

Technical note

Shortlist options

in support of the Cycling and Micromobility Programme Business Case

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Contents

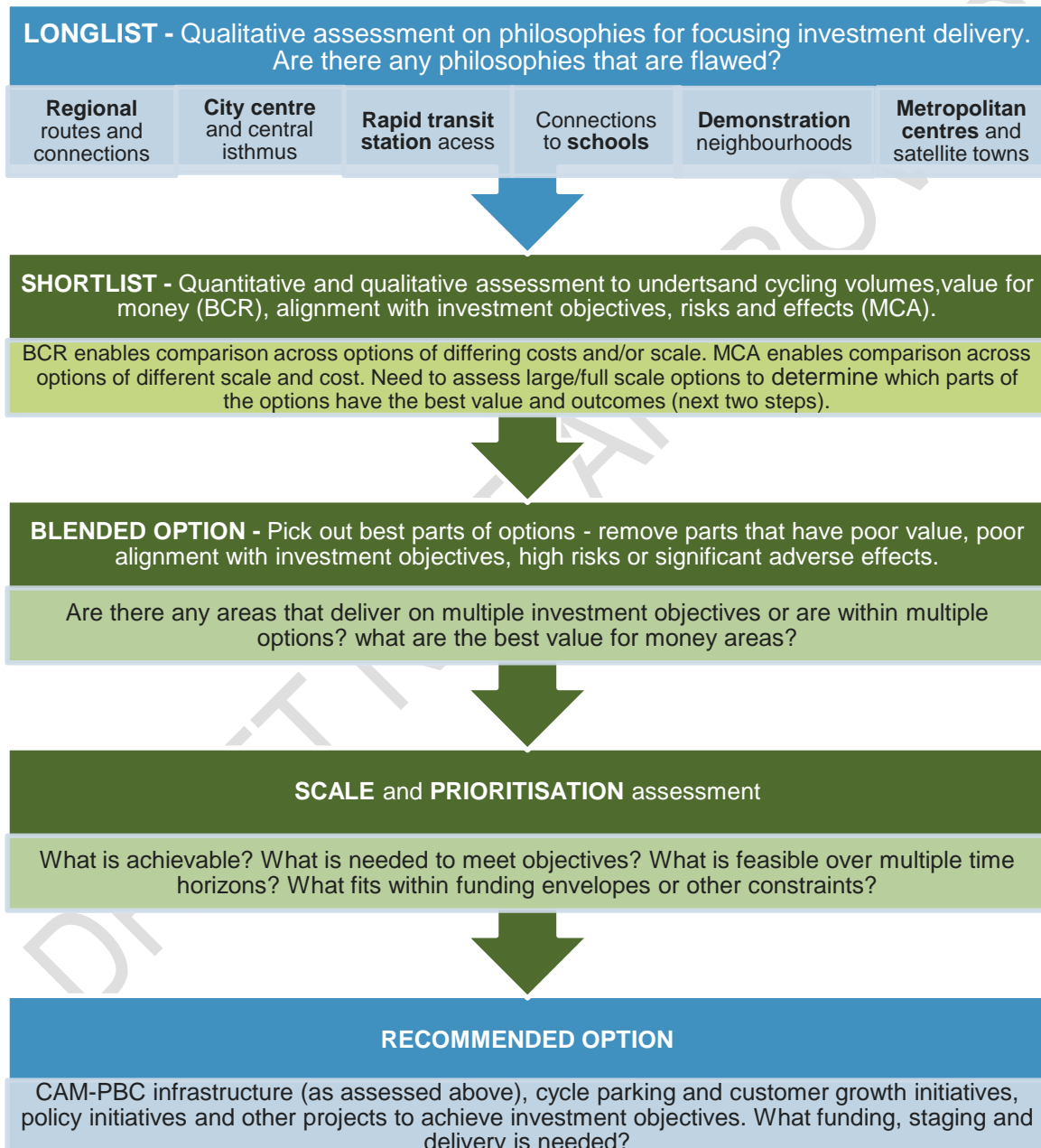
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1 Introduction

The purpose of this document is to outline the Shortlist options for the Cycling and Micromobility Programme Business Case (CAM-PBC).

The following diagram summarises the option development and assessment process, of which the boxes coloured green highlight the phases addressed within this technical note.



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2 Shortlist option development

The longlist assessment showed four longlist options should proceed to shortlist, including:

- Shortlist option 1 – Regional routes and connections.
- Shortlist option 2 – Rapid transit station access.
- Shortlist option 3 – Connections to schools.
- Shortlist option 4 – Metropolitan centres and satellite towns.

Indicative network maps were developed for each of these shortlisted options by mapping the Cycle and Micromobility Network in Future Connect that aligned with each of the option scopes. These options excluded the parts of the Cycle and Micromobility Network that are within the Do Minimum (i.e. existing, committed and planned cycle facilities).

Table 2-1 Shortlist options

Option	Network criteria
Option 1 – Regional routes and connections	Missing links ¹ in the Cycle and Micromobility Network - 'Regional' routes and 'Major' connections into the 'Regional routes'.
Option 2 – Rapid transit station access	Missing links within a 2km radius of rapid transit stations (as the crow flies) that have the highest station boarding numbers and population densities surrounding them, as determined through analysis undertaken in 2017 and verified with 2020 data. It excludes most stations in the central isthmus as the surrounding connections are within the Do Minimum.
Option 3 – Connections to school	Missing links within 1-2km radius of school clusters that collectively result in a high number of students as determined by analysis undertaken in 2017 and verified with 2020 data.
Option 4 – Metropolitan centres and satellite towns	Missing links within 2km radius of metropolitan centres and the satellite towns of Pukekohe and Warkworth (as the crow flies).

The shortlist of options was developed further from the longlist by selecting locations for investment (i.e. school clusters and RTN stations) based on likely demand (i.e. school roll, boardings, population density), missing links, and denser unitary plan zoning. As a result, a number of areas did not make it into the shortlist of options as they fell outside of the catchments around the identified RTN stations, school clusters and metropolitan centres, or did not provide an immediate major connection to a regional route. These areas include Torbay, Birkdale, Birkenhead, Glenfield, Swanson, Titirangi, Lynfield, Remuera, Meadowbank, Howick.

¹ 'Missing links' refers to those links on the Cycle and Micromobility Network in Future Connect that are not existing, committed (RLTP funded) or planned (unfunded) as part of another project or programme.

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2.1 Do Minimum / Reference Case scenarios

Two Do Minimum / Reference Case scenarios have been developed:

- Do Minimum / Reference Case 1 – a standard Do Minimum that will be used to compare against the shortlist of options and for economics assessment. It includes all existing cycle facilities and all future cycle facilities that are either under construction or have committed funding for implementation through the 2021-2031 Regional Land Transport Plan (RLTP). This scenario in effect represents a ‘status quo’ of continuing cycling investment in Auckland.
- Do Minimum / Reference Case 2 – this scenario includes all projects / programmes that include cycle facilities but are not currently funded for implementation under the RLTP. Cycle facilities in these projects / programmes will not be included in the shortlist of options, as the funding for these facilities are being sought through other business cases. Reference Case 2 will be layered on top of the recommended option to illustrate the need for these projects / programmes to deliver cycle facilities.

