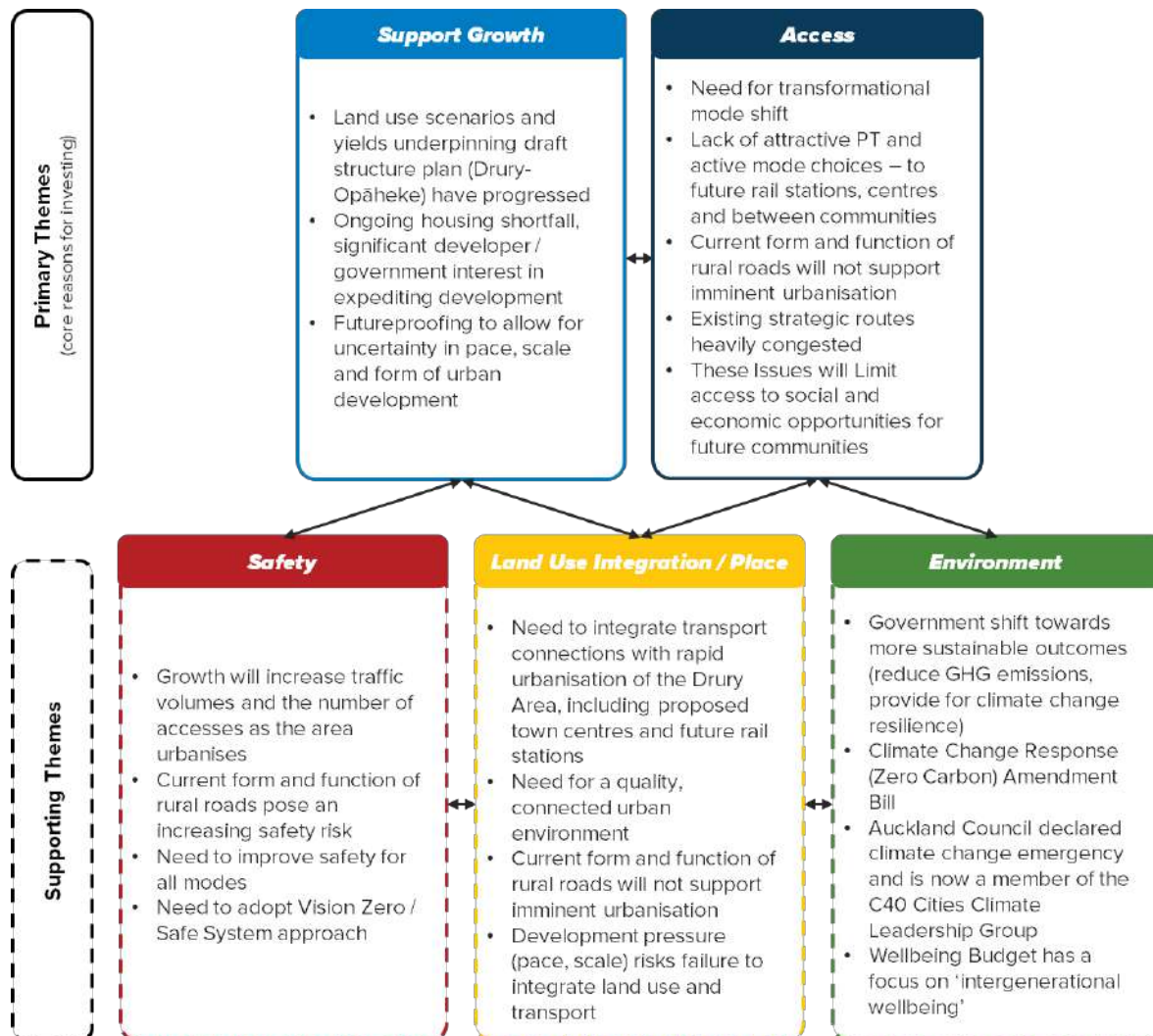


Figure 9-58 Primary and supporting investment theme

Table 9-38 Outcomes against key and supporting investment themes

	State Highway 22	Waihoehoe Road Upgrade	Jesmond Road Upgrade	Bremner Road Upgrade	Ōpāheke/Ponga	Ōpāheke N-S Arterial
Recommended network	Four lane arterial in the interim, transforming to priority lanes which will align with the staging of Pukekohe Expressway. Includes walking and cycling facilities.	Western section includes upgrade to a four-lane arterial including bus lanes (part of the FTN) and walking and cycling facilities. Eastern section includes upgrade to a two-lane arterial for both general and PT traffic, and walking and cycling facilities.	Upgrade to a four-lane arterial including bus lanes (part of the FTN) and walking and cycling facilities	Upgrade to a four-lane arterial including bus lanes (part of the frequent bus network) and walking and cycling facilities. Includes realignment of Bremner road - the Jesmond to Bremner connection - through the Auranga development.	Ōpāheke Rural and Ponga Road is upgraded to a two-lane arterial (24m) for both general and PT traffic and walking and cycling facilities. Similarly, Ōpāheke Urban is upgraded to a two-lane arterial with walking and cycling facilities, but within the existing 20m corridor.	New four lane arterial including bus lanes (part of the FTN) and walking and cycling facilities
Supporting Growth	The existing SH22 condition is appropriate for the rural context, but not supportive of the imminent urbanisation and increased demand. The upgrade of this section of SH22 supports this growth and the planned town centre in Drury by improving connectivity and accessibility.	Jesmond-Bremner-Waihoehoe: Existing roads are appropriate for the rural conditions, but not supportive of the imminent urbanisation and increased demand anticipated, particularly given pressure from developers in the Drury West (Auranga) area. Route protection for the arterial upgrades including multimodal facility provision will enable the transport needs from the predicted growth in Drury and Ōpāheke to be met. . In general, protecting these preferred corridors considering imminent growth, allows proactive urban planning that is supportive of the future transport network. Notably, the existing alignment of Bremner Road provides an indirect and unattractive route, less supportive of both developer and structure plan land-use intentions. Agreements with land-owners and developers through the Auranga section will support SGA's route protection and allow for this more direct realignment. Waihoehoe East / Ōpāheke/Ponga: route protection for the upgrade of these sections aligns with current urbanisation occurring in the rural environment and ensures connections to the wider south network for these residential areas. Future growth of the urban section of Ōpāheke has been catered for via a consistent link from Ponga Road, whilst avoiding significant impacts on the existing adjacent urban environment.				Will enable quality urbanisation in the Drury-Ōpāheke growth area by providing a new N-S connection to cater for increased local trips; connecting residential areas with employment zones – as well as facilitating regional trips to Papakura and Takaanini.
Access	Arterial upgrade to support the form and function of the corridor to provide more appropriate and safe access to Drury west station, town centre and adjacent land use. Safe walking and cycling connections are key to provide for the diverse transport demand.	Jesmond-Bremner-Waihoehoe: Provides a vital link for the Drury FTN and active mode network by providing high quality, safe and attractive PT and active mode facilities. Provides a seamless connection between future train stations, centres and residential areas, ensuring the Drury growth area has well connected transport choices within and beyond Drury. This will improve access to economic and social opportunities for existing and future communities in the South, by supporting a transformational mode shift away from use of LOVs, reducing an over-reliance on existing strategic transport corridors, and better aligning the form and function of existing roads with the planned future urban form. Waihoehoe East / Ōpāheke/Ponga: These sections don't include priority lanes, however frequent bus routes will provide PT connections, as well as active mode facilities (for the communities in the east), to economic and social opportunities within and beyond Drury.				Supporting network resilience by attracting more of the local Drury/Ōpāheke trips, with multimodal choice between Drury and Papakura, meaning local N-S trips can avoid using SH1 and Mill Road

	State Highway 22	Waihoehoe Road Upgrade	Jesmond Road Upgrade	Bremner Road Upgrade	Ōpāheke/Ponga	Ōpāheke N-S Arterial
Safety	Urbanisation of the Drury local area combined with high speeds, a high number of accesses and increasing traffic volumes on this section of SH22 will lead to an increased risk of DSI crashes. Upgrades to the corridor will address these concerns.	Jesmond-Bremner-Waihoehoe: Form and function of these rural roads are inadequate for the planned urbanisation (centre and higher density zoning), where greater transport demand and increased pedestrian movement is anticipated. This will be achieved through the delivery of high quality, safe and attractive active mode and PT facilities that allow for increased protection through the separation of different mode users. The design will be consistent with Vision Zero principles and outcomes sought by AT through prioritising facilities that support safe travel by foot, bike or PT, which currently are not present along the existing corridor. Ōpāheke/Ponga: The design will be consistent with Vision Zero principles and outcomes sought by AT through prioritising facilities that support safe travel by foot, bike or PT, which currently are not present along the existing corridor. The speed environment will be reduced to 50km/h, which is likely to reduce to crash severity. Localised widening around the existing and future intersections to accommodate for vehicle stacking and tie-ins and walking and cycling facilities/ crossings. Additionally, a grade separation of the existing level crossing at Ōpāheke Road is proposed.				Network resilience – providing alternative N-S routes, which in turn can have safety benefits. This corridor will also provide safe walking and cycling facilities.
Land Use Integration/Place	The upgrade of this road will align with the anticipated land use context. The consequences of not addressing the high vehicle speed and lack of active mode provision will result in an unsafe and unattractive street environment, which in turn will preclude/deter the establishment of a compact, walkable urban environment	Jesmond-Bremner-Waihoehoe: In comparison to the existing form of the corridors, corridor upgrades are more supportive of the planned zoning and growth. PT facilities prioritise FTN movement, directing and integrating PT into the Drury centres. Transport and land-use have a mutually beneficial relationship – route protection for FTN movement along these corridors encourages proactive urban planning, i.e. mixed-use centres and higher-density THAB zoning, providing the necessary catchment. Conversely, multimodal connectivity to employment, social centres and rail stations is improved for current and future communities, to and through the Drury area. Connected active mode networks within station catchments are also particularly supportive of facilitating wider land use interaction and improved wellbeing. Waihoehoe East / Ōpāheke/Ponga: Active Mode Corridor upgrades allows for the more peripheral land-use that is primarily medium-low density residential to develop in a way that isn't entirely reliant on LOVs, instead falling within the wider cycling catchment of both the stations (Drury Central and Papakura station) and mixed-use/employment centres (Drury Central, Papakura Centre and industrial area). Thus, these corridors improve connectivity to/through the Drury area to support current and future residents with multi-modal facility provision to connect to key destinations.				The Ōpāheke N-S arterial increases the transport choice available for N-S movements in Drury, supporting network resilience by attracting more of the local trips, connecting communities with employment centres – Papakura in the north and Drury Central centre and station in the south-west.
Environment	The upgrade of this road will provide high quality, safe and attractive PT and active mode facilities, reducing LOV reliance, in turn providing health, wellbeing and environmental benefits, including GHG emission reduction	Jesmond-Bremner-Waihoehoe: Upgrade rural roads to provide high quality, safe and attractive PT and active mode facilities, to support the anticipated growth and land-use adjacent to the corridor. This increased transport choice is likely to reduce the reliance on LOVs, improve health and wellbeing, and the environment, including GHG emission reduction. Waihoehoe East / Ōpāheke/Ponga Upgraded two lane corridor with frequent bus services and safe and attractive active mode facilities will be provided to support the anticipated growth and land-use adjacent to the corridor. This will increase transport options reduce the reliance on LOVs, improve health and wellbeing, and the environment, including GHG emission reductions. Modelling shows significant increase in walking and cycling trips along these corridors.				Improves transport choice and reduces reliance on LOVs that the strategic N-S corridors primarily cater for, gaining health/wellbeing, social and environment benefits

9.3.2 Difference to the IBC Network

Following a more detailed investigation of the potential implications of the growth on transport demand and the resultant transport system requirements, the recommended network differs from the earlier IBC network. The most substantial changes include:

- **SH22 extent of upgrade extended to edge of FUZ (as opposed to just Oira Road):** This extension ensures the entirety of SH22 interacting with the Drury West FUZ is route protected to be able to respond to future growth
- **Waihoehoe Road (east section) is now proposed to be two lanes** with additional walking and cycling facilities, as opposed to four lanes. This is a result of the Form and Function assessment carried out in the DBC stage. The expected future traffic volumes and bus frequency can be adequately catered for by the proposed two-lane cross section
- **Similarly, the Ōpāheke Road – Ponga Road corridor is also proposed to be two lanes with additional walking and cycling facilities** as a result of the Form and Function assessment
- **Croskery Road and Hunua Road upgrade excluded from Drury Local DBC:** these corridors form an important link to the wider South FTN story, and the case to route protect for a wider corridor will be addressed in the Takaanini FTN DBC.

9.3.3 Implementation staging assessment

Given the role of the Route Protection DBC is to identify a transport system to support the next 30+ years of growth, there is inherent uncertainty in relation to the recommended network and the proposed staging strategy. Whilst route protection is the focus of this DBC, understanding the implications of these scenarios, and consequently outlining the recommended staging for implementation is integral to understand the property liability, the consenting and route protection strategy (see section 11.1 below). To understand the potential implications, several scenarios were considered:

- Recommended staging scenario
- Funding availability – Committed projects only
- Mode shift & emissions reduction led scenario

The sections below summarise the outcomes of the alternative staging scenario assessment. Refer to **Appendix B: Transport Assessment Report** for further details.

Key principles for staging have been developed that seek to assist in delivering the desired transport and land use outcomes. These principles include:

- Integrating land use and transport to support:
 - Place making
 - Influencing travel, particularly reducing the need to travel, and inducing a mode shift away from single-occupant cars;
 - Maintaining accessibility to unlock socio-economic opportunities
- Providing safe and attractive travel choices
- Providing network resilience and value for money

The key influencers for the recommended staging strategy include:

- Future Urban Land Supply Strategy 2017
- Plan changes
- Travel and mode shift targets

The principles and triggers identified above result in a staging strategy that requires the majority of the package to be implemented within the first decade. The upgrades of existing corridors in Drury facilitates the imminent growth expected from Auranga Precinct development, and multiple Private Plan Changes currently lodged. The staging of these upgrades is critical to ensure:

- reduced reliance on private vehicle trips for local and regional journeys; and that
- future journeys are safe.

9.3.3.1 Recommended staging strategy

Table 9-39 outlines the proposed Staging Strategy for Drury Local.

This scenario assumes that the development ready timeframes identified in FULSS materialise and the associated projects to support the growth occur concurrently. It also assumes optimal DTIP sequencing goes ahead, considering NZUP and related projects.

The principles and triggers identified above result in majority of the package to be implemented within the first decade to support the imminent growth expected from Auranga Precinct development, and Private Plan Changes currently lodged in Drury West/ Drury East. Also, it integrates well with the planned new centres and rail stations in Drury. Table 9-39 outlines the proposed Staging Strategy for Scenario 1

Table 9-39 Recommended Staging Strategy

Project	Decades			Triggers
	1	2	3	
Jesmond Road FTN Upgrade				- Support development of Auranga Precinct & connect to Drury West station. - Private plan changes lodged by Lomai Properties Karaka and Drury Limited
Bremner Road FTN Upgrade				Support development of Auranga Precinct & connect to Drury Central station.
SH22 Upgrade				- Support development of Auranga Precinct. - Private plan changes lodged by Lomai Properties Karaka and Drury Limited
Waihoehoe Road FTN Upgrade				Drury East growth acceleration: Private Plan Change by - Oyster Capital, - Fulton Hogan and - Kiwi Property
Ōpāheke North-South Arterial FTN				FULSS land release - 2nd Decade. Great South Road to be sequenced first and progressively upgraded over time.
Ōpāheke Road - Ponga Road Upgrade				FULSS land release - 2nd Decade. Great South Road to be sequenced first and progressively upgraded over time.

9.3.3.2 Funding availability – committed projects only scenario

This scenario assumes that the development ready timeframes identified in FULSS materialise, committed schemes (including NZUP) occur in Decade 1 and the rest of the projects are scheduled in Decades 2 and 3.

To understand the implications of this scenario, projects not committed in the first decade were scheduled for Decades 2 and 3. As shown in Table 9-40, this scenario results in no Drury Arterial projects being implemented during Decade 1.

Table 9-40 Committed project staging scenario

Project	Decades			Triggers for Recommended Staging Scenario
	1	2	3	
Jesmond Road FTN Upgrade				Support development of Auranga Precinct & connect to Drury West station. Private plan changes lodged by Lomai Properties Karaka and Drury Limited
Bremner Road FTN Upgrade				Support development of Auranga Precinct & connect to Drury Central station.
SH22 Upgrade				Support development of Auranga Precinct. Private plan changes lodged by Lomai Properties Karaka and Drury Limited
Waihoehoe Road FTN Upgrade				Drury East growth acceleration: Private Plan Change by Oyster Capital, Fulton Hogan and Kiwi Property
Ōpāheke North-South Arterial FTN				FULSS land release - 2nd Decade. Great South Road to be sequenced first and progressively upgraded over time.
Ōpāheke Road - Ponga Road Upgrade				FULSS land release - 2nd Decade. Great South Road to be sequenced first and progressively upgraded over time.
Legend				
Committed project scenario				
Base staging scenario				

Auranga Precinct development is expected to yield 2,650 new dwellings in Drury West. In addition to this, with increased emphasis on prioritising growth in Drury, more growth is expected in Drury Central if the Private Plan Changes are accepted and development is pulled forward to the 1st decade. The existing transport infrastructure will be inadequate for this substantial growth in travel demand. Some of the key implications of this alternative staging scenario are:

- Safety: the current corridor form and function is inappropriate to safely accommodate future traffic volumes
- Access to jobs: lack of investment in walking and cycling, and PT connections will increase reliance on currently congested corridors such as SH1 and Great South Road, and therefore potentially result in very poor accessibility from Drury

- Reliance on cars and emissions: similar to above, the lack of investment in the 1st decade will result in much greater reliance on single occupant vehicle usage

Overall this scenario has the lowest early investment cost. However, there are significant adverse effects expected if future growth materialises and existing transport infrastructure remains unchanged. The adverse effects would compromise safety, wellbeing, liveability and lead to several unwanted outcomes.

9.3.3.3 Mode shift & Emissions Reduction led Scenario

For this scenario mode shift and emission reduction projects were prioritised. It assumes NZUP committed schemes scheduled as per government programmes (generally Decade 1), it brings all PT projects forwards into Decade 1 unless otherwise stated (with rationale).

As shown in Table 9-40, this scenario results in the following differences from the recommended scenario:

- SH22 pushed back to second decade as PT elements of the corridor are expected to be implemented after Pukekohe Expressway is operational
- Ōpāheke North-South Arterial FTN project pulled forward to the first decade

Table 9-41 Committed project staging scenario

Project	Decades			Triggers for Recommended Staging Scenario
	1	2	3	
Jesmond Road FTN Upgrade				- Support development of Auranga Precinct & connect to Drury West station. - Private plan changes lodged by Lomai Properties, Karaka and Drury Limited
Bremner Road FTN Upgrade				Support development of Auranga Precinct & connect to Drury Central station.
SH22 Upgrade				- Support development of Auranga Precinct. - Private plan changes lodged by Lomai Properties, Karaka and Drury Limited
Waihoehoe Road FTN Upgrade				Drury East growth acceleration: Private Plan Change by - Oyster Capital, - Fulton Hogan and - Kiwi Property
Ōpāheke North-South Arterial FTN				FULSS land release - 2nd Decade. Great South Road to be sequenced first and progressively upgraded over time.
Ōpāheke Road - Ponga Road Upgrade				FULSS land release - 2nd Decade. Great South Road to be sequenced first and progressively upgraded over time.
Legend				
Mode shift project scenario				
Base staging scenario				

The implications of this scenario were as follows:

- Similar to the “Funding availability” scenario, delaying SH22 upgrade would negatively impact both existing and future (Auranga development) communities

- Whilst accelerating Ōpāheke North-South Arterial FTN would provide some positive mode shift outcomes, the increase in public transport and active mode patronage could potentially be quite low as the Ōpāheke area is not due for development until the second decade

As a result of the above, the recommended programme would likely be impacted by this scenario as follows:

- Poor accessibility and safety outcomes for existing and future communities in Drury West due to delaying SH22 upgrades
- Questionable value for money proposition if Ōpāheke North-South Arterial FTN is implemented before Future Land release in Ōpāheke

Overall this scenario identified that the Drury Local package would likely need to be brought forward in the order of two to five years from a cashflow perspective. This would further challenge the already challenged affordability of this package.

9.3.3.4 Land use uncertainty – Employment concentration scenario

For this scenario we have undertaken analysis if the proposed employment in the 'Supporting Growth' areas were limited or did not occur. To understand the implications of this scenario, employment was relocated from these areas to the central Auckland region where more traditional employment locations are (such as the CBD). The implications of this analysis were as follows:

- There was an increase PT and vehicle trips, but less 'local' walking and cycling trips due to the removal of local employment
- An increase in trip length for PT and private vehicles as people travel from the growth areas to the more centralised employment areas
- Increased congestion on some key strategic links including the motorway networks and the rail network

As a result of the above analysis the recommended programme would likely be impacted by this scenario as follows:

- There would be increased pressure on the strategic transport system in the Drury area earlier due to the increased number of trips.
- This could manifest itself in the following outcomes for the recommended programme:
 - Investment in Jesmond, Bremner and Waihoehoe earlier in the first decade to get PT access to the Drury rail stations (nominally in the order of two to three years earlier)
 - Earlier need for SH22 upgrade to provide access to the strategic road network (nominally in the order of three to five years earlier)
 - Ōpāheke projects would be under pressure to move potentially into decade two (nominally in the order of two to three years earlier)
- Another potential outcome of this scenario which was not an outcome of the modelling (as land use is fixed) but the effective reduction in accessibility to employment in these growth areas will likely have a reduction in the level of growth that would eventuate in these areas due to the reduced attraction of these areas for employment.

Overall this scenario identified that the Drury Local package would likely need to be brought forward in the order of two to five years from a cashflow perspective. This would further challenge the affordability of this package.

9.3.3.5 Recommended Drury Local Package

Figure 9-59 summarises the recommended Drury Local staging.

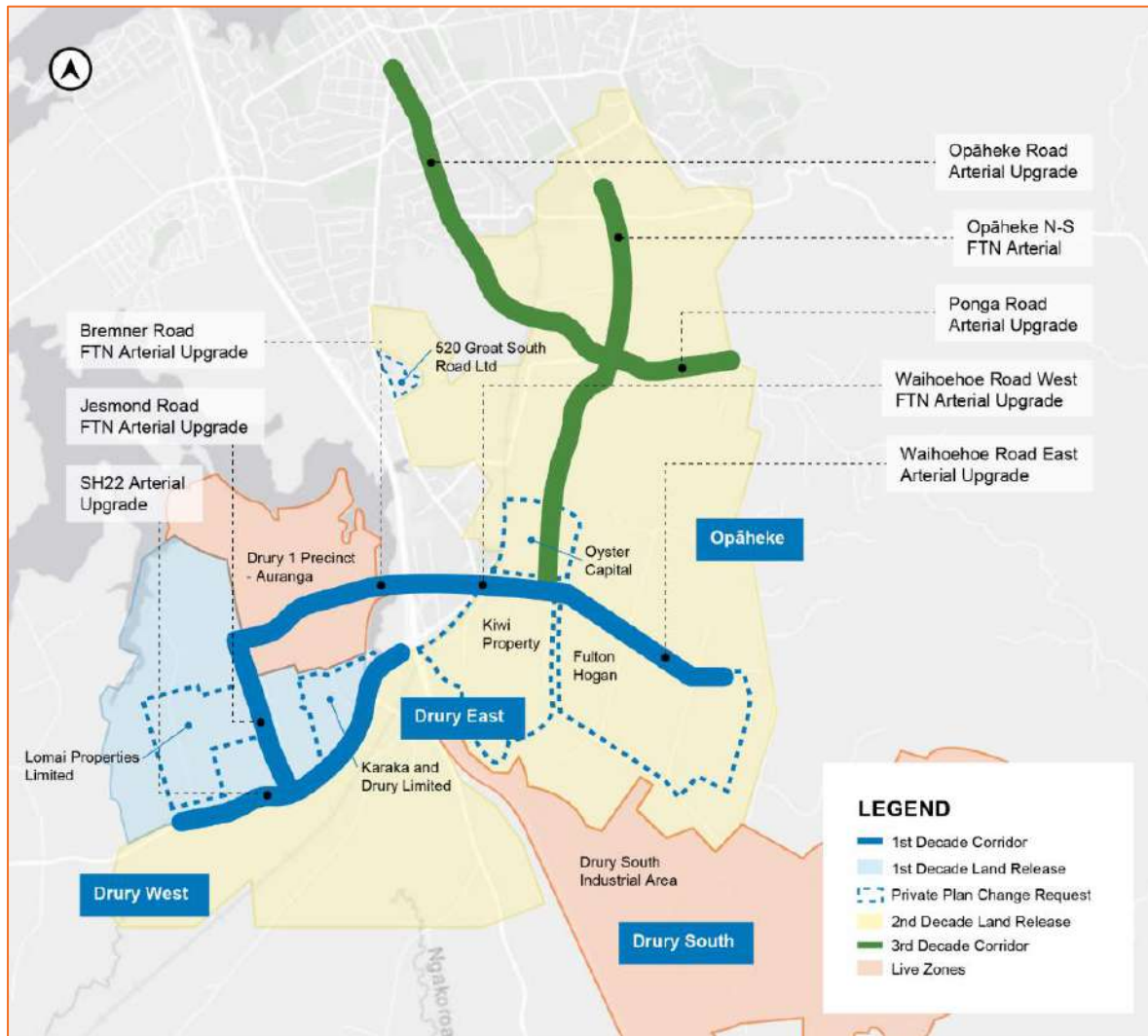


Figure 9-59 Recommended staging approach

Whilst this staging analysis shows that the recommended package could ‘flex’ to deal with the scenarios tested above, overall the analysis indicates that:

- Growth in Drury is expected to occur sooner than earmarked in FULSS 2017 and the recommended staging ensures the future transport network in Drury can accommodate this growth
- The recommended package is flexible, and due to the “staging principles”, can be updated appropriately to changing futures and demands
- Local employment is incredibly important and provides enhanced outcomes as well as financial benefits.

