

New Wilks Road interchange – RECOMMENDED OPTION

RECOMMENDED OPTION FOR Wilks Road interchange



PROJECT ALIGNMENT

Risks and Opportunities

- Risk of works in the vicinity of the North Shore Airport and associated impacts on operation.
- Risk that the interchange places pressure on rural zoned land to the North East of the interchange to urbanise.

Interdependencies

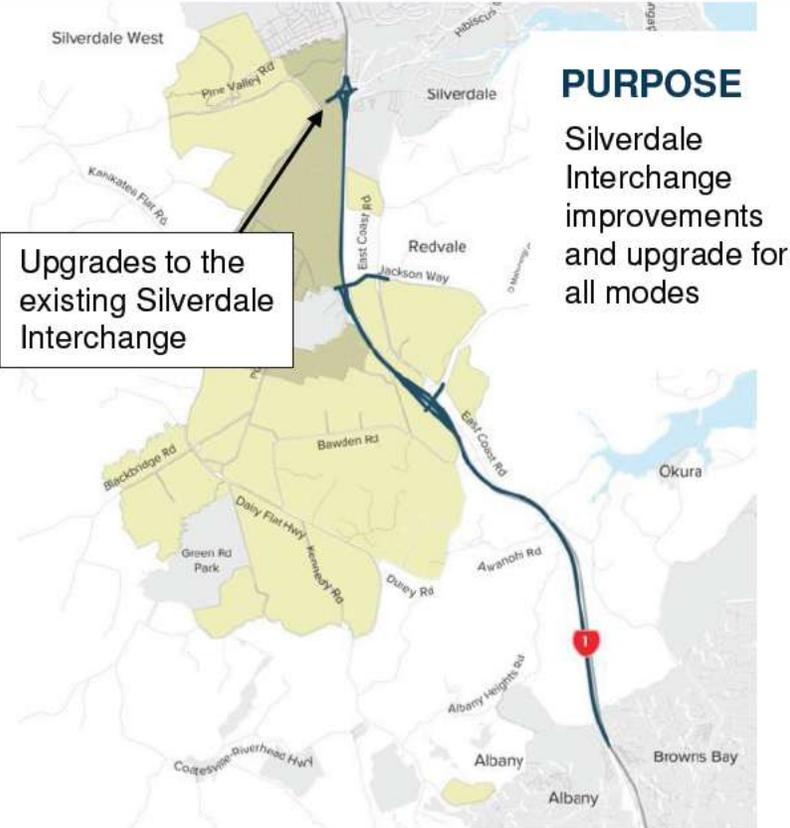
- Interdependency with the Redvale interchange and service road arrangement providing access to the Motorway service centre
- Interdependency with the New Connection between Dairy Flat Highway and Wilks Road

Investment Objectives		Alignment
Access	Improve productivity of the SH1 corridor between Albany and Silverdale.	Provides accessibility for the Silverdale West industrial structure plan area to the strategic road network. Contributes to an increase in the proportion of employment accessible by private vehicles increases in each of the time intervals assessed. Within 15 mins there is a 27% increase and within 30 mins there is a 2% increase.
Resilience	Improve reliability and resilience of the SH1 corridor between Albany and Silverdale for general vehicles and freight.	Provides connectivity to the SH1 corridor for business within Silverdale west.
Travel Choice	Support the transition to a reduced reliance on SOV travel by providing a high quality, low carbon transport network	Interchange provides for all transport modes including separated active mode facilities.
Integration	Integration: Integration with both the transport network and the timing and pace of development in the area.	Provision of high quality strategic access supports development of industrial land. Project enables heavy vehicles from the industrial area to gain access to SH1 without needing to travel through the neighbouring residential areas.
Contribution to climate change response		
Climate Change	Elimination of this project would have adverse effects involving increase VKT and time in congestion. The Option assessment considered multiple locations. The recommended option performed best from an embodied carbon and equally well from an enabled carbon perspective.	

Improvements to the existing Silverdale interchange

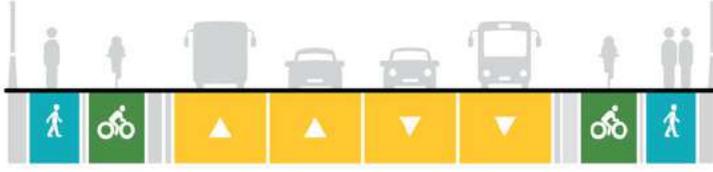
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Improvements to the existing Silverdale interchange



CORRIDOR FORM AND FUNCTION

- Two general traffic lanes each direction
- Separated active mode facilities
- 50 kph in future



GAP ANALYSIS

- No gaps identified. Optioneering considered adequate to progress to route refinement

CONSTRAINTS



Legend

- Culvert
- Open watercourse
- Flood Plains
- Indigenous Vegetation (Non-SEA)
- Potential Natural Wetlands
- QEII Covenant
- Significant Ecological Areas Overlay
- Existing Designations
- Business- General Business Zone
- Future Urban Zone
- Residential - Mixed Housing Urban Zone
- Open Space - Informal Recreation Zone
- Open Space - Sport and Active Recreation Zone

OPTION ASSESSMENT: PROCESS

1. Constraints mapping undertaken
2. Interchange form and function undertaken
3. Consideration of active mode treatment
4. Constraints led design undertaken for the project

Improvements to the existing Silverdale interchange - EMERGING PREFERRED OPTION DEVELOPMENT

ACTIVE MODE TREATMENT

Option	Commentary	Preferred Option
Upgrade to Silverdale Interchange – active mode bridge options		
North side of main interchange	-This option doesn't provide an efficient and safe connection for active mode users using the cycle facilities that are anticipated to exist on both the northern and southern sides of Dairy Flat Highway and Hibiscus Coast Highway.	<input type="checkbox"/>
South side of main interchange	-This option doesn't provide an efficient and safe connection for active mode users using the cycle facilities that are anticipated to exist on both the northern and southern sides of Dairy Flat Highway and Hibiscus Coast Highway.	<input type="checkbox"/>
Both sides side of main interchange	-There are currently limited east-west connections between Dairy Flat Highway and Silverdale. -There are expected to be future active mode facilities on both the northern and southern sides of Dairy Flat Highway and Hibiscus Coast Highway -The New Walking and Cycling Path along SH1 to crosses the SH1 corridor (West to East) in this location. This requires a crossing to the north of the interchange. -The Hibiscus Coast Bus Station (Park and Ride) is expected to remain in place within Silverdale for the foreseeable future – at least until the main RTC is operational. This creates demand for a crossing facility on the south of the interchange.	<input checked="" type="checkbox"/>

INTERCHANGE FORM ASSESSMENT

Option	Commentary	Preferred Option
Silverdale Interchange		
Roundabouts	-Equally preferred from an operational perspective as gyratory – preferred over traffic signals. -Selection of roundabouts or a gyratory with grade separated active modes would provide flexibility in the footprint to accommodate future signalisation, if necessary. -Potential for vehicles to use roundabouts for u-turning which is an adverse outcome according to SME feedback.	<input type="checkbox"/>
Gyratory	-Equally preferred from an operational perspective as roundabouts – preferred over traffic signals. -Selection of roundabouts or a gyratory with grade separated active modes would provide flexibility in the footprint to accommodate future signalisation, if necessary. -A 'gyratory' configuration was preferred by SME's, as this removed the potential for re-circulating (u-turning) vehicles that can be associated with roundabouts.	<input checked="" type="checkbox"/>
Traffic signals	-Less preferred than roundabouts and gyratory configurations from an operational perspective. -Less opportunity to accommodate roundabout or gyratory configurations within a traffic signal designated footprint.	<input type="checkbox"/>

DESIGN REFINEMENTS

During the option development phase, the following design refinements were made:

- Geometric refinements to active mode connections to Dairy Flat Highway and Hibiscus Coast Highway from each active mode bridge.
- Refinements to minimise property effects outside the existing road reserve.
- Consideration of the Small Road access on south-east side of interchange.

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Consideration of interim staging options for Public transport to reduce bus travel time through the interchange	M
Consideration of upgrade staging	M

Improvements to the existing Silverdale interchange – RECOMMENDED OPTION

RECOMMENDED OPTION



Risks and Opportunities

- Opportunity for a staged implementation to respond to a staged development of the FUZ land to the west.
- Opportunities for value engineering / consolidation of walking and cycling components.

Interdependencies

- Interdependency with Dairy Flat Highway upgrade.
- Forms the east – west crossing for the SH1 walking and cycling path so needs to be in place for this project.

PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Improve the access of people to economic and social opportunities for movements through the Silverdale interchange	Provision of active mode facilities across the interchange linking people and jobs via safe and separated facilities. Improved accessibility between the existing urban area and the FUZ area on the west.
Resilience	Improve the reliability of people movement through the interchange	Reduced congestion will improve reliability of the interchange and east-west connection between urban areas.
Travel Choice	Support transformational mode share and a low carbon transport network in the North including the provision of high-quality active mode facilities through the interchange	Provision of active modes through the interchange will encourage active mode trips and contribute to the overall mode share of 20% for active modes.
Safety	Contribute to the operation of an interchange that is free of deaths and serious injuries.	Recommended intersection form for a 'Safe System' which minimises the risk of deaths and serious injuries at the intersection.

Contribution to climate change response

Climate Change	Removal of this project from the network would severely compromise several key outcomes for the network by increasing congestion and journey time, causing east-west severance, and negative effects on the HBC bus station. Option development has looked to make best use of existing infrastructure.
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Upgrade to Pine Valley Road

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Upgrade to Pine Valley Road

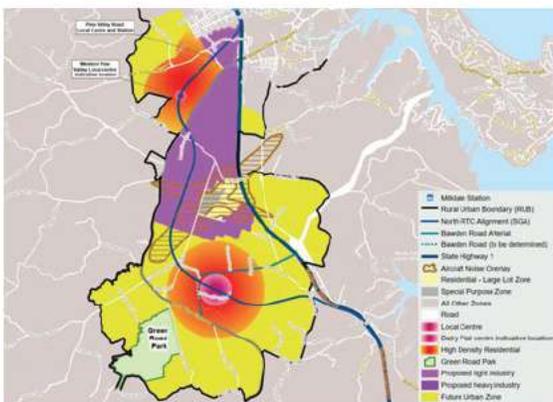


PURPOSE

Improve the existing east-west connection for all modes between Kahikatea Flat Road and the new Argent Lane Connection that runs through Milldale.

LAND USE

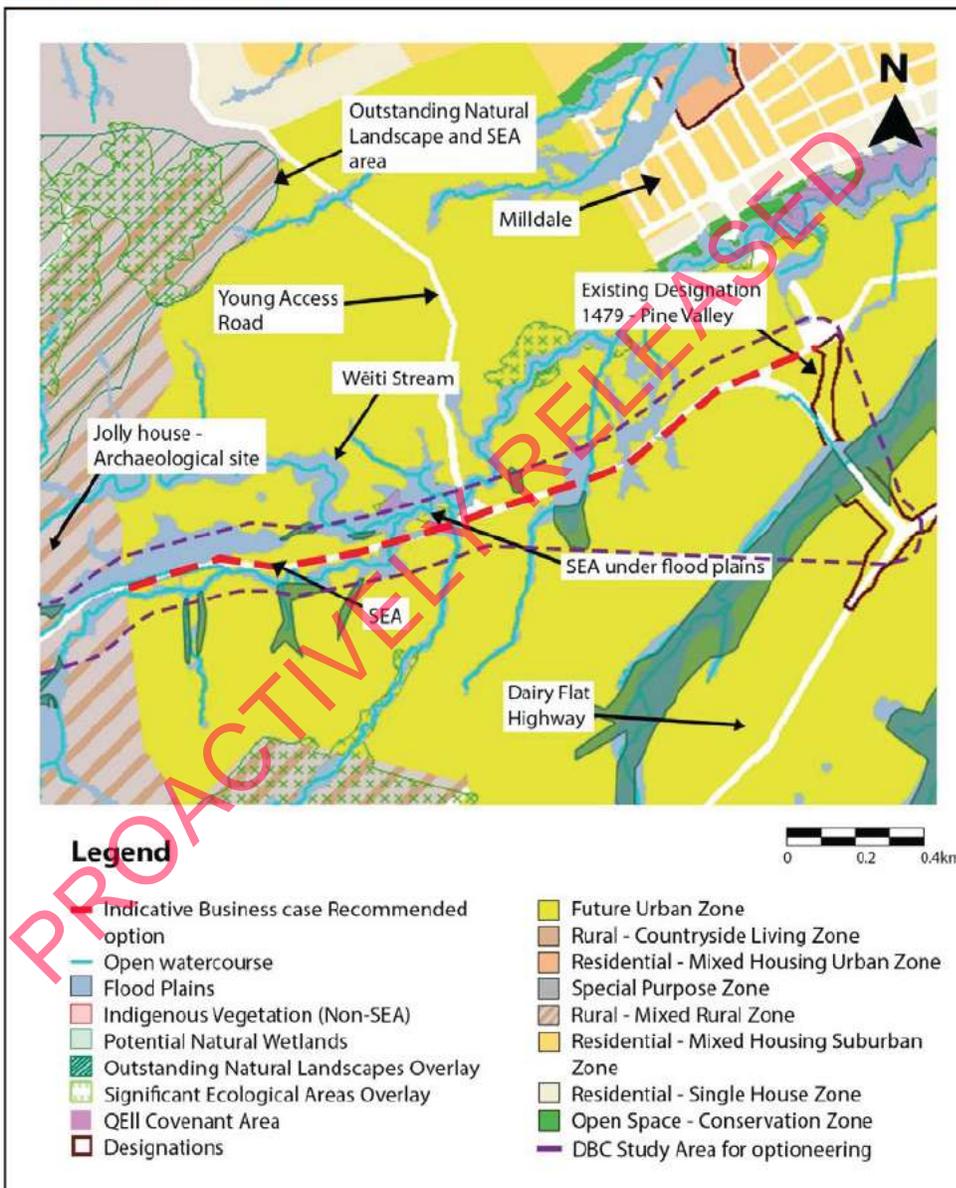
- Land use in the catchment is mostly Future Urban Zone.
- Spatial land use strategy identifies a potential local centre south of Pine Valley Road



GAP ANALYSIS

- The gap analysis identified the need to test an option at the eastern end of the corridor.
- A need to consider options/designs that avoid (where practicable) and otherwise minimise impacts on SEA around Wēiti Stream.

CONSTRAINTS



CORRIDOR FORM AND FUNCTION

- Single traffic lane in either direction for general vehicles and public transport
- Dedicated walking and cycling facilities will be provided along the corridor.
- Posted speed limit will be 50 km/hr.



Indicative 24m cross section

OPTION ASSESSMENT: PROCESS

1. Constraints mapping undertaken
2. Optioneering scope narrowed to the existing road corridor following review of constraints and existing designation for New Pine Valley Road
3. Single option developed using a targeted MCA and constraints-led design approach

Upgrade to Pine Valley Road – ROUTE REFINEMENT AND ASSESSMENT

EMERGING PREFERRED OPTION – Hybrid option

- **S1 - Road Widening to the north** - to avoid the stream / floodplain and wetlands running parallel to south side of road and to minimise number of properties impacted.
- **S2 - Road Widening more to the South** - to avoid SEA and Esplanade Reserve along Wēiti
- **S3 - Road Widening on both sides** – no significant constraints but consider avoiding wetlands and streams nearby where possible. Consider opportunity to use recently constructed roundabouts on eastern side of the alignment.



MCA criteria (targeted to those criteria that may differentiate)	Widen both sides (existing centreline – 24m cross-section)	Widen to the North (hold southern boundary and widen to North – 24m cross-section)	Widen to the South (hold northern boundary and widen to South – 24m cross-section)	Hybrid option
1a Heritage	No known issues.	No known issues.	No known issues.	No Known issues
2a. Land use futures	FUZ both sides Will need to tie into existing designation 1479 at eastern end where roundabouts have recently been constructed. Potential for a section of road (outside of scope) at the eastern end to be closed off in the future.	As for Widen both sides	As for Widen both sides	As for Widen both sides
2b. Urban design	No key issues.	No key issues.	No key issues.	No key issues
2d Social cohesion;	Similar number of properties affected either side of road.	Similar number of properties affected either side of road.	Similar number of properties affected either side of road.	Similar number of properties affected either side of road
2c. Land requirement		Wēiti Stream (Esplanade Reserve), would require Minister's consent to acquire.		
3b. Stormwater/flooding	Floodplains on both sides of road of a similar size.	Floodplains on both sides of road of a similar size.	Floodplains on both sides of road of a similar size.	Floodplains on both sides of road of a similar size.
3c. Ecology	Some areas of potential wetland. Similar on both sides of the road. SEA directly adjoins northern side of road around Wēiti Stream –avoid if practicable. Wēiti tributary parallel to southern side of road at the western end. Non-SEA indigenous forest is on south where Wēiti tributary crosses under the road.	Some areas of potential wetland. Similar on both sides of the road. SEA directly adjoins northern side of road around Wēiti Stream –avoid if practicable. Wēiti Stream (Esplanade Reserve), would require Minister's consent to acquire	Some areas of potential wetland. Similar on both sides of the road. Non-SEA indigenous forest is on south where Wēiti tributary crosses under the road.	Some areas of potential wetland. Similar on both sides of the road.
3d Natural hazards	Western section of the route has steep topography on the southern side and the central section, steep topography on the north. This corresponds to the stream alignment which is parallel along the route. Widening both sides will reduce the extents of the batters.	Western section of the route has steep topography on the southern side and the central section, steep topography on the north. This corresponds to the stream alignment which is parallel along the route. Impact of widening on one side may result in larger batters.	As for Widen to North	Western section of the route has steep topography on the southern side and the central section, steep topography on the north. This corresponds to the stream alignment which is parallel along the route. Widening both sides will reduce the extents of the batters.
5a Construction impacts on utilities/infrastructure				
6a Construction cost/risk				

- High/significant constraints or potential effects (avoid where practicable)
- Moderate constraints or potential effects present (consider avoiding on balance with other issues)
- No key constraints present or potentially low adverse/positive effects

Upgrade to Pine Valley Road – EMERGING PREFERRED OPTION DEVELOPMENT

HOW SOLUTION MEETS FUTURE MODAL PRIORITY

- Provision for separated cycle facilities and footpaths along the length of the corridor to connect key destinations.
- Retention of existing level of traffic capacity i.e. one lane in each direction.
- Carefully manage existing vehicle access points to remove conflicts with walking & cycling movements. Additionally, safe crossing facilities are required.



Future Modal Priority

INTERSECTION FORM ASSESSMENT

Intersection	Existing (if relevant)	Future – SGA Recommendation
1 – Pine Valley Road (SGA 24m 2-lane arterial) / Old Pine Valley Road (Local Road)	Priority	Single – Lane Roundabout
2 – Pine Valley Road (SGA 24m 2-lane arterial) / Young Access (Local Road)	Priority	Priority Controlled (<i>SME feedback to convert intersection to Single-Lane Roundabout</i>)

DESIGN REFINEMENTS

During the design refinement stage, the following key refinements were made to Option 1:

- Within the eastern portion (S3) the design refinement looked to minimise effects on a water feature on the southern side of Pine Valley Road through shifting the alignment to the north.
- Within the central portion (S2) the design refinement looked to minimise effects to the stream on the northern side of Pine Valley Road through shifting the alignment to the south where necessary to avoid the need for stream diversions.
- The Young Access Road roundabout was shifted to the south to minimise impacts on the SEA.

CONSULTATION FEEDBACK

An emerging preferred option was consulted on with the Public in July to August 2022. There was limited community feedback on this project which included the following:

- General strong support for planning of future road upgrades
- Highlighting the importance of Pine Valley Road as a connection to the surrounding rural hinterland and advocated for upgrade of the full length of the road.
- As the proposed upgrade does not add traffic capacity, the form and function of Pine Valley to the west of the study area is considered appropriate for future use.

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Provision of an appropriate transition between the urban and rural environment at the western extent of the project.	M
Integration of earthworks with surrounding development	L

Upgrade to Pine Valley Road – RECOMMENDED OPTION

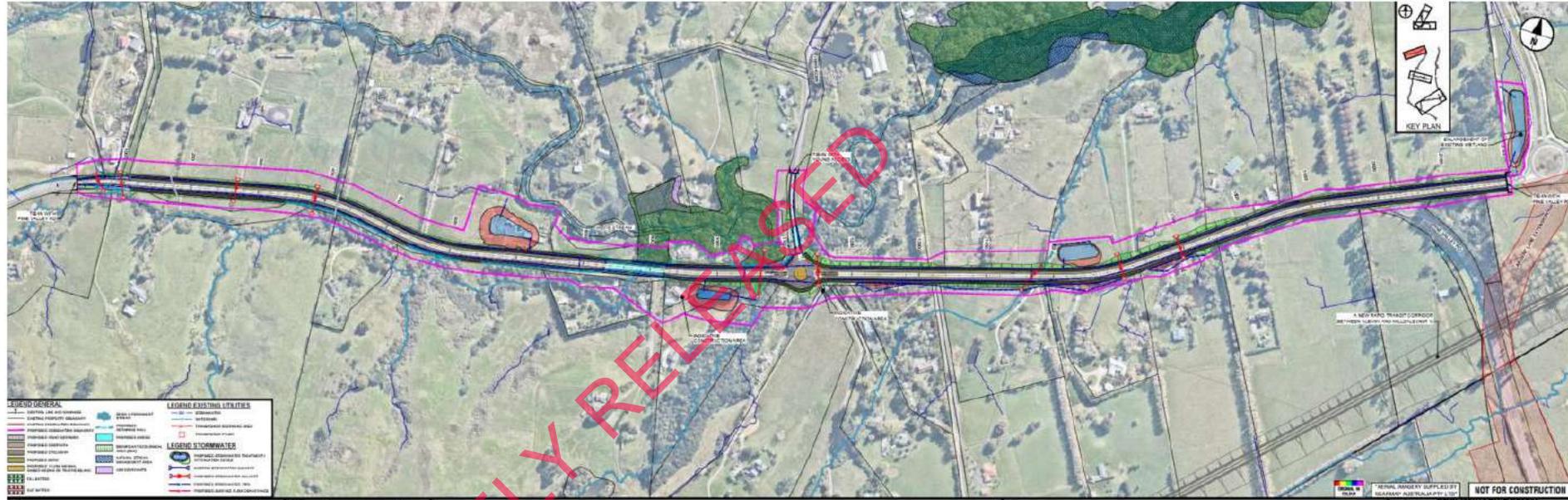
RECOMMENDED OPTION FOR Pine Valley Road

Risks and Opportunities

- Opportunities for developers to contribute to implementation.
- Opportunity for connection to a Rapid Transit station for local bus services via Pine Valley Road.

Interdependencies

- Interdependency with the upgrade of Old Pine Valley Road / Argent Lane intersection.



PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Improve access to economic and social opportunities by providing an integrated multi-modal corridor along Pine Valley Road	Existing rural corridor is upgraded to a multimodal urban arterial. The new walking and cycling paths will improve access for the future residential zoning and potential local centre to Argent lane and Dairy Flat Highway helping to reduce the need for private vehicle trips for short distances. Contribution to 48% increase in jobs accessible via active modes within 10 min for the Wainui area.
Travel Choice	Support transformational mode share in the North by providing a high quality, low carbon transport network	Provision of a contiguous active mode facility to connect into the walking and cycling networks for the rest of the FUZ area. Contribution to 71% of FUZ area within 400m of dedicated separated active mode facilities.
Integration	Provide corridor protection to support planned growth and flexibly enable future land use and transport integration	Intersection upgrades to support active mode permeability across the corridor. Integrates with proposed centres in Silverdale West and a future RTC station in the area.
Contribution to climate change response		
Climate Change	As the Pine Valley Road corridor is an existing road, eliminating this project would reduce road safety, create an incomplete network of active modes in the northern growth area and reduce active mode travel for short trips resulting in a higher reliance on private vehicle use (enabled emissions). The recommended route seeks to avoid key constraints and as such represents the option with the lowest climate change resilience risk and lowest embodied carbon. All options delivered similar outcomes from an enabled carbon perspective.	

New connection between Milldale and Grand Drive

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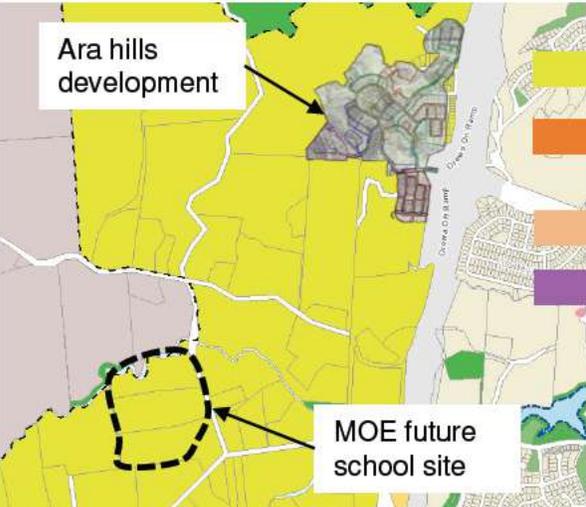
New connection between Milldale and Grand Drive (Upper Orewa Road Extension)



PURPOSE

- The corridor provides a north-south connection for all modes between Wainui Road and the Grand Drive Interchange.

LAND USE



- Land use in the catchment is mostly Future Urban Zone.
- Ara Hills development has some consented development at the northern end. Mix of either residential (urban) or neighbourhood centre.
- Ministry of Education have purchased land to west for a school (ECE, Primary and secondary)

GAP ANALYSIS

- The gap analysis concluded that the IBC was sufficient in considering options
- Highlighted the need to consider the new NPSs for Freshwater and UD and consider private developments in the area

CONSTRAINTS



Legend

- Indicative Business case Recommended option
- Open watercourse
- Flood Plains
- Indigenous Vegetation (Non-SEA)
- Potential Natural Wetlands
- Rural Urban Boundary
- Significant Ecological Areas Overlay
- Flood Prone Areas
- Outstanding Natural Landscapes Overlay
- Designations
- Future Urban Zone
- Residential - Large Lot Zone
- Rural - Countryside Living Zone
- Residential - Mixed Housing Urban Zone
- Rural - Mixed Rural Zone
- Rural - Rural Production Zone
- Open Space - Sport and Active Recreation Zone
- Open Space - Conservation Zone
- Open Space - Informal Recreation Zone

CORRIDOR FORM AND FUNCTION

- At northern end (through Ara Hills), 30m four lane arterial with separated active modes and bus lanes.
- South of Ara hills, the corridor is to provide one lane in each direction.
- Dedicated walking and cycling facilities will be provided along the corridor.
- Posted speed limit will be 50 km/hr.



Indicative 24m cross section

OPTION ASSESSMENT: PROCESS

- Constraints mapping
- Route option development – development of route options for MCA analysis
- Route option assessment – MCA of the route options
- Targeted MCA and Constraints led assessment of the common Upper Orewa Road upgrade segment of the project

New connection between Milldale and Grand Drive (Upper Orewa Road Extension) – MCA option assessment

OPTIONS CONSIDERED



Non-scored criteria assessment:

- Value for money - Option A preferred, as Option B has significantly more earthworks than Option 1 (in the order of \$15m more expensive)
- Manawhenua preference – Option B supported by those Manawhenua who have identified a preference

EMERGING PREFERRED – OPTION B

- Performs best from an effects perspective.
- Is more expensive however provides greater opportunity for integration with development of the FUZ land.
- Option B aligns with Manawhenua preferences.
- Opportunity for protection of this corridor through alternative means to a NOR.

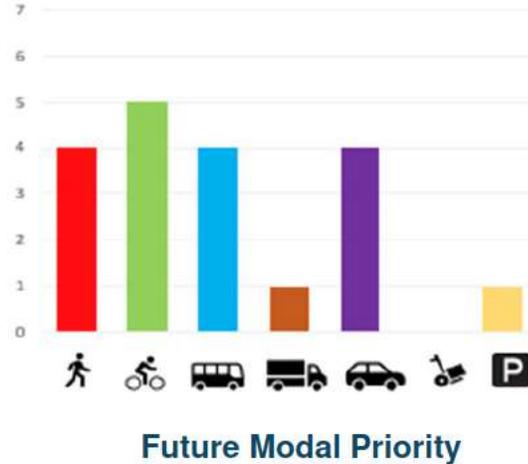
MCA ASSESSMENT

MCA Criteria	Option A	Option B
Investment Objective 1 - Access: Access to economic and social opportunities in Wainui East will be limited if this connection is not provided	2	2
Investment Objective 2 - Resilience: Enable reliable and resilient people movement	2	2
Investment Objective 3 - Travel Choice: Support transformational mode share in the North by providing a high quality, safe and attractive movement of people	3	3
2a. Land use futures	0	1
2b. Urban design	-2	-1
2c. Land requirement	-1	-1
2d. Social cohesion	-2	-2
2e. Human health and wellbeing	-2	-2
3a. Landscape / visual	-3	-3
3b. Stormwater/flooding	-2	-1
3c. Ecology	-4	-3
3d. Natural hazards	-3	-2
5a. Construction impacts on utilities / infrastructure	-1	-1
5b. Construction disruption	-3	-3
6a. Construction costs / risk / value capture	-2	-2

New connection between Milldale and Grand Drive (Upper Orewa Road Extension) – Emerging preferred option development

HOW SOLUTION MEETS FUTURE MODAL PRIORITY

- Provision for separated cycle facilities and footpaths along the length of the corridor to connect active modes to key destinations.
- Provision for a single traffic lane for private vehicles and public transport services.
- Carefully manage existing vehicle access points to remove conflicts with walking & cycling movements. Additionally, safe crossing facilities are required.



DESIGN REFINEMENTS

- Refinements to alignment in northern section due to sight distance requirements at the Ara Hills tie in point and to tie-in with land set aside by Ara Hills developer.
- Structure allowed for to span the Orewa River.
- Steepen grades of road of northern portion (8%) to minimise the earthworks

CONSULTATION FEEDBACK

An emerging preferred option was consulted on with the Public in July to August 2022. There was limited community feedback on this project which included the following:

- General strong support for planning of future road upgrades

INTERSECTION FORM ASSESSMENT

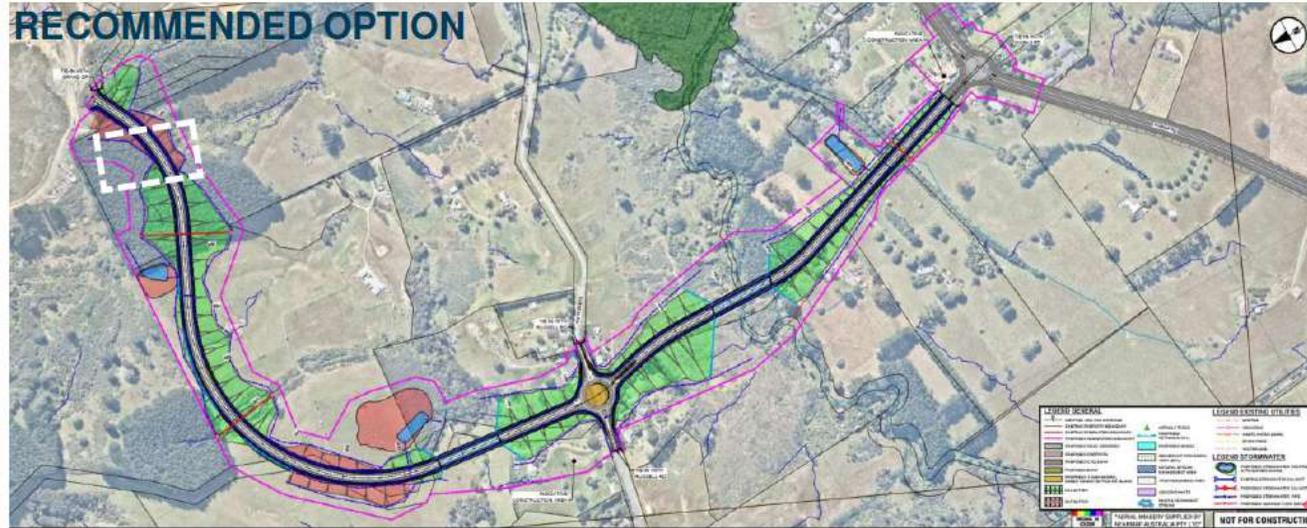
Intersection	Existing (if relevant)	Future – SGA Recommendation
1 – Upper Orewa Road and Wainui Road	Priority	Roundabout
2 – Upper Orewa Road and Russel Road	Priority	Roundabout

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Integration of the horizontal and vertical alignment with the development on either side of the road to reduce earthworks	M
Consideration of interface with the future School site	M

New connection between Milldale and Grand Drive (Upper Orewa Road Extension) – Recommended option

RECOMMENDED OPTION



Risks and Opportunities

- Opportunity to integrate with a future school with high quality active mode and PT facilities
- Opportunity to reduce impacts through design changes
- Regional consenting risk due to high earthworks and interaction with Orewa River tributaries.

Interdependencies

- Interdependency with the Ara Hills Development Road 1

PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Enable access to economic and social opportunities by providing a new integrated multi-modal corridor	New road corridor providing connectivity for all modes between the Future Urban development area and SH1 Grand Drive interchange in the north and Wainui Road in the South. This route provides connectivity for residential development, a neighbourhood centre and a future school site. Contribution to 48% increase in jobs accessible via active modes within 10 min for the Wainui area.
Travel Choice	Support transformational mode share in the North by providing a high quality, low carbon transport network	Provision of a contiguous active mode facility to connect between the existing communities in Orewa, the new growth area and a future school site. Connects to wider roading network to extend the future bus service offerings and further support mode shift. Contribution to 71% of FUZ area within 400m of dedicated separated active mode facilities.
Resilience	Enable reliable and resilient people movement	Location of the corridor provides effective access to Future Urban Zone to the West of Ara Hills. Corridor provides a N-S connection for local trips reducing the reliance on the SH1 corridor.
Contribution to climate change response		
Climate Change	Currently no active mode or public transport connection is provided between Grand Drive and Wainui Road. Without this connection there will be reduced accessibility to the proposed Hall Farm development and Wainui East for both feeder buses and active modes. The recommended option requires additional embodied carbon for construction however provides better infrastructure resilience and is considered to better provide for access to surrounding road which could reduce the need for local roads when developed.	

Upgrade to Dairy Flat Highway between Silverdale interchange and Dairy Flat

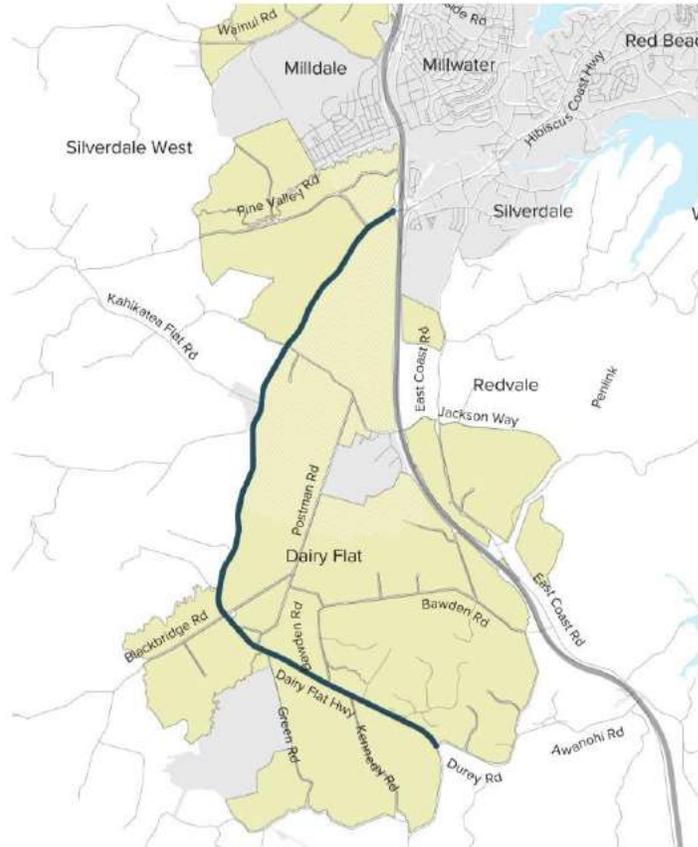
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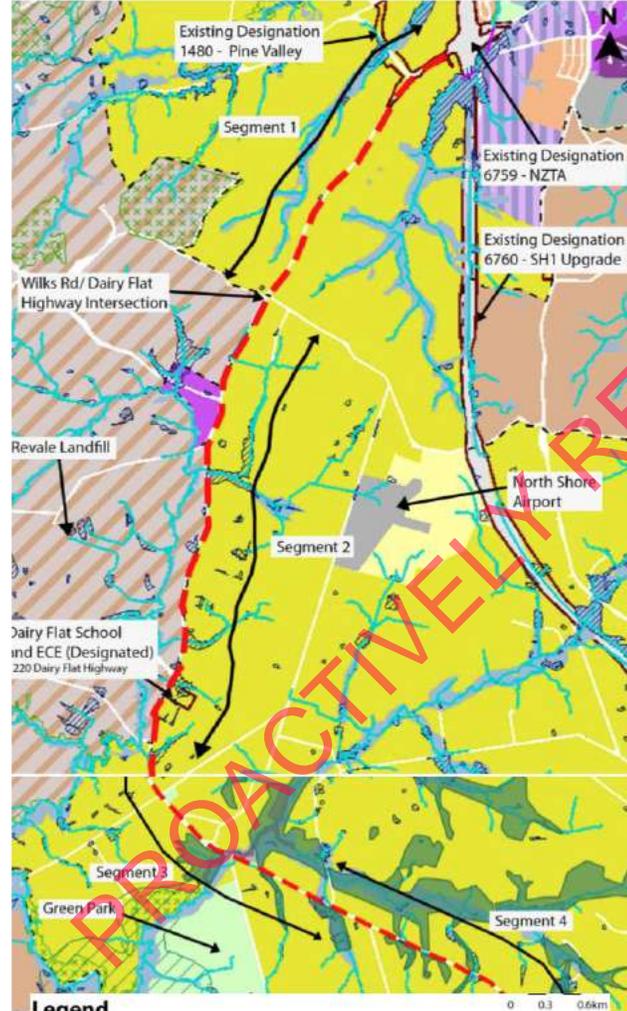
Upgrade to Dairy Flat Highway between Silverdale interchange and Dairy Flat

PURPOSE

Dairy Flat Highway forms an important north-south connection on the North network providing connection to the existing urban areas, Silverdale West industrial area, Dairy Flat Future Urban area. The corridor forms a strategically important connection to Albany and forms an alternative North south link to the SH1 corridor.



CONSTRAINTS



Legend

- | | |
|---|--|
| Indicative Business case Recommended option | Future Urban Zone |
| Open watercourse | Residential - Terrace Housing and Apartment Buildings Zone |
| Flood Plains | Residential - Mixed Housing Suburban Zone |
| Indigenous Vegetation (Non-SEA) | Residential - Mixed Housing Urban Zone |
| Potential Natural Wetlands | Rural - Mixed Rural Zone |
| Rural Urban Boundary | Rural - Rural Production Zone |
| Significant Ecological Areas Overlay | Open Space - Informal Recreation Zone |
| Flood Prone Areas | Open Space - Sport and Active Recreation Zone |
| Outstanding Natural Landscapes Overlay | |

GAP ANALYSIS

- The gap analysis concluded that the IBC was sufficient in considering options proportionate to the scale of impacts and is not subject to any new information which requires a 'corridor' level of assessment to be undertaken
- Further consider NPSs and ways to minimise/avoid effects on sensitive receiving environments (heritage features, streams, natural wetlands and an Outstanding Natural Landscape near Green Road Park).

CORRIDOR FORM AND FUNCTION

- A mixture between the 30m 4 lane arterial cross section and a 29m two lane rural edge treatment.
- Posted speed limit will be 50 km/hr. within urban areas and 60km/h in rural edge sections.



