

# Biking and Micro-mobility Programme

Single Stage Business Case

July 2022






**Hamilton  
City Council**  
Te kaunihera o Kirikiriroa

# DOCUMENT CONTROL

## Document version history

Date	Version	Author	Changes
15 March 2021	A	Nathan Harper	Draft Strategic Case
22 March 2021	B	Nathan Harper	Draft Economic Case
9 April 2021	C	Nathan Harper	Draft SSBC for review
27 February 2022	D	Nathan Harper	Refocus with 10 year programme for client review
06 June 2022	E	Nathan Harper / Dirk du Preez	Redraft SSBC and programme towards transitional approach
1 July 2022	F	Nathan Harper / Dirk du Preez	Final Single Stage Business Case

## Document review

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## EXECUTIVE SUMMARY

### Introduction

This Biking and Micro-mobility Programme Single Stage Business Case (SSBC) presents a coordinated 10 year biking and micro-mobility programme of activities to make Hamilton a city where many more people use bikes and micro-mobility devices (encompassing bikes, e-scooters and e-skateboards etc.) day-to-day, helping shape our city that is easy to live in and move around. This long-term vision is called *Connected Neighbourhoods*.

It is recommended that Hamilton City Council and the Waka Kotahi Board:

1. Endorse the *Connected Neighbourhoods* vision “I can go anywhere on my bike”
2. Endorse the Strategic Network Plan as shown in Figure 13
3. Endorse the establishment of the biking and micro-mobility programme as an ongoing programme with the governance and management arrangements, and delivery structure as described in Section 5.0
4. Endorse the 10 year biking and micro-mobility programme for the purpose of informing the 2024-27 NLTP as described in Section 2.13, and costs as summarised in Section 3.0
5. Approve \$1.9m of funding in the 2021-24 NLTP to kick start the biking and micro-mobility programme ready for delivery in the 2024-27 NLTP as shown in the table below

Biking and micro-mobility programme funding for 2021-2027 (\$m)

Component	2021 /2022	2022 /2023	2023 /2024	NLTP 2021-24	2024 /2025	2025 /2026	2026 /2027	NLTP 2024-27	Total
Capital P50	-	0.7	0.6	1.3	14.9	12.8	13.4	41.1	42.4
Maintenance and operating	-	-	0.6	0.6	1.0	1.2	1.3	3.5	4.1
Total	0.0	0.7	1.2	1.9	16.0	14.0	14.7	44.7	46.6

### Proposed investment

The biking and micro-mobility programme is proposed as an ongoing programme to govern, manage, and deliver biking investment in Hamilton. A 10 year \$101-131m programme for investment has been developed Hamilton wide, which works towards the overall *Connected Neighbourhoods* vision. Delivery of the Strategic Network Plan for biking and micro-mobility is proposed to begin in the 2024-27 NLTP.

This SSBC requests funding approval for the establishment of the biking and micro-mobility programme with \$1.9m in the 2021-24 NLTP to get the programme ready for delivery in the 2024-27 NLTP, comprising \$1.3m of capital and \$0.6m of operating costs as shown above.

## Background

People need to go places every day safely, efficiently, and reliably. In Hamilton these journeys use a variety of modes of travel with most people using private car to get around, causing congestion on the roads and streets at peak times. With high growth predicted in the next 30 years and onward, Hamilton needs to act before congestion and emissions from transport become crippling to everyday travel and the economy.

People riding bikes and other forms of micro-mobility make up a very small proportion of total travel in Hamilton at 3.8%. Investment in safe biking networks can provide more travel choices for shorter trips, eliminate or mitigate future investment in road capacity, improve people's safety and health, reduce emissions and private car travel, and help to make Hamilton more liveable for its people.

This Biking and Micro-mobility Programme SSBC seeks to:

- Improve mode share, in line with Access Hamilton targets
- Improve safety
- Develop a Strategic Network Plan, providing a comprehensive biking and micro-mobility network
- Provide a prioritised 10 year programme of activities that give effect to the Strategic Network Plan, and
- Inform a future revision of the Access Hamilton programme.

## Hamilton context

Hamilton is one of the fastest growing cities in New Zealand, and is forecast to reach 282,000<sup>1</sup> people, around 75% growth by 2051.

Hamilton's transport system is car dominated with 86% of trips to work made by car, the highest of the five major New Zealand cities<sup>2</sup>. Bike all day mode share is very low at 3.8%.

The transportation sector is by far the highest contributor to emissions at 64% of gross emissions, which can be transitioned to low carbon transport modes<sup>3,4</sup>.

Hamilton has significant opportunities to encourage more biking and micro-mobility use:

- Positive attitudes – Hamilton residents are the most supportive of biking out of the six largest NZ cities at 78%.<sup>5</sup> 63% of Hamilton's non-cyclists are open to cycling and 56% of existing cyclists are open to biking more.<sup>6</sup>
- Flat geography – Hamilton has a relatively flat geography, so riders do not need to go up and down hills to get around, making travel by biking and micro-mobility less physically taxing for people.
- Short trips – Around 60% of all trips in Hamilton are shorter than 5km, which is in the sweet spot for moving to biking and micro-mobility.
- 20-minute city – The majority of Hamilton is within a 20-minute bike ride or less of the largest employment, educational, retail and recreational locations, and
- Compact urban form – 45% of Hamilton's population can reach the city centre by bike within 10 minutes, and 84% can reach the city centre within 20 minutes.

<sup>1</sup> Future Proof (2022) *Hamilton-Waikato Report Metro Spatial Plan Transport Programme Business Case, Shortlist Option Assessment Report*, Initial Working Draft, Revision A, April 2022.

<sup>2</sup> Waka Kotahi NZ Transport Agency (2019) *Keeping Cities Moving*, September 2019, <https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/keeping-cities-moving.pdf>

<sup>3</sup> Waikato Regional Council (2020) *Waikato Region Greenhouse Gas Emissions Inventory, for the period July 2018 to June 2019*, April 2020, <https://www.waikatoregion.govt.nz/assets/WRC/WRC-2019/Waikato-Region-GHG-Inventory-18-19.pdf>

<sup>4</sup> Hamilton City Council, *Climate Change Flyer* [https://www.hamilton.govt.nz/our-services/environment-and-health/Documents/Climate%20Change%20Flyer\\_P10.pdf](https://www.hamilton.govt.nz/our-services/environment-and-health/Documents/Climate%20Change%20Flyer_P10.pdf)

<sup>5</sup> NZ Transport Agency (2018) *Understanding Attitudes and Perceptions of Cycling and Walking*, August 2018, <https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/NZTA-Attitudes-to-cycling-and-walking-final-report-2018.pdf>

<sup>6</sup> NZ Transport Agency (2019) *Understanding Attitudes and Perceptions of Cycling and Walking*, Final Report, September 2019 <https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/NZTA-Attitudes-to-cycling-and-walking-final-report-2019.pdf>

## Strategic and local context

There is clear and strong alignment for investment in biking and micro-mobility against national and regional policies and documents, including the Government Policy Statement on Land Transport 2021/22 – 2030/31, National Policy Statement on Urban Development, Emissions Reduction Plan (ERP), and the Hamilton-Waikato Metropolitan Spatial Plan (MSP).

HCC have been seeking to improve biking outcomes for some time. Key local documents including the Access Hamilton PBC and MSP PBC, show that HCC have clear ambitions to be a bike friendly city, with a safer transport system, improved transport choice, for all ages and abilities, and improved access and connections by bike.

## Problems

Partners and key stakeholders agreed the following key problems:

- Problem One: Increasing real and perceived conflicts are resulting in crashes and a high perception of risk for micro-mobility users (40%)
- Problem Two: A disjointed, poor quality and incomplete network is causing low micro-mobility use and poor health and environmental outcomes (30%), and
- Problem Three: A car centric culture and transport system, and high growth, results in increasing congestion and unequal transport choices (30%).

Supporting evidence has shown that these problems are significant and urgent, there is a case for change, and that there is a compelling need for investment in biking and micro-mobility.

## Why now?

Investment in biking and micro-mobility needs to start now, to avoid a car dominated and congested future where Hamilton accommodates high growth by dedicating more urban space and considerably more money to roads and car parks, because we don't have choices in how we travel. Hamilton's vehicle kilometres travelled (VKT) by private car and corresponding emissions will almost double, and 'net zero' targets will not be met.

Investment in biking and micro-mobility will encourage mode shift toward biking and micro-mobility, support a more compact urban form, improve travel choices, enable intensification and affordable housing, and is essential to improving health, wellbeing and liveability in our cities. Investment in safe and complete biking networks is needed to enable Vision Zero road safety ambitions, and to encourage people to get on their bikes and e-scooters to reduce VKT, emissions and achieve 'net zero' targets.

*"We know that we need to start investing more in these kinds of initiatives now... If not, I think we may miss an opportunity to make big improvements to the city and offer people real choice about how to get around safely. ...This investment will benefit everyone, whether you walk, cycle, drive or catch a bus."*  
Hamilton City Councillor Dave Macpherson<sup>7</sup>

<sup>7</sup> Hamilton City Council (2021) Council Touts Bigger Spend on Cycling, press release, 9 March 2021, <https://www.scoop.co.nz/stories/AK2103/S00218/council-touts-bigger-spend-on-cycling.htm#:~:text=Investing%20public%20money%20into%20safer,benefits%20for%20everyone%20in%20Hamilton.&text=A%20further%20%2430.7%20million%20would,with%20a%20%2428%20million%20hitch.>

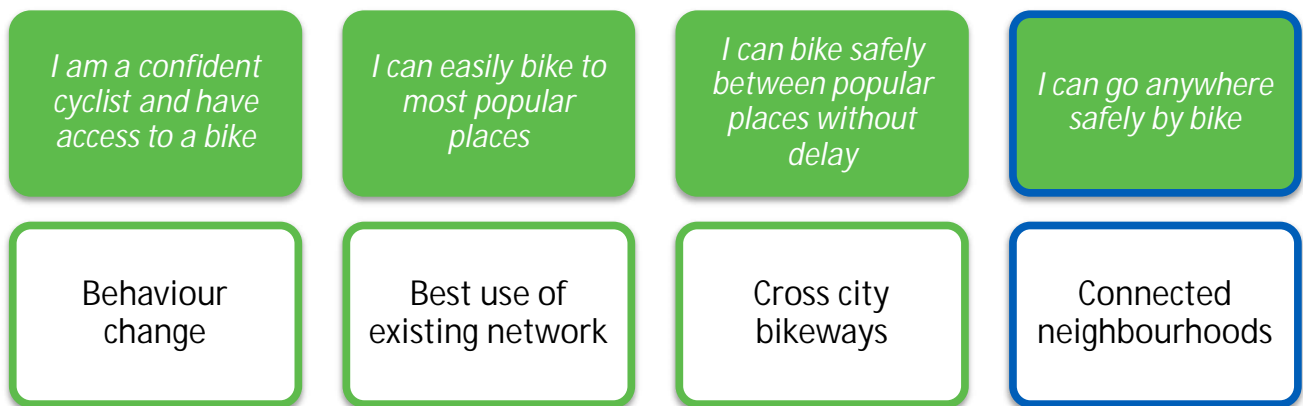
## Investment objectives

The Partners and key stakeholders identified and agreed the following key investment objectives:

1. To improve safety of micro-mobility users by reducing deaths and serious injuries, and improving the perception of safety
2. To increase micro-mobility use by improving network quality and access, and
3. To improve health and environmental outcomes by improving physical health and reducing CO<sub>2</sub> emissions.

## Option assessment

Stakeholder ideas were collated into a long list of options to achieve the investment objectives. Using the most effective options from the long list assessment, four short list options were developed that varied in cost, scale, infrastructure provision and effectiveness at achieving the investment outcomes. The short list options were assessed by Partners and key stakeholders in a multi-criteria assessment (MCA).



Based on the short list option MCA assessment and consideration of Mana Whenua, Elected Member, community and stakeholder engagement feedback, *Connected Neighbourhoods* was identified as the preferred option. More than 86% of community respondents agree or strongly agree that *Connected Neighbourhoods* would encourage them to regularly bike or e-scooter.

This SSBC (Revision C) was presented to the HCC Infrastructure Operations Committee on 27 April 2021, where HCC elected members unanimously approved the business case for submission to Waka Kotahi. This was based on the *Connected Neighbourhoods* programme which took 30 years to deliver at a likely cost of more than \$1b.

## Connected Neighbourhoods vision

The *Connected Neighbourhoods* 30 year vision is that *"I can go anywhere on my bike"*, creating a network and environment that is safe and convenient for people to go anywhere by bike or micro-mobility.

The core principles of *Connected Neighbourhoods* are:

- Quality separated biking facilities are provided on busy roads
- Local roads that are redesigned to be cycling friendly with slower speed limits, and
- It connects neighbourhood centres and schools as well as large destinations.

Where traffic volumes and speeds are high, bikes should be segregated from traffic on quality separated facilities. Where vehicle speeds and volumes can be reduced, or where conflicts with vehicles can be mitigated lesser facilities may be considered. On quiet local roads where there are fewer vehicles, speeds are lower, and potential conflicts are minimal, minor treatments would be sufficient to provide safe cycling opportunities on street.



## Strategic Network Plan

The long term Strategic Network Plan for biking and micro-mobility to achieve the *Connected Neighbourhoods* vision is shown over the page. The routes shown are indicative only, and the most appropriate streets or roads between these destinations will be established through future investigations.

The Strategic Network plan totals 328km of biking and micro-mobility network, consisting of three route types and lengths:

- Tier 1: Cross city connections 70km – Connect key activity clusters with separated bike lanes as these can be expected to generate the most travel demands due to the scale of the activities connected
- Tier 2: Community links 148km – Connect activity centres to the Tier 1 network using separated or buffered cycle lanes, and
- Tier 3: Local links 110km – Speed management treatments on local roads and quieter collector roads to integrate with the Tier 1 and 2 networks.

*“Overall I think the city needs a far more cohesive approach to cycling, joining up the cycleways we have, taking them off-road and making sure people can go between more destinations safely. And of course transport choice has a huge impact on our environment and on efforts to lower our carbon footprint.”*

Hamilton City Mayor Paula Southgate<sup>8</sup>

## A new urgency

Since April 2021 the national and local context and urgency for investment in biking and micro-mobility has changed significantly. Three key changes influencing this SSBC are the development of the ERP, the National Policy Statement on Urban Development, and the MSP PBC. These three documents show that:

- Population growth in Hamilton is predicted to increase 75% from 2018 to 2050<sup>9</sup>
- As a result of growth, Hamilton’s VKT is expected to increase 88% in roughly the same timeframe, almost doubling private car travel
- NPS-UD enables more growth and more density within Hamilton, faster than was previously permitted, and
- The ERP requires a 20% reduction in VKT and therefore carbon emissions by 2035, to work towards achieving our ‘net zero’ goal by 2050.

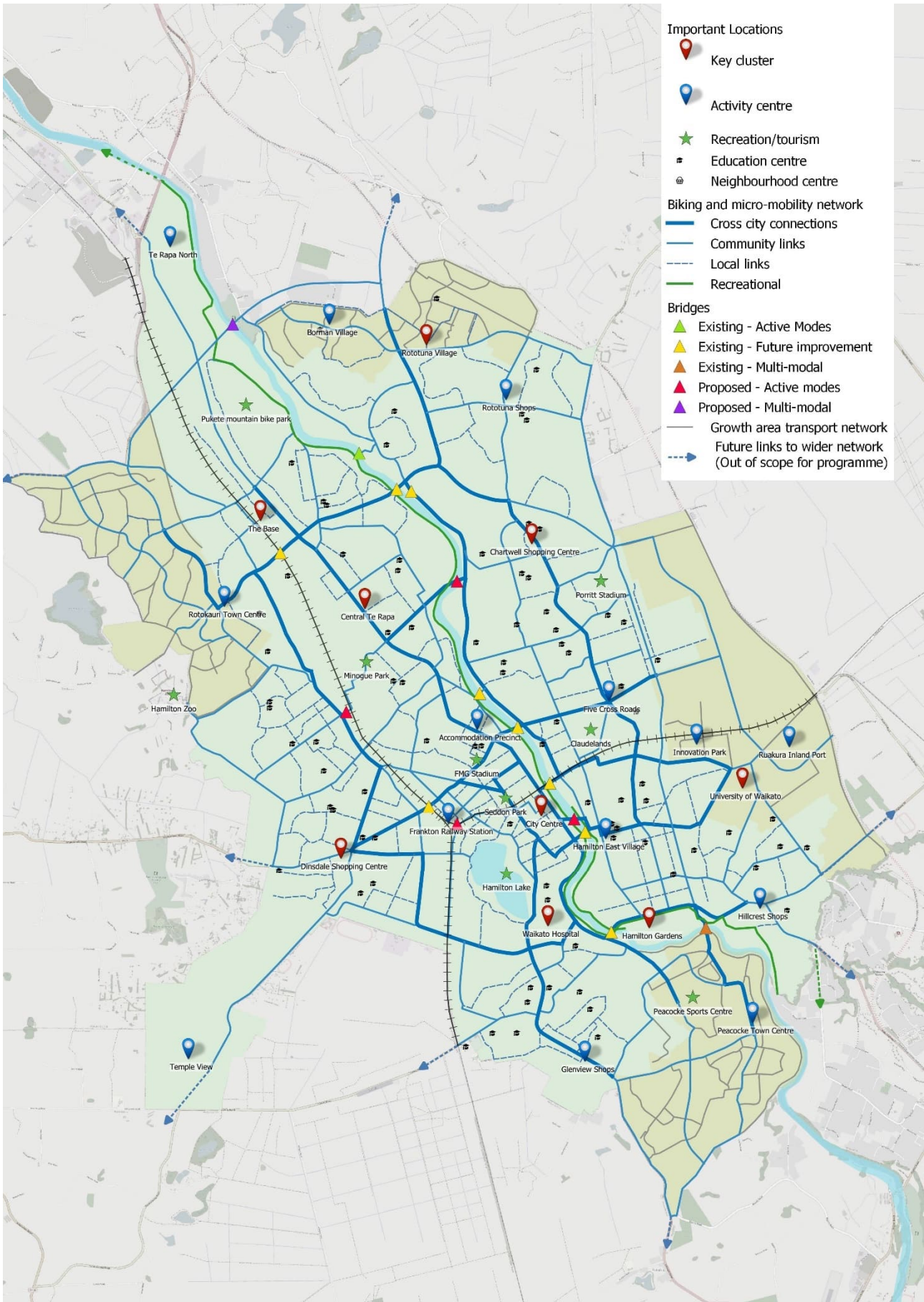
If Hamilton continues to accommodate population growth with private car transport as it always has done, we can expect our VKT to almost double. This will result in worsening congestion requiring further investment in roads and car parks which will be expensive and require scarce urban space. Emissions from transport will almost double, and we will not reach ‘net zero’ targets.

To hit the ERP 20% VKT reduction by 2035 target, Hamilton needs to deliver the significant ‘step change’ in walking and cycling mode share envisaged by the ERP and MSP. Delivery using the traditional approaches are expected to cost more than \$1b, take 30 years to deliver, and require huge resources from HCC and delivery partners. This will be too slow, too expensive to afford, and too late to hit the ERP 20% reduction by 2035.

<sup>8</sup> Hamilton City Council (2021) Council Touts Bigger Spend on Cycling, press release, 9 March 2021, <https://www.scoop.co.nz/stories/AK2103/S00218/council-touts-bigger-spend-on-cycling.htm#:~:text=Investing%20public%20money%20into%20safer,benefits%20for%20everyone%20in%20Hamilton.&text=A%20further%20%2430.7%20million%20would,with%20a%20%2428%20million%20hitch>

<sup>9</sup> Future Proof (2022) *Hamilton-Waikato Report Metro Spatial Plan Transport Programme Business Case, Shortlist Option Assessment Report*, Initial Working Draft, Revision A, April 2022.