- In comparison to the other scenarios, the outcomes of this staging align better with the GPS, and supports growth occurring concurrently
- The Jesmond-Bremner-Waihoehoe FTN connection and SH22 has been proposed for decade one to ensure it responds to the urgency of growth occurring adjacent to these corridors. This is evidenced by the live zones in Drury West (Auranga) and the significant developer interest surrounding Drury Central. The upgrade of these corridors concurrently with anticipated growth provides mode-choice (FTN, Active modes and private vehicles) and access for the communities.
- Additionally, the rest of the Drury Local corridors are proposed for decade 3 as opposed to decade 2, to align with the rest of the Drury FUZ land being released.

9.4 Option outcomes and benefits

9.4.1 Key performance indicator – outcomes

The recommended package outcomes against KPIs are summarised in Table 9-42 – these outcomes against the KPIs reinforce the investment needed in the Drury Local corridors. At a high level, the Drury Local Package delivers well against the investment themes with sound improvement in the provision of quality PT and active mode networks/facilities, contributing to positive safety and mode share outcomes. **Appendix K: Drury Local Key Performance Indicators** goes into further detail, outlining the PBIO line of site with the KPI outcomes.

Table 9-42 Drury Local KPIs and outcomes

KPI	Outcomes
Provision of PT	A total of 7km of new or corridor upgrades are proposed for FTN.
PT network quality	FTN and bus priority improves PT reliability: • Reduced journey length spent in congestion: Percentage of bus passenger km travelled in severe congestion in AM peak is 0.04% compared to 0.3% in the do-minimum • Jesmond Road, Bremner Road, Waihoehoe Road FTN upgrade results in a total of eight minutes journey time savings along the corridor (AM peak) compared to the do-minimum. • Ōpāheke N-S Arterial reduces PT journey times by four minutes (AM peak). • Reduced time spent in congestion: Percentage of hours spent in severe congestion (volume/capacity >0.9) by PT vehicles in AM Peak is 0.5% in Preferred Option compared to 11.8% in the do-minimum
Mode share (local and regional trips)	For local trips, active mode share increases to 32% (1% cycle and 31% walk) for Drury. For regional trips, increase to 52% overall mode share for PT trips traveling north from Drury. Along each corridor, PT mode share on FTN routes are as follows: • Jesmond Road: 8% PT mode share • Bremner Road: 10% PT mode share • Waihoehoe Road: 24% PT mode share • Ōpāheke N/S: 18% PT mode share
Change in human health and emission	The FTN network improves human health by better air quality: • Reduction of NO₂: 0.3 tonnes annually compared to the do-minimum • Reduction of PM₁₀: 0.6 tonnes annually compared to the do-minimum • Reduction of CO₂: 1,268 tonnes annually compared to the do-minimum • Reduction of fuel consumption: 575 tonnes annually compared to the do-minimum

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New PT users	1,400 new PT boardings on buses in the AM peak along Bremner Road, Jesmond Road and Waihoehoe Road. 440 new PT boardings on buses along Ōpāheke N-S Arterial - Rail patronage to Drury West station increases by 10% - Rail patronage to Drury Central station increases by 40%
Increased active mode trips	Number of new daily walking and cycling movements: - Jesmond Road: 2,300 daily walking and cycling trips - Bremner Road: 1,400 daily walking and cycling trips - Waihoehoe Road: 2,500 daily walking and cycling trips - Ōpāheke / Ponga Road: 1,000 daily walking and cycling trips - Ōpāheke N-S Arterial: 900 daily walking and cycling trips A total of extra 600 cycle-km and 1,500 walk-km daily compared to the do-minimum.
Access to PT network and active mode network	Dwellings within 500m catchment of Drury FTN stops – 30,000 (or 23% of all dwellings in the South region) Population within 500m catchment of Drury FTN stops – 82,000
Access to Local town centre and key destinations	2,700 dwellings are within 800m walk and 43,000 dwellings (or 33% of all dwellings in the South region) are within 3km cycle of Drury Local Town Centre In AM peak, the number of PT trips to: - Auckland CBD: 1,700 trips – 29% increase compared to the do-minimum - Isthmus and North: 1,100 trips – 31% increase compared to the do-minimum - Manukau: 350 trips – 40% increase compared to the do-minimum - Auckland Airport: 300 trips – 46% increase compared to the do-minimum
Active modes provision	A total of 17km new walking and cycling facilities are proposed for the entire Drury Local network
Street amenity	Traffic volumes on Drury local roads reduce by 10% (5,300 daily trips)
Reduction in DSIs	Design aspects incorporated to minimise safety risks, include: - Cross section design to meet Design Philosophy and Engineering Standards - Intersections analysed for appropriate form and spacing - Speed reduction in line with the urbanisation along the route - Limited or banned accesses along the route - Walking and cycling facilities segregated from general traffic - FTN running along the outer lane, reducing the need for vulnerable users to cross into the median at bus stops
Access to jobs	The FTN network reduces travel time to key destinations and increases access to jobs significantly: 91,200 jobs (or 9% of all jobs in Auckland) are accessible within 30 minutes by car. 2% increase compared to the do-minimum 107,400 jobs (or 10% of all jobs in Auckland) are accessible within 45 minutes by PT. 28% increase compared to the do-minimum 313,000 jobs (or 30% of all jobs in Auckland) are accessible within 60 minutes by PT. 43% increase compared to the do-minimum
Availability of alternatives to strategic connection	Ōpāheke North-South Arterial provides a fit-for-purpose corridor for local trips. I.e. local trip making is not reliant on Mill Rd or SH1 within Drury and Ōpāheke Ōpāheke North-South Arterial reduces delays along GSR to 5mins and 5s, compared to the 8mins and 34s of delay that would occur without the NS arterial

9.4.2 Sustainability outcomes

This section discusses the sustainability outcomes of the Drury Local package. **Figure 9-60** summarises the regional level benefits. In summary, the overall package contributes to the future resilience of the regional network by providing alternative modes to cars and alternative routes between centres. Additionally, mode choices support regional emissions reduction, reduced VKT, and improved health and wellbeing.

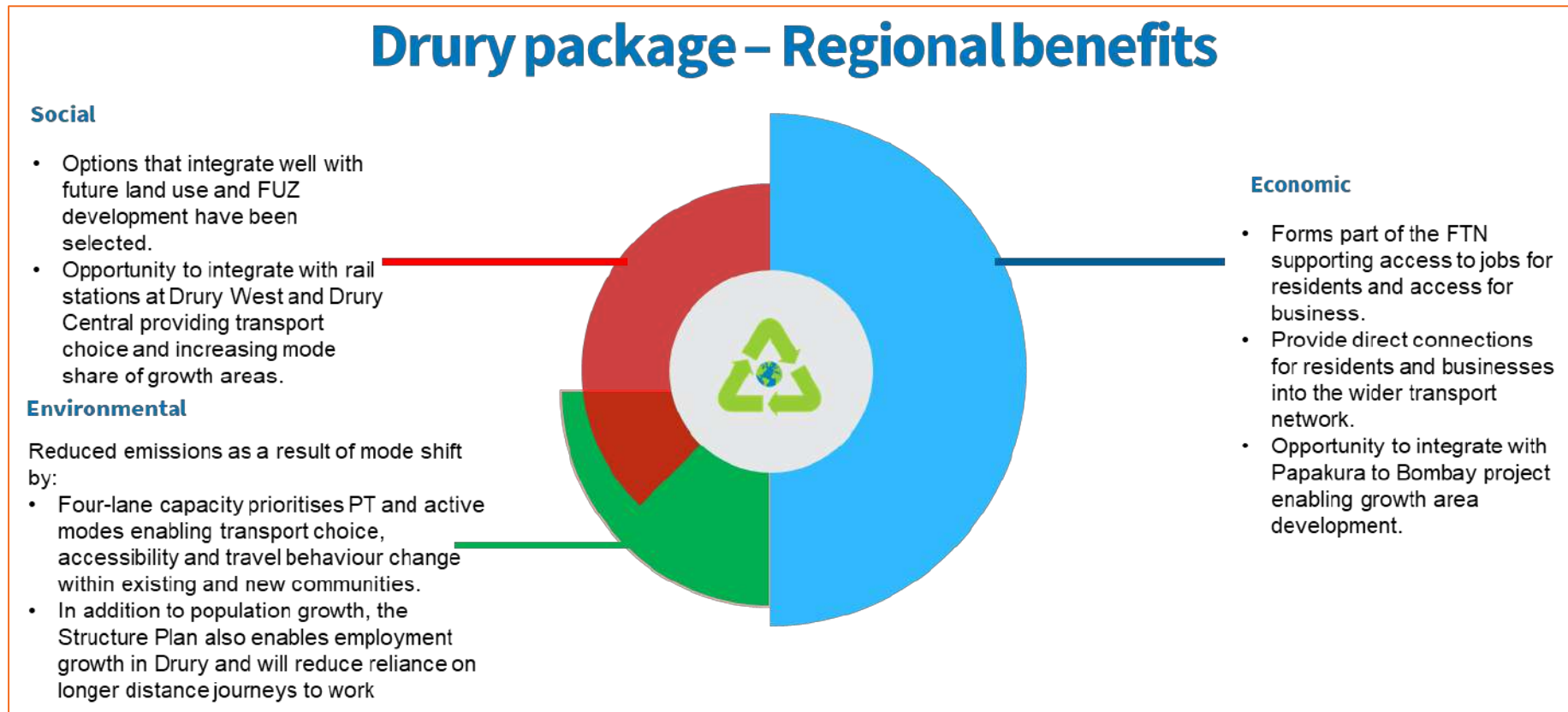


Figure 9-60 Drury Package Regional Sustainable Benefits

Local economic benefits – Figure 9-61 summarises the local economic benefits of the Drury Local Package. In summary, the four-lane capacity across the majority of the corridors facilitates PT prioritisation, and in conjunction with active mode facilities on all corridors, enables greater accessibility, transport choice, and travel behaviour change within existing and new communities. Additionally, the Drury Local FTN supports access to business and jobs for residents. Planned integration with future land use means the corridor upgrades provide direct connections for residents and businesses into the wider transport network, including to proposed rail stations at Drury West and Drury Central. This is integral in increasing PT and active mode share in growth areas.

Drury Package – Local Economic Outcomes

Transport Choice

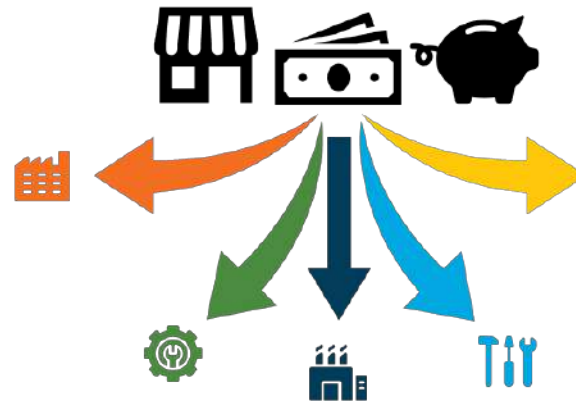
Four-lane capacity prioritises PT and active modes enabling transport choice, accessibility and travel behaviour change within existing and new communities.

- Greater than 50% of overall mode share for PT trips in the AM peak travelling north
- Ability to cater for busses every 4mins along these corridors
- Facilitating 1,840 new PT trips in the AM Peak

Access to jobs

Forms part of the FTN supporting access to jobs for residents and access for business. Reduces travel time to key destinations and increases access to jobs significantly

- 10% (107,400 jobs) of all jobs in Auckland accessed in 45mins by PT from Drury
- 30% (313,000 jobs) of all jobs in Auckland accessed in 60mins by PT from Drury
- 91,500 jobs accessed in 30mins travelling by car



Connection to the rail corridor

Opportunity to integrate with rail stations at Drury West and Drury Central providing transport choice and increasing mode share of growth areas.

- Enables access to wider PT network. 40% of rail patronage at Drury Central Station is facilitated by the corridors

Integrate with other projects

Opportunity to integrate with Papakura to Bombay project enabling growth area development.

Connectivity

Provide direct connections for residents and businesses into the wider transport network.

Integration with development

Options that integrate well with future land use and FUZ development have been selected.

- The provision of 17km of new walking and cycling facilities are proposed for the entire Drury Local network
- Amenity of these corridors are expected to be improved by the FTN providing mode choice and reducing daily traffic flows along these corridors by 10% (5,300 daily trips)

Figure 9-61 Drury Package Local Economic Outcomes

Local environmental benefits – Figure 9-62 summarises the local environmental benefits of the Drury Local Package. In summary, impacts on local streams, significant ecological areas, flood zones and overland flow paths have been avoided where possible or mitigated through design. Opportunities to enhance riparian habitats, and the preservation of mature trees that may support ‘Threatened’ bats, have been identified, and selected wherever possible. Additionally, impact of earthwork quantities has been considered, and the significant burden on resource use that four-laning requires. Identification of opportunities to mitigate excessive use of materials will be explored during the design phase.



Figure 9-62 Drury Package Local Environmental Benefits

Local social benefits – Figure 9-63 summarises the local social benefits of the Drury Local Package. In summary, all projects support safer walking and cycling through segregated routes, providing greater and more attractive transport choice and encouraging healthier and more active lifestyles. Improved transport choice and access significantly improves social opportunities and reduces isolation. There is potential to link Bremner Road and Waihoehoe Road with Local Board greenways routes, contributing to wider network connections for communities. Additionally, wherever possible, options have been selected that have reduced impact on social facilities, e.g. heritage sites.

Drury Package – Local Social Outcomes



Figure 9-63 Drury Package Local Social Benefits

9.4.3 Assessment against investment objectives

9.4.3.1 Jesmond, Bremner, Waihoehoe and Ōpāheke/Ponga upgrades

IO1: Support growth and a more sustainable, quality urban form in Drury by improving connectivity to/through the Drury and Ōpāheke area.

Figure 9-64 below details the outcomes against the Investment Objective: supporting growth in Drury and Ōpāheke area, that will improve connectivity and accessibility. The existing rural condition of these corridors precludes this opportunity, which is evidenced by the positive contribution and impact that the Drury Local Package has.

The key outcomes are highlighted below:

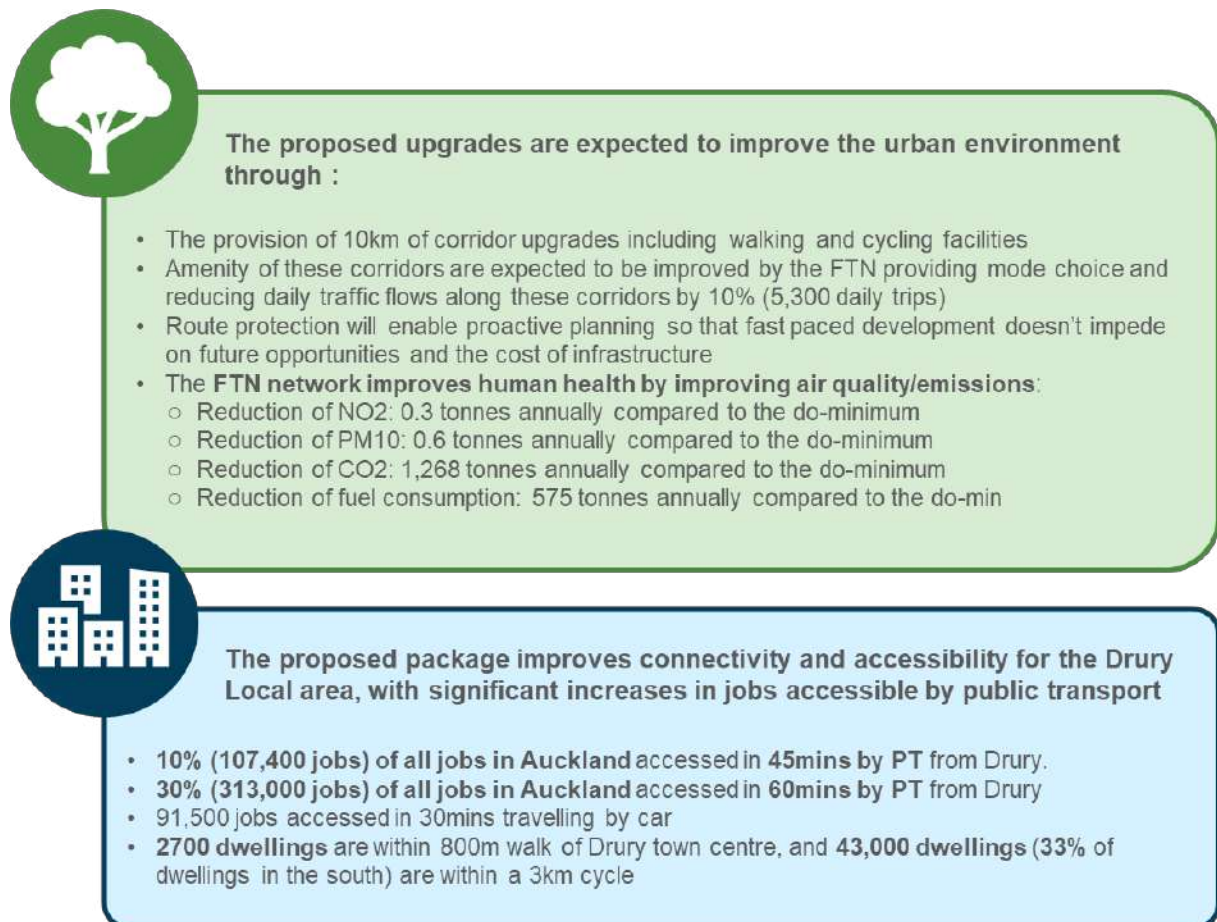


Figure 9-64 Jesmond, Bremner, Waihoehoe and Ōpāheke/Ponga - IO1 key outcomes

IO2: Achieve a transformational mode shift for trips to key destinations in Drury (incl. rail stations, centres and the strategic north-south PT network) by providing high quality, safe and attractive PT and active mode facilities on Jesmond Road, Bremner Road, Waihoehoe Road and Ōpāheke/ Ponga Road

Figure 9-65 below details the mode shift outcomes for Drury. The existing rural condition of these corridors constrains mode shift due to lack of safe or attractive FTN or active mode facilities. Without intervention LOV dependence and inequality will perpetuate. The key outcomes are highlighted below:

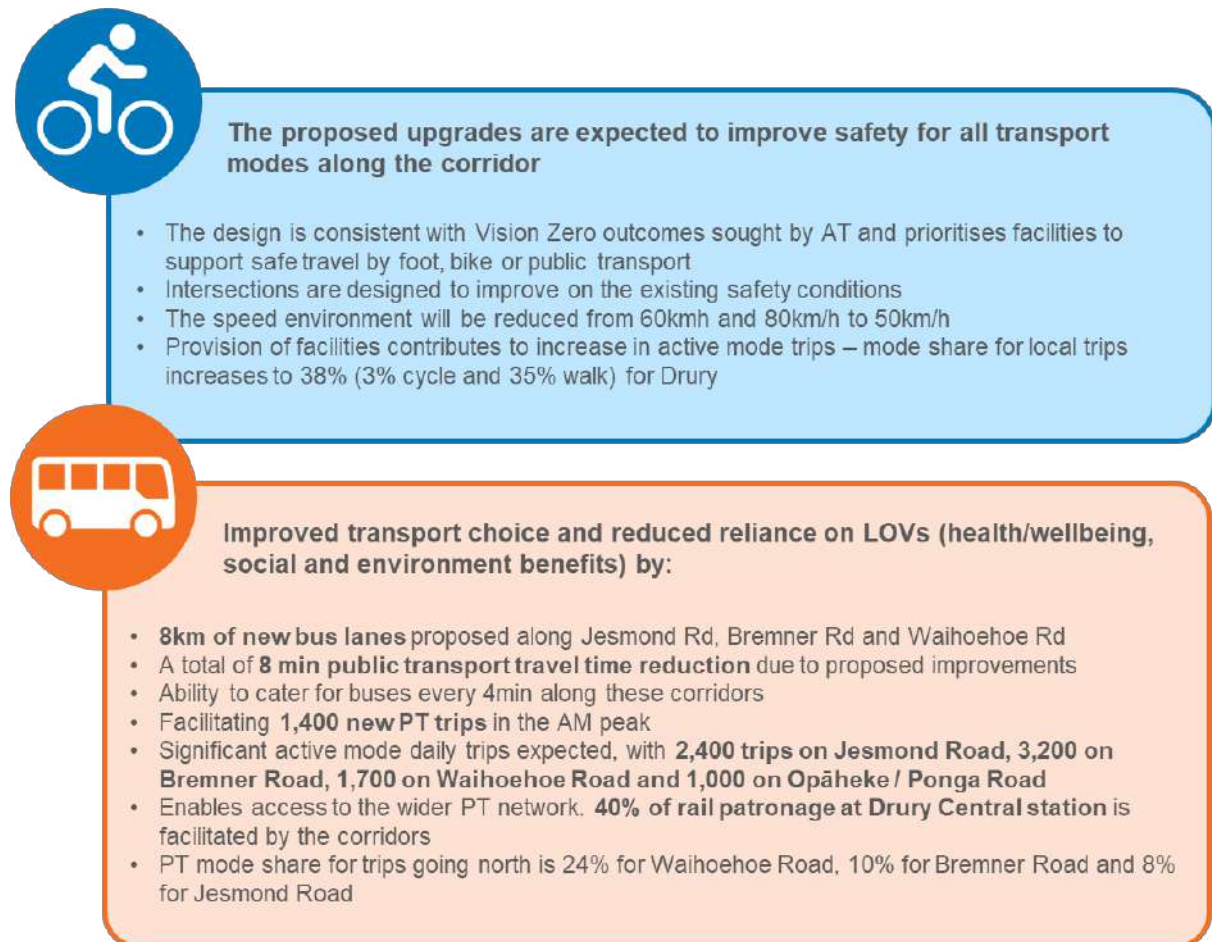


Figure 9-65 Jesmond, Bremner, Waihoehoe and Ōpāheke/Ponga - IO2 key outcomes

9.4.3.2 SH22 upgrade from Oira Road to Drury interchange

IO1: To support imminent growth and the planned town centre in Drury by improving connectivity and accessibility along this section of SH22

Figure 9-66 below details the outcomes against the Investment Objective: supporting growth in Drury and Ōpāheke area, that will improve connectivity and accessibility along this section of SH22. The existing rural condition of SH22, as well as maintaining the State Highway function, precludes this opportunity. The Drury Local Package will make a positive contribution and impact with key outcomes highlighted below:



Figure 9-66 SH22 IO1 outcomes

IO2: Significantly reduce the risk of DSIs from private vehicle crashes and to provide a safe connection for active modes along this section of SH22

This investment objective looks to upgrade the form and function of SH22 to address the existing safety issues – due to unfit facilities, and a lack of safe, active mode facilities. This will be exacerbated by the imminent growth occurring adjacent to the corridor – i.e. more pedestrians and greater access needs. This is evidenced by CAS data and expected increased traffic volumes. Figure 9-67, outlines the measures that will be used to achieve the improved safety outcomes for SH22.