OPTION ASSESSMENT: PROCESS

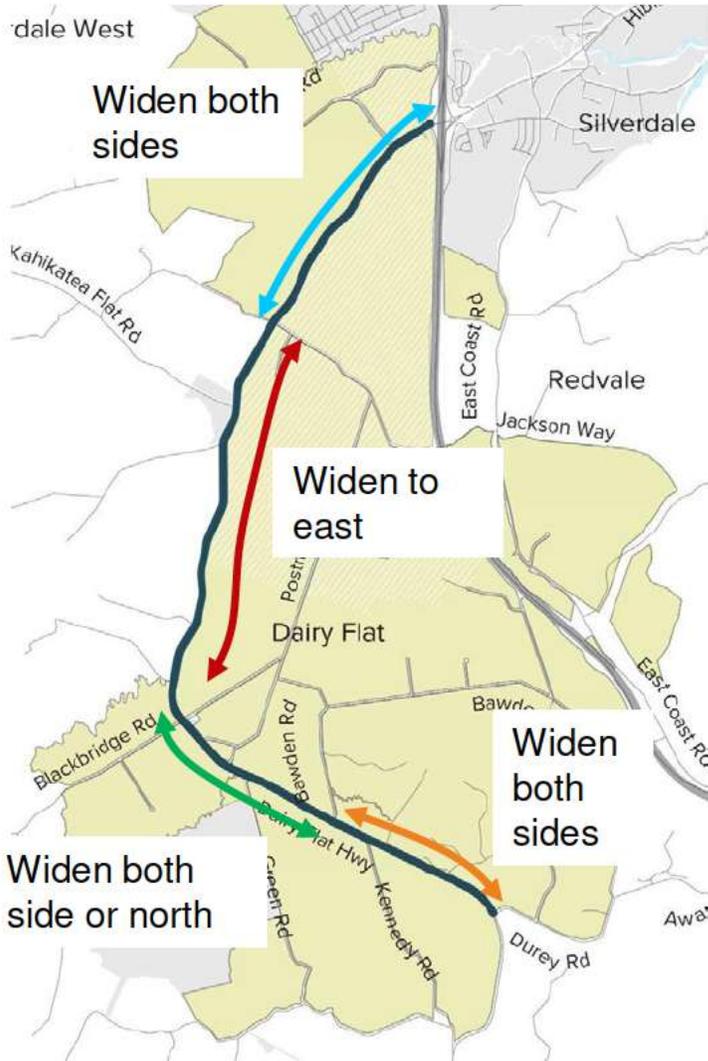
The following steps were undertaken:

- Targeted MCA and Constraints led assessment by sections of the corridor
- Development of a single option

Upgrade to Dairy Flat Highway between Silverdale interchange and Dairy Flat

OPTIONS CONSIDERED

- Corridor considered in 4 segments
- Within each segment, consideration was given to widening the corridor to the West, East and on both sides



Segment	Recommendation	Key reasons
Segment 1 – Silverdale to Wilks	Widen both sides (widen where practical around archaeological sites)	Lowest impact on surrounding land/constraints
Segment 2 – Wilks to Richards Road	Widen to East (widen to west where possible around Dairy Flat School)	Hold the rural edge and minimise impacts on industrial/rural property
Segment 3 – Richard Road to Bawden Road	Hybrid- Combination of widening both side and widening to the north	Lowest impact on surrounding land while minimising effects on potential wetlands and floodplains and the Outstanding natural heritage area
Segment 4 – Bawden Road to Durey Road	Widen both sides	Lowest impact on surrounding land/constraints

Upgrade to Dairy Flat Highway between Silverdale interchange and Dairy Flat

HOW SOLUTION MEETS FUTURE MODAL PRIORITY

- Provision for separated cycle facilities and footpaths along the length of the corridor to connect active modes to key destinations.
- Section 1 and 2 will serve the future industrial area; hence have a freight priority
- Increased pedestrian, cycling and bus priority on Sections 3 and 4 due to land use

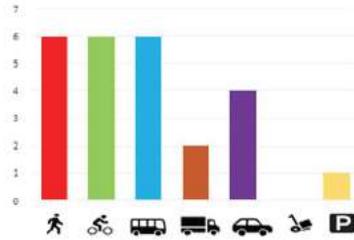
Future Modal Priority – Silverdale to Wilks Road



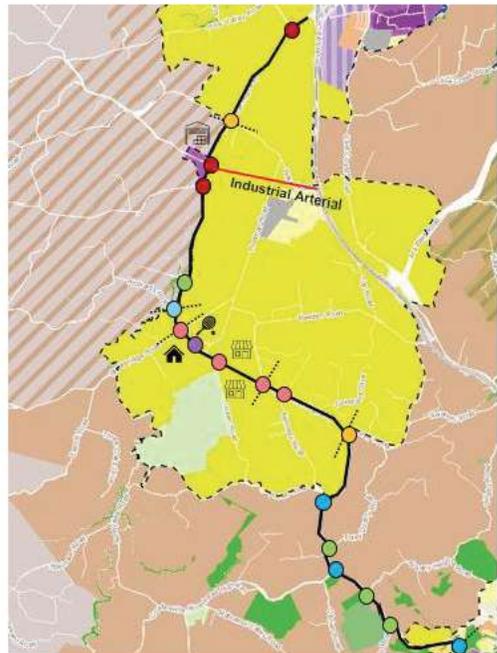
Future Modal Priority – Wilks Road to Richards Road



Future Modal Priority – Richards Road to Durey Road



INTERSECTION FORM ASSESSMENT



- Dual Lane Roundabout
- Single Lane Roundabout
- Signalised Intersection
- Priority Controlled Intersection
- Left-in / Left-out
- Dual-lane Roundabout (Signalised intersection will be tested within the footprint)

DESIGN REFINEMENTS

During the design refinement stage, the following key changes were made to the alignment:

- Widening around the Dairy Flat School was shifted to west to minimise impacts on the school carpark.
- Consideration was given to the location of the Dairy Flat Highway / Postman Road intersection due to impacts on the Tennis Club. Due to constraints in this location, the existing intersection location was maintained.
- Adjustments to the horizontal and vertical alignment and proposed physical works (bridges and retaining walls) were undertaken to minimise effects on floodplains and streams in the vicinity of the Bawden Road and Green Road intersections.
- Adjustments to Physical works to minimise impacts on the Outstanding Natural Landscape area south of Dairy Flat Highway.
- Wilks Road / DFH intersection is pushed further to South west to minimise impacts on heritage site (Wade Junction Hotel archaeological site).
- Some additional encroachment over the Rural Urban Boundary to reduce impacts on dwellings on the east where western property impacts were low.
- Active mode facilities through existing industrial centre area included on both sides of road.

CONSULTATION FEEDBACK

An emerging preferred option was consulted on with the Public in July to August 2022. There was limited community feedback on this project which included the following:

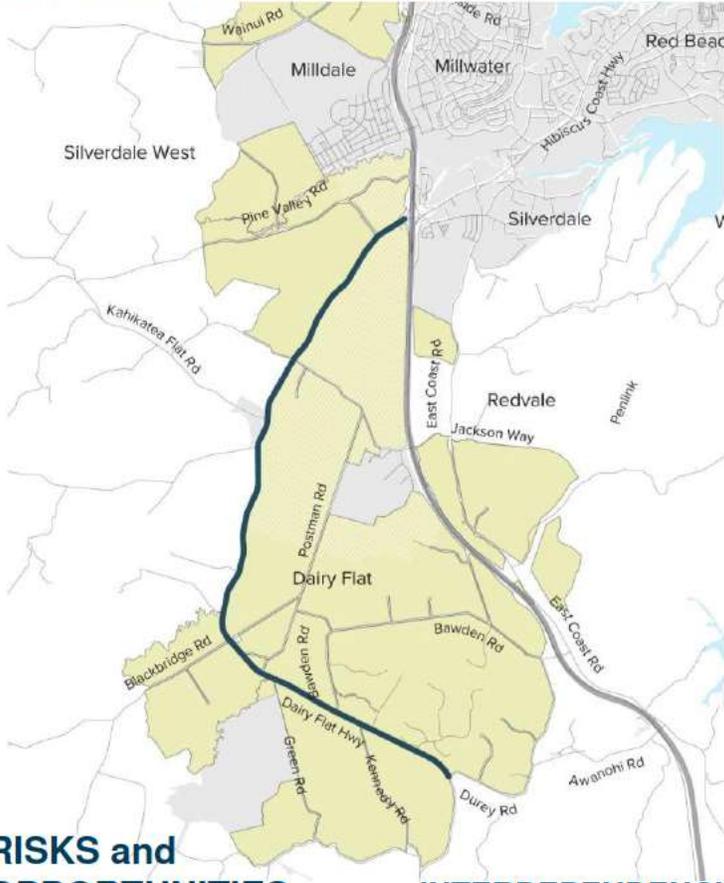
- General strong support for planning of future road upgrades
- Safety improvements and a speed reduction are needed
- The need for appropriate intersection treatments
- The proposed upgrade of this corridor will change the nature of the Dairy Flat Highway, by reducing speed and treating intersections in an appropriate manner.

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Consider opportunities to integrate road upgrade with neighbouring development on either side of the corridor	M
Consider localised narrowing of the corridor to reduce effects on sensitive areas.	M
Consider a staging approach to manage road space and influence travel behaviour as the area develops	L

Upgrade to Dairy Flat Highway between Silverdale interchange and Dairy Flat

RECOMMENDED OPTION



RISKS and OPPORTUNITIES

- Opportunity to reduce impacts through design changes
- Opportunity for developers to contribute to construction costs
- Archaeological impacts

INTERDEPENDENCIES

- Interdependency with upgrade to DFH in the rural section south of Durey Road
- Upgrade of DFH and New Pine Valley Road by AT

PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Improve access to economic and social opportunities by providing an integrated multi-modal corridor along Dairy Flat Highway	Contribution to an improvement in access to jobs via active modes and Public transport. In the Wainui area, an 48% increase in jobs accessible via active modes within 10 min for the Wainui area. A 48% increase in jobs accessible within 30min via Public Transport. In the Dairy Flat area, an 100% increase in jobs accessible via active modes within 10 min. More than a 100% increase in jobs accessible within 30min via Public Transport.
Resilience	Enable reliable people and freight movement	Provides a strategic facility providing access between Silverdale, future employment areas, residential land and future centres. Corridor has been raised in a number of locations to provide resilience to flooding (designed to meet Q100 levels).
Travel Choice	Support transformational mode share in the North by providing a high quality, low carbon transport network	Provision of a contiguous active mode facility to connect into the walking and cycling networks for the rest of the FUZ area. Bus Priority measures providing contribution to an overall mode share of 33% for public transport.
Integration	Provide corridor protection to support planned growth and flexibly enable future land use and transport integration	Provision of high-quality strategic access supports development of adjoining land. Contribution to 49% of FUZ area within 400m of dedicated separated active mode facilities.
Contribution to climate change response		
Climate Change	Dairy Flat Highway is an existing arterial road therefore elimination of this project is not viable. The recommended route seeks to avoid key constraints and as such balances the option with the lowest climate change resilience risk and lowest embodied carbon. All options delivered similar outcomes from an enabled carbon perspective.	

New connection between Dairy Flat Highway and Wilks Road

NOR 11

PROACTIVELY RELEASED

New Connection From Dairy Flat Highway to Wilks Road

PURPOSE

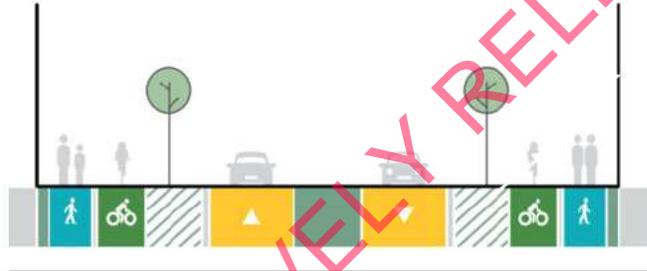
To provide an improved east-west connection through the centre of the Silverdale West – Dairy Flat Industrial Area to SH1



CORRIDOR FORM AND FUNCTION

Segment 1 – Kahikatea Flat Road to Postman Road

- Single traffic lane in either direction for general vehicles and public transport
- Dedicated walking and cycling facilities will be provided along the corridor.
- Posted speed limit will be 50 km/hr.



Segment 2 – Postman Road to SH1 interchange

- Single traffic lane in either direction for general vehicles and dedicated public transport lane
- Dedicated walking and cycling facilities will be provided along the corridor.
- Posted speed limit will be 50 km/hr.



GAP ASSESSMENT

The gap analysis found the following:

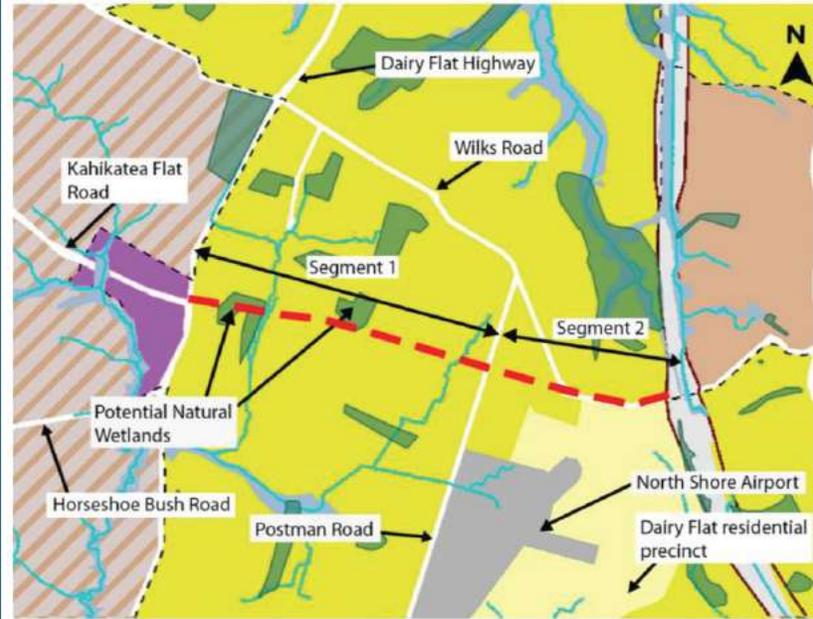
- The IBC recommended connecting these two defined points.
- There are few key constraints between these two connection points.
- An alignment between these two points would be consistent with the Silverdale West - Dairy Flat Industrial Structure Plan.
- Interdependencies with the Wilks Road interchange and upgrade of Dairy Flat Highway.

OPTION ASSESSMENT: PROCESS

The following steps were undertaken:

1. Constraints mapping exercise undertaken
2. Targeted MCA and Constraints led assessment by section of the corridor
3. Development of a single option

CONSTRAINTS



Legend

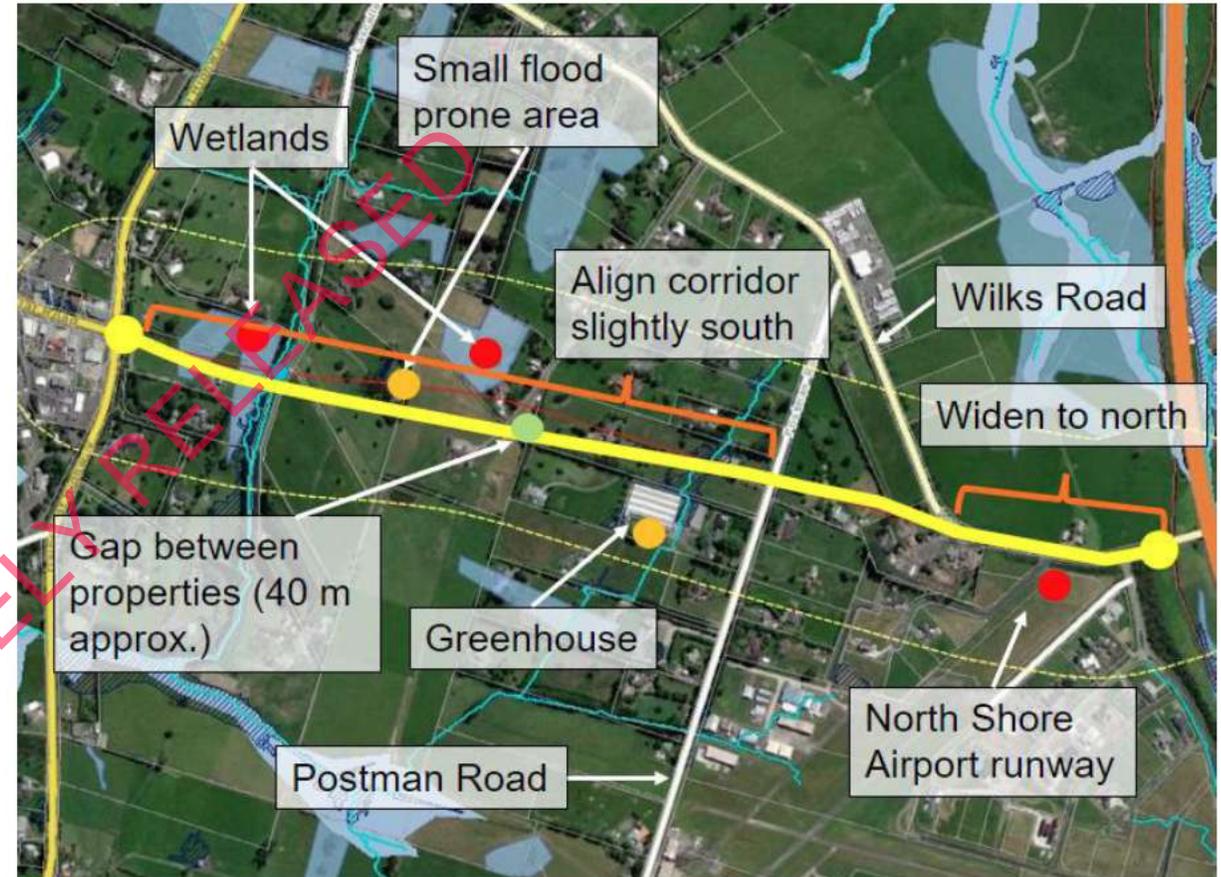
Indicative Business case Recommended option	Future Urban Zone
Open watercourse	Residential -Terrace Housing and Apartment Buildings Zone
Flood Plains	Residential - Mixed Housing Suburban Zone
Indigenous Vegetation (Non-SEA)	Residential - Large Lot Zone
Potential Natural Wetlands	Residential - Mixed Housing Urban Zone
Rural Urban Boundary	Rural - Mixed Rural Zone
Significant Ecological Areas Overlay	Rural - Rural Production Zone
Outstanding Natural Landscapes Overlay	Special Purpose Zone
	Business - Mixed Use Zone

0 0.2 0.4km

Recommended Option

Through consideration of the constraints and development of the option, the following recommendations were identified:

- Segment 1 –Align corridor slightly to South to avoid or minimise potential effects on key constraints where possible
- Segment 2 – Align corridor as shown between Postman Road and Wilks Road (as no key constraints) and widen to North along Wilks Road section to avoid impacts on the North Shore airport / runway and residential precinct.

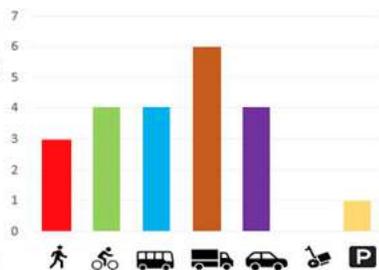


New Connection From Dairy Flat Highway to Wilks Road– PRELIMINARY ASSESSMENT

HOW SOLUTION MEETS FUTURE MODAL PRIORITY

- Provision for separated cycle facilities and footpaths along the length of the corridor to connect active modes to key destinations
- Eastern section has a reduced bus function as services use alternative routes
- Increased pedestrian priority on eastern section as this will be a key connection to SH1 facility and crossing to east.

Future Modal Priority – Western section



Future Modal Priority – Eastern section



INTERSECTION FORM ASSESSMENT

Intersection	Future – SGA Recommendation
1 – Industrial Arterial (SGA 30m 4-lane arterial) / Dairy Flat Highway (SGA 30m 4-lane arterial) / Kahikatea Flat Road (Existing Collector)	Signalised Intersection
2 – Industrial Arterial (SGA 30m 4-lane arterial) / Postman Road (Existing Collector)	Roundabout

DESIGN REFINEMENTS

During the design refinement stage, the following key refinements were made :

- Refinements to alignment at western end to minimise effects on potential natural wetlands
- Design refinements around the Kahikatea Flat Road / Dairy Flat Highway has considered existing business located on the west of the intersection and impacts on the businesses (e.g. removal of swales)

CONSULTATION FEEDBACK

An emerging preferred option was consulted on with the Public in July to August 2022. There was limited community feedback on this project which included the following:

- General strong support for planning of future road upgrades
- Consider upgrading Kahikatea Flat Rd into Dairy Flat and bring forward implementation of Wilks Rd interchange

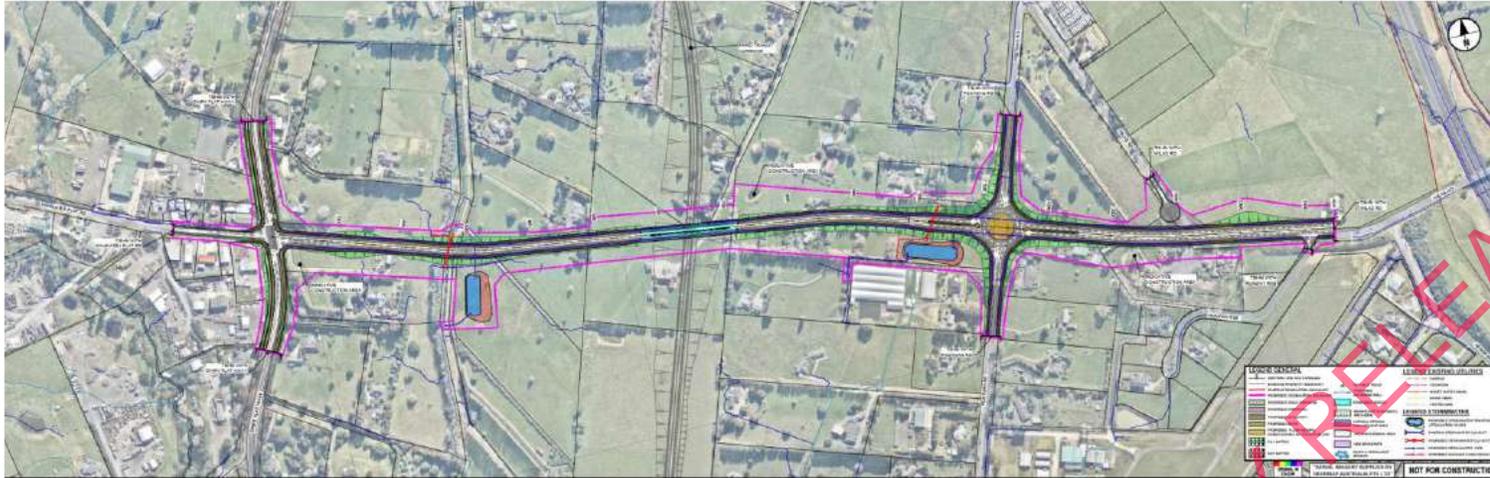
The recommended project includes upgrade of the Kahikatea Flat Road / Dairy Flat Highway intersection as a signalised intersection due to space requirements. Staging of the projects is discussed in more detail in the DBC but is uncertain at this stage.

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Consideration of a staging approach to manage provision of road space as the area develops	L
Provision of priority measures for freight	M
Consideration of integration of earthworks and stormwater facilities with development on either side of the corridor	M

New Connection From Dairy Flat Highway to Wilks Road

RECOMMENDED OPTION



RISKS and OPPORTUNITIES

- Risk of impacts on the North Shore Airport operation
- Opportunity for developer contribution to implementation of the road.

INTERDEPENDENCIES

- Wilks Road interchange project
- Dairy Flat Highway upgrade

PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Enable access to economic and social opportunities by providing a new integrated multi-modal corridor	Provides accessibility for the Silverdale West industrial structure plan area to the strategic road network. Contributes to an increase in the proportion of employment accessible by private vehicles increases in each of the time intervals assessed. Within 15 mins there is a 27% increase and within 30 mins there is a 2% increase.
Travel Choice	Support transformational mode share in the North by providing a high quality, low carbon transport network	Corridor provides for all transport modes including separated active mode facilities and bus priority over a portion of the corridor.
Resilience	Enable reliable and resilient people movement	Provides connectivity to the SH1 corridor for business within Silverdale west area.

Contribution to climate change response

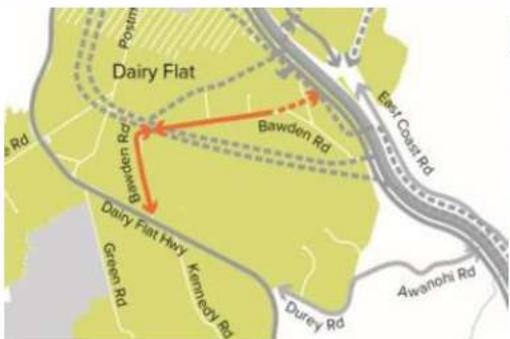
Climate Change	The link provides direct and important link for the Silverdale West industrial area. Provision of the corridor will enable more local jobs in the Silverdale area, reducing long distance travel and enabled carbon. The corridor has been right sized with a mixture of 2 and 4 lane cross section to manage provision of road space and limit attractiveness for general vehicles. The corridor has an opportunity to provide priority for PT and Freight which will further reduce enabled carbon.
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Upgrade and extension to Bawden Road

NOR 12

PROACTIVELY RELEASED

Upgrade and extension to Bawden Road



PURPOSE

Provide an east-west connection between the strategic transport network and the future Dairy Flat town centre, Dairy Flat residential and Rapid Transit station.

CONSTRAINTS



Legend

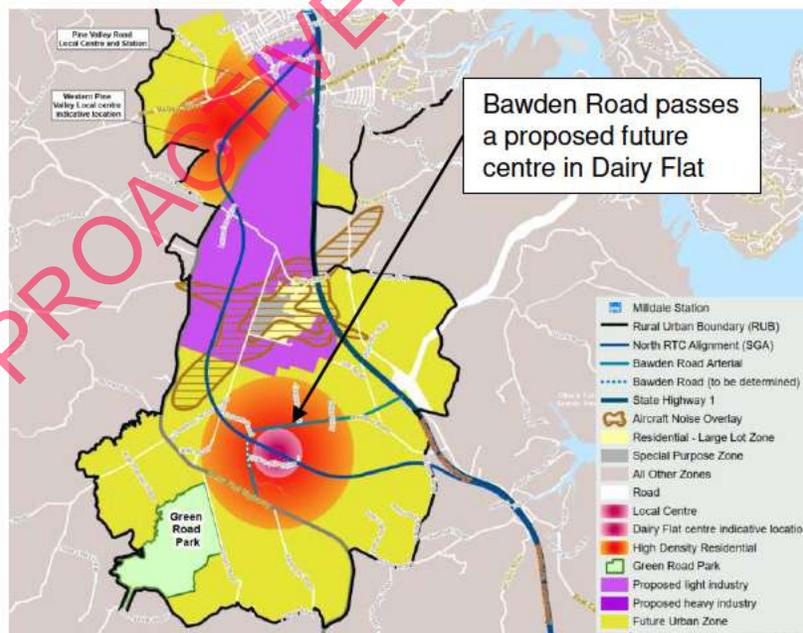
- | | |
|---|--|
| Indicative Business case Recommended option | Future Urban Zone |
| Open watercourse | Residential - Terrace Housing and Apartment Buildings Zone |
| Flood Plains | Residential - Mixed Housing Suburban Zone |
| Indigenous Vegetation (Non-SEA) | Residential - Large Lot Zone |
| Potential Natural Wetlands | Residential - Mixed Housing Urban Zone |
| Rural Urban Boundary | Rural - Mixed Rural Zone |
| Significant Ecological Areas Overlay | Rural - Rural Production Zone |
| Outstanding Natural Landscapes Overlay | Open Space - Sport and Active Recreation Zone |
| Designations | DBC Study Area for optioneering |

CORRIDOR FORM AND FUNCTION

- Single traffic lane in either direction for general vehicles and a dedicated public transport lane
- Separated cycle lanes and footpaths on both sides
- Posted speed limit will be 50 km/hr.



LAND USE



GAP ANALYSIS

The gap analysis found the following:

- All options need to tie into the proposed Ō Mahurangi Penlink interchange
- Uncertainty around location of Dairy Flat town centre and RTC alignment- hence more detailed corridor options should be considered at DBC phase, including consideration of the likely location of a future town centre and the selected RTC alignment.

OPTION ASSESSMENT: PROCESS

The following steps were undertaken:

1. Constraints mapping
2. Detailed Corridor Options developed and assessed via MCA
3. Targeted MCA and Constraints led assessment followed to look at which side of the road to widen

Upgrade and extension to Bawden Road

Options Considered



In relation to non-scored criteria:

- Manawhenua who stated a preference, noted their overall preference for Option A.
- From a policy perspective, Option A is preferred as it minimises impacts on potential natural wetlands and avoids new stream crossings.
- There was no real difference between the options in relation to value for money.

Option A is the recommended option for the following reasons:

1. Scores best overall against the investment objectives, land use futures, urban design and against environmental and social criteria as it follows the existing road corridor.
2. Aligns with Manawhenua preferences.
3. Provides access to a future RTC station for bus services from both the north and south.
4. Preferred option from an ecology perspective as avoids large wetlands on both sides of the road and avoids new stream crossings.
5. Slightly preferred from construction cost/risk perspective.
6. Less property acquisition required.

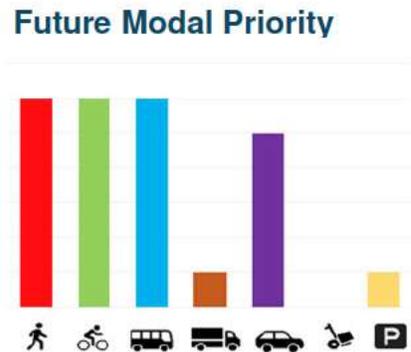
MCA assessment

MCA Criteria	Option A	Option B	Option C
Investment Objective 1: Access	3	2	1
Investment Objective 2: Resilience	3	3	3
Investment Objective 3: Integration	3	3	1
Investment Objective 4: Travel Choice	3	3	1
2a. Land use futures	2	1	0
2b. Urban design	2	2	1
2c. Land requirement	-1	-1	-2
2d. Social cohesion	-1	-2	-3
2e. Human health and wellbeing	-1	-2	-3
3a. Landscape / visual	-3	-3	-3
3b. Stormwater	-2	-3	-1
3c. Ecology	-2	-3	-3
3d. Natural hazards	-1	-1	-2
5a. Construction impacts on utilities / infrastructure	-2	-1	-1
5b. Construction disruption	-2	-2	-3
6a. Construction costs / risk	-2	-3	-3

Upgrade and extension to Bawden Road

HOW SOLUTION MEETS FUTURE MODAL PRIORITY

- Provision for separated cycle facilities and footpaths along the length of the corridor to connect active modes to key destinations.
- Key bus priority route with bus lanes provided to connect to the Dairy Flat centre and potential RT station
- Carefully manage existing vehicle access points to remove conflicts with walking & cycling movements. Additionally, safe crossing facilities are required.



CONSULTATION FEEDBACK

An emerging preferred option was consulted on with the Public in July to August 2022. There was limited community feedback on this project which included the following:

- General strong support for planning of future road upgrades
- Concerns over the speed and alignment of Bawden Road

The recommended option realigns corners and reduces the speed of Bawden Road.

INTERSECTION FORM ASSESSMENT

Intersection	Existing (if relevant)	Future - SGA Recommendation
Bawden Road / Top Road	Priority T intersection	Dual lane roundabout
Bawden Road / Bobs Way	Priority T intersection	Priority T intersection
Bawden Road / Oregon Park	Priority T intersection	Priority T intersection
Bawden Road / Dairy Stream Road	Priority T intersection	Dual Lane Roundabout
Bawden Road / Dairy Flat Highway	Priority T intersection	Dual lane roundabout

DESIGN REFINEMENTS

The design refinement considered constraints present along the existing Bawden Road corridor by section. The key outcomes of this process are outlined below:

- Realignment of Western tie to Dairy Flat Highway to minimise impacts on streams / floodplains and potential natural wetlands
- Maximised grades on Bawden Road to reduce earthworks at eastern end. Connection to Top Road maintained requiring work to Top Road to tie in.
- Intersection between Bawden Road and Dairy Stream Road has been amended to allow for a roundabout.

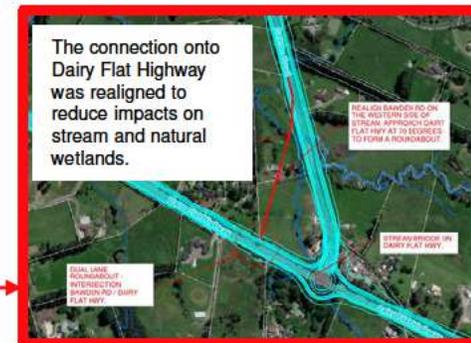


Hybrid option for the whole section to avoid key constraints

Section 1 – Widen both sides – No major constraints in this area

Section 2 – Widen to east side – To avoid a large section of wetland to the west

Section 3 – Consider location of wetlands. Avoid floodplain to the east.



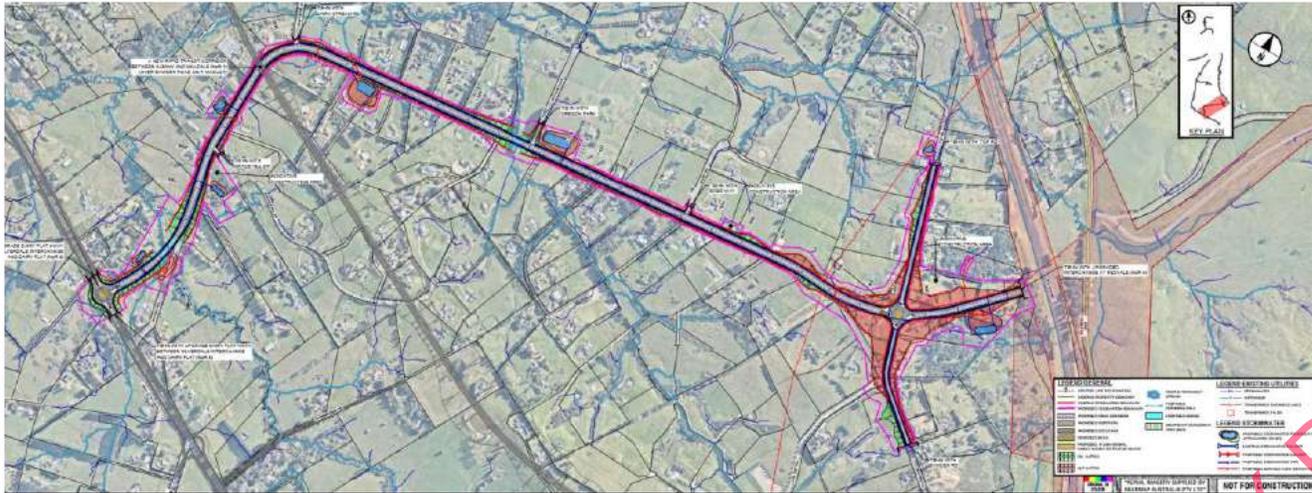
The connection onto Dairy Flat Highway was realigned to reduce impacts on stream and natural wetlands.

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Consider how the Bawden Road corridor is treated in the vicinity of a future Dairy Flat Centre and potential RTC station	M
Integration of earthworks and stormwater treatment with surrounding development to optimise the urban outcomes	M

Upgrade and extension to Bawden Road

RECOMMENDED OPTION



RISKS and OPPORTUNITIES

- Uncertainty over the land use in this location as no structure planning has been completed at this point.
- Significant earthworks required at eastern end and opportunity to integrate with development to reduce impacts
- Stormwater and ecological impacts at western end.

INTERDEPENDENCIES

- Redvale interchange upgrade
- Dairy Flat highway upgrade
- Land use and town centre location

PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Enable access to economic and social opportunities by providing a new integrated multi-modal corridor	Contribution to an overall improvement in access to jobs via Public Transport and active modes. Within the Dairy Flat area, within 10 mins there is more than an 100% increase in access to jobs via active modes. Within 45min, there is a more than an 100% increase in access to jobs via public transport.
Travel Choice	Support transformational mode share in the North by providing a high quality, low carbon transport network"	Contribution to a Mode share of 20% for active modes and 33% for Public Transport. Contribution to 59% of Dairy Flat being within 400m of a dedicated, separated active mode facility.
Resilience	Enable reliable and resilient people movement	In the Dairy Flat area, there is an 13% reduction of vehicle kilometres travelled in peak congestion (>90% v/c) in the AM peak in the Recommended Option.

Contribution to climate change response

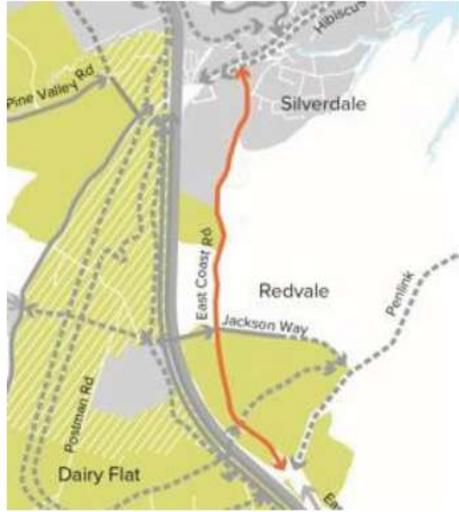
Climate Change	The recommended option follows an existing road for the majority of the length. Elimination of the corridor is not considered a practical option and would require provision of a connection in another greenfield location. The recommended route seeks to avoid key constraints and as such balances the option with the lowest climate change resilience risk and lowest embodied carbon. All options delivered similar outcomes from an enabled carbon perspective.
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Upgrade to East Coast Road between Silverdale and Redvale Interchange

NOR 13

PROACTIVELY RELEASED

Upgrade to East Coast Road from Silverdale to Redvale Interchange



PURPOSE

High quality safe and direct active mode connection between the growth areas of Silverdale and Redvale

GAP ANALYSIS

The gap analysis of previous phases concluded:

- An appropriate range of alternatives was considered, and the project could proceed to route refinement
- Consider ways to minimise earthworks considering location of the road on a ridgeline
- Consider implications of the Ō Mahurangi Penlink project occurring earlier than assumed.

CORRIDOR FORM AND FUNCTION

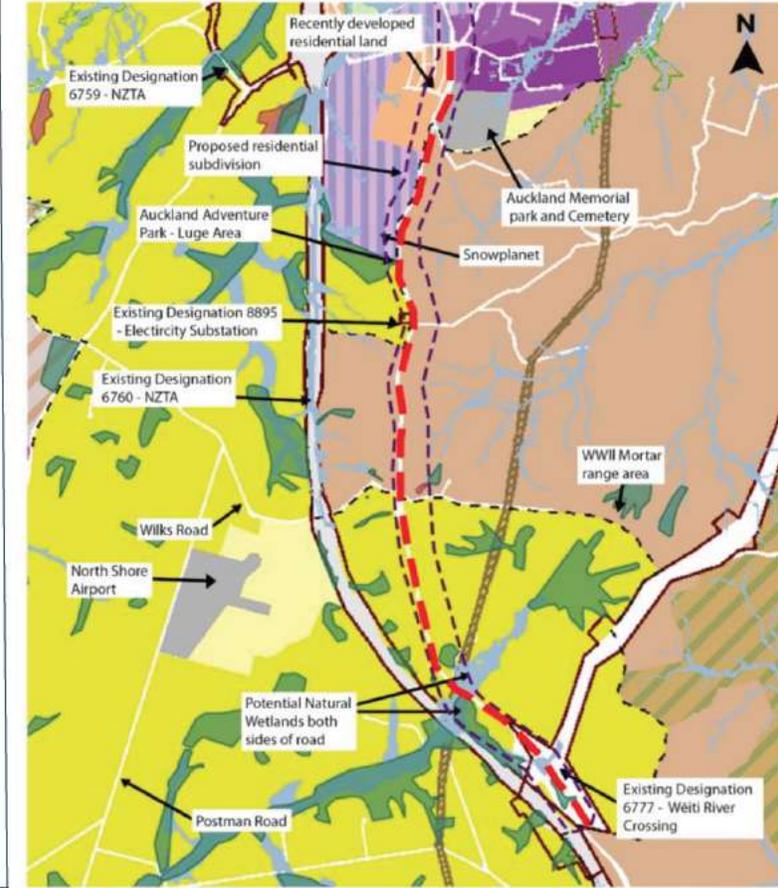
- **Segment 1: Hibiscus Coast Highway to Newman Road** - Single traffic lane with dedicated walking and cycling facilities and 50 km/hr speed limit
- **Segment 2: Newman Road to Jackson Way** - Single traffic lane with dedicated walking and cycling facilities on one side and 60 km/hr speed limit
- **Segment 3: Jackson Way to Redvale** - Single traffic lane with dedicated walking and cycling facilities and 50 km/hr speed limit.