# Strategic Network Plan



## Transitional delivery approach

HCC and Waka Kotahi have recently developed draft *Transitional Cycling Design Guidance* (Appendix E) for providing biking and micro-mobility networks, which proposes to remove the conflict/risk and only if this is not achievable reduce it. If neither removal or reduction is possible seek to protect or mitigate, and in all situations seek to enhance cycling amenity and utility.

The 'transitional' approach is expected to deliver more of the Strategic Network Plan faster and for a fraction of the cost. This approach is expected to deliver the step change in mode shift to biking and micro-mobility sought by the ERP and MSP sooner than traditional approaches, and significantly contribute towards meeting the 2035 ERP VKT and emissions reduction targets.

## 10 year programme

The biking and micro-mobility programme is proposed as an ongoing programme to govern, manage, and deliver biking investment in Hamilton, which works towards the overall *Connected Neighbourhoods* vision using the transitional delivery approach.

A significant portion of the 10 year programme are projects which respond to opportunities that are unknown now, but will present over time. Therefore, the programme management, monitoring and assurance activities proposed are critical to ensure opportunities to deliver biking and micro-mobility improvements alongside other HCC and Waka Kotahi programmes and investments are recognised and realised.

The 10 year programme for biking and micro-mobility includes:

- Planned projects: Eight priority routes as identified in Section 2.12 are planned projects to encourage people to change their preferred mode of travel to biking or other micro-mobility modes
- Responsive / opportunistic projects: Respond to opportunities which arise from activities being undertaken by other HCC programmes, land use development and business as usual activities etc.
- Area wide projects: Aim to slow, reduce or remove the conflicts with vehicle traffic on local roads within an area, including low traffic neighbourhoods
- End-of-trip facilities: Providing high quality end of trip facilities to make getting around by bike, e-scooter or e-skateboards more convenient
- Funded projects: The governance, management and delivery of the Eastern Pathways School Link and City Centre to University Link projects will be incorporated into the programme structure
- Design guidelines: Development of Hamilton specific biking and micro-mobility transitional and permanent design guidelines
- Kick start pre-implementation: Early investigations to ensure that the programme is ready to start implementation in 2024/25, including development of designs, cost estimates, safety audits, data collection, and stakeholder engagement
- Business cases: Three SSBCs have been allowed for to plan multi-modal corridor SSBCs for delivery after 2031
- Behaviour change activities: Staff to work towards social licence for city wide mode shift, pre and post project communications and engagement, and the management of community feedback during and post delivery
- Non-infrastructure activities: E-bike/bike borrow, purchase subsidies, and lock subsidies to make purchasing a bicycle or e-bike more affordable to a wider range of individuals
- Programme management and delivery: Resources to ensure the successful management, delivery and monitoring of the ongoing biking and micro-mobility programme, and
- Maintenance: An improved maintenance regime and development of an improved maintenance specification to ensure levels of service are maintained.

## Outcomes

By 2031 the expected outcomes of investing in the 10 year biking and micro-mobility programme are to:

1. Reduce deaths and serious injuries to bike and micro-mobility users across Hamilton by 40% per year
2. Increase the proportion of Hamilton's street network perceived as safe by biking and micro-mobility from 6% to 24%
3. Encourage 21,600 people to make biking and micro-mobility their main means of transport, an increase of 15,700 people
4. Increase biking and micro-mobility mode share from 3.8% to 15% of journey to work and journey to education trips
5. Increase the proportion of Hamilton's street network which has a high level of service for biking and micro-mobility from 10% to 21%
6. Improve health outcomes for 15,700 people from using biking and micro-mobility as a form of exercise, and
7. Reduce VKT by private car and CO<sub>2</sub> emissions from transport by 6.7%.

The expected outcomes from the 10 year programme strongly align with the Ministry of Transport's Transport Outcomes Framework, and directly support the strategic priorities for GPS 2021 of safety, better travel options, and climate change.

Investment in the 10 year programme is expected to make a strong contribution towards the 20% VKT reduction by 2035 required by the Emissions Reduction Programme.

## Investment prioritisation profile

The 10 year programme has a BCR of 8.3 which is rated as a 'High'. Combined with a 'Very High' GPS alignment and 'High' scheduling rating results in an investment priority order of 1.

The completed *Connected Neighbourhoods* vision also has a priority order of 1, showing that the first decade of investment proposed by this SSBC contributes towards an overall programme that is rated highly by Waka Kotahi.

# 1.0 STRATEGIC CASE

## 1.1. Introduction

People need to go places every day safely, efficiently and reliably. In Hamilton these journeys use a variety of modes of travel with most people using private car to get around, causing congestion on the roads and streets at peak times. With high growth predicted in the next 30 years and onward, Hamilton needs to act before congestion and emissions from transport become crippling to everyday travel and the economy.

People riding bikes and other forms of micro-mobility make up a very small proportion of total travel in Hamilton. Investment in safe biking facilities can provide more travel choices for shorter trips, eliminate or mitigate future investment in road capacity, improve people’s safety and health, and help to make Hamilton more liveable for its people.

### 1.1.1. Biking and micro-mobility trips

Micro-mobility is defined as:

- ...personal vehicles that can carry one or two passengers. Bicycles are probably the most common example – MaaS Alliance
- ...forms of transport that can occupy space alongside bicycles. – Deloitte Insights

Micro-mobility encompasses biking. People riding bikes are currently the most dominant and common example of micro-mobility. As a result, this document uses the two terms interchangeably throughout.

Figure 1 shows the proportion of trips by all modes, in one-kilometre distance bands in Hamilton.

Figure 1 – Proportion of daily trips by mode in Hamilton, by distance<sup>10 11</sup>

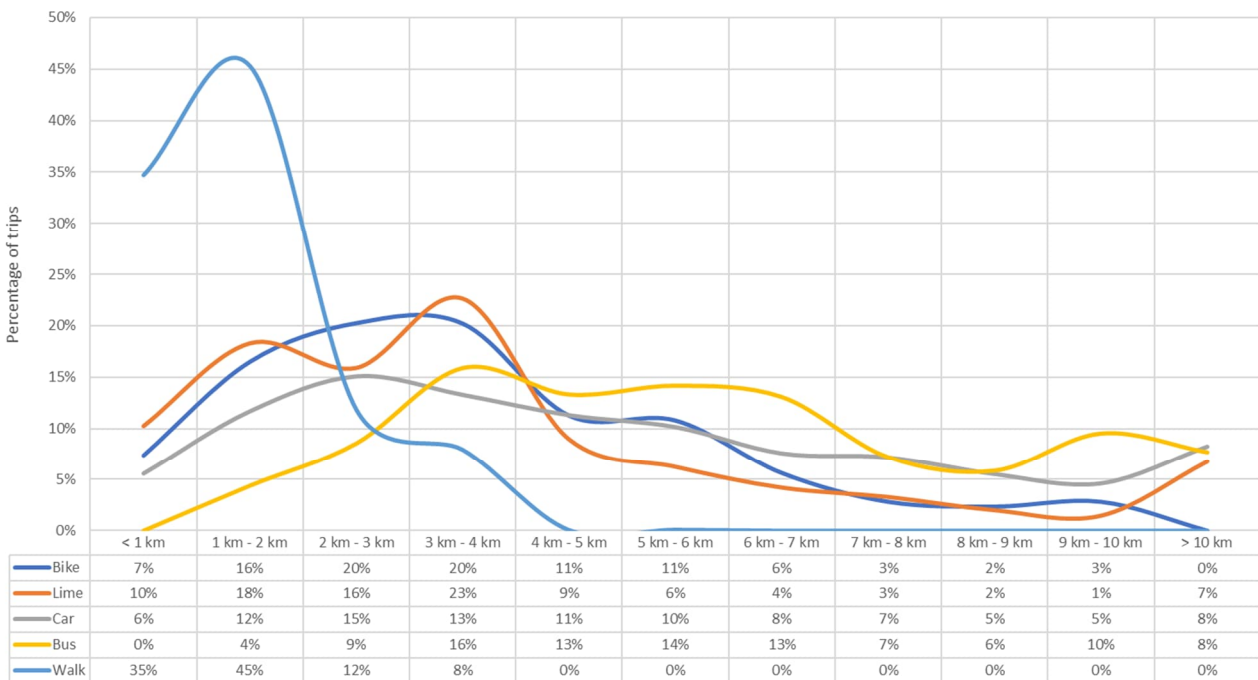


Figure 1 shows that walking (light blue line) is most popular for distances less than 2km, with the upper limit at around 4km. Biking (dark blue line) and micro-mobility trips (Lime e-scooters – orange line) largely follow the same profile as each other, with most trips between 1km and 4km, but a long tail out to around 10km. Most bus trips (yellow line) appear to be between 3km and 7km. Interestingly the largest

<sup>10</sup> Statistics NZ (2018) Census data for journey to work and education  
<sup>11</sup> Lime (2019) Hire e-scooter all day travel data, September 2019

proportion of car trips are around 2-3km, but cars have the flattest profile of all the modes indicating distance is less limiting than for other modes.

E-scooters and e-skateboards are becoming increasingly attractive forms of micro-mobility for shorter urban trips and the 'first and last mile' to extend the reach of public transport. Lime rental e-scooters appeared on Hamilton's streets in August 2019.

Figure 1 shows that around 60% of all trips in Hamilton are shorter than 5km. This length is in the sweet spot for biking and micro-mobility trips, meaning that the opportunities for encouraging mode shift and increasing biking and micro-mobility use in Hamilton are significant.

### 1.1.2. Purpose

The Access Hamilton Strategy Strategic Case<sup>12</sup> sets the strategic direction for transport in Hamilton and has been approved by Hamilton City Council (HCC) and Waka Kotahi. The Access Hamilton Programme Business Case (PBC)<sup>13</sup> builds on the Strategic Case, sets a multi modal investment programme and targets for Hamilton, and has been approved by HCC. Waka Kotahi has endorsed the strategic direction of the PBC, however there remains a gap in the PBC that defines tactically how the PBC targets will be met.

This Biking and Micro-mobility Programme Single Stage Business Case (SSBC) seeks to fill this tactical gap in the PBC for biking and micro-mobility trips. HCC recognises that the trip distance profile, travel speed between 15 and 30km/h, and nature of biking and micro-mobility trips are similar, and have different needs from walking, bus and general traffic modes.

### 1.1.3. Scope definition

This Biking and Micro-mobility Programme SSBC seeks to:

- Improve mode share, in line with Access Hamilton targets
- Improve safety
- Develop a Strategic Network Plan, providing a comprehensive biking and micro-mobility network
- Provide a prioritised 10 year programme of activities that give effect to the Strategic Network Plan, and
- Inform a future revision of the Access Hamilton programme.

As agreed with project Partners, the scope of this SSBC is to develop an investment programme for biking and micro-mobility as a single mode. However, the Partners recognise that biking and micro-mobility is part of Hamilton's integrated multi-modal transportation system and therefore biking outcomes influence the success of other transport modes. Multi-modal approaches are needed to achieve the system wide transport outcomes for Hamilton, and as a result it is key that this Biking and Micro-mobility Programme SSBC should inform future revisions of the Access Hamilton programme.

As a single mode programme, pedestrian travel is not considered in the SSBC beyond acknowledging that every trip begins and ends with walking, and that micro-mobility plays a part in the 'first and last mile' access to public transport stops and services.

During the development of the SSBC several activities were identified through the long list options identification that were outside the scope, or outside of the ability of HCC to control or implement. Section 2.13.13 summarises these 'complementary' activities that are critical to encourage mode shift to biking and micro-mobility in Hamilton, help make the most of the proposed infrastructure investments, and decrease reliance on private car travel.

<sup>12</sup> Hamilton City Council (2016) *Access Hamilton Strategy Strategic Case*.

<sup>13</sup> Hamilton City Council (2018) *Access Hamilton 2018 Programme Business Case, Version 2.0, September 2018*

## 1.2. Hamilton context

### 1.2.1. Population and growth

Hamilton had a 2018 population of 161,000<sup>14</sup> and has been growing at around 2.5% per year<sup>15</sup> over the last few years.

Hamilton is one of the fastest growing cities in New Zealand, and is forecast to reach 282,000<sup>16</sup> people, around 75% growth by 2051.

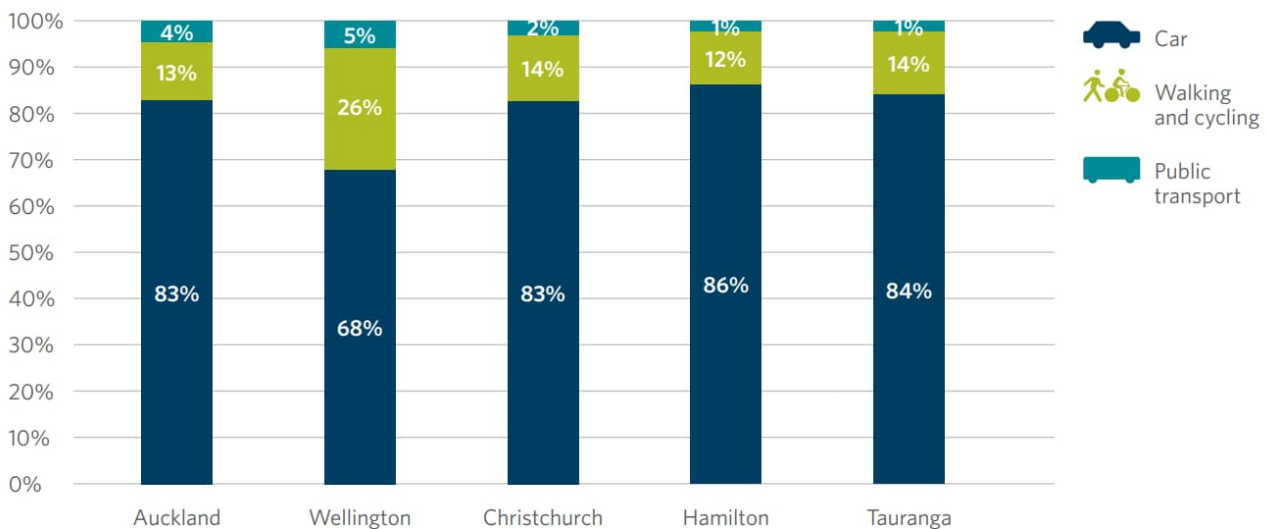
Growth in the districts around Hamilton is also predicted to be significant, with commuter travel into Hamilton from other districts forecast to grow by around 40%<sup>17</sup> from current levels by 2048.



### 1.2.2. Transport mode share

Hamilton’s transport system is car dominated with 86% of trips to work made by car, the highest of the five major New Zealand cities<sup>18</sup> as shown in Figure 2. Bike all day mode share is very low at 3.8%.

Figure 2 – Mode share of total trip legs in New Zealand (2014-2018)



SOURCE: New Zealand Household Travel Survey data (2014-2018)

Since 2012 traffic growth in Hamilton has been around 2% each year on average. Since 1990, secondary students travelling to school by bike has decreased from 19% to 3%, while travel by car has increased<sup>19</sup>.

### 1.2.3. Greenhouse Gas Emissions

Through the Climate Change Response (Zero Carbon) Amendment Act 2019, New Zealand has committed to “reduce net emissions of all greenhouse gases (except biogenic methane) to zero by 2050”.<sup>20</sup> Transport contributes to over 20% of greenhouse emissions and 47% of carbon dioxide CO<sub>2</sub> emissions in New Zealand.

<sup>14</sup> Waka Kotahi (2020) *Hamilton-Waikato Metro Area, mode shift plan*, <https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/Hamilton-Waikato-regional-mode-shift-plans.pdf>

<sup>15</sup> Hamilton City Council (2018) *Access Hamilton 2018 Programme Business Case*, Version 2.0, September 2018

<sup>16</sup> Future Proof (2022) *Hamilton-Waikato Report Metro Spatial Plan Transport Programme Business Case, Shortlist Option Assessment Report*, Initial Working Draft, Revision A, April 2022.

<sup>17</sup> Hamilton City Council (2018) *Access Hamilton 2018 Programme Business Case*, Version 2.0, September 2018

<sup>18</sup> Waka Kotahi NZ Transport Agency (2019) *Keeping Cities Moving*, September 2019, <https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/Keeping-cities-moving.pdf>

<sup>19</sup> Ministry of Transport (2015) *25 Years of New Zealand Travel: New Zealand Household Travel 1989-2014*, October 2015, <https://www.transport.govt.nz/assets/Uploads/Report/25yrs-of-how-NZers-Travel.pdf>

<sup>20</sup> Ministry of Environment (2019) *Climate Change Response (Zero Carbon) Amendment Act 2019*, 13 November 2019, <https://environment.govt.nz/acts-and-regulations/acts/climate-change-response-amendment-act-2019/>

The Waikato Region has the second highest carbon emission profile in the country<sup>21</sup>, with transportation being the second largest contributor for emissions providing 16% of the region's emissions<sup>22</sup>. On-road petrol and diesel from motorised vehicle use contribute to almost all the transportation emissions. Table 1 shows the overall emission estimates for the Waikato Region as well as adjacent territorial local authorities.

Table 1 – Overall emissions by type by territorial authorities (2018/2019) (t CO2e)

Emissions	Waikato Region	Hamilton City	Matamata-Piako	Waikato District	Waipā District
Stationary energy	1,601,427	277,392	133,351	450,305	102,836
Transportation	2,001,658	635,615	131,961	297,225	208,351
Waste	291,708	30,999	6,596	47,438	33,386
Industry	143,213	50,732	10,775	23,914	16,821
Agriculture	8,608,976	6,257	1,475,468	1,721,291	1,148,353
Forestry	-5,530,909	-752	14,318	-350,870	-25,254
Total net (incl. forestry)	7,116,073	1,000,243	1,772,469	2,189,304	1,484,493
Total gross (excl. forestry)	12,646,982	1,000,995	1,758,151	2,540,173	1,509,747

In Hamilton the transportation sector is by far the highest contributor to emissions at 64% of gross emissions, which can be transitioned to low carbon transport modes<sup>23,24</sup>.

#### 1.2.4. Opportunity for biking and micro-mobility in Hamilton

Hamilton has significant opportunities to encourage more biking and micro-mobility use:

- Positive attitudes – Hamilton residents are the most supportive of biking out of the six largest NZ cities at 78%,<sup>25</sup> and strongly support biking and micro-mobility as part of Hamilton's multi-modal transport system. 84% of residents wish to see e-scooters for hire operating.<sup>26</sup> 63% of Hamilton's non-cyclists are open to cycling and 56% of existing cyclists are open to biking more.<sup>27</sup>
- Flat geography – Hamilton has a relatively flat geography, so bikers do not need to go up and down hills to get around, making travel by biking and micro-mobility less physically taxing for people.
- Short trips – Figure 1 shows that around 60% of all trips in Hamilton are shorter than 5km, which is in the sweet spot for moving to biking and micro-mobility.
- 20-minute city – Figure 3 shows that the majority of Hamilton is within a 20-minute bike ride or less of the largest employment, educational, retail and recreational locations, and
- Compact urban form – 45% of Hamilton's population can reach the city centre by bike within 10 minutes as shown in Figure 4, and 84% can reach the city centre within 20 minutes.

These factors show that the opportunities for encouraging mode shift towards biking, and increasing biking and micro-mobility use in Hamilton are significant.