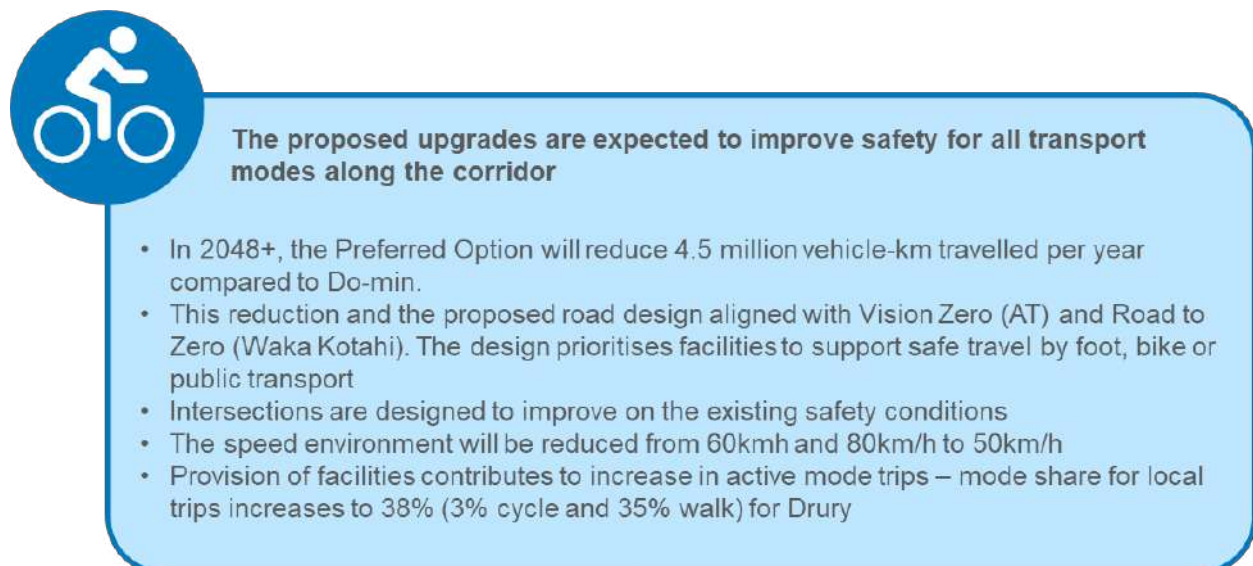


Figure 9-67 SH22 IO2 outcomes

IO3: Support a more sustainable, high quality, connected urban form along this section of SH22 that responds to the timing, scale and form of urban development

Figure 9-68 below details the quality urbanisation outcomes for Drury. The existing condition of SH22 provides unsafe conditions for the imminent growth and urbanisation occurring adjacent to the corridor – i.e. more pedestrians and greater access needs. The key outcomes are highlighted below:



Figure 9-68 SH22 IO3 Outcomes

9.4.3.3 New Ōpāheke N-S FTN/ Arterial – between Drury and Papakura

IO1: Enable quality urbanisation in the Drury-Ōpāheke growth area by improving N-S arterial connection between proposed centres

This investment objective looks at providing a new corridor (Ōpāheke NS) in order to address network resilience. The Ōpāheke NS arterial provides a missing NS link for the urban Drury Local area, that would otherwise have to use more strategic functioning corridors – i.e. SH1 or Mill Road, thus adding more traffic to these corridors, and adversely impacting network resilience. Key outcomes are shown in Figure 9-69, which highlights the positive contribution and impact that this corridor has on the wider South Network, as well as acting as a key component of the Drury Local Package.



Figure 9-69 Ōpāheke NS FTN/Arterial IO1 Outcomes

IO2: Improve transport choice and network resilience by providing a safe and attractive multi-modal transport connection between Drury and Papakura

Figure 9-70 below details the improved transport choice and network resilience outcomes for Drury. The FTN, improved active mode facilities and access to these networks provides increased transport choice and resilience. The key outcomes are highlighted below:

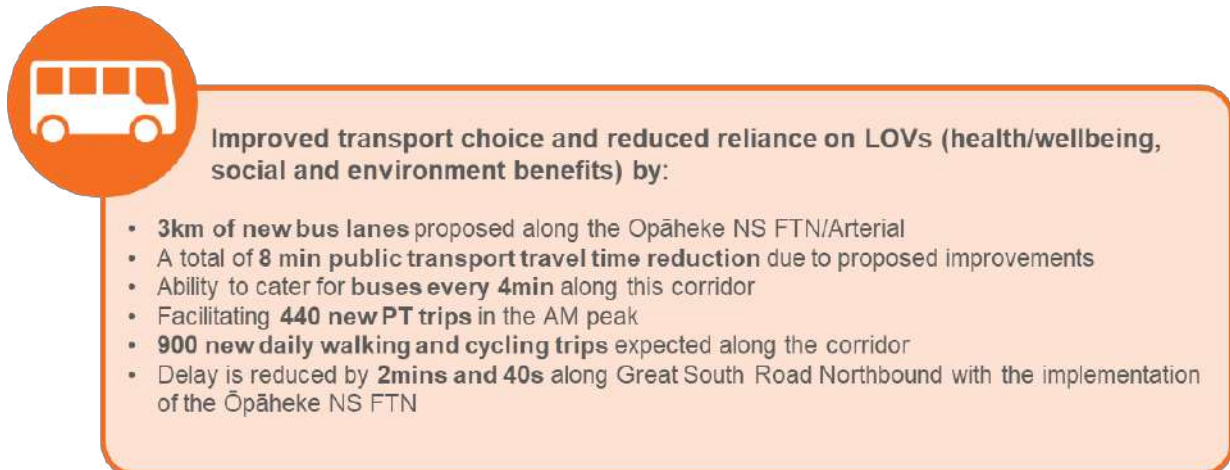


Figure 9-70 Opāheke NS FTN/Arterial IO2 Outcomes

9.5 Supporting measures/elements

To realise the full range of benefits identified above, the recommended Drury package is reliant on network wide improvements, ranging from transport infrastructure, through to proper land use planning and Travel Demand Management measures.

Figure 9-71 below re-emphasises the interrelated SGA projects that are a critical dependency for Drury Local – these are summarised in section 5.7 above. Of most note is the Drury Local interrelationship with the SH22 Northern connector, Rails stations and Rail corridor upgrades. For Drury, this provides a seamless connection between future train stations, centres and residential areas, ensuring the Drury growth area has well connected transport choices within and beyond Drury.

Expanding on the importance of stations – both for Drury transport and land use development - locating rail stations within walking distance of higher density development and future town centres is fundamental to facilitate modal shift, support commercial and mixed-use centres and contribute to vibrant, active urban environments. The upgrade of the Drury Local corridors surrounding the stations supports local access and catchments, through the provision of active mode facilities and FTNs to access the stations. In general, protecting these preferred corridors considering imminent growth, allows proactive urban planning that is supportive of the future transport network. These corridors provide a vital link for the Drury FTN and active mode network, connecting communities to employment, social centres and rail stations. Connected active mode networks within station catchments are particularly supportive of facilitating wider land use interaction.

From this perspective, with reference to SGA investment themes, notable themes include ‘Support Growth’ and ‘Land Use/Place Integration’. Successful alignment with these themes is dependent on a mutual transport and land use relationship– route protection of these corridors that allows for quality transport choice/infrastructure is integral to ensuring sustainable growth in Drury-Ōpāheke. Equally the functionality of these corridors is also dependent on the land-use and growth developing within the expectations of the zoning – i.e. high density (particularly around the stations) and local employment provision (implications discussed in 9.3.3.4).

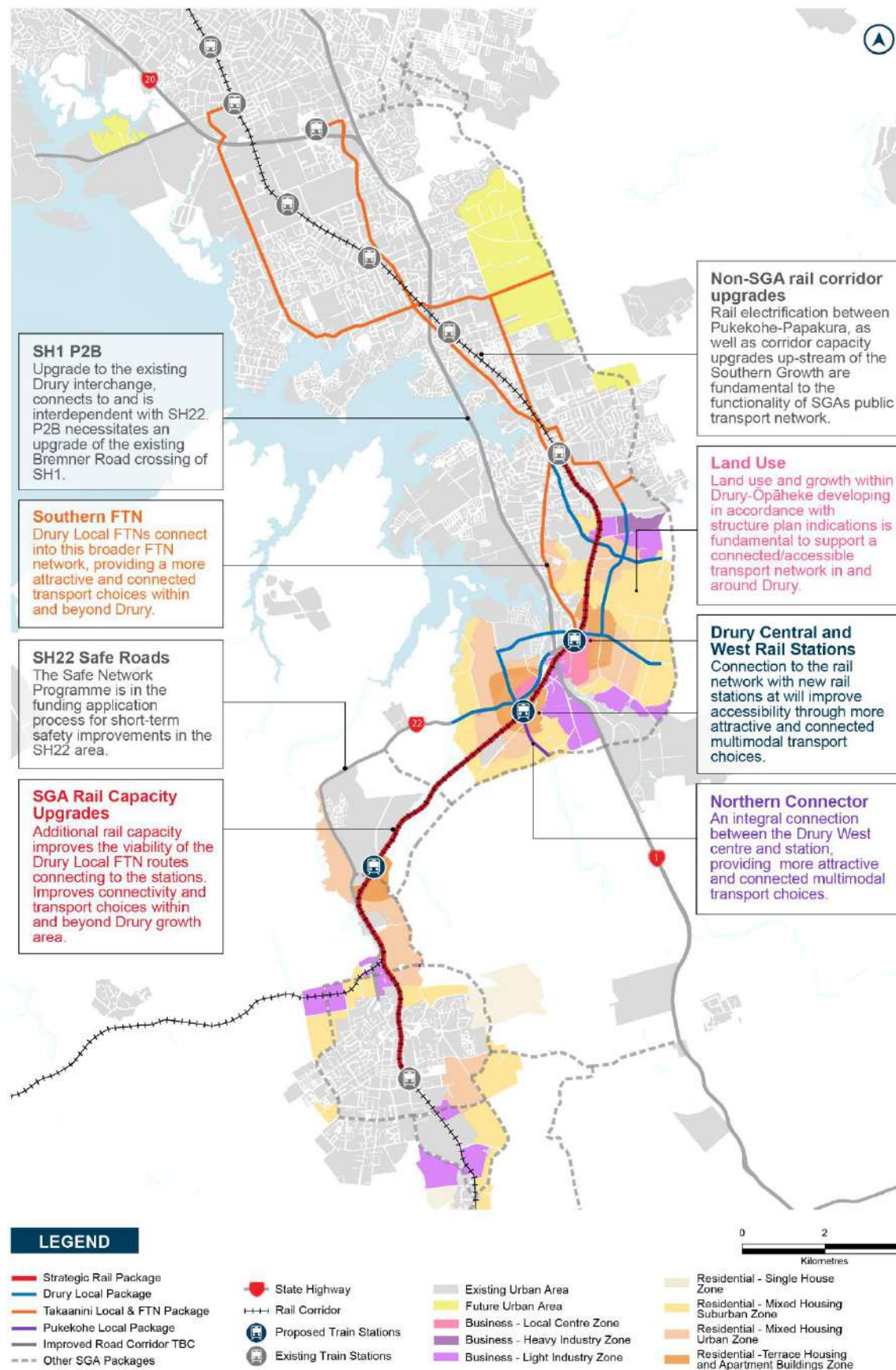


Figure 9-71 Southern growth area projects interrelated with Drury Local

9.6 Economics

This section summarises the economic analysis which has been prepared for the full recommended package. The Drury Package DBC is for the purposes 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 Economic Evaluation Manual (EEM). The Drury Local Transport Assessment report (**Appendix B**) sets out the full methodology, assumptions, scenario testing, incremental analysis, and sensitivity analysis undertaken.

9.6.1 Assumptions

The full economic evaluation assumptions and basis for these are discussed in detail in the Drury Local Transport Assessment report (**Appendix B**). The key assumptions are as follows:

- Assessment of base and congested (CRV) travel time benefits from the SATURN models;
- Assessment of base running vehicle operating costs (VOC) from the SATURN models;
- Base Date of 1 July 2019;
- Time Zero, construction start date and duration specified for each sub-project as in Table 9-43
- Discount rate 6% applied to all annual benefits and costs, and sensitivity tested at 3% and 8%;
- Analysis period of 40 years, and sensitivity tested at 60 years;
- Traffic reliability benefits assumed as 8% of the base travel time benefit;
- Public transport reliability benefits as 70% percentage of PT user benefits. The basis for this is discussed later in this report;
- CO₂ benefits as 5% of VOC benefits;
- Travel Time user cost is a mixture of Urban Arterial and Rural Strategic composite costs. The Rural Strategic value was included to reflect the impact on the longer-distance strategic trips on SH1, which would more closely align with the occupancy and trip purpose of 'Rural Strategic' trips than 'Urban Arterial' trips. The percentage of Rural Strategic is calculated from the Sector-Sector traffic benefits calculation as in **Appendix B**. The proportion of benefits due to the trips between External North and External South Zones to the total benefits is considered as percentage of rural strategic and rest is Urban Arterial. For the sake of simplicity, the sector-sector benefit analysis is done only for morning peak period and the same percentage is applied for other peaks.
- Walking and cycling benefits were estimated based on trip demand and travel cost matrices from SAMM, using the same method as used for PT benefits in the MSM
- Modelling based mostly on the whole package, with extra model runs to understand the contribution of some key elements. Otherwise, the allocation to sub-elements was based on assumptions, depending on the type of benefit
- WEBS calculated for a test-case of the full package in 2048+ in accordance with the EEM, then applied to sub-elements using an adopted percentage uplift to the conventional benefits. The analysis is done for three principal type WEBS – Agglomeration, Imperfect

Competition impact and Labour supply impact. The process of the WEB calculation for each type is described in **Transport and Economics Report, Appendix B**.

Table 9-43 Core Time Zero, Construction Start Date and Period Assumption

Individual Projects	Time Zero	Construction Start Year from Time Zero	Construction period (in years)
Bremner, Jesmond, Waihoehoe	1 July 2028	2	3
State highway (SH22)	1 July 2028	2	2
Ōpāheke Ponga	1 July 2042	2	2
NS Ōpāheke Arterial	1 July 2042	2	3

9.6.2 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 Drury Package DBC is for the purposes of route protection, rather than imminent implementation. The estimates and appraisal have been developed with available information for the purpose of informing a decision whether to invest in route protection (**Appendix C: Cost Report**).

9.6.2.1 Capital cost

Cost estimates (expected cost P50) and property costs for each individual project are outlined below in Table 9-44 and Table 9-45.

Table 9-44 Expected (P50) project construction cost per project (undiscounted costs, NZ\$ million)

Project	Construction Cost (Millions)
Bremner, Jesmond and Waihoehoe (BJW)	
SH22	
Ōpāheke NS (NS)	
Ōpāheke/Ponga (OP)	
Total	

Table 9-45: Property Cost per project (undiscounted costs, NZ\$ million)

Project	Property cost (Millions)
BJW	
SH22	
NS	
OP	
Total	

9.6.2.2 Operation and maintenance costs

For the purpose of this assessment, operating and maintenance cost associated with each project have been incorporated as follows:

9.6.2.2.1 General corridor maintenance

Maintenance of road and transport corridors will vary significantly depending on a number of factors. For the purpose of this assessment, an annual cost of [REDACTED] of new infrastructure has been assumed for urban 2 lane road. [REDACTED] of new infrastructure has been assumed for urban 4 lane road. For the rural 2 lane road a general maintenance cost of [REDACTED] is assumed. Hence, for the roads which undergo upgrades from rural to urban has an additional maintenance cost of [REDACTED] for 2 lanes.

9.6.2.2.2 Road resurfacing

Resurfacing can be expected to occur periodically throughout the life of a pavement. An allowance of [REDACTED] has been provided at 10-year intervals. Reconstruction of the pavement has not been provided for as it is assumed that the pavement life will exceed the 40-year evaluation period.

Table 9-46 Other annual costs (undiscounted costs NZ\$ million)

Projects	General infrastructure maintenance (annual)	Resurfacing (every 10 years)
BJW		
SH22		
NS		
OP		
Total		

9.6.2.3 Public transport operating costs

PT operating costs were adopted from those used in the IBC, namely [REDACTED] for buses and [REDACTED] for trains. Although the cost of operating PT services depends on several variables (distance travelled, drivers' salaries, fleet maintenance and parking, etc.), at this stage a simplification was used. The operation costs for bus and rail services were estimated using a cost rate per VKT, based on 2017/18 data provided by Auckland Transport. These rates were applied to the change in bus and rail service kms from the MSM model. The change in farebox revenue was calculated from the models, but only used in the Government BCR. The revenue was not included in the National BCR as it is considered an economic transfer. The list of all the project costs available for the economics is summarised in Table 9-47.

Table 9-47 NPV Project Costs, \$m

Projects	PV capital Cost, \$M	PV Maintenance Cost, \$M	PV PT Operating Cost, \$M	PV total net costs, \$M PV
BJW				
SH22				
NS				
OP				

Drury Local
Package

9.6.3 Benefits

Table 9-48 summarises the key economic benefits generated from the Drury Package based on a core set of assumptions.

Table 9-48 Economic benefits - Drury package projects

Benefits	NPV Benefits (\$m)				
	BJW	SH22	NS	OPa-Pon	Package
Travel Time	5.4	10.2	186.4	0.4	202.4
Congestion	2.5	4.5	39.5	1.4	47.9
Trip Reliability	0.4	0.8	14.9	0.0	16.2
Vehicle Operating Costs	3.1	5.1	47.1	2.3	57.6
Active Mode	36.3	2.7	33.7	20.8	93.4
Crash Savings	9.5	9.8	16.6	9.9	45.8
PT Benefits	236.5	28.1	42.7	31.4	338.7
CO ₂	0.2	0.3	2.4	0.1	2.9
PV Total Net Benefits	293.9	61.4	383.2	66.4	804.9
WEBs %	30%	30%	30%	30%	30%
Total WEBs Benefits	88.2	18.4	115.0	19.9	241.5
PV Benefits Including WEBs	382.1	79.8	498.2	86.3	1046.3

Key Observations:

- The package travel time benefits are derived largely from the Opaheke NS Arterial Project as this provides significant reduction in travel time between the Drury and Papakura regions.
- The development of walking and cycling facilities along the Drury urbanised corridors is about 14 km in length and passes through future communities of some 60,000 people. Providing the ability to walk on these corridors is therefore expected to have significant benefits.
- Crash benefits for the analysis period are similar across the projects. Since, the Time Zero of the Opaheke N-S project is Year 2042 it yields much greater benefits for the analysis period.
- The greatest benefit source is from public transport. PT benefits are mostly obtained due to the improved FTN Routes and other frequent Bus Services proposed for BJW. Given that the FTN route is specifically targeted at providing frequent, reliable services this scale of benefit is considered reasonable
- Wider Economic Benefits (WEBs) provide a significant contribution in the benefits for Drury Local package. The calculation of WEBs is done based on guidelines laid out in EEM and the outcome is considered reasonable as it significantly improves accessibility to rail stations, major employment area and future major town centre at Drury.

9.6.4 Benefit Cost Ratio (BCR)

Benefit cost ratios (BCRs) have been generated for each of the individual projects and the total Drury Local package using the net present value benefits and costs described above to generate the total BCRs shown below in Table 9-49. Both a National BCR (BCR_N) and Government BCR (BCR_G) have been calculated. The BCR_G includes fare revenue to consider the net costs to Government. Individual project BCR_G range between 0.5 and 1.6, with a package BCR of 1.

Table 9-49 National and Government BCRs per project

Projects	PV total benefits, \$M PV	PV total net costs, \$M PV	PV Fare Revenue, \$M PV	National BCR	Government BCR
BJW				0.8	0.9
SH22				0.5	0.5
NS				1.6	1.6
OP				0.7	0.7
Drury Local Package				1.0	1.1

9.6.5 Sensitivity testing

Sensitivity testing was undertaken to understand the impact of different assumptions on the Drury Local project BCRs. The sensitivity testing has been broken into analysis framework and parameter testing. The analysis framework includes testing the following variables:

- Time zero – as per Table 9-50
- Discount rate -
- Analysis period – 40 and 60 years

	BJW	SH22	NS	Ōpāheke-Ponga
Time Zero 1	2028	2028	2042	2042
Time Zero 2	2033	2033	2037	2037

	Discount rate	Analysis Period	BCR				
			BJW	SH22	NS	Ōpāheke-Ponga	Total
Time Zero 1							
Time Zero 2							

- Wider Economic Benefit percentage- [REDACTED]
- Crash Reduction percentage – [REDACTED]
- Benefits allocation percentage to individual projects
- PT reliability percentage – [REDACTED]
- Active mode benefits variability - [REDACTED]

9.6.5.1 Wider Economic Benefit percentage

The sensitivity of the proportion of WEBs applied was tested for 25% -50%. Table 9-52 shows the total package BCR range varies between 0.9-1.1. The base BCR under the core assumptions (30%) is shown in bold.

Table 9-52 WEBs percentage sensitivity test

WEB%	BCR				
	BJW	SH22	NS	Opa-Pon	Total
25%	0.8	0.5	1.5	0.7	0.9
30%	0.8	0.5	1.6	0.7	1.0
40%	0.9	0.6	1.7	0.7	1.1
50%	0.9	0.6	1.8	0.8	1.1

9.6.5.2 Crash reduction percentage

The crash reduction percentage is a special parameter which have been introduced for the new improved roads. The core assumption of 20% reduction of the standard crash rate in the base case yields a BCR of 1.0. Table 9-53 shows very low variance in BCR when the crash reduction assumption is removed.

Table 9-53: BCR variation with crash reduction percentage

Crash reduction%	BCR				
	BJW	SH22	NS	Opa-Pon	Total
0%	0.8	0.5	1.5	0.7	1.0
20%	0.8	0.5	1.6	0.7	1.0

9.6.5.3 Benefits allocation percentage

As detailed in the full Drury Local Transport Assessment report (**Appendix B**) sensitivity testing of the percentage of benefit allocation to each project was undertaken. As most of the benefits come from the traffic benefit and PT benefits, sensitivity testing focused on the percentages allocated to these, along with active mode benefits to understand the effect on the BCR. Altering the allocation percentage of each individual project typically had no impact on the Opaheke N-S Arterial, and only a small-scale fluctuation on the other individual projects as shown below in Table 9-54.

Table 9-54: Project benefit allocation percentage sensitivity on BCR

Allocation %	BCR				
	BJW	SH22	NS	Ōpāheke-Ponga	Total
Core %	0.8	0.5	1.6	0.7	1.0
Travel time % adjustment	0.8	0.5	1.6	0.7	1.0
PT% adjustment	0.7	0.8	1.6	0.7	1.0
Active mode% adjustment	0.8	0.6	1.6	0.6	1.0

9.6.6 Summary

Sensitivity testing of the analysis factors vary the BCR range between 0.7-2.2 for the Total Drury Package. The parameter sensitivity tests show minimal impact on the BCR range. The start date of the projects and discount rate have the most significant impact on the BCR. A summary of the BCR range for each of the projects, and the total package is provided in Table 9-55.

Table 9-55 Summary of BCR Range for the Projects

	BJW	SH22	NS	Ōpāheke-Ponga	Total
Analysis Framework	0.6-2.1	0.4-1.4	0.9-3.7	0.5-1.4	0.7-2.2
Parameter Sensitivity	0.7-0.9	0.6-0.8	1.5-1.6	0.6-0.9	0.9-1.1

Overall, the analysis has demonstrated that the Drury Package has a BCR of around 1.0 under the assumptions adopted although with the revised evaluation assumptions coming into force with a lower discount rate and longer evaluation period this would increase to 1.7. It was found to only be below 1 (0.7) under a test with the higher 8% discount rate or with WEBs lower than calculated. The BCR was found to be greater than 1 with a 4% discount rate or where projects were slightly delayed. This indicates that the Package is likely to be an investment with a BCR greater than 1, although this will depend on the timing of elements being optimised to match the land use growth.

The appraisal has not considered 3rd party funding (such as developer contributions), nor of more detailed staging scenarios in line with the growing travel demand (e.g. construction of initial 2-lane corridors expanded to 4 lanes at a later date when needed). Both of these opportunities would significantly increase the likely BCRs. The progressive development of this area over the next 30+ years suggests there would likely to significant opportunities for such strategies.