2.1.1 Do Minimum / Reference Case 1

Projects included within the Do Minimum / Reference Case 1 scenario include:

- All existing cycle facilities; and
- All future cycle facilities that are either under construction or have committed funding for implementation through the RLTP as shown in Table 2-2 below:

Table 2-2 Do minimum projects

Auckland Transport's Urban Cycleway Delivery programme	Auckland Transport programmes / projects with committed funding for implementation of cycle facilities	Waka Kotahi programmes / projects with committed funding for implementation of cycle facilities	Auckland Council's projects
Eastern Busway Shared Path (Section 2, 3, 4)	Pt Chevalier to Herne Bay	Northern Pathway (Constellation to Albany)	Te Whau pathway
New Lynn to Avondale – Section 1, 2 & 3	Meadowbank Kohimarama Connectivity	SH20B Early Improvements	
Links to Glen Innes: Package 1	Māngere Cycleways	Papakura to Drury South shared path	
Waitematā Safe Routes	Matakana Link Road	Penlink shared path	
Great North Road	Medallion Drive Link	Glen Innes to Tāmaki Drive Shared Path	
Links to Glen Innes: Package 2	Lincoln Road Corridor Extent (North of Te Pai)	Old Māngere Bridge replacement link	
Glen Innes to Tāmaki Drive: Section 4	Glenvar Road and East Coast Road improvements	SH16 Brigham Creek to Waimauku	
	Northwest Growth Improvements - Fred Taylor to Maki	The Strand - Optimisation Programme	
	Tāmaki Drive/ Ngāpipi Road safety improvements		

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	<p>Greenfields Transport Infrastructure - Trig Road, Dunlop Road, Baker Lane</p> <p>Connected Communities – Sections of the Ponsonby Road, Great North Road, New North Road, Sandringham Road, Mt Eden Road, Manukau Road corridors</p> <p>Drury Local Road - Waihoehoe Road West</p> <p>Minor Cycle and Micromobility Improvements pop-up protection programme - prioritised 3-year list</p>		
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Area-based programmes such as Access 4 Everyone (A4E), Supporting Growth and the Brownfields Programme Business Case have not been included in the Do Minimum / Reference Case 1 map, given the current uncertainty around the quantity and location of cycle facilities that will be delivered.

2.1.2 Do Minimum / Reference Case 2

Projects included within the Do Minimum / Reference Case 2 scenario include:

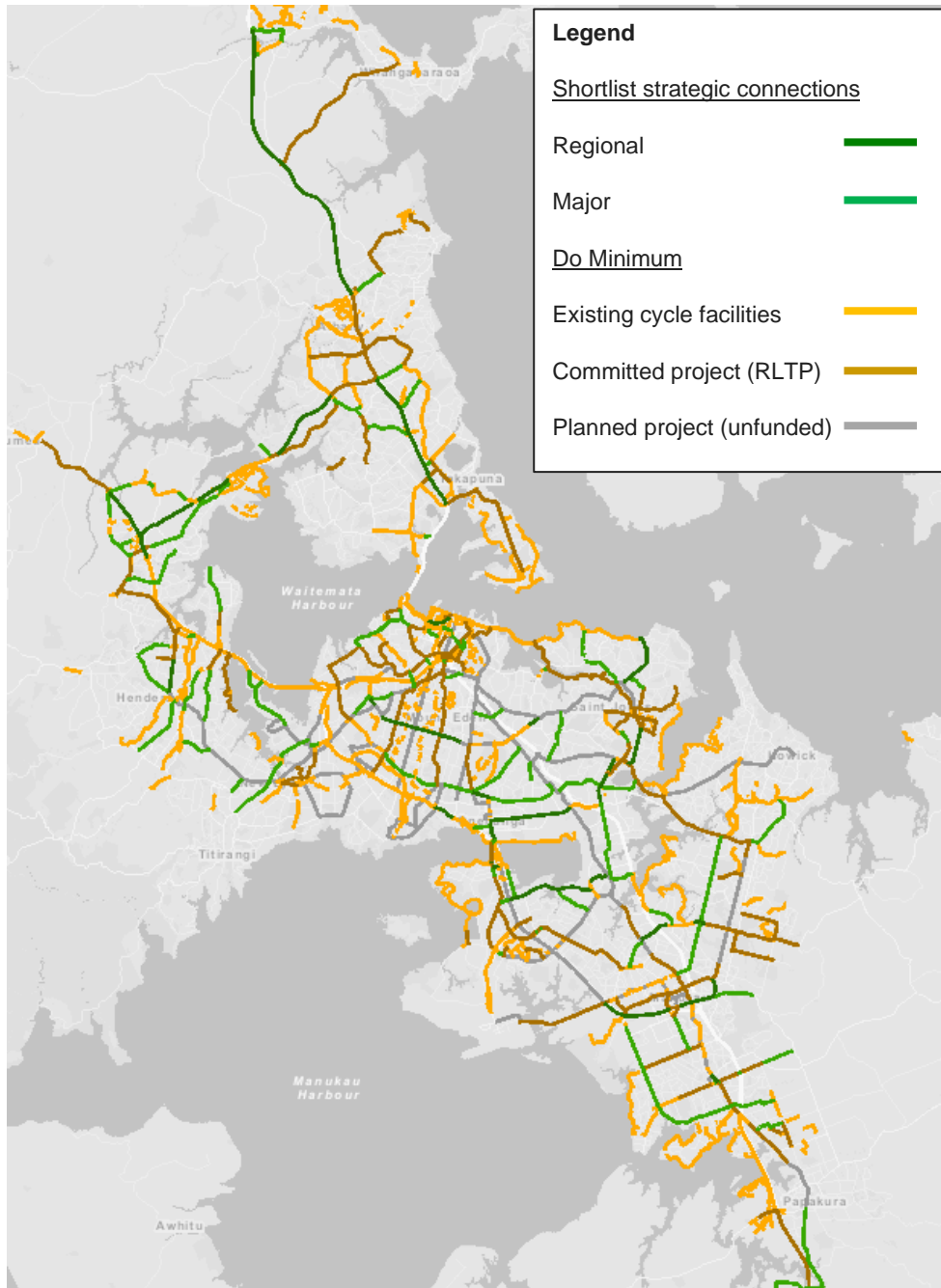
- Do Minimum / Reference Case 1 projects;
- Auckland Transport programmes/projects that do not have committed funding for implementation of cycle facilities in the RLTP;
 - Connected Communities Corridors - unfunded corridors/sections.
 - Airport to Botany (A2B) on AT Network.
 - Light Rail - Queen St, Dominion Road.
- Waka Kotahi programmes/projects that do not have committed funding for implementation of cycle facilities;
 - SH1 Shared Path - Drury South to Bombay.
 - 20Connect:
 - SH20 between Onehunga and Mangere; and
 - SH20B / Puhinui Road.

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2.2 Shortlist option 1 – Regional routes and connections

The focus of this option is to fill in the missing links in the ‘Regional’ cycle routes and develop the ‘Major’ connections into those routes, to cater to longer distance trips (typically journeys to work and tertiary education, as well as recreational trips).

Figure 2-1 below shows the indicative cycle and micromobility strategic connections for Shortlist Option 1 in green.



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Figure 2-1 Shortlist option 1 - Regional routes and connections

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2.3 Shortlist option 2 – Rapid transit station access

The focus of this option is to get people out of single occupancy vehicles for longer distance trips by improving access to public transport through the provision of cycling and micromobility infrastructure around Auckland’s busiest rapid transit stations.

Figure 2-2 below shows the indicative cycle and micromobility strategic connections for Shortlist Option 2 in green, with the yellow routes showing indicative local connections.