<sup>21</sup> Waka Kotahi (2020) Arataki Version 2 – Waikato, August 2020, <https://www.nzta.govt.nz/assets/planning-and-investment/arataki/docs/regional-summary-waikato-august-2020.pdf>

<sup>22</sup> Waikato Regional Council (2020) Waikato Region Greenhouse Gas Emissions Inventory, for the period July 2018 to June 2019, April 2020, <https://www.waikatoregion.govt.nz/assets/WRC/WRC-2019/Waikato-Region-GHG-Inventory-18-19.pdf>

<sup>23</sup> Waikato Regional Council (2020) Waikato Region Greenhouse Gas Emissions Inventory, for the period July 2018 to June 2019, April 2020, <https://www.waikatoregion.govt.nz/assets/WRC/WRC-2019/Waikato-Region-GHG-Inventory-18-19.pdf>

<sup>24</sup> Hamilton City Council, Climate Change Flyer [https://www.hamilton.govt.nz/our-services/environment-and-health/Documents/Climate%20Change%20Flyer\\_P10.pdf](https://www.hamilton.govt.nz/our-services/environment-and-health/Documents/Climate%20Change%20Flyer_P10.pdf)

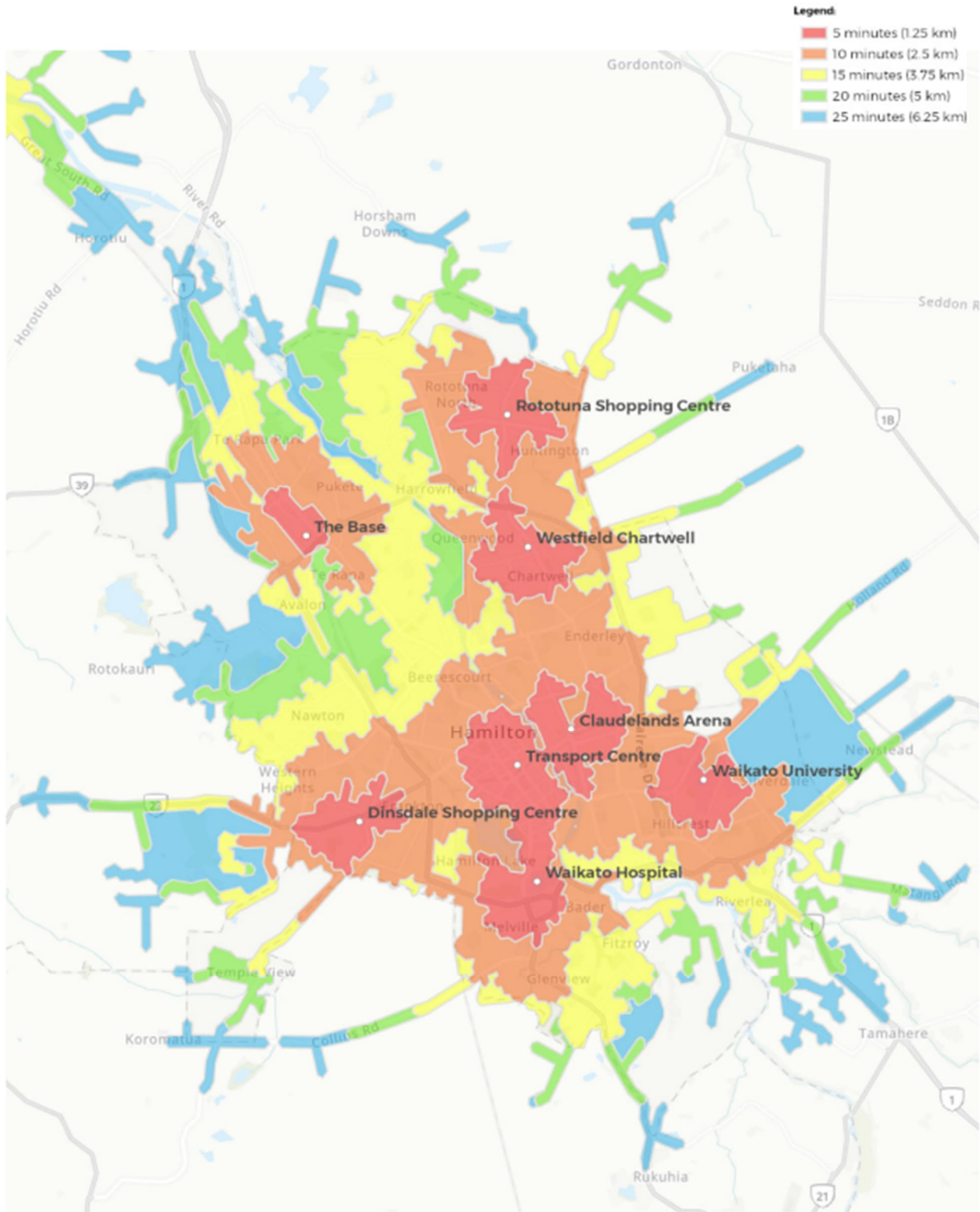
<sup>25</sup> NZ Transport Agency (2018) Understanding Attitudes and Perceptions of Cycling and Walking, August 2018, <https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/NZTA-Attitudes-to-cycling-and-walking-final-report-2018.pdf>

<sup>26</sup> Hamilton City Council (2020) Infrastructure Operations Committee Agenda, Thursday 27 February 2020, <https://www.hamilton.govt.nz/AgendasAndMinutes/Infrastructure%20Operations%20Open%20Agenda%20-%20-%2027%20February%202020.pdf>

<sup>27</sup> NZ Transport Agency (2019) Understanding Attitudes and Perceptions of Cycling and Walking, Final Report, September 2019 <https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/NZTA-Attitudes-to-cycling-and-walking-final-report-2019.pdf>

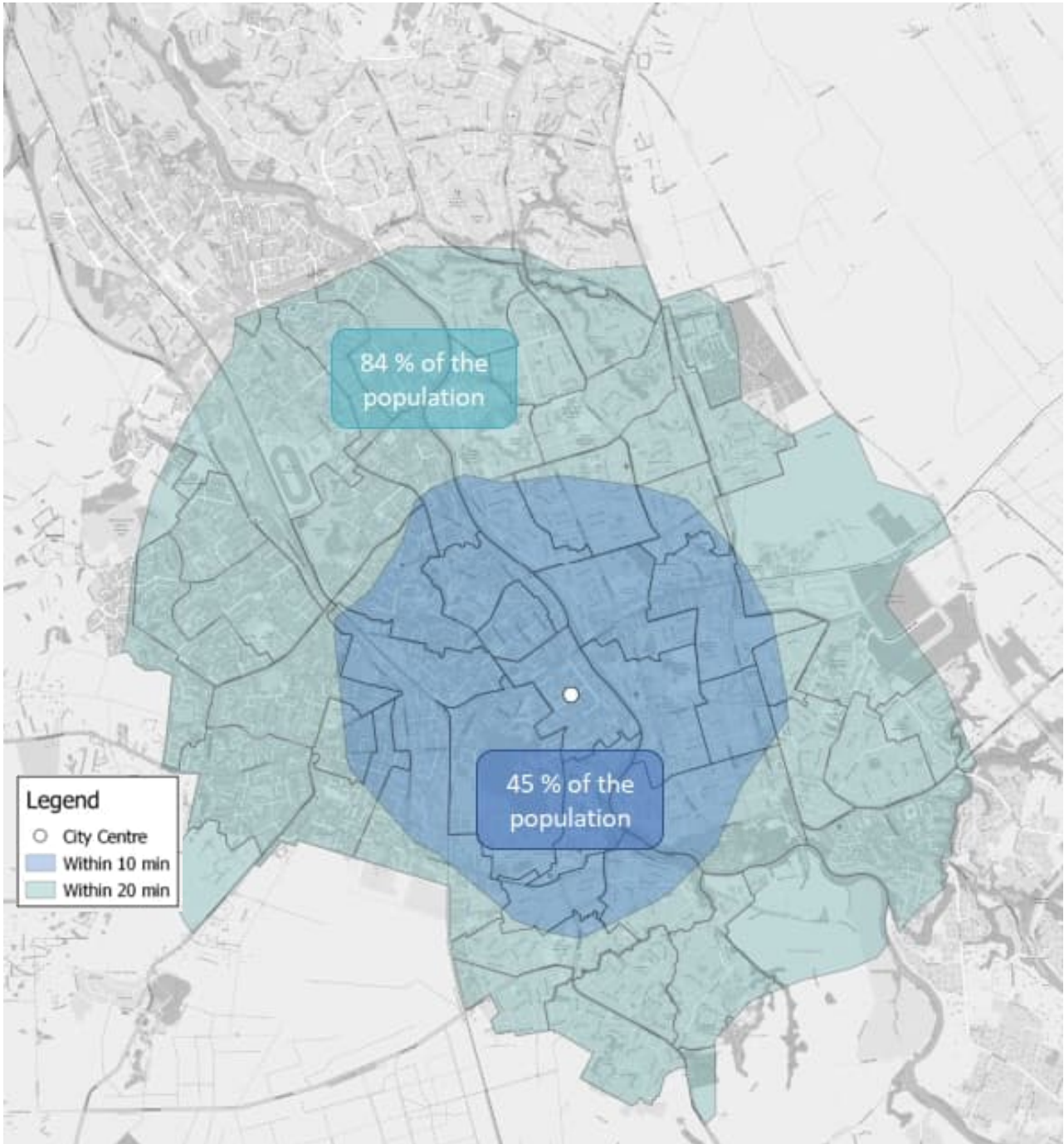


Figure 3 – Cycling catchment analysis (at 15km/h)<sup>28</sup>



<sup>28</sup> Waka Kotahi (2020) *Hamilton-Waikato Metro Area, mode shift plan*, <https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/Hamilton-Waikato-regional-mode-shift-plans.pdf>

Figure 4 – Proportion of population within 10 and 20 minute cycling catchments



### 1.2.5. Summary of previous engagement

Hamilton City Council often engages with residents on various topics. A summary of relevant survey information predating the SSBC is summarised in Table 2, focused on what it would take to get more people using biking and micro-mobility.

Table 2 –Summary of previous engagement

Engagement theme	Description
A lack of safety prohibits bike trips	A 2019 survey to establish an attitudes and behaviours baseline for Access Hamilton noted that many people in Hamilton are ready and willing to travel more by bike. Nearly 60% of respondents indicated they would bike more if it felt safer.
A disconnected network (the gaps) prevents bike trips	Most people are dissatisfied or very dissatisfied with the on-road biking network in Hamilton mainly because of the lack of safe infrastructure, and discontinuity and gaps in the network forcing them to use the road network for portions of their bike journeys. <sup>29</sup> For those residents who cycle, the lack of connectivity across the network impacts the enjoyment of cycling and impacts on route choice and whether they make the trip in the first place. <sup>30</sup>
A safe network does not currently reach key destinations	The current network of off-road pathways does not connect well to key destinations (parks, schools, and retail areas) and there are gaps in the off-road network that mean people must use the road. <sup>31</sup> Similar observations are true for the on-road network.
Desire to bike if the right infrastructure was provided	<p>The 'right infrastructure' refers to cycleways with physical separation from general traffic provided as a continuous network.<sup>32</sup></p> <p>A survey completed in 2018<sup>33</sup> focused on travel to school in the Hukanui road area in eastern Hamilton. While three quarters of parents and students are open to taking active modes to school some of the time, safety concerns and limited convenience prevent this. 86% support improved cycleways with 82% wanting separated cycleways to avoid conflicts with traffic.</p> <p>Hamiltonians are the most likely to consider improved routes as a reason to cycle.<sup>34</sup></p> <p>56% of Hamilton respondents agreed that new cycleways encourage them to bike more<sup>35</sup>. New Plymouth saw a 35% increase in cycling between 2006-2013 after building an improved cycling network<sup>36</sup>.</p> <p>In Hamilton 8% of existing cyclists are regular urban riders and 1% are committed commuters<sup>37</sup> who generally bike regardless of the on-road conditions. Providing improved biking facilities, whilst making their journeys safer, is unlikely to change behaviours.</p>

<sup>29</sup> Hamilton City Council (2018) *Hamilton City's Bike Plan Survey*

<sup>30</sup> Hamilton City Council (2019) *Community engagement outcomes paper – Play Strategy*, draft.

<sup>31</sup> Hamilton City Council (2018) *Hamilton City's Bike Plan Survey*

<sup>32</sup> Hamilton City Council (2019) *Community engagement outcomes paper – Play Strategy*, draft.

<sup>33</sup> CCASM (2018) *Safety considerations for Walking and Cycling Infrastructure from Hukanui School Communities*, August 2018,

[https://www.ccas.com/site\\_files/18568/upload\\_files/FINAL%20VERSIONSafeWaysToSchoolHukanuiProject.pdf?dl=1](https://www.ccas.com/site_files/18568/upload_files/FINAL%20VERSIONSafeWaysToSchoolHukanuiProject.pdf?dl=1)

<sup>34</sup> NZ Transport Agency (2018) *Understanding Attitudes and Perceptions of Cycling and Walking*, August 2018, <https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/NZTA-Attitudes-to-cycling-and-walking-final-report-2018.pdf>

<sup>35</sup> NZ Transport Agency (2018) *Understanding Attitudes and Perceptions of Cycling and Walking*, August 2018, <https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/NZTA-Attitudes-to-cycling-and-walking-final-report-2018.pdf>

<sup>36</sup> New Zealand Transport Agency (2013) *The Walking and Cycling Model Community Story with New Plymouth & Hastings*, July 2013, <https://www.nzta.govt.nz/assets/Walking-Cycling-and-Public-Transport/docs/model-community-story-single.pdf>

<sup>37</sup> NZ Transport Agency (2019) *Understanding Attitudes and Perceptions of Cycling and Walking*, Final Report, September 2019 <https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/NZTA-Attitudes-to-cycling-and-walking-final-report-2019.pdf>

### 1.3. Strategic context

Appendix A provides an overview of national and regional scale policies and other documents, and how these support investment in biking and micro-mobility. The consistent messages for Hamilton include:

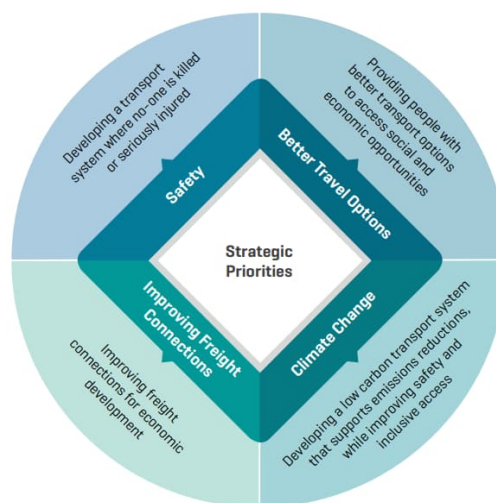
- Mode shift toward biking and micro-mobility is essential to improving wellbeing and liveability in our cities
- Safer biking infrastructure is required to enable Vision Zero road safety ambitions
- Mode shift toward biking and micro-mobility supports good urban form, that enables intensification and affordable housing outcomes, and
- Investment into safe, separated, and well-connected cycleways is needed to provide travel choices and encourage people to get on their bikes and e-scooters.

The following sections summarise the key strategic documents for the investment in biking and micro-mobility in Hamilton. This includes the Government Policy Statement on Land Transport 2021/22 – 2030/31, National Policy Statement on Urban Development, Emissions Reduction Plan, and the Hamilton-Waikato Metropolitan Spatial Plan.

#### 1.3.1. Government Policy Statement on Land Transport 2021/22 – 2030/31

The Government Policy Statement on Land Transport (GPS 2021)<sup>38</sup> outlines four strategic priorities for land transport in New Zealand: safety, better travel options, improving freight connections, and climate change. The GPS seeks to develop a low carbon transport system that supports emissions reductions, while improving safety and inclusive access.

Nearly 20% of New Zealand's domestic greenhouse gas emissions come from transport, with 90% of these emissions from road transport. New Zealand has committed to reduce greenhouse gas emissions to 30% below 2005 levels by 2030 under the Paris Agreement on Climate Change. As a result, government investment decisions should support the rapid transition to a low carbon transport system and contribute to a resilient transport sector that reduces harmful emissions. To achieve this GPS 2021 outlines that mode shift in urban areas from private vehicles to public transport, walking, and cycling as an action to support efforts to reduce emissions.



A low carbon transport system requires measures to manage travel demand, and infrastructure interconnected to encourage walking, cycling and the use of public transport. Cities need to be places where people can safely and enjoyably travel by low emissions transport modes such as walking, cycling, and emissions-free public transport.

Several indicators will be measured to monitor the progress in achieving the strategic priorities, such as:

- Tonnes of greenhouse gases emitted per year from land transport
- Vehicle Kilometres Travelled (VKT), and
- Distance per capita travelled in single occupancy vehicles.

This is important for the investment in biking and micro-mobility as shifting people onto bikes, e-scooters and other micro-mobility modes will reduce the VKT travelled by single occupancy vehicles and reduce carbon emissions by transport.

<sup>38</sup> Ministry of Transport (2020) Government Policy Statement on Land Transport 2021/22 – 2030/31, September 2020, <https://www.transport.govt.nz/assets/Uploads/Paper/GPS2021.pdf>

### 1.3.2. Emissions Reduction Plan

The Government is committed to reducing emissions, with the Zero Carbon Act requiring 'net zero' emissions of all greenhouse gases other than biogenic methane by 2050.<sup>39</sup> The Emissions Reduction Plan (ERP) sets the direction for climate action for the next 15 years and outlines the policies and strategies New Zealand will take to meet the first emissions budget.<sup>40</sup>

Transport is predicted to deliver some of the greatest emissions reductions. The key target relevant to the investment in biking and micro-mobility is Target One: *"Reduce vehicle kilometres travelled (VKT) by cars and light vehicles by 20% by 2035 through providing better travel options, particularly in our largest cities."*

The ERP requires a significant step change in walking and cycling rates to achieve the 20% reduction in VKT and therefore carbon emissions. This cannot be achieved by delivering car dominated transport infrastructure in Hamilton as we have done in the past. The ERP supports local government to accelerate widespread road space reallocation to support public transport, active travel and placemaking.

### 1.3.3. National Policy Statement on Urban Development

The National Policy Statement on Urban Development (NPS-UD)<sup>41</sup> was prepared under the Resource Management Act 1991 (RMA). Main changes resulting from the NPS-UD include:

1. No more parking minimums in the district plan
2. Requires changes to the district plan to zone for a lot more density in existing urban areas:
  - a. No density limits in the central city
  - b. Up to six stories zone enabled in a walkable catchment to the central city
  - c. Medium density in and around major commercial centres, and
3. Medium Density Residential Standards apply to the general residential zone. This enables, without a resource consent, up to three units on any existing residential property in the city creating the potential for more redevelopment and infill.

NPS-UD enables more growth and more density within Hamilton, faster than was previously permitted in the HCC District Plan. Unless there is an urgent investment in public transport, walking, and cycling infrastructure, the increased densities and the sustained population growth forecast for Hamilton will result in a significant increase in VKT, congestion and greenhouse gas emissions.

### 1.3.4. Metro Spatial Plan

The Hamilton Waikato Metropolitan Spatial Plan (MSP) is a vision and framework for how Hamilton City and the neighbouring communities within Waipā and Waikato districts will grow and develop over the next 100 + years, creating one of the most liveable places and sought-after places to live in New Zealand.<sup>42</sup> The metro area will be a place where people can easily access employment, education and health facilities, serviced by reliable and efficient transport connections and great places.

The MSP identified a transformational move for a *"radical transport shift"* for a multi modal transport network<sup>43</sup>. MSP key move three is for *"an active mode network that improves the health and wellbeing of people, communities and environment"*.