10 Financial Case

This section outlines the Financial Case for both route protection and implementation of the recommended Drury upgrades. The Financial Case including the cost and property liability aspect (given the route protection focus) is based on several uncertainties as long-term route protection has not been previously widely undertaken. The types of uncertainty include:

- the 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.

10.1 Costs

The financial implications for Supporting Growth can broadly be summarised into the following categories:

a) Route protection costs

- b) Land and Property acquisition
- c) Programme development costs
- d) Pre-implementation costs
- e) Project implementation costs
- f) Operations and maintenance costs

This business case is seeking approval to proceed with route protection of Drury Local projects. Figure 10-1 below summarises the whole-of-life costs for the Drury Local Package.

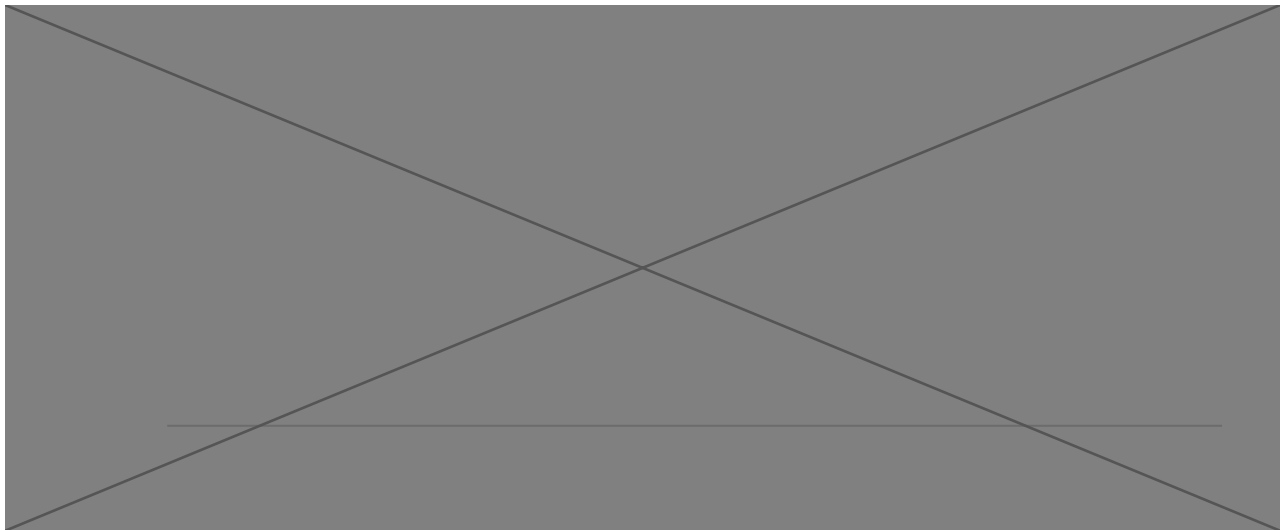


Figure 10-1 Drury package cost breakdown

Figure 10-2 below shows the whole-of-life cashflow of the Drury Local package.

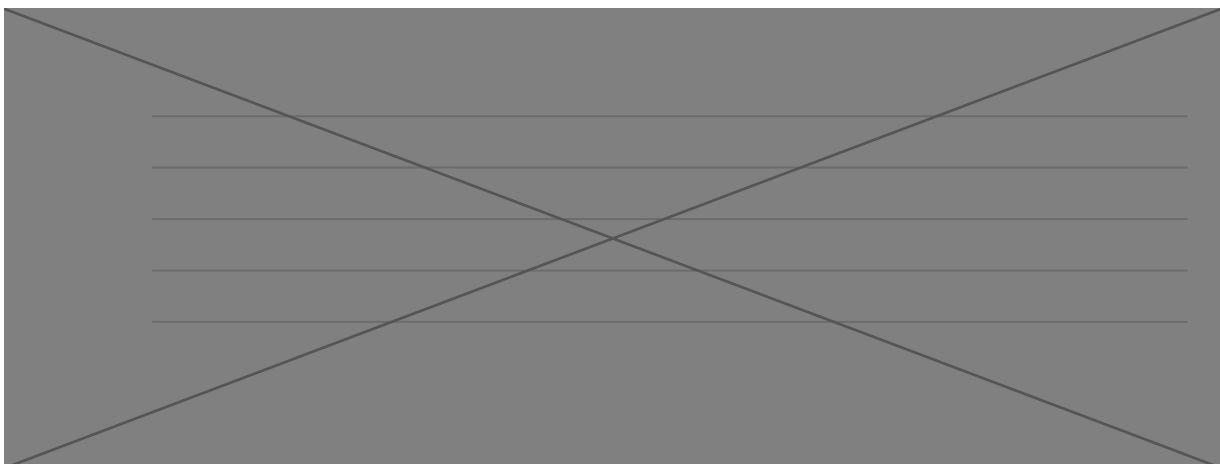


Figure 10-2 Drury cashflow by project phase

10.1.1 Cost of route protection



[Redacted text block]

[Redacted text block]

Professional services - NOR & lodgement costs

[Redacted text block]

Table 10-1

[Redacted text block]

[Redacted text block]

- [Redacted list item]
- [Redacted list item]
- [Redacted list item]

Expected property costs of route protection

[Redacted text block]

[REDACTED]

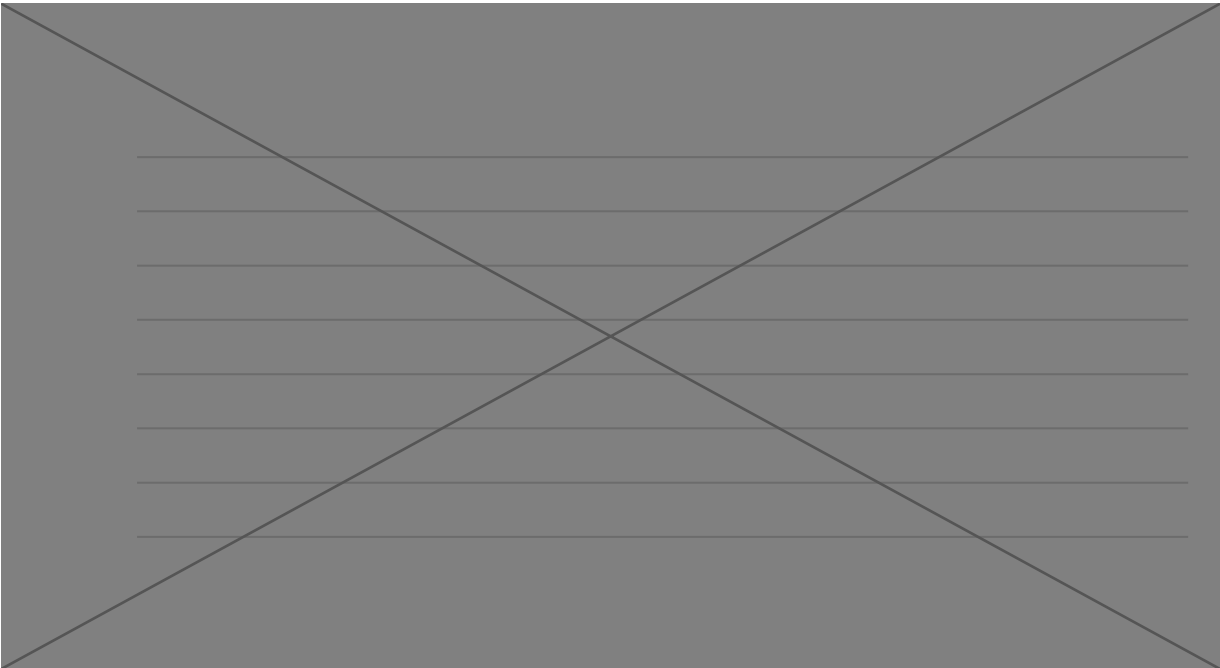
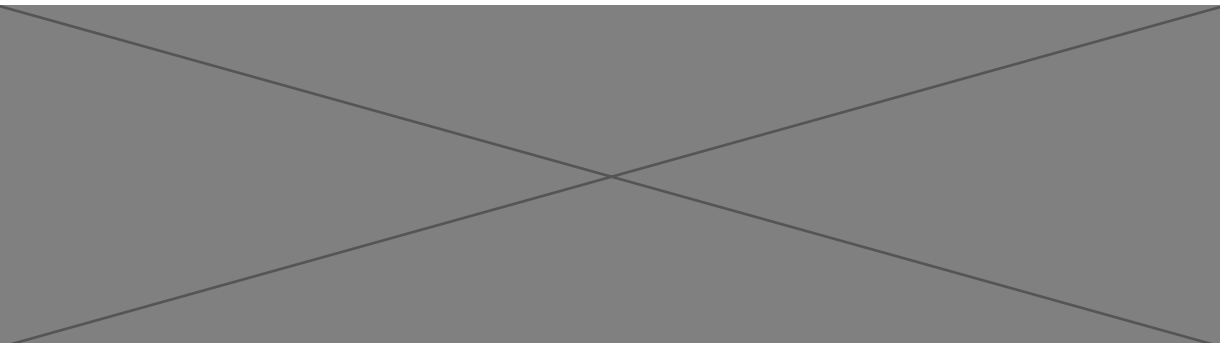


Figure 10-3 Property cost summary

[REDACTED]

Table 10-2

[REDACTED]



[REDACTED]

[REDACTED]

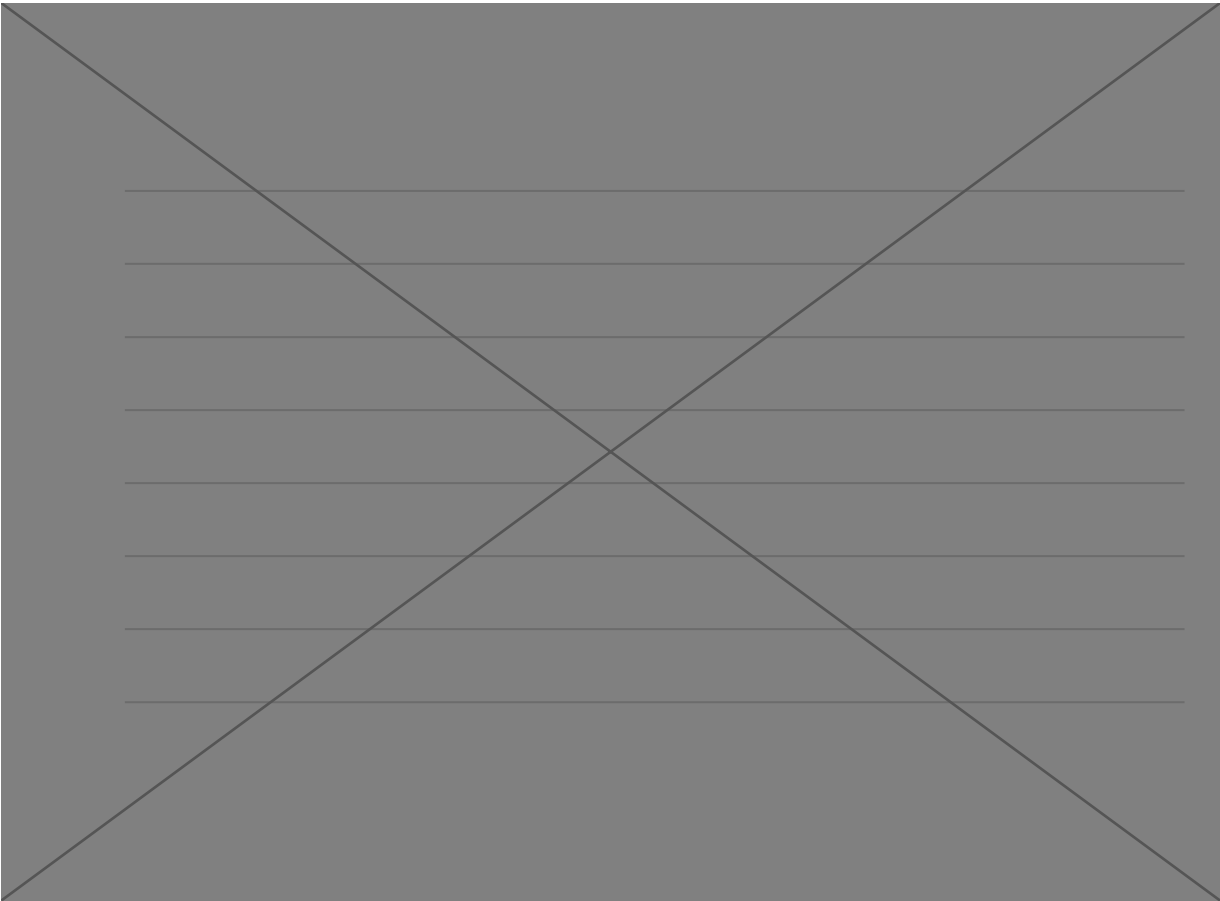
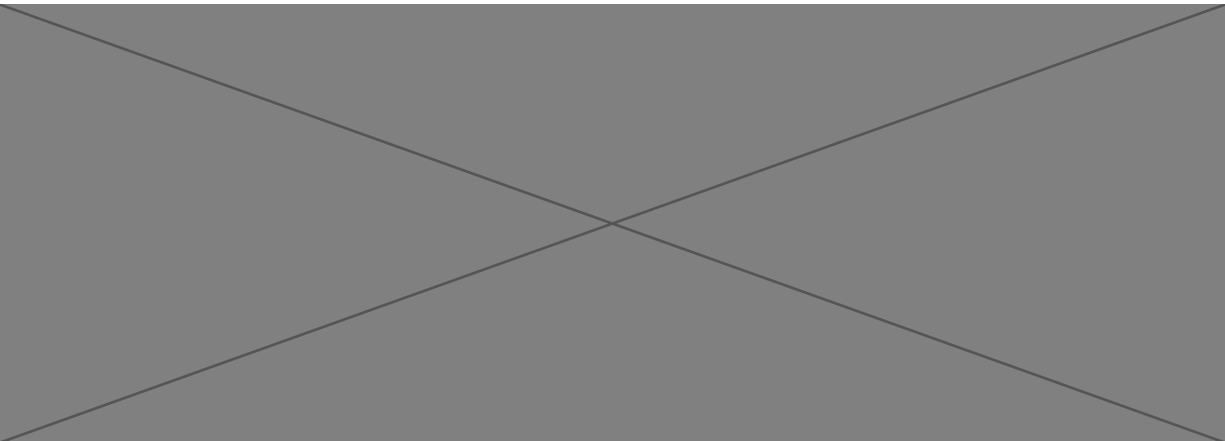


Figure 10-4 Route protection cashflow

Table 10-3



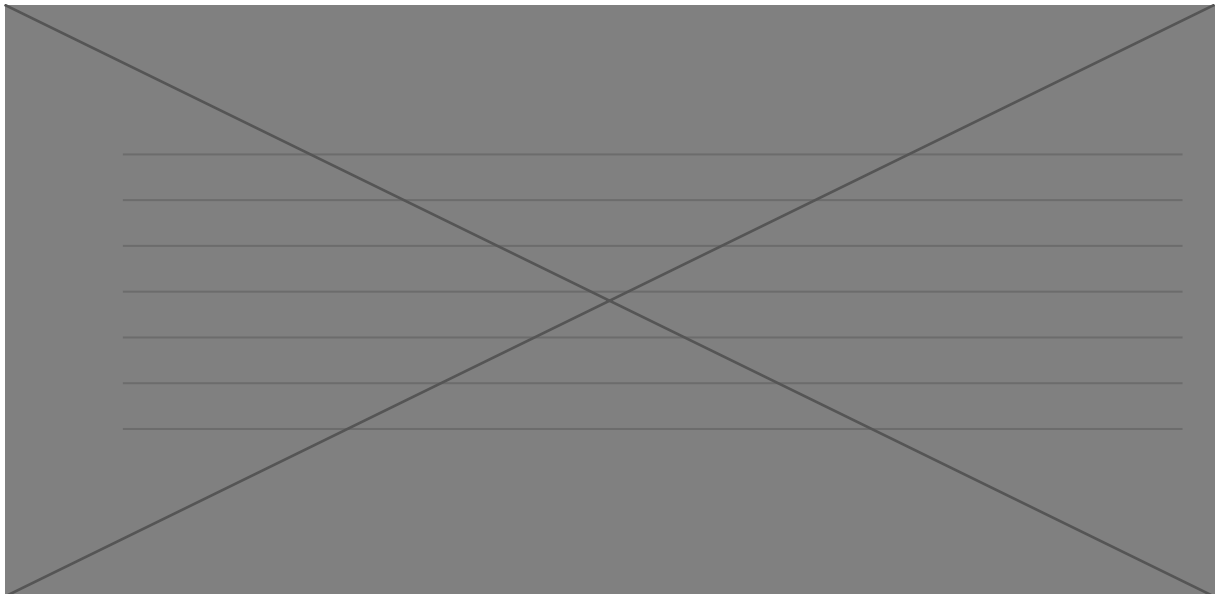
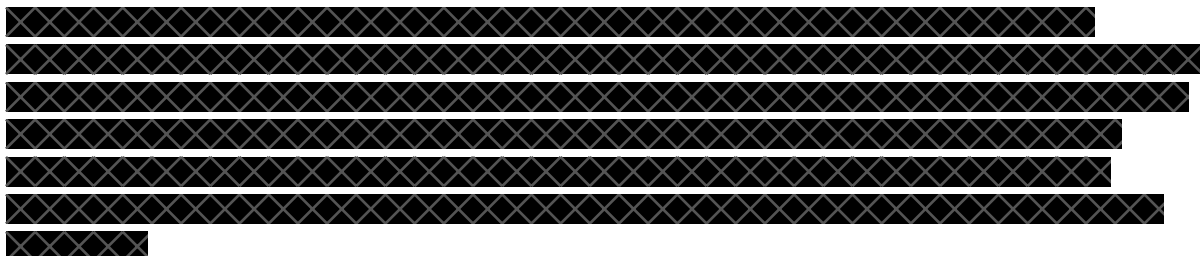


Figure 10-5

10.1.2 Implementation costs

The following project implementation costs have been assessed.

- a) Programme development costs
- b) Pre-implementation costs
- c) Project implementation costs
- d) Operations and maintenance costs



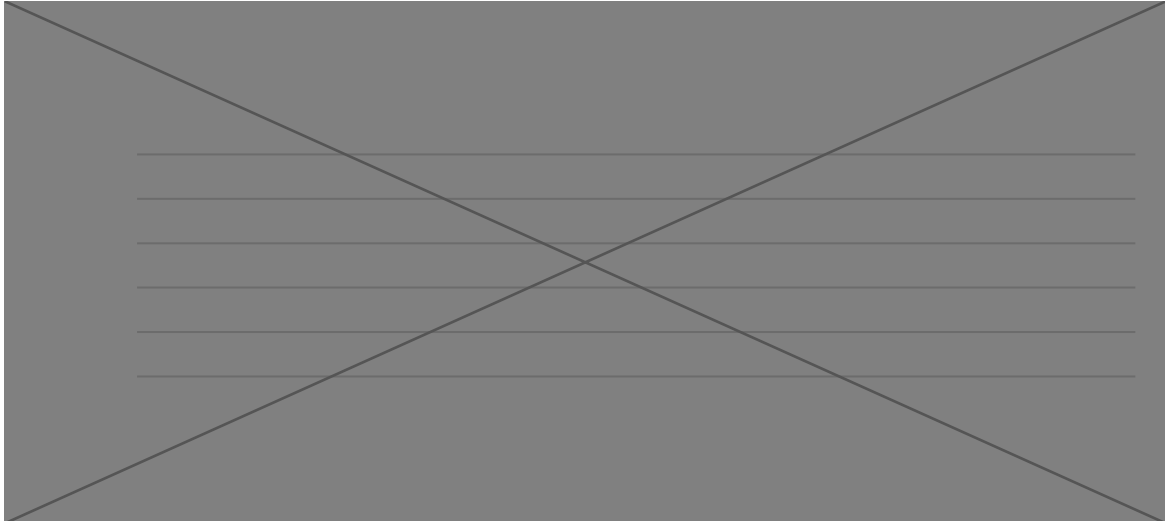


Figure 10-6 Implementation cashflow – by project phase

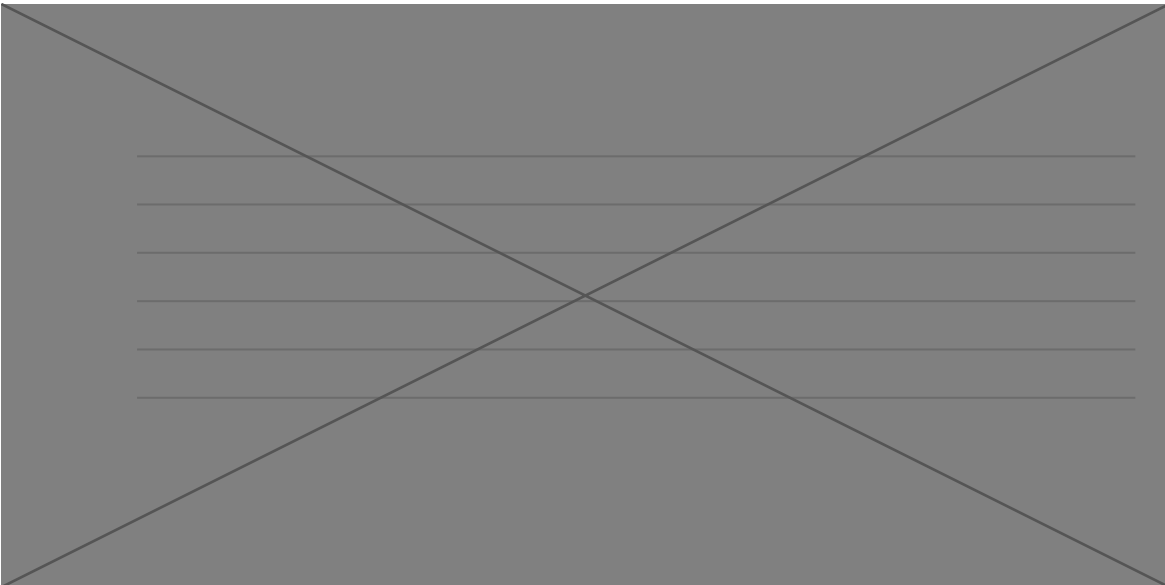


Figure 10-7 Implementation cashflow – by projects

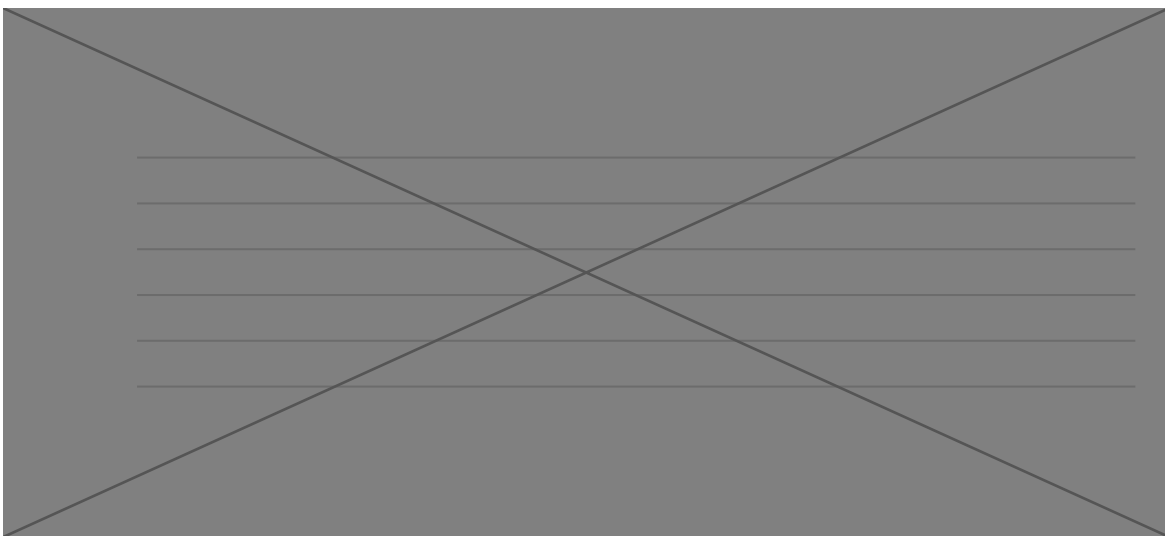


Figure 10-8



10.1.3 Operations & maintenance cost

[REDACTED] of new infrastructure has been assumed for urban two-lane roads, [REDACTED] has been assumed for urban four lane roads. For a rural two-lane road, [REDACTED]. Hence, for the roads which undergo upgrades from rural to urban an additional maintenance cost [REDACTED]. Resurfacing can be expected to occur periodically throughout the life of a pavement. [REDACTED]. Reconstruction of the pavement has not been provided for as it is assumed that the pavement life will exceed the 40-year evaluation period.