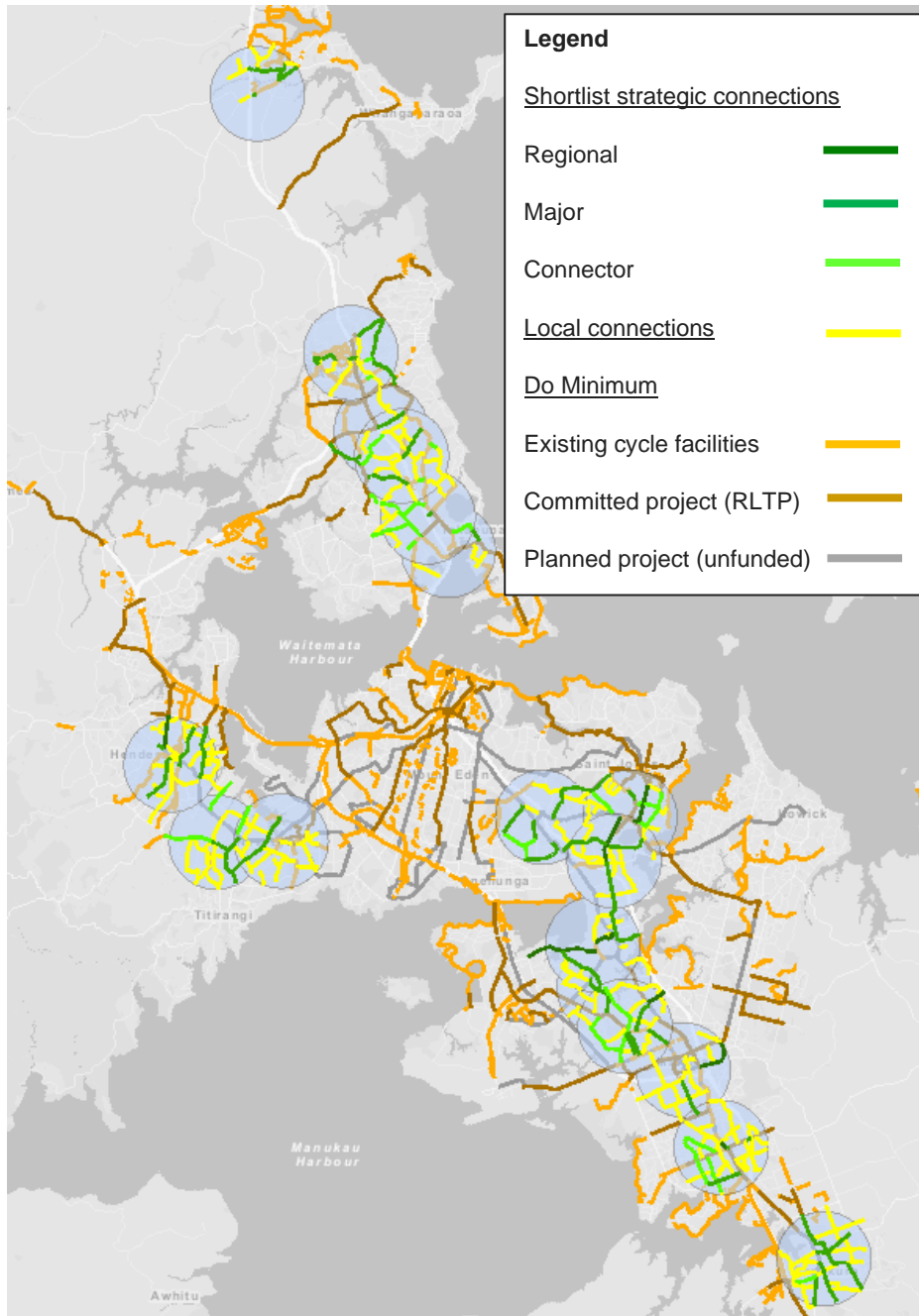


Figure 2-2 Shortlist option 2 - Rapid transit station access

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The rapid transit stations identified in the 2017 PBC were used as a starting point, and were refined based on:

- 2019 passenger boardings data (2020 was also considered in conjunction but not to the same extent given the impacts of COVID-19); and
- Exclusion of most rapid transit stations within 5km of the city centre on basis that people would be more likely to cycle directly to their destination, and because the city centre stations are well served by the Do Minimum / Reference Case.

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2.4 Shortlist option 3 – Connections to schools

The focus of this option is to improve access to primary and secondary education and get more children and young adults cycling at an early age. Figure 2-3 below shows the indicative cycle and micromobility strategic connections for Shortlist Option 3 in green, with the yellow routes showing indicative local connections.

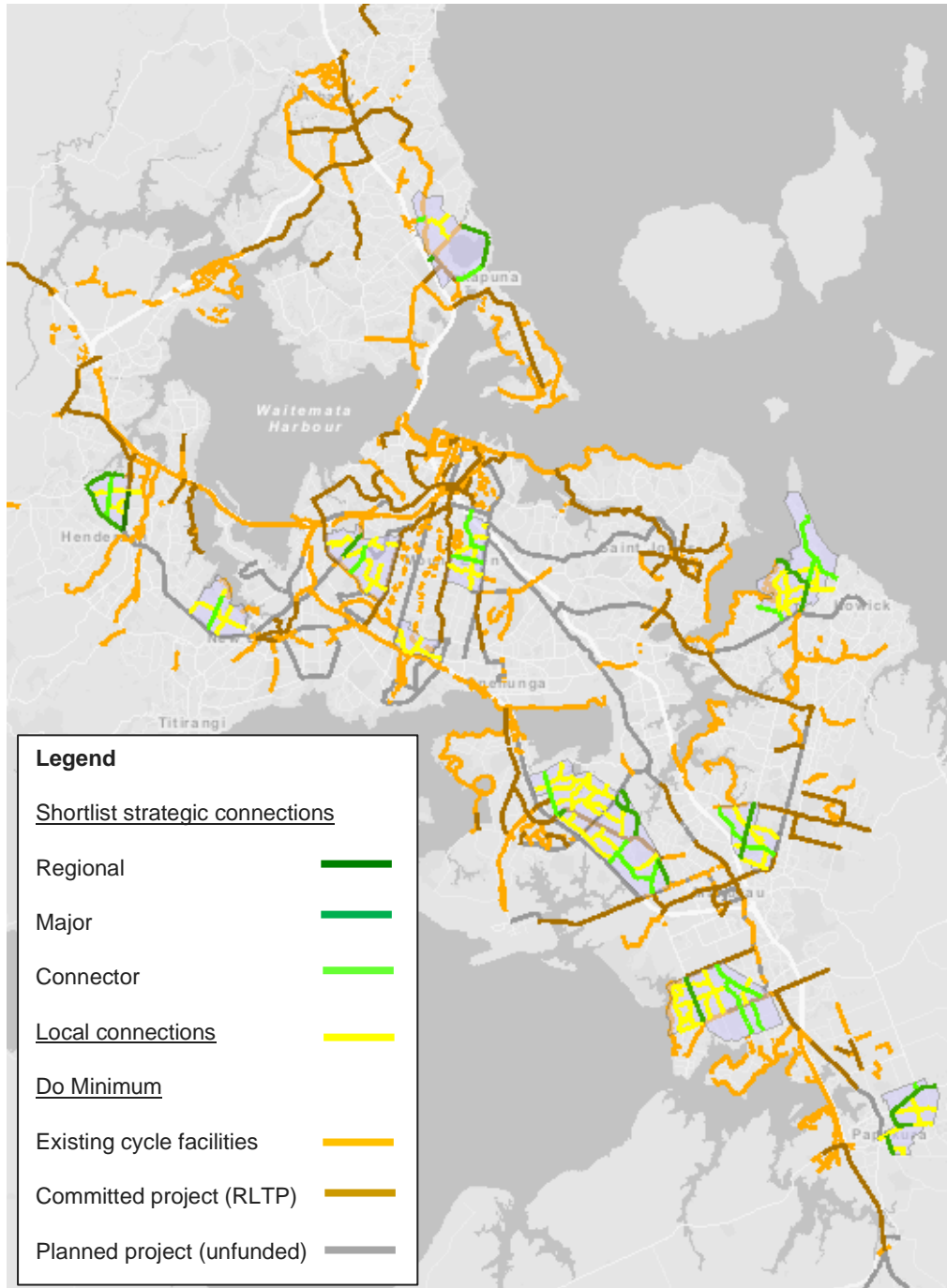


Figure 2-3 Shortlist option 3 - Schools access

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2.5 Shortlist option 4 – Metropolitan centres and satellite towns

The focus of this option is to enable cycling and micromobility use in areas of high growth and densification, by developing cycle and micromobility networks within and connecting to the metropolitan centres of Albany, Westgate, Takapuna, Henderson, Newmarket, Botany, Sylvia Park, Manukau and the satellite towns of Warkworth and Pukekohe.