OPTION ASSESSMENT: PROCESS

The following steps were undertaken:

1. Constraints mapping
2. Two options developed and assessed via MCA
3. Targeted MCA and Constraints led assessment considering which side to widen on
4. Reconsideration of form and function recognising significant property impact and scale of works

CONSTRAINTS

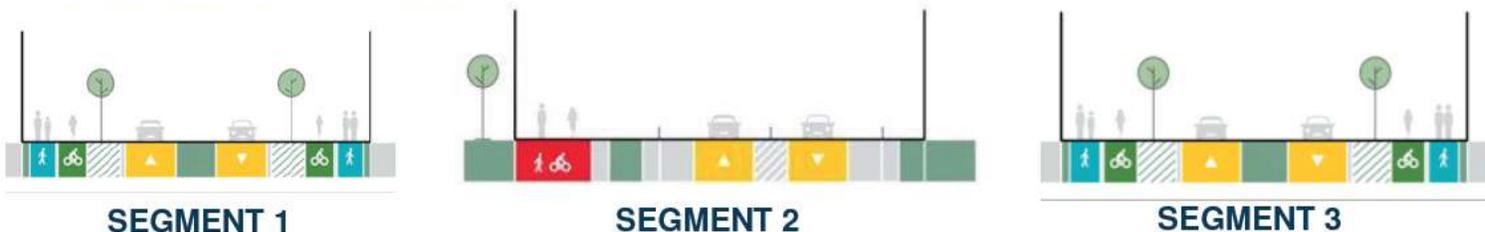


Legend

- Indicative Business case Recommended option
- Open watercourse
- Flood Plains
- Indigenous Vegetation (Non-SEA)
- Potential Natural Wetlands
- Significant Ecological Areas Overlay
- Outstanding Natural Landscapes Overlay
- Designations
- DBC Study Area for optioneering
- Future Urban Zone
- Residential - Large Lot Zone
- Rural - Countryside Living Zone
- Residential - Mixed Housing Urban Zone
- Rural - Mixed Rural Zone
- Rural - Rural Production Zone
- Open Space - Sport and Active Recreation Zone
- Business - Light Industry Zone
- Business - General Business Zone
- Business - Heavy Industry Zone
- Special Purpose Zone

CORRIDOR FORM AND FUNCTION

Recommended cross sections

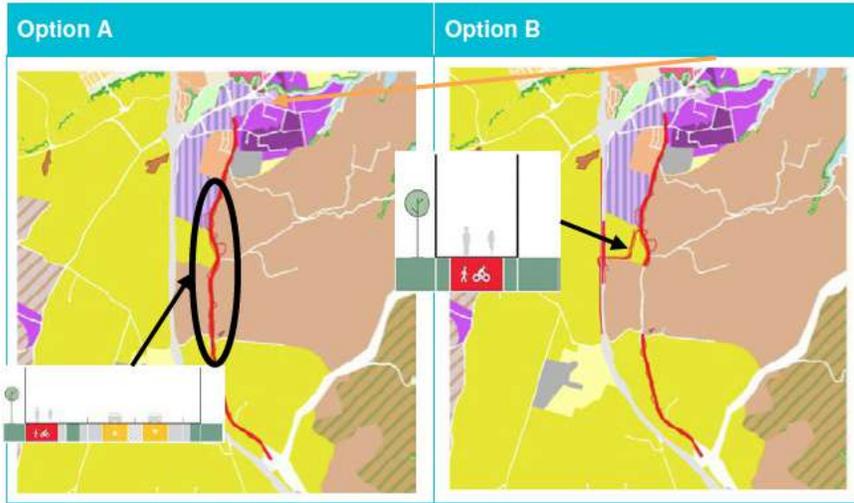


PROACTIVELY RELEASED

Upgrade to East Coast Road from Silverdale to Redvale Interchange

Options Considered

An MCA assessment was undertaken on two options.



- **Option A:** Active mode upgrade of East Coast Road between Hibiscus-Coast Highway in the north and Pen link in the south
- **Option B:** Active mode upgrade of East Coast Road limited to the Business and FUZ sections with an east-west active mode connection across SH1 to the strategic Active Mode corridor

In relation to non-scored criteria:

- Option A was the stated preference of those Manawhenua that stated a preference
- Option A was slightly preferred from a policy perspective as it affects less potential natural wetlands
- Option A was preferred from a value for money perspective as it has better benefits and similar costs.

Option A is the emerging preferred option for the following reasons:

- Scores better for Access and travel choice investment objectives (as it has a more direct N-S connection without interruption)
- Supported by Manawhenua who have stated a preference
- Less future land use segregation (as it avoids connection across FUZ to SH1)
- Less impact on ecology (potential wetlands, flood prone areas and streams)
- Less geotechnical instability risk.

MCA Assessment

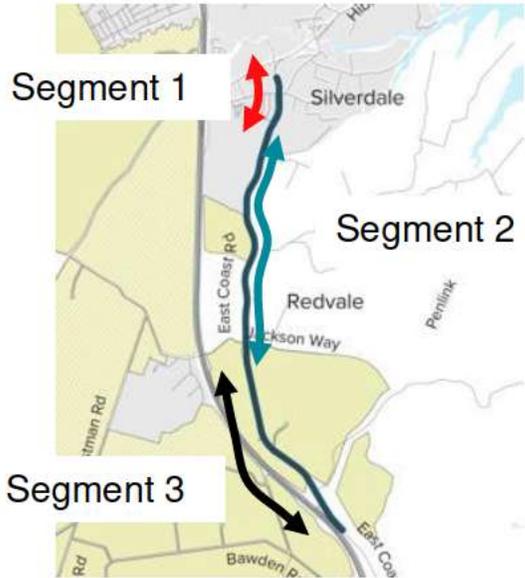
MCA Criteria	Option A	Option B
Investment Objective 1- Access: Access/integration: Improve access to economic and social opportunities through direct and attractive active mode facilities	3	2
Investment Objective 2 - Travel Choice: Provide a high quality, low carbon strategic active mode facility within the catchment	3	2
Investment Objective 3 - Safety: A safe facility which separates vulnerable users from conflict with vehicles	3	3
1a. Heritage	-1	-1
2a. Land use futures	2	1
2b. Urban design	3	1
2c. Land requirement	-1	-1
2d. Social cohesion	-2	-2
2e. Human health and wellbeing	2	2
3a. Landscape / visual	-3	-3
3b. Stormwater	-1	-1
3c. Ecology	-2	-3
3d. Natural hazards	-2	-3
5a. Construction impacts on utilities / infrastructure	-2	-2
5b. Construction disruption	-1	-2
6a. Construction costs / risk / value capture	-3	-3

Upgrade to East Coast Road from Silverdale to Redvale Interchange

Targeted MCA and constraints led design

The following recommendations were made to inform option refinement:

- **ECR Segment 1 - Widening to both sides** where possible. Avoid the cemetery and make use of grassed road corridor adjacent the recently developed residential land on the west. This option also avoids recently developed land parcels. Then widen to west where the route adjoins the cemetery.



- **ECR Segment 2 - Widening to both sides** to avoid/minimise impacts and the partial land acquisition of snow planet/ adventure park (where possible) and avoids impacts on dwellings to east. Avoid substation constraint by widening to the east around this area. The overall preference is to widen into future urban zone land and not rural zoned land.
- **ECR Segment 3 - Widen both sides** as there are no key constraints that aren't on both sides of the road. Potential flooding of road due to upstream catchment and low spot in road from contours. Crosses permanent stream. Large enough catchment for bridge. Reduce cuts near Puke at northern end of segment.

Reconsideration of form and function (Segment 2 only)

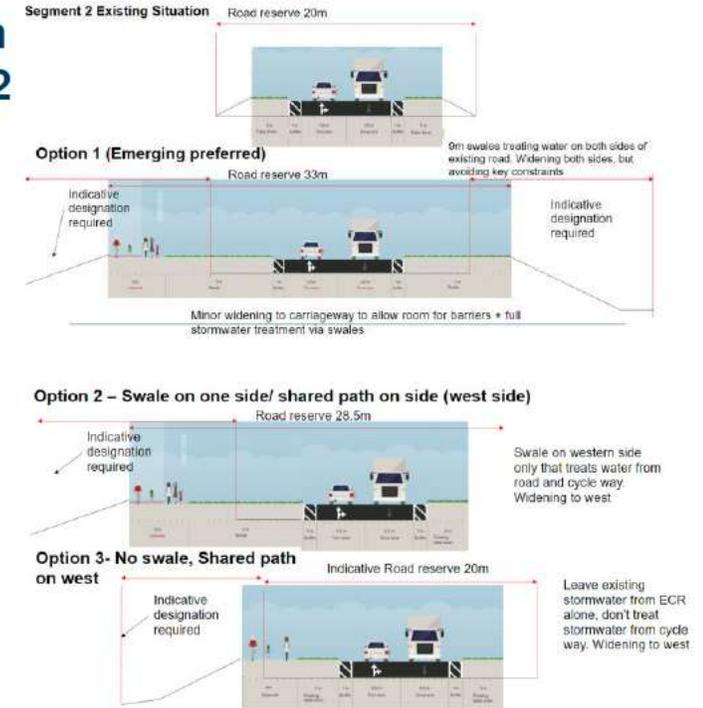
The impacts of the emerging preferred option were significant given the topography of the area.

Options were considered to change the cross section to reduce impacts.

Three options were tested using targeted MCA framework.

The project team **recommended Option 3** be selected for the following reasons:

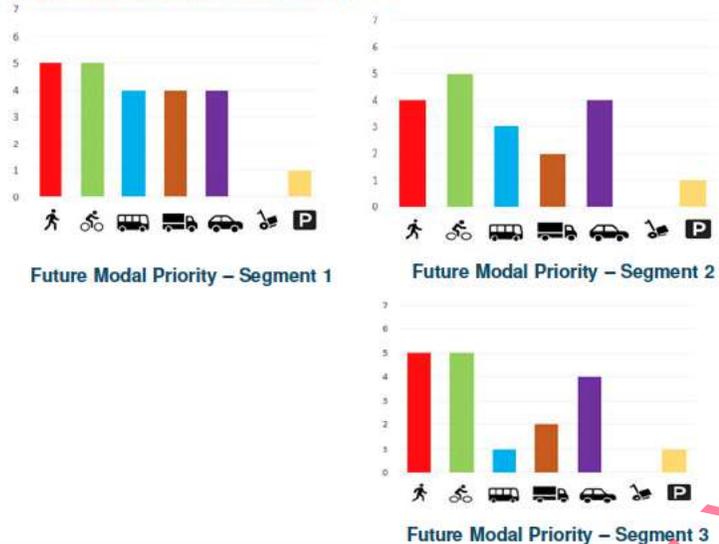
- Topography – Option 1 creates very large earthworks batters and significant property and land use effects on both sides.
- When comparing Options 2 and 3, overall earthworks/effects from widening to the west are likely quite a lot greater for Option 2 (for a relatively minor stormwater benefit). Option 2 would only provide stormwater treatment for half the road surface (to west).
- Option 3 meets project objectives and there would still be opportunity to treat stormwater through a piping system in place of the table drain in future if this was desired.



Upgrade to East Coast Road from Silverdale to Redvale Interchange

HOW SOLUTION MEETS FUTURE MODAL PRIORITY

- Provision for separated cycle facilities and footpaths along the length of the corridor to connect active modes to key destinations.
- Segment 2 has lower pedestrian priority due to rural nature.
- Segment 3 has reduced freight and PT as demand is low.
- Carefully manage existing vehicle access points to remove conflicts with walking & cycling movements. Additionally, safe crossing facilities are required.



DESIGN REFINEMENTS

The following refinements were made to the design during the design refinement:

- Revision to the assumed cross section to reduce earthworks in Segment 2
- Provision of retaining walls in some locations to reduce impacts
- Southern extents of the upgrade are included in the SH1 upgrade package due to interdependence with Redvale interchange upgrade.
- Intersection with Dairy Stream SH1 crossing included (single lane roundabout)

CONSULTATION FEEDBACK

An emerging preferred option was consulted on with the Public in July to August 2022. There was limited community feedback on this project which included the following:

- General strong support for planning of future road upgrades
- Query whether walking and cycling path on both sides of the road are necessary

The recommended option includes walking and cycling on one side only within segment 2. On segment 1 and 3, facilities on both sides are required due to the future urban nature of the corridor.

INTERSECTION FORM ASSESSMENT

Intersection	Existing (if relevant)	Future – SGA Recommendation
1 – East Coast Road and Hibiscus Coast Highway	Signals	Signalised Intersection
2 – East Coast Road and Forge Road	Signals	Signalised Intersection
3 – East Coast Road and Newman Road	Priority	Priority Controlled Intersection (<i>Agreement</i>)
4 – East Coast Road and Spur Road	Priority	Priority Controlled Intersection (<i>SME's indicated a preference for a Roundabout</i>)
5 – East Coast Road and Wilks Road	Priority	Single-Lane Roundabout
6 – East Coast Road and Jackson Way	Priority	Priority Controlled (<i>Agreement</i>)

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Consideration of localised narrowing to reduce earthworks extents	M
Consideration of retaining walls to reduce extent of batter slopes	M
Management of vehicle access to reduce conflict with pedestrians and cyclists	M

Upgrade to East Coast Road from Silverdale to Redvale Interchange

RECOMMENDED OPTION

RISKS and OPPORTUNITIES

- Stormwater treatment on rural section for the existing carriageway is left as is in the existing situation.

INTERDEPENDENCIES

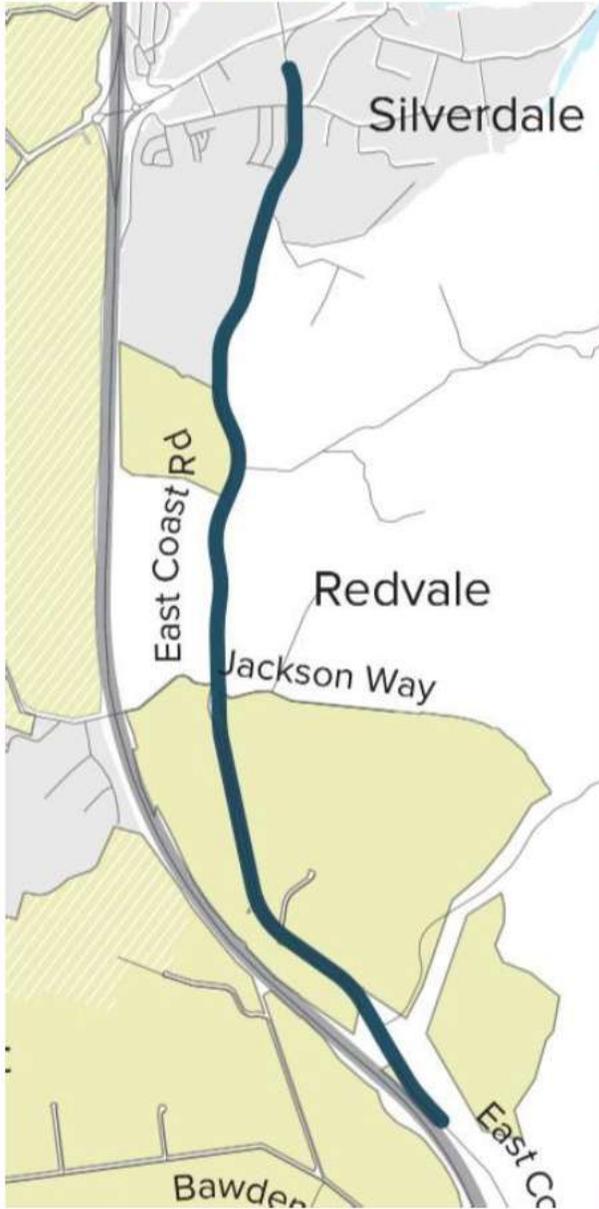
- Redvale interchange upgrade
- Wilks Road interchange

PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Enable access to economic and social opportunities by providing a new integrated multi-modal corridor	The project contributes to an increase in accessibility to jobs for the Dairy Flat and Silverdale area. Within the Dairy Flat area, within 10 mins there is more than an 100% increase in access to jobs via active modes. Within 45mins, there is a more than an 100% increase in access to jobs via public transport.
Travel Choice	Support transformational mode share in the North by providing a high quality, low carbon transport network"	The corridor provides a continuous active mode facility between the Silverdale area and the FUZ land to the south. Contribution to an overall mode share of 20% for active modes and 33% for public transport for the North area.
Resilience	Enable reliable and resilient people movement	Provides an alternative corridor to SH1 and provides connectivity to the SH1 in a number of locations. Contribution to an overall 9% reduction of vehicle kilometres travelled in peak congestion (>90% v/c) in the AM peak.

Contribution to climate change response

Climate Change	As the corridor is an existing arterial road, elimination of the project would have an adverse effect on enabled carbon. The reduced cross section adopted for this project significantly reduces embodied carbon while maintaining enabled carbon benefits. This comes at the expense of stormwater treatment (climate change resilience),but is considered an appropriate trade off given the lack of flooding and stormwater issues in this location.
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PROACTIVELY RELEASED

Upgrade to Dairy Flat Highway between Dairy Flat and Albany

NOR 9

PROACTIVELY RELEASED

Upgrade to Dairy Flat Highway between Dairy Flat and Albany

PURPOSE

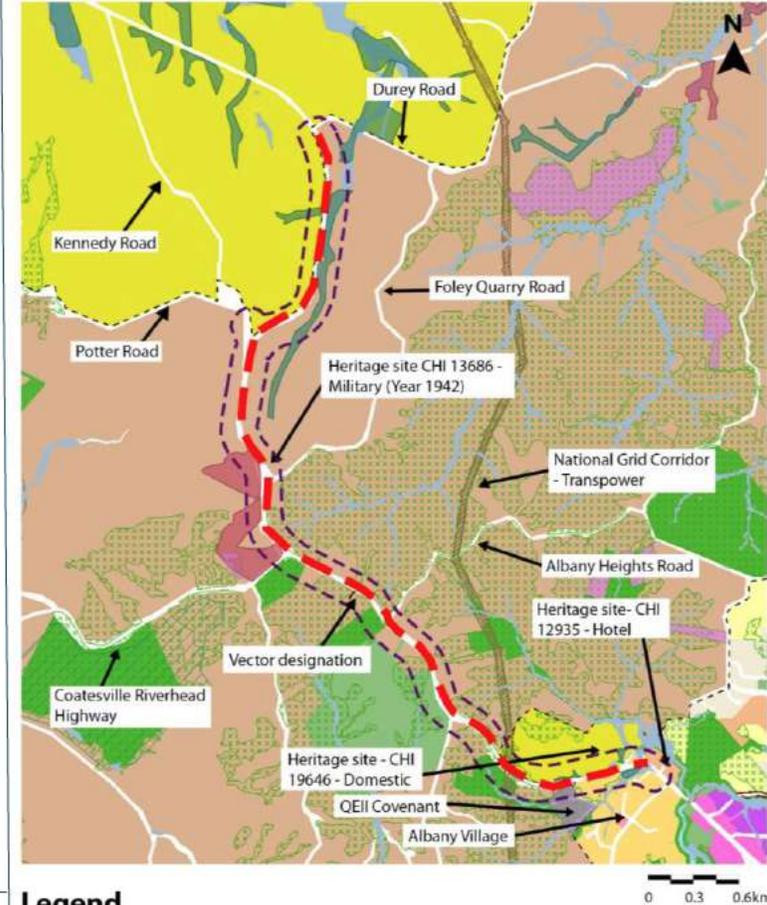
Upgrade of Dairy Flat Highway between Albany Village and the FUZ to improve safety and provide walking and cycling facilities.

OPTION ASSESSMENT: PROCESS

The following steps were undertaken:

1. Constraints mapping
2. Offline options considered but discounted
3. Route options developed and assessed via MCA
4. Targeted MCA and constraints-led assessment of the selected route alignment – as an input to option refinement. Note: this was considered necessary as the corridor has numerous and complex constraints, which require a 'thread the needle' approach to manage effects and costs of the project.

CONSTRAINTS



GAP ANALYSIS

The Gap analysis of previous phases concluded:

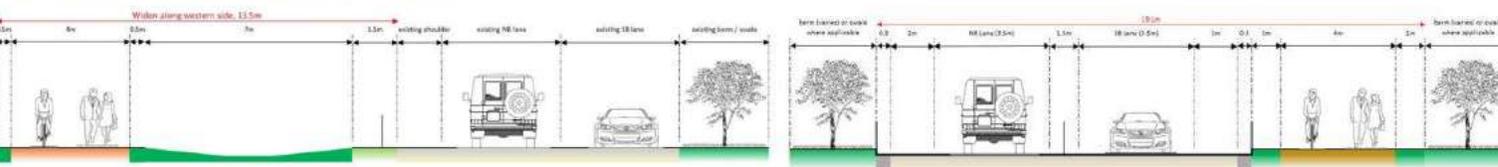
- A sufficient range of options was considered at IBC stage and the project could proceed to route refinement
- Further analysis was required to investigate how adverse effects on the SEAs can be avoided, minimised or mitigated

CORRIDOR FORM AND FUNCTION

- **Segment 1: Durey Road to Potter Road** Single traffic lane with dedicated walking and cycling facilities and 60 km/hr speed limit with swale treatment for stormwater.
- **Segment 2: Potter Road to Albany** - Single traffic lane with dedicated walking and cycling facilities and 60 km/hr speed limit with kerb and channel

FORM AND FUNCTION ASSESSMENT

Recommended cross sections



SEGMENT 1

SEGMENT 2

Legend

- Indicative Business case Recommended option
- Open watercourse
- Flood Plains
- Indigenous Vegetation (Non-SEA)
- Potential Natural Wetlands
- Rural Urban Boundary
- Significant Ecological Areas Overlay
- Outstanding Natural Landscapes Overlay
- Designations
- National Grid Corridor
- DBC Study Area for Optioneering
- Future Urban Zone
- Residential - Large Lot Zone
- Rural - Countryside Living Zone
- Residential - Mixed Housing Urban Zone
- Rural - Mixed Rural Zone
- Rural - Rural Production Zone
- Open Space - Conservation Zone
- Open Space - Informal Reaction Zone
- Business - Light Industry Zone
- Business - Neighbourhood Centre Zone
- Business - Local Centre Zone
- Special Purpose Zone
- QEII Covenant

Upgrade to Dairy Flat Highway between Dairy Flat and Albany

Options Considered



Offline options were considered away from Dairy Flat Highway. These options were excluded as they did not meet investment objectives.

An MCA assessment was undertaken on four route refinement options.

Recommended option:

Option D (cycle path on west side, north of Coatesville Riverhead and east side to the south of Coatesville Riverhead Highway)

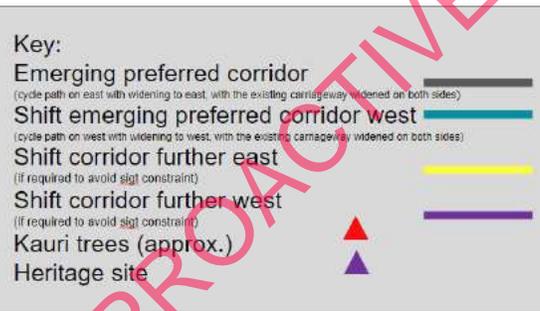
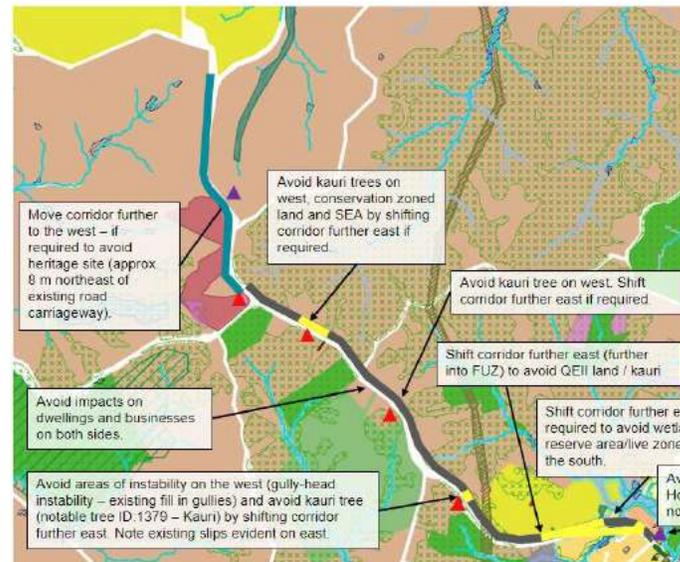
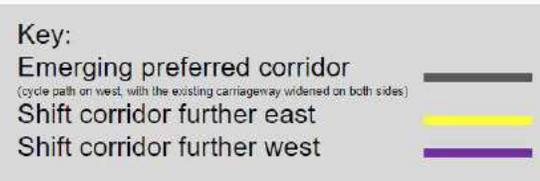
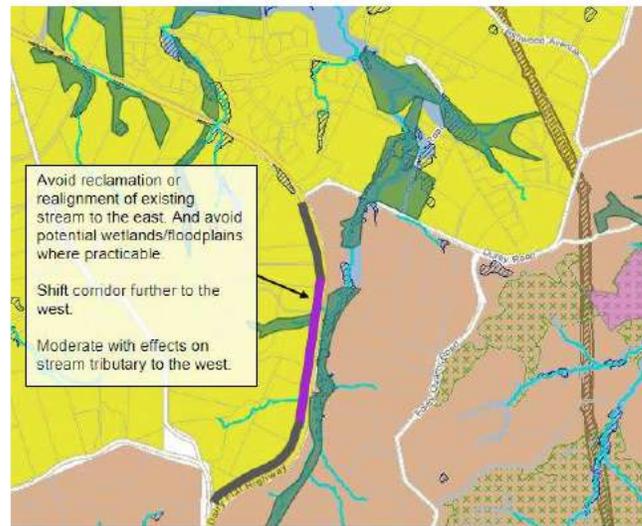
Option D was preferred for the following reasons:

- Significant constraints are present on the west, including ecology (SEAs and mature Kauri), a QEII covenanted area, natural hazards and social features (reserves)
- Option D was preferred from a natural hazard perspective
- Option D was supported by Manawhenua
- Although a crossing from west to east will be required for this option, a safe crossing can be included in the design.

MCA Criteria	Option A (Cycling path on west)	Option B (Cycling path on west then east)	Option C (Cycling path on west with safety)	Option D (Cycling path on west then east with safety)
Investment Objective 1 - Access/integration	2	1	2	1
Investment Objective 2 - Travel Choice	3	3	3	3
Investment Objective 3 - Safety	2	1	3	2
1a. Heritage	-1	-2	-1	-2
2a. Land use futures	1	0	1	1
2b. Urban design	3	3	3	3
2c. Land requirement	-1	-1	-1	-1
2d. Social cohesion	-1	0	-1	0
2e. Human health and wellbeing	1	1	1	1
3a. Landscape / visual	-3	-3	-3	-3
3b. Stormwater/flooding	-1	-1	-1	-1
3c. Ecology	-4	-4	-4	-4
3d. Natural hazards	-3	-2	-3	-2
5a. Construction impacts on utilities / infrastructure	-2	-2	-2	-2
5b. Construction disruption	-1	-1	-1	-1
6a. Construction costs / risk / value capture	-2	-2	-2	-2

Upgrade to Dairy Flat Highway between Dairy Flat and Albany

Targeted MCA and constraints-led assessment



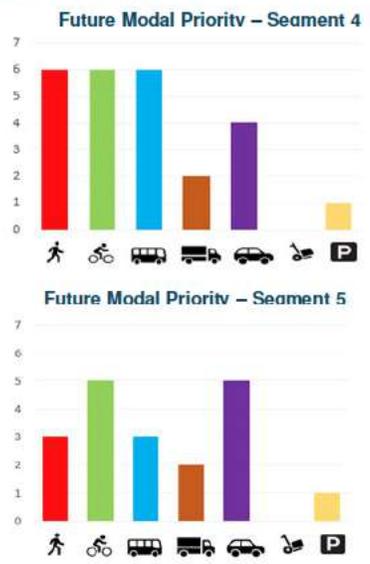
PROACTIVELY RELEASED

Note: The emerging preferred corridor had cycle path on the east for the whole of Segment 2 and 3. However, to avoid SEA and heritage constraints on the eastern side between Potter Road and the Coatesville-Riverhead roundabout, it is recommended to shift the emerging preferred corridor to the west for this section and then cross over (safely) to the east at the roundabout - assuming this can be done safely. If feasible this would include avoiding the kauri tree just north of Coatesville-Riverhead Highway

Upgrade to Dairy Flat Highway between Dairy Flat and Albany

HOW SOLUTION MEETS FUTURE MODAL PRIORITY

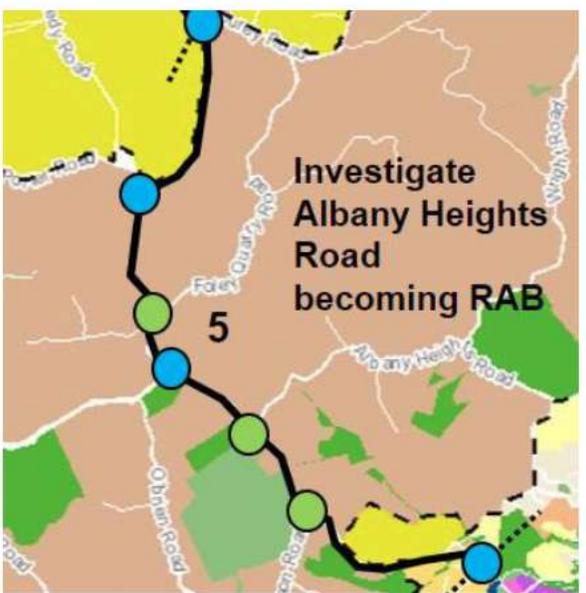
- Provision for separated cycle facilities and footpaths along the length of the corridor to connect active modes to key destinations.
- Segment 5 has lower pedestrian priority due to rural nature and distance to the Albany Centre.
- Segment 5 has increased car priority as it provides a key link to Albany for the surrounding area.
- Carefully manage pedestrian and cycle crossing points and existing vehicle access points to remove / manage conflicts. Additionally, safe crossing facilities are required.



DESIGN REFINEMENTS

The following design refinements were made:

- Foley Quarry access Road and Hobson Road changed to left in left out due to topographical constraints and presence of a barrier.
- Project extents adjusted to end at Stevenson Crescents to tie in with existing AT project.
- Shortening of passing lane to avoid impacts on a SEA / QEII parcel of land.
- Retaining provided at various locations to reduce extents of earthworks and associated impacts on property and surrounding environment.



INTERSECTION FORM ASSESSMENT

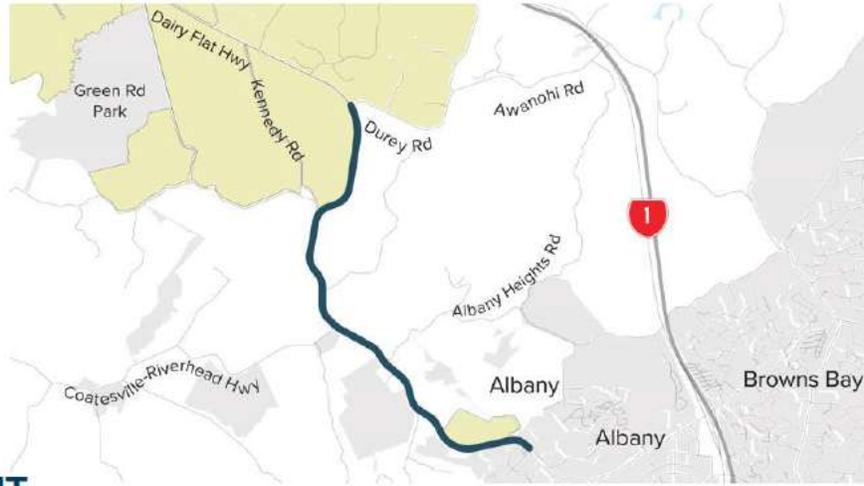
- Dual Lane Roundabout
- Single Lane Roundabout
- Signalised Intersection
- Priority Controlled Intersection
- Left-in / Left-out

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Consider reallocation of road space from the passing lanes to reduce the overall extents of works, costs and effects	M
Consider use of retaining walls to reduce earthworks	M
Consideration of property access and connection across the active mode facilities to ensure safety for all users	M

Upgrade to Dairy Flat Highway between Dairy Flat and Albany

RECOMMENDED OPTION



RISKS and OPPORTUNITIES

- Significant effect on SEA area
- Opportunity to reduce cost and impacts of the project through reallocation of road space.

INTERDEPENDENCIES

- The Avenue project in Albany treats the corridor through the Albany village and is important for delivering outcomes of this project
- Dairy Flat Highway upgrade north of this project

PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Improve access to economic and social opportunities through direct and attractive active mode facilities	Improvements to accessibility to employment for the Dairy Flat area. Within the Dairy Flat area, within 10 mins there is more than an 100% increase in access to jobs via active modes. Within 45min, there is a more than an 100% increase in access to jobs via public transport.
Travel Choice	Provide a high quality, low carbon strategic active mode facility within the catchment	The corridor provides a continuous active mode facility between the Dairy Flat growth area and the existing Albany area to the south. Contribution to an overall mode share of 20% for active modes and 33% for public transport for the North area.
Safety	A safe facility which separates vulnerable users from conflict with vehicles.	Separated active mode facilities reducing conflict for users. Road safety barriers are expected to reduce overall DSIs by XX over the project lifetime.

Contribution to climate change response

Climate Change	The Dairy Flat Highway is an existing arterial road and provides an important resilience role to State Highway in this location. If this project was not included in the network, this would result in a significant reduction in outcomes across the network. The recommended option has diverged from a standard cross section to reduce the extents of earthworks over certain sections while maintaining the enabled carbon benefits from the facility.
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Upgrade to Wainui Road

NOR 10

PROACTIVELY RELEASED

Upgrade to Wainui Road

PURPOSE

Form an important east-west connection for all modes on the edge of proposed Milldale town centre. Additionally, the corridor connects to SH1 and the growth area of Millwater.



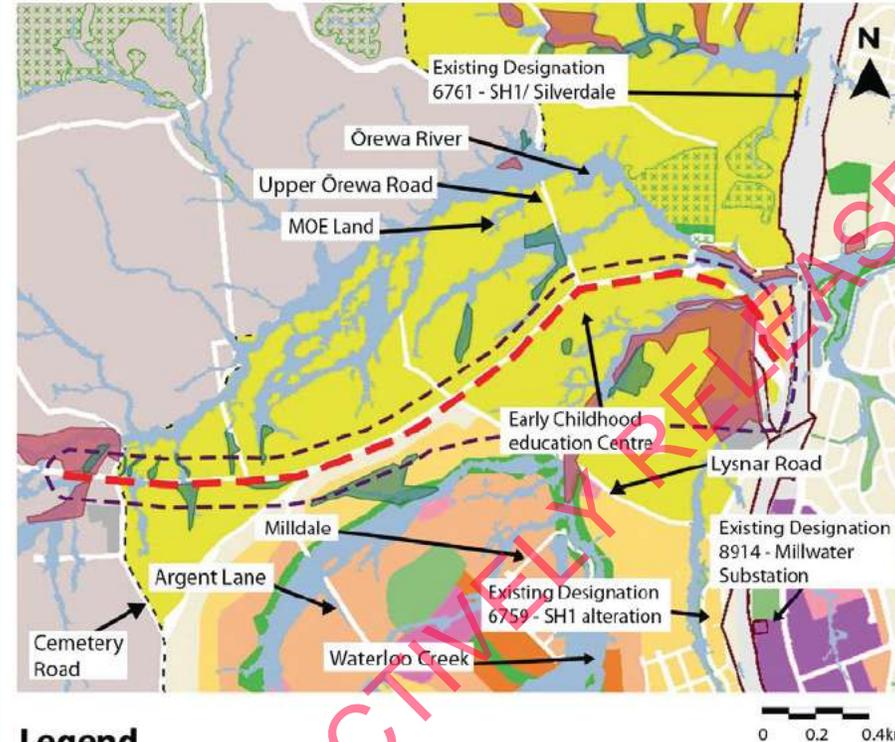
GAP ANALYSIS

The gap assessment process determined:

- An appropriate range of options was considered at IBC stage
- Consider options that avoid (where practicable) or minimise effects on the SEA and Orewa river
- Consider the need to route protect the western portion of the corridor due to developer arrangements.

The scope of the project was refined to between SH1 and Lysnar Road due to developer agreements in place for the western portion.

CONSTRAINTS



Legend

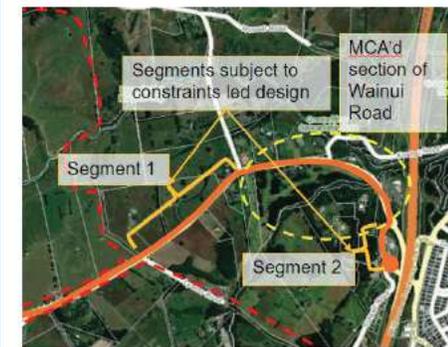
Indicative Business case Recommended option	Future Urban Zone
Open watercourse	Residential - Large Lot Zone
Flood Plains	Rural - Countryside Living Zone
Indigenous Vegetation (Non-SEA)	Residential - Mixed Housing Urban Zone
Potential Natural Wetlands	Rural - Mixed Rural Zone
Rural Urban Boundary	Rural - Rural Production Zone
Significant Ecological Areas Overlay	Open Space - Sport and Active Recreation Zone
Outstanding Natural Landscapes Overlay	Business - Light Industry Zone
Designations	Business - General Business Zone
Open Space - Informal Recreation Zone	Business - Heavy Industry Zone
Open Space - Conservation Zone	Residential - Terrace Housing and Apartment Buildings Zone
Special Purpose Zone	Business - Neighbourhood Centre Zone
DBC Study Area for optioneering	Business - Local Centre Zone

CORRIDOR FORM AND FUNCTION

- Single traffic lane in either direction for general vehicles and public transport
- Dedicated walking and cycling facilities will be provided along the corridor.
- Posted speed limit will be 50 km/hr.



OPTION ASSESSMENT: PROCESS



The following steps were undertaken:

1. Constraints mapping
2. Options developed and assessed via MCA for Segment 2.
3. Targeted MCA and constraints-led assessment for Segments 1 and 2.

Upgrade to Wainui Road

DBC Options Considered

Option A: WR_01



Option B: WR_02



Options included:

- **Option A:** Widening along both sides of Wainui Road between Upper Orewa Road and the roundabout at the top of SH1 southbound off-ramp
- **Option B:** Widening to the north between Upper Orewa Road and Kowhai Road. Then widens to south between Kowhai Road and the roundabout at the top of the SH1 southbound offramp

Non-Scored criteria

In regard to non-scored criteria:

- Manawhenua who stated a preference, noted a preference for Option A
- There was no real differentiation between options from a policy perspective or a Value for Money perspective.

Recommended option: Option A -Widening both sides for the following reasons:

- Option A performs best from an effects-based perspective. In particular, the option scores better for ecology and landscape/visual (natural character) as it minimises disturbance of riparian vegetation within the Orewa River/Waterloo Creek crossing. The option also has less impact on existing businesses including a private lodge and golf course.
- Option A was supported by Manawhenua who had stated a preference.

MCA Assessment

MCA Criteria	Option A	Option B
Investment Objective 1 - Access	3	3
Investment Objective 2 - Integration	3	3
Investment Objective 3 - Travel Choice	3	3
2a. Land use futures	2	3
2b. Urban design	2	2
2c. Land requirement	-1	-1
2d. Social cohesion	-1	-2
2e. Human health and wellbeing	1	1
3a. Landscape / visual	-2	-3
3b. Stormwater	-1	-1
3c. Ecology	-2	-3
3d. Natural hazards	-2	-1
5a. Construction impacts on utilities / infrastructure	-2	-2
5b. Construction disruption	-2	-2
6a. Construction costs / risk / value capture	-2	-2

Upgrade to Wainui Road

Targeted MCA and constraints-led assessment undertaken for Segments 1 and 2 (outside the scope of the MCA assessment). The key findings of this assessment are outlined below:

Segment 1: Between Lysnar Road and Upper Orewa Road

Options considered:

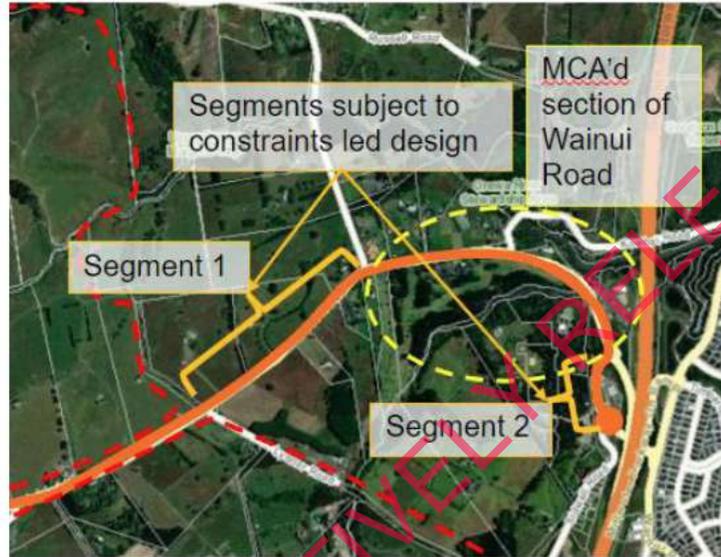
- Widen both sides
- Widen to the south
- Widen to the north

Recommendation:

- Widen both sides

Reasons for recommendation:

- Reduced impact on property compared with widening to South
- Makes best use of existing road corridor and construction
- Avoids impact on ECE



Segment 2: Between Roundabouts and SH1

Options considered:

- Widen both sides
- Widen to the south
- Widen to the north

Recommendation:

- Widen both sides

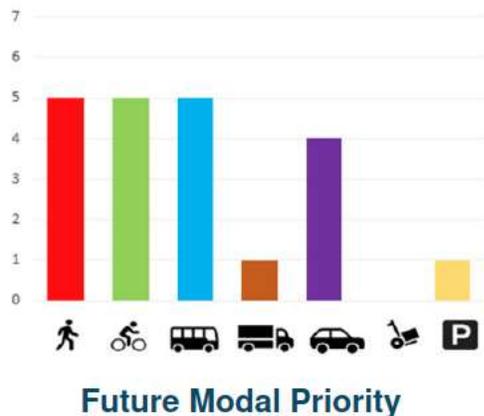
Reasons for recommendation:

- Reduced impact on property compared with widening to west
- Makes best use of existing road corridor and construction
- Not expected to impact on Montessori Primary School

Upgrade to Wainui Road

HOW SOLUTION MEETS FUTURE MODAL PRIORITY

- Provision for separated cycle facilities and footpaths along the length of the corridor to connect active modes to key destinations.
- Provision for a single traffic lane for private vehicles and public transport services
- Carefully manage existing vehicle access points to remove conflicts with walking & cycling movements. Additionally, safe crossing facilities are required.