The MSP clearly supports investment in biking and micro-mobility to contribute towards a radical transport shift. MSP also supports the creation of a biking network that safely connects where people want to travel, making biking easy and attractive, and improving the health and wellbeing of Hamilton's people.

<sup>39</sup> Waka Kotahi (2020) *Arataki, Section C Key Drivers*, Version 1.1, <https://www.nzta.govt.nz/assets/planning-and-investment/docs/arataki/key-drivers.pdf>

<sup>40</sup> Ministry for the Environment (2021) *Te hau marohi ke anamata Transitioning to a low-emissions and climate-resilient future*, October 2021, <https://environment.govt.nz/publications/emissions-reduction-plan-discussion-document/>

<sup>41</sup> Ministry for the Environment (2020) *National Policy Statement on Urban Development 2020*, July 2020, <https://environment.govt.nz/publications/national-policy-statement-on-urban-development-2020/>

<sup>42</sup> Future Proof (2020) *Hamilton-Waikato Metropolitan Spatial Plan*, September 2020, <https://futureproof.org.nz/assets/FutureProof/H2A/Metro-Spatial-Plan/Hamilton-Waikato-Metropolitan-Spatial-Plan-Final-Low-Res.pdf>

<sup>43</sup> Future Proof (2020) *Hamilton-Waikato Metropolitan Spatial Plan*, September 2020, <https://futureproof.org.nz/assets/FutureProof/H2A/Metro-Spatial-Plan/Hamilton-Waikato-Metropolitan-Spatial-Plan-Final-Low-Res.pdf>

## 1.4. Local context

Table 3 shows that HCC has been seeking to improve biking and micro-mobility outcomes in Hamilton for some time, including ambitions for:

- A bike friendly city
- A safer transport system
- Improved transport choice and access to opportunities
- An all-ages and abilities approach towards mobility in the central city, and
- Improved connections for cycling, including across bridges and to play destinations.

The following sections further summarise key documents for the investment in biking and micro-mobility in Hamilton, including the Access Hamilton PBC and the Metro Spatial Plan Programme Business Case.

Table 3 – Local policy alignment

Document	Intent	Relevance to this project
Hamilton City Council documents		
Access Hamilton (2018)	<p>The Access Hamilton strategy identifies three key outcomes and investment objectives for Hamilton’s transport system.</p> <ul style="list-style-type: none"> <li>• Safety – Hamilton’s transport system is safer.</li> <li>• Choice – Hamilton will be a more accessible city with increased mode share by PT, walking and cycling.</li> <li>• Growth – residential and business growth is supported by investment in Hamilton’s transport system.</li> </ul>	<i>Increased biking and micro-mobility mode share derived from a safe network is essential to achieving these outcomes.</i>
Biking Plan 2015-2045	Sets out a vision for a bike friendly city. Goals are for a safe and accessible network, where people are visible riding bikes, and biking is an easy form of transport to choose. Biking also adds value to the economy.	<i>Identifies goals for safety, travel choice, accessibility, and liveability. Establishes the School Link and University to City Centre Link projects</i>
Speed Management Plan (2022)	Hamilton has a Vision Zero goal for road safety. The following priorities will guide speed management implementation decisions: 1. High benefit routes which deliver maximum benefit in reducing deaths and serious injuries; 2. Places where there is strong community demand for change; 3. Supporting changes in neighbouring areas to achieve consistent and logical implementation; 4. Places where lots of people walk or bike, or where they will soon walk and bike.	<i>Hamilton has a Vision Zero goal for road safety. Speed management has a beneficial safety effect towards micro-mobility users.</i>
River Plan	Sets out a vision for the Waikato River be the defining heart of Hamilton. A theme to improve access along and to the river.	<i>Objective to adapt bridges for improved pedestrian and cyclist access.</i>
City Centre Transformation Plan (2015 version, update underway)	<p>A central city that is easy to get around for all ages with excellent walking and cycling paths and defined loops enhances the central city’s appeal. Cycling friendly options in the central city as part of a well-used biking network connecting the central city. Victoria Street identified for high levels of bike friendliness.</p> <p>One of the seven outcomes (transport) <i>“Multimodal choices across public transport, micro-mobility and walking and cycling leading to more pedestrian friendly environments”</i></p>	<i>Aims for all ages biking and micro-mobility to be better enabled within the central city and is supported by healthier and accessible streets for all people.</i>

Document	Intent	Relevance to this project
Play Strategy	To provide a range of opportunities for people to engage in physical activity across Hamilton City. Notes from engagement, there is strong support for more cycling infrastructure (particularly off-road biking trails) which is suitable for all ages and abilities and which connects to key destinations.	<i>Supports a connected network of play opportunities throughout the city.</i>

### 1.4.1. Access Hamilton PBC

**Vision** – Hamilton’s transport network enables everyone to connect to people and places in safe, accessible, and smart ways.

**Purpose** – To improve the health and wellbeing of Hamiltonians by ensuring the transport network supports good travel choices that are safe, easy, and connected.



The Access Hamilton Programme Business Case (PBC)<sup>44</sup> is the parent document that this biking and micro-mobility programme needs to align with, and seeks the benefits of:

- Efficient and reliable access between key activities for all transport system users
- A transport system that is safe to use for all modes, and
- Infrastructure and service delivery that contributes to the strategic priorities of Hamilton city and its investment partners.

The Access Hamilton PBC investment objectives are to:

- Support residential growth to 33,000 dwellings by 2048
- Support 540ha industrial land by 2048
- Reduce DSIs by 60% by 2048, with an overarching goal of zero DSIs, and
- Increase PT, walking and cycling mode share from 14% to 29% by 2028 and short trips by foot to ~50%.

<sup>44</sup> Hamilton City Council (2018) Access Hamilton 2018 Programme Business Case, Version 2.0, September 2018

### 1.4.2. Metro Spatial Plan PBC

Following on from the MSP as summarised in Section 1.3.4, the relevant investment objectives to biking and micro-mobility from the MSP Programme Business Case (PBC) are:

- To reduce deaths and serious injuries resulting from the transport systems
- To deliver alternative mode options that are preferable to private cars for the majority of trips
- To support the MSP's compact and quality compact urban form with supportive and capable transport systems that make best use of existing infrastructure and reduces environmental impacts and protects Taonga
- To reduce carbon emissions to achieve net zero transport by 2050, and
- To provide equitable transport and mobility choices for all.

Based on the MSP PBC growth predictions, Hamilton's population is forecast to grow 75% between 2018 and 2050<sup>45</sup>. As a result of this growth, in the 2051 AM peak period VKT will be 46% higher than in 2013<sup>46</sup> for the Waikato Region, and 88% higher for Hamilton city. Therefore, if Hamilton enables the MSP land use growth and increased density as it has done in the past, travel will continue to be dominated by private cars, VKT and congestion will increase, and emissions from these vehicles will get significantly worse.

Investment in biking and micro-mobility in Hamilton will support the MSP PBC intent to improve safety, encourage mode shift to active modes, support a more compact urban form, improve mode choice, and reduce carbon emissions from transport.

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<sup>45</sup> Future Proof (2020) *Hamilton-Waikato Metropolitan Spatial Plan*, September 2020, <https://futureproof.org.nz/assets/FutureProof/H2A/Metro-Spatial-Plan/Hamilton-Waikato-Metropolitan-Spatial-Plan-Final-Low-Res.pdf>

<sup>46</sup> Future Proof (2021) *Hamilton-Waikato Report Metro Spatial Plan Transport Programme Business Case Strategic Case*, Initial Working Draft, Revision A, September 2021.



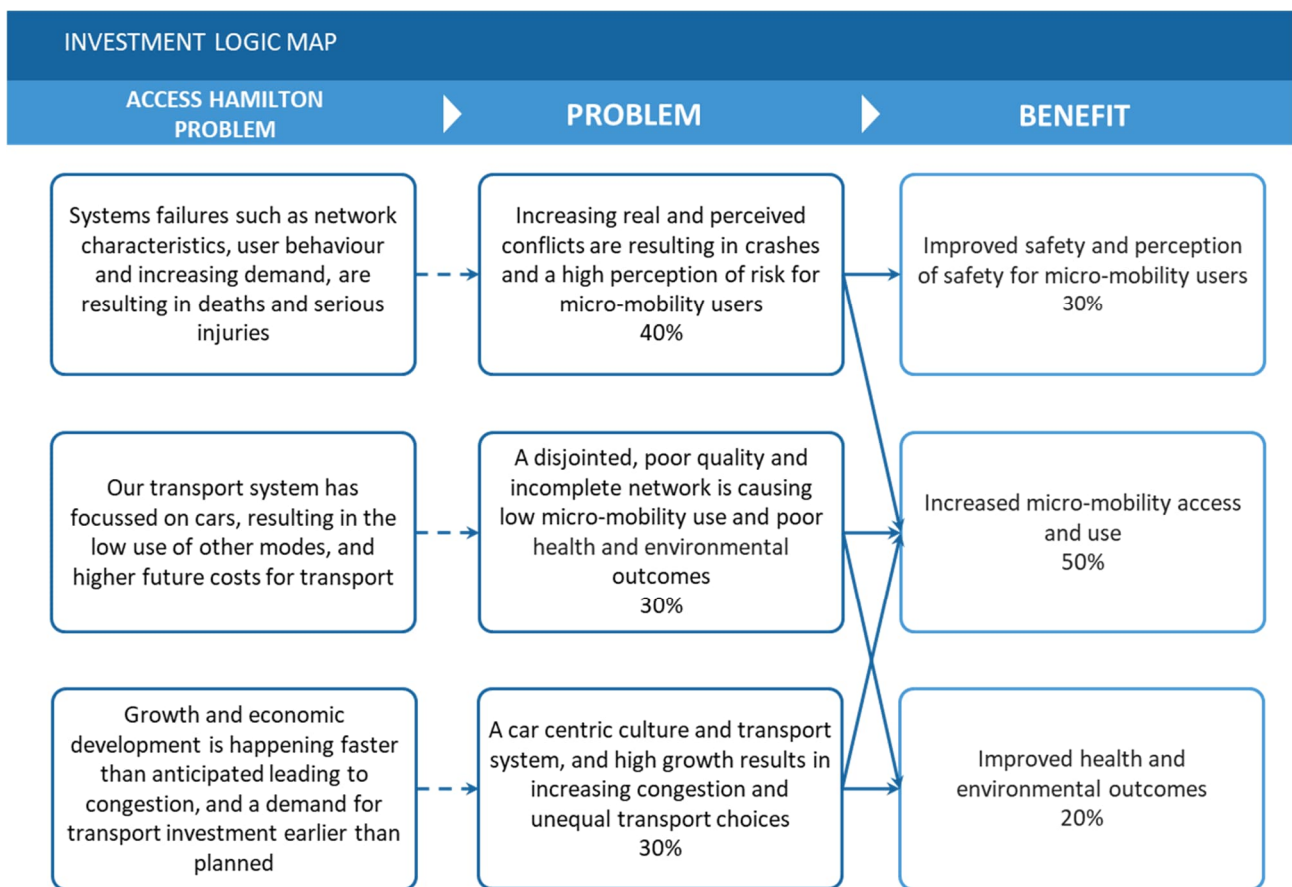
### 1.5. Defining the problem/opportunity

An Investment Logic Mapping (ILM) workshop was held on 26 June 2020 with HCC and Waka Kotahi. At this session Partners reviewed background information on current issues and needs, reviewed the ‘parent’ Access Hamilton PBC problems and benefits, and agreed the following key problems:

- Problem One: Increasing real and perceived conflicts are resulting in crashes and a high perception of risk for micro-mobility users (40%)
- Problem Two: A disjointed, poor quality and incomplete network is causing low micro-mobility use and poor health and environmental outcomes (30%), and
- Problem Three: A car centric culture and transport system, and high growth, results in increasing congestion and unequal transport choices (30%).

The ILM, demonstrating the direct links to the Access Hamilton PBC problem statements is shown in Figure 5, and included in Appendix B for reference.

Figure 5 – Biking and Micro-mobility Investment Logic Map



The following sections summarise the evidence for the cause and effect of the problem statements.

### 1.5.1. Problem One

Increasing real and perceived conflicts are resulting in crashes and a high perception of risk for micro-mobility users

The locations of 'real' observed bike related crashes in Hamilton between 2015 and 2019 are shown in Figure 6. Biking related crashes comprise 4% of all crashes, but 10% of Deaths and Serious Injuries (DSI). Therefore, people on bikes are two and a half times more likely to be killed or seriously injured in a crash than motorists, and 15 times more likely when compared on a per kilometre travelled basis.<sup>47</sup>

Figure 6 also shows that many DSIs occur on the existing cycling network, indicating that users are being hurt while using the routes they should be. Many of the crash hotspots are in the central suburbs, and particularly at intersections, showing that this is also a risk area for bikers.

Section 1.5.3 and Figure 8 show that if we continue to enable high growth in Hamilton using our existing car dominated strategies, we will see increasing VKT and resulting congestion in the future. This increase in VKT will result in 'increasing' safety conflicts between modes, more bike related crashes, and injuries and deaths will inevitably increase as a result.

However, for biking crash records do not tell the whole story. Not feeling safe riding a bike has been a consistent community feedback theme for Hamilton<sup>48</sup> as summarised in Sections 1.2.5 and 2.6.3. Therefore the 'perception' of safety is a critical consideration for people deciding to get on their bikes and e-scooters, or not. Without both actual and perceived safety large numbers of people will not choose to bike.

Hamilton has a large biking network with 114km of biking facilities in total as shown in Figure 7. This shows that a good proportion of the city has a cycle facility. What Figure 7 does not show is that most of our facilities are painted bike lanes without any separation space or delineators from general traffic. These provide no protection to cyclists from traffic, and therefore do not give users the high 'perception of safety' they need to encourage them onto their bikes and e-scooters.

Hamilton has a Vision Zero goal for road safety – we don't believe any loss of life on our streets is acceptable. Waka Kotahi's areas of focus for 2021-31 seeks to significantly reduce harms (high) through the Road to Zero, with an emphasis on separated facilities and infrastructure improvements in areas with significant levels of walking and cycling<sup>49</sup>. Currently we are falling well short of this ambition.

In summary, the evidence shows that Hamilton has real crashes and perceived conflicts, that are forecast to increase as Hamilton grows. The poor quality of our existing biking network gives bike and micro-mobility users a high perception of risk and a low perception of safety.

<sup>47</sup> Hamilton City Council (2020) Analysis of Deaths and Serious Injuries and VKT for 2018 and 2019, March 2020.

<sup>48</sup> Waka Kotahi (2020) *Hamilton-Waikato Metro Area, mode shift plan*, <https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/Hamilton-Waikato-regional-mode-shift-plans.pdf>

<sup>49</sup> Waka Kotahi (2020) *Arataki Version 2 – Waikato Regional Summary*, <https://www.nzta.govt.nz/assets/planning-and-investment/arataki/docs/regional-summary-waikato-august-2020.pdf>

Figure 6 – Bike crashes in Hamilton 2015 – 2019

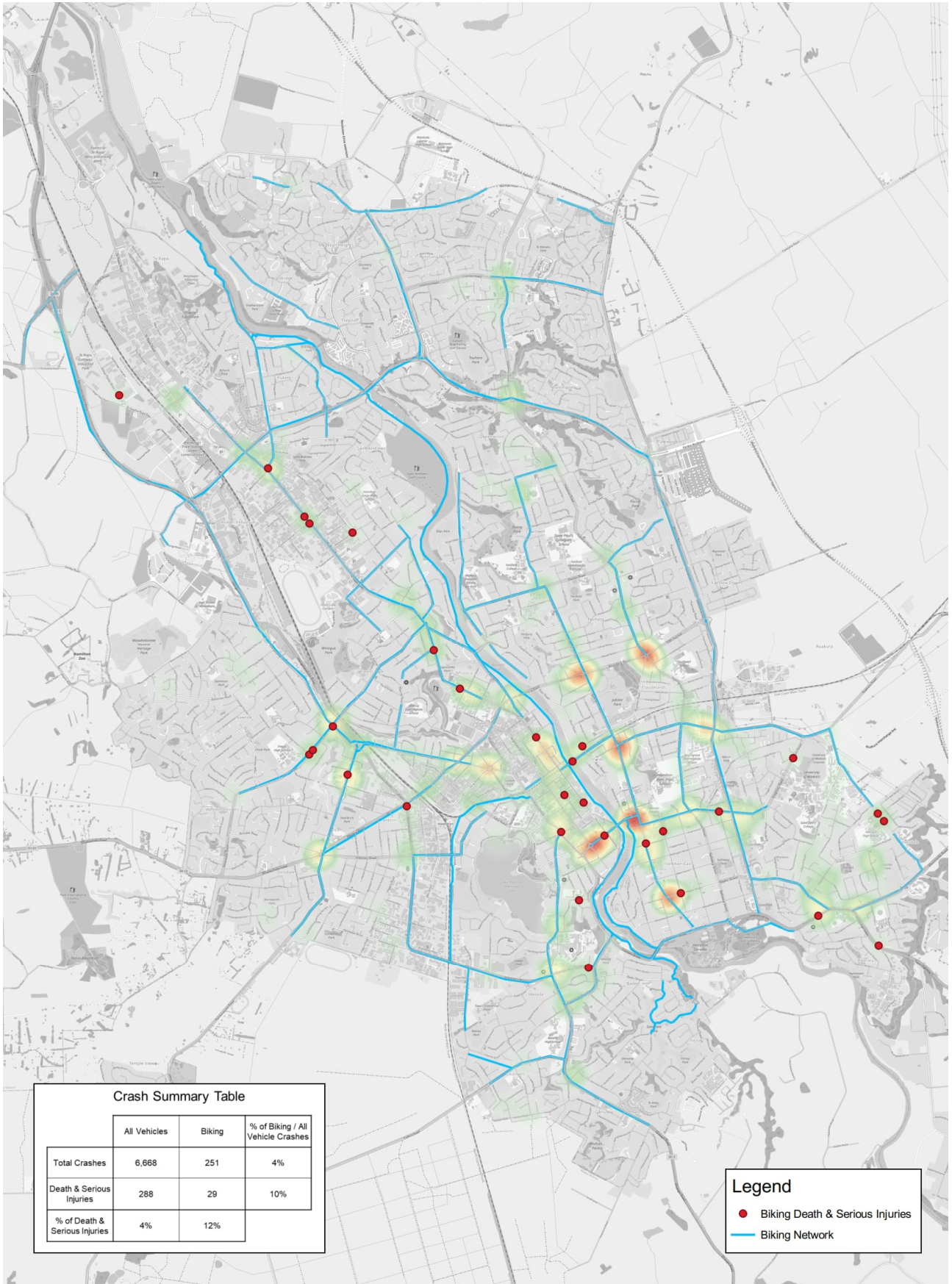
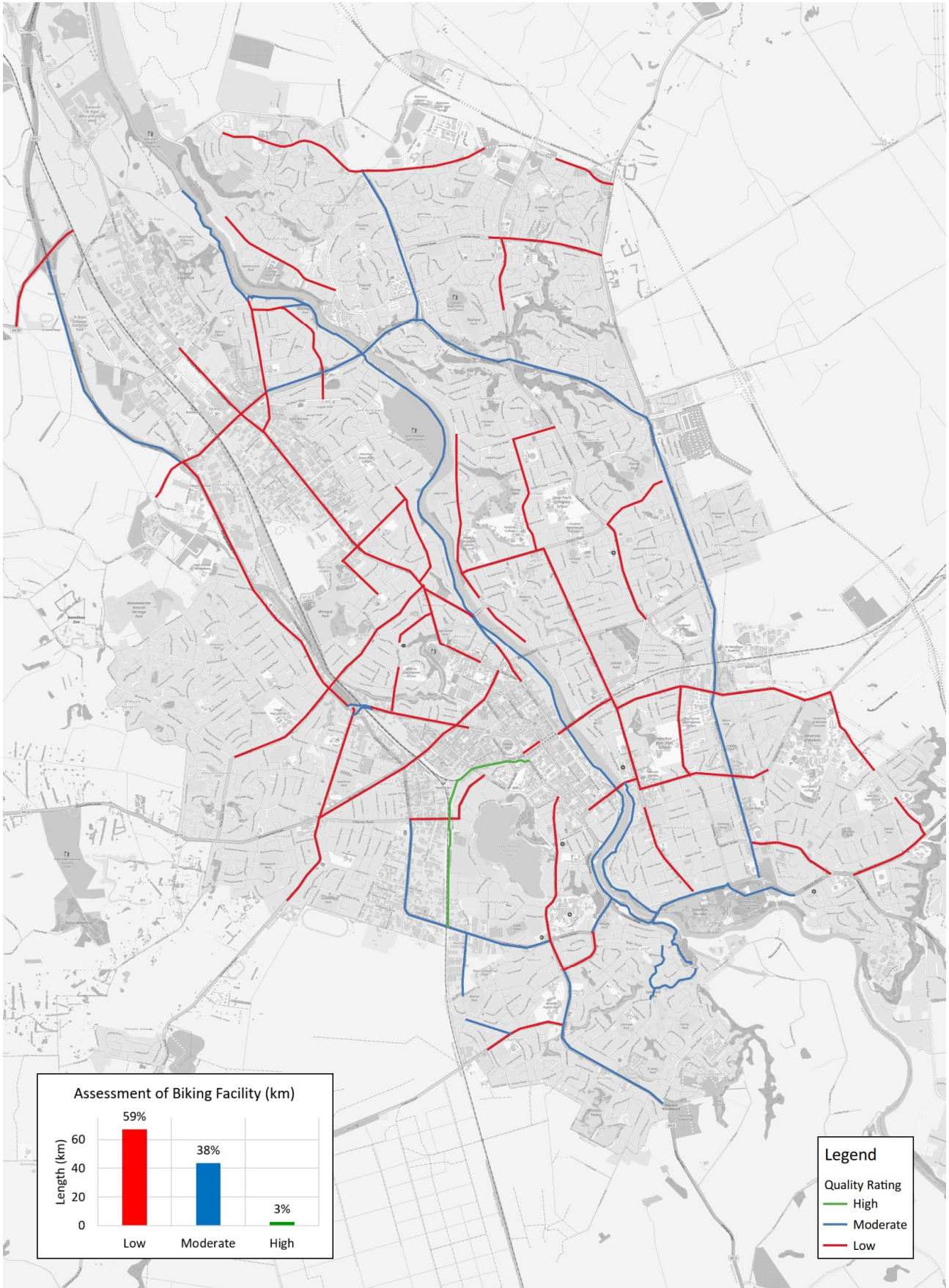