Figure 2-4 below shows the indicative cycle and micromobility strategic connections for Shortlist Option 4 in green.

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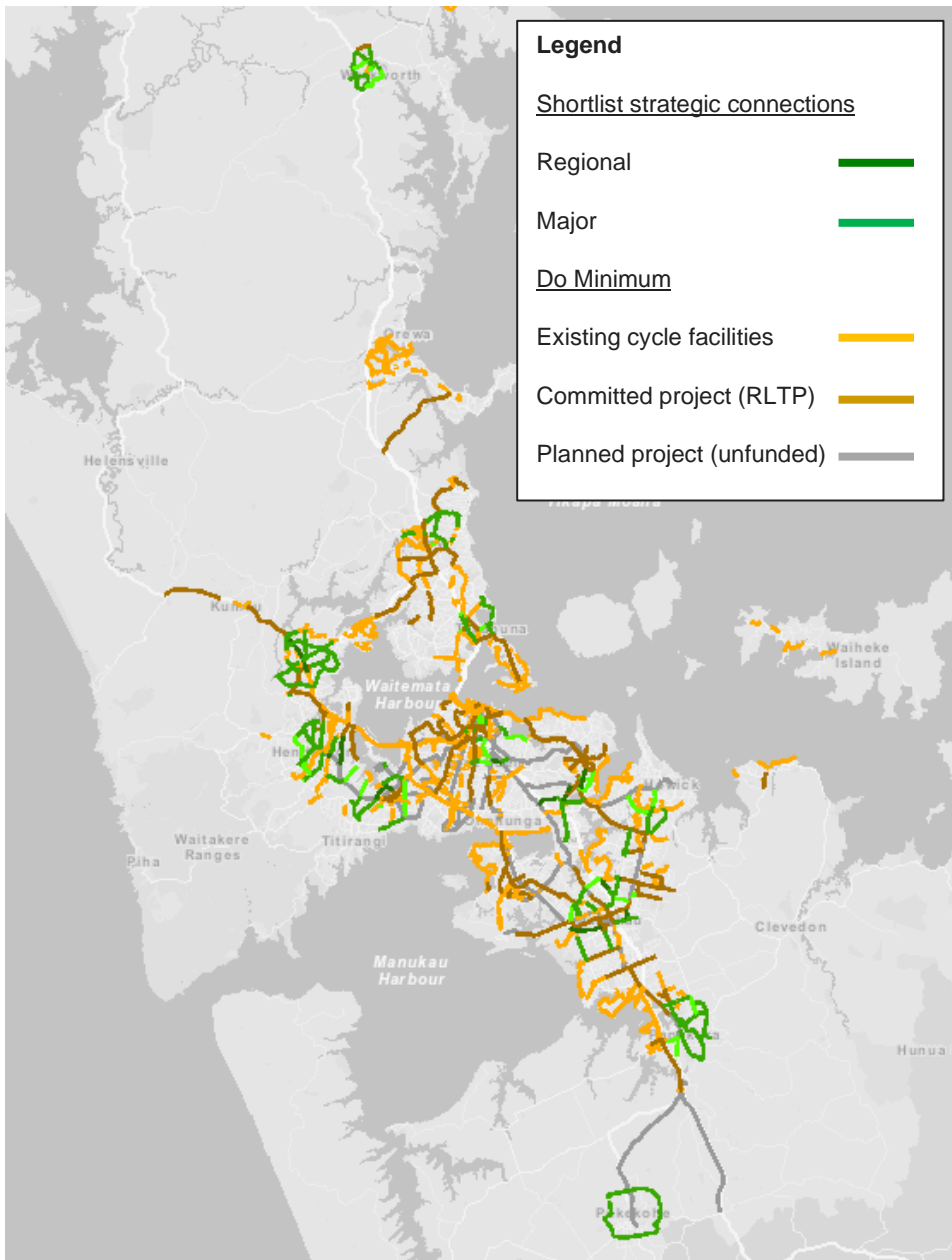


Figure 2-4 Shortlist option 4 - Metropolitan centres and satellite towns

3 Shortlist option assessment

3.1 Demand assessment

Cycling and micromobility demands for shortlist options 1 and 4 were ascertained from the Auckland Cycle Model (ACM). Demands for shortlist options 2 and 3 were determined from RTN station boardings, school roles, and census data. The reason the ACM was not used to determine demands to RTN station and schools (shortlist options 2 and 3) was because the ACM cannot estimate short

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distance cycle trips; particularly those to public transport or school. However, the ACM more readily forecasts long trips between neighbourhoods.

The Flow Transport Consultants report can be found in Appendix M of the CAM-PBC and includes detail on the review and validation of the ACM.

3.1.1 Demand to rapid transit stations

The cycling and micromobility (CAM) demands to and from the rapid transit stations was determined by:

$$\begin{aligned}
 & \text{station boardings} * \text{mode share of CAM} \\
 & \quad * \text{proportion of boardings within area affected by infrastructure improvements} \\
 & = \text{demand for CAM}
 \end{aligned}$$

Where:

- Potential mode share is from a literature review, which found a mode share of approximately 10% could be attainable, with 20% achieved in countries like the Netherlands; and
- Proportion of boarding's within affected area is estimated from Stats NZ CommuteWaka data that shows number of residents within the cyclable catchment of the station and existing destinations and mode share for those residents.

3.1.2 Demand to schools

The cycling and micromobility (CAM) demands to and from schools was determined by:

$$\begin{aligned}
 & \text{school roll} * \text{mode share of CAM} \\
 & \quad * \text{proportion of students living within area affected by infrastructure improvements} \\
 & = \text{demand for CAM}
 \end{aligned}$$

Where;

- mode share is from a literature review and review of Travelwise data that shows schools with good cycling mode share have 20% or more kids cycling to school, and
- proportion of students within affected area is estimated from school/s zone sizes.

3.2 Multi-criteria assessment (MCA)

The shortlist MCA assessment can be found in Appendix F-1 of this technical note and is summarised in Table 3-1.

Table 3-1 Shortlist MCA assessment results summary

	Shortlist Option 1 -Regional connections	Shortlist Option 2 - RTN Access	Shortlist Option 3 -School Access	Shortlist Option 4 - Metro Centres
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MCA ranking	4th	2nd	1st	2nd
Investment objectives	High Positive (8.8)	High Positive (8.4)	High Positive (8.8)	High Positive (8.0)
Critical success factors (risks)	Moderate negative (-8)	Low negative (-2)	Low negative (-1)	Moderate negative (-5)
Opportunities and Impacts	Moderate positive (9)	Moderate positive (11)	Moderate positive (13)	Moderate positive (11)
Uncertainties	More benefit certainty than options 2 and 3 but greater costs per km and more complexity	More uncertainty about demands than option 1 and 4. Need cycle parking	Strong 'safety for kids' messaging. Could get school kids cycling later in life. School culture is important	More benefit certainty than options 2 and 3 but greater costs per km and more complexity

3.3 Value for money

Benefits were calculated using the ACM. The outputs are summarised in Table 3-2 below. Value for money was assessed using Waka Kotahi Monetised benefits and costs manual.

Table 3-2 Summary of benefits and costs of each shortlist option

		Shortlist Option 1 - Regional connections	Shortlist Option 2 - RTN Access	Shortlist Option 3 - School Access	Shortlist Option 4 - Metro Centres
Total (2038) ²	Additional trips (daily)	26,682	20,213	12,818	22,730
	Additional cycle km (daily)	166,863	40,427	26,061	118,294
	Mode shift from vehicles (daily car km removed)	70,083	46,414	24,236	52,050
Per \$M PV ³ spent	Additional trips (daily)	18	27	40	23
	Additional cycle km (daily)	116	54	81	123
	Mode shift from vehicles (daily car km removed)	49	62	75	54
Total PV Benefits (\$M)		1,910	566	290	1,351
Total PV Cost (\$M)		1,443	753	322	963
Interim BCR		1.32	0.75	0.90	1.40

² While the Investment Objectives relate to years 2030 and 2031 (to align with the Auckland Climate Plan and Road to Zero), the modelled years (and as a result the economic assessment years) are in 2028 and 2038 years.