DESIGN REFINEMENTS

- Scope of project adjusted to end at Lysnar Road to reflect presence of an IFA between AT and developer for the western portion.
- Lengthening and raising of structure over Orewa River to improve flood resilience and minimise earthworks on adjacent areas.

INTERSECTION FORM ASSESSMENT

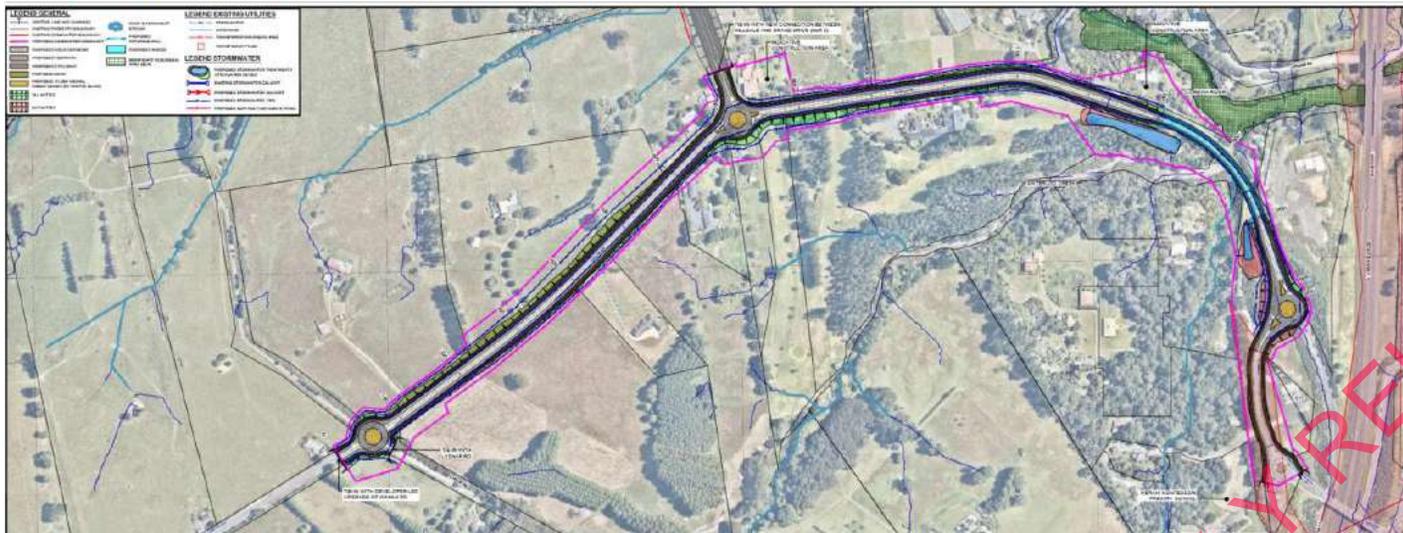
Intersection	Existing (if relevant)	Future – SGA Recommendation
Wainui Road and Lysnar Road	Priority	Roundabout
Wainui Road and Upper Orewa Road	Priority	Roundabout
Wainui Road and Kowhai	Priority	Priority Controlled

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Consider use of a low impact bridge structure for active modes across the Orewa River to reduce impacts	M
Consider use of retaining walls to reduce earthworks	M
Consideration of property access and connection across the active mode facilities to ensure safety for all users	M

Upgrade to Wainui Road

RECOMMENDED OPTION



RISKS and OPPORTUNITIES

- Opportunity to improve water quality in the receiving environment
- Opportunity to integrate with surrounding development.

INTERDEPENDENCIES

- Wainui to Grand Drive link
- Active mode upgrades to the Wainui Road interchange

PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Improve access to economic and social opportunities by providing an integrated multi-modal corridor along Wainui Road	Contribution to improved access to jobs within the Wainui area. For active modes, there is a 48% increase in the number of jobs within 10min active mode travel. For Public transport there is a 100% increase in jobs within a 30min public transport trip.
Travel Choice	Support transformational mode share in the North by providing a high quality, low carbon transport network	Provision of continuous active mode facilities between the Wainui interchange and the Argent Lane corridor. Contribution to an overall mode share of 20% for active modes and 33% for public transport for the North area.
Integration	Provide corridor protection to support planned growth and flexibly enable future land use and transport integration	Enables 71% of the FUZ area in Wainui to be within 400m of a dedicated, separated active mode facility.
Contribution to climate change response		
Climate Change	As the corridor is an existing arterial road, elimination of the project would have an adverse effect on enabled carbon. The recommended option represents the option with the lowest embodied carbon and provides enabled carbon benefits through enabling mode shift for residents of the future growth area.	

Upgrade of Hibiscus Coast Highway and Grand Drive for public transport and active modes

Type A Business case

PROACTIVELY RELEASED

Upgrade of Hibiscus Coast Highway and Grand Drive for public transport and active modes



PURPOSE

Provide a high-quality strategic walking and cycling connection and PT priority (bus lanes) through the growth areas of Orewa, Millwater and Silverdale.

The project team is seeking a Type A business Case and not pursuing Route Protection for this project.

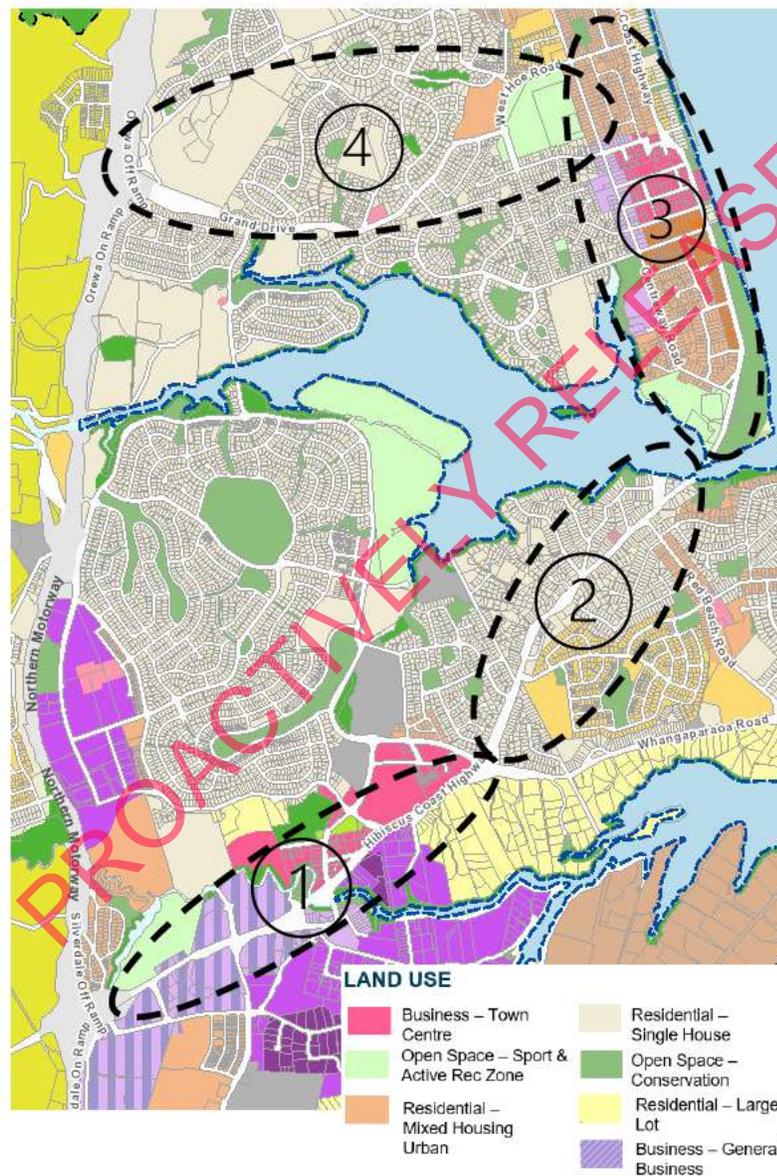
The general design philosophy of the project is to stay within the existing road reserve.

OPTION ASSESSMENT: PROCESS

The following process was followed in relation to this project:

- Constraints mapping process undertaken
- Corridor Form and function process identified gaps
- A Type A Business Case was selected
- Concept design developed to inform DBC

LAND USE



Sections

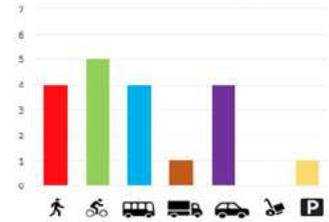
Section	Upgrades Required	Business Case Type
Section 1: Grand Drive	<ul style="list-style-type: none"> • Separated walking and cycling • Bus priority at intersections 	Type A
Section 2: HBC Orewa	N/A	Nothing required
Section 3: HBC north of Whangaparāoa	<ul style="list-style-type: none"> • Separated walking and cycling • Bus priority at intersections 	Type A
Section 4: HBC Silverdale to Whangaparāoa	<ul style="list-style-type: none"> • Separated walking and cycling • Bus priority at intersections 	Type A

Upgrade of Hibiscus Coast Highway and Grand Drive for public transport and active modes

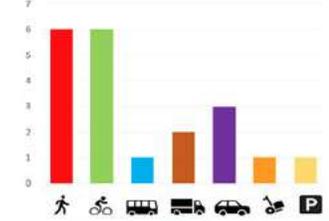
HOW SOLUTION MEETS FUTURE MODAL PRIORITY

- Provision for separated cycle facilities and footpaths along the majority of the corridor to connect active modes to key destinations. For Section 3, no separate cycling facilities are proposed due to the town centre land use and presence of a path through reserve land.
- Private vehicle priority is highest in Segment 1 and 4 reflecting connection to SH1 at both ends.
- Bus priority varies across the corridor and is highest in Segment 4 as the corridor connects to the HBC bus station.
- Pedestrian priority is highest around Orewa centre (Segment 2) and Silverdale centre (Segment 4).
- Segment 4 has a higher freight priority due to the industrial area south of Hibiscus Coast Highway.

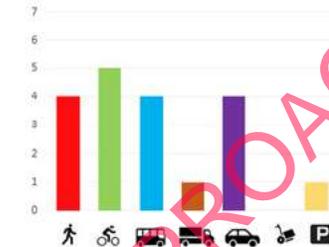
Future Modal Priority – Segment 1



Future Modal Priority – Segment 2



Future Modal Priority – Segment 3



Future Modal Priority – Segment 4

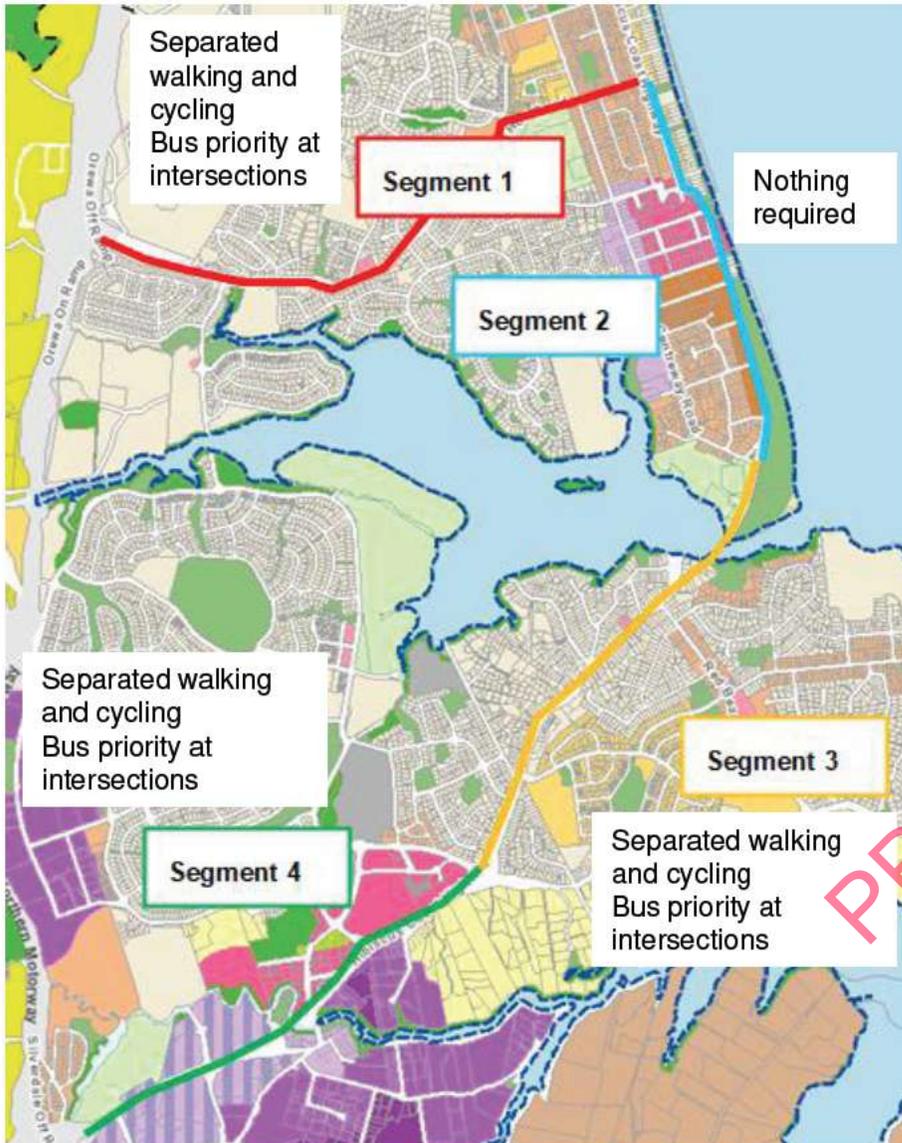


MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Consideration of reductions to design standards to ensure upgrades can be achieved within the road reserve	M
Detailed investigation and design of services	M
Consideration of changes required to property access and consideration of options	H
Consultation with the affected community on proposed changes to the corridor	H
Consideration of reallocation of road space to reduce widening requirements of the project in selected sections including removal of on street parking and median space	M
Consideration of high value ecological and coastal areas and minimising work which effects these areas	M

Upgrade of Hibiscus Coast Highway and Grand Drive for public transport and active modes

RECOMMENDED OPTION



RISKS and OPPORTUNITIES

- Risk that outcomes are compromised through reduced standard of infrastructure
- Opportunity to reduce effects on community and property through upgrades within the road reserve.
- The Ō Mahurangi Penlink project will remove traffic from the corridor and provides opportunity for reallocation of road space

INTERDEPENDENCIES

- The Ō Mahurangi Penlink project relieves this corridor to the west of Whangaparaoa Road.
- Silverdale intersection upgrade

Investment Objectives		Alignment
Access	Access/integration: Improve access to economic and social opportunities through direct and attractive active mode facilities	Improved access to jobs within the existing Orewa and Silverdale area. Contribution to improved job accessibility via active modes and PT. For active mode travel, a 28% increase in jobs accessible within a 10min active mode trip. For PT, a 100% increase in the jobs accessible within 30-45min public transport trip.
Travel Choice	Provide a high quality, low carbon strategic active mode facility within the catchment	Provision of separated active mode facilities and bus priority through the corridor providing travel choice to the Orewa and Silverdale residents. Contribution to a wider mode share of 20% for active modes and 33% for public transport.
Safety	A safe facility which separates vulnerable users from conflict with vehicles.	A separated provision for walking and cycling. Upgrades likely to include a reduction in speed over part of the corridor which is likely to result in reduced DSIs.
Contribution to climate change response		
Climate Change	As the corridor is an existing arterial road, elimination of the project would have an adverse effect on enabled carbon. The recommended option represents the option with the lowest embodied carbon and provides enabled carbon benefits through enabling mode shift for residents of the future growth area.	

A new SH1 crossing at Dairy Stream

NOR 5

PROACTIVELY RELEASED

A new SH1 crossing at Dairy Stream

PURPOSE

To provide an all-modes connection across SH1 in the vicinity of Dairy Stream (just south of the Motorway Service Centre on SH1) providing connectivity between communities and access to social-economic opportunities between and on both sides of the existing SH1



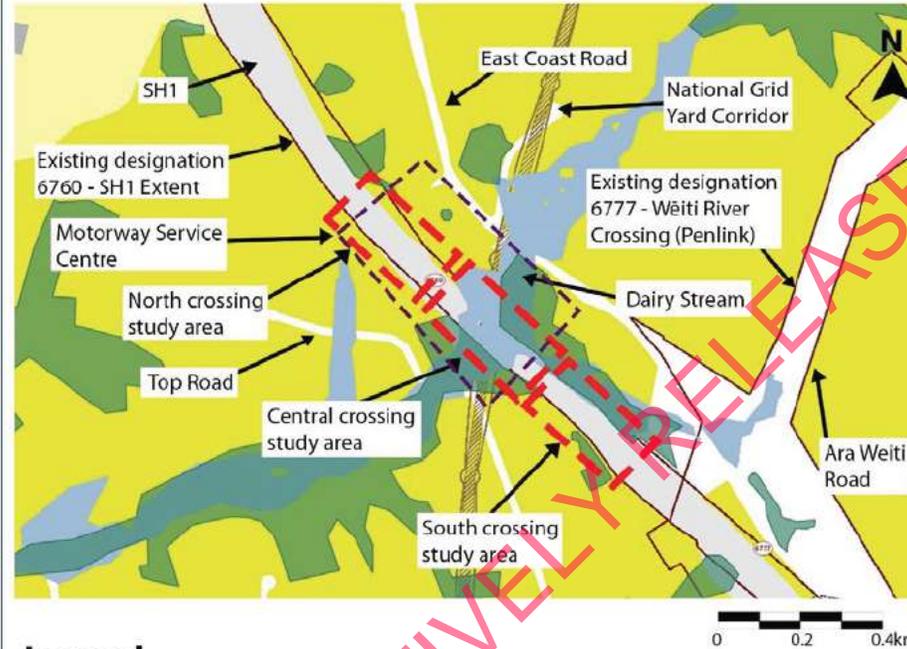
GAP ANALYSIS

The gap assessment process determined:

- An appropriate range of options was considered at IBC stage

Further investigation of SH1 and interchange options confirmed the desire to retain the existing Motorway service centre.

CONSTRAINTS



Legend

— Open watercourse	Future Urban Zone
— Flood Plains	Residential - Large Lot Zone
— Indigenous Vegetation (Non-SEA)	Rural - Countryside Living Zone
— Potential Natural Wetlands	Residential - Mixed Housing Urban Zone
— Rural Urban Boundary	Rural - Mixed Rural Zone
— Significant Ecological Areas Overlay	Rural - Rural Production Zone
— Designations	— DBC Study Area for optioneering

CORRIDOR FORM AND FUNCTION

- Single traffic lane in either direction for general vehicles and public transport.
- Dedicated walking and cycling facilities will be provided along the corridor.
- Posted speed limit will be 50 km/hr.



The berm space and median would be removed on any bridge structure

OPTION ASSESSMENT: PROCESS

The following steps were undertaken:

1. Constraints mapping
2. Three broad areas for the connection were considered and assessed using a targeted MCA and constraints-led assessment

A new SH1 crossing at Dairy Stream

DBC Options Considered

Three areas considered for a crossing:

- Northern area
- Central area
- Southern area



Recommended option – Northern area

The assessment recommended the northern study area for the following reasons:

- Largely avoids floodplains and wetlands
- Provides adequate spacing with the Redvale interchange
- Is remote from the National Grid corridor

MCA criteria (targeted to those criteria that may differentiate)	Northern area between the flood plain and motorway service centre	Central area within the flood plain and wetland area	Southern area between the flood plain and Redvale Interchange
1a Heritage	No known Issues	No Known issues	No known Issues
2a. Land use futures /Policy analysis	Located within FUZ	National grid corridor – Height restrictions for structures beneath and near the national grid overhead powerlines. Located within FUZ	Located within FUZ
2b. Urban design	No key issues.	No key issues.	No key issues.
2d Social cohesion; 2c. Land requirement	No key issues. Best option to reduce overall severance of SH1 as this bridge location is evenly spaced between the Redvale and Wilks interchanges	No key issues	No key issues
3b. Stormwater/flooding	Small flood prone area.	Large floodplains and flood prone areas on both sides of SH1.	Flood plains and flood prone areas on the northern side of SH1.
3c. Ecology	Small potential wetland to the north.	Large potential wetlands on both sides of SH1. Stream located within the centre of the option.	Potential wetlands nearby at stream crossing on both sides of road. Unable to avoid.
3d Natural hazards	Design to consider spanning across the service lane, active mode corridor and widening of SH1.	South of Worsnop Way, catchment > 80 ha (bridge required).	Too close to Redvale Interchange – it will be a duplicate facility.
5a Construction impacts on utilities/infrastructure		SH1 will be raised at this section to achieve freeboard.	
6a Construction cost/risk			

- Significant constraints present – avoid where practicable
- Moderate constraints present – consider avoiding on balance with other issues
- No significant or moderate constraints present

A new SH1 crossing at Dairy Stream

HOW SOLUTION MEETS FUTURE MODAL PRIORITY

- Provision for separated cycle facilities and footpaths along the length of the corridor to connect active modes to key destinations.
- Provision for a single traffic lane for private vehicles and public transport services
- Carefully manage existing vehicle access points to remove conflicts with walking & cycling movements. Additionally, safe crossing facilities are required.



DESIGN REFINEMENTS

- During design refinement the connection was pushed further north as a result of geometric requirements and a desire to retain access to Worsnop Road
- Angle of the bridge altered to achieve the required vertical grades

INTERSECTION FORM ASSESSMENT

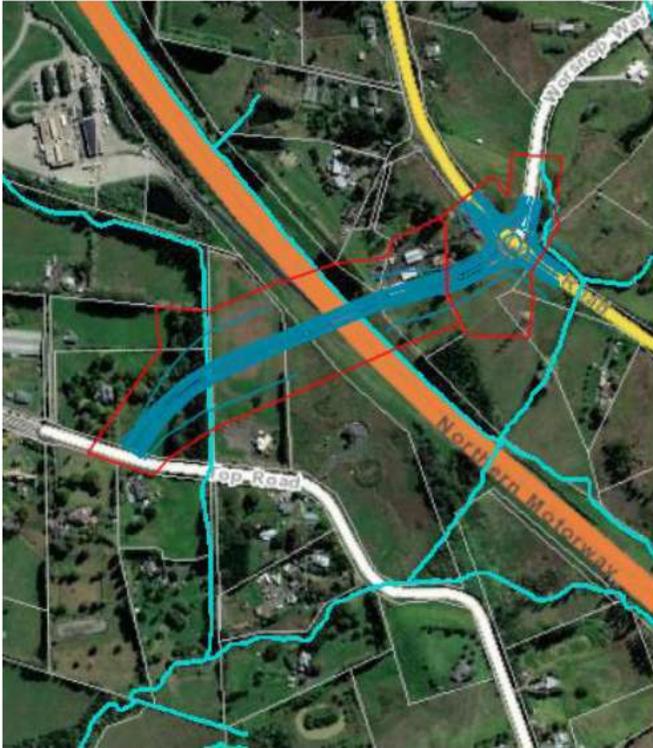
Intersection	Existing (if relevant)	Future – SGA Recommendation
Dairy Stream Bridge / Top Road	N/A	Priority intersection
Dairy Stream Bridge / East Coast Road / Worsnop Road	N/A	Single lane roundabout

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Consider opportunities to integrate this connection with development of FUZ land on either side of SH1	M
Consider use of retaining walls to reduce earthworks	M
Consideration of property access and connection across the active mode facilities to ensure safety for all users	M

A new SH1 crossing at Dairy Stream

RECOMMENDED OPTION



RISKS and OPPORTUNITIES

- Opportunity for the project to guide future subdivision patterns through early identification of the optimal crossing position

INTERDEPENDENCIES

- SH1 upgrade project
- Upgrade of East Coast Road
- Project needs to connect to the local and collector road network in the future. The network is uncertain at this time.

PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Enable access to economic and social opportunities by providing a new integrated multi-modal corridor	Provides a direct connection between FUZ land on eastern and western side of SH1 for all modes providing access to jobs and social opportunities. Contribution to an overall improvement in access to jobs via Public Transport and active modes. Within the Dairy Flat area, within 10 mins there is more than an 100% increase in access to jobs via active modes. Within 45min, there is a more than an 100% increase in access to jobs via public transport.
Travel Choice	Support transformational mode share in the North by providing a high quality, low carbon transport network	Contribution to a Mode share of 20% for active modes and 33% for Public Transport
Resilience	Enable reliable and resilient people movement	Provides an east west connection across SH1 that is separated from the SH1 interchange at Redvale, thus provides an alternative route between eastern and western areas which is not susceptible to congestion and resilience issues.
Integration	Provide corridor protection to support planned growth and flexibly enable future land use and transport integration	Contribution to a 50% increase (percentage points) in the proportion of Dairy Flat within 400m of a high-quality, dedicated active mode facility in the Recommended Option.
Contribution to climate change response		
Climate Change	Without this link in place, future development areas on either side of SH1 will be severed from each other. East west movements for all movements will need to use future motorway interchanges as connections. This is anticipated to lead to unattractive walking and cycling conditions, and congestion and unreliability for public transport services. The recommended location for the bridge is considered to provide best resilience to climate change and best outcomes from an enabled carbon perspective.	

A new active mode connection along the Dairy Stream

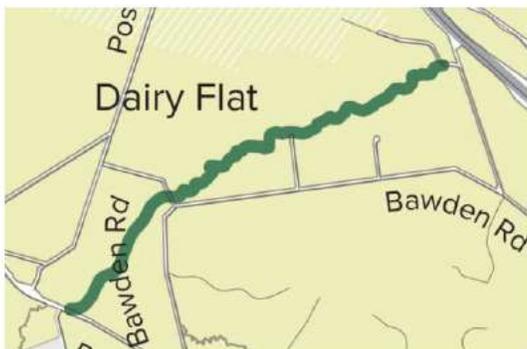
Type A Business case

PROACTIVELY RELEASED

A new active mode connection along Dairy Stream

PURPOSE

Provide a high-quality strategic walking and cycling connection through the growth area of Dairy Flat which connects to the wider strategic active mode network

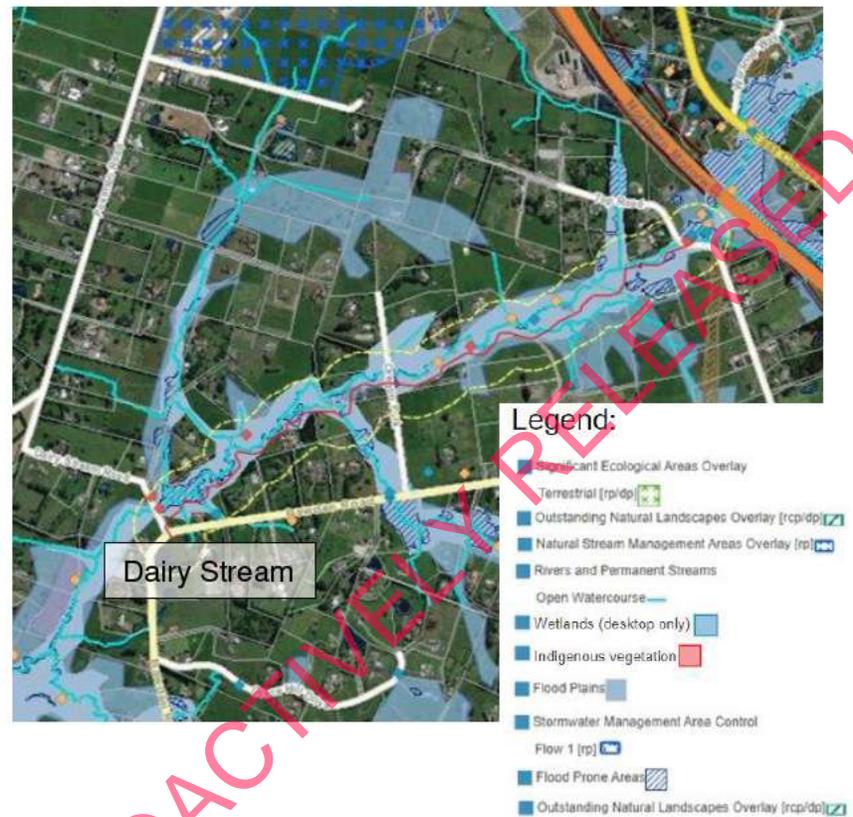


Type A Business case

The Dairy Stream active mode facility was determined as a Type A business case which did not require / warrant route protection at this time. This was determined for the following reasons:

- The project follows a riparian corridor which is unlikely to see build out from development of the FUZ area
- A riparian corridor is likely to be vested to Council through the plan change process
- The project is likely to be implemented as a greenway type project and therefore not by AT / WK

CONSTRAINTS



Other Constraints

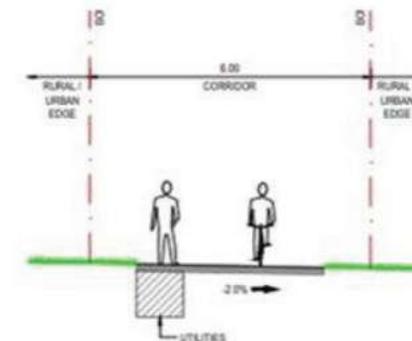
- Alignment follows Dairy Stream – Floodplains, potential wetland areas, stream crossings, riparian vegetation (largely exotic)

Opportunities

- Opportunity to locate active mode corridor parallel (but offset) with stream alignment, i.e.: at the outer edge of existing (and proposed) vegetated buffer.

CORRIDOR FORM AND FUNCTION

- Dedicated walking and cycling facilities will be provided along the corridor.



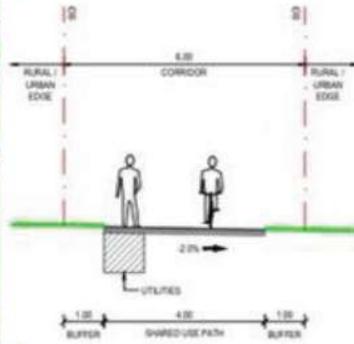
OPTION ASSESSMENT: PROCESS

The following steps were undertaken:

1. Constraints mapping
2. Single option developed for DBC purposes

A new active mode connection along the Dairy Stream

RECOMMENDED OPTION



RISKS and OPPORTUNITIES

- The facility is at risk during flooding events and is unlikely to be usable during the event itself
- Opportunity for developers to contribute to implementation
- Opportunity for low impact design (e.g.: Bridle path) to limit effects on receiving environment

INTERDEPENDENCIES

- New SH1 crossing at Dairy Stream

PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Improve access to economic and social opportunities through a direct and attractive active mode facilities within the Dairy Flat area	Provides a direct connection between SH1 facility, a future Dairy Flat centre and the Green Park. Contribution to an overall improvement in access to jobs via active modes. Within the Dairy Flat area, within 10 mins there is more than an 100% increase in access to jobs via active modes.
Travel Choice	Provide a high quality, low carbon strategic active mode facility within the catchment	Contribution to a Mode share of 20% for active modes. Contribution to 59% of Dairy Flat being within 400m of a dedicated, separated active mode facility.
Safety	A safe facility which separates vulnerable users from conflict with vehicles.	A separated active mode facility free of conflict with vehicles
Contribution to climate change response		
Climate Change	Elimination of the connection would likely adversely affect mode shift by reducing active mode facilities through the Dairy Flat growth area and wider inter-connections in the strategic active modes network. The project is expected to have benefits from an enable carbon perspective by carries some risk from a climate change resilience perspective given the location.	

Upgrade to Argent Lane and New Pine Valley Road

PROACTIVELY RELEASED

Upgrade to Argent Lane and New Pine Valley Road

PURPOSE

Upgrades to the existing Argent Lane and New Pine Valley Road between Wainui Road to Old Pine Valley Road to provide for all modes.

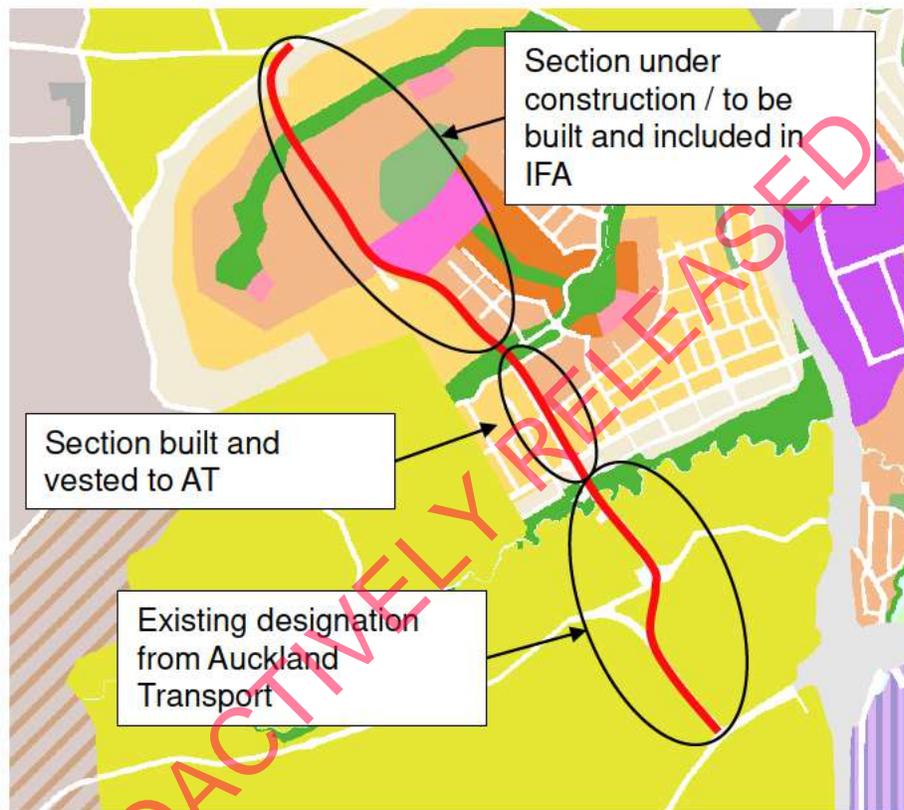


Type A Business case

The upgrade to Argent Lane and New Pine Valley Road was determined as a Type A business case as the corridor did not require route protection at this time. This was determined for the following reasons:

- The Milldale development and Auckland Transport have delivered a two lane collector road in this location.
- Sufficient road space has been allowed for to implement a four lane road in the future.

CONSTRAINTS



Other Constraints

- Existing crossing over the Weiti Stream

Opportunities

- Existing portions have been implemented as a two-lane road with a wide median and can be easily modified to a four-lane arrangement.

CORRIDOR FORM AND FUNCTION

- Current corridor provides for a single lane of traffic with separated walking and cycling facilities.
- In the future, this is required to be widened to allow for four traffic lanes.
- Posted speed limit will be 50 km/hr.



OPTION ASSESSMENT: PROCESS

The following steps were undertaken:

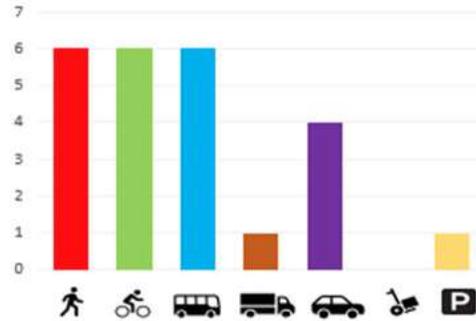
1. Constraints mapping
2. Single option developed for DBC purposes

New Argent Lane and new Pine Valley Road

HOW SOLUTION MEETS FUTURE MODAL PRIORITY

- Provision for separated cycle facilities and footpaths along the length of the corridor to connect active modes to key destinations.
- Key bus priority route with bus lanes provided to connect to the Dairy Flat centre and potential RT station
- Carefully manage existing vehicle access points to remove conflicts with walking & cycling movements. Additionally, safe crossing facilities are required.

Future Modal Priority



PROJECT ALIGNMENT

Investment Objectives		Alignment
Access	Improve access to economic and social opportunities through a direct and attractive active mode facilities within the Dairy Flat area	The Argent Road corridor provides a connection through the Milldale area . Contributes to the Wainui area having increased jobs accessible via active modes and public transport. Within the Wainui area, within 10 mins there is more than an 48% increase in access to jobs via active modes. Within 45min, there is a more than an 48% increase in access to jobs via public transport.
Travel Choice	Provide a high quality, low carbon strategic active mode facility within the catchment	Contribution to a Mode share of 20% for active modes and 33% for Public Transport. Contribution to 71% of Wainui being within 400m of a dedicated, separated active mode facility.
Safety	A safe facility which separates vulnerable users from conflict with vehicles.	A separated active mode facility free of conflict with vehicles
Contribution to climate change response		
Climate Change	Elimination of the connection would likely adversely affect mode shift by reducing active mode facilities through the Dairy Flat growth area and wider inter-connections in the strategic active modes network. The project is expected to have benefits from an enable carbon perspective by carries some risk from a climate change resilience perspective given the location.	

MATTERS TO CONSIDER FURTHER IN FUTURE DETAILED DESIGN

Design Parameters	Complexity Rating
Consideration to intersection form and function along the corridor within the context of development which has occurred (i.e. Schools, centres)	M
Stormwater treatment – The current Argent Lane design relies on rain gardens for stormwater treatment. This needs to be considered through detailed design	M
Crossing of the Wēiti Stream is a highly sensitive environment. Detailed design should consider how to best avoid, mitigate and remedy effects.	H

PROACTIVELY RELEASED

Recommended Option

11 Recommended North Package

The recommended North transport package is shown in Figure 11-1. From this network the following walking, cycling and micro mobility network will be achieved as shown in Figure 11-2.