Figure 7 – Hamilton Biking Facility Quality Assessment



## 1.5.2. Problem Two

A disjointed, poor quality and incomplete network is causing low micro-mobility use and poor health and environmental outcomes

Figure 7 shows that the Hamilton biking network is 'disjointed' and 'incomplete', with significant gaps in the network that make trips to, around, and across the city difficult. The disconnection and gaps reduce the usefulness and attractiveness of the network for bikers, which was identified in public consultation.

Figure 7 also shows an assessment of the quality of Hamilton's biking facilities. Broadly, on road painted cycle lanes are rated as low quality, shared paths with pedestrians are rated as medium quality, and off-road shared paths and separated cycleways are rated as high quality. More than half of Hamilton's biking network (59%) is rated as 'poor quality' facilities. Only 3% of the bike network is high quality traffic segregated facilities that are perceived as safe by users.

Figure 2 shows that Hamilton's transport system is car dominated with 86% of trips to work made by car, the highest of the five major New Zealand cities.<sup>50</sup> Bike and micro-mobility use in terms of all day mode share is very 'low' at 3.8%.

In Hamilton the transportation sector is by far the highest contributor to emissions with approximately 64% of gross emissions, which can be transitioned to low carbon transport modes<sup>51,52</sup>. As a result of our unsafe network, few people are brave enough to change modes from car to bike and e-scooter, which is exacerbating 'poor physical health' and 'environmental outcomes' from emissions.

Regular aerobic exercise is known to cut the risk of heart diseases, diabetes, cancer, high blood pressure and obesity<sup>53</sup>. A major study in the United States of America<sup>54</sup> followed 236,450 participants for five years and found that biking to work was associated with a 41% lower risk of dying compared with commuting by car or public transport. Cyclists also had a 52% lower risk of succumbing to heart disease than non-cyclists, and a 40% lower chance of dying from cancer. People who rode e-bikes for 40 minutes each week for a month improved in cardiovascular health, aerobic capacity, and blood sugar control, while also losing body fat.<sup>55</sup>

The Government is committed to reducing emissions, with the Zero Carbon Act requiring 'net zero' emissions of all greenhouse gases (other than biogenic methane) by 2050<sup>56</sup>. Making biking easier with good cycleways to get more people on bikes to help to reduce greenhouse gas emissions is a key transport pillar of the HCC Climate Change Action Plan<sup>57</sup> and Climate Change Commission Report.<sup>58</sup>

The evidence shows that Hamilton has a poor quality, disjointed and incomplete network, and the corresponding safety concerns from the lack of dedicated bike infrastructure is discouraging biking and causing low micro-mobility use. Our dependence on fossil fuels to travel is causing poor environmental outcomes and resulting in poor health for Hamilton residents and getting people on bikes is a key focus for us to reduce VKT, help to reduce emissions and meet our Net Zero obligations locally and nationally.

<sup>50</sup> Waka Kotahi NZ Transport Agency (2019) *Keeping Cities Moving*, September 2019, <https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/Keeping-cities-moving.pdf>

<sup>51</sup> Waikato Regional Council (2020) *Waikato Region Greenhouse Gas Emissions Inventory, for the period July 2018 to June 2019*, April 2020, <https://www.waikatoregion.govt.nz/assets/WRC/WRC-2019/Waikato-Region-GHG-Inventory-18-19.pdf>

<sup>52</sup> Hamilton City Council, Climate Change Flyer [https://www.hamilton.govt.nz/our-services/environment-and-health/Documents/Climate%20Change%20Flyer\\_P10.pdf](https://www.hamilton.govt.nz/our-services/environment-and-health/Documents/Climate%20Change%20Flyer_P10.pdf)

<sup>53</sup> World Health Organisation (2002) *A Physically Active Life through Everyday Transport*, Copenhagen, Denmark.

<sup>54</sup> Jason Gill and Carlos Celis-Morales (2017) *Cycling to work: major new study suggests health benefits are staggering*, The Conversation, April 20 2017, <https://theconversation.com/cycling-to-work-major-new-study-suggests-health-benefits-are-staggering-76292>

<sup>55</sup> Considerable (2019), *The popularity of electric bikes is skyrocketing among older riders*, September 3 2019, <https://www.considerable.com/health/fitness/popularity-electric-bikes/>

<sup>56</sup> Waka Kotahi (2020) *Arataki, Section C Key Drivers*, Version 1.1, <https://www.nzta.govt.nz/assets/planning-and-investment/docs/arataki/key-drivers.pdf>

<sup>57</sup> Hamilton City Council (2020) *2020/2021 Climate Change Action Plan*, September 2020, <https://www.hamilton.govt.nz/our-city/climate-change/Documents/2020%202021%20Climate%20Change%20Action%20Plan.pdf>

<sup>58</sup> Climate Change Commission (2021) *Draft advice for Consultation*, January 2021, <https://ccc-production-media.s3.ap-southeast-2.amazonaws.com/public/Executive-Summary-advice-report-v3.pdf>

### 1.5.3. Problem Three

A car centric culture and transport system, and high growth, results in increasing congestion and unequal transport choices (30%).

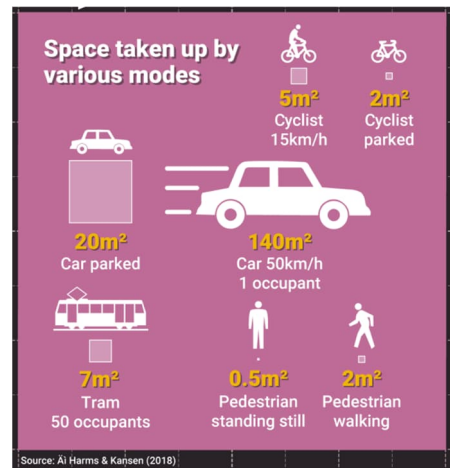
Figure 2 clearly shows that Hamilton’s transport system is ‘car centric’ with 86% of trips to work made by car. Hamilton’s transport network is car dominated with poor consideration for other modes, meaning there is little realistic mode choice for most than to get around by car. Our city was built on ‘car culture’, and all our ‘transport choices’ are heavily weighted towards private car use.

Figure 8 shows forecast WRTM modelled congestion for Hamilton for the 2021 and 2041 AM and PM Peaks, after completion of the Waikato Expressway, albeit that these results are based on superseded land use projections.

Based on the MSP PBC growth predictions, population growth in Hamilton is forecast to grow 75% between 2018 and 2050<sup>59</sup>. As a result of this growth, in the 2051 AM peak period VKT will be 46% higher than in 2013<sup>60</sup> for the Waikato Region, and 88% higher for Hamilton city. Therefore, if Hamilton keeps enabling the MSP and NPS-UD ‘high growth’ land use and increased density as it has done in the past, travel will continue to be dominated by private cars, VKT and congestion will increase and emissions from these vehicles will get significantly worse.

Hamilton cannot afford the billions of dollars needed to match high growth with wider roads and car parks, and there is little available space in our urban areas to accommodate the infrastructure needed. On current trends we will run out of road capacity for accessing the city centre in around 2036<sup>61</sup>, even if there were enough car parks available.

Hamilton needs to squeeze more productivity from our existing transport corridors, moving more people while using the same space. A wide traffic lane can accommodate 1,900 cars per hour<sup>62</sup>, however a high-quality cycleway can accommodate 4,600 cyclists per hour. On a space basis a bike park occupies 2m<sup>2</sup> versus 20m<sup>2</sup> for a parked car. More biking and micro-mobility helps us to better use the existing transport investment we have made and supports a well-functioning urban environment.



The evidence shows that Hamilton’s transport network is car centric, meaning there is little realistic mode choice for most than to get around by car. If we don’t change this, it will result in increasing VKT, crippling future congestion and emissions which will harm our economic and social outcomes. Hamilton cannot afford to match high growth with wider roads and car parks, and there is little available space in our urban areas to accommodate the infrastructure needed.

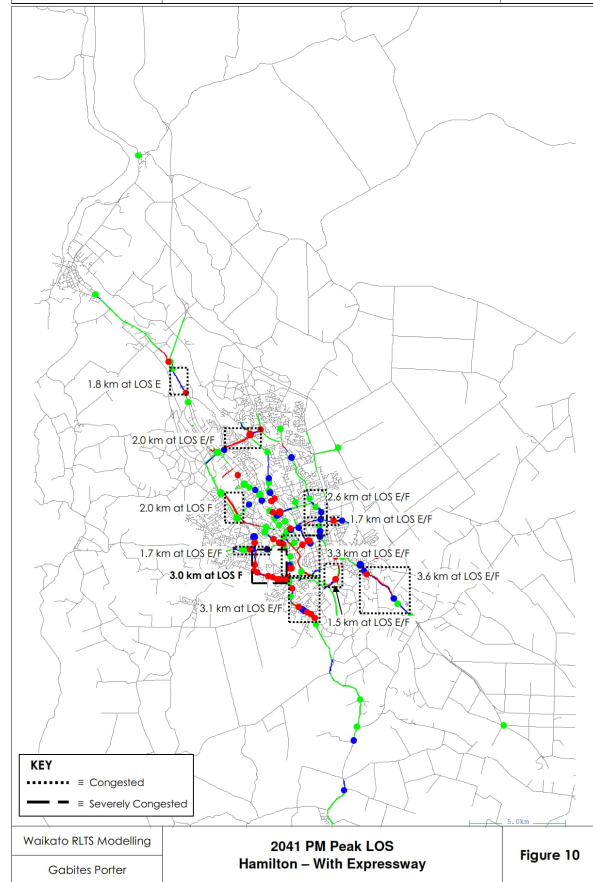
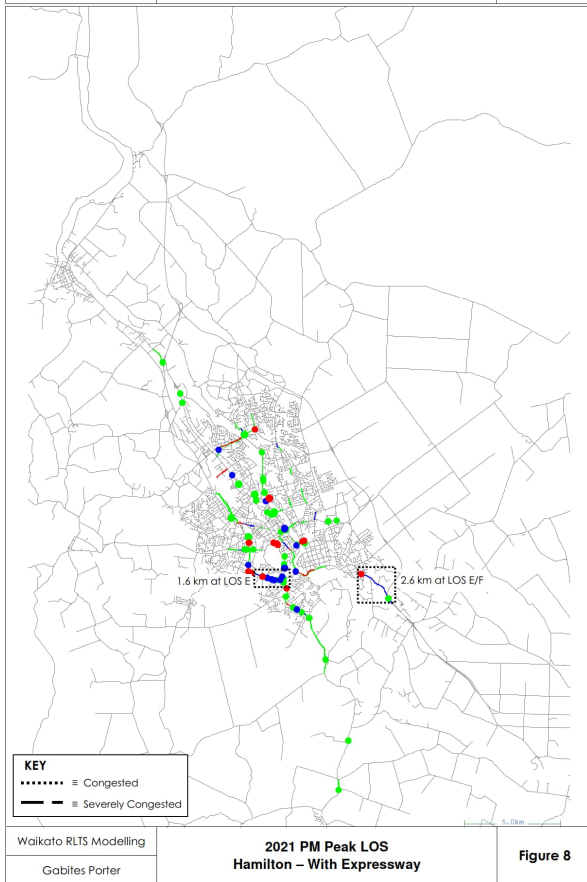
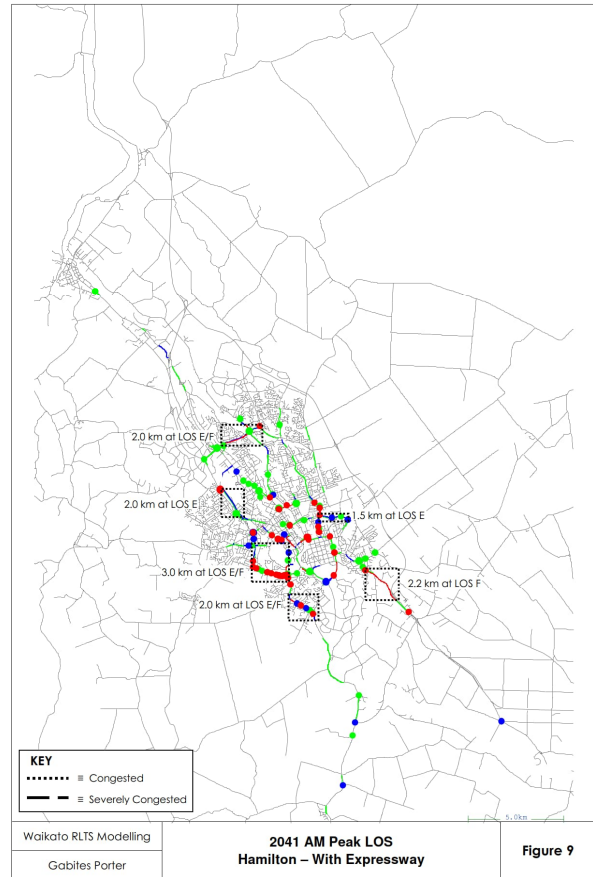
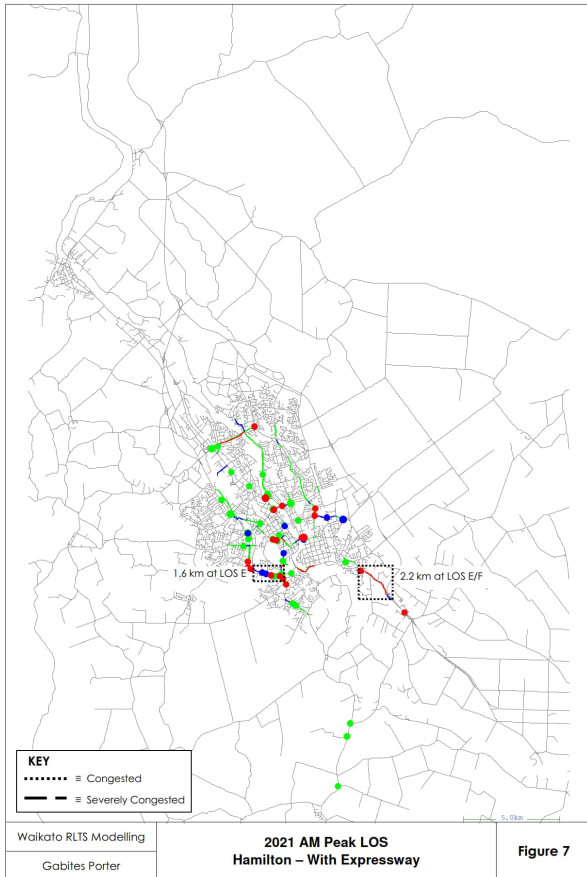
<sup>59</sup> Future Proof (2020) *Hamilton-Waikato Metropolitan Spatial Plan*, September 2020, <https://futureproof.org.nz/assets/FutureProof/H2A/Metro-Spatial-Plan/Hamilton-Waikato-Metropolitan-Spatial-Plan-Final-Low-Res.pdf>

<sup>60</sup> Future Proof (2021) *Hamilton-Waikato Report Metro Spatial Plan Transport Programme Business Case Strategic Case*, Initial Working Draft, Revision A, September 2021.

<sup>61</sup> Hamilton City Council (2018) *Access Hamilton 2018 Programme Business Case*, Version 2.0, September 2018

<sup>62</sup> Transport for Victoria Department of Economic Development, Jobs, Transport and Resources (2017) *Victoria Cycling Strategy 2018-28: Increasing Cycling for Transport*

Figure 8 – Forecast congestion in Hamilton 2021 – 2041



## 1.6. Partners and key stakeholders

Hamilton City Council – Hamilton City Council (HCC) is responsible for fully managing the local road network that forms, with the state highway, the land transport network for the city, and is responsible for public transport infrastructure that services the area. Investment by HCC is required to improve the local road network and other complementary improvements to fully realise the benefits for solving problems and improving mode share for biking identified in this Strategic Case.

Waka Kotahi – Waka Kotahi is a partner to this business case and is fundamentally concerned with improving travel choice and reducing car dependency and greenhouse gas emissions to increase the wellbeing of New Zealand's cities. Investment in the transport network may be needed to help solve the problems identified in this Strategic Case and fully realise the benefits of investing. Waka Kotahi is also an RCA and will be concerned with any impact that this investment proposal will have on the state highway network.

Local Iwi – Waikato Tainui and Ngaati Hauaa are the local iwi, they have a broad interest in the environment of Hamilton, and connection to the area. In implementing projects after this SSBC, HCC will need to work with both iwi in respect of the objectives identified in Tai Tumu Tai Pari Tai Ao and Te Rautaki Tāmata Ao Turoa o Hauā Environmental Management Plans for transportation.

Table 4 summarises key stakeholder groups with an interest in this SSBC.