Table 10-4 Annual maintenance costs (\$ million)

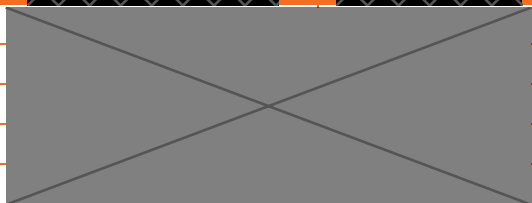
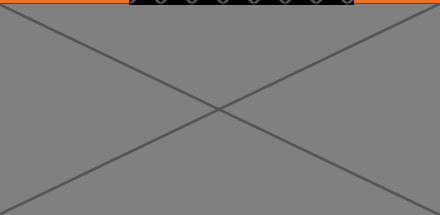
Projects			
Bremner Road, Jesmond Road, Waihoehoe Road			
SH22			
Ōpāheke North-South			
Ōpāheke Road – Ponga Road			
Total			
			
			
			
			
			

Table 10-5 NPV PT Operating Cost (\$ million)

Projects	PV PT	[REDACTED]
Bremner Road, Jesmond Road, Waihoehoe Road		
SH22		
Ōpāheke North-South		
Ōpāheke Road – Ponga Road		
Drury Local Package		

10.1.4 Cost split / share

Based on an established Framework Agreement the split of project delivery, operations and maintenance cost responsibilities between investment partners are as follows.

Waka Kotahi will be responsible for:

- SH22 upgrade
- Bremner Road bridge upgrade (partial, as part of P2B)

Auckland Transport will be responsible for:

- Jesmond Road
- Bremner Road
- Waihoehoe Road
- Ōpāheke N-S
- Ōpāheke Road
- Ponga Road

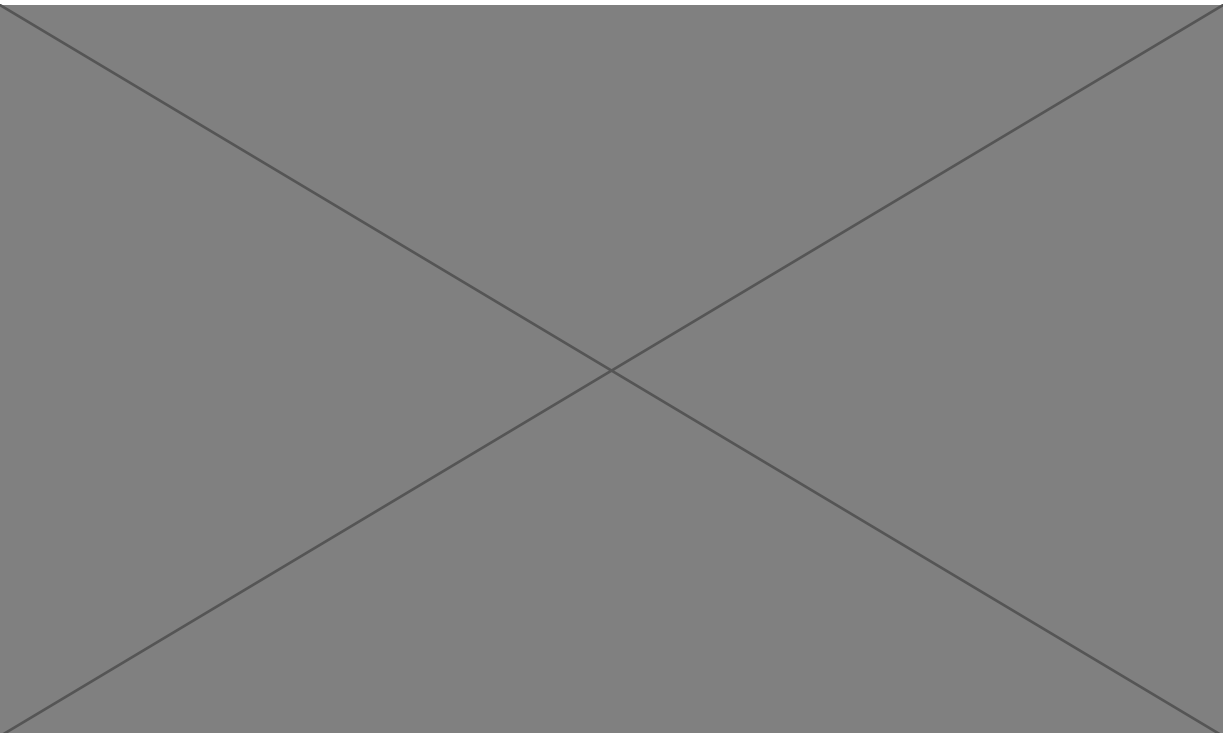
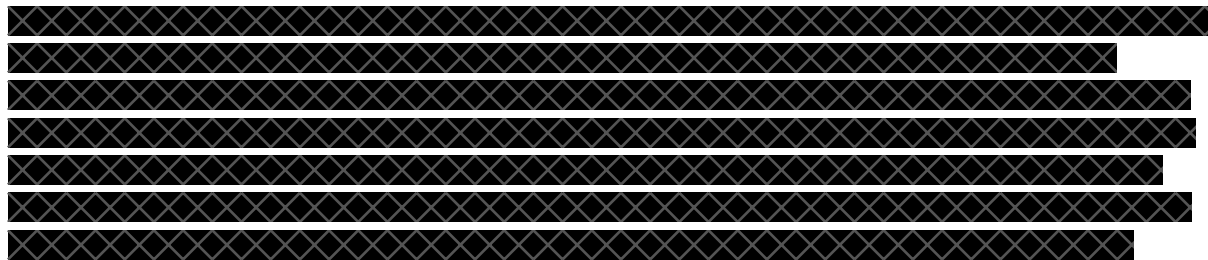


Figure 10-9 Package cost share by organisation

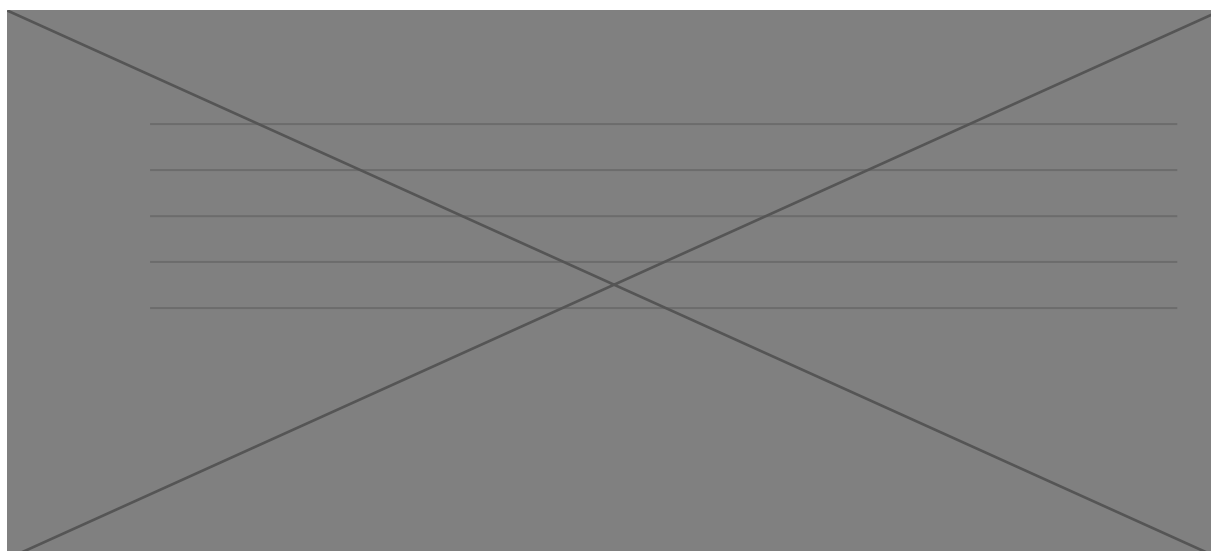


Figure 10-10 Cost share by projects

10.2 Available funding sources

The following section highlights potential funding options to meet the cost of delivering the Supporting Growth Programme.

10.2.1 Public funding sources

National Land Transport Fund (NLTF) –For the 2018-21 NLTP, the total funds allocated is \$13.1b (excluding local share contribution of \$3.8b). This amounts to approximately \$4.3b per year.



Approved organisations' local share –Auckland Transport & Auckland Council are the most relevant organisations to contribute funds to Drury Local projects.

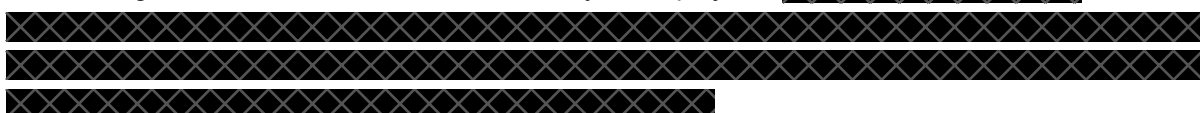


Figure 10-11 and Figure 10-12 summarises the funding allocation for this decade.

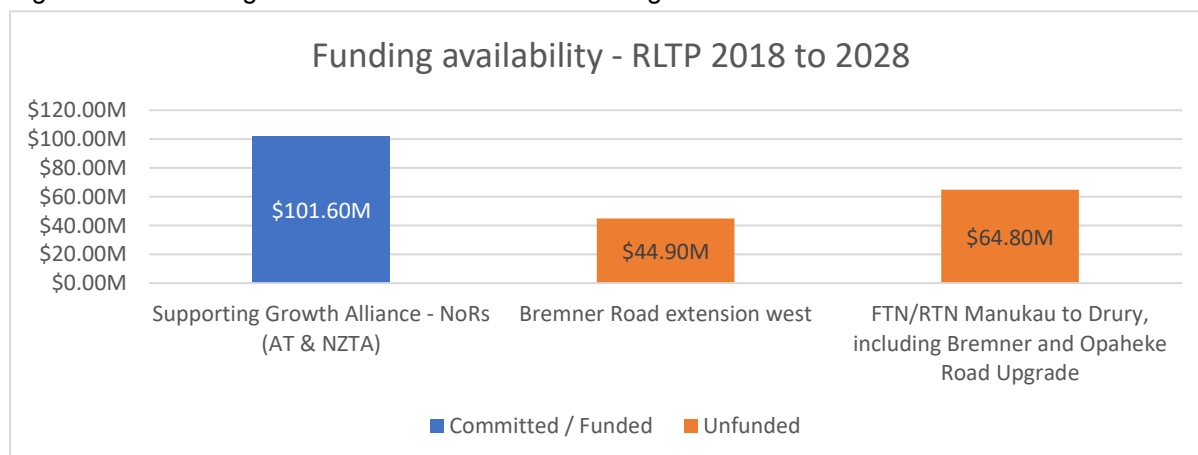


Figure 10-11 RLTP 2017/18 to 2027/28

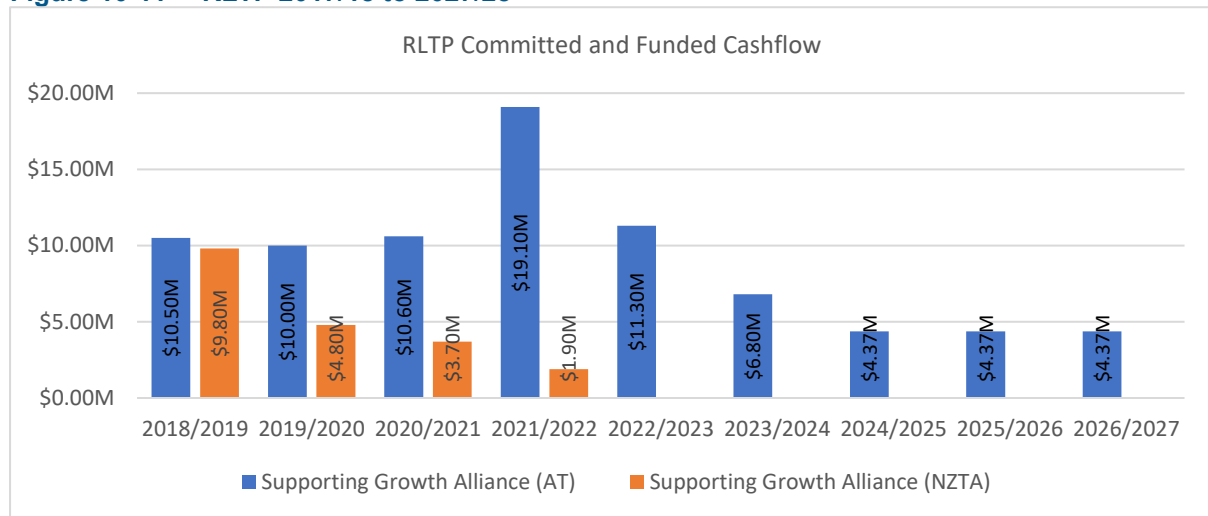


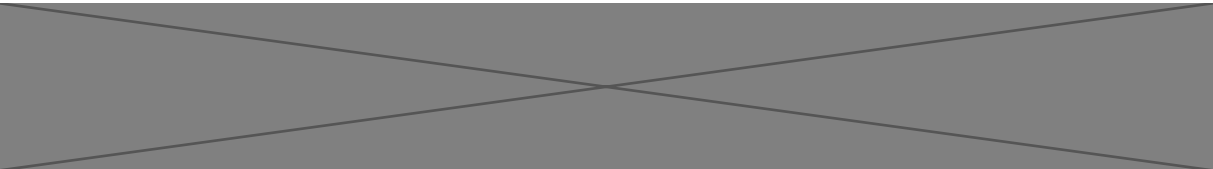
Figure 10-12 RLTP Cashflow

[REDACTED]

[REDACTED]

The two primary costs that relate to route protection are the professional services for the NoR works and the potential property costs. The current allocation of funding for these items over the next decade is summarised below.

[REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

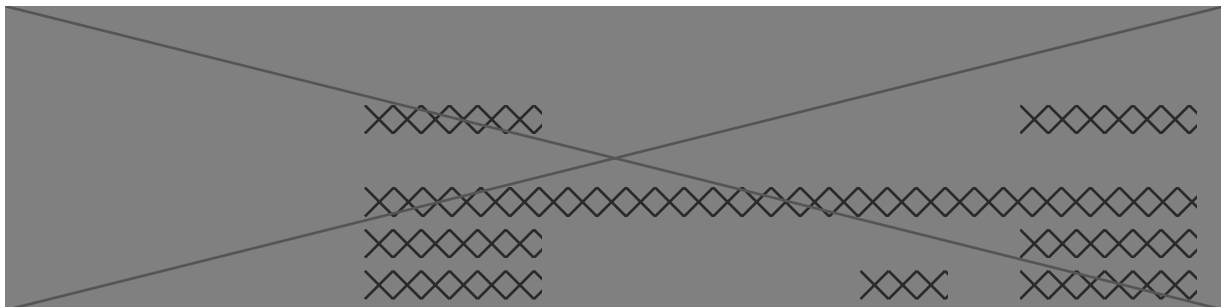
[REDACTED]

[REDACTED]

10.3.2 First decade implementation funding

[REDACTED]

[REDACTED]



[REDACTED]

10.3.3 Current commitments

- NZ Upgrade Programme - NZUP reflects the Government's transport policy with \$6.8 billion (\$3.5 billion for Auckland) allocated to invest across road, rail, PT and walking and cycling infrastructure. [REDACTED]
- Bremner Road bridge upgrade as part of SH1: Papakura to Drury South upgrade
- Bremner Road Auranga upgrade
- The RLTP acknowledges the delivery of transport infrastructure to support growth in Drury, but there are currently no funding commitments.
- Auckland Transport Alignment Project (ATAP) - The ATAP Package helps to unlock funding that will enable more homes to be built over the next decade in major greenfield growth areas to the north, northwest and south.

[REDACTED]

10.3.4 Supplementary funding sources

Supplementary funds refer to contributions that are additional to NLTF, local share funding or through Crown loans. Examples of supplementary funding relevant to Drury Local include:

- **Financial contributions towards the costs of improving network infrastructure (Developer Contributions)** – [REDACTED]

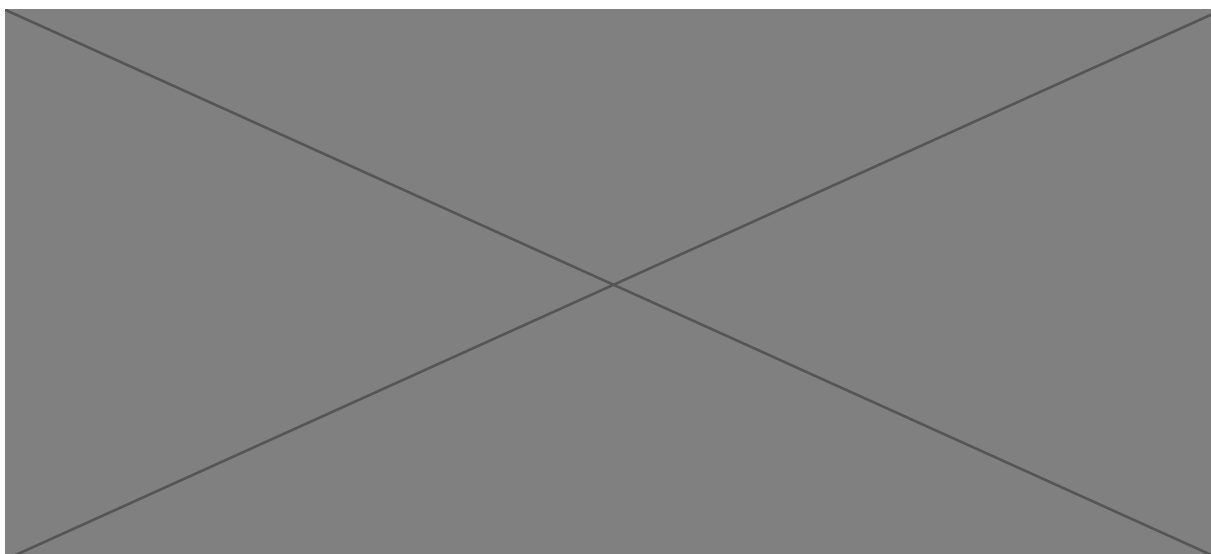
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

- Leasing temporary land requirement opportunities [REDACTED]
- Land acquisition opportunities [REDACTED]
- Debt finance and Public Private Partnerships (PPPs)
- Value capture / Beneficiary pays.

[REDACTED]
[REDACTED]

Table 10-8

[REDACTED]



[REDACTED]

[Redacted]

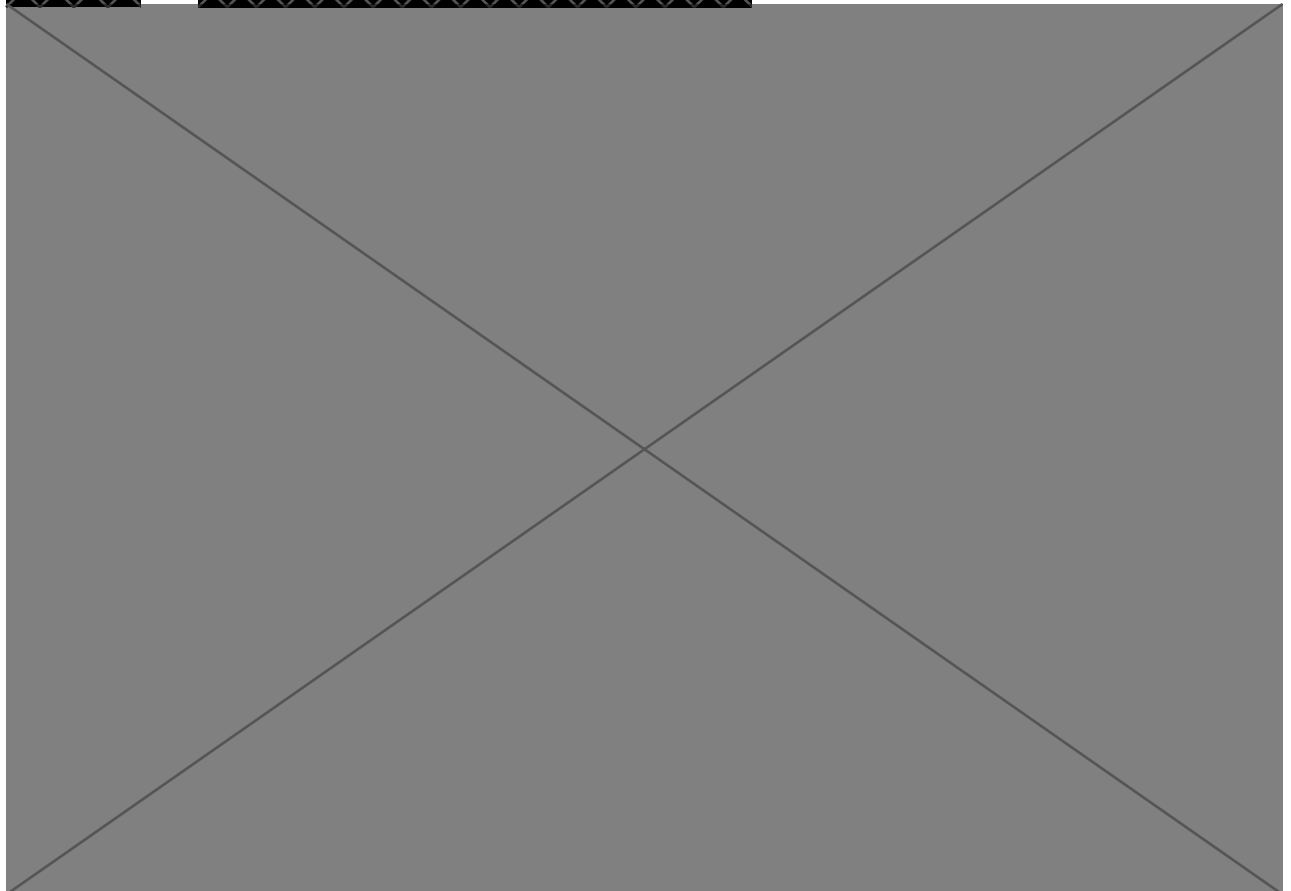
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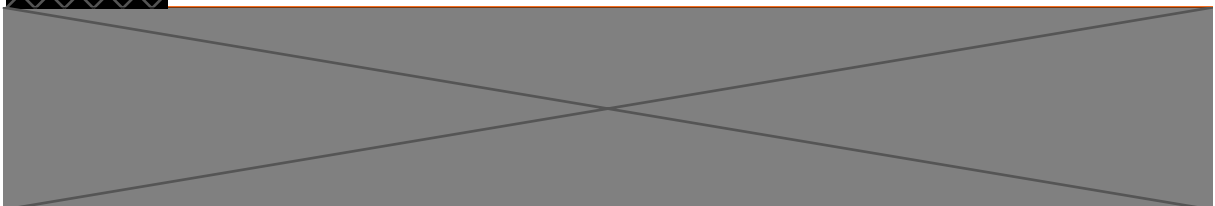
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[Redacted]

[Redacted]

[Redacted]

[Redacted]



[Redacted]

[Redacted]

11 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. It describes the:

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

Table 11-1 summarises the project requirements base on the approaches outlined in **Appendix H: Route Protection Strategy** and **Appendix G: Property Acquisition Strategy**.