Figure 11-1 Recommended North Transport Package

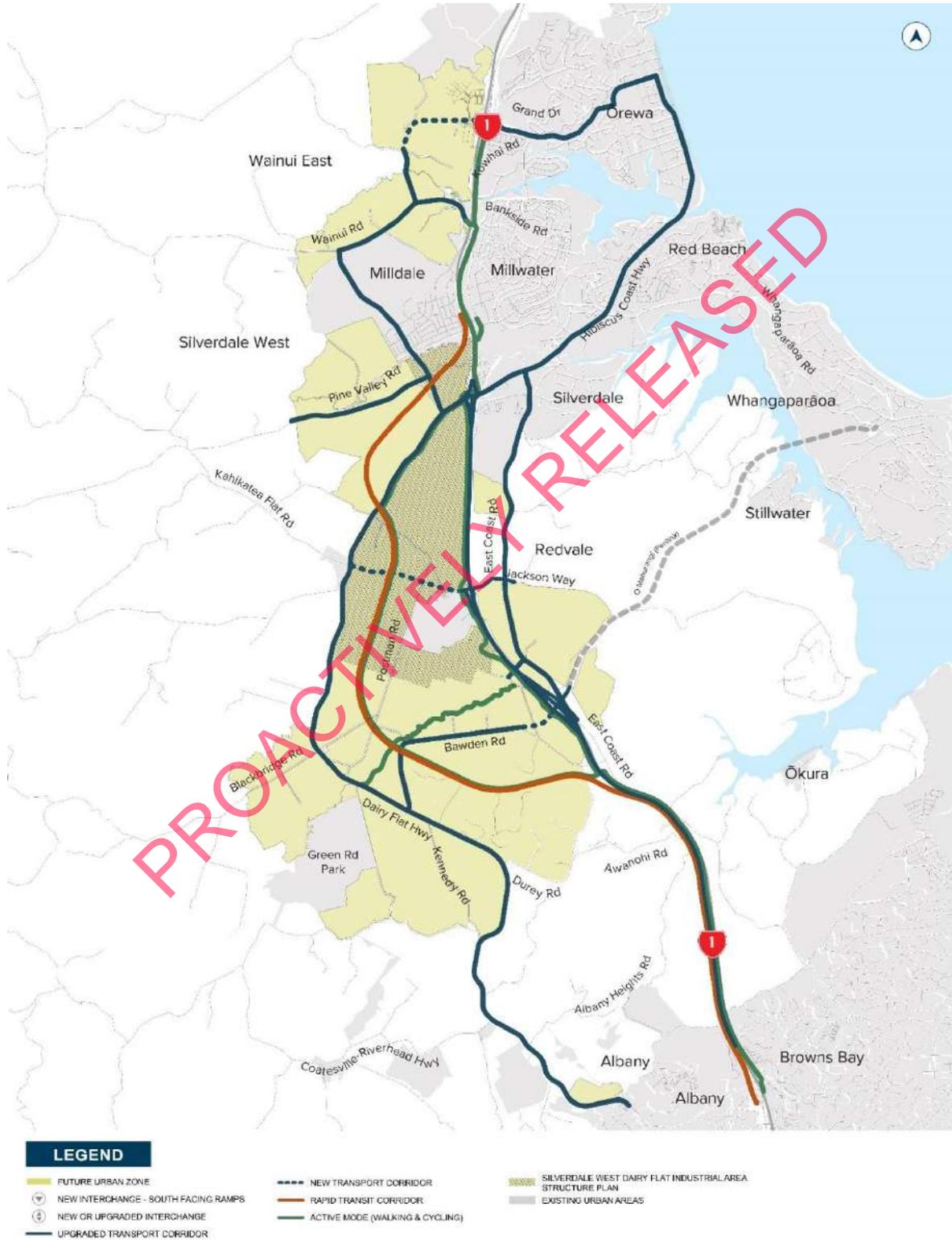
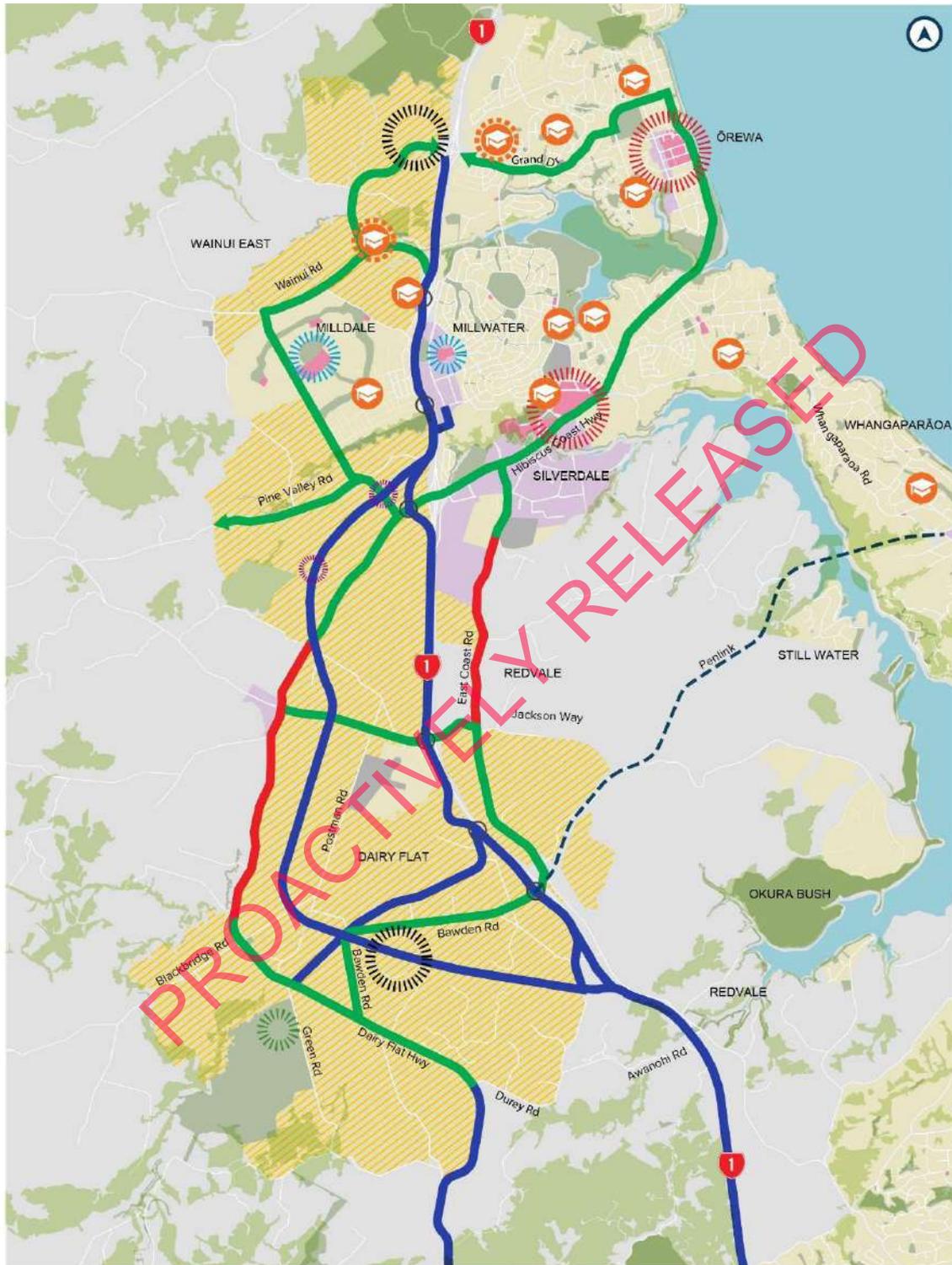


Figure 11-2 Recommended walking, cycling and micro mobility network



LEGEND

Schools (Existing / Proposed)	Town / Metro Centre	AUP Employment Zones
Cycleway and footpath each side	Local Centre	AUP Residential Zones
Bi-directional cycle plus footpath	Indicative Future Town Centre (tbc)	AUP Future Urban Zones
Active mode path	Futura Regional Park	AUP Open Space Zones
SH1 Separated Crossing	Indicative Possible Future Local Centre	AUP Special purpose zone
Penlink Connection - including active mode path (Non SGA)		AUP Centres

0 1 2
Kilometres

This is a comprehensive transport solution that responds to planned growth and provides a transport network that supports:

- Long term development of a low carbon transport system to support future growth and facilitates mode shift from private vehicles to public transport and active modes to reduce greenhouse gas emissions.
- The network supports local jobs with the Silverdale West industrial area and provides direct freight access to the strategic network to minimise conflict with surrounding residential land.
- Local jobs are provided via centres in the future urban areas with direct access to the RTC corridor to encourage a mix of land use around future stations.
- Opportunity for intensification of land use around RTC station and walk up catchments.
- Transport corridors maximise opportunities for walk up catchments to public transport interchanges and a high frequency local bus network.
- Increased reliability for public transport through provision of an alternative strategic link and additional resilience through urbanised alternative routes.
- Real travel choice with high quality, attractive alternatives to the private vehicle. This includes a contiguous, legible active mode network that connects people to key destinations and encourages active mode trips within the compact urban area.
- An area wide focus on safety through a holistic set of measures including Road to Zero safety principles, fully separated cycling facilities, well designed intersections and sufficient space for all modes to interact safely.

The outcomes will be achieved by targeted investment in:

- A new Rapid Transit corridor between Albany and Milldale – To provide a strategic public transport corridor to serve the growth in the North between Albany and Silverdale, leading to an increase in public transport (PT) mode share and improved accessibility to social and economic opportunities in the North.
- Upgrades to SH1 between Albany and Silverdale with a new interchange at Wilks Road and upgraded interchange at Redvale – The interchanges provide access to/from the strategic road network to serve adjacent development areas. Widening to SH1 will provide bus shoulder lanes from Albany to Silverdale in the short-medium term, with managed motorway capacity between Albany and Silverdale Interchange in the long term.
- Improvements to the existing Silverdale Interchange – Updated layout at the Silverdale Interchange.
- A new walking and cycling path along SH1 (SH1 Walking and Cycling Path) – To provide a high-quality strategic walking and cycling connection adjacent to SH1 which will allow people to access social and economic opportunities in the various development areas in the North.
- A new walking and cycling path along the rapid transit corridor (RTC Walking and Cycling Path) – To provide a high-quality strategic walking and cycling connection adjacent to the proposed RTC in Dairy Flat and Silverdale which will allow people to access social and economic opportunities.
- Provision of a network of arterials that will support provision for frequent public transport, walking and cycling and general traffic including Upgrade to Wainui Road, Upgrade to Pine

Valley Road, Upgrade to Dairy Flat Highway between Silverdale and Albany, New connection between Dairy Flat Highway and Wilks Road (New Link Road), Upgrade to East Coast Road between Silverdale and Redvale Interchange, Upgrade and extension to Bawden Road, New Connection between Milldale and Grand Drive, Upgrade of Hibiscus Coast Highway and Grand Drive for public transport and active modes, A new SH1 crossing at Dairy Stream (Dairy Stream Motorway Crossing), New Argent Lane and new Pine Valley Road,

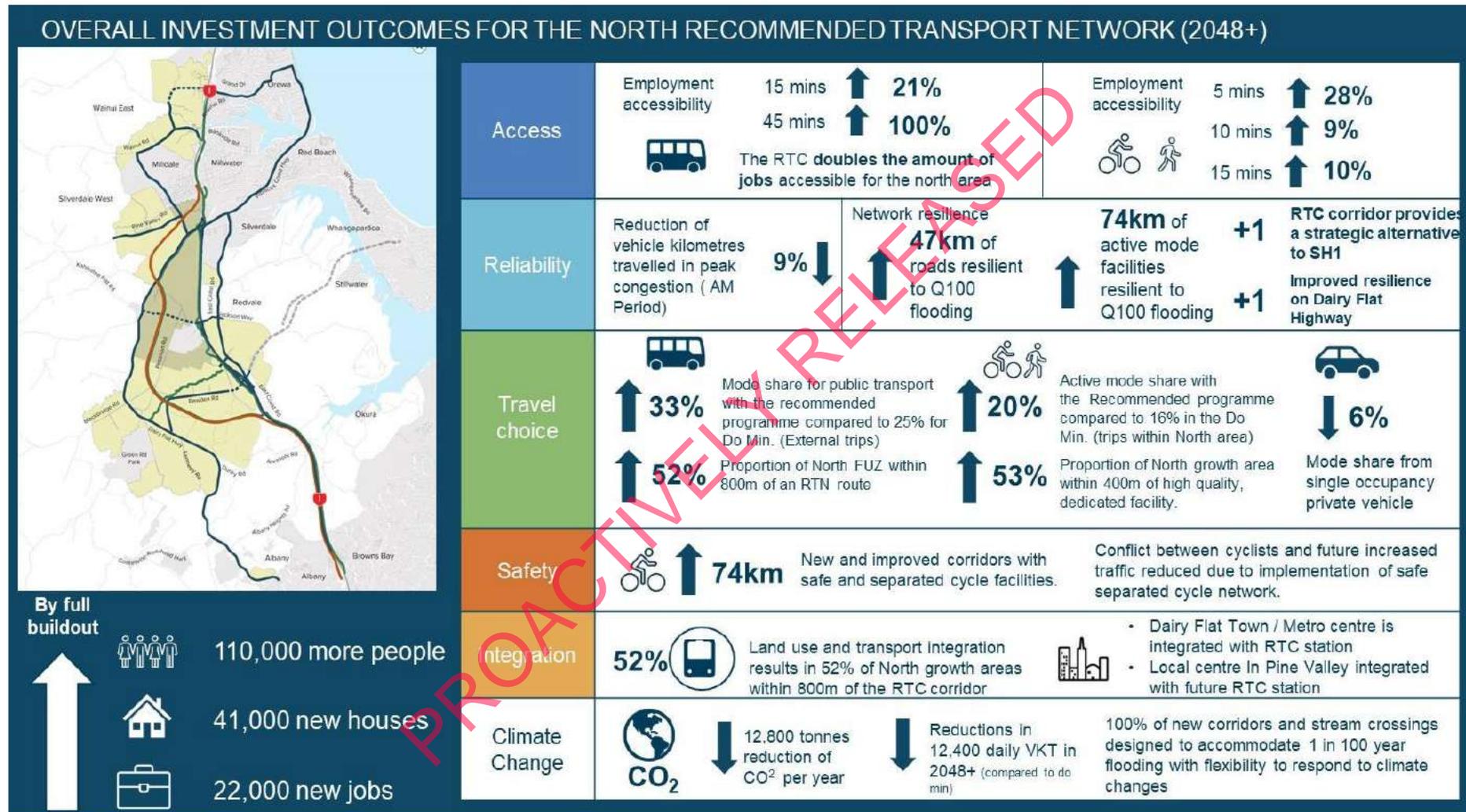
- Improved walking and cycling links including: Upgrades to the Wainui Interchange for Active Modes, A new active mode connection along the Dairy Stream and the Silverdale to Highgate active mode connection.

11.1 Key Performance Indicator Outcomes

The key outcomes for this recommended network are shown in Figure 11-3. Additional detailed information on overall outcomes for the North as well as insights for key strategic and local interventions are included in **Appendix G: Transport Outcomes Report**.

PROACTIVELY RELEASED

Figure 11-3 Outcomes for the North recommended network



The North DBC recommended programme provides transport benefits by:

1. Supporting the realisation of further benefits from these earlier interventions e.g., through investment on local roads to improve connectivity to rapid transit stations to maximise station catchments.
2. Delivering additional transport benefits for the existing northern area catchment (Silverdale, Ōrewa and Whangaparāoa) which as a result of this DBC programme are provided with enhanced travel choice and accessibility.

This recommended programme is a holistic package of interventions and whilst individual options may vary in their performance when considered in isolation, the performance of the programme is greatly increased when considered as a connected and complementary transport response. This results in the sum of the whole being greater than the sum of the individual parts. Each individual project addresses a local issue but then has a wider role in extending or completing an active mode or public transport network which has a flow on effect to the transport choices, reliability and efficiency area wide.

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

Table 11-1 Investment theme commentary

North Investment Theme	Commentary
Access	<ul style="list-style-type: none"> • The proportion of employment accessible by active modes increases in each of the time intervals assessed. Within 5 mins the proportion of employment increases by 28%, within 10 mins there is a 9% increase and in 15 mins there is a 10% increase in the Recommended Option compared to the Do-min. • The proportion of employment accessible by PT increases in each of the time intervals assessed. Within 15 mins the proportion of employment increases by 21%, within 30 mins and 45 mins there is more than a 100% increase in the Recommended Option compared to the Do-min.
Reliability/Resilience	<ul style="list-style-type: none"> • The transport network as a whole experiences less severe congestion. There is an 9% reduction of vehicle kilometres travelled in peak congestion (>90% v/c) in the AM peak in the Recommended Option. • 47 km of the road network within the Northern growth area achieves Q100 Flood level immunity. This helps support the overall sustainability and resilience goals of the North transport network. • The average PT travel time from the North area changes from an average of 82min to 68min to a destination in the City Centre.
Mode choice	<ul style="list-style-type: none"> • There is a 20% (4% increase) in active mode share in the Recommended option. • There is a 33% (8% increase) PT mode share in the Recommended option. • There is 6% mode shift from single occupancy private vehicles in the Recommended Option.
Safety	<ul style="list-style-type: none"> • While the number of previous active mode DSIs are relatively low. The conflict risk for these users will increase in the future as there are more vehicles and active mode users on the network. This risk can be significantly reduced by providing dedicated facilities separated from traffic.

North Investment Theme	Commentary
	<ul style="list-style-type: none"> The north network includes 74km of separated active mode facilities. 10 DSI reduction per year is anticipated from the recommended network.
Integration	<ul style="list-style-type: none"> The Rapid Transit corridor ensures 1400 Ha of developable future urban area is within a direct catchment of the RTC corridor. The RTC corridor integrates with the Future Town/Metro Centre in Dairy Flat and a proposed local centre in Pine Valley. In the Recommended Option, 3,103 hectares (53%) of the North is within 400m of a dedicated, separated active mode facility. Compared to the Do-min Option which has 242 hectares (4%). With the RTC corridor, 52% of the FUZ area is within 800m of the RTC corridor and an additional 49% of the population of the Northern growth area are within 400m of a high-quality, dedicated active mode facility in the Recommended Option The north network includes 46.8 km of new urban street scape space which will provide enough space for street furniture/lighting and tree planting appropriate to the known place function and built form. The proposed network supports the development of the Silverdale West Structure plan which provides industrial land and a large quantum of local jobs for the Northern Growth area.
Climate Change Response	<ul style="list-style-type: none"> The recommended network is based on the premise of maximising mode shift in the North. It is estimated to achieve a reduction in CO2 emissions of 12,800 tonnes per year compared to the Do Minimum scenario. The recommended network has been adapted to respond to 1 in 100 year flooding with 100% of new corridors and stream crossings meeting Q100 flood level immunity with flexibility to adjust to climate change. Conserve and provide opportunities to enhance the natural environment and cultural heritage including wetlands, SEA's, streams and vegetation stands.

Many of the outcomes outlined above compare the recommended network against a do minimum scenario. In the North area, the Do Minimum scenario is somewhat unrealistic in that the development of FUZ land is assumed to take place with no significant investment in transport infrastructure assumed. Travel in the Do minimum scenario is suppressed as a result of the significant congestion occurring on the network. This results in relatively high proportions of people using alternatives to private vehicle travel despite the lack of facilities and lower quality public transport network.

11.2 Sustainability outcomes

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

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

Figure 11-4 Sustainability principles

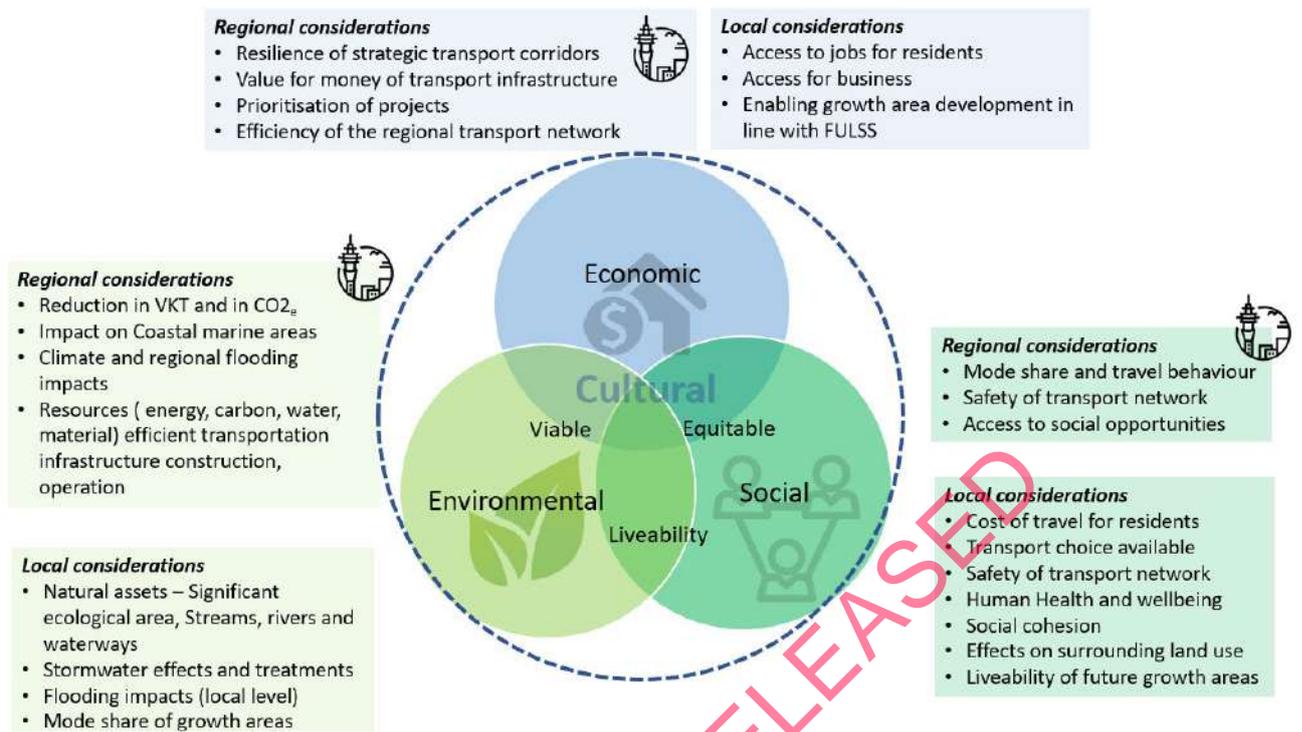


Figure 11-5 to Figure 11-7 detail how the recommended programme delivers against these three principles to support a positive environmental outcome, better community outcomes and impact on economics outcomes for the communities.

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Figure 11-5 North environmental outcomes

North Environment Outcomes



Wetlands

Natural wetlands and high amenity wetlands have been avoided where possible in the development of options.



Earthworks

Earthmoving quantities have been considered to seek a good cut/fill balance, significant gullies have been avoided. This is of particular significance for the RTC corridor where the route was influenced by effects on earthworks and the surrounding land. This remains a key step for most corridors to further optimise earthworks during the next stages of detailed design.



Stormwater

Stormwater ponds have been provided where possible to assist the attenuation and treatment of stormwater from the corridors.



Riparian habitats

Opportunities to enhance riparian habitat and retain mature vegetation have also been identified. Opportunities for stream enhancements have been identified for the SH1 corridor, RTC, Pine Valley Road and Dairy Flat Highway.



Habitats

Wherever possible, impacts on local streams, QEII covenanted areas and Significant Ecological Areas have been avoided, and where this has not been possible opportunities for mitigation through design have been identified.



Recycling materials

Where possible design solutions that reuse existing roads or assets have been adopted. New corridors presents a burden on resource use. Upgrades of existing roads have focused on road space reallocation to minimise excessive use of materials and identification of opportunities to reuse materials during the design phase. Future implementation stages will need to consider how to further minimise embodied carbon and construction emissions as well as consider type of materials used.



Emissions

9% reduction in vehicle kilometres travelled in peak congestion in the AM peak. CO2 reduced by 12,800 tonnes per annum from 2048+

Attractive public transport and safe active mode facilities on all corridors reduces private vehicle mode share to 71%



Climate change and flooding

Options which impact the least on flood zones and Overland Flow Paths have been selected wherever possible and 100% of new roads have been raised to meet Q100 flood immunity levels.

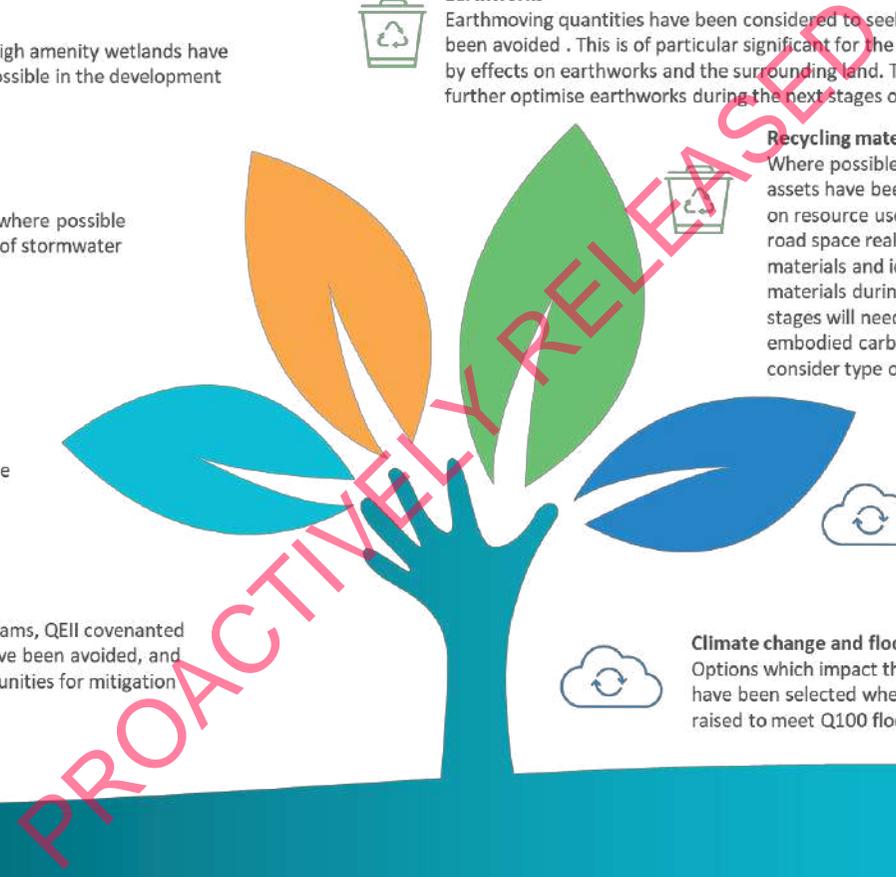


Figure 11-6: North social outcomes

North Social Outcomes

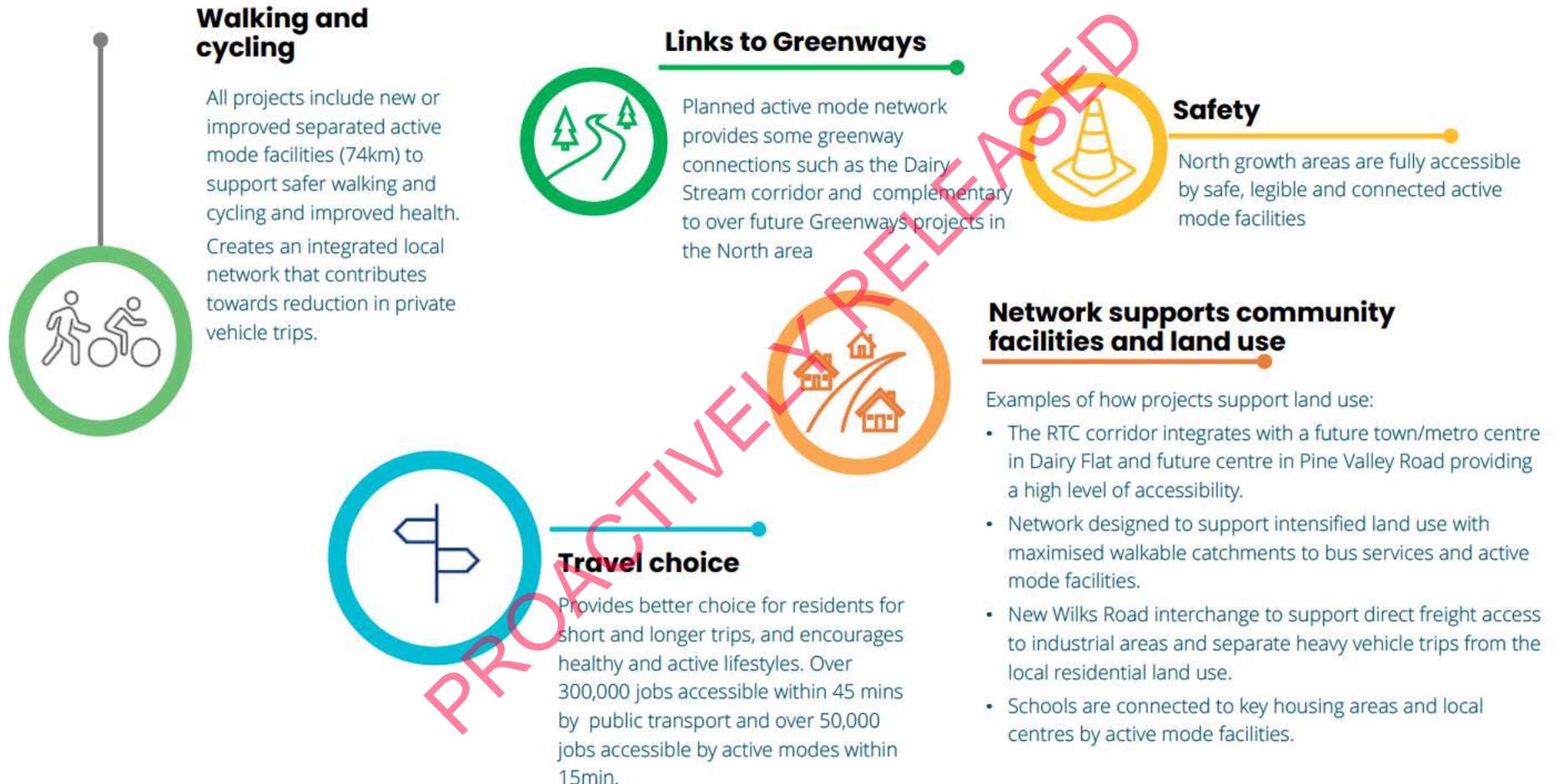


Figure 11-7 North Economic outcomes

North Economic Outcomes

Transport Choice

- Focused investment in public transport and active mode options to enable travel choice in the Growth Area
- Active mode investment creates connected infrastructure linking people to jobs and schools.
- Public transport services have been designed to maximise developable area within a direct catchment of RTC stations to provide a high-quality PT service
- Reductions in 80M annual VKT in 2048+ (compared to do min)
- Mode share for the North recommended network in 2048 AM peak is:

  **20%**
 **33%**

- Further improvements on bus mode share can be expected with supporting measures such as travel behaviour and parking controls.



Access to jobs

- Over 300,000 jobs can be accessed within 45 minutes by public transport.
- Over 50,000 jobs can be accessed within 15 minutes by active modes

Integrate with other projects

- Integrates with RTC corridor at Albany to the south of the study area.
- Intergration with Ō Mahurangi Penlink project providing a direct connection to Whangaparaoa for all modes

Connectivity

- Provide direct connections for freight to the strategic road network via a new Wilks Road interchange

Integration with development

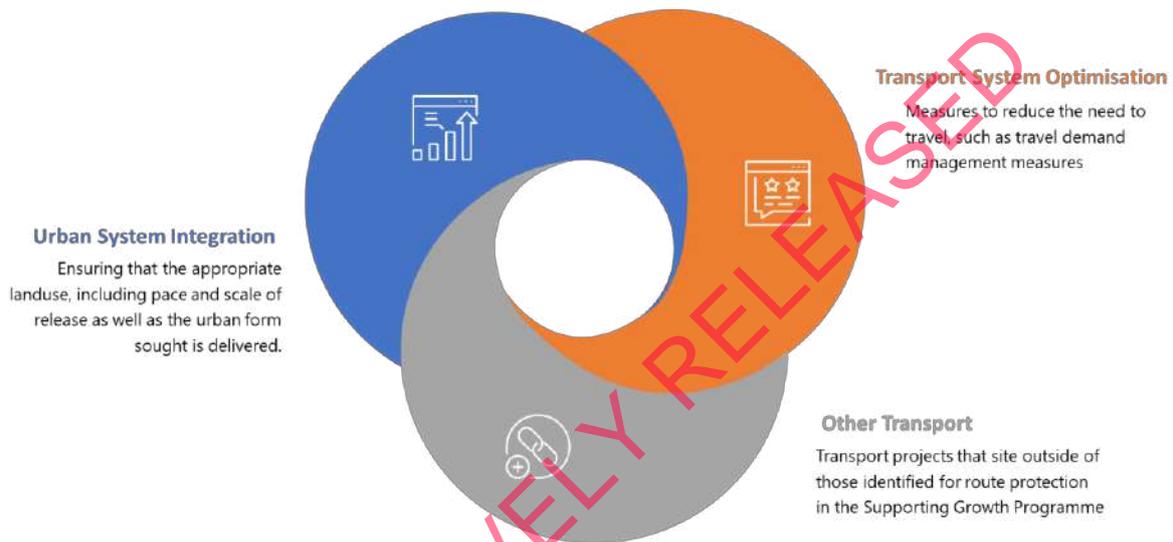
- Options that integrate well with future land use and FUZ development have been selected.
- The RTC corridor provides 1400 Ha of developable area within the FUZ within a walkable catchment to a RTN station.
- Walking and cycling network and road network offer a spine network on which surrounding development can access and build upon.

11.3 Supporting measures

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

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

Figure 11-8 Additional contributory elements



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

Specific North complementary measures are summarised in Table 11-2. Management of these measures are discussed further in the Management Case of this DBC (Section 14).

Table 11-2 Supporting measures for the North Recommended Network

Supporting measure	Measure	North application
Urban System integration	Ongoing land use and transport integration	<p>This programme of transport interventions is intrinsically linked to the urban system including land use, urban form & place quality, density & proximity, and employment self-sufficiency. Te Tupu Ngātahi recognises this with place making and liveability outcomes a key focus area, alongside alignment with the future pace, location and scale of the proposed growth.</p> <p>It is therefore critical that these urban system integration outcomes are delivered alongside and at the appropriate timing for the transport interventions recommended.</p>

Supporting measure	Measure	North application
		<p>Parts of the North area have an adopted structure plan (Silverdale West industrial area) which gives an initial level of certainty over how land use is expected to develop. The first phase of this structure plan area is anticipated to undergo a plan change in the following years.</p> <p>Other parts of the network are yet to undergo structure planning and thus the land use is less certain. Continued discussions will be required with Council to help shape the land use in these areas to best support the overall North transport outcomes. This will include maximising development around RTC stations and centres and creation of local cycling networks on newly developed roads to connect with the planned arterial active mode network to support the wider uptake of cycling. There will be an important ongoing discussion in relation to timing of growth and the ability to have the core infrastructure ready to enable good travel behaviour choices and access from the outset of development.</p> <p>Land use integration discussions will also need to be extended to identified government partners such as Kāinga Ora or Eke Panuku as well as third party developers to maximise opportunities to best connect developments with the transport network.</p>
Transport system optimisation	Travel Demand Management	The Te Tupu Ngātahi programme IBCs identified a wide range of Travel Demand Management 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.
	Increased bus frequencies	The North recommended network enables a future high frequency local bus network. However, without the operational funding to actually increase bus services and the overall attractiveness of the service, the public transport mode shift will not be realised.
	Fleet Management	Whilst mode shift is preferable to reduce emissions there is also a role for better fleet management to support emission reduction targets. This will include wider government-led initiatives to support the uptake of electric vehicles (including buses) to reduce emissions from private vehicles and could also extend to the introduction and uptake of biofuels. Emission modelling in 2048+ includes an assumption of ~66% of the total fleet being electric and this is a major contributor to reduction in emissions. Therefore, this is a very important measure to support the overall reduction in emissions and maximise the outcomes of the North recommended network.
Other Transport	Implementation of key projects	This programme relies on a number of other transport projects being in place within the transport system to support the preferred transport network and realise the desired transport outcomes. Examples of this are:

Supporting measure	Measure	North application
		<ul style="list-style-type: none"> • Completion of Ō Mahurangi Penlink project • Completion of the Argent Lane and New Pine Valley Road upgrades • Completion of the Milldale to Highway Bridge. <p>The DBC has identified project dependencies in Section 5.2.</p>

11.4 Difference to the IBC network

The recommended North transport network is mostly aligned with the IBC network as shown in Figure 11-9. The corridors highlighted in red are the corridors that have changed since the IBC and additional details of these changes are summarised in Table 11-3.

Figure 11-9 Comparison of the North IBC network to the DBC network (key changes circled)

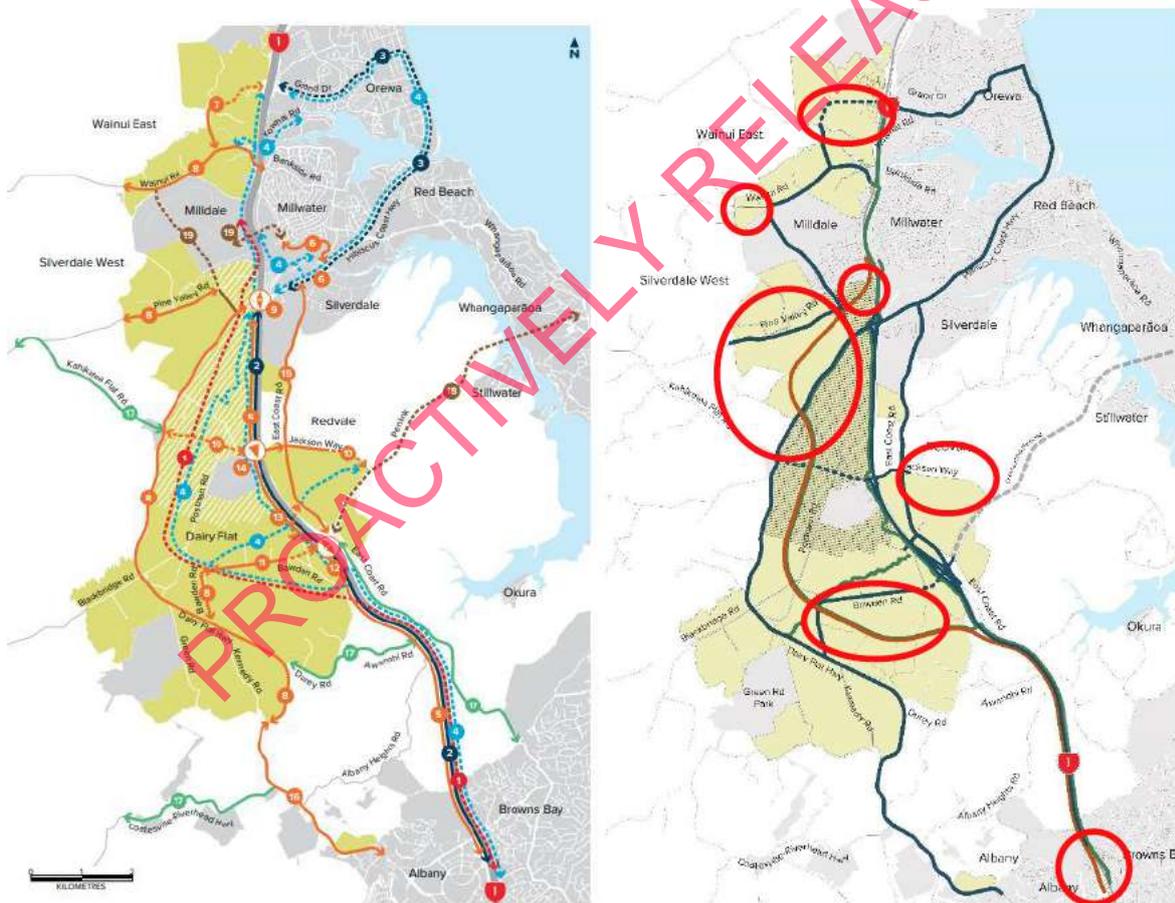


Table 11-3 Summary of key changes between North IBC and DBC networks

Corridor	What has changed?
RTC tie in to Albany	The DBC assessed and ultimately recommends changing the tie in point for the Rapid Transit corridor between the eastern side of SH1 (IBC) to the western side.
Jackson Way arterial	The IBC included an arterial road along Jackson Way with connection to Ō Mahurangi Penlink. During the DBC project, this corridor was excluded from the route protection scope as the traffic volumes expected considered to reflect a collector road.
RTC alignment in Dairy Flat	Through the DBC option development, the RTC alignment altered from the IBC corridor as more detailed design and assessment. The change in alignment (up to 200m to the south) reduced the project effects on ecology and property.
RTC alignment in Pine Valley	Through the DBC option development, the recommended option has diverted north of Dairy Flat Highway. The recommended option provides for Stations within a future residential development area.
New connection between Wainui and Grand Drive alignment	Through the DBC option development, a change to the alignment has occurred at the northern extent with the alignment moved to the north west compared with the IBC alignment.
Wainui Road extents	Through the DBC, the length of Wainui Road has been reduced to reflect the presence of an existing Infrastructure Funding Agreement between the developers and Auckland Transport. The western extent has been identified at Lysnar Road.
Kowhai Road active mode connection	This project was removed from the DBC scope as a connection has been completed by the developer in this area.
Silverdale to Highgate active mode connection (Curley Avenue)	The DBC option development considered options for this connection. The recommended option favours a connection to the SH1 active mode facilities as opposed to the IBC option through the Curley Avenue area.

11.5 Staging assessment

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

11.5.1 Proposed staging

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

- Provide a meaningful improvement to Walking and cycling and public transport in the short to medium term to support the existing urban areas and portions of new growth already underway.
- Programme public transport and active mode facilities and services from the outset of urban development to support a shift to more sustainable travel.
- Prioritise PT and active mode facilities that support attractive access to the RTC stations.
- Consider staging of elements of a project to match likely development stages and system needs, whilst also considering pathways to achieve the full-build elements.
- Consider the need to support place-function, not solely movement function.
- Provide safe travel by all modes.
- Staging that can respond to the timing, scale and form of urban development.

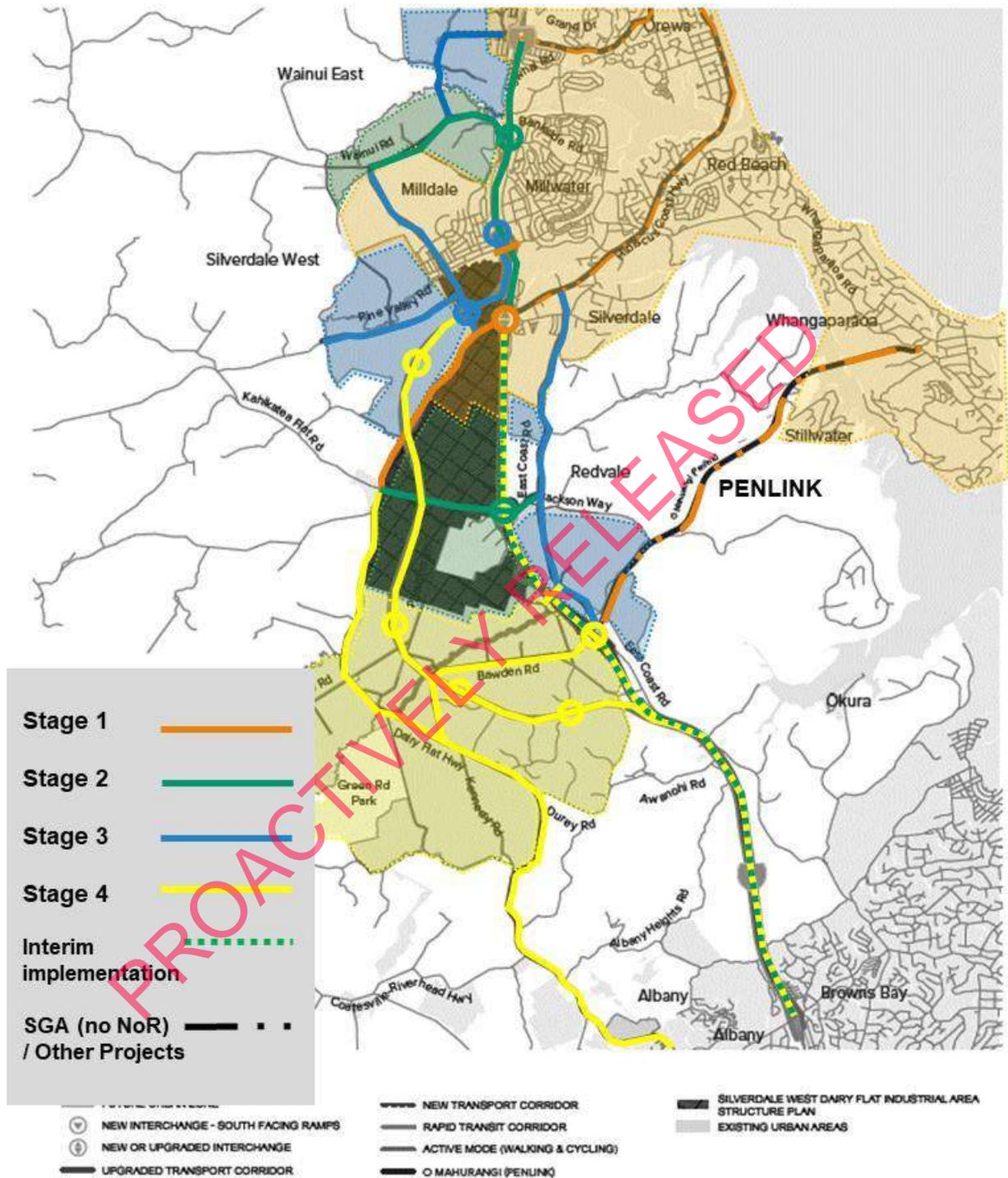
For the north network, the application of the staging principles and expected land use pressures has resulted in four stages of implementation of projects within the programme. While some expected timeframes are provided, these are uncertain, however there is a direct correlation between land use and the transport infrastructure required to support each area. At a high level, the key components of each stage are set out in Table 11-4.