³ PV indicates 'present value' i.e. value in current dollar terms

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As shown above, Option 1 and Option 4 have the largest number of additional daily cycle kilometres per dollar spent, which is an indicator of health benefits (the main monetised benefit). However, the Auckland Cycle Model is best set up for longer cycle trips between neighbourhoods, not within neighbourhoods so Option 2 and 3 daily cycle trips may be underestimated. All four options achieve relatively large emissions reductions per dollar spent, as indicated by mode shift from vehicles (daily car kilometres removed). This benefit has not been monetised at the shortlist stage.

All options have interim BCRs of around 1.0. However, cycle demands only include the one user type the option is targeting (i.e. trips to RTN stations and trips to schools respectively). Therefore, the BCRs are conservative. Once the cycle volumes are layered, the BCRs are likely to be above 1.0 across all options, and therefore all likely to be economically viable.

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4 Blended Option

All shortlisted options scored well against the investment objectives and were shown to have merit. However, they each had shortcomings that need to be overcome. Namely, risk of delivery for regional routes and connections and metropolitan centres and satellite towns, and monetised benefits realisation for rapid transit access and school access.

By taking the strategic connections and focus areas from all four shortlist options as a blended programme option, each connection could be assessed individually against a set of criteria to develop an ordered list of potential projects that deliver the best value for money with available and additional funding.

As a result, all four shortlist options were layered to develop a blended option with 180 strategic connections as well as focus areas and are estimated to cost \$3.5 to \$4 billion. Prioritisation of these connections and was then needed to determine a preferred priority order for delivery and no matter what funding is made available.

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5 Prioritisation

The prioritisation layered the benefits of each connection, targeting connections with lower delivery complexity (including avoiding moving kerbs), improving safety, and building off existing (or committed) safe cycle facilities to build a connected network.

Figure 5-1 below provides a visual representation of the prioritisation process.

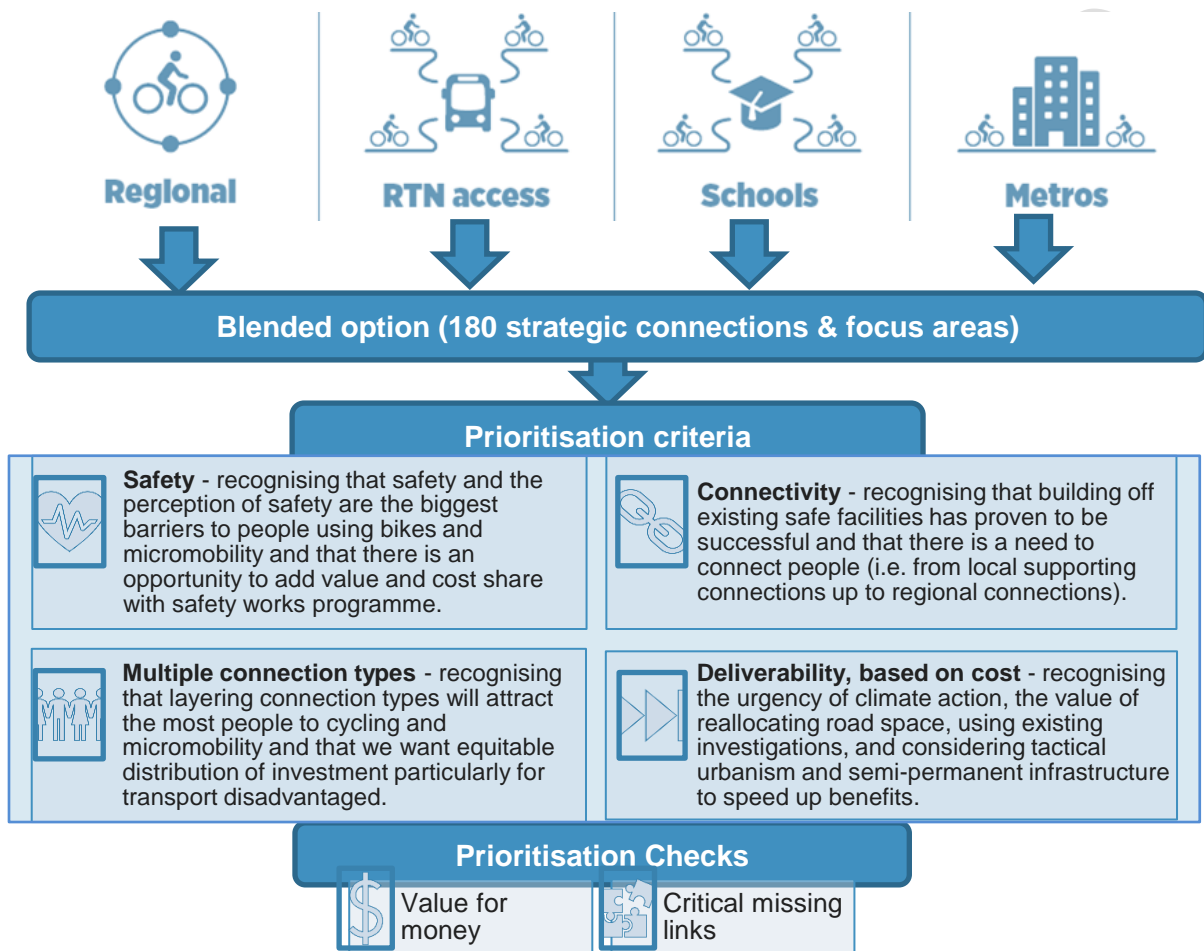


Figure 5-1 Prioritisation process

Bringing together the four shortlisted options resulted in a list of over 180 strategic connections for prioritisation, as well as focus areas where metropolitan centres, RTN stations and/or school clusters overlapped.

The prioritisation process resulted in an ordered list of potential projects that were prioritised in a way that recognises the importance of the building a safe, connected network that caters to multiple different connection types, while also recognising the need to improve deliverability (based on construction cost) through the potential to reallocate road space.

The prioritisation criteria included: connectivity to existing (or committed) protected cycle facilities, the number of connection types, targeting connections with lower physical works complexity (including avoiding / minimising moving kerbs) and targeting connections with a higher active road user safety

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risk. The criteria are shown in Table 5-1 along with the scoring system that support the decision (use of professional judgement) to confirm the priority order of the entire programme.

Table 5-1 Initial prioritisation criteria and scoring summary

Criteria	Categorisation	Value
Connectivity to existing or future cycle facilities (to establish a more connected Auckland CAM network)	Yes - Existing (Protected)	5
	Yes - Committed (Funded)	4
	Yes - Existing (Unprotected)	3
	Yes - Planned (Unfunded)	1
	No	0
Multiple connection types i.e. Regional, RTN, schools, metro and town centres	3 or 4 connection types	5
	2 connection types	3
	1 connection type	1
Deliverability based on construction cost and complexity	AT network - reallocate existing road space (\$2-3m/km)	5
	AT network - mid-range (\$5-6m/km)	3
	AT network - move kerbs (\$8-10m/km)	2
	Waka Kotahi network - off-road (\$20-25m/km)	1
Safety based on Active Road User Corridor Risk ⁴	High	5
	Medium High	4
	Medium	3
	Low Medium	2
	Low	1

Further checks

The resulting prioritised list of strategic connections were checked using a proxy value for money metric based on the forecast number of users against the estimated cost of delivering the connection. This step helped to refine the prioritised list by demoting connections that had lower benefits relative to cost and promoting connections that had higher benefits relative to cost, using a manual 'prioritised order' score, based on bands of five (i.e. 5, 10, 15, 20 etc). Some examples include:

- Ash Street and Rata Street had prioritisation scores of 15 and 14 respectively out of 20, however they had very high proxy value for money scores, based on the demand forecasts generated. They were therefore given a higher ranking via a manual 'prioritised order' score.
- Bairds Road (southern end) had a prioritisation score of 18 out of 20 (top 5), however it had a lower proxy value for money score, based on the demand forecast generated. It was therefore given a lower ranking via the manual 'prioritised order' score.