Table 11-1 Summary of requirements for each project

Project	Consenting / Route protection strategy	Property Acquisition strategy
Jesmond Road FTN/Arterial Upgrade	Route protection of corridor via designation - is of high urgency due to significant development pressure in the Drury area - Plan Change 6 and commencement of development within Drury 1 Precinct, and NZUP.	Profile A – Traverses through primarily rural greenfield land. Possible complexity with the Bremner Road intersection and adjacency to Auranga.
Bremner Road FTN/Arterial Upgrade	Route protection of corridor via designation. It is noted however that the Jesmond to Bremner Link has been route protected to some extent through the Drury 1 Precinct Plan and its provisions providing a two-lane road and allowing for a 28m corridor for future upgrading. Route protection is of high urgency due to significant development pressure in the Drury area - Plan Change 6 and commencement of development within Drury 1 Precinct, NZUP, and development within Drury Sports Complex.	Profile A and B Profile B for East sections due to existing urban area and considerable property acquisition required.
Waihoehoe West FTN/Arterial Upgrade	Route protection of corridor via designation - is of high urgency due to significant development pressure in the Drury area, signalled by the acceptance of three of these plan changes by the Council in July 2020, and the recent NZUP.	Profile A – Traverses through primarily rural greenfield land.
Waihoehoe East Arterial Upgrade	Route protection of corridor via designation - is of high urgency due to significant development pressure in the Drury area, signalled by the acceptance of three of these plan changes by the Council in July 2020, and the recent NZUP.	Profile A – Traverses through primarily rural greenfield land.
Ōpāheke Road Urban Arterial Upgrade	Although route protection of the entire Ōpāheke Road urban corridor is not required as it can be generally provided for within the existing road corridor, a designation is recommended to protect the discrete areas of private land required for driveway regrading and the Ōpāheke Road / Settlement Road roundabout. This is of medium urgency as development in the area is unlikely to significantly change in the near future and an established community is already developed. However, some intensification in the area has begun and is likely in the future, particularly within the THAB zone in the north-east.	Profile B Existing urban section. Primarily occurs within road reserve, but intersection with Settlement requires property take.

Project	Consenting / Route protection strategy	Property Acquisition strategy
Ōpāheke Rural Arterial Upgrade	Route protection of corridor via Designation -This is of medium urgency as although no private plan changes have been lodged immediately surrounding the corridor, it is anticipated plan changes will continue to progress in the Drury-Ōpāheke Area. Additionally, development within the Ōpāheke 1 Precinct has commenced and will continue to intensify as well as and development plans within the Ōpāheke Reserve.	Profile A – Traverses through primarily rural greenfield land.
Ponga Road Arterial Upgrade	Route protection of corridor via designation -This is of medium urgency, as although no private plan changes have been lodged immediately surrounding the corridor, it is anticipated plan changes will continue to progress in the Drury-Ōpāheke area.	Profile A – Traverses through primarily rural greenfield land.
Ōpāheke NS FTN/Arterial Upgrade	Route protection of corridor via designation - is of high urgency due to significant development pressure in the Drury area, signalled by the acceptance of three of these plan changes by the Council in July 2020, and the recent NZUP.	Profile A – Traverses through primarily rural greenfield land.
SH22 Arterial Upgrade	An alteration to an existing designation is available for SH22 (existing Waka Kotahi designation) – providing an efficient use of an existing corridor reducing private property impacts. This is of high urgency due to significant development pressure in the Drury area, signalled by the acceptance of three of these plan changes by the Council in July 2020, and the recent NZUP.	Profile A – Traverses through primarily rural greenfield land.

11.1 Package consenting and route protection approach

NoR D1: It is recommended one NoR (**NoR D1**) to alter the existing SH22 designation be submitted by Waka Kotahi, because:

- It is not appropriate for any other corridor to be grouped with SH22, as it is a state highway corridor and the responsibility of Waka Kotahi;
- Although having similar transport outcomes and timing (decade one, by 2028) as other recommended options, the transport function is different (road widening and an active mode upgrade) and is not part of the FTN network.

NoR D2: It is recommended to group the FTN road widening upgrades (Jesmond Road, Bremner Road and Waihoehoe Road West) together in one NoR (**NoR D2**), served by AT, because:

- They are all in the Drury area;
- Each of the corridors have the same transport outcomes and transport function (FTN);
- Similar level of complexity and planning risk;
- Route protection of each of these corridors is of high urgency; and
- Implementation of each of these corridors is expected in the first decade of development by 2028.

NoR D3: It is recommended Waihoehoe Road East is designated through its own NoR (**NoR D3**), served by AT for the following reasons:

- It is one of few corridors without an FTN function located in Drury East;

- Although having similar transport outcomes and timing (decade one, by 2028) as other recommended options, the transport function is different (an active mode upgrade) and is not part of the FTN network; and
- It has a lower level of planning risk than the FTN network.

NoR D4: It is recommended that the new Ōpāheke N-S FTN arterial is contained in its own NoR (**NoR D4**), served by AT, because:

- The location of the project spreads across Drury and Ōpāheke to Papakura;
- Although, having similar transport outcomes as the rest of the FTN network, this FTN route serves a north-south function, connecting Papakura and Drury centres, slightly different to the local east-west connection to stations and between Drury centres;
- The greenfield project is a slightly more complex project in terms of planning constraints, construction, flood plain and multiple stream crossings (but not high risk); and
- Implementation of the corridor is expected in the second-third decade from 2038

NoR D5: It is recommended to group the Ponga Road, Ōpāheke Road rural and Ōpāheke Road urban (discrete areas for protection) corridors into one NoR (**NoR D5**) served by AT, because:

- All three corridors are located in Ōpāheke along one linear corridor;
- Although having similar transport outcomes as other recommended options, the transport function includes active mode upgrades and none of the corridors are part of the FTN network;
- All of the corridors have a similar level of planning risk;
- Route protection of each of these corridors is of medium urgency; and
- All corridors are proposed for implementation in the second-third decade from 2038

Route protection for most of the corridors (route protection of discrete areas only for Ōpāheke Road urban), and therefore lodging the relevant NoR, is generally of high priority in order to protect the land required for the proposed network, while providing certainty to landowners, businesses, stakeholders and the community. This is particularly important in the Drury-Ōpāheke area where zoned land areas are being increasingly developed, FUZ land is being live zoned and/or a number of private plan changes have been lodged with and accepted by the Council, signalling a desire for expedited growth of the FUZ by developers.

It is recommended that NoRs D1 to D5 are packaged into a single application for lodgement since the urgency of route protection of the corridors is generally high. The packaging of NoRs provides an opportunity to improve efficiencies in the NoR process, streamlining statutory timeframes and avoiding unnecessary duplication.

Table 11-2: Drury Overall NoR Grouping and Packaging Recommendations

Drury Strategic Transport Network NoR Package 1 – high urgency	
Project	Notice (and requiring authority)
State Highway 22 (SH22) Urban Arterial	NoR D1 (Waka Kotahi) – alteration to designation 6707
Jesmond Road FTN Arterial Upgrade	NoR D2 (AT)
Bremner Road FTN Arterial Upgrade	
Waihoehoe Road West FTN Arterial Upgrade	
Waihoehoe Road East Arterial Upgrade	NoR D3 (AT)
New Ōpāheke North-South FTN Arterial	NoR D4 (AT)
Ponga Road Arterial Upgrade	NoR D5 (AT)
Ōpāheke Road (rural) Arterial Upgrade	
Ōpāheke Road (urban) Arterial Upgrade Designating discrete areas outside the existing road corridor only	

[REDACTED]

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

[REDACTED]
[REDACTED]
[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

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

- Scale: [REDACTED] (P50)
- Complexity: New road corridors & upgrades to existing. Significant earthwork requirement for NS Arterial, and multiple bridges proposed
- Funding: [REDACTED]
[REDACTED]
- Timing and urgency: Jesmond Road, SH22, Bremner Road and Waihoehoe Road are required within the first decade. Ōpāheke N-S, Ōpāheke Road and Ponga Road upgrades are required in the third decade.
- Defined scope: [REDACTED]
- Supplier market conditions: there are several suppliers available for this type and scale of project in the Auckland market.
- Client involvement, control and capability: client desires to retain design control
- MSQA and level of construction monitoring likely to be CM4 (daily monitoring)
- Non-cost success factors: strong client desire to achieve best practice environmental and stakeholder outcomes
- [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
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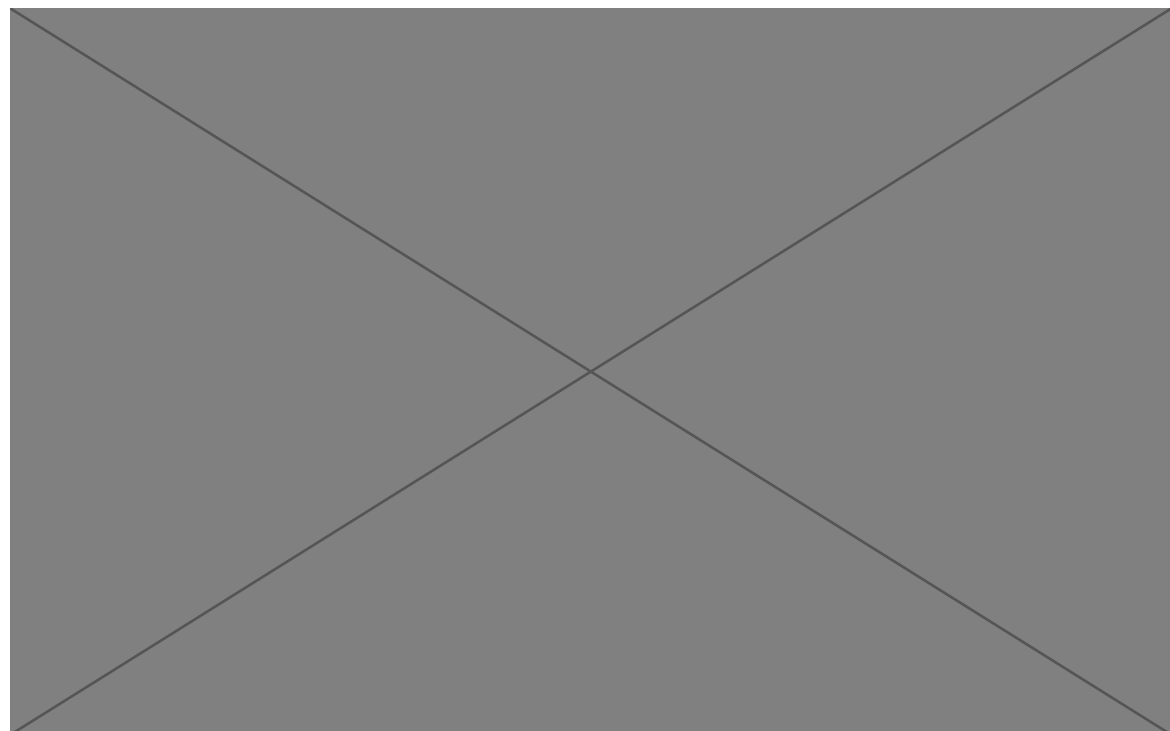
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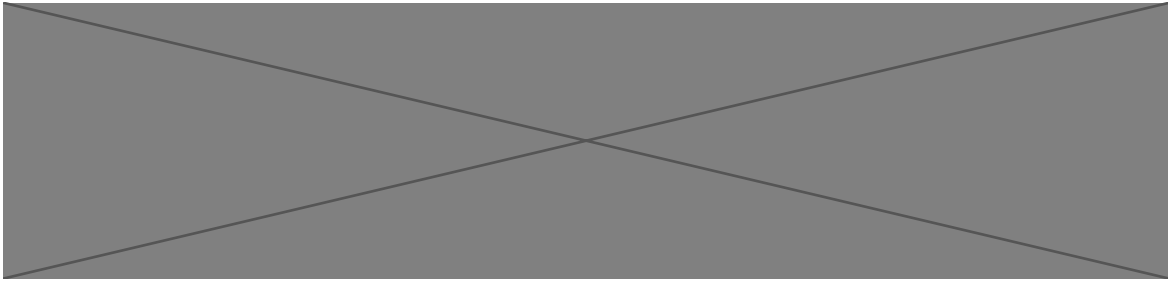
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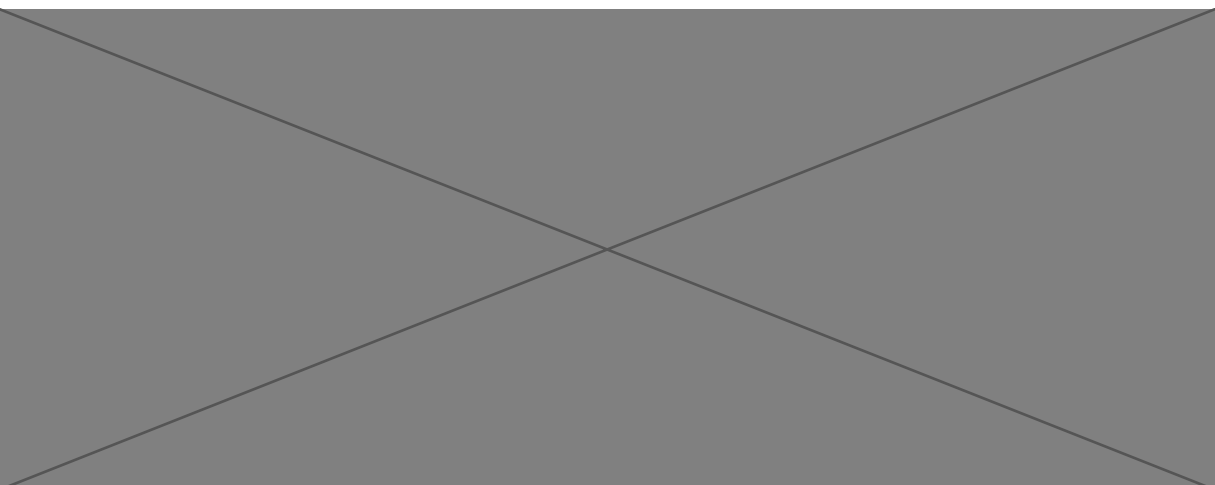
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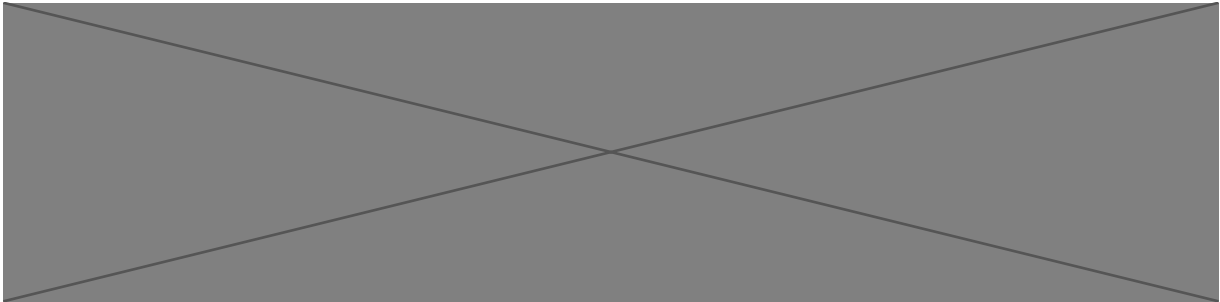
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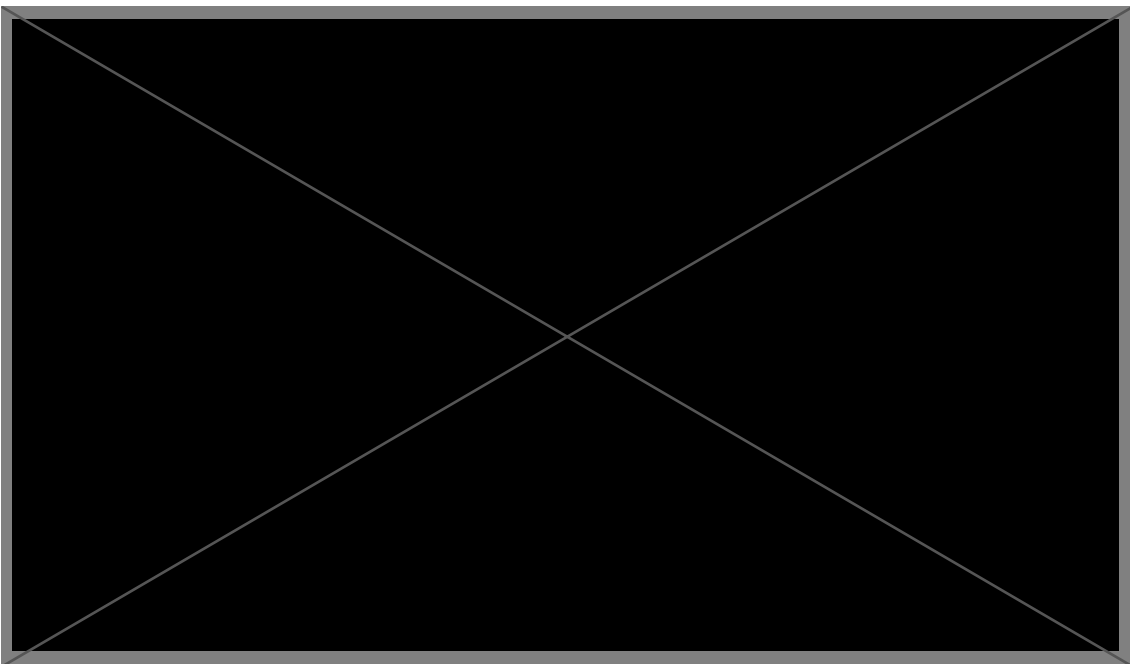
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11.8.2 Ongoing property management

Both Auckland Transport and Waka Kotahi 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 properties, where required. [REDACTED]

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12 Management Case

The Management Case describes the delivery arrangements for the next phase of each project. It assesses whether this proposal is deliverable and demonstrates that an appropriate project management regime is in place for the next phases of the project. It tests the project planning, governance structure, risk management, communications and stakeholder management, benefits realisation and assurance.

It is noted that this project sits within the wider context of the Supporting Growth programme, and as such this management case draws on the overarching management case developed as part of the wider programme. It is noted that a separate management case has also been developed as part of the Auckland Council DBC which identifies specific monitoring and project evaluation in terms of housing outcomes. It is not intended to reiterate these processes, but rather the focus of this management case is the delivery arrangements of specific project-based elements.

12.1 Route protection management

12.1.1 How is the route protection phase being governed?

Te Tupu Ngātahi has been formed to identify and protect the 'transport system' required to support Auckland's urban greenfield growth, consistent with and aligned to both the urban spatial planning (e.g. through the Auckland Plan, Future Urban Land Supply Strategy and Unitary Plan) and as directed by wider national policy (such as the GPS). While the next phase of work for Te Tupu Ngātahi is to deliver route protection for the recommended network in Auckland's greenfield growth areas, it is recognised that meeting the programme's investment objectives and wider policy directives will require a system response including land use planning, travel demand management and other system interventions.

AT and the Waka Kotahi identified that an Alliance model (working collaboratively with AT, Waka Kotahi and professional services (legal, planning, design, communication, financial) would be the appropriate delivery mechanism to deliver route protection outcomes in an agile, efficient manner within a five-year programme. However, in addition it recognised the Alliance will need to work collaboratively with owner and partner organisations in respect of the wider land use and 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 12-1.

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

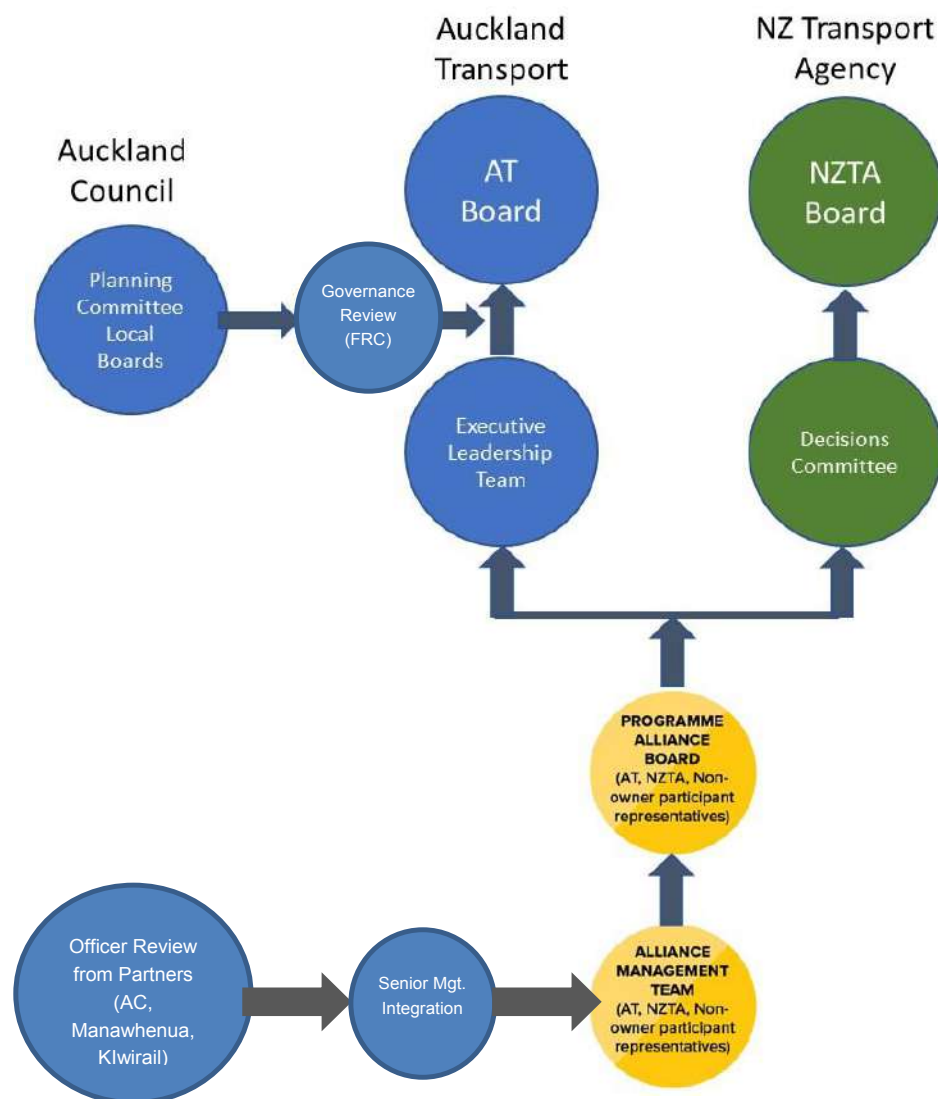


Figure 12-1 Te Tupu Ngātahi governance structure

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

The outcomes sought from the Te Tupu Ngātahi alliance over the next three 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
 - Make decisions to route protect corridors for longer term projects
- The recommended transport network for each growth area is route protected within three years.
- Efficiency of process – In 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.

12.1.1.1 Route protection programme

Te Tupu Ngātahi's focus is on the route protection of the strategic transport network, however the future physical network has been 'right sized' based on the DBC investigations and expectations in respect of travel demand management, land use outcomes (including local employment) and forecast PT services. Accordingly, the investigation has included TDM and land use provisions (that support the accessibility and mobility needs of people and businesses and improving city competitiveness, urban form and liveability) and that are required to be in place to ensure that the route protected transport system is sufficient to meet forecast demand.

12.1.1.2 Packaging approach

The route protection strategy sets out a methodology for identifying potential route protection packages based on a range of "drivers" or factors. These include (for example): opportunities for place making/achieving liveability outcomes; timing of Council's structure planning processes; developer readiness; whether growth pressure is imminent; presence of Central Government interest; number of affected landowners; availability of funding; presence of scheduled environmental features; potential for adverse environmental or cultural effects.

For each notional package, preliminary route protection mechanisms have been selected from a range of options, including NoRs for designation, developer agreements, structure plan/plan change opportunities. The DBCs have selected NoRs for the majority of the recommended network, with a smaller number of developer agreements proposed. The reason for this relates principally to the issue of timing in respect of developer readiness/alignment and the Council's structure planning timetable.

12.1.1.3 The general route protection approach

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

Route protection in its broadest sense involves several layers; including **identification**, **communication** and **formal protection**. Only the third layer, involving either NoR or land acquisition (outright or by developer agreement), provides permanent protection that can be managed by the investor requiring authority. Other less formal mechanisms include identification of preferred corridors on structure plan maps, publication of those corridors to the community and inclusion of corridors in plan change documents, either by collaboration with the proponent of the plan change (council or developer) or by submission and participation in the hearing process.

It is likely that all three levels of route protection will be used for the Supporting Growth network, depending on the urgency and priority of individual network components and any funding constraints. Ultimately, the Drury projects will all require NoRs for formal route protection.

12.1.1.4 Risks of route protection via NoR

Most NoRs lodged with Council are supported by detailed information on design and effects on the environment because they are intended to facilitate construction in the short to medium term and are often accompanied by applications for regional consents for the same reason. The level of information provided may enable the requiring authority to seek a waiver of the outline plan process because the level of certainty is so high; and the AEE and proposed conditions are sufficient to address all outline plan matters.