Table 11-4: Staging of the north network relative to land use

Stage and indicative timing	Transport Network
Stage 1 (2023-2033)	Provides the necessary infrastructure to support the stage 1 of the Silverdale West industrial area and includes upgrade to the Hibiscus Coast Highway and Grand Drive corridor to support mode shift in the existing brownfield areas.
Stage 2 (2033-2043)	Continues to provide infrastructure to support the ongoing development of the Silverdale West industrial area and includes some infrastructure around the Milldale development. An upgrade is proposed on SH1 to improve bus travel to and from the north area.
Stage 3 (2043-2053)	Includes infrastructure required to cater for development of the Pine Valley area and Redvale development areas. From a Public transport perspective, Stage 3 includes implementation of a portion of the RTC corridor and a station at Pine Valley as a catalyst from development in the area however is dependant on the mode of the RTC corridor.
Stage 4 (beyond 2053)	Sees the full implementation of the RTC corridor and infrastructure required to serve the Dairy Flat area. Following implementation of the RTC corridor, changes could be made to SH1 to reuse the bus lanes for another purpose.

Figure 11-10 provides the proposed staging of projects in a summary map.

Figure 11-10: North programme staging



11.5.2 What happens if the timing of land use changes?

The timing of growth in the Northern growth area is subject to inherent uncertainty in timing. Since the IBC phase, regional forecasting has suggested a delay to growth in the northern area. In recent

population forecasts, Auckland regional growth has reduced further compared to the growth assumed in the regional transport model.

The council is considering both changes in regional forecasts and the implications of Policy changes such as the NPS:UD and MDRS on both existing urban areas and Future urban areas alike in the refresh of the FULSS work. The Future Development Strategy workstream is occurring in parallel to this DBC. While no detailed changes were available to be taken into account within the DBC, consideration has been given to what a delay in growth might mean for the North staging.

On the flipside, portions of the North area could come under development pressure building on successful developments in the area such as Milldale and Ara Hills or taking advantage of Transport infrastructure projects. Examples from elsewhere in Auckland suggest development of FUZ land out of the Council's desired sequencing can occur and avenues are available to developers to progress these projects.

Table 11-5 sets out some consideration of changes to land use timing, considering both delay and acceleration to land use development and provides commentary on how this might influence staging of infrastructure.

Table 11-5: Resilience of the proposed network to land use changes

Change	Commentary
Dairy Flat growth is delayed further	<p>With growth in Dairy Flat delayed further, Stage 4 of the recommended staging strategy would be delayed. Infrastructure such as implementation of the full RTC, Upgrades to Dairy Flat Highway, Upgrade and extension of Bawden Road, Upgrade of the Redvale interchange, Dairy Flat SH1 crossing and Dairy Stream active modes would be delayed in implementation timeframes.</p> <p>With the RTC corridor implementation delayed further, consideration should be given to further enhancements to the SH1 bus lanes through consideration of priority at the interchanges to better serve the existing and newly developed areas until such time as the RTC corridor could be implemented.</p>
Dairy Flat growth occurs earlier than anticipated and earlier than land to north	<p>With growth in Dairy Flat area occurring earlier, the staging approach to the RTC project will need to adapt to service this area. Development of the RTC corridor from the south (Albany) to Dairy Flat could serve the area and drive desirable land use outcomes. As areas to the north are developed, the RTC corridor could be extended north.</p> <p>Other projects within the Dairy Flat area would also likely be required to cater for growth including Redvale interchange, The Dairy Stream SH1 crossing, Bawden Road, Dairy Flat Highway and dairy stream active mode corridor.</p>
Wainui area develops earlier than anticipated	<p>The Wainui area (north of Milldale) is expected to come under development pressure prior to the FULSS and regional modelling assumed timeframes for development.</p> <p>If development was brought forward, implementation of supporting transport infrastructure would be required. The infrastructure expected to be required include:</p> <ul style="list-style-type: none"> • Wainui Road • SH1 walking and cycling facility • SH1 upgrade

Change	Commentary
	<ul style="list-style-type: none"> • New connection between Wainui and Grand Drive • Argent land and New Pine Valley Road upgrade <p>If land use development is accelerated, funding is likely to be a key consideration governing if the required infrastructure can be implemented to support development.</p>
Redvale area develops earlier than anticipated	<p>The Ō Mahurangi Penlink project is currently under construction and will provide access for land in the Redvale area. Development pressure could occur in this area prior to the assumed timing in the FULSS and regional planning.</p> <p>Several parts of the network are expected to be required earlier to cater for any change in timing including:</p> <ul style="list-style-type: none"> • Upgrade to East Coast Road • Walking and Cycling facilities on SH1

Appendix N – Staging consideration provides further details as to each project and the interdependency on other projects and land use development in the north. The proposed network is considered to be robust to external land use changes. The main impact from land use changes will be the order of infrastructure development.

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12 Economic Case

This section summarises the economic analysis which has been prepared for the full recommended package. The North 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 Monetised Benefits and Costs Manual (MBCM).

Appendix K: Economics Assessment sets out the full methodology, assumptions, scenario testing, incremental analysis, and sensitivity analysis undertaken. For economic assessment purposes the North DBC has been split into the following packages in Table 12-1.

Table 12-1 Economic packages for assessment.

Economic Package	Corridors included
North overall	All projects
Rapid Transit Corridor	Rapid transit corridor between Albany and Milldale including stations
SH1 improvements	SH1 upgrades between Albany and Silverdale including interchanges and active mode corridor between Albany and Grand Drive.
Dairy Flat	Upgrades within the Dairy Flat area including: <ul style="list-style-type: none"> • Bawden Road upgrade • Dairy Flat Highway (Kahikatea to Durey) • Dairy Flat Highway Durey Road to Albany • Dairy Stream active modes • Dairy Stream SH1 crossing
Silverdale West	Upgrades within Silverdale West including: <ul style="list-style-type: none"> • Dairy Flat Highway • New link between Wilks Road and Dairy Flat Highway • East Coast Road upgrade
Wainui	Upgrades within Wainui and the Upper Orewa area including: <ul style="list-style-type: none"> • Pine Valley Road • Wainui Road • Argent Lane and New Pine Valley

12.1 Key assumptions

The key assumptions assumed in the economic analysis are shown in Table 12-2.

Table 12-2 Key economic assumptions

Assumption Type	North DBC Assumptions
Base date	1 July 2022
Time zero	<ul style="list-style-type: none"> Time zero was assumed a year before construction start for each project.
Analysis period	<ul style="list-style-type: none"> Analysis period for local project packages is 40 years, but sensitivity tested at 60 years Analysis period for Strategic Packages is assumed as 60 years for base case analysis
Travel time benefits	Travel Time user cost is a mixture of Urban Arterial and Rural Strategic composite costs. The North DBC project traffic benefits are largely associated with Urban projects. As such, it is expected to have 90% urban arterial share and rest 10% as rural strategic. This aligns with the assumed share estimated for Te Tupu Ngātahi South DBCs. For robustness, a test with 100% urban arterial share was undertaken and the BCR remained unaffected.
Vehicle operating costs	Assessment of base running vehicle operating costs (VOC) from the EMME models other than RTC (using MSM Model).
Discount rates	Discount rate 4% applied to all annual benefits and costs, but sensitivity tested for 3% and 6%.
Transport reliability benefits	<ul style="list-style-type: none"> Assumed as 8% of the base travel time benefit, as a standard approach. Public transport reliability benefits are estimated as 70% of public transport user benefits in the commuter peaks and 40% in other periods.
Public transport reliability	For RTC, the PT reliability is predicted to be 90% in commuter peaks and 40% in other peaks.
Emissions	CO2 benefits are calculated from VEPM 6.1 Emissions.
Walking and cycling benefits	Estimated based on trip demand and travel cost matrices from SAMM, using the same method as used for PT benefits in the MSM, and using same approach as South DBCs.
WEBS	WEBS calculated for a test-case of the full package in 2048+ and for RTC as a representation of strategic projects, in accordance with the MBCM, then applied to the project 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.

12.2 Cost

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

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

12.2.1 Capital Cost

Cost estimates (expected cost P50) and property costs for each individual project are outlined in Table 12-3.

It is worth noting the following key cost assumptions:

- **Type A projects** (Hibiscus Coast Highway, Argent Lane and New Pine Valley Road upgrade and Dairy Stream active modes) do not require land and are therefore not being progressed to route protection. The costing methodology for these routes has been based on linear rates for the concept designs.
- Property pricing undertaken by AT. For AT projects, this does not include Auckland Council property as when AT is acquiring land under the Public Works Act (PWA) it is doing so on behalf of Auckland Council. For WK projects, allowance has been made for acquisition or temporary occupation of this land.

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Table 12-3 Capital Costs

No.	Package Projects	P50 Cost (Undiscounted, \$M 2023)	P50 Property Cost ¹¹ (Undiscounted, \$M 2023)
1	Rapid Transit Corridor	\$1,745	\$352
2	SH1 improvements	\$2,161	\$93
3	Wainui package	\$781	\$62
4	Silverdale West package	\$357	\$49
5	Dairy Flat package	\$1,314	\$124
	Total	\$6.4B	\$679M

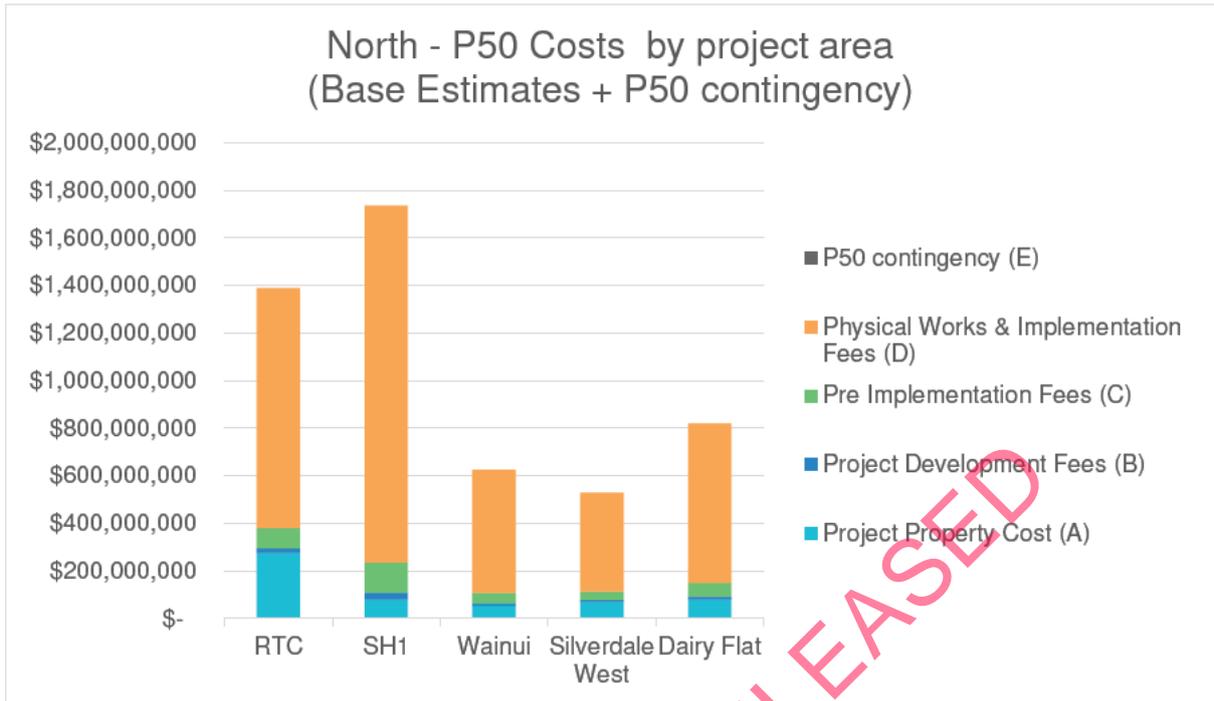
The P50 estimated costs for the North projects includes the following costs.

- Property.
- Project development.
- Pre-implementation.
- Physical works and Implementation.

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

¹¹ Includes temporary occupation cost

Figure 12-1 North P50 Cost estimates – by project area



12.2.2 Operation and maintenance costs

Operating and maintenance costs associated with the North are shown in Table 12-4. The following descriptions describe how these costs were assessed.

[Redacted]

12.2.3 Public transport operating costs

PT operating costs were adopted from those used in the IBC, namely ██████████ for buses. 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 light rail service kms from the MSM model.

The change in farebox revenue¹² 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 farebox revenue obtained from MSM for the RTC stations have been discounted in similar way as the benefits as mentioned in Section 1.3.6.

12.3 Benefits

The key economic benefits generated by the North recommended programme are summarised in Table 12-5.

Table 12-5 North economic benefits

Items	NPV Benefits (\$m)					
	RTC	SH1	Wainui Arterials	Silverdale West Arterials	Dairy Flat Arterials	North DBC(All Projects)
Traffic - Travel Time Benefits	447	889	35	243	3	1618
Traffic - Congestion Benefits	179	195	5	18	-29	368
Traffic - Trip Reliability	36	71	3	19	0	129
Traffic - Vehicle Operating Costs	-20	49	12	39	-59	21
Active Modes	9	17	89	8	20	143
Crash savings	5	10	0	3	0	18
PT - Travel Time Benefits	474	3	81	32	132	723
PT - Reliability	249	5	39	16	64	373
PT - Health benefits	242	-23	24	11	22	276
CO2	14	-2	1	3	-3	12
PV total net benefits excluding WEBS	1635	1213	290	393	150	3681

¹² Farebox revenue - Fares collected on public transport services

Key observations

- The PT user benefits comprise the major portion of benefits for RTC which appears reasonable for this scale and type of Project. The RTC project has a major benefit to the remaining network through reducing congestion.
- The SH1 improvements is expected to improve travel time benefits significantly. There is modelling evidence that when SH1 and RTC are implemented together, there combined effects are much intensified than individual implementation.
- In the Dairy Flat and Wainui area, the majority of benefits are provided through public transport and active mode benefit streams.

12.4 Benefit Cost Ratio (BCR)

The Base Estimate BCRs with and without Wider Economic Benefits (WEBs) are shown in Table 12-6 and Table 12-6. Overall, the North programme is expected to achieve a **1.1 BCR**.

Table 12-6 North DBC BCR excluding WEBs

Projects	PV total benefits, \$M PV	PV total net costs, \$M PV	National BCR
RTC	1635	919	1.8
SH1 improvements	1217	1251	1.0
Wainui	290	516	0.6
Silverdale West	393	198	2.0
Dairy Flat	150	480	0.3
North programme wide	3685	3365	1.1

Table 12-7 North DBC BCR including WEBs

Projects	PV total benefits, \$M PV	PV total net costs, \$M PV	National BCR
RTC	1880	919	2.0
SH1 improvements	1395	1251	1.1

Projects	PV total benefits, \$M PV	PV total net costs, \$M PV	National BCR
Wainui	333	516	0.6
Silverdale West	452	198	2.3
Dairy Flat	173	480	0.4
North programme wide	4233	3365	1.3

The North recommended transport programme underpins the whole premise for growth in the North and without it growth would be constrained. The evaluation is based on the standard evaluation methods for transport infrastructure, which is typically dominated by travel time savings. The purpose of many of the identified schemes are primarily about providing the basic infrastructure to make growth happen such as urbanising existing rural roads or providing new connections to enable the land use to develop. Therefore, although travel times may improve for those living in the area this is a secondary consideration to the fundamental requirement to provide access.

12.5 Range of BCR estimation

The BCR range estimation is split into analysis framework and parameter sensitivity tests. The Analysis framework includes Discount rate and Analysis period and Parameter sensitivity include %WEBs, PT Reliability, Active mode and traffic benefits variability. Full details are included in **Appendix K: Economics Assessment**.

The sensitivity tests show that the BCR have fairly small impact on the parameter sensitivity tests but larger variations are observed on discount rate and analysis period sensitivity. For the Rapid Transit Corridor, the BCR may range between 1.4-2.2 and for SH1 improvements 0.6-1.3. The North Program-wide DBC BCR have not been tested for parameter sensitivity but given that it has negligible effect on BCR, and the BCR lies within the analysis framework range, it can be predicted to range between 0.8-1.6.

Table 12-8: Summary of BCR Range for the North DBC Projects (Draft and subject to peer review)

	RTC	SH1	Wainui Arterials	Silverdale West Arterials	Dairy Flat Arterials	Combined North DBC
Analysis Framework	1.4-2.2	0.6-1.7	0.4-0.9	1.4-3.1	0.2-0.4	0.8-1.6
Parameter Sensitivity	1.5-2.2	0.7-1.2	0.5-0.7	1.6-2.5	0.2-0.4	0.9-1.4

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 station corridors expanded to full stations at a later date when needed). Both of these opportunities could 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.

12.5.1 Delay to growth in the North

The Land use growth might slow down in the north area for unknown reasons in long term and hence the project start date might need to be delayed meeting the changed transport needs. We recognise such situation to arise but believe it will not have any significant impact on the economic returns from the project as the costs and benefits timestreams will be shifted with the project start.

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12.6 Investment prioritisation method

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

Factor	Rating
GPS alignment	<p>High – Very High</p> <p>Gives close effect to the GPS. The recommended North network has a strong focus on safety, mode shift (30% mode share by PT and 20% mode share for active modes) and better access to social and economic opportunities (100% increase in jobs accessible via PT). This is provided through new connections, real transport choice and design improvements. The mode shift focus of the network fundamentally supports the development of a low carbon transport network for future growth. The proposed upgrades on State Highway 1 and upgrade arterial network supports improved freight connections.</p>
Efficiency	BCR 1.1 (L)
Scheduling	<p>High.</p> <p>This programme has a high interdependency rating. Non delivery of the route protection will affect developability of FUZ land and lead to significant increases in implementation costs and reduce outcomes achieved by the projects once implemented. Without the investment the planned land release will not be able to occur at the same speed or density.</p>
Priority order	2
<p>Explain any variances from the existing NLTP priority order</p> <p>The North IBC used the Waka Kotahi 2018-2021 Investment Prioritisation Method. This identified programme as High – Very high for alignment and low for Cost Benefit Appraisal. Activities were assessed by activity class in the IBC phase. The North DBC remains consistent with this assessment. Both the costs and benefits have increased from the IBC however have remained consistent from a relatively perspective.</p> <p>These projects are not VKT based and therefore these benefits are not particularly well captured under the MBCM framework. Due to the route protection nature of this DBC, no consideration has yet been given to value engineering or alternative value capture methodologies. The IBC BCR included WEBS as part of its base BCR, however the new MCBM excludes WEBS from the base calculations. BCR range in this table to demonstrate that the alignment between the IBC and DBC is not dissimilar when WEBS are considered.</p>	

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Financial Case

13 Financial Case

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

- Level of third party (developer) funding, as this requires negotiation, agreement and must be undertaken on a case by case basis.
- Change in quantum of property acquisition required.
- Cost of property is higher or lower than assumed.
- Growth is quicker or slower than assumed.

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

The following analysis is based on the staging assumed in the Economic Case which is broadly based on the estimated release of land in the North as set out in Appendix N Staging considerations. Section 10.5 discussed an example of an alternative staging which would lead to a delay in implementations of parts of the network. Given this is a route protection DBC, the effect of this possible alternative staging is unlikely to change the costs of potential property acquisition needed in the first 20 years, but spread out capital expenditure over a greater period.

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

Not all projects in the recommended network have been recommended to proceed for route protection. Table 13-1 provides a summary of the project assumptions for this financial case. For more detailed information on the route protection strategy refer to Section 10.5 and Appendix L: Route Protection Strategy.

Table 13-1 Financial case assumptions for route protection

NOR	Package Projects	Project to be implemented	Route Protection required?	Type of Route protection
1	Rapid Transit Corridor – Albany to Milldale (including new walking and cycling path along RTC)	Yes	Yes	NOR
2	New Milldale Station	Yes	Yes	NOR
3	New Pine Valley Station	Yes	Yes	NOR
4A	Upgrades to SH1 between Albany and Silverdale	Yes	Yes	NOR
4B	New Walking and Cycling path along SH1	Yes	Yes	NOR
4C	Upgrade to Silverdale Interchange	Yes	Yes	NOR
4D	New Wilks Interchange	Yes	Yes	NOR

NOR	Package Projects	Project to be implemented	Route Protection required?	Type of Route protection
4E	Upgrade to Redvale Interchange	Yes	Yes	NOR
4F	Wainui Interchange Active Mode Upgrade	Yes	Yes	NOR
4G	Silverdale to Highgate Active Mode Connection	Yes	Yes	NOR
5	New Crossing of SH1 at Dairy Stream	Yes	Yes	NOR
6	New Connection between Milldale and Grand Drive	Yes	Yes	NOR
7	Upgrade to Pine Valley Road	Yes	Yes	NOR
8	Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat	Yes	Yes	NOR
9	Upgrade to Dairy Flat Highway between Durey Road and Albany Village	Yes	Yes	NOR
10	Upgrade to Wainui Road	Yes	Yes	NOR
11	New Connection between Dairy Flat Highway and Wilks Road	Yes	Yes	NOR
12	Upgrade and Extension to Bawden Road	Yes	Yes	NOR
13	Upgrade to East Coast Road	Yes	Yes	NOR
A1	Upgrade of Argent Lane and New Pine Valley Road	Yes	No	N/a
A2	Upgrade of Hibiscus Coast Highway and Grand Drive for public transport and active modes	Yes	No	N/a
A3	Dairy Stream Active Mode Path	Yes	No	N/a

13.1 Whole of life costs

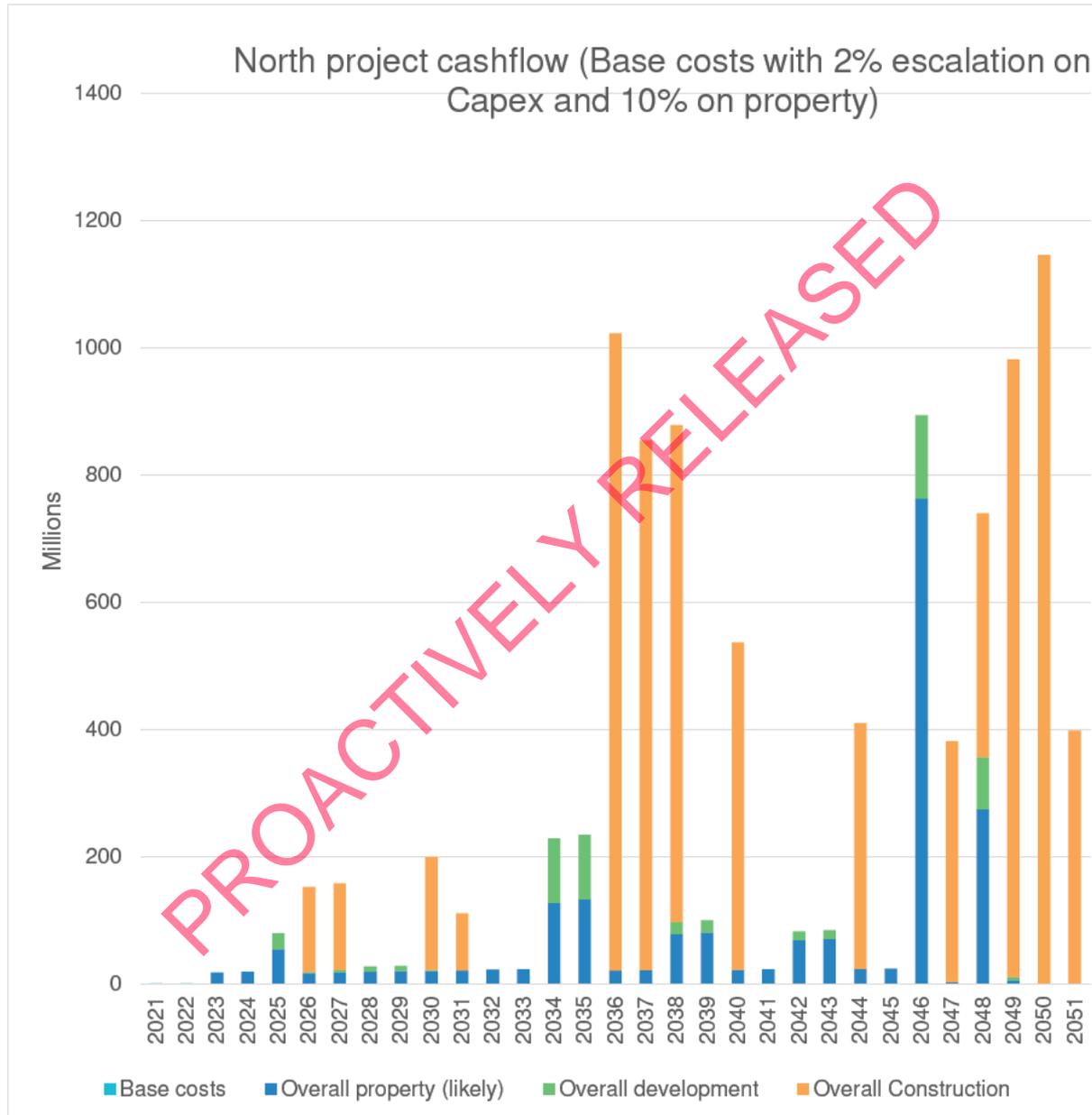
The financial implications for Waka Kotahi and Auckland Transport can be summarised into the following categories:

- **Cost of route protection** (Post lodgement costs, early property acquisition and property implementation costs).

- **Implementation costs** (Project development, pre-implementation, project implementation).
- **Operations and Maintenance costs.**

The North cashflow by project phase is shown in Figure 13-1. This demonstrates that the initial costs are predominantly route protection and development costs with implementation costs spread over the next 30 years.

Figure 13-1 Whole of life North cashflow (excluding contingency)



13.1.1 Cost of route protection

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

13.1.1.1 Professional services – Post lodgement costs

The expected post lodgement cost is detailed in Table 13-2. It is assumed these costs will be incurred following NOR lodgement in 2023. It is assumed costs will be split equally over 2024 and 2025. Post lodgement fees are already allocated within the RLTP and no additional funding is required to cover post lodgement for the North NoRs.

Table 13-2 Professional service costs for North post lodgement

Post Lodgement cost item	Cost (undiscounted \$Millions)
Target Cost Estimate (TCE)	7.6
Risk	0.5
Escalation	1.6
Management cost (including 5.7% charge)	6.2
TOTAL	15.9

13.1.1.2 Expected property costs of route protection

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

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

- Profile A: Designate and hold until implementation (generally applies to greenfield sites and assumes 20% early acquisition)
- Profile B: Designate and moderate acquisition (generally applies to brownfield sites and assumes 40% early acquisition).
- Profile C: Early acquisition (applicable for strategic sites where 60% of property is acquired early).

The North profiles are shown in Table 13-3 below. The majority of corridors within the North are considered likely to follow Profile A being predominantly within Greenfield areas, having limited full acquisitions and low implementation timeframes. The RTC project has been assumed to follow Profile B due to the offline nature of the corridor, quantum of full acquisitions and impacts on the existing land.

No project has been identified as a profile C due to the generally longer lead time for expected implementation. However, going forward further consideration to early acquisition of key sites such as RTC station sites might be considered by the owners as part of the commitment to land use and transport integration in the North.

Table 13-3 Property acquisition profiles for the North¹³

Package Projects	Profile A	Profile B	Profile C
A new Rapid Transit corridor between Albany and Milldale		✓	
Upgrades to SH1 between Albany and Silverdale	✓		
A new walking and cycling path along SH1	✓		
Improvements to the existing Silverdale interchange	✓		
Upgrade to Pine Valley Road	✓		
Upgrade to Dairy Flat Highway between Silverdale interchange and Dairy Flat	✓		
New connection between Dairy Flat Highway and Wilks Road	✓		
Upgrade and extension to Bawden Road	✓		
New connection between Milldale and Grand Drive	✓		
Upgrade to East Coast Road between Silverdale and Redvale Interchange	✓		
Upgrade to Dairy Flat Highway between Dairy Flat and Albany	✓		
Upgrade to Wainui Road	✓		
Upgrade of Hibiscus Coast Highway and Grand Drive for public transport and active modes		N/A	
New SH1 crossing at Dairy Stream			
A new active mode connection along the Dairy Stream		N/A	
New Argent Lane and new Pine Valley Road		N/A	

The overall cashflow associated with the cost of route protection is shown in Figure 13-2 and illustrates how the condensed timeframe for land release front loads the route protection liability for the North. The assumed staging shows a relatively consistent property requirement for both the strategic (RTC and SH projects) and local projects. One local project (part of Dairy Flat highway) is assumed to be implemented within the 10-year period and thus requires property for implementation.

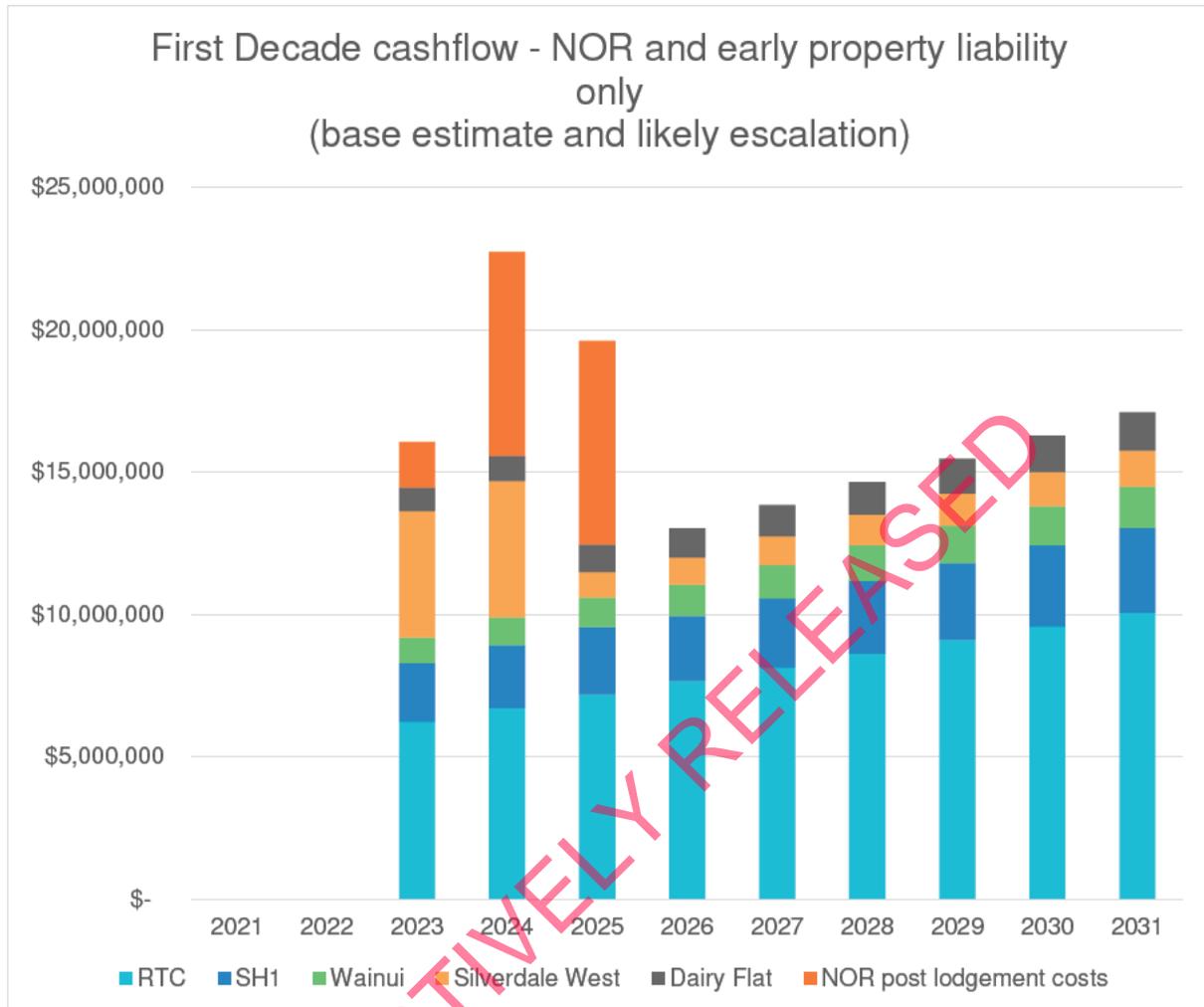
¹³ Note only corridors that are proceeding to route protection are included in this property assessment..

Figure 13-2 Cashflow for cost of route protection- NoR Post Lodgement Costs, Early Property Acquisition, Property Implementation (base estimate plus likely escalation 10%)



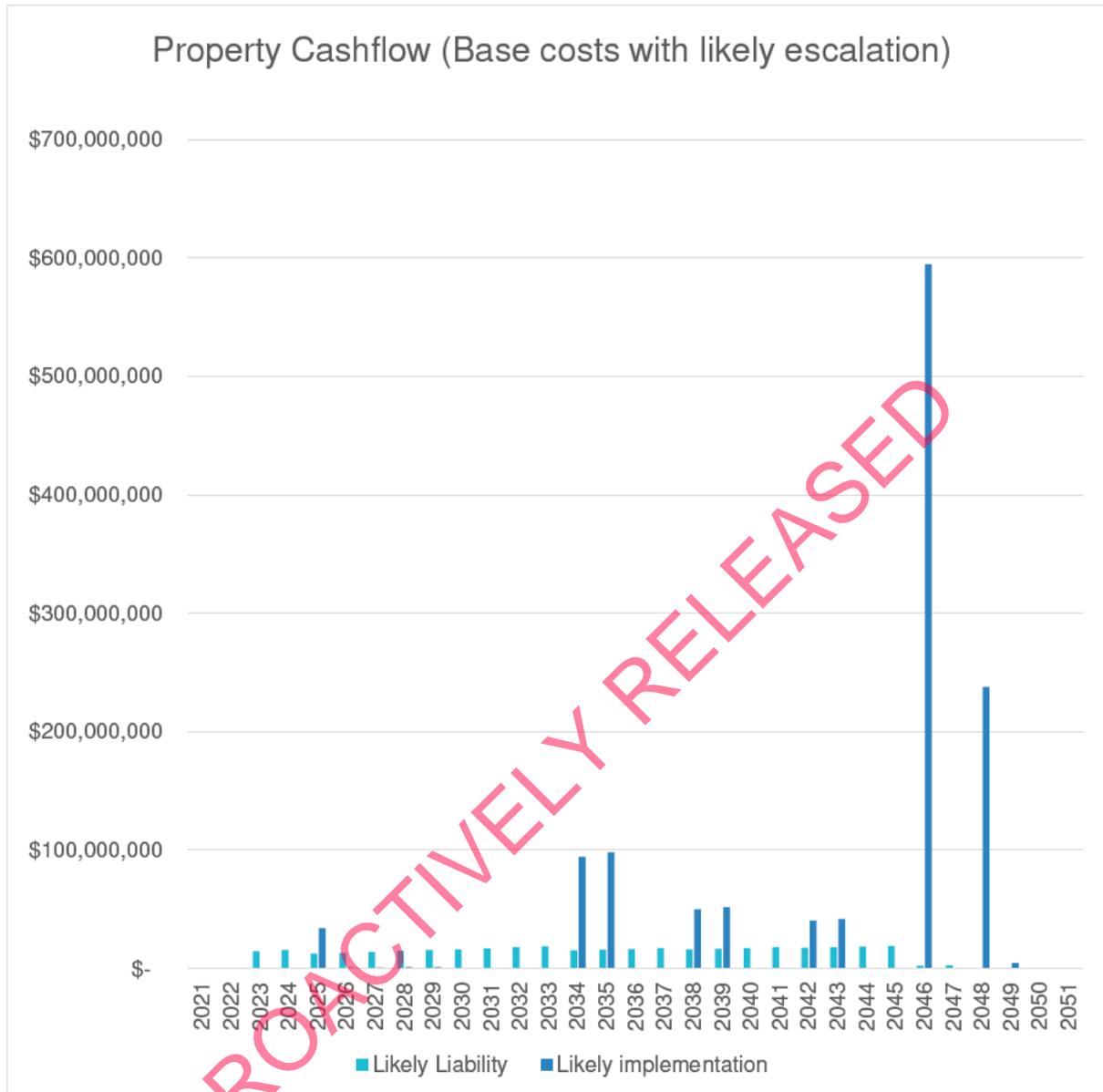
The first decade cashflow for the **route protection only** part of the property costs is shown in Figure 13-3 and totals \$133M for the shown scenario (base estimate plus 10% escalation including NoR costs). The total first decade early property acquisition ranges from \$106M (5% escalation) to \$159M (15% escalation) depending on the level of escalation assumed. The assumed staging to respond to land use release demonstrates the speed at which the early property acquisition is anticipated to start to meet the current implementation timeframes.

Figure 13-3 First decade cashflow for cost of route protection – NOR Post Lodgement Costs, Early Property Acquisition (base estimate plus likely escalation 10%)



A final full property cashflow summary is provided in Figure 13-4 to illustrate how the project cashflow occurs over time. This graph includes NOR post lodgement costs, early property acquisition and property implementation costs.

Figure 13-4 Total Property North Cashflow including Early Property Acquisition and Property Implementation costs (base estimate plus likely escalation)



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

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

The 'likely' escalation has generally been assumed for reporting purposes. The overall route protection costs for these three scenarios are shown in Table 13-4 as well as the % split across the three components. The early property acquisition as a result of the NORs (consisting of NOR post lodgement and the route protection liability) ranges from \$171-305M.

Table 13-4 Full Cost of Route Protection costs

Scenario	NOR Post Lodgement \$M (undiscounted)	Property Route Protection Liability \$M	Property Implementation \$M	Total cost for route protection \$M
Base Estimates, Low Escalation	\$15.9 (1%)	\$273M (25%)	\$814 (74%)	\$1104
Base Estimates, Likely Escalation	\$15.9 (1%)	\$379 (23%)	\$1250 (76%)	\$1646
Base Estimates, High Escalation	\$15.9 (1%)	\$486 (22%)	\$1679 (77%)	\$2181

The cashflow for the just the early property acquisition element of these escalation scenarios is shown graphically in Figure 13-5.

Figure 13-5 Early Property Acquisition Cashflow (base estimate, three escalation scenarios)



Note these reported property costs are the full estimated costs and there is potential for these to reduce following agreements with developers to vest land or with the ability to sell residual land back following the infrastructure upgrades. The potential cost savings from the developer aspect is likely to have the most impact on the early property acquisition aspect as land would not be able to be sold until after completion of construction.

13.1.1.3 Impact of alternative staging on costs of route protection

The staging based on the latest land use assumptions spreads the delivery of the transport network across a 30-year period. Within the first decade, only one project is assumed for implementation, the remaining components are spread over the 10–30-year timeframe.

The alternative staging scenario (outlined in detail in Appendix N – Staging considerations) delays the timing of implementation further beyond the 30-year timeframe.

Theoretically the property liability for early purchases in the first decade will reduce slightly as a result of this change. In reality, this is unlikely to occur as the property owners are affected in a similar manner to anticipated staging scenario, whether or not projects are delayed further.