⁴ KiwiRAP Active Road User Corridor Risk 2014-2018, AT GIS accessed in 2021.

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- Note: Strategic connections that ranked well in the prioritisation score and proxy value for money score, but that sat within the extent of other cycle projects/programmes (e.g. Access for Everyone) or relied on a planned (but unfunded) cycle project (e.g. Skypath; some of the Connected Communities corridors) were manually demoted using the ‘prioritised order’ scoring. Some examples include Cook Street, Victoria Street West, Grafton Road, Fanshawe Street, Stokes Road and Epsom Road.

A visual inspection of the gaps in the Cycling and Micromobility Strategic Network in Future Connect was also undertaken. This ensured that strategic connections that completed a gap in the Strategic Network by linking two separate existing or committed cycle facilities but may not have scored well within the prioritisation process, were moved up the priority list, using the manual ‘prioritised order’ score. This was to reflect the importance of building a connected network and helped to shape the preferred programme. Some examples include:

- Walmsley Road, Favona Road, James Fletcher Road, Tui Street and Kaka Street together complete the east-west strategic connection in Māngere East.
- High Street, Trenwith Street, Station Road, Mason Ave and a section of Great South Road together complete the east-west strategic connection in Ōtāhuhu.
- Hobsonville Road and Buckley Avenue together complete the north-south strategic connection between Hobsonville and Westgate.

The visual checks also involved checking the infrastructure was delivered in an equitable manner – especially regarding social equity and transport disadvantaged groups. The result of these checks was minor reordering of the prioritised list, where marginally lower scoring high priority connections were prioritised over others (in locations where there is less transport choice with minimal/no safe cycle connections) to ensure the programme had regional spread and demonstrated equity.

Lastly, the high scoring strategic connections that were located within the Cycling SSBCs currently in development (i.e. Henderson, Māngere East and Manukau) were given the highest priority, to ensure investment is directed to these areas first. This was not only to reflect their identified high priority, but also to ensure they are scheduled first in the programme given they are further through the investigation phase and the community expectations built through previous and ongoing community consultation. If these connections are not prioritised, there is a risk that there is no pipeline for construction over the first years of the programme. Some examples include:

- Sections of Swanson Road and Great North Road were manually promoted in priority to as this is the critical missing link between Rathgar Road and the Henderson town centre.
- Druces Road and Carruth Road in Manukau both had prioritisation scores of 14, with high proxy value for money scores, making them among the highest scoring strategic connections in Manukau. These connections were identified in the shortlist and emerging preferred option of the Manukau Cycling SSBC and therefore manually promoted.

The full prioritisation scoring is documented in Appendix I of the CAM-PBC.

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Prioritisation of focus areas

Focus areas were also prioritised and were allocated an additional portion of investment in addition to the amount allocated to the strategic connection identified within the area. Focus areas were prioritised based on the following:

- A Cycling SSBC for the focus area is currently in development – i.e. Henderson, Māngere East and Manukau. The additional funding allocation was seen as being critical to supporting the high scoring strategic connections identified in these areas by completing more local connections. Furthermore, these areas were seen as being important test cases for a ‘just transition’ given their lower than average cycle mode share, lack of a safe and connected cycle network and higher social deprivation. The Cycling SSBCs in these areas also have political and community support demonstrated through their respective engagements.
- The area represents an overlap of a metropolitan centre, RTN station and/or school cluster. Concentrated investment in the area (beyond the identified strategic connection) is required to deliver local networks between the strategic connection and key trip origins/destinations.

These areas were typically allocated \$20-\$30 million of investment to improve cycle connections to key destinations (e.g. schools, RTN station, town centre) that would be explored through the next stage business cases. Potential interventions include modal filters, traffic calming, intersection upgrades, and separated cycling facilities to create safe local area networks adjacent to the strategic connection identified in the area.

It is important to note that a balance between delivering strategic connections and focus areas was a key consideration, which influenced the amount of investment allocated to focus areas. This was to acknowledge the added time and complexity of planning and delivering focus areas (which require a full SSBC) compared to strategic connections which can be delivered through SSBC lites if they fall below the \$15 million cost and risk profile. This is described in Part C of the CAM-PBC.

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6 Sensitivity tests

The prioritisation list is intended to be able to be reprioritised should external or internal changes happen (e.g. other projects such as A2B are delivered earlier than expected, or investigation finds a connection will cost more to deliver than expected). As such, it is sensitive to change but sensitivity testing was run to determine how sensitive each connection was to each of the prioritisation criteria.

A summary of the sensitivity test results are in Table 6-1. It shows the top 25 connections for five sensitivity tests run. Duplicated connections with the base ranking are coloured. The 'Value for money' sensitivity test assumed planned but unfunded projects (Reference case 2) would proceed and that the network was connected, so it was skewed towards high demand routes that in reality may not achieve the demands forecast in the short term because of the lack of a connected network if other projects are not delivered (e.g. Curran Street relies on a cross harbour connection). Many of the connections that score well in the sensitivity tests were excluded from the top 25 of the base prioritised list because of their high reliance on planned but unfunded projects (Reference case 2).

Table 6-1 Sensitivity tests

Base Prioritised list	Ignore connectivity	Ignore number of connection type	Ignore complexity	Ignore safety	Value for money
Rathgar Road	East Tamaki Rd (west and east)	Kitchener Rd; Hurstmere Rd	Kitchener Rd; Hurstmere Rd	Kitchener Rd; Hurstmere Rd	Curran St; Jervois Rd (east)
Universal Drive	Kitchener Rd; Hurstmere Rd	Cook St	Ash Street	Bairds Road (south)	Waipuna Road
Swanson Rd; GNR	Ash Street	Bairds Road (north)	Bairds Road (south)	Chapel Road; Ti Rakau Dr	Botany Rd
Walmsley Rd; Favona Road	Bairds Road (south)	Cascades Rd	Chapel Road; Ti Rakau Dr	Hobsonville Rd; Buckley	Shore Rd
James Fletcher; Tui; Kaka	Chapel Road; Ti Rakau Dr	Ash Street	Hobsonville Rd; Buckley	High Street; Trenwith	Mt Smart Rd; Station Rd
Carruth Rd	Edmonton Road	Bairds Road (south)	Rata Street	Puhoi to Mangawhai shared path	Grafton Road
Druces Road	Henderson Valley Road	Chapel Road; Ti Rakau Dr	Rathgar Road	Ash Street	Stokes Rd; Epsom Ave
Station Rd; Mason Ave; GSR connection	Hobsonville Rd; Buckley Ave	Hobsonville Rd; Buckley Ave	Stokes Rd; Epsom Ave	Rata Street	Ash Street
High Street; Trenwith Street	Oteha Valley Rd (east of SH1)	Victoria St West (Nelson to Queen)	Universal Drive	Rathgar Road	Boston Road
Roscommon Road	SH16/Northwestern	Grafton Road	Moire Rd; Luckens Rd (west section)	Stokes Rd; Epsom Ave	Rata Street
Mahia Road	Station; Mason; GSR	Greville Rd	Broadway; Clevedon	Universal Drive	Bairds Road (north)