By contrast, designations with a primary focus on route protection are used in situations where:

- construction is not imminent and may be some decades away
- there is a level of uncertainty regarding the design of the project, which given the time horizon for implementation cannot be advanced further
- maximum flexibility is required in footprint and conditions.
- The level of design detail may be modest, comprising a wide corridor and an envelope of effects, which will require particular care when assessing effects, including impacts on property owners and other affected parties, and meeting the statutory tests. Recent examples of route protection designations include the Waka Kotahi's Southern Links network of long-term infrastructure to accommodate growth in and around Hamilton City. In that case, the intended start of construction for many of the corridors protected was at least 20 years away.

Notwithstanding this tension between the need for certainty and flexibility, the Environment Court has confirmed that route protection designations are contemplated by the RMA and remain an appropriate planning mechanism, on the basis that the outline plan process is available to provide greater detail in the future when the requiring authority is in a position to fund, design and construct the work.

However, it is also clear from case law that a route protection approach presents risks:

- All NoRs must be supported by information that is sufficiently detailed to enable the nature and scale of effects to be understood by both the court/decision maker and submitters.
- There may be circumstances, such as sensitive receiving environments, where a greater level of detail and potentially greater route specificity is required.
- A decision maker is likely to impose conditions that constrain the proposed activity to the envelope of effects that are contemplated in the NoR and are considered acceptable to the decision maker. The Outline Plan process does not permit a requiring authority to extend the effects beyond those considered when the NoR was approved.

For those recommended network components that will likely require implementation within the first decade (including some where construction may immediately follow route protection), the level of information and technical assessment required to support a NoR (and potentially the necessary regional resource consents) will be more detailed, in line with the standard approach. These NoRs will have a lower risk profile as a result. For Drury, it is envisaged that all projects will progress to

route protection immediately – with the urgency driven by active developers and private plan changes lodged in Drury.

12.1.1.5 Lower level route protection

Lower levels of route protection include identification and communication of the recommended transport network, including utilising opportunities presented by structure planning and plan change processes. The proposed work programme with the Council continues to offer the best means of ensuring that Te Tupu Ngātahi remains well placed to provide integrated and timely input into these processes. While use of these planning processes does not provide the highest and best level of route protection, they do offer a mechanism that will "buy time" by signalling future network intentions to the community and property owners.

In relation to developer agreements, the key risk is that development will proceed without protection of the recommended network, resulting in increased land values, potentially adversarial NoR processes and sub-optimal outcomes in terms of transport and land use integration. [REDACTED]

[REDACTED] There are also risks associated with investing time in seeking developer agreements, including sunk costs where no agreement can be reached, lack of alignment on issues, the need to compromise the recommended network in order to achieve agreement and the risk that we reach agreement with a developer that does not align with the Council's land use plans. The use of NoRs as a "backstop" will assist to mitigate some of these risks.

12.1.1.6 Mitigation for route protection phase risks

Te Tupu Ngātahi considers that the primary layer of mitigation for addressing route protection phase risks involves a "whole programme" approach to route protecting the recommended network that takes the DBC route protection recommendations and ensures a consistent, whole of programme approach to achieving the route protection outcomes sought.

The Te Tupu Ngātahi team developed a Strategic + Local approach to programme-wide route protection which split route protection of the IBC recommended network into the following distinct workstreams (which has in turn driven the DBC packaging):

- **Strategic:** Three bundles of strategic network components (North, North West and South), comprising NoRs that are all required for long term implementation, require similar levels of design information and assessment and will need long lapse periods. These components will form the "spine" of the recommended network.
- **Local:** Multiple area-based packages of arterials and active modes (new and upgrades of existing roads). These can be packaged in a number of ways but are typically grouped together to make a clear transport system story (i.e. this road links A to B) and they often impact a large number of property owners in the same community, many in developed urban areas, and will therefore require more detailed design to ascertain the width of corridors to support upgrades and the specific nature of property impacts for both new and upgraded arterials. Lower levels of route protection will be particularly important for these workstreams, particularly developer agreements for new arterials in greenfield areas.
- **Area-wide Warkworth:** There are efficiencies to be gained from advancing all Warkworth components in one package at an early stage to align with the Council's structure plan and plan change process, scheduled to be advanced in mid-2019.

- **Special projects:** the North West Housing Infrastructure Fund (HIF) projects already form special projects and the Drury Arterials are likely also to be recommended for acceleration outside the Strategic & Local programme approach.

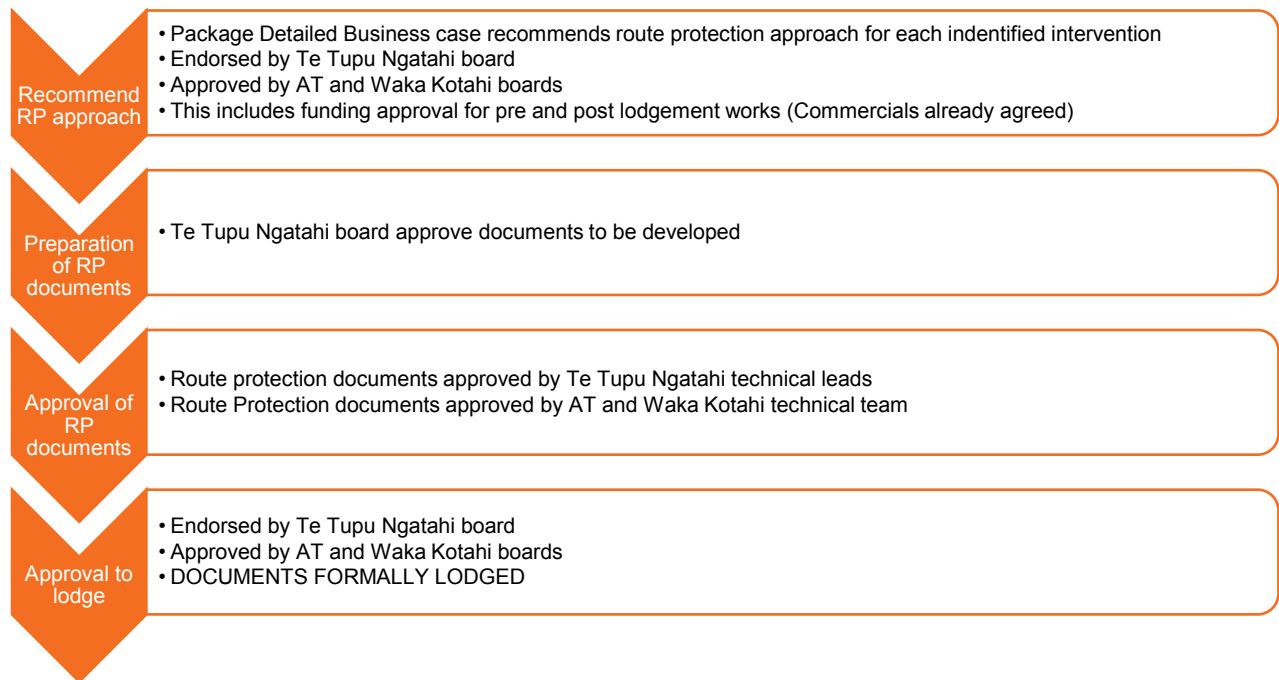
This approach has been 'tweaked' for some areas in the development of the DBCs based on the specific risks in an area.

The second layer of risk mitigation relates to the completion of specific tasks in the programme-wide workstream. These tasks include:

- In parallel to the DBC team, a Developer Response team and workstream to engage proactively with developers in priority areas, particularly those preparing plan changes to ensure all opportunities for lower level route protection are maximised.
- Agreeing with Council and AT protocols for participating in plan change and resource consent processes in priority areas.
- Continue to prepare ITAs as Council initiates new structure planning processes.
- In respect of projects likely to require NoRs, agreeing relevant and acceptable information levels with the Council in advance of NoR lodgement (assuming a two stage approvals process as per the consenting strategy, with the odd exception such as NZUP projects that may be direct referral). This workstream commenced in 2019 and early discussions with Council confirm that they are keen to in progress this.
- Agreeing protocols for undertaking more detailed "spot design" to address concerns of specific landowners or specific locations that require a greater level of investigation (e.g. areas of significant ecological areas (SEA) or reserve land).
- Development of proposed standardised conditions in collaboration with Council to address concerns about effects that may not be sufficiently certain at the outset (i.e. by applying performance standards as opposed to a fixed methodology) and the matters that can appropriately be deferred to later management plans, including any necessary public consultation regarding the content of those plans.
- Seeking extended lapse dates and agreeing property use protocols with affected landowners that apply during an extended lapse period.
- Developing a responsive yet cost-effective property acquisition strategy.

12.1.2 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 below:



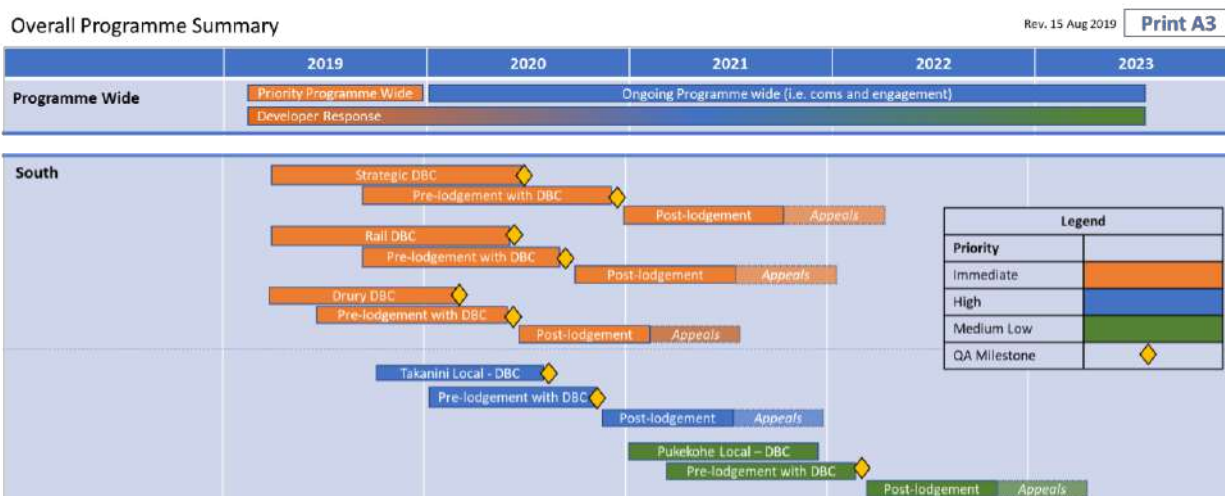
The above process allows for multiple review and staged approvals of the documents as they are prepared.

12.1.3 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.

Te Tupu Ngātahi has used the above matters to help inform a prioritised programme for route protection as shown below:



There will be pressures that arise throughout the life of the programme that will result in the need for this programme to be reviewed and refined. This prioritisation review will be done as an issue arises and at a minimum every six months by Te Tupu Ngātahi. The Te Tupu Ngātahi management team will make a recommendation of any prioritisation change to the Alliance board for endorsement. This endorsement (or not) of any change will also need to consider cashflow implications for the owners. Each DBC includes the latest thinking on route protection timing, considering the entire programme view.

12.1.4 Property

The Te Tupu Ngātahi Programme Wide Property Strategy identifies an approach for the securing of strategic properties.

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.

12.1.5 NoR Management

12.1.5.1 Who will decide on lodgement decisions?

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.

12.1.5.2 Hearing management

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.

12.1.5.3 How will property agreements be managed if this is route protection mechanism?

Where the identified route protection mechanism does not include a designation process, such as a developer agreement, the following steps will be undertaken:

- SGA 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.

12.1.6 Risk and opportunity management

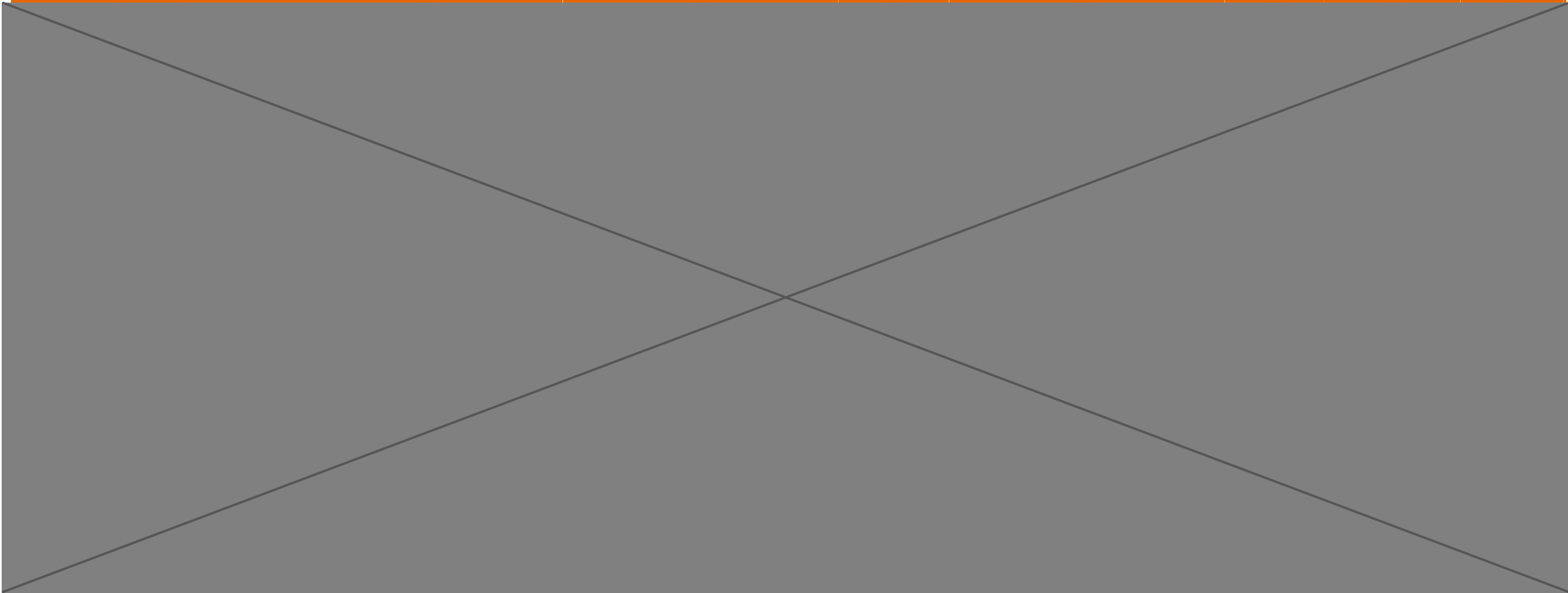
The Supporting Growth programme is a large programme comprised of multiple projects, inherent with areas of uncertainty that transpire into risks and opportunities. These must be managed to enable successful delivery.

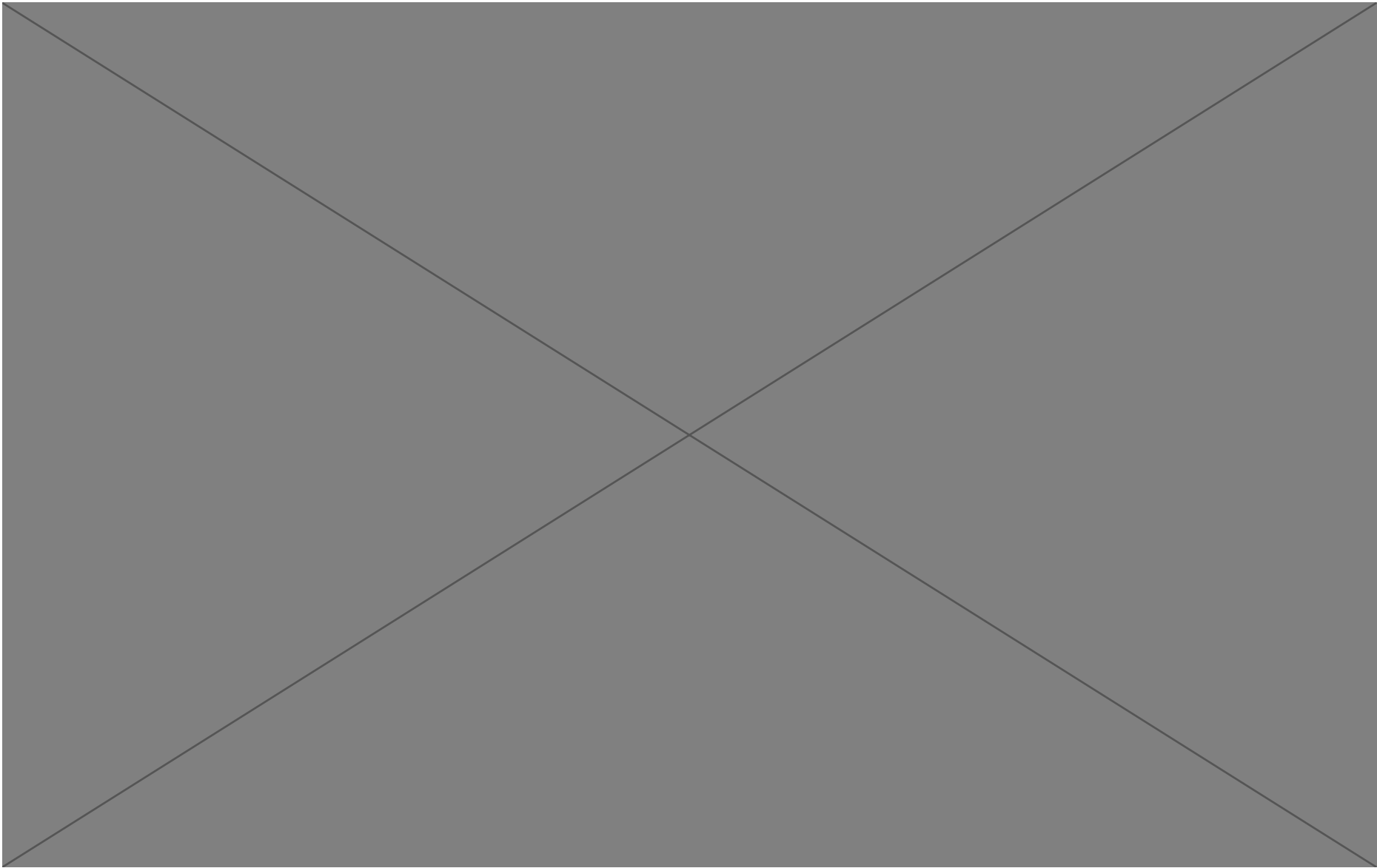
A Risk and Opportunity Management Plan has been developed and endorsed by the Te Tupu Ngātahi governance team. The risk management process is consistent with AS/NZS ISO 31000:2009 and is consistent with typical risk management processes undertaken by AT and Waka Kotahi. Key overarching risks and opportunities at a programme-wide level are set out Table 12-1.

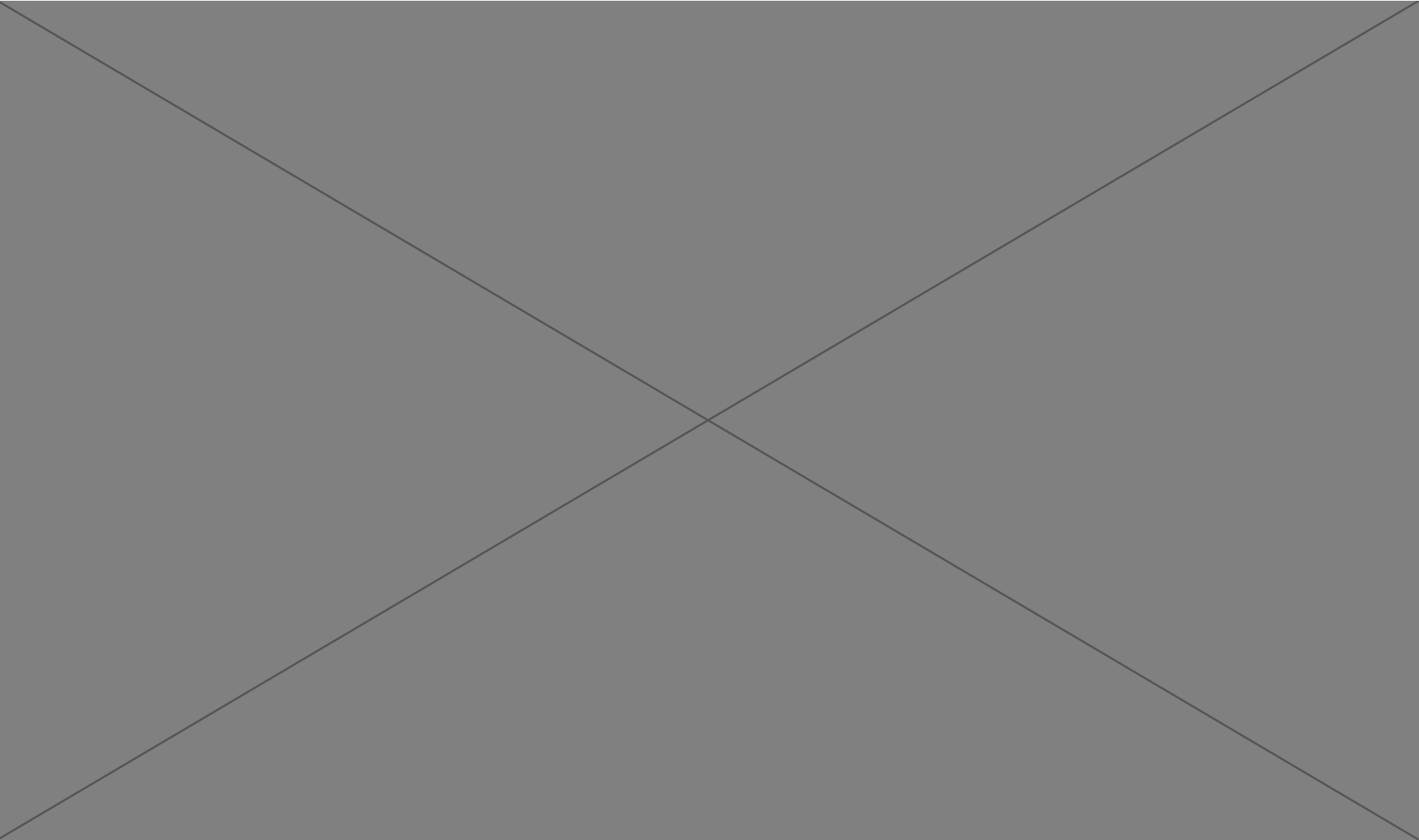
Risk and opportunity for the programme has been included below at two levels:

- Implementation risk for the recommended networks - Specific risk assessments have also been completed for each DBC Package-.
- DBC and route protection risks for the programme of route protection are outlined in Table 12-1
- Each DBC has identified package specific designation risks as well as there more general ones.

Table 12-1: Critical and high risks/opportunities – Route Protection





The NoR process can be dynamic and fast moving during the hearings and therefore careful management of the risks is required. Critical decisions are needed to be made 'on the move' and therefore accurate and sound risk information is needed.

As set out in the Risk Management plan, the risks (and opportunities) are reviewed regularly, including:

- Monthly at individual project level
- Quarterly at programme level

Each risk has an identified risk owner whose role is to action the plan to eliminate or mitigate the identified risks. As well as an individual risk owner, the overall programme risk process and register is owned and maintained by the Programme Risk Manager.