13.1.2 Implementation costs

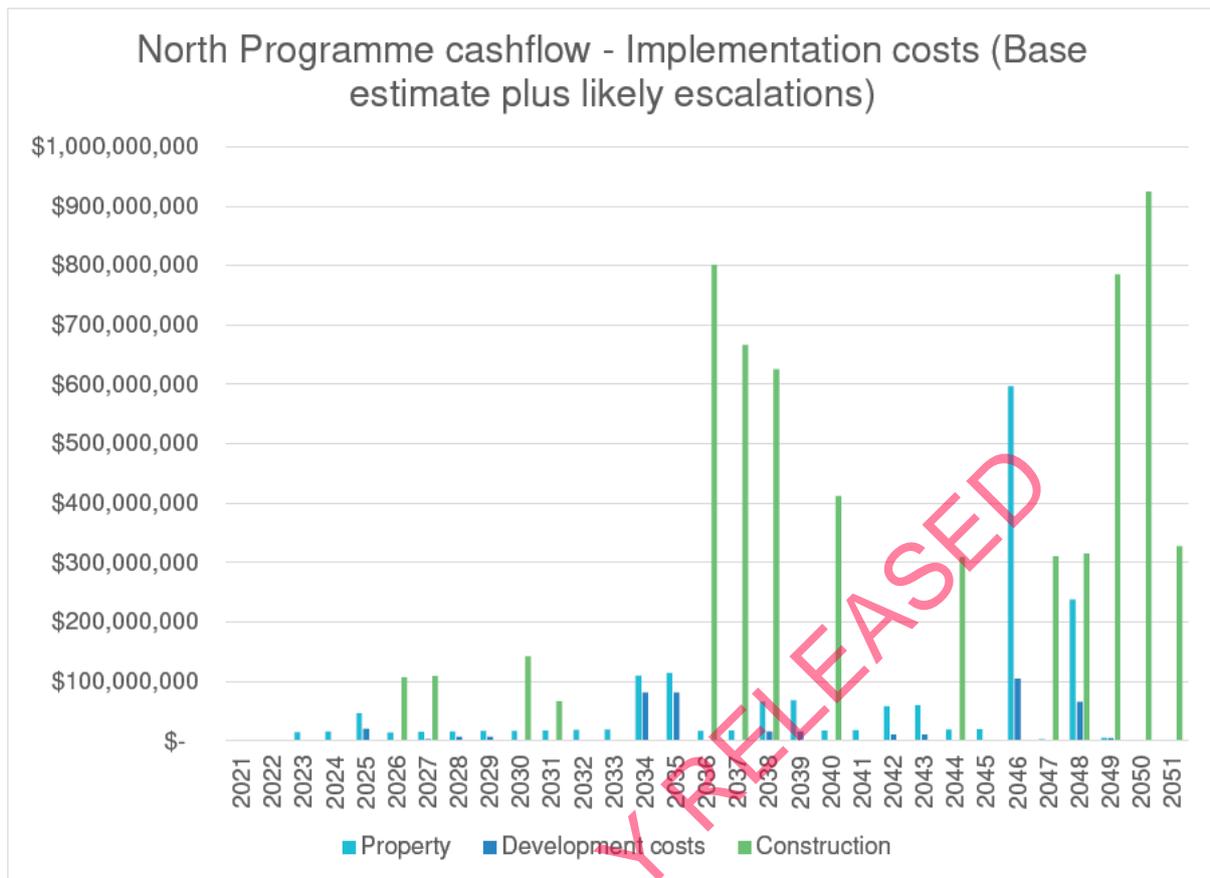
The implementation costs include:

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

Figure 13-6 shows the project cashflow for the implementation costs with the assumed land use release scenario.

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Figure 13-6 North Cashflow – Implementation costs (Base estimates, likely construction escalation)



13.1.3 Operational costs

The operational costs were described in Section 11.2.2 and these have been applied as an annual or one-off cost as appropriate. The spend profile for these costs is shown in Figure 13-7 for general operations and maintenance and as expected is weighted at the end of the assessment period once infrastructure is constructed. Figure 13-8 provides the public transport operational cost profile.

Figure 13-7 North Operation and maintenance cost profile (general and resurfacing)

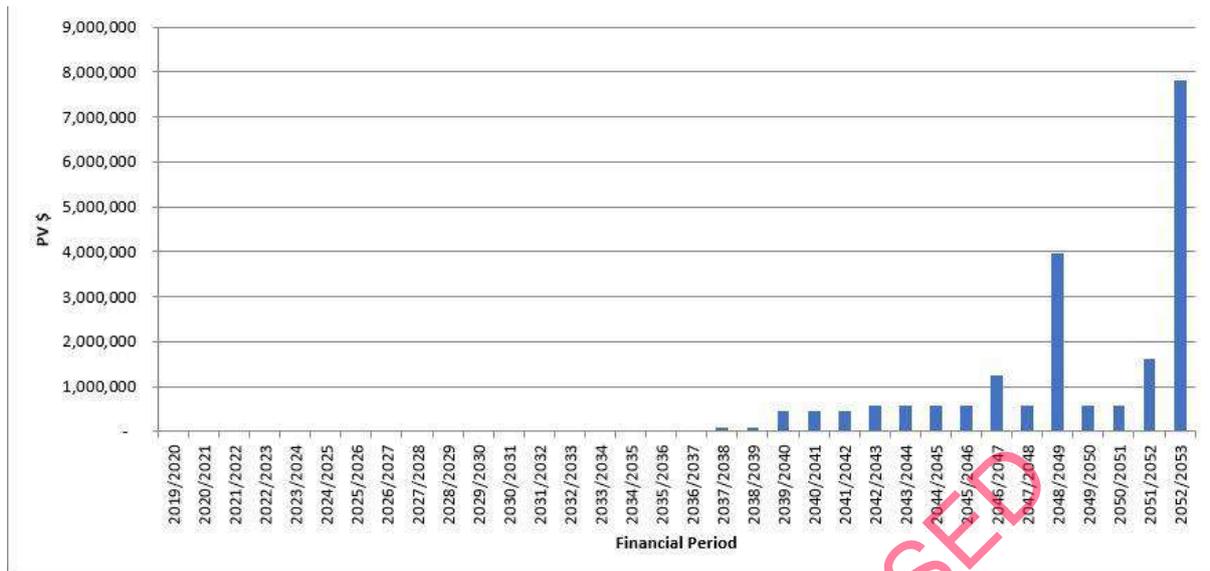
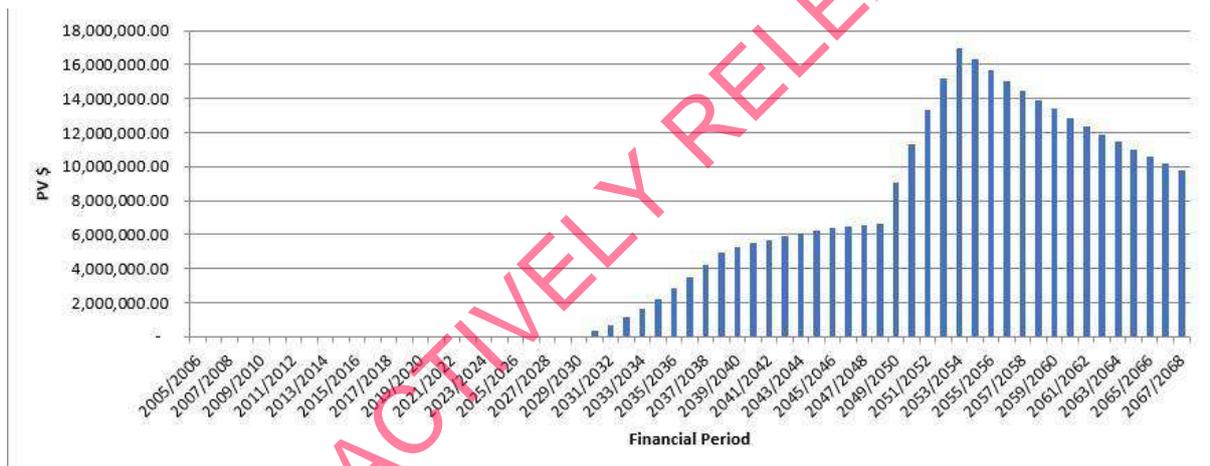


Figure 13-8 North PT Operational cost profile



13.2 Funding

13.2.1 Funding sources

Potential funding sources are detailed in Table 13-5.

Table 13-5 Potential funding sources for the North

Funding source	Commentary
National Land Transport Fund (NLTF)	<p>This is anticipated to be the main funding stream for the North Projects. For the 2018-21 NLTP, no specific funding is allocated to the North area.</p> <p>The Supporting Growth programme has funding allocated for Pre and post lodgement activities.</p>

Funding source	Commentary
	The NLTF funding is projected to increase to between \$4.5b and \$5b in 2028. At similar allocation percentage (using population as proxy), Auckland's NLTF share could be somewhere between \$1.5b and \$1.7b in 2028.
Approved organisations' local share	Auckland Transport and Auckland Council are the most relevant organisations to contribute funds to the North, with the majority of ownership resting with Auckland Transport.
Government grants	This is a long term delivery programme and the nature of additional government funds will vary throughout time. But it is feasible that one or more of the projects may qualify for criteria under separate government funding. Examples of current funding streams include projects being delivered under NZUP funding. This DBC cannot assume any of this type of funding but it is worth noting that the owners should be looking for opportunities to contest this type of future funding for the North projects. This would obviously increase the affordability of this large-scale investment.
Other supplementary funding sources Refers to contributions that are additional to the NLTF, local share funding or Crown loans.	<ul style="list-style-type: none"> • Financial contributions towards the costs of improving network infrastructure (Developer Contributions). Note Auckland Council is undertaking a citywide assessment of Developer Contributions with a framework for Drury being consulted on at the time of the writing of this DBC. It is noted the intention is that a similar process will be rolled out for both green and brownfield growth Auckland Wide. This process aims to capture contributions based on a beneficiary style analysis. • Leasing temporary land requirement opportunities from Auckland Council. • Land acquisition opportunities from Auckland Council. • Debt finance and Public Private Partnerships (PPPs). • Value capture / Beneficiary pays. <p>This DBC identifies cost saving opportunities from financial contributions from developers for the North Programme, primarily through the delivery of growth corridors and vesting of land. This assessment has not considered debt finance or value capture and it is recommended this is further explored by the owners as the Programme progresses.</p>

An analysis of the recently released Regional Land Transport Plan (RLTP) 2021-2031 is detailed in Table 13-6 and includes the following funding streams directly related to the North recommended transport network.

Table 13-6 Identified RLTP funding

Item	Description	Funding status	Considered by RLTP if additional funding available
Supporting Growth Route Protection Programme	There are three funded line items for Supporting growth covering the	Post Lodgement \$64.5M	N/A

Item	Description	Funding status	Considered by RLTP if additional funding available
	programme, site investigations and post lodgement and property purchase	Site investigations \$28M Programme \$40M Category 1 - committed	

The Post lodgement component of the North NoRs is covered within this current funding allocation. No specific property purchase is currently allowed for in the north area. Preparation of this documentation does not in itself trigger the early property acquisition, this arises once the NOR is formally lodged.

The project owners (AT specifically) considers the allocation of funding for early property acquisitions due to NOR's, a priority in the next RLTP.

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13.2.2 Funding share

Based on discussions with owners the projects have been split for delivery by organisations as shown in Table 13-7.

Table 13-7: Projected split of owners for North Projects

NOR	Package Projects	Owner
1	Rapid Transit Corridor – Albany to Milldale (including new walking and cycling path along RTC)	Waka Kotahi
2	New Milldale Station	Waka Kotahi
3	New Pine Valley Station	Waka Kotahi
4	Upgrades to SH1 between Albany and Silverdale including interchanges and active modes	Waka Kotahi
5	New Crossing of SH1 at Dairy Stream	Auckland Transport
6	New Connection between Milldale and Grand Drive	Auckland Transport
7	Upgrade to Pine Valley Road	Auckland Transport
8	Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat	Auckland Transport
9	Upgrade to Dairy Flat Highway between Durey Road and Albany Village	Auckland Transport
10	Upgrade to Wainui Road	Auckland Transport
11	New Connection between Dairy Flat Highway and Wilks Road	Auckland Transport
12	Upgrade and Extension to Bawden Road	Auckland Transport
13	Upgrade to East Coast Road	Auckland Transport
N/a	Upgrade of Hibiscus Coast Highway and Grand Drive for public transport and active modes	Auckland Transport
N/a	Dairy Stream Active Mode Path	Auckland Transport
N/a	Upgrade of Argent Lane and New Pine Valley Road	Auckland Transport

The assessment of funding has been undertaken using the project owners as a starting point. This assessment has been further refined to include identification of potential cost savings through additional supplementary funding sources such as land being vested by developers or other contributions. The potential cost savings attributed to developer contributions have been based on the following high-level principles in Table 13-8 and are consistent with principles being adopted in the other SGA workstreams including the Warkworth and NW assessments.

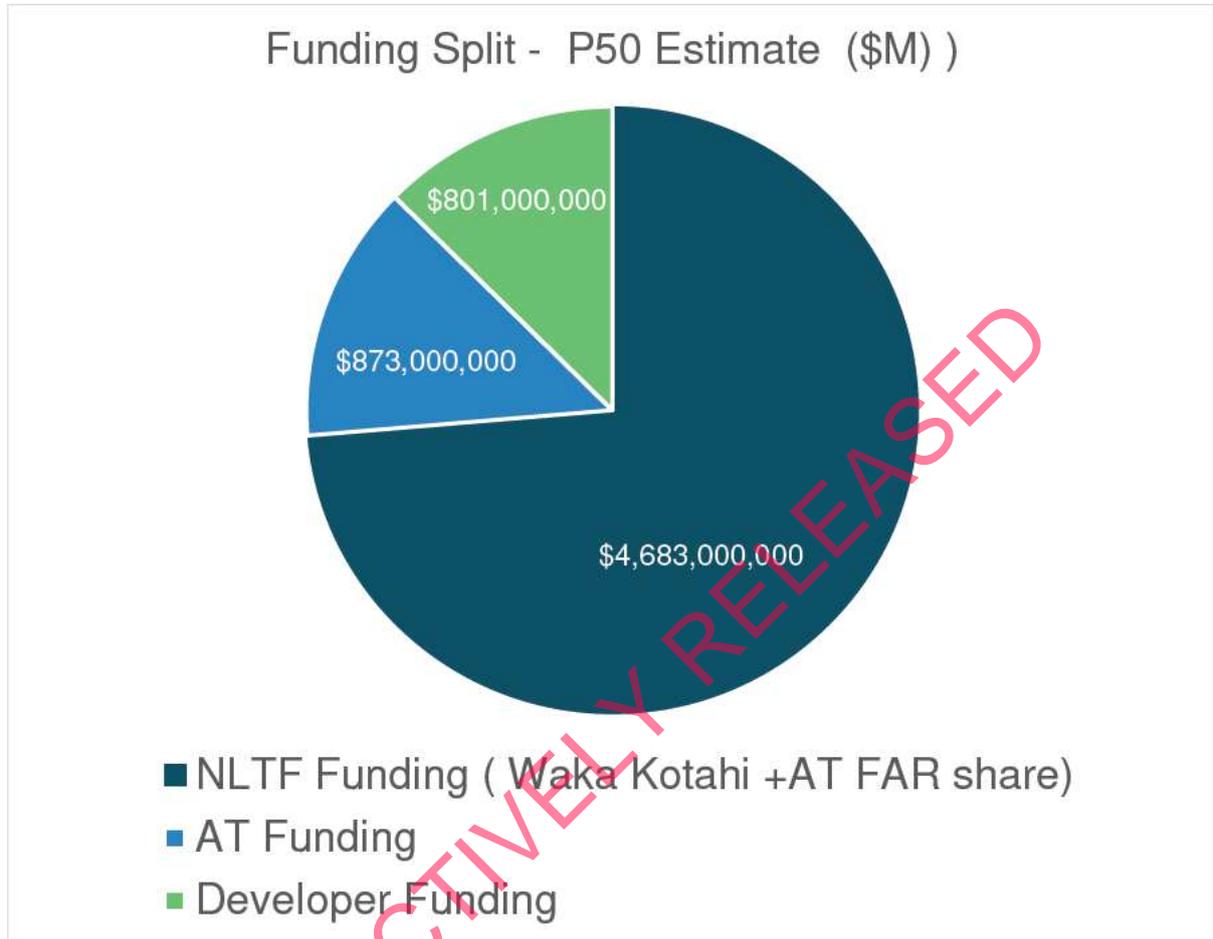
Table 13-8 Assumptions for developer contributions and potential cost savings

Corridor Type	Developers % of implementation costs	Developers % property costs	Commentary
Strategic infrastructure	0%	0%	<ul style="list-style-type: none"> Developers not expected to contribute to strategic infrastructure. The exception is regarding RTC stations where there is potential for developers to work with Waka Kotahi to build a station on their land.
RTC stations	50% of selected station costs	50% of selected station costs	<ul style="list-style-type: none"> Stations within the Dairy Flat area are assumed to attract some contribution from developers. A 50% contribution is assumed for station development at 3 stations through the Dairy Flat area. Stations in the north (Milldale and Pine Valley) have no assumed contribution.
Greenfield 24m corridor	80%	50%	<ul style="list-style-type: none"> Developers need these roads to activate land use. Depending on timing it is anticipated to be able to negotiate for vesting of at least 50% of property on these routes.
Greenfield 30m corridor	50%	50%	<ul style="list-style-type: none"> Assuming developers pay for the 2 lane part of these new corridors and AT pays for the upgrade to 4 lanes.
Brownfields 24m corridor	20%	25%	<ul style="list-style-type: none"> Developers will need the urbanisation upgrades of walking and cycling facilities etc to support developments. Depending on timing, opportunity for larger developers to vest land as part of this process.
Brownfields 30m corridor	50%	25%	<ul style="list-style-type: none"> Widening will be required because of significant growth. Assumed developers would pay half of necessary intersection upgrades and associated localised widening. Developments will also be beneficiaries of the improved cycle and bus priority facilities. Complexity regarding timing and implementation of other strategic projects which would remove strategic traffic from these corridors and increase the % of development traffic.

The estimated funding split for the P50 costs is shown in Figure 13-9 and Figure 13-10. This highlights that the majority of funding (\$4.6Bn) is likely to be required from the National Land Transport Fund (NLTF) which consists of the Waka Kotahi share plus the Auckland Transport FAR

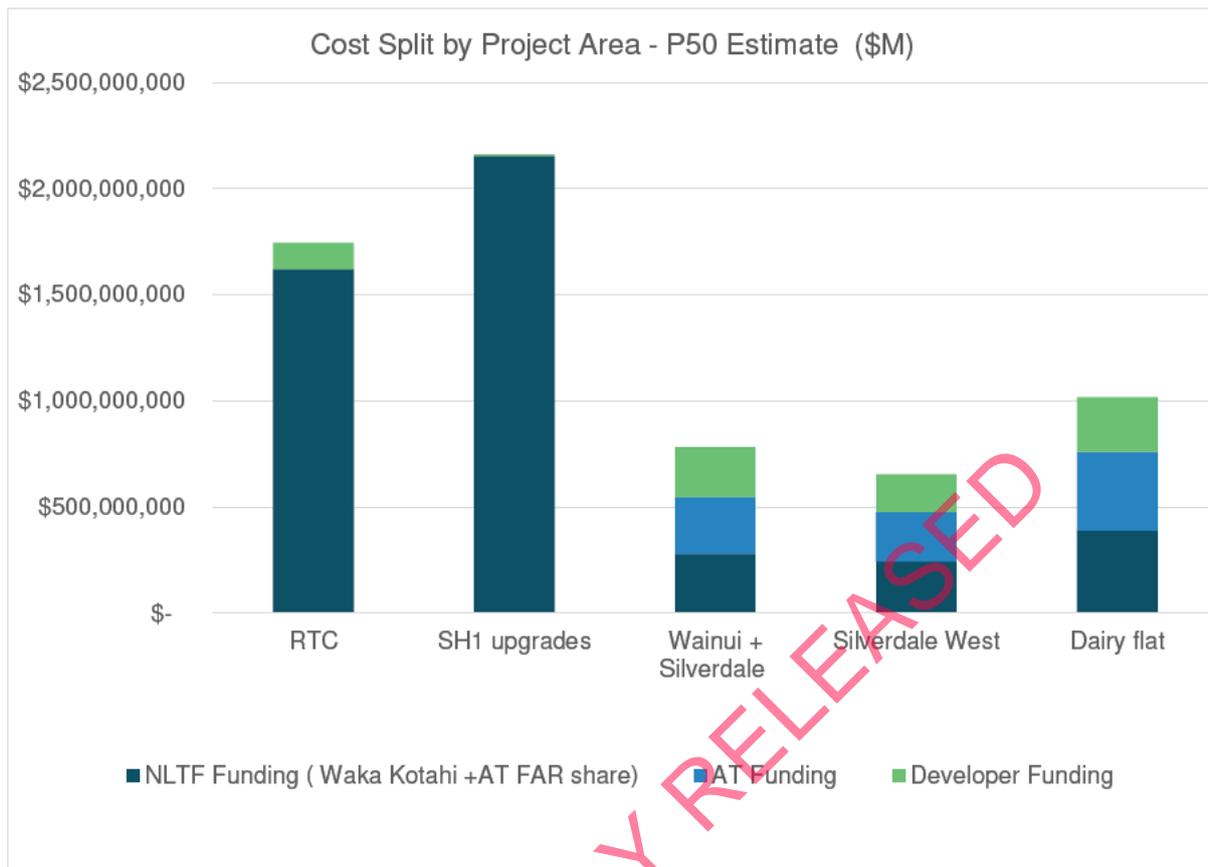
share. There are good opportunities for the Auckland Transport share (and ultimately NLTF) to be reduced through the ability to harness contributory funding from developers which is currently estimated to have an indicative value around \$760M P50 costs for the North DBC.

Figure 13-9 Funding Split for North Projects (P50 Costs)



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Figure 13-10 Funding Split for North Projects by Project Area (P50 Costs)



13.2.3 First Decade route protection affordability

The provenance of the first decade (2021-2031) route protection liabilities have been discussed in Section 12.1.1.2 and Table 13-9 provides additional commentary on available funding for these liabilities.

Table 13-9 Decade 1 Cost for route protection (NoR and early property acquisition)

Area	Forecast Cost (undiscounted \$M)	Potential Funding
Professional services – SGA post lodgement	\$15.9M	Covered by RLTP Supporting Growth Programme funding.
Early property acquisition (assuming staging as per App N)	\$106M Low escalation \$133M Likely escalation \$159M High escalation	As no funding is currently available for the North area, this leaves at best leaves a \$106M shortfall and at worst it is a \$159M shortfall.

13.3 Financial Case Summary

Table 13-10 summarises the first decade costs and current funding allocation for the assumed staging. As highlighted by the table, funding is currently allocated for NoR lodgement – however, additional funding will be required during this RLTP cycle to offset property risk arising from NoR

Table 13-10 First decade North Financial Case Summary (Base estimates, no contingency, likely property escalation)

Element	Base estimate ¹⁴ 2021-2031 (\$M)	Potential cost savings (\$M)	Resultant Costs (\$M)	Potential funding (\$M)	Funding required (\$M)
Professional services for NOR	15.9	0	15.9	15.9	0
Early property acquisition	133	0 ¹⁵	133	0	133
Property implementation	37	8	29	0	29
Implementation	424	120	304	0	304
Operations and maintenance	3	0	3	0	3

This is a substantial transport investment programme to support the planned North growth. The current staging is based on the Council's latest thinking on the timing of land use which assumes the majority of growth and land will be released in Decade 2 and Decade 3 pushing much of the investment into the second and third decades.

As is shown by the RLTP funding, there is no funding allocated to the north area beyond the obtaining of NORs. A funding source is needed for the route protection of the North network to cover the likely property liability from the notice of requirements.

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

- Throughout the design process a rigorous approach has been undertaken to consider reductions of corridor widths for constrained corridors such as Dairy Flat Highway and East Coast Road. Localised reduced cross sections have been applied where appropriate and have been used to

¹⁴ Includes likely property and construction escalations. Base estimate so no contingency included.

¹⁵ Given the timeframes of the projects, cost savings are unlikely for early property purchase.

avoid significant topographical or ecological constraints or reduce impacts to adjacent property land uses.

- Provision of additional vehicle capacity for greenfield corridors has been restricted to two lanes with only a selection of corridors providing 4 lanes to support future bus reliability.
- The topography throughout parts of the North is particularly steep. A number of greenfield corridors have been optimised to balance cut and fill and reduce earthwork batter impacts on property.
- Several projects have been excluded from Route protection and the concept designs have been developed to avoid impacts on external properties such as the Hibiscus Coast Highway and Grand Drive Active modes and bus priority upgrade, the Dairy Stream active mode connection and the Argent Lane and New Pine Valley Road upgrade.
- The DBC has not considered cross section reductions for greenfield corridors as the overall benefits of the 24 or 30m cross sections will best provide for the future growth.
- Flexibility has been a particular necessity for the RTC due to the current uncertainty about mode and lack of land use planning along the route. The current alignment protects for an RTC that can be implemented independent of mode decisions and has the ability to respond to future phases of land use planning with the confirmation of station locations on part of the corridor. The alignment also provides for modal neutrality which needs to be fully grade separated. As more certainty is realised for this project there are opportunities to reduce land take and make design decisions which could reduce both the property liabilities and realise cost reductions through value engineering. This flexibility does come at additional cost in this DBC, but there is a pathway through subsequent stages to reduce cost as risks can be mitigated or better understood.
- Specific analysis has been undertaken to understand which intersections in the North should remain route protected for roundabouts compared with intersections that have clear operational or legibility requirements for signals. In this way the additional footprints associated with roundabouts have been minimised.

13.4 Affordability scenarios

Given the current funding constraints for the North route protection, some consideration has been given to funding constrained scenarios for route protection of the North Network. Table 13-1 sets out four scenarios considered in light of the funding constraints for route protection of the north network.

Table 13-11: Consideration of affordability scenarios for route protection

Scenario	Projects excluded	Rationale	Change in 1 st decade property liability and route protection costs
5. Recommended route protection strategy	All NORs included. 13/13 NORs or 19/22 projects	As per the recommendations in the route protection strategy (Appendix L)	100% of pre lodgement costs (~\$11M) 100% of post lodgement costs (~16M)

Scenario	Projects excluded	Rationale	Change in 1 st decade property liability and route protection costs
			100% of financial risk from property (~133M)
6. Removal of two NORs	<p>No route protection for the following projects:</p> <p>NOR 9: Upgrade to Dairy Flat Highway between Dairy Flat and Albany</p> <p>NOR 6: New connection between Milldale and Grand Drive</p> <p>11/13 NORs or 17/22 projects</p>	<p>Removed two projects with high cost and limited risk in build out. (low route protection priority)</p>	<p>100% of pre lodgement costs (~\$11M)</p> <p>95% of post lodgement costs (~16M)</p> <p>94% of financial risk from property (~125M)</p>
7. Partial route protection	<p>Route protection for high priority projects only.</p> <p>5/13 NORs or 11/22 projects</p>	<p>Route protection of high priority projects only (as per Appendix L)</p> <p>(Includes: NOR 1,2,3,4,10)</p>	<p>100% of pre lodgement costs (~\$11M)</p> <p>70% of post lodgement costs (~16M)</p> <p>73% of financial risk from property (~97M)</p>
8. Delayed route protection	<p>No route protection at this point in time</p>		<p>100% of pre lodgement costs (~\$11M)</p> <p>No post lodgement or property cost at this time</p>

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

Property purchased in the next 10 years (required for the long-term implementation of projects) does not represent additional cost for the project in the long term, rather an advance of funding compared

to the typical property purchase timing. It is likely this will reduce the overall project costs in the long term due to property escalation.

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

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Commercial Case

14 Commercial Case

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

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

14.1 Route protection approach

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

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

As discussed previously, the corridors in the North DBC are split into four types of route protection relevant to the North network including:

- Type A – No route protection as the corridor upgrade does not require additional land
- NoR – Development of a NoR for route protection
- NoR – Alteration to an existing designation
- Plan Change and Landowner Agreements/Memorandum - Delivery by third parties

Table 14-1 summarises the individual corridor route protection requirements and priority. The management of the route protection processes is considered further in the Management Case of this DBC.

A key consideration during the development of the route protection strategy was the ability to obtain long lapse dates through the NoR process. Several of the projects within the package are identified for implementation in around 30 years' time and as such long lapse dates will be required to protect these corridors. Appendix L: Route Protection strategy provides further details about consideration of mechanisms. Given the anticipated timing of land use, longer lapse dates are considered appropriate in this circumstance and there is examples of other infrastructure providers successfully getting NoRs with long lapse dates.

Figure 14-1 Proposed Route Protection

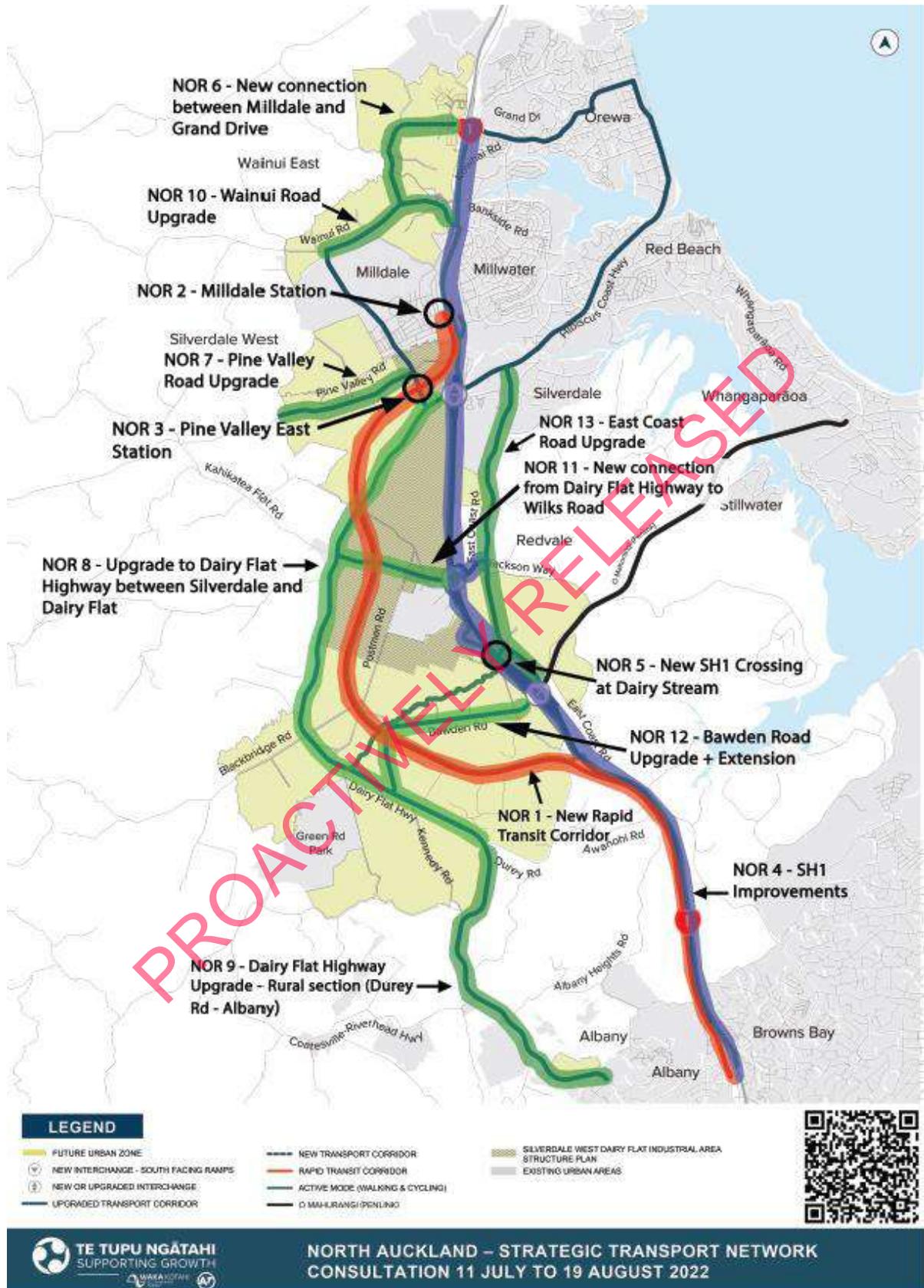


Table 14-1 North Route Protection by Corridor Summary

NOR #	Projects	Route protect?	Mechanism	Requiring Authority	Priority (relative to other projects in package)	Notes
1	Rapid transit corridor – Albany to Milldale	Yes	NoR	Waka Kotahi (or potentially AT)	High	
2,3	Rapid transit stations – Milldale and Pine Valley North (and associated facilities)	Yes	NoR	AT/WK	High	
N/A	Rapid transit stations – Pine Valley South and Dairy Flat	No	N/A	N/A	N/A	No route protection now. Pursue value capture opportunities. Stations can be route protected at a later date following structure planning
4A, 4C, 4D, 4E	SH1 improvements, including: <ul style="list-style-type: none"> SH1 widening (Albany to Silverdale) Ō Mahurangi Penlink interchange upgrade New Wilks interchange Silverdale interchange upgrade	Yes	NoR (alteration to motorway designations)	Waka Kotahi	High	Consider bundling with New Walking and Cycling Path along SH1 (above row)
4B	New Walking and Cycling Path along SH1	Yes	NoR (alteration to motorway designations) or new NoR	Waka Kotahi	High	Consider bundling with SH1 improvements project (next row)
4F	Wainui Road active mode motorway crossing	Yes	NoR (alteration to motorway designation)	Waka Kotahi	High	Priority assumes the project is bundled with SH1 active mode corridor project
4G	Silverdale to Highgate Active mode connection	Yes	NoR (alteration to existing motorway designation)	Waka Kotahi	High	Priority assumes the project is bundled with SH1 active mode corridor project
5	New SH1 Crossing at Dairy Stream	Yes	NoR	AT	Medium	
6	New Connection between Milldale and Grand Drive	Yes	NoR	AT	Low	Continue to investigate developer agreements
7	Pine Valley Road upgrade	Yes	NoR	AT	Low	Continue to investigate developer agreements
8	Dairy Flat Highway Upgrade (FUZ section)	Yes	NoR	AT	Medium (Silverdale to Kahikatea Flat Road) and Low (Kahikatea Flat Road to Durey Road)	Opportunity to route protect as a single NOR
9	Dairy Flat Highway Upgrade south of FUZ	Yes	NoR	NAT	Low	

NOR #	Projects	Route protect?	Mechanism	Requiring Authority	Priority (relative to other projects in package)	Notes
10	Wainui Road upgrade	Yes	NoR (eastern end) and developer agreements (western end – west of Lysnar Road)	AT	High	
11	New Connection from Dairy Flat Highway to Wilks Road	Yes	NoR	AT	Medium	
12	Bawden Road Upgrade and Extension	Yes	NoR	AT	Medium	
13	East Coast Road Upgrade	Yes	NoR	AT	Medium	Continue to investigate developer agreements
A1	Argent Lane and New Pine Valley Road	No	N/A	N/A	N/A	No additional space is required.
A2	Hibiscus Coast Highway active mode and PT priority upgrade	No	N/A	N/A	N/A	No additional space is required.
A3	Dairy Stream active mode connection	No	N/A	N/A	N/A	Land is already protected from development

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14.2 Property Overview

14.2.1 Wider Te Tupu Ngātahi Context

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

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

- The programme is about long-term affordability and property will be generally acquired closer to implementation. It is noted that the longer property purchase is delayed the more expensive property will become through property escalation and change of land use for FUZ zoning.
- There will be potential early property acquisition costs as soon as the NoR is lodged for each project.
- The Requiring authority will take the lead on property negotiations for that specific project, utilising the current processes of that organisation (Auckland Transport or Waka Kotahi).
- Advance Purchase Guideline processes will apply.
- Where there is opportunity for strategically important properties to be acquired, these should be taken. The RTC station land has been identified as strategically important for the North area.
- A programme wide property resource will look at opportunities for resultant value capture from residual land as part of the land use integration opportunities of the programme.
-
- Early property acquisition costs are a critical issue once the identified projects are route protected and the Property Overview outlines the analysis and approach to providing as much certainty as possible to what this cost could be into the future.

This Preliminary Property Overview is a living document developed for the route protection business case phase. Given the long-term route protection, this Overview will need to be revisited, reviewed and updated each decade and more frequently in the lead up to project implementation, during development of the detailed business cases and the design and advancement of the consenting and land acquisition programmes. The acquisition programme is dependent on detailed design and final land requirement plans being completed.

A total of 1,518 property interests have been identified for acquisition as outlined in Table 14-2. Once property duplications (e.g., properties that might have partial land acquisition and temporary rental charges) are considered this results in a total of 742 individual properties.

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14.2.2 Compensation

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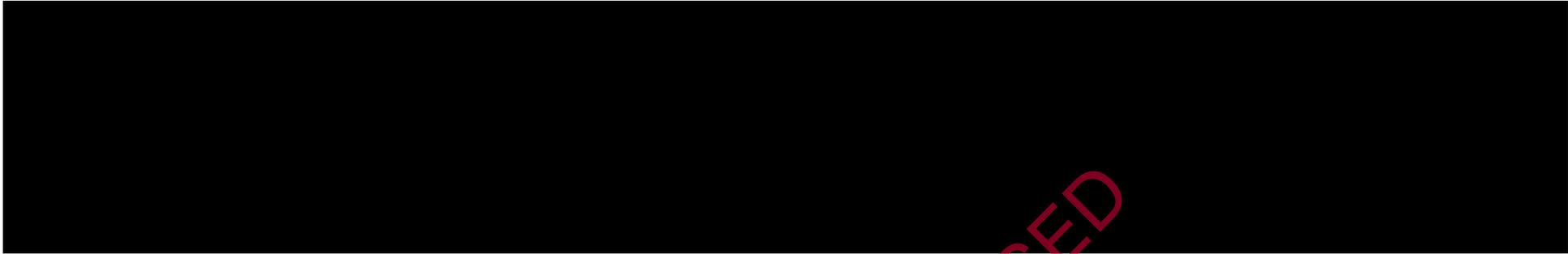
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14.2.3 Key property risks and opportunities

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

Table 14-4 Key Property Risks for North

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

14.2.4 Managing property risks

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

- **Joint governance from owners.** It is recommended that a joint owner approach to property be taken at a governance level to ensure the appropriate prioritisation of funding.
- **Appropriate resourcing.** This is a large programme of works over an extended period of time and appropriately resourcing will ensure best for programme outcomes are achieved.
- **Developer Agreement.** Focussing on getting early and comprehensive developer agreements in place could reduce the affordability burden from a property perspective.
- **Application of Betterment.** Strengthening the case early for this aspect of the valuation process and ensuring a consistent and common approach across all projects is critical to potential successful use of this tool.

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

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

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

14.2.5 Wider Te Tupu Ngātahi property management

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

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

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

- **The pre allocation of funding for strategic property purchases.** The current process does enable this to occur – however it requires AT Board approval and delegated approvals, and in the case of Waka Kotahi, approval from LINZ for individual property purchases on a case by case basis. This process would benefit from streamlining with delegated authorities in place with the respective organisations and a ring-fenced fund identified within the RLTP. This fund would be

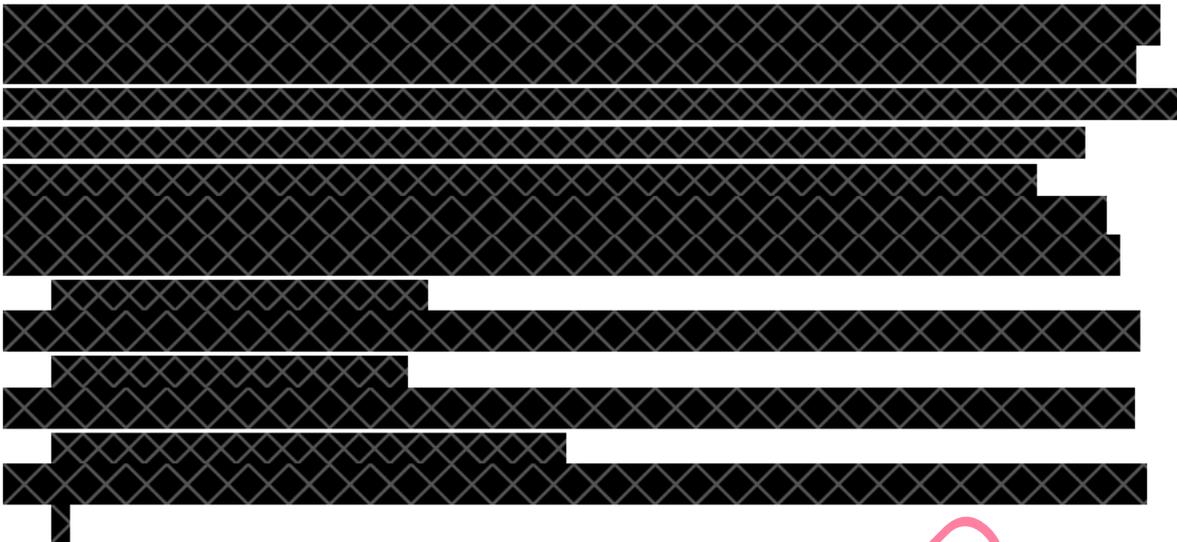
utilised for properties that are endorsed as 'Early Acquisitions'. This fund may also be used to respond to developer integrations opportunities that occur in an ad hoc manner and can occur out of sequence in response to private led plan changes. This would enable a more nimble and efficient mechanism consistent with more commercial operations.