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Base Prioritised list	Ignore connectivity	Ignore number of connection type	Ignore complexity	Ignore safety	Value for money
	connection		(west of Marne Rd)		
Hobsonville Rd; Buckley Ave	Sunnynook Road	Hendry Ave	Mountain Road	East Coast Rd (south of Oteha Valley to Rosedale)	Cascades Rd
Archibald Road	Victoria St West (Nelson to Queen)	James Fletcher; Tui; Kaka	West Coast Road	Roscommon Road	Edmonton Road
Titirangi Road	Anzac St	Mt Smart Rd (west of Onehunga Mall); Onehunga Mall	Clevedon Rd (east of Marne Rd)	Waipuna Road	Carruth Rd
Rata Street	Cook St	Rosebank Road	Kolmar Road	Wylie Road	Chapel Road; Ti Rakau Dr
Ash Street	Fanshawe St	Russell Road	Marne; Onslow; Settlement	Moire; Luckens (west section)	Hobsonville Rd; Buckley
Rosebank Road	Harris Rd; Springs Rd	Shore Rd	Cook St	Cook St	Mahunga Dr
Kitchener Rd; Hurstmere Rd	High Street; Trenwith	Swallow Drive; Wordsworth Road; Friedlanders	Mt Smart Rd (west of Onehunga Mall); Onehunga Mall	Kenderdine Road	Wylie Road
Anzac St	Hollyford Dr	Tristram Avenue (east)	Russell Road	Grafton Road	Roscommon Road
Mt Smart Rd (west of Onehunga Mall); Onehunga Mall	Lincoln Rd	Bucklands Beach Rd (south)	Swallow Drive; Wordsworth Road; Friedlanders Road	Greville Rd	Hobson Drive; Jellicoe Rd
Hendry Ave	Manukau Station; Redoubt (west)	Sunnybrae Road	High Street; Trenwith	Hendry Ave	Royal Rd (existing)
Pilkington Road; Queens Rd	Mt Wellington Hwy (north of SE Hwy ramp)	Whitaker Rd	Puhoi to Mangawhai shared path	James Fletcher; Tui; Kaka	Morrin Road
Mt Wellington Hwy (north of SE Hwy ramp)	Pilkington Road; Queens	Fanshawe St	East Coast Rd (south of Oteha Valley to Rosedale)	Rosebank Road	Rathgar Road
Waipuna Road	Preston Rd; Reagan Rd	High Street; Trenwith	Roscommon Road	Shore Rd	Spencer Rd

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As shown, the list is sensitive to the criteria used, so changing strategic priorities and values could affect the prioritisation, however there is still a lot of consistency especially when routes that rely on planned but unfunded projects are removed from the sensitivity tests. Table 6-2 shows those connections that scored well across all the sensitivity tests.

Table 6-2 Connections that scored well across sensitivity tests

Base	Number of times in top 25 of sensitivity tests
Hobsonville Rd; Buckley Ave	5
Ash Street	5
High Street; Trenwith Street	4
Kitchener Rd; Hurstmere Rd	4
Rathgar Road	3
Roscommon Road	3
Rata Street	3

Table 6-3 lists those connections in the top 25 of the base list that did not score well in the sensitivity tests and the reason for their inclusion. They typically are included because they bundle well with other high scoring connections or are more progressed (i.e. are already being investigated through a SSBC, so can be delivered quicker than other connections).

Table 6-3 Reason for inclusion of strategic connections that did not score well in sensitivity tests

Connections in base list	Reason for inclusion
Swanson Road; Great North Road	Already in investigation (SSBC) phase. Great North Road is a critical link in Henderson. Swanson Road scored well across the prioritisation and sensitivity, just not in the top 25. It was prioritised in part because it is the most advanced connection with scheme design complete and completes the connection between Rathgar Road and the Henderson town centre and train station.
Walmsley Road; Favona Road	Already in investigation (SSBC) phase. Can be delivered quicker as part of the Māngere East Cycling SSBC compared to other connections. Scored well across the prioritisation and sensitivity tests, just not in the top 25.
Druces Road	Already in investigation (SSBC) phase. Can be delivered quicker as part of the Manukau Cycling SSBC compared to other connections. Scored well across the prioritisation and sensitivity tests, just not in the top 25.
Mahia Road	Bundles with Roscommon Road, which scores well, completing the connection to Great South Road (Regional network).
Archibald Road	Bundles with other connections in New Lynn area that scored well (e.g. Rata St and Ash St).
Titirangi Road	This connects into Rata St and Ash St, which both scored well – so it makes sense from a packaging of connections perspective.

The prioritised list identified priorities for investigation. Although proceeding to investigation, some connections may not proceed to design or construction based on findings in the investigation stage.

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7 Preferred programme

The shortlist assessment concluded that a blend of all strategic connections and focus areas from the shortlist options provides the greatest investment benefits (coupled with an extensive prioritisation process to establish the priority order).

The resulting prioritised list of projects reflects the importance of building a safe, connected network that caters to multiple different connection types, while also recognising the need to improve deliverability (based on construction cost) through the potential to reallocate road space. The prioritised list is made up of:

- **Strategic connections**, which are connections on the Cycle and Micromobility Strategic Network in Future Connect. Identified projects will typically be delivered through road space reallocation and single stage business case lites (SSBC lites) provided they have an estimated whole-of-life cost less than \$10 million. In some instances, strategic connections will require kerb moving and a full single stage business case (SSBC), stepping through the Indicative and Detailed stages. This is discussed further in Part C.
- **Focus areas**, which will be delivered primarily through full SSBCs as they will need to confirm the local connections that link into the strategic connections and will therefore have more options to consider. The intention of the focus areas is to deliver a suite of interventions that create safe cycling environments in local streets. Interventions may include modal filters, traffic calming, speed reductions as well as protected cycle facilities. The suite of interventions in each area will be confirmed by the associated next stage business case and will depend on vehicle volumes and design speeds to ensure any provision is Vision Zero safe as per AT's Transport Design Manual.
- **Cycle parking**, covered in Appendix G of the CAM-PBC.
- **Customer growth initiatives**, which includes activation, marketing, training, wayfinding and bike hubs, covered in Appendix G of the CAM-PBC.

The projects for the \$306 million investment programme, which is allocated in the RLTP, is shown in Table 7-1 and Figure 7-1. A dynamic programme was developed with a prioritisation methodology that is able to respond to changes in context (e.g. if another project comes online earlier than expected then connections that link into that project would score higher in the prioritisation). Strategic connections may also be put on hold or change, if through early investigation and design, the connection proves more complex (and therefore costly) than anticipated. This approach ensures that the programme maintains flexibility to respond to unforeseen risk and change.

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Table 7-1 Preferred programme projects to \$306 million

Location	Strategic connections	Focus areas	Investment
Henderson	<ul style="list-style-type: none"> Universal Drive, Rathgar Road, Swanson Road, Great North Road connection; \$18.2 million; 4km 	<ul style="list-style-type: none"> LANs; \$2 million 	\$20.2 million
Māngere East	<ul style="list-style-type: none"> James Fletcher Road, Tui Road, Kaka Street connection; \$5 million; 2km 	<ul style="list-style-type: none"> LANs and supporting connections; \$45 million 	\$50 million
Manukau	<ul style="list-style-type: none"> Druces Road, Carruth Road connection; \$18 million; 3km 	<ul style="list-style-type: none"> LANs and supporting connections; \$32 million 	\$50 million
Ōtāhuhu	<ul style="list-style-type: none"> Station Road, Mason Avenue, Great South Road connection; \$10.5 million; 2km High Street, Trenwith connection; \$3.5 million; 1km 	<ul style="list-style-type: none"> N/A 	\$14 million
Manurewa	<ul style="list-style-type: none"> Roscommon Road connection; \$12 million; 4km Mahia Road connection; \$12 million; 4km 	<ul style="list-style-type: none"> N/A 	\$24 million
Hobsonville	<ul style="list-style-type: none"> Hobsonville Road, Buckley Road connection; \$16 million; 5km 	<ul style="list-style-type: none"> N/A 	\$16 million
New Lynn	<ul style="list-style-type: none"> Ash Street, Rata Street connection; \$8 million, 3km Titirangi Road connection; \$16 million; 2km Archibald Road; \$5 million, 2km 	<ul style="list-style-type: none"> Supporting connections between residential areas, schools, metro centre and train station; \$25 million 	\$54 million
Avondale	<ul style="list-style-type: none"> Rosebank Road connection; \$24 million; 5km 	<ul style="list-style-type: none"> N/A 	\$24 million
Takapuna	<ul style="list-style-type: none"> Kitchener Road, Hurstmere Road connection; \$7 million 2km Anzac Street connection; \$9 million; 1km 	<ul style="list-style-type: none"> N/A 	\$16 million
Onehunga	<ul style="list-style-type: none"> Mt Smart Road; Onehunga Mall Road connection; \$9 million; 3km Hendry Drive; \$3 million; 1km 	<ul style="list-style-type: none"> N/A 	\$12 million
Total	<ul style="list-style-type: none"> 45km strategic connections; \$175 million 	<ul style="list-style-type: none"> 4 focus areas; \$110 million 	\$285 million
Cycle parking	<ul style="list-style-type: none"> Cycle parking at RTN stations and key destinations 		\$1 million
Customer growth initiatives⁵	<ul style="list-style-type: none"> Schemes to improve access to bicycles Promotion, activation and events. Digital experience improvements Marketing Communications 		\$20 million