Table 4 – Key stakeholders and focus areas

Key Stakeholders	Focus areas
Schools	Wellbeing of students and staff
Waikato Regional Council	First mile/last mile public transport integration
Biking special interest groups	Improved biking outcomes and getting more people biking
Sports agencies	Linking recreational cycling and recreational network into the city's network. Encouraging more biking.
Healthcare providers / insurers	Improved wellbeing of residents by increasing biking and bike safety
HCC staff	Delivering programme of infrastructure and network operations activities, achieving aligned outcomes (e.g. speed management)



## 1.7. Benefits and opportunities

The benefits of investing to resolve the problems were identified and agreed as part of the 26 June 2020 ILM workshop summarised in Section 1.6. The ILM, showing the line of sight between the Access Hamilton PBC problems, the problem statements agreed for this Programme, and the potential benefits of investment is shown in Figure 5, and included in Appendix B for reference.

Table 5 shows the alignment of the potential benefits to Key Performance Indicators (KPI's) and measures of these KPIs consistent with the Waka Kotahi Land Transport Benefits Framework and Management Approach (August 2020).

Table 5 – Potential benefits, KPI's, and measures

Benefit	KPI	Measure	Baseline
Improved safety and perception of safety for micro-mobility users 30%	Improved safety 15%	1.1.3 Number of deaths and serious injuries	9.2 DSI's per annum
	Improved perception of safety 15%	2.1.1 Perception of safety and ease	6% of network perceived as high safety
Increased micro-mobility access and use 50%	Improved micro-mobility mode share 25%	10.1.1 Number of users	4,350 users
		10.2.10 Mode share	3.8% mode share for Journeys to Work and Education
	Improved accessibility 25%	10.1.4 Proportion of network meeting target LoS	9% of network at LOS A-B
Improved health and environmental outcomes 20%	Improved health 10%	3.1.1 Physical health benefits from active modes to 'new' users	0 'new' users
	Reduced emissions 10%	8.1.1 Decrease CO2 emissions	0 transport tonnes of CO2 reduced per annum
		8.1.2 Mode shift from private vehicle	0 VKT reduced from private vehicles

## 1.8. Investment objectives

Investment objectives were developed based on the identified problems and likely benefits for the Programme as part of the 26 June 2020 ILM workshop, as summarised in Sections 1.5 and 1.7. The investment objectives were confirmed at the long list workshop on 27 July 2020.

The Partners and key stakeholders identified and agreed the following key investment objectives:

1. To improve safety of micro-mobility users by reducing deaths and serious injuries, and improving the perception of safety
2. To increase micro-mobility use by improving network quality and access, and
3. To improve health and environmental outcomes by improving physical health and reducing CO2 emissions.

The investment objectives are measured through the KPI's, measures and baselines as summarised in Table 5.

These three investment objectives are the primary reasons we are investing in the biking and micro-mobility programme and are the key success criteria any investment needs to align with to form part of the 10 year programme. A critical success factor for this SSBC, is that the proposed investment is consistent with and builds towards the 'parent' Access Hamilton PBC outcomes.

## 1.9. Key constraints, dependencies and assumptions

Investment in biking and micro-mobility is subject to the constraints, dependencies and assumptions as shown in Table 6. Management strategies have been developed to record management of these and they will be carefully monitored and managed during the implementation of the programme.

Table 6 – Key constraints, dependencies and assumptions

	Constraints	Notes
C1	Implementation funding	The biking and micro-mobility programme is likely to include a significant amount of investment, and funding from the 2021-24 NLTF is oversubscribed. Obtaining funding for biking and micro-mobility in Hamilton also needs to compete with other local and national investment priorities.
C2	Capacity to deliver	High HCC staff workloads limits their ability to be involved in the SSBC, and also limits HCC's ability to deliver an expanded investment programme.
C3	NIMBY sentiment	The community are generally in support of biking, but directly impacted communities don't want to make the necessary changes, i.e. removal of parking, reallocation of road space etc.
	Dependencies	Notes and management strategies
D1	Eastern Pathways SSBC's	This SSBC provides the Strategic Network Plan, that helps to justify investment in the Eastern Pathways corridors. This project continues to work closely with the Eastern Pathways team, to ensure consistency of engagement, technical approaches and assumptions, and reporting tactics.
D2	Urban Form	The Hamilton-Waikato Metro Spatial Plan and the NPS Urban Development both influence Hamilton's planning and policies towards a quality, compact city which is more reliant on biking and micro-mobility travel modes, and networks. Integrate the strategic intent of these influences on the urban form, and continue to evolve the programme to respond to these directions.
D3	Access Hamilton Programme	This SSBC builds on the context, problem statements and mode shift targets outlined in Access Hamilton (2018). Access Hamilton is currently being refreshed in 2021/22, and will directly draw on the Strategic Network Plan, and outcomes assessment.
	Assumptions	Notes and management strategies
A1	Greenfield growth areas	The four greenfield growth areas of Peacocke, Rotokauri, Rototuna, and Ruakura, will take connections and cycleway typologies from this programme. Funding to build the internal infrastructure within those areas has been assumed to come from those programmes.
A2	Information accuracy and currency	We have assumed that information provided to the SSBC is current, and continue to update the SSBC when new information becomes available.
A3	Implementation is feasible	The level of this SSBC, time and available budget has meant that the practicality of implementing new infrastructure on the identified roads and streets within the transportation network has not been assessed. The investment programme recommends further investigations and business case stages which will investigate the issues and constraints within those corridors to resolve these uncertainties.
A4	Costs are for cycleway improvements only	Costs presented within the 10 year programme represent only the biking and micro-mobility component. We anticipate that any urban improvement projects will include other investments in walking, public transport, placemaking etc. that will be delivered as one project.

## 2.0 ECONOMIC CASE

This section summarises the option generation, assessment and selection of the preferred option for the biking and micro-mobility programme.

### 2.1. Do Minimum

The Do Minimum forms the basis for comparison of the options in this section and assumes that travel in Hamilton continues to be car dominated in the future as it is now.

The Partners have agreed that no new biking and micro-mobility facilities are assumed beyond those completed to date and the construction of the Eastern Pathways projects which are on separate funding pathways as summarised in Section 2.1.1. Existing infrastructure is assumed to be maintained at current levels, non-infrastructure programmes such as school education and travel plan programmes continue as they currently do, low cost / low risk programmes continue at current levels, and no additional funding is sought or granted.

The result of these assumptions are summarised in Section 1.5.3 for Problem 3, that travel in Hamilton will continue to be dominated by private cars, VKT is forecast to increase 88% to accommodate forecast growth, and the resulting congestion and emissions will harm our economic and social outcomes. Active modes and public transport will continue to have very low mode share.

Either Hamilton spends to match high growth with wider roads and car parks to abate congestion, which is unaffordable and there is little available space in our urban areas to accommodate the infrastructure needed. Or we invest in reducing VKT which is what is proposed in this SSBC. The economic impacts of not investing in the biking and micro-mobility programme are possibly greater than the benefits lost if we choose not to fund investment in biking and micro-mobility.

#### 2.1.1. Projects on separate funding pathways

The Eastern Pathways School Link (funding approved) and CBD to University Link (SSBC in development) projects are on separate fundings pathways to this SSBC. While they have not been constructed yet, the Partners have agreed that for the options assessment these projects are assumed to be part of the Do Minimum, because they are not included in the costs, benefits, and outcomes attributed to the investment sought from this SSBC.

These projects include:

- Eastern Pathways School Link Corridor (funding approved)
  - Peachgrove Road and Hukanui Road from Clyde Street to Wairere Drive
- Eastern Pathways City Centre to University Corridor (SSBC in development)
  - Central City active modes bridge connection
  - The preferred biking & micro-mobility corridor via Grey Street, Cook Street and Knighton Road
- Eastern Pathways Biking Connections (funding approved)
  - Ruakura to City Centre via Te Aroha Street, Ruakura Road, and Claudelands Road, and
  - Crosby Road from Hukanui Road to Wairere Drive.

Figure 35 shows the spatial relationship between these funded projects and the biking and micro-mobility planned projects.

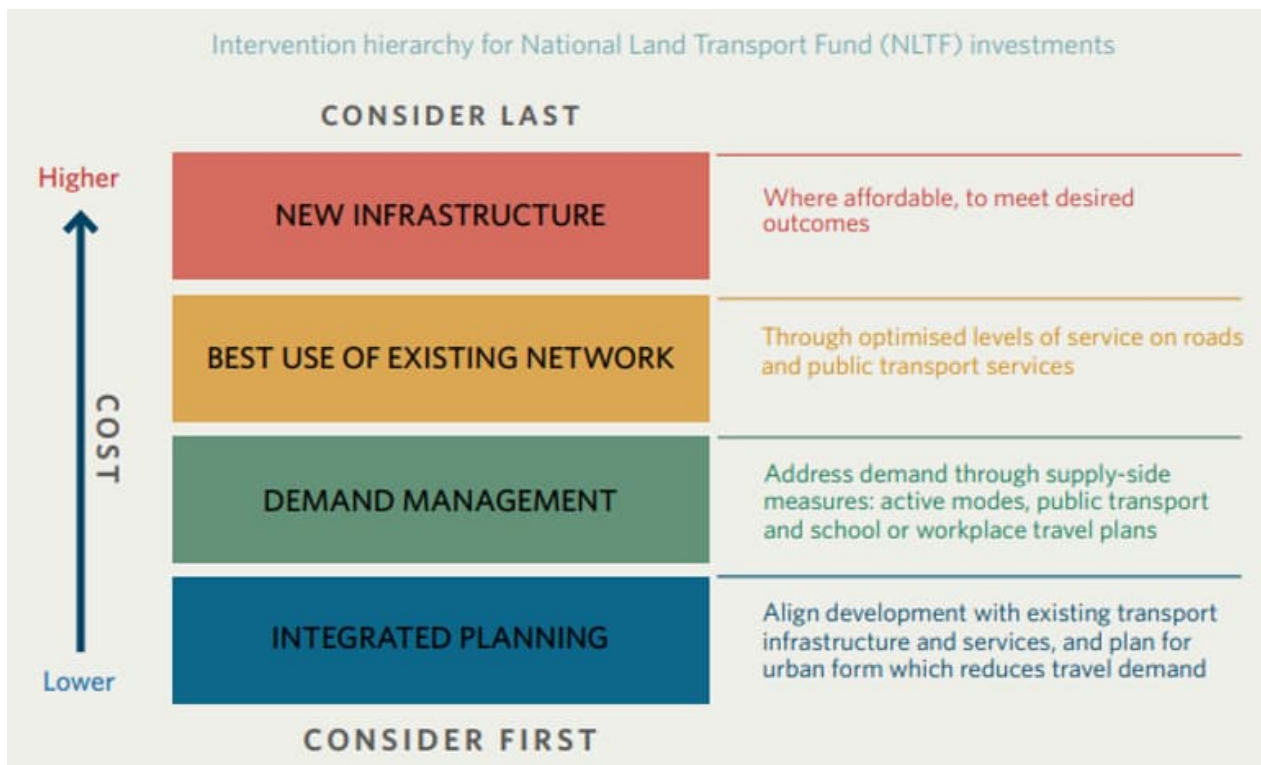
## 2.2. Long list options identification

The ILM suggested that both infrastructure and other investments were needed to achieve the investment outcomes stakeholders want from this programme, and therefore we needed to cast a wide net to consider all the possible responses to address the problem statements and achieve the potential benefits.

Two approaches were used to identify the long list of alternatives and options, 'bottom up' and 'top down'. 'Bottom up' ideas were collated from a variety of sources of information, including proposed projects, customer complaints, Bike Waikato activities, and previous stakeholder engagement. These ideas were categorised into more generalised options, grouped into alternatives and then aligned with the Intervention Hierarchy headings as shown in Figure 9 using the following logic.



Figure 9 – NLTF Intervention hierarchy



The experience of the project team was used 'top down' to make sure all logical alternatives and options were included in the final list of options for assessment. This was reviewed and confirmed at the long list workshop on 27 July 2020.

The full list of alternatives and options has been included in Appendix C for reference.

## 2.3. Long list assessment

A long list assessment workshop was held with representatives from HCC and Waka Kotahi on 27 July 2020. The aim of this assessment was to establish a 'toolkit' of the most effective and complementary option treatments to develop the short list programme options. A 'fast-fail' approach using the Investment Objectives from Section 1.8 and Critical Success Factors were employed to assess the options.

Two critical success factors were used:

- Consistency with Access Hamilton – To ensure that the programme did not contradict the direction and outcomes sought from Access Hamilton PBC as the ‘parent’ business case, and
- Within scope of the business case – To ensure that the options were within the scope of the single mode SSBC to deliver, or were within of the ability of HCC to control (e.g. redefining the future urban form of Hamilton was not within the SSBC scope).

Stakeholders were divided into three groups who separately scored the options against the Investment Objectives using a four-point scale:



Stakeholders also assessed options against the critical success factors on a pass / fail basis.

The results from the stakeholder groups were combined into an overall assessment by the project team and tabulated to show which options stakeholders considered would be most effective in achieving the investment outcomes, to inform the development of the short list. The full assessment of the long list options is included in Appendix C for reference.

Seven options were discounted from further consideration, mainly because the changes needed to implement the options were outside the scope of this project, or outside of the ability of HCC to control.

Section 2.13.13 describes and discusses activities that contribute to the success of the biking and micro-mobility programme, but are outside of scope for this single mode SSBC, including:

- Parking management policy
- Urban form and land use / transport integration
- District Plan changes to enable intensified urban form
- Road pricing and congestion charging, and
- Vehicle and fuel taxes.

These measures are key for encouraging mode shift to biking and micro-mobility in Hamilton, making the most of the proposed infrastructure investments, and decreasing reliance on private cars.

## 2.4. Short list options

After assessing the options at the long list workshop on 27 July 2020, workshop participants discussed ideas for how different programme ‘themes’ might be developed to achieve the investment outcomes. Using the most effective options from the long list assessment, these ideas were developed into five short list options (and the Do Minimum), as summarised in Table 7.

High level descriptions of how each short list option may impact a user are outlined below.

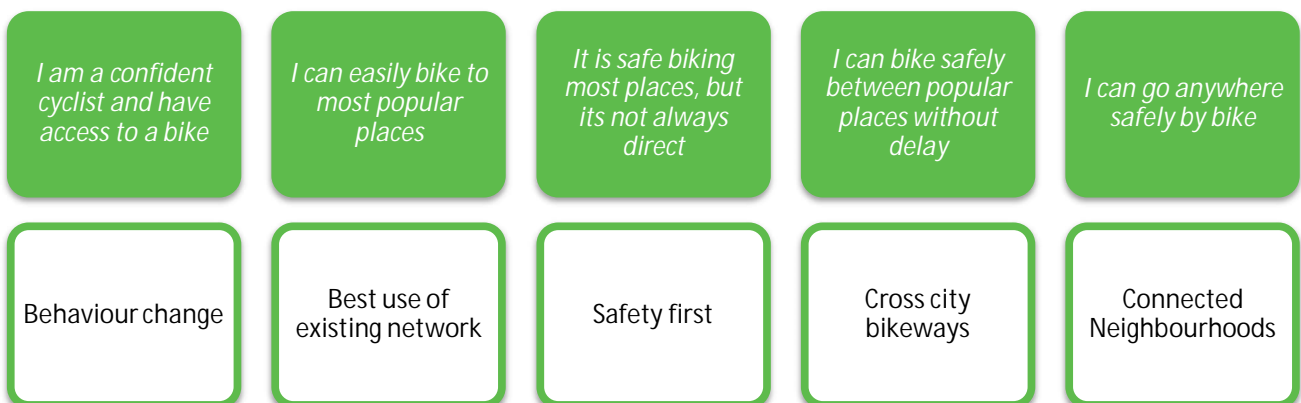
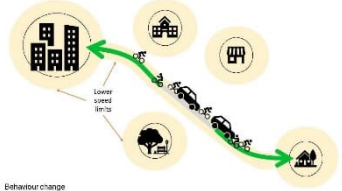
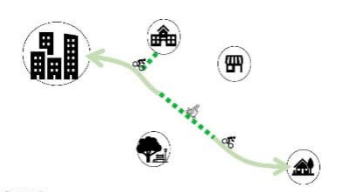
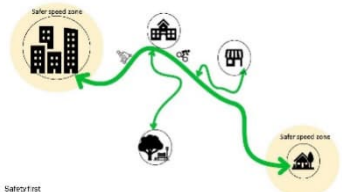
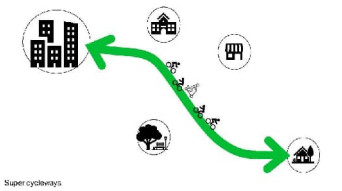
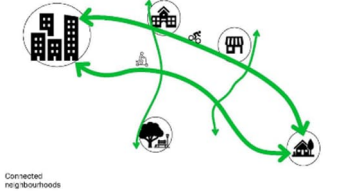


Table 7 – Short list option descriptions

Approach	Description
<p>Do Minimum</p>	<p>Existing biking network and facilities, and committed projects and programmes.<sup>63</sup></p>
<p>Supporting behaviour change</p>  <p>Behaviour change</p>	<p><i>"I have access to a bike and feel confident using it"</i></p> <ul style="list-style-type: none"> <li>• Education programmes to raise awareness</li> <li>• Policies to facilitate and promote the wider uptake of biking and e-scooters, like higher parking costs or speed limit reductions</li> <li>• Increase access to bikes and e-scooters</li> <li>• Community biking hubs</li> </ul>
<p>Best use of the existing network</p>  <p>Best use of existing network</p>	<p><i>"I know where to bike to get from A to B"</i></p> <ul style="list-style-type: none"> <li>• Fill in the gaps in the existing biking network</li> <li>• Reallocate existing road space to bikes and e-scooters, but minimise kerb changes</li> <li>• Provide a cycle network of consistent quality connections</li> <li>• Connect bike network to open space paths</li> </ul>
<p>Safety first</p>  <p>Safety first</p>	<p><i>"I can bike most places safely"</i></p> <ul style="list-style-type: none"> <li>• Fix areas known to be less safe for cycling before doing anything else</li> <li>• Provide separate space for pedestrians, bikes and cars on busy roads</li> <li>• Safer speed zones around schools and neighbourhood centres</li> <li>• Biking links are a bit less direct between popular destinations</li> </ul>
<p>Cross city bikeways</p>  <p>Superb cycleways</p>	<p><i>"I can bike between popular places without any delays"</i></p> <ul style="list-style-type: none"> <li>• High quality separated bikeways between high demand destinations</li> <li>• Smaller destinations are less well connected to the bike network</li> <li>• Bikes and e-scooters get priority over cars at intersections on busy roads</li> </ul>
<p>Connected Neighbourhoods</p>  <p>Connected neighbourhoods</p>	<p><i>"I can go anywhere on my bike"</i></p> <ul style="list-style-type: none"> <li>• Quality separated biking facilities on busy roads</li> <li>• Local roads that are redesigned to be cycling friendly with slower speed limits</li> <li>• Connects neighbourhood centres and schools as well as large destinations</li> </ul>

The short list options were described in Table 7 to emphasise the differences rather than similarities between options, to make them more distinct for public engagement. However, despite the Table 7 descriptions the options include many of the same activities. For example, behaviour change components making up the *"Supporting Behaviour Change"* option were included within each of the other options also.

<sup>63</sup> The Do Minimum has since been updated in 2021-22 with the inclusion of the projects on separate funding pathways as detailed in Section 2.1.1.

Appendix C contains a detailed breakdown of the assumptions and interventions making up each short list option for reference.