- **Dedicated Resources.** A dedicated Waka Kotahi and Auckland Transport resource to work through commercial deals and evaluate strategic purchase opportunities. This team will work with the OIM team on the identification, acquisition and enhancement of properties purchased through the fund. Without dedicated resource, the property approach required for a programme of this scale will potentially suffer and opportunities for considerable efficiencies (and enhanced outcomes) will be lost.
- **Governance:** The fund would need to be managed and administered by members of both organisations to ensure transparency of process. This group would oversee the expenditure of the fund and make recommendations to the acquiring entities approvals processes. The governance group would be responsible for agreeing, setting and delivering against the objectives of the fund as well as confirming the priority areas for investment.
- **Commercial Focus:** The fund will need to be managed with commercial acumen that could also identify commercial opportunities that may arise from an advanced property purchase strategy, such as aggregation of properties and alignment with/proximity to partner land holdings. While this may require changing current approaches, and potential policy and mandate, this presents the opportunity to substantially reduce the total cost of the property for this programme. To fully realise the opportunities there may be a need to work with partners such as Kāinga Ora.
- **Policy and Procedure Changes:** The fund would benefit from some changes including allowing residual land purchased by AT to be sold and reinvested in the Strategic Land fund, without returning to Auckland Council. Another key change could be the application of Funding Assistance Rate (FAR) for advance property purchases.

14.2.6 Property next steps

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

- The Implementation DBC reconfirms the property cost and requirements as design confidence is further developed.
- Any changes in design avoid the need for minor land requirements.
- Value engineering is undertaken to minimise the land required for projects.
- Detailed property valuations are undertaken closer to implementation.
- Agreements with developers are progressed and 'locked in' as soon as possible to try and reduce the total property costs of the programme.
- Active management (including resourcing) of property programme with a view to reduce costs as much as possible, whilst also looking for opportunities to maximise value and cost savings when opportunities and funding allows.



- **Willing buyer willing seller.** Where there are properties that hold strategic benefit to the programme and there is an opportunity for early purchase, consideration will be given to securing these properties earlier in the acquisition programme. It is considered that early acquisitions could reduce the overall property costs if acquisition occurs in earlier decades. The station sites for the RTC stations have been identified including land around the Silverdale and Redvale interchanges. The acquisition of this land would provide flexibility for the owners to implement the facility in a timely manner to support land use and behaviour change. Importantly as the land holding is split among a few landowners, ownership of the land would enable other developers to implement parts of the network when required.
- **Compulsory process.** The remaining projects will go through the road controlling authorities' normal PWA compulsory approvals process. This will include the application of the AT's current Early Acquisition Guideline and Waka Kotahi's Advance Purchase Policy processes for any purchases prior to the typical three-year period prior to implementation.

14.3 Procurement Plan

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

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

- Scale.
- Complexity.
- Programme.

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

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

Table 14-5 Implementation Procurement Strategy

Consideration	Waka Kotahi projects	Auckland Transport Projects
Scale and complexity	<p>The implementation of the RTC corridor and State Highway upgrade between Albany and Awanohi Road are interrelated, as the earthworks are required to the east of SH1 to accommodate the upgrades. Careful consideration should be given to ensuring initial upgrades (SH1 enhancements) future proof the corridor for the RTC in the future.</p>	<p>The Dairy Flat Highway -Albany to Dairy Flat section) and Grand Drive to Milldale connection are likely the most complex of the arterial roads due to the challenging topography and sensitive receiving environment. The other new greenfield corridors have lower risks and less opportunity for significant innovation in alignment – although efficiencies could be gained through alignment with developers.</p> <p>Depending on the timing for implementation, the upgrades of existing corridors could have some traffic management challenges due to the unavailability of alternative routes</p> <p>It is noted for all corridors that opportunities exist for embodied carbon material innovation during construction.</p>
Timing and urgency	<p>The latest Council development assumptions indicate development of the North FUZ is likely to take place largely in the third decade.</p> <p>However, there is likely development pressure in the Silverdale West area and north of Milldale. This development pressure could eventuate within the first decade.</p>	
Defined scope	<p>The strategic upgrades will need to tie into the network south of the study area. There is still uncertainty as to the future RTC mode. Once clarification on this is provided by other studies, this will be defined in the project scope.</p>	<p>For the local roads, the detailed design will be completed prior to awarding the construction contract, this will define the expected outputs and will involve lower tendering costs for prospective suppliers than other contract models. Local roads are considered business as usual projects for Auckland Transport.</p>
Supplier market conditions	<p>For Road upgrades, there are several suppliers available for this type and scale of work in Auckland which lends itself to traditional contracts for competitive delivery.</p> <p>The strategic projects are significant in scale and risk. There are a handful of Tier one contractors capable of undertaking this work. The contract method will need to balance the need for competition with the management of risk.</p>	

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

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

14.4 Required Services

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

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

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

Table 14-6 Considerations for required services

Consideration	Waka Kotahi projects	Auckland Transport Projects
Scale and complexity	The SH1 and RTC project have significant effects given the scale of the projects and environment which they traverse. Regional consents and RC will be complex. Specialist capability might be needed to design and deliver these strategic projects.	New roads such as the New connection between Milldale and Grand Drive and the Dairy flat Highway rural upgrade are expected to attract additional design fees given the effects of the new links. Smaller design fees expected for the arterial road projects. Standard service providers are likely to be suitable for most of these upgrades.
Funding	No projects in the recommended North Transport Package have confirmed implementation funding.	
Timing and urgency	The RTC project is linked to release of land in the Dairy Flat and Pine Valley areas.	Local road implementation is likely be related to development pressure in the immediate area.

Consideration	Waka Kotahi projects	Auckland Transport Projects
	<p>The SH1 project is identified as being need during the second decade subject to availability of funding.</p> <p>More details can be found in Appendix N.</p>	<p>Dairy Flat Highway and Wainui Road are expected to come under development pressure in the first decade.</p> <p>More details can be found in Appendix N.</p>
Defined scope	Consent conditions to be secured before award of physical works contract.	
Supplier market conditions	Auckland market can service this range of contracts and service requirements.	
Client involvement, control and capability	Clients desire to retain control.	
Non-cost success factors	Strong desire for the clients to achieve best practice environmental and stakeholder outcomes. Committed to addressing carbon reduction and maximising the opportunities to mitigate or where necessary adapt designs to best respond.	
Tangible demonstration of value for money	Competitive tender for services recommended.	

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

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

Overall procurement risk is low for the majority of projects within the north area considering that with appropriate planning, there are skills, capability and client expertise to deliver these North projects.

Certain projects like the RTC and SH1 improvements have an elevated risk due to the scale of works and effects envelope of the projects.



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Management Case

15 Management Case

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

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

There are two distinct phases for delivery:

- Route protection including:
 - Preparation of NoR documentation for lodgement (13 packages)
 - Developer agreements [REDACTED]
- Post route protection management – post lodgement activities for NoR packages.

These are discussed separately in Sections 15.1, 15.4.2 and below. Each section discusses the specific governance, key activities, roles and responsibilities, risks and stakeholder engagement requirements applicable for that stage. This is followed by some additional overall programme management considerations.

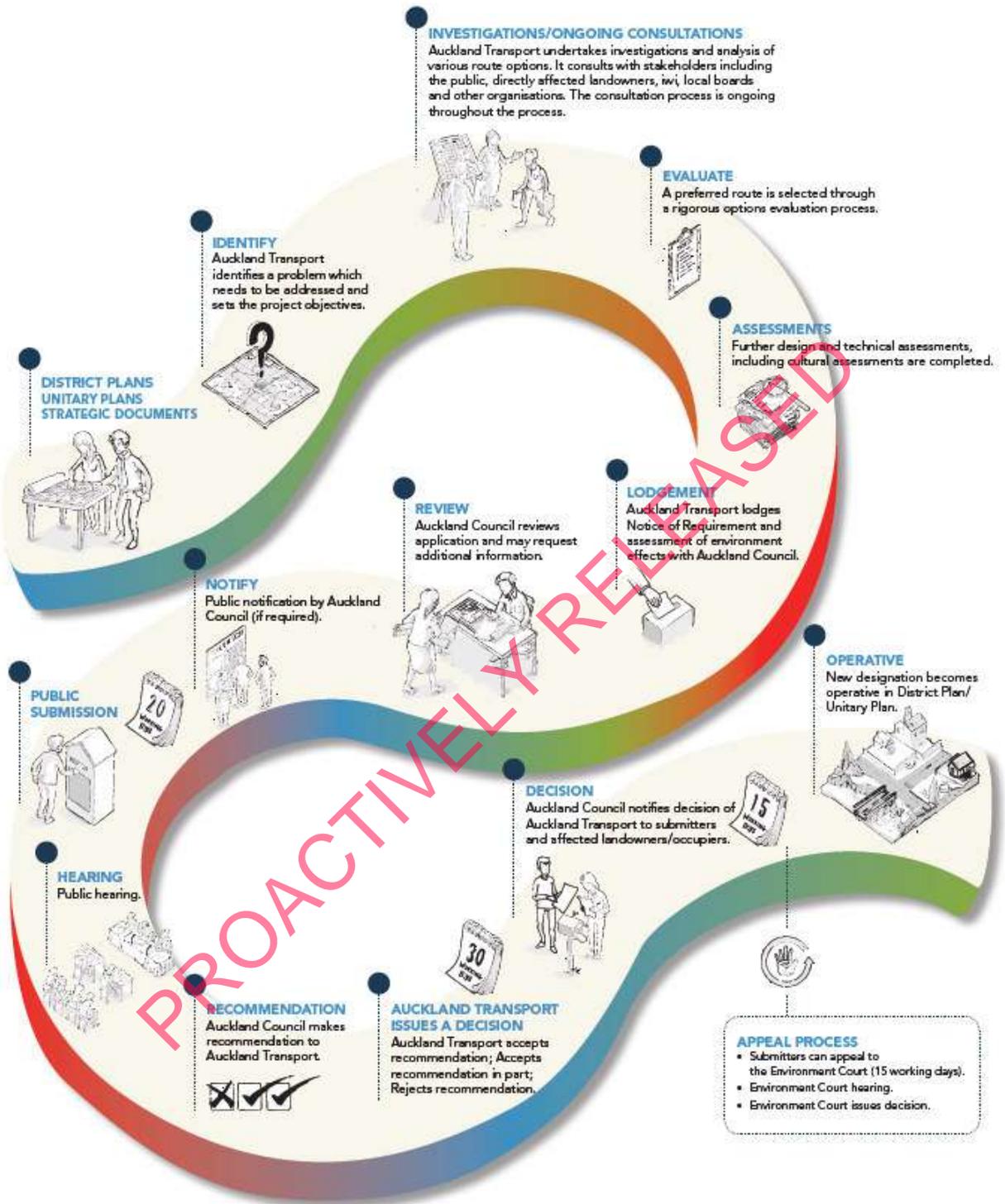
15.1 NoR Route protection management

It is noted there are multiple methods to achieve route protection and this section is based on obtaining a transport designation. This section covers the preparation and lodgement of NoR documentation and any post lodgement activities to confirm the operative designation. It concerns 17 projects within the North to be delivered through 13 NoR packages.

15.1.1 Route protection process

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

Figure 15-1 Route protection process

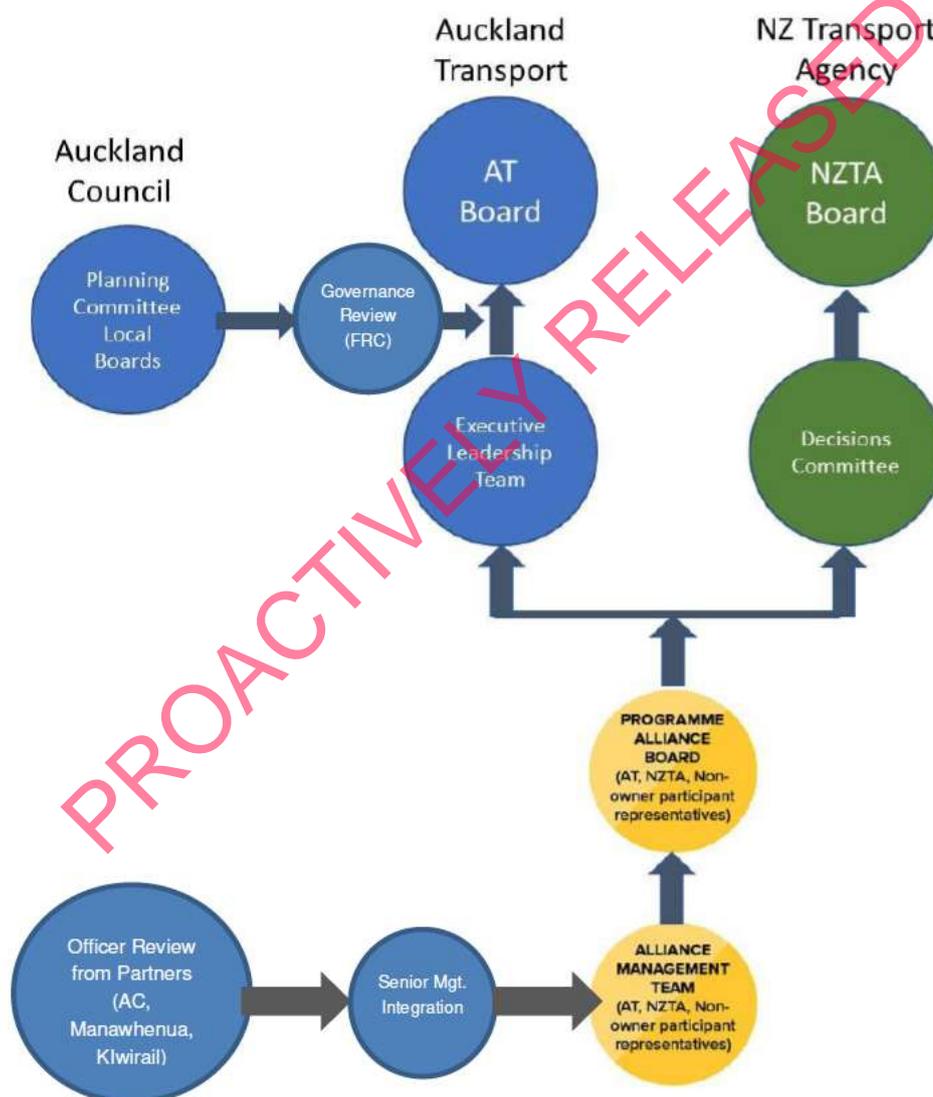


15.1.2 How is the route protection phase being governed?

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

Governance in the context of the Alliance is defined as the processes by which the Alliance is directed, controlled and held to account. The Governance Management Plan has been developed and guides the implementation of a shared understanding of why, how and who is responsible for the effective governance of the Alliance. This structure is summarised below in Figure 15-2.

Figure 15-2 Te Tupu Ngātahi governance structure



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

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

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

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

15.1.3 Who decides and approves the route protection approach?

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

Figure 15-3 Route Protection approval process



15.1.4 How are different projects prioritised over others?

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

- **Urgency** – development pressure including the lodgement of private plan changes, council structure planning, or the timing of related projects to the intervention.
- **Financial benefits obtained from protection** – route protection can reduce property and construction costs associated with a project. Benefits achieved are significant if protection is obtained prior to development but erodes over time for projects in the longer term.
- **Place shaping** – certain projects have an increased influence on the surrounding urban environment. Protection of these project corridors is likely to enable land use and shape the urban form within an area.

- **Potential for value capture** – Some projects have significant value capture opportunities which are enabled through corridor protection and increased certainty for land use and development opportunities.
- **Contribution to programme outcomes** – The extent to which a project contributes to the overall programme benefits including mode share, accessibility, resilience etc.

The North has been prioritised by Te Tupu Ngātahi to progress as a complete programme through route protection due to the urgency of development (in parts of the study area and the ability of this network to support place making and good urban form as the area is developed. The Te Tupu Ngātahi management team regularly review the overall programme prioritisation (at least every six months) and any changes are recommended to the Alliance board for endorsement. The North growth area has approval to commence the pre-lodgement work in parallel to the development of the DBC and current expectation is that lodgement will occur in Q3 of 2023.

15.1.5 Property

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

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

15.1.6 NoR Lodgement

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

Table 15-1 Management of the NoR process

Stage	Management
Lodgement	<ul style="list-style-type: none"> • The decision to formally lodge documents will be made by the AT and Waka Kotahi board for all projects as per current processes for both organisations. This includes the Alliance getting owner endorsement from technical leads within each owner as per the earlier described Quality Assurance process and any 'pre board' committees as required. • To ensure that the documents prepared are appropriate to the receiving authority (Council) regular (fortnightly) meetings have been established with the regulatory arm of Council to agree levels of detail and standard consent conditions prior to lodgement.
Hearing	<ul style="list-style-type: none"> • 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.

Stage	Management
	<ul style="list-style-type: none"> 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.
Property agreements	<p>Where the identified route protection mechanism does not include a designation process, such as a developer agreement, the following steps will be undertaken:</p> <ul style="list-style-type: none"> Te Tupu Ngātahi working closely with AT and/or Waka Kotahi property teams will provide technical advice to negotiations. AT and/or Waka Kotahi will develop developer agreements. AT and/or Waka Kotahi property teams will remain the 'custodian' of the agreement and ensure any conditions are undertaken and the agreement is monitored and actioned as required.

15.2 Management of projects not recommended to be route protected

The Route protection strategy includes a different approach for several projects within the North network. Ongoing management of these projects is discussed in the Table 15-2.

Table 15-2: Management of Type A projects

Project	Route protection approach	Ongoing management
Rapid Transit Corridor stations within Pine valley West, Silverdale West and Dairy Flat	No route protection recommended for stations west of Pine Valley.	<p>Waka Kotahi and AT must play an important role in the development of structure plans and plan changes in this area to ensure that potential future station locations are not compromised by development of adjoining land.</p> <p>Once more certainty is available on the Mode of the RTC and future land use for the area, consideration should be given to:</p> <ul style="list-style-type: none"> Whether route protection of stations is required Whether strategic property purchase could be undertaken Development agreements opportunities could be explored around stations
Hibiscus Coast Highway and Grand Drive Active modes and bus priority	Not required	The upgrade of this corridor is recommended to proceed to an implementation business case. At this point AT will confirm the details of upgrades required on this corridor.

Project	Route protection approach	Ongoing management
Dairy Stream active mode connection	Not required	As structure planning and plan changes occur for this area, it is expected that an esplanade reserve will be identified along Dairy Stream. AT involvement in the Structure plan and plan changes should advocate for this facility to be included and explore opportunities for developers to contribute to this facility.
New Pine Valley Road and Argent Lane extension	Not required	As sufficient property is provided for this project, the next steps for the upgrade will likely include an implementation Business case (depending on funding required) followed by detailed design and implementation. This upgrade can be dealt with as per a typical road upgrade and will be managed by AT.

15.3 Route protection through Plan Change and developer agreements

[Redacted content]

15.4 Risk and opportunity management

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

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

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

The key identified programme risks are shown in Table 15-3.

Table 15-3: Key Risks for the North DBC

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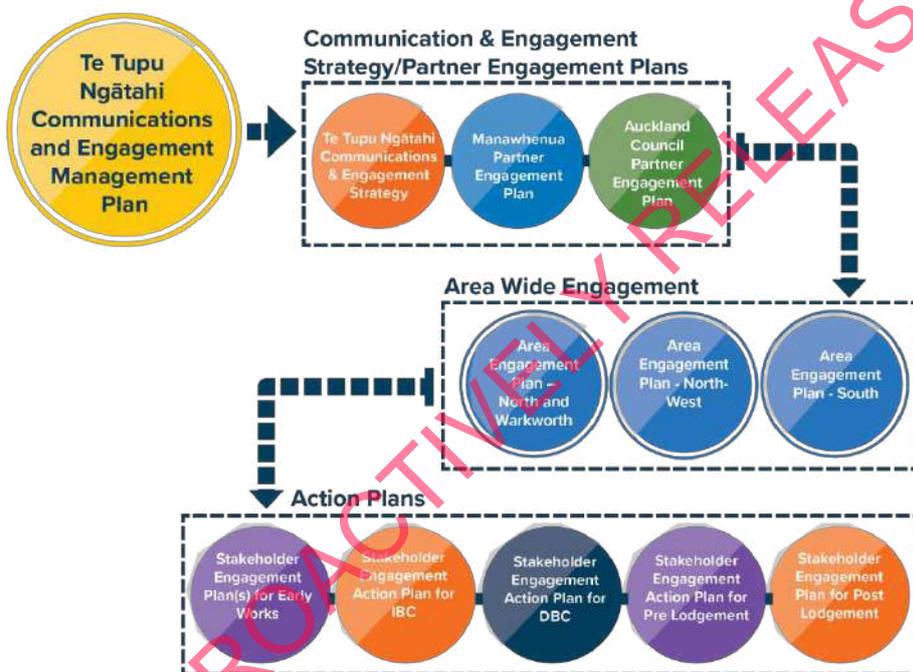
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15.4.1 Engagement

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

A Communications and Engagement Management Plan has been prepared which outlines operational policies and procedures for managing the communications, stakeholder and community engagement workstream within Te Tupu Ngātahi. The Management Plan has informed the Communications and Engagement Strategy and a variety of plans to inform engagement with partners, key stakeholders and the community/public. The relationship of these documents is shown in Figure 15-4.

Figure 15-4 Te Tupu Ngātahi communications and engagement



The focus of the engagement at a programme wide level during the preparation of the NoRs is detailed in Table 15-4.

Table 15-4 Engagement during preparation of NoR

Theme	Programme Wide response	North specific response
Manawhenua	<ul style="list-style-type: none"> Regular hui to communicate progress and discuss specific project activities. 	<ul style="list-style-type: none"> Regular hui. Discussions around impacts and mitigations on sensitive locations such as the Weiti, Lukus Creek, Okura Creek area and Orewa River.

Theme	Programme Wide response	North specific response
Public engagement	<ul style="list-style-type: none"> • Continue to build understanding of wider Te Tupu Ngātahi progress and the process of route protection as set out in the Programme Wide Comms and Engagement Strategy • Continue one-on-one engagement with landowners / developers (e.g., meetings) regarding potential effects and opportunities for shared alignment in outcomes (e.g. through developer agreements) – particularly in areas where land is live zoned or is about to be. • Inform stakeholders about the processes for route protection (e.g., via e-updates, meetings and website information) and provide an opportunity for participation (i.e. submission on the NoR or similar as appropriate). 	<ul style="list-style-type: none"> • Development of engagement plan for NoR preparation phase. • For the North particular regard will be given to the re-engagement strategy with landowners associated with the RTC corridor and new road connections. • Initial land owner meetings will need to be held with property on projects which have had limited owner interactions to date.
Council engagement	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Participation in Council land use forums. • Continued relationships with Council Plans and Places about future structure plans.
Stakeholders	<ul style="list-style-type: none"> • Provide information (and seek feedback) on staging and timing for the preferred network, including specific opportunities for sequencing of urban development (e.g., meetings with utility providers regarding integration of utilities within the future transport corridor). • Ongoing workshops and communications with Programme-wide stakeholders and stakeholder groups e.g., Development/Freight/Road Users Group, Active Modes/Public Transport Advocacy Group and Environmental/Social Impact Group 	<ul style="list-style-type: none"> • Ongoing attendance at existing stakeholder forums.
Environment	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Will be considered as part of the preparation of AEE documentation.
Property	<ul style="list-style-type: none"> • Identify opportunities for AT and Waka Kotahi to undertake early property acquisition (e.g. willing buyer/willing seller arrangements. Note leading this process is outside the specific scope of work for Te Tupu Ngātahi. 	<ul style="list-style-type: none"> • Information to be passed on by project team to appropriate owner organisation.
Decision makers	<ul style="list-style-type: none"> • Enable Te Tupu Ngātahi to inform decision makers on the risks and opportunities of potential route protection mechanisms for the preferred network. 	<ul style="list-style-type: none"> • Regular update of risks and opportunities registers. • Project team to work with Owner Interface Managers to

Theme	Programme Wide response	North specific response
		allow briefing into owner organisations.

15.4.2 NoR Post route protection management

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

15.4.2.1 Key tasks

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

Table 15-5 Key tasks post designation

Task	Commentary
Management of designations obtained in previous phase.	This could include the management of conditions and the potential for monitoring lapse periods as required. The requiring authority for a project will be responsible for the management of a specific designation. Both AT and Waka Kotahi have existing and proven systems for the management of these designations and currently do this on a regular basis. The Te Tupu Ngātahi designations would be added to the respective requiring authority's current suite of designations to manage.
Scoping, procurement and delivery of required implementation DBCs.	<p>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.</p> <p>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:</p> <ul style="list-style-type: none"> • Review of any changes in critical assumption since package DBC completed. • Further design development. • Safety Audit. • Parallel Estimate. • Consenting Strategy. • Confirmation of funding sources. • Inter-dependences with other projects and any critical triggers. • Procurement Strategy. • The scoping of this ImpDBC will be undertaken by the lead entity for the intervention and it is recommended that: <ul style="list-style-type: none"> • Scoping is undertaken at least three years prior to planned implementation. • The ImpDBC is completed at least one year prior to planned implementation, earlier if property issues are anticipated.

Task	Commentary
<p>Scoping, procurement and delivery of projects to implementation.</p>	<p>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 Figure 15-5 below.</p> <p>Figure 15-5 Project implementation</p>  <p>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).</p> <p>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.</p> <p>Both AT and Waka Kotahi have the systems and capability to successfully manage the procurement and delivery of each of these steps.</p>
<p>Purchasing and management of property acquisitions.</p>	<p>Typically, the vast majority of property purchase for a project is anticipated in the three years prior to implementation of a particular project. The Programme Wide Property Strategy also outlines the need for a dedicated Supporting Growth Strategic Property Fund for advanced property purchase and a dedicated team to drive this fund.</p> <p>Both AT and Waka Kotahi have well proven and tested property management processes and dedicated teams in place to manage these property purchases and then the ongoing management of these properties.</p>
<p>Land use and transport integration optimisation activities.</p>	<p>Tasks could include continued input into future structure planning or progressing intensified land use development and Transit Oriented Development at stations. These tasks are likely to involve ongoing discussions with multiple organisations with the outcome to maximise land use and transport integration. Many of these have been identified in the next steps section of this North DBC (Chapter 15).</p>

15.4.2.2 How will the North programme be governed?

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

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

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

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

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

15.4.2.3 Risk and opportunity management

Both the AT and Waka Kotahi delivery systems and processes have risk management at their core. In terms of the key risks envisaged at this time for this stage of the programme, these are 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 is generally consistent with levels assumed at the DBC.
- Appropriate width of designations obtained for latest transport system requirements.

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

15.5 Overall programme management

15.5.1 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.

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

15.5.2 Benefits realisation

Ongoing tracking and measurement are another important aspect of the programme to make sure the outcomes sought are delivered. This is particularly important for a programme of this scale and duration where there is likely to be considerable change in what 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). 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.
- Minimise the amount of re-work when completing the benefits for the DBCs.
- Inform the consenting strategy.

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

- Contribution towards the desired GPS results (benefits).
- Return on the investment – expected benefits compared with expected cost.
- Reason for the decisions, especially where there is a cost benefit ratio lower than would normally be required for inclusion in the NLTP.¹⁶

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.

¹⁶ Government Policy Statement on Land Transport, 2021, Section 3.2

15.5.3 Optimising the outcomes from Te Tupu Ngātahi Programme

Specific measures to support the North recommended network have been detailed in Section 10.3.

Table 15-6 outlines the proposed management to ensure that these complementary and necessary elements are also delivered.

Table 15-6 Proposed management for supporting measures

Element	Organisations	Proposed Te Tupu Ngātahi Management
Urban System integration	<p>This is an incredibly complex arrangement as there are often competing needs and low cross party coordination in planning and implementation activities. It is critical that common outcomes are sought, clearly communicated to all parties for alignment and that parties are held to account in the delivery of their particular aspect of the complete solution.</p> <p>There are multiple parties involved in these aspects, including:</p> <ul style="list-style-type: none"> • Auckland Council (statutory & spatial planning, consent authority, civil & social infrastructure provider, local transport system specifier & operator, via CCO Auckland Transport). • Government departments (public facilities including schools and other facilities). • Developers (implement form and function ultimately). • Transport authorities (build stations and supporting infrastructure). • Kāinga Ora – an urban development agency to assist in delivering transport supportive urban outcomes. • Separation in metropolitan rail provision between public transport operators and infrastructure providers. • Council urban renewal agencies such as Panuku in Auckland. 	<p>Develop an urban strategy for the North.</p> <p>All parties will be critical to its development, actions and active monitoring.</p> <p>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.</p>
Transport system optimisation	<p>To be led by Waka Kotahi and Auckland Transport.</p> <p>Financial, technological and operational incentives are also needed to support mode shifts needed to address climate change and congestion.</p>	<p>Provide a dedicated TDM resource.</p> <p>It is proposed that a dedicated resource is tasked with ensuring the TDM elements identified are developed, implemented and monitored.</p>
Other Transport	<p>It is critical that there is cross organisation collaboration and alignment on the implementation of these 'other' projects so that the outcomes sought can be delivered by all projects. There are many competing needs and</p>	<p>Part time programme coordinator role</p>

Element	Organisations	Proposed Te Tupu Ngātahi Management
	<p>challenges to aligning multiple projects and careful planning and management of this integration is required. There will need to be coordination between:</p> <ul style="list-style-type: none"> • Waka Kotahi (funding and state highway projects). • Auckland Transport (Local roads and public transport services). • KiwiRail (Rail infrastructure). • Developers (Key local transport links). • Kāinga Ora. 	<p>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.</p>

15.5.4 Ongoing programme management roles

It is proposed to manage identified roles through the establishment of a **Green Fields Action team**. This ongoing programme management team for the programme provides for a total of five roles as shown in Figure 15-6. This includes three roles to deliver optimised outcomes as detailed above and two additional roles for previously identified property tasks.

Figure 15-6 Project management team roles



16 Conclusion and Next Steps

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

1. Approval of the North recommended transport network.

Approval and endorsement is sought for the recommended options of the North recommended transport network which includes:

- Total of 22 recommended projects in the North.
- Two key pieces of strategic infrastructure including the Rapid Transit Corridor and the upgrade of State Highway corridor between Albany and Silverdale
- Three new or upgraded state highway interchanges.
- Eight upgraded arterial roads.
- Two new arterial road alignments
- One rural transport corridor upgrade on Dairy Flat Highway

2. Approval of lodgement and route protection preparation for the North.

- Approval for lodgement and route protection for the North growth area which includes:
- 13 NoR packages.

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

3. Approval to release funding from the existing allocated SGA funding for the North post lodgement activities.
4. Acknowledgement of the potential early property acquisition and associated risk arising from route protection of the recommended North Package.

It is acknowledged that this business case is focussed on route protection and that there are funding implications associated with early property acquisition of this route protection. This business case does not seek to resolve issues surrounding the funding required for the delivery of the recommended new infrastructure and services. For a range of reasons including forward revenue projections, there is significant uncertainty surrounding the ability to fund the programme using traditional funding mechanisms/ NLTF over the long-term.

Acknowledging this uncertainty and the forecast long-term funding gap it is recommended that route protection and resultant property purchases be completed at this time because:

While growth predictions have been the subject of change in recent time and timing changes are expected to be formalised through Councils FDS work, ongoing development pressure is present in the North area. No change to extent of growth is proposed. Therefore, there is certainty that we are route protecting for an area that will need additional transport infrastructure in the future.

The very nature of route protection enables the provision of planned infrastructure rather than “responsive” infrastructure which typically results in infrastructure being retrospectively added and squeezed into available land that has already experienced growth-related development. This planned approach therefore provides the owners with significant opportunity to front foot and respond to key issues such as climate change and other mitigation/ adaptation needs of the network. Importantly it

also protects the ability to actually realise the step change transport outcomes (mode shift, land use integration and accessibility enhancements) which otherwise can be compromised as space is restricted.

Financially, a small investment now is forecast to save many millions of dollars in property and implementation costs that makes financial sense. Route protection requires some upfront expenditure but is cheaper than acquiring land later due to escalated property prices due to underlying growth in land values, rezoning and development.

Implementation will be considerably less difficult (and costly) due to a designation being in place prior to the growth. sp

Having route protection in place now provides increased certainty for developers, providing a better environment for co-funding agreements to be made, providing the best possible opportunity for increased affordability of the required infrastructure.

- The most significant risk for route protecting now is affordability due to the early property acquisition costs. This can be managed through Programme wide initiatives to address this issue including:
 1. Having a property team focussed on the Te Tupu Ngātahi programme.
 2. Developing an agreed position for the programme on the approach and application to betterment.
 3. Developing and providing programme position on advanced property purchase.
 4. Provide agreed programme positions outlined above to the Auckland Transport and Waka Kotahi boards for endorsement in the fourth quarter of 2023.

There is also the challenge of funding the implementation of the options identified given the constrained NLTF. Whilst not the focus of this business case, it is important that Auckland Transport and Waka Kotahi work together to resolve this long-term funding challenge. It is almost certain given the challenges facing the NLTF that alternative funding mechanisms are required. Whilst both organisations have experience with these, the scale of the wider Te Tupu Ngātahi programme is of a scale not undertaken before, providing unique challenges and opportunities for alternative funding models.

16.1 Next Steps

The following key next steps for Te Tupu Ngātahi in terms of route protection are:

1. Preparation of documentation for NoR
2. Approval to lodge the NoR
3. Lodgement of NoR
4. Post lodgement activities.

In a DBC this complex there have been a number of key activities that have been identified that need to be undertaken to either reduce residual risks, better manage uncertainty or unlock additional potential and opportunities for the projects. These activities will also support a handover to the owner organisations once the Te Tupu Ngātahi programme is completed. These are documented in Table 16-1 to Table 15-3 below and are split into general, strategic project and local project actions. Some fall outside the Te Tupu Ngātahi remit of route protection and in these instances, appropriate owners have been identified for the actions. These steps have been discussed with both Auckland Transport and Waka Kotahi to agree the best solution for ongoing management.

PROACTIVELY RELEASED

Table 16-1 General next steps for North

Project/ NoR	Corridor	Next step	Action	Owner/s	Dates
All	<ul style="list-style-type: none"> Recommended North Transport Network. 	<p>Property</p> <p>Management of property acquisition</p>	<ul style="list-style-type: none"> Develop overall plan for Northern property purchase. Consideration of strategic advance purchases, agreeing developer agreements. 	Waka Kotahi/Auckland Transport	Ongoing
All	<ul style="list-style-type: none"> Recommended North Transport Network. 	<p>Land use and transport integration for non- structure planned areas.</p> <p>Opportunities as part of future structure planning processes to ensure further integration between the preferred transport network and land use.</p>	<ul style="list-style-type: none"> Owners to continue to work with Auckland Council in further iterations of the Spatial Land Use framework. Owners to engage with Auckland Council in the structure planning process and preparation of Integrated Transport Assessments (ITAs). Consider instigating a recurring meeting to aid regular dialogue in the lead up to the commencement of the structure plan process. 	<p>Waka Kotahi/Auckland Transport/Auckland Council</p> <p>With interim support from Te Tupu Ngātahi.</p>	2023 -2030 regular dialogue
All	<ul style="list-style-type: none"> Recommended North Transport Network. 	<p>Sustainability and Climate Change response.</p> <p>Organisations are developing strategies to respond.</p>	<ul style="list-style-type: none"> Climate change factors have already been incorporated in the North DBC e.g., through the transport outcomes/investment objectives, option selection, measurement of emissions. Te Tupu Ngātahi has developed a programme wide response to these broader issues and scope for NoR phase. Will continue to explore ways to mitigate greenhouse gas emissions through subsequent phases. Owner organisations are currently developing their own tools to assess and review projects against climate change. It is recommended that the Te Tupu Ngātahi projects are included in owner climate change assessment programmes at the appropriate future gateways to realise the maximum opportunities for mitigation and adaptation. 	Waka Kotahi/Auckland Transport	
All	<ul style="list-style-type: none"> Recommended North Transport Network. 	<p>Changes to the Resource Management Act</p> <p>Impacts on the Route protection strategy.</p>	<ul style="list-style-type: none"> North NoR team will continue tracking these policy changes and will need to adapt the strategy if required. Not expected to influence the “why” for route protection but might impact the “how”. 	Te Tupu Ngātahi NoR team	Ongoing

Table 16-2 Next steps – Project specific next steps

Project/ NoR	Corridor	Next step	Action	Owner/s	Dates
1,2,3	<ul style="list-style-type: none"> Rapid Transit Corridor - stations 	<p>Explore Value capture opportunities around RTC stations</p>	<ul style="list-style-type: none"> The RTC station land has been identified as a strategic opportunity from a property perspective. Consideration should be given to property purchase in and around stations to provide future Value Capture opportunities via willing selling / willing buyer arrangements or applications for hardship. 	Waka Kotahi	2023-2035
1	<ul style="list-style-type: none"> Rapid Transit Corridor 	<p>Confirmation of RTC mode.</p> <p>Direction is being informed by Auckland Rapid Transit Plan and the work currently being undertaken by the Additional Waitemata Harbour Connections business case.</p>	<ul style="list-style-type: none"> AWHC business case to confirm mode. Expected to be completed in 2023. Modal decision could be late 2023. North DBC team to continue using mode agnostic principles in NoR preparation, but for the purposes of effects assessment assume a busway. Working closely with AWHC team and wider Waka Kotahi/Auckland Transport to understand how the modal decision is progressing. If resolution is achieved during NoR timeframes then refinements to design based on mode choice could be undertaken e.g station location, alignment refinements and grade separation assumptions. 	Waka Kotahi/Auckland Transport / Te Tupu Ngātahi.	2023-2025

Project/ NoR	Corridor	Next step	Action	Owner/s	Dates
1	<ul style="list-style-type: none"> Rapid Transit Corridor 	<p>RTC Station Locations.</p> <p>Final detailed station locations and alignment to be confirmed during NoR preparation. Consideration to be given to land use intensification around stations.</p>	<p>Waka Kotahi and Auckland Transport urban design and land use futures teams to commence discussions with:</p> <ul style="list-style-type: none"> Potential wider partners such as Kāinga Ora or Panuku to understand the development potential around stations. Auckland Council Plans and Places Group regarding structure planning for the Kumeū town centre and access to the Kumeū RTC stations e.g boulevard. approach. To also include the consideration of a complementary north south road to provide access to the future Huapai RTC station. Consideration of the NPS:UD and potential third party developer interest. 	<p>Waka Kotahi/Auckland Transport</p> <p>(Depending on the designated Requiring Authority).</p> <p>With support from Auckland Council.</p>	<p>2023-2035</p>
	<ul style="list-style-type: none"> Rapid Transit Corridor 	<p>Consideration of optimal locations for Collector roads to cross the rapid Transit corridor</p>	<p>The location of grade separated crossings for collector roads is not yet known given the uncertainty of the collector and local road networks.</p> <p>As private plan changes and consent applications are identified, consideration should be given to the optimal location for collector roads to cross the RTC corridor with the least impact on the vertical geometry.</p>	<p>Waka Kotahi</p>	<p>2023 onwards</p>
4	<ul style="list-style-type: none"> State Highway improvements 	<p>Consideration of interim rapid transit services.</p> <p>Opportunity to improve existing public transport services prior to the implementation of the RTC.</p>	<p>Develop a plan to assess the need for interim public transport improvements pre delivery of the RTC. This might consider aspects such as:</p> <ul style="list-style-type: none"> Temporary bus services (such as frequent shuttles to Westgate) and infrastructure on SH16. Interim passenger rail services. Temporary use of RTC or ASH facilities for bus services. Impacts on planned RTC staging. 	<p>Auckland Transport</p>	<p>2023-2030</p>
	<ul style="list-style-type: none"> State Highway 	<p>Demand management strategy to be developed</p>	<ul style="list-style-type: none"> Prior to the implementation for the RTC corridor in the North, consideration should be given to State Highway corridor and how this space could be used to improve travel choices and manage VKT. A demand management strategy is recommended to be prepared to weigh up the use of this space and integrate with the network downstream. 	<p>Waka Kotahi</p>	<p>Prior to implementation of the RTC corridor</p>
	<ul style="list-style-type: none"> Dairy Flat Highway upgrades, Rapid Transit corridor Pine Valley station 	<p>Involvement in the plan change process to ensure the Dairy Flat upgrade is</p>	<ul style="list-style-type: none"> The Silverdale West area is likely to be subject to a Plan Change within 2023. Involvement in the plan change will ensure outcomes are obtained with regard to the road network and urban development in the surrounding areas. 	<p>Auckland Transport / Waka Kotahi</p>	<p>2023-2024</p>

Appendix Cover

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- Appendix A: North Strategic Case**
- Appendix B: Climate Change Response**
- Appendix C: Alternatives Assessment**
- Appendix D: Technical Assessment**
- Appendix E: Engagement Summary**
- Appendix F: Transport Outcomes Report**
- Appendix G: Cost Report**
- Appendix H: Urban Design Evaluation**
- Appendix I: Design Report**
- Appendix J: Economics Assessment**
- Appendix K: Property Overview**
- Appendix L: Route Protection Strategy**
- Appendix M: Risk Register**
- Appendix N: Staging Considerations**
- Appendix O: Mana whenua engagement summary**
- Appendix P: ES screens**