⁵ As outlined in Part C of the CAM-PBC, customer growth initiatives will be included in the cost of projects rather than as a programme level line item as they are part of the capital cost.

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Total		\$306 million
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Figure 7-1 Preferred \$306 million programme

An indicative scale of projects that could be delivered with \$1 billion is shown in Table 7-2 and Figure 7-2. Delivering \$1 billion of cycling infrastructure over the next 10 years is considered feasible, subject to funding availability, sufficient internal resourcing, and overall industry capacity.

Table 7-2 Indicative scale of projects with funding increase to \$1 billion

	Strategic connections	Focus areas	Investment
Projects listed under \$306 million	<ul style="list-style-type: none"> 45km strategic connections 	<ul style="list-style-type: none"> 4 focus areas 	\$285 million
Additional projects	<ul style="list-style-type: none"> 105km strategic connections 	<ul style="list-style-type: none"> 3 focus areas 	\$645 million
Total	<ul style="list-style-type: none"> 150km strategic connections; \$745 million 	<ul style="list-style-type: none"> 7 focus areas; \$185 million 	\$930 million
Cycle parking	<ul style="list-style-type: none"> Cycle parking at RTN stations and key destinations 		\$17 million
Customer growth initiatives	<ul style="list-style-type: none"> Schemes to improve access to bicycles Promotion, activation and events. Digital experience improvements Marketing Communications 		\$53 million
Total			\$1 billion

An indicative scale of projects that could be delivered with \$2 billion is shown in Table 7-3. Approximately \$2 billion is the minimum investment needed in cycling infrastructure, cycle parking, and customer growth initiatives to meet the aspirations of Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan of 7% mode share by distance for cycling and micromobility. However, delivering \$2 billion over 10 years will be difficult because of the scale of construction and delivery management required.

Table 7-3 Indicative scale of projects with funding increase to \$2 billion

	Strategic connections	Focus areas	Investment
Projects listed under \$1 billion	<ul style="list-style-type: none"> 150km strategic connections 	<ul style="list-style-type: none"> 7 focus areas 	\$930 million
Additional projects	<ul style="list-style-type: none"> 110km strategic connections 	<ul style="list-style-type: none"> 7 focus areas 	\$930 million
Total	<ul style="list-style-type: none"> 260km strategic connections; \$1,500 million 	<ul style="list-style-type: none"> 14 focus areas; \$360 million 	\$1,860 million
Cycle parking	<ul style="list-style-type: none"> Cycle parking at RTN stations and key destinations 		\$34 million
Customer growth initiatives	<ul style="list-style-type: none"> Schemes to improve access to bicycles Promotion, activation and events. Digital experience improvements Marketing Communications 		\$106 million
Total			\$2 billion

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Figure 7-2 Indicative \$1 billion programme

Most of the strategic connections in the \$306 million, \$1 billion and \$2 billion programmes connect to existing or committed (RLTP funded) cycle facilities, with only 12%, 10% and 20% of each respective programme (based on investment value) connecting to planned but unfunded (or no) projects and therefore risk being stranded assets if unfunded projects are not delivered in the next ten years. However, these proportions drop significantly to less than 1% across all programmes, when connections that tie into other strategic connections in the programme are removed (assuming these are delivered as part of the investment programme and therefore complete connections are delivered). The preferred programme is intended to be flexible, where strategic connections would be reprioritised to ensure assets are not stranded.

The full prioritised list of projects can be found in Appendix I of the CAM-PBC. Connections will be procured in packages for the investigation, design, and construction phases. Procurement and delivery of these projects are discussed in more detail in Part C of the CAM-PBC.

7.1 Focus area indicative example

As shown in the tables above, the preferred programme includes added investment in several focus areas. These areas typically require \$20-\$30 million of investment and have multiple key destinations such as schools, RTN stations, metropolitan centres, and regional connections that the cycle and micromobility network needs to serve.

A hypothetical example is shown below, which shows potential interventions to improve cycle connections to key destinations that would be explored through the next stage business case (SSBC). Potential interventions include modal filters, traffic calming, intersection upgrades, and separated cycling facilities. They would be used to create safe LANs adjacent to the strategic connection identified in the area.

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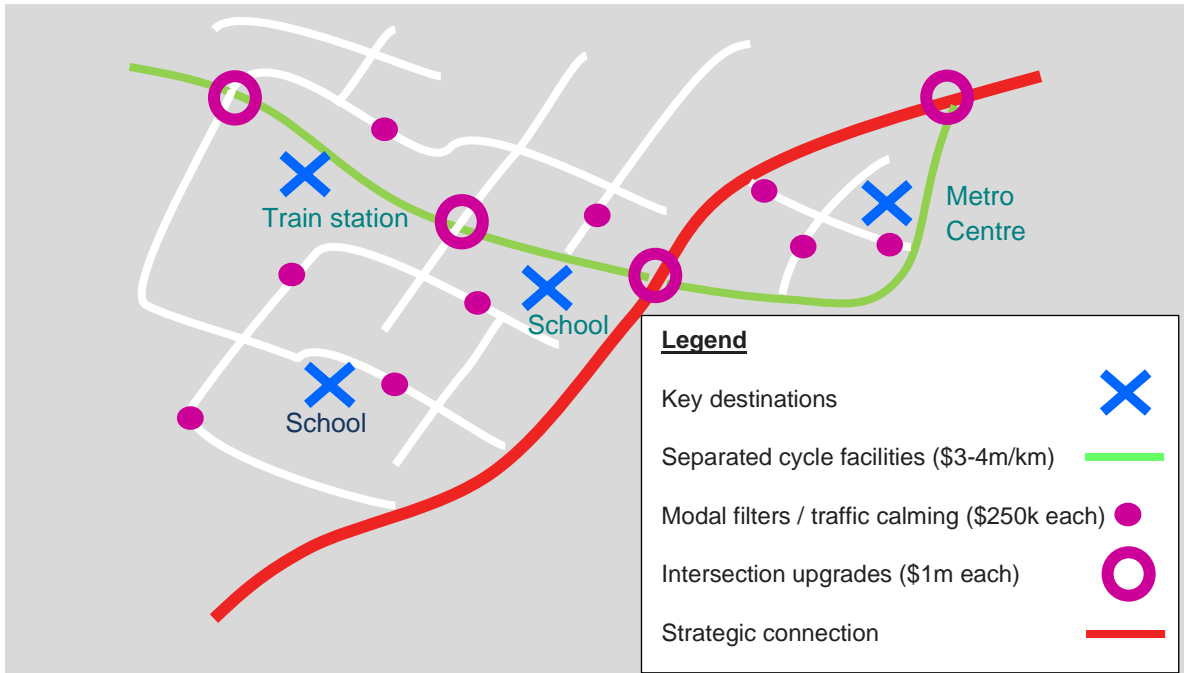


Figure 7-3 Focus area example

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Appendix F-1 – Shortlist MCA

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