#### 2.4.1. Amalgamation of Safety First and Connected Neighbourhoods

Partners and key stakeholders at the 11 September 2020 short list assessment workshop felt the *Safety first* and *Connected Neighbourhoods* approaches to be indistinguishable – and as a result they were amalgamated into a single *Connected Neighbourhoods* approach.

The short list approaches taken forward for assessment were:

- Supporting behaviour change
- Best use of the existing network
- Cross city bikeways, and
- Connected Neighbourhoods.

Further details describing each short list option, and the alignment between the long list options and the short list options is shown in Appendix C.

#### 2.4.2. Draft network

A three-tier biking and micro-mobility network was developed to test the effectiveness of different short list options, ensuring that the differences between the short list options were restricted to the type and level of treatment between programmes. Each approach also included non-network infrastructure such as bike racks and non-infrastructure interventions such as behaviour change activities aimed at improving the convenience, safety and attractiveness of biking and micro-mobility.

The network was used to estimate costs and transport outcomes for the short list options, and was further developed for the preferred option as outlined in Section 2.8.

## 2.5. Short list assessment

#### 2.5.1. Assessment criteria

A short list assessment workshop was hosted on 11 September 2020, where participants scored the approaches in a multi-criteria assessment (MCA) against the Investment, Implementability and Assessment of Effects criteria in line with Waka Kotahi guidance, as shown in Table 8.

Table 8 – Short list assessment criteria

Category	Criteria	Description
Investment	Improving the safety of micro-mobility users	<ul style="list-style-type: none"> <li>• Reducing deaths and serious injuries</li> <li>• Improving the perception of safety</li> </ul>
	Increasing the accessibility of micro-mobility users	<ul style="list-style-type: none"> <li>• Improving mode share by biking and micro-mobility</li> <li>• Improving access to key destinations</li> </ul>
	Improving health and environmental outcomes	<ul style="list-style-type: none"> <li>• Improving the physical health of the population</li> <li>• Reducing citywide CO2 emissions</li> </ul>
Implementability	Feasibility	<ul style="list-style-type: none"> <li>• Technical / constructability – technical risk in developing or implementing the option</li> <li>• Designation and consenting risk – the relative level of complexity in gaining statutory approvals, extent of designation, considering any non-complying and prohibited activities</li> </ul>

		<ul style="list-style-type: none"> <li>Safety in design / zero harm – Health and safety risk in construction, operations, and maintenance</li> </ul>
	Affordability	<ul style="list-style-type: none"> <li>Capital cost</li> <li>Annual operational and maintenance costs</li> <li>Benefit / cost ratio</li> <li>Financial – is it funded in the NLTP</li> </ul>
	Stakeholder / customer	<ul style="list-style-type: none"> <li>How acceptable is this to the stakeholders and customers?</li> </ul>
Assessment of effects	Cultural	<ul style="list-style-type: none"> <li>How does this impact on Mana Whenua values?</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>How does this impact on the environment and / or landscape?</li> </ul>
	Community	<ul style="list-style-type: none"> <li>How will the community be affected?</li> </ul>

All criteria were scored by workshop participants relative to the Do Minimum option using a seven-point scale as detailed in Table 9. The full short list MCA assessment has been included in Appendix C for reference, which for quantitative assessments includes definitions of what constitutes each score given in Table 9.

Table 9 – MCA scoring scale

-3	-2	-1	0	+1	+2	+3
Significant Adverse - Impact or Risk	Moderate Adverse - Impact or Risk	Minor Adverse - Impact or Risk	Neutral	Minor Positive	Moderate Positive	Significant Positive

### 2.5.2. Assessment results

Appendix C contains the detailed assessment of the short list programme approaches against the Investment, Implementability and Assessment of Effects assessment criteria, and the assessment of outcomes for the short list options.

The assessment shows that *Supporting Behaviour Change* was the most affordable option and had the least detrimental effects but only scored the same as the *Do Minimum* in terms of investment outcomes. Ranked fourth.

*Best Use of the Existing Network* scored moderately for investment outcomes, had moderate implementability risks, costs and environmental effects, and would be seen positively by the community. Ranked second.

Cross city bikeways scored moderately for investment outcomes, but had significantly more implementability effects and higher costs, and similar community and environmental effects as *Best Use of the Existing Network*. Ranked third.

*Connected Neighbourhoods* scored the highest against the investment outcomes criteria of all options, indicating that this option is expected to be the most effective. The large scale of the physical works increases the cost and technical difficulty of this programme compared to all options, but is expected to perform the best in terms of impact on the environment and positive effects on the community. Ranked First.



## 2.6. Short list engagement

### 2.6.1. Mana Whenua engagement

Mana whenua were asked for their feedback on the short list programme approaches at the Te Ngaawhaa Whakatupu Ake committee meeting on 02 October 2020. Their feedback strongly supported investment in biking and micro-mobility, and in the approaches where more and safer infrastructure is proposed but didn't indicate an absolute preference for a specific approach. They requested consideration of linking cultural sites to the proposed network at the implementation stages of the programme.

Mana whenua wanted to be involved when the biking network is being implemented at a project level. As Partners mana whenua are regularly involved as part of HCC's business processes regarding transportation projects and it is expected that these processes will apply for projects stemming from this SSBC. Examples include the cultural impact assessment developed for the School Link SSBC and the University to Central City SSBC and input by mana whenua to the design of the Ruakura Road urban arterial upgrade.

### 2.6.2. Elected Member involvement

Implementation principles were developed with HCC Elected Members in July 2020, and formed part of the engagement with stakeholders and the public:

- Design for all ages and abilities
- Enhance the urban environment
- Safety in design throughout the design process
- Draw on best practice design and ideas
- Work with open space linkages
- Fair consideration of all transport modes
- Work with the community
- Quality first – do it once, do it right
- Quick progress
- Easy to navigate by bike
- Timely maintenance, and
- Improved end of trip facilities.

"Quality first – do it once, do it right" was initially included in this list, and describes the approach intended for the Eastern Pathways programme of high quality and high-cost infrastructure. However due to affordability and the slow pace to deliver improvements, HCC is now investing in biking and micro-mobility with transitional approaches and road space reallocation. As the 10 year programme follows this philosophy, 'quality first' has been removed from the implementation principles.

A workshop with HCC Elected Members was held on 7 October 2020, where Councillors indicated a preference for a safety-based approach with cycleways separated from traffic. The general consensus from Elected Members was expressed for the *Connected Neighbourhoods* and *Cross city bikeways* approaches.

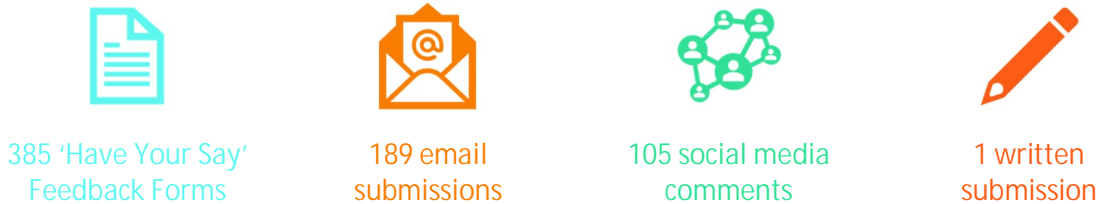
### 2.6.3. Community engagement

The community and stakeholder engagement for the Biking and Micro-mobility Programme ran for a five-week campaign period from Thursday 22 October to Sunday 29 November 2020. Four themes aligned to the short list options were presented to the community to understand which approach they thought would best encourage them to regularly bike, e-scoot and e-skate around Hamilton.

The four themes are:

- Supporting behaviour change “I have access to a bike and feel confident using it”
- Best use of the existing network “I can bike to most popular places”
- Cross city bikeways “I can bike safely between popular places without delay”
- Connected Neighbourhoods “I can go anywhere on my bike safely”

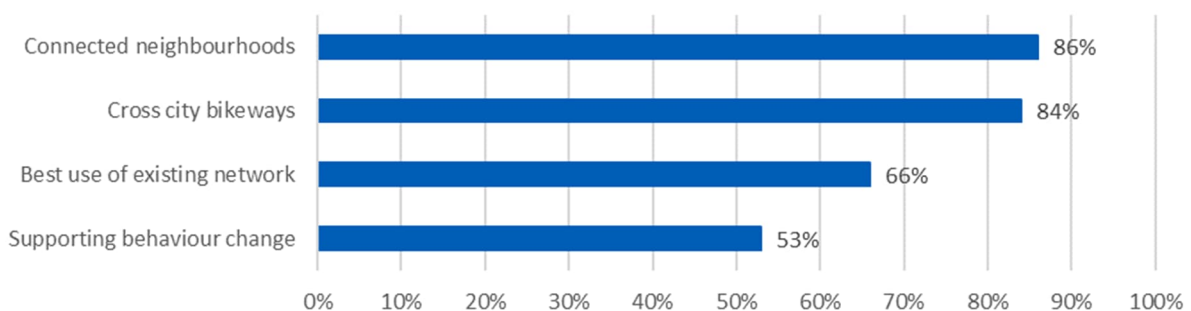
Responses included:



More than 84% of respondents *agree* or *strongly agree* that the *connected neighbourhoods* and *cross city bikeways* themes would encourage them to regularly bike or e-scooter as shown in Figure 10. Both themes include bikeways separated from traffic and pedestrians, and seek to improve user safety. Respondents were critical that the *best use of existing network* or *supporting behaviour change* themes would improve mode shift or improve safety.

Figure 10 – Community engagement results

*“This theme will encourage me to regularly bike or e-scooter”*



Three key points we heard:

- Safety concerns, and the need for safety improvements to encourage more biking and e-scooting;
- The need for a well-connected citywide network for bike and e-scooters; and
- Strong support for dedicated infrastructure, in particular for separated bikeways.

The full results of the community engagement have been included in Appendix D.

## 2.7. Selection of Connected Neighbourhoods as the preferred option

On the basis of the short list option MCA assessment in Appendix D and consideration of mana whenua, Elected Member, community and stakeholder engagement feedback, the *Connected Neighbourhoods* programme was identified as the preferred option.

This Biking and Micro-mobility Programme SSBC (Rev C) was presented to the HCC Infrastructure Operations Committee on 27 April 2021, where HCC elected members unanimously approved the business case for submission to Waka Kotahi. This was based on the *Connected Neighbourhoods* programme which took 30 years to deliver at a likely cost of more than \$1b as detailed in Appendix D.

Since April 2021 the national and local context and urgency for investment in biking and micro-mobility has changed significantly, and the biking and micro-mobility investment programme has needed to change to meet these challenges. The key drivers and necessary changes to deliver *Connected Neighbourhoods* reduce costs and speed up delivery of the Strategic Network Plan are summarised in Section 2.9.

### 2.7.1. Connected Neighbourhoods vision

The *Connected Neighbourhoods* 30 year vision is that “*I can go anywhere on my bike*”, creating a network and environment that is safe and convenient for people to go anywhere by bike or micro-mobility.

The core principles of *Connected Neighbourhoods* are set out in Table 7 and as follows:

- Quality separated biking facilities are provided on busy roads
- Local roads that are redesigned to be cycling friendly with slower speed limits, and
- It connects neighbourhood centres and schools as well as large destinations.

These principles align with the intervention hierarchy introduced in Figure 9. Where traffic volumes and speeds are high, bikes should be segregated from traffic on quality separated facilities. Where vehicle speeds and volumes can be reduced, or where conflicts with vehicles can be mitigated lesser facilities may be considered. On quiet local roads where there are fewer vehicles, speeds are lower, and potential conflicts are minimal, minor treatments would be sufficient to provide safe cycling opportunities on street.

The Strategic Network Plan presented in Figure 13 totals 328km, consisting of three route types and lengths. These three tiers strongly align with the core principles of *Connected Neighbourhoods*:

- Tier 1: Cross city connections 70km – Connect key activity clusters with separated bike lanes as these can be expected to generate the most travel demands due to the scale of the activities connected
- Tier 2: Community links 148km – Connect activity centres to the Tier 1 network using separated or buffered cycle lanes, and
- Tier 3: Local links 110km – Speed management treatments on local roads and quieter collector roads to integrate with the Tier 1 and 2 networks.

## 2.8. Strategic Network Plan development

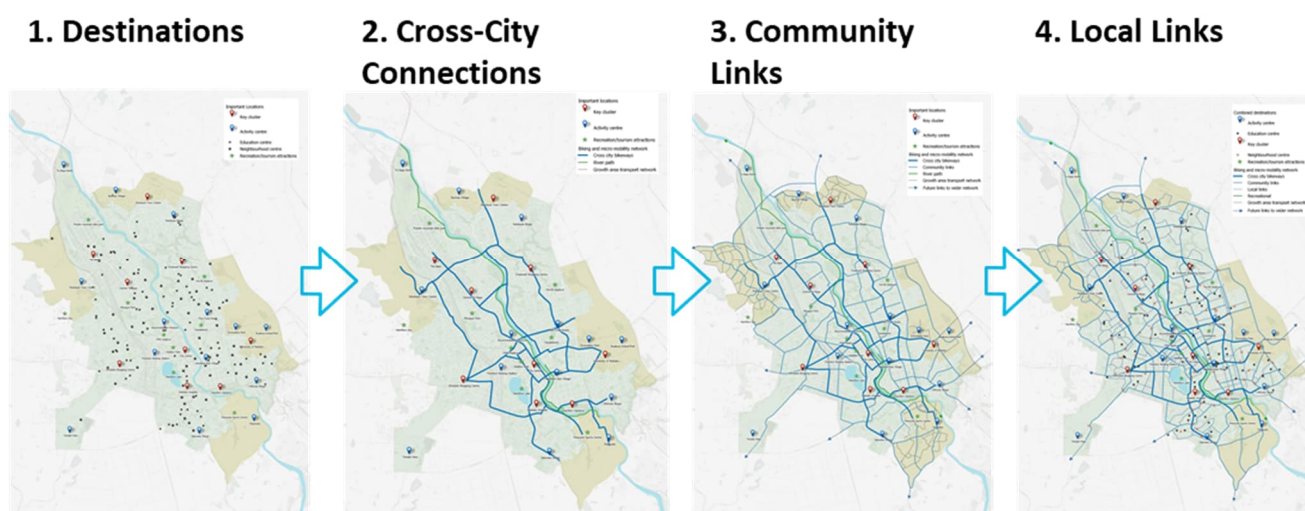
Partners and key stakeholders attended a network development workshop on 15 December 2020 to develop the biking and micro-mobility network for *Connected Neighbourhoods*. Participants developed a hierarchy of destinations to connect, and prepared a three-tier biking and micro-mobility network connecting these destinations.

The agreed destination hierarchy comprises:

- Key clusters – Clusters of mixed-use commercial employment and education destinations of greatest importance (and thereby the higher trip generating groups of uses), including:
  - City centre
  - The University of Waikato
  - Waikato Hospital
  - The Base
  - Dinsdale centre
  - Chartwell centre
  - Rototuna village
  - Te Rapa centre
  - Hamilton Gardens<sup>64</sup>
- Activity centres – Locations of local (suburb-scale) economic and social significance
- Neighbourhood centres – Smaller neighbourhood shop centres which typically include a dairy, some takeaways, liquor store etc. This category also includes local community amenities such as libraries and swimming pools
- Education centres – Primary, secondary, tertiary and early childhood education centres, and
- Tourism and recreation attractions – Large parks and sports facilities.

After determining the relative importance of destinations, workshop participants focussed on connecting the first two categories of destinations, key clusters and activity centres. Figure 11 summarises the process of determining connections and network treatment types.

Figure 11 – Network development process



<sup>64</sup> Hamilton Gardens was classified as a Key Cluster due to the sheer number of trips it generates on a regular basis and the potential it has for being an attractor of a high number of tourist and recreational biking trips.

Figure 11 explains the different levels of the network. These include:

- Tier 1: Cross city connections – Connect key clusters with wide separated bike lanes as these can be expected to generate the most travel demands due to their scale
- Tier 2: Community links – Connect activity centres to the Tier 1 network using separated or buffered cycle lanes
- Tier 3: Local links – Speed management treatments on local roads and quieter collector roads to integrate with the Tier 1 and 2 networks, and
- Recreational Links – Primarily recreational and tourist routes, such as the Te Awa Cycleway.

Figure 13 shows the proposed biking and micro-mobility strategic network plan. The network consists of 328km of bike facilities, including:

- 70km of Tier 1: Cross city connections
- 148km of Tier 2: Community links, and
- 110km of Tier 3: Local links.

Please note that the links shown along routes in Figure 13 are indicative only. The network plan should be interpreted as connecting destinations together with a tiered typology of biking network connections. The most appropriate alignment and intervention will be determined as the programme is rolled out and detailed investigations are carried out for individual corridors.

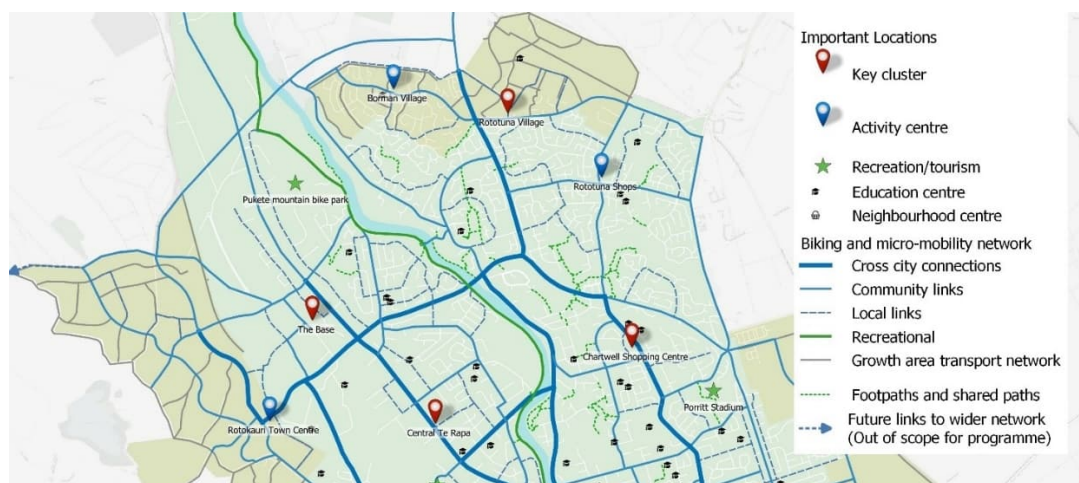
### 2.8.1. Population within reach of the network

With the biking and micro-mobility Strategic Network Plan in place, an estimated 75% of Hamilton's 2050 population of 282,000<sup>65</sup> will be within 250m<sup>66</sup> of either a cross-city connection or a community link bike facility. When including the local links and low speed, low volume cycle friendly roads, more than 90% of the population will be within 250m of a safer and more attractive route to bike on.

The last 250m will often be via low speed and low volume road. Roads with speeds lower than 30km/h and traffic volumes less than 2,000 vehicles day are sufficiently bike friendly to encourage people to use these roads to connect to the proposed bike network.

The Strategic Network Plan has been designed to integrate with the footpaths and shared paths through parks and open spaces, as shown in Figure 12 using an excerpt of the Strategic Network Plan. These can be integrated with the network on an opportunity basis where they serve a link function and can support one of network tiers to better connect a destination.