12.1.7 Comms and 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 12-2.

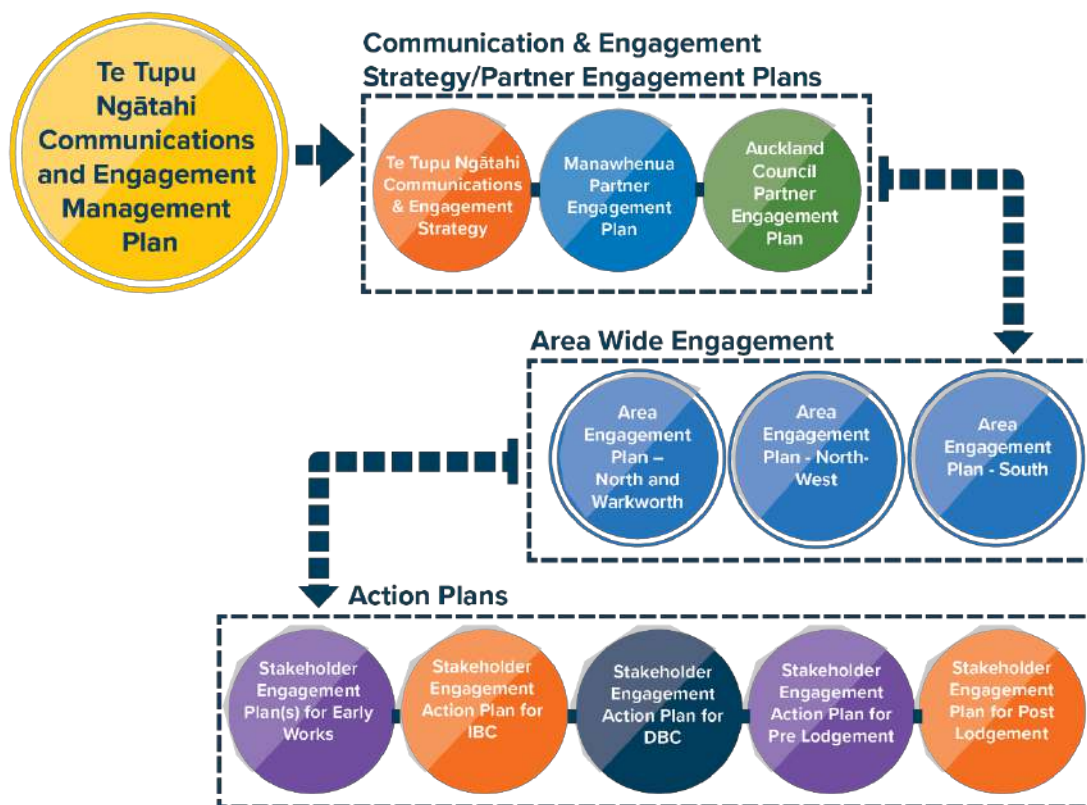


Figure 12-2: Communications and engagement

12.1.7.1 Engagement and communication next steps

The focus of the engagement at a programme-wide level post the DBC's is to:

- Continue to build understanding of Te Tupu Ngātahi progress and the process of route protection, by clearly communicating the preferred network and next steps with partners, landowners within corridor study areas, stakeholders and the general public. This includes website content, letters, e-updates, face-to-face meetings, information sheets and public open days as set out in the Programme Wide Comms and Engagement Strategy.
- 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.
- Ongoing discussion with Kiwirail as an investment partner in the transport networks required to support future urban growth
- **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).

- **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).
- **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).
- Identify opportunities for AT and Waka Kotahi to undertake early(?) **property acquisition** (e.g. willing buyer/willing seller arrangements, albeit leading these processes is outside the specific scope of work for Te Tupu Ngātahi).
- Enable Te Tupu Ngātahi to inform decision makers on the **risks and opportunities** of potential route protection mechanisms for the preferred network.
- 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.

12.2 Post route protection management

12.2.1 How will programme be governed?

The governance of this future stage is yet to be determined. This will need to be resolved prior to obtaining the first NoR which is in the order of two years away. This is currently being explored by AT and Waka Kotahi and the outcomes of this will need to be documented in this Management Case. [REDACTED]

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It is not critical for this governance arrangement to be determined now; however, it will need to be resolved within the next 12-18 months with the following steps proposed in Figure 12-3.

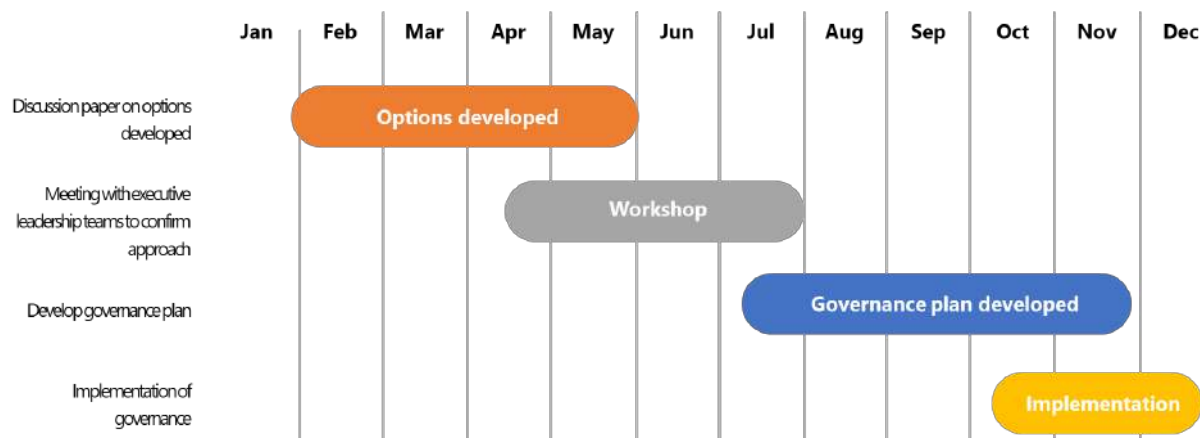


Figure 12-3 Governance plan

These discussions will need to consider topics such as:

- Funding
- Programme prioritisation
- Governance
- Operations of the programme team

For the purposes of this management case it is assumed that some form of collaborative governance model is adopted, such as either Option 2 or 3 above.

12.2.2 What are the key tasks in this phase?

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

- Management of designations obtained in previous phase
- Scoping, procurement and delivery of required implementation DBCs
- Scoping, procurement and delivery of projects to implementation
- Purchasing and management of property acquisitions
- Management of comms and engagement needs for entire programme and individual properties

The following sections outline the details of each of these tasks.

12.2.3 NoR management

There will be the need for the ongoing management of the designations obtained through the NoR process. This will 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 daily basis. The Supporting Growth designations would be added to the respective requiring authority's current suite of designations to manage.

12.2.4 Delivery of 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
- Property Strategy Update
- 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.

12.2.5 Project 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 12-4 below:



Figure 12-4 Project implementation

Depending on the project, there will be a number of 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 the Waka Kotahi have the systems and capability to successfully manage the procurement and delivery of each of these steps.

12.2.6 Property

Managing the contingent property liability as a result of the route protection process proposed will require careful, deliberate and ongoing management to ensure the risks are appropriately managed, but also so that the considerable opportunity that exists is realised. As outlined in the property strategy in Appendix G, this includes:

- **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 of time and appropriately resourcing will ensure best for programme outcomes are achieved.
- **Developer Agreement** – Focussing on getting early and comprehensive developer agreement 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.

It is also important to outline that the Supporting Growth Programme Wide property strategy sets out a number of initiatives to effectively manage the significant acquisition programme of the route protection approach.

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- [REDACTED]
[REDACTED]
- [REDACTED]
[REDACTED]
[REDACTED]

12.2.7 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 considered to be:

- 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 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.

12.3 Overall Programme Management

12.3.1 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 as a result of land use zoning and market forces. Therefore, each DBC and the overall prioritisation has identified triggers for implementation of a number of the projects in the programme.

Key principles to determine the prioritisation of the programme have included the following:

- **Scale and pace of development (type and pace)** – It will be critical that the transport system keeps pace and helps leads and drives (quantity is not quality in itself) the land use response, the programme will therefore need to be flexible to changes in strategic development pressures within the programme areas.
- **Mode share outcomes being delivered** – It will be important that the mode shift objectives of the programme are delivered acknowledging that poor prioritisation of the programme risks imbedding higher levels of private vehicle use particularly if development pressures results in land use occurring out of sequence.

- **Placemaking imperative being delivered** – The transport system has a critical role to play in the delivery of successful liveability and placemaking outcomes. The delivery and prioritisation of the programme will impact on this outcome.

These principles should be continued in any further prioritisation.

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. 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.

The prioritisation should therefore be reviewed regularly, with the programme reconsidered against the prioritisation principles at least annually by AT and Waka Kotahi. It is critical that the programme prioritisation is reviewed during the LTP and RLTP review processes.

The governance arrangement of the programme will determine how the prioritisation review is undertaken.

Regardless of the ongoing governance arrangement of the programme, this prioritisation should occur together with all implementation partners.

12.3.2 Benefits realisation

12.3.2.1 General

Ongoing tracking and measurement is 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 actually occurs (such as pace and scale of land use) over this long time period.

The DBCs have therefore been developed with a consistent programme wide Benefit Logic Map (BLM).

The BLM was used to show how an individual project contributed to the overall programme objectives and outcomes.

12.3.2.2 Benefit Logic Mapping

The BLM was developed based on a number of inputs, including the strategic priorities contained within the GPS which have been adopted as the strategic objectives for the programme. Figure 12-5 below describes strategic flow from the GPS through to the RLTP.



Figure 12-5 Linkages between land transport documents¹⁸

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 on the basis of 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

¹⁸ Government Policy Statement on Land Transport, 2018/19 – 2027/28, June 2018

- 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:

- return on the investment – expected benefits compared with expected cost
- contribution towards the desired GPS results (benefits)
- reason for the decisions, especially where there is a cost benefit ratio lower than would normally be required for inclusion in the NLTP.”¹⁹

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 - in the event that strategic objectives change or external factors dictate - becomes a simple exercise of re-mapping the outputs and outcomes to the updated benefit set.

12.4 Optimising the outcomes from the Supporting Growth Programme

A stated guiding principle for Supporting Growth is: ¹

“... that unconstrained demand should not be provided for, and opportunities should be sought to influence and reduce demand before infrastructure options are considered.”

“The key drivers...are based on the following strategies: -

- *Managing transport demand*
- *Flexibility to respond to changes*
- *Shaping the future urban development”*

¹ Information shown in italics is taken from the Indicative Business Case for Supporting Growth in the North.

If all the transport infrastructure projects identified in the Supporting Growth 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-conditions to investments, that also need to be implemented and monitored to ensure the successful overall outcome of the programme.

These elements have been broadly summarised into three areas, being Urban System Integration, Transport System Optimisation and Other Transport, as shown in Figure 12-6 below.

¹⁹ Government Policy Statement on Land Transport, 2018/19 – 2027/28, June 2018, Section 2.5

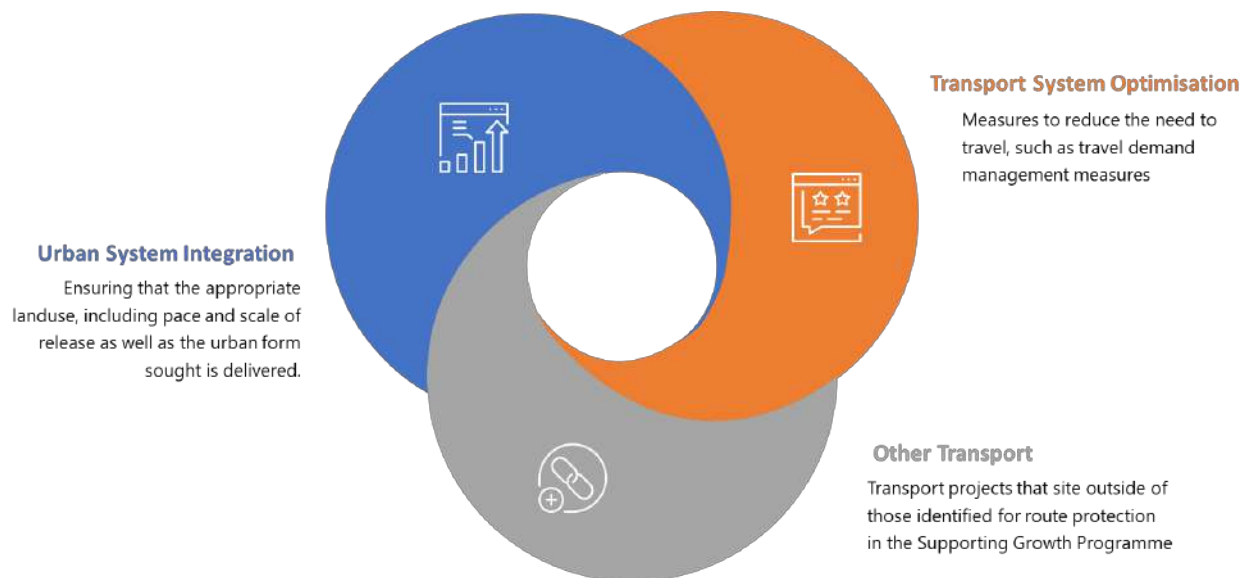


Figure 12-6 Additional contributory elements

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 underutilised, sub-optimal and critical elements such as mode-shift targets will not be met.

The following sections outline what needs to be done to ensure that these complementary and necessary elements are also delivered.

12.4.1 Urban system integration

This programme of transport interventions by the very name of the programme (Supporting Growth) is intrinsically linked to the urban system including land use, urban form & place quality, density & proximity, and employment self-sufficiency etc. The programme 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.

It is therefore critical that these urban system integration outcomes are delivered alongside and at the appropriate timing for the transport interventions recommended.

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)



- Separation in metropolitan rail provision between PT operators and infrastructure providers



This is an incredibly complex arrangement as there are often competing needs and complete lack on integration. Given this complexity and these often-competing needs, it is absolutely critical that common outcomes sought, are clearly communicated to all parties and that parties are held to account in the delivery of their particular aspect of the complete solution.

An Urban Strategy is a comprehensive approach to deliver the SGA vision, programme objectives and priorities via a series of tactical and strategic urban interventions which influence land use change and address the totality & integrated nature of the:

Urban (People + Place + Environment + Economy + Movement) + **Transport** (Regulatory + Infrastructure + Technology + Mobility Providers + Service Purchasing + Customer Interface Technologies + Customer Needs/Requirements) systems.

It is therefore recommended that an Urban Strategy by each of the Supporting Growth four areas is developed, supported, endorsed and implemented by the appropriate parties. This is an emerging area in the planning and delivery of programmes.

The urban environment is defined by five key aspects as shown in the Figure 12-7 below and these along with the transport system is what an Urban Strategy focusses on to ensure the integrated urban outcomes sought are delivered.

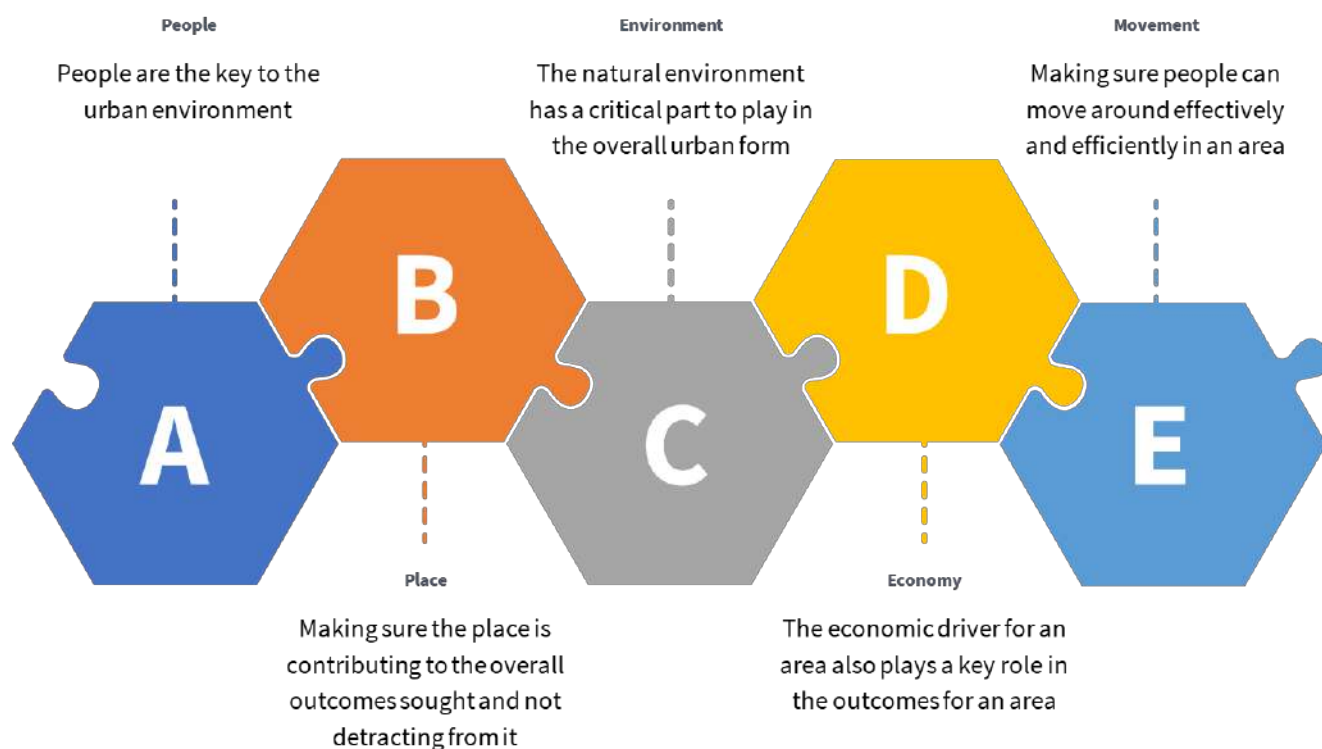


Figure 12-7 Five key aspects of the urban environment

Given the complexity and criticality to the programme outcomes of ensuring this integrated approach is adopted and maintained it is recommended that a coordinated programme approach is adopted to ensure the delivery of this important element. This is discussed in more detail in the following sections of this report.

12.4.2 Transport system optimisation

The Supporting Growth programme has been 'right sized' based on a number of assumptions, including the current and projected urban environment and a hierarchy of interventions where travel demand, as an example of optimisation, has been an important higher order intervention (than the final infrastructure projects) in the programme.

TDM is one component of the totality of the transport system in Figure 12-8 below:

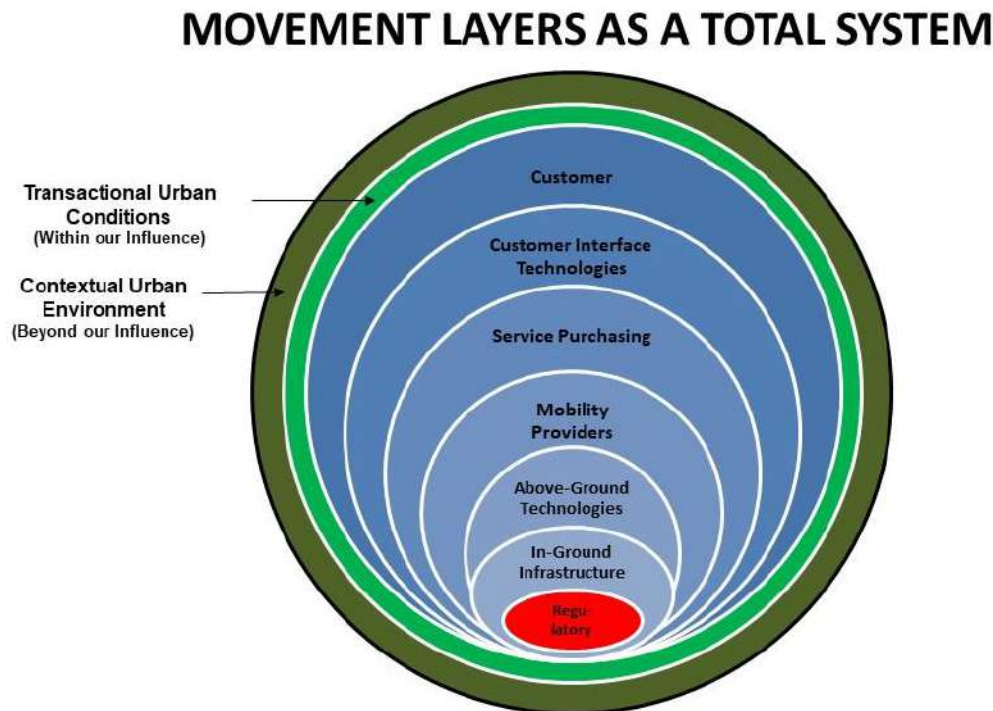


Figure 12-8 Transport system

The Supporting Growth programme IBCs identified a wide range of TDM initiatives to ensure the demand pressure on the transport system of Auckland substantial growth is appropriately managed prior to the transport system being called upon to move people to and from their destinations.

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.

It is therefore suggested that a coordinated programme approach is adopted to ensure the delivery of this important element. This is discussed in more detail in the following sections of this report.

12.4.3 Other transport

This programme relies on

a number of other transport projects being in place within the transport system to support the project and realise the sought outcomes. An example of this is the rail four tracking in the Supporting Growth programme. If the rail network to the north of the study area is also not expanded to four tracks the full benefits of this project will not be realised.

Each DBC has identified the projects they are dependent on and a series of triggers for implementation for each project have been identified. See section 5.7.

It is therefore 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 PT services)
- Kiwirail (Rail infrastructure)
- Developers (Key local transport links)
- Kainga Ora

The proposed approach to ensuring this integration is outlined in a subsequent chapter of this document.

12.4.4 Proposed approach to ensure ongoing programme interventions

To ensure these three key elements are delivered in a coordinated way to deliver the outcomes sought, the following approach is proposed:

- **Urban system integration** – It will be important that an Urban Strategy is developed for each area. 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** – As with the Urban Strategy workstream, it is proposed that a dedicated resource is tasked with ensuring the TDM elements identified are developed, implemented and monitored.
- **Other transport** – 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.

This approach is summarised in Figure 12-9 below.

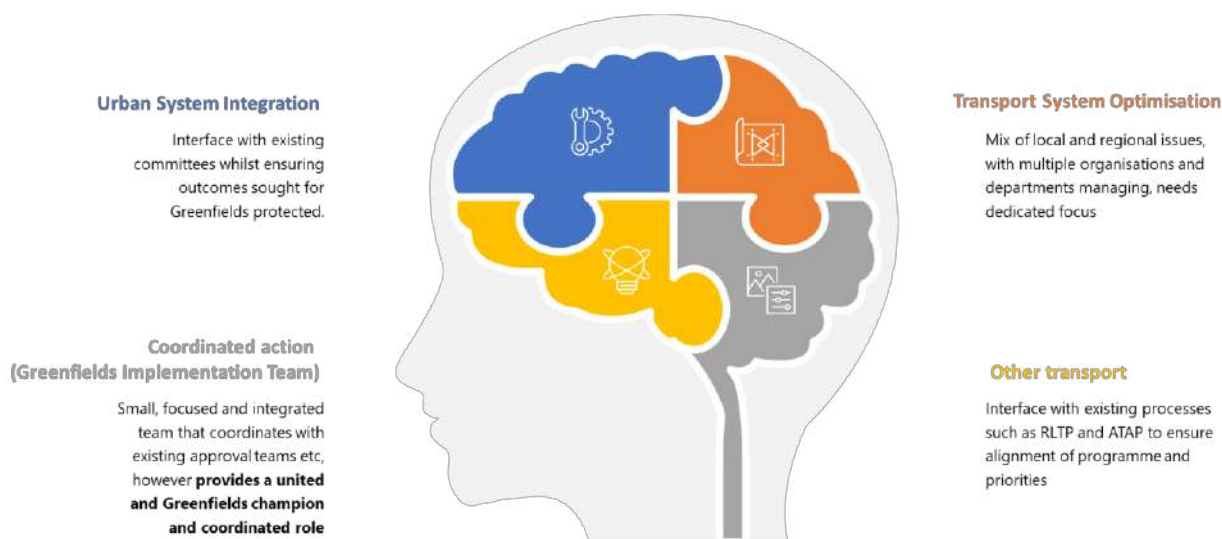


Figure 12-9 Integrated programme approach

This approach and these resources are proposed to form the **Green Fields Action team**, which when combined with the two identified property roles indicates an ongoing programme management team for the programme of five roles as outlined below.



Urban Coordinator	TDM Coordinator	Projects Coordinator	Property Outcome Team
- Manage delivery of Urban Strategy's - Manage implementation of strategies - Lead coordination of parties and ensure delivery	- Manage delivery of TDM elements - Lead coordination of parties and ensure delivery	Lead coordination of parties and ensure delivery coordination	- Two roles - Identify and prioritise strategic property purchases - Develop commercial outcomes form property portfolio

Figure 12-10 Project management team roles

12.5 Overall Business Case Recommendation

This business case for route protection seeks the following approvals:

- Approval of the recommended Drury Local network upgrades

- Approval for lodgement and route protection of the recommended Drury Local network upgrades
- [REDACTED]
- Acknowledgement of forecast contingent property liability arising from route protection of the recommended Drury Local network upgrades

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

- [REDACTED]

- [REDACTED]

[REDACTED] Whilst not the focus of this business case, [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

- [REDACTED]

- [REDACTED]

- [REDACTED]

13 List of Appendices

Appendix A - Options Assessment Report

Appendix B – Transport Assessment

Appendix C – Cost Report

Appendix D – Urban Design Evaluation

Appendix E – Design Report

Appendix F – Engagement Summary

Appendix G – Route Protection Property Strategy

Appendix H – Route Protection Summary

Appendix I – Risk Register

Appendix J - Drury Local Project Evidence

Appendix K - Drury Local Key Performance Indicators