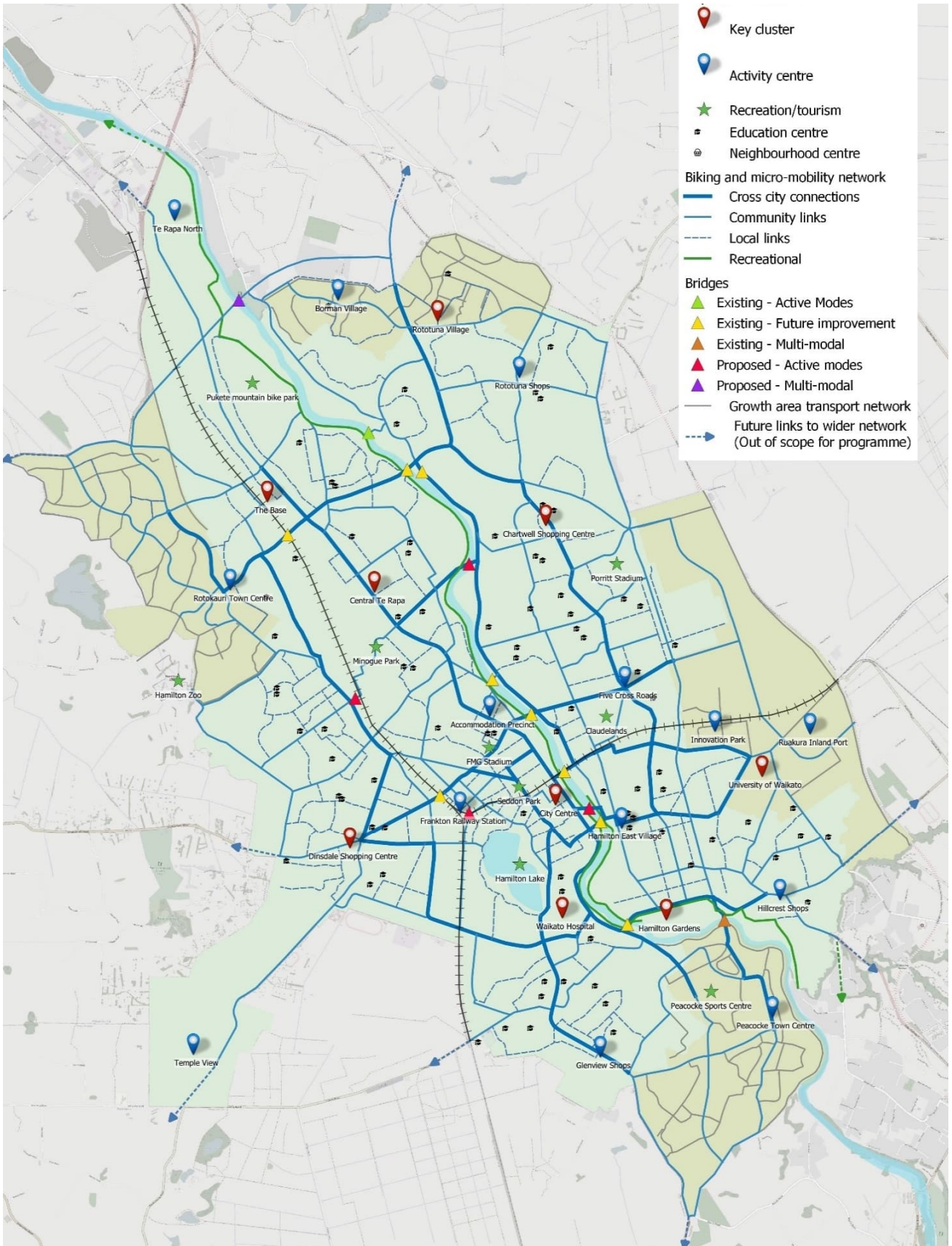
Figure 12 – Example of network integration with open space paths



<sup>65</sup> Future Proof (2022) *Hamilton-Waikato Report Metro Spatial Plan Transport Programme Business Case, Shortlist Option Assessment Report*, Initial Working Draft, Revision A, April 2022.

<sup>66</sup> The CROW manual and the 'Coherence and Accessibility' basic quality design principle recommends that, in urban areas, people should not have to travel more than about 250 metres to reach the bicycle network

Figure 13 – Strategic Network Plan



## A NEW WAY FORWARD

This section summarises the development of the *Connected Neighbourhoods* vision, outlines the rationale for the transitional approach to delivery of the 10 year programme, and presents the 2050 demand assessment.

### 2.9. A new urgency

During the development of this SSBC the context and urgency for investment in biking and micro-mobility has changed significantly, and the biking and micro-mobility programme has needed to change substantially to meet these challenges. HCC has worked together with Waka Kotahi to refine the SSBC and investment programme to deliver the *Connected Neighbourhoods* outcomes in a more timely and affordable way.

Three key changes influencing this SSBC are the development of the Emissions Reduction Plan (ERP, summarised in Section 1.3.2), the National Policy Statement on Urban Development (NPS-UD, Section 1.3.3), and the Metro Spatial Plan PBC (MSP PBC, Section 1.4.2). These three documents show that:

- Population growth in Hamilton is predicted to increase 75% from 2018 to 2050<sup>67</sup>
- As a result of growth, Hamilton's VKT is expected to increase 88% in roughly the same timeframe, almost doubling private car travel
- NPS-UD enables more growth and more density within Hamilton, faster than was previously permitted, and
- The ERP requires a 20% reduction in VKT and therefore carbon emissions by 2035, to work towards achieving our 'net zero' goal by 2050.

If Hamilton continues to accommodate population growth with private car transport as it always has done, we can expect our VKT to almost double, which will result in:

- Progressively worsening congestion particularly at key river crossings, arterial intersections, and approaches to the city centre, which will require further investment in roads and car parks which will be expensive and require scarce urban space
- Incremental extensions and improvements to public transport and active mode networks
- Private vehicles will continue to be the vastly dominant mode of transport<sup>68</sup>, and
- Emissions from transport will almost double, and we will not reach 'net zero' targets.

To hit the ERP 20% VKT reduction by 2035 target, Hamilton needs to deliver the significant step change in walking and cycling mode share envisaged by the ERP and MSP. For cycling this reduction cannot be achieved by delivering 'traditional' biking and micro-mobility infrastructure as we have always done in the past. This is expected to cost more than \$1b, take 30 years to deliver, and require huge resources from HCC and delivery partners. This will be too slow, too expensive to afford, and too late to hit a 20% reduction by 2035.

To align with the ERP the *Reduced Emissions* KPI has been expanded to include 8.1.2 Mode shift from private vehicle, measured by VKT reductions.

#### 2.9.1. Social licence

'Social licence' from the people of Hamilton will be critical to achieve the step change in mode shift towards biking and micro-mobility, and VKT reductions for private cars. Social licence in this context refers to the public acceptance of Council activities, relating to community approval and trust that HCC are doing the right things and making changes at the right speed. Without social licence to improve biking and micro-

<sup>67</sup> Future Proof (2022) *Hamilton-Waikato Report Metro Spatial Plan Transport Programme Business Case, Shortlist Option Assessment Report*, Initial Working Draft, Revision A, April 2022.

<sup>68</sup> Future Proof (2021) *Hamilton-Waikato Report Metro Spatial Plan Transport Programme Business Case Strategic Case Initial Working Draft*, Revision A, September 2021

mobility, HCC may incur local or city-wide public opposition to the installation of biking infrastructure, which will cause delivery delays and increase costs. In the past HCC has not been able to proceed with some projects due to public opposition.

In the short to medium term, the biking and micro-mobility programme will need to strike a careful balance between delivering the Strategic Network Plan quickly to achieve the programme outcomes and ERP targets, and maintaining social licence from residents to implement the programme. Some key considerations include:

- Speed of delivery
- Cost to the ratepayer
- Disruption in the community from construction on multiple projects in the same area
- Maintenance requirements
- Viable travel choices are needed before the reallocation of existing road space and car parking can happen, and
- Inconvenience to drivers from traffic management, reduced speeds, and less direct trips.

There is no 'one size fits all' approach to these issues, and to maintain social licence an evolutionary approach to delivering the Strategic Network Plan will be needed. Therefore, communications and engagement will be critical to the successful delivery of the biking and micro-mobility programme, and staff to address social licence for biking and micro-mobility in Hamilton have been included in the 10 year programme and costs.

## 2.10. Transitional delivery approach

Hamilton needs a different approach to speed up delivery of biking and micro-mobility infrastructure, reduce the cost of delivering the Strategic Network Plan, deliver the step change in mode shift to cycling, and contribute towards the substantial VKT reductions needed from the programme.

This section introduces the 'transitional' approach to delivery of biking and micro-mobility network improvements, outlines the cost and delivery speed implications, and provides some practical examples of where the approach has been successfully delivered in Hamilton.

### 2.10.1. Transitional Cycling Design Guidance

HCC and Waka Kotahi have recently developed draft *Transitional Cycling Design Guidance* (unpublished – see Appendix E). The purpose of this document is “to provide a framework for the delivery of transitional cycling improvements that promote and improve cycling in Hamilton City.”

The approach to transitional improvements in the guidance is based on the standard risk management approach hierarchy of interventions. The first consideration should be given to remove the conflict/risk and only if this is not achievable reduce it. If neither removal or reduction is possible seek to protect or mitigate, and in all situations seek to enhance cycling amenity and utility:

- Remove – Most of the key concerns about people cycling are around safety. This relates largely to situations where they are negotiating traffic on streets. In some locations you may be able to remove through movement traffic and this will remove the safety risk, or you may be able to find a route that doesn't mix with traffic (i.e., through a park). Such approaches require careful consideration but, in most cases, should be the first place to begin.
- Reduce – Where there isn't scope to create traffic free/highly reduced situations, you may be able to find ways to reduce conflict or reduce the likelihood of a poor outcome from conflict. In many cases this will be through reducing traffic speeds or creating improved arrangements for cyclists and drivers to avoid conflicts.
- Protect – In some locations—you may have to provide low-cost interventions that help to protect cyclists (which in some cases will also protect pedestrians). This approach may include locations where concrete kerb build outs are installed, or specific filtering devices that create a buffer



between cyclists and drivers. It may also mean moving cyclists onto lower risk areas such as shared paths but only where pedestrian conflict is likely to be low

- Enhance – In all instances, interventions should improve the facilities provided to biking and micro-mobility by either removing or reducing the conflicts, or providing physical protection from traffic.

The transitional approach provides opportunities to fine tune approaches in the Hamilton context, though the proposed ongoing programme delivery for biking and micro-mobility. The key principle will be to 'fail fast' at a low cost, and implement lessons about what is working, and what is not quickly.

### 2.10.2. Transitional delivery cost advantages

The 'Remove' and 'Reduce' stages of the *Transitional Cycling Design Guidance* are generally low cost, as they seek to separate biking and micro-mobility from traffic movements through alternative corridors, restricting traffic movements, and reducing speeds and severities of conflicts. 'Protect' is the costliest step of the transitional approach, as this seeks to separate cyclists from traffic on busy routes by creating a buffer, barrier or space between cyclists and motorised modes.

Unit rates were derived to estimate the project costs as summarised in Appendix H. These rates show that the average cost of providing bike paths or lanes by carriageway widening, while maintaining existing traffic lanes and/or parking arrangements are very high at around \$12-15m per kilometre.

The ERP supports local government to accelerate widespread road space reallocation to support public transport, active travel and placemaking. Road space reallocation will assist to accelerate delivery of the biking and micro-mobility Strategic Network Plan, at a much lower cost than traditional permanent solutions. Faster delivery is likely to be much less disruptive to the community during construction, which can negatively impact social licence and threaten future projects.

Moving and replacing kerbs typically requires the relocation of utilities, replacement of drainage systems, new concrete kerbs, and major improvements at intersections to extend the level of service for biking and micro-mobility along the corridor. Around three quarters of biking related crashes occur at intersections so improvements at these locations are critical in improving the safety and level of service. Widening to include cycling facilities at intersections typically also includes costly property acquisition.

The costs of providing facilities within the existing carriageway space using road space reallocation is significantly less expensive, as kerbs are not moved and therefore the physical works are much reduced. The average cost of these type of facilities is between \$670,000 and \$870,000 per kilometre, a saving of over \$10m per kilometre. Therefore, road space reallocation using transitional style 'protect' treatments are the basis of the proposed investment in biking and micro-mobility on our busiest routes.

### 2.10.3. Faster and cheaper delivery of Connected Neighbourhoods

Figure 14, Figure 15 and Figure 16 provide an indication of delivery pace, envisaged mode shares and capital investment required to deliver the Strategic Network Plan over 30 years for the following scenarios:

- Business As Usual (BAU) – The Do Minimum as presented in Section 2.1
- Full separation – Based on Tiers 1 and 2 of the Strategic Network Plan being delivered as separated facilities to a permanent high-quality standard during the first decade, and road space reallocation during decades 2 and 3, and
- Transitional – Based on delivery of the Strategic Network Plan using transitional style approaches with lower cost and faster delivery.

Figure 14 – Kilometres of safe network to cycle on delivered over 30 years (km)

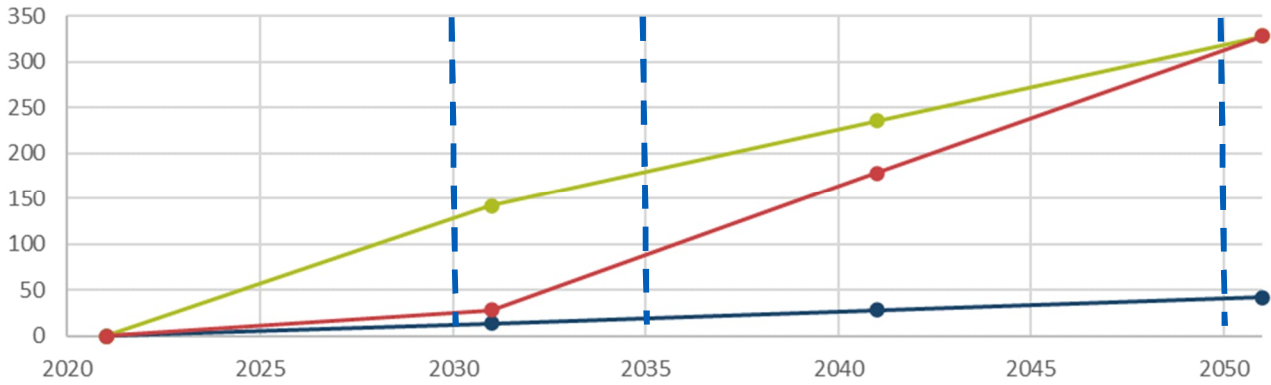


Figure 15 – Percentage mode share by biking & micro-mobility

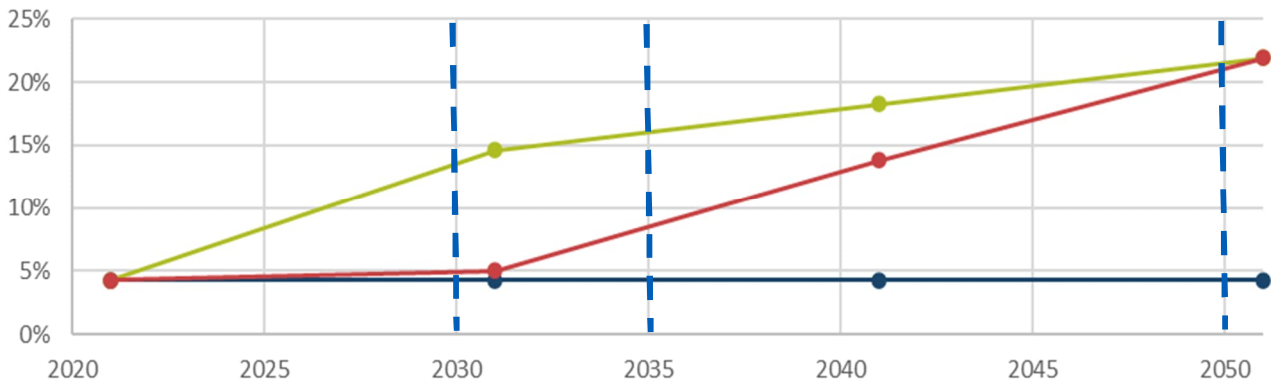


Figure 16 – Capital costs needed to deliver over 30 years (\$m)

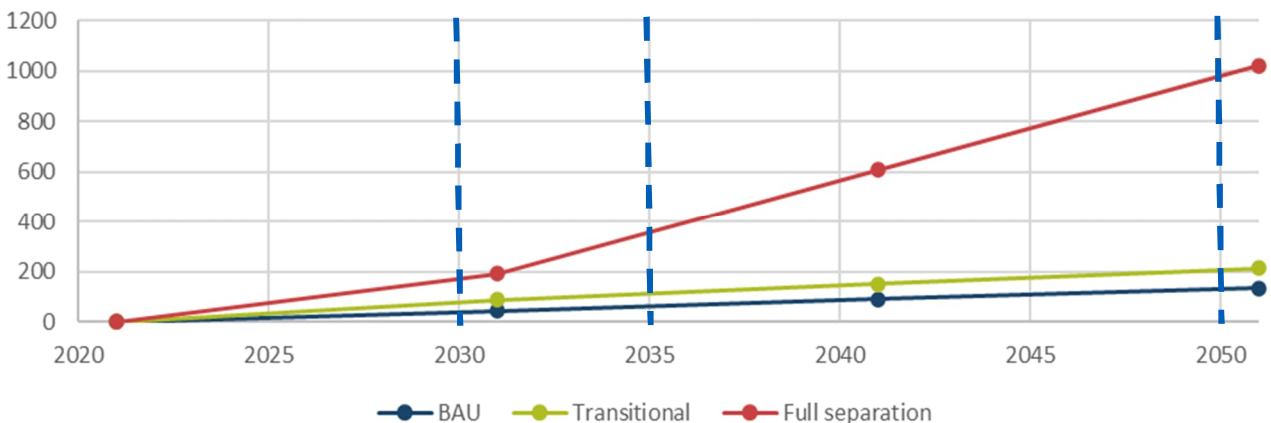


Figure 14, Figure 15 and Figure 16 show that while the BAU scenario (blue) has low costs, it delivers less than 50km of the network over 30 years for \$135m, and achieves very little mode shift. Therefore, BAU delivery will not achieve the step change in mode shift and VKT reductions demanded by the ERP and MSP PBC.

The full separation (red) scenario provides twice the amount of network at the same cost per kilometre as the BAU during 2021-2031. Decades 2 and 3 assume social licence to implement the remaining network based on road space reallocation. Figure 14, Figure 15 and Figure 16 show it would cost \$1b+ to deliver the full 328km Strategic Network Plan by 2051, and require a significant step up in delivery and budget for decades 2 and 3 to achieve the mode shift and resulting VKT reductions at 2050.

The blue vertical dotted lines in Figure 14, Figure 15 and Figure 16 show the ERP target years for emissions reductions. Despite the high cost, at 2031 the full separation scenario will only result in a 5% biking and micro mobility mode share in 2031, which will not assist the ERP 20% reduction in VKT by 2035 target.

A more agile, less costly, and less disruptive transitional approach (green) has been investigated based on HCC's draft *Transitional Cycling Design Guidance*, summarised in Section 2.10.1. This approach uses more cost-effective interventions that can be delivered at pace, access restrictions to slow or reduce vehicle traffic, and road space reallocation on the busiest routes. It is envisaged that 142km or 43% of the network can be delivered by 2031. The full 328km Strategic Network Plan can be delivered by 2051 for \$220m. At the decade 1 pace the Strategic Network Plan could be implemented by 2039, if funding and delivery resources are available.

The transitional approach is predicted to result in a 15% biking and micro-mobility mode share in 2031 for half the cost, compared to the 5% expected from the full separation scenario.

Figure 14, Figure 15 and Figure 16 illustrate that the transitional approach is expected to deliver more of the Strategic Network Plan faster and for a fraction of the cost of full segregation. The transitional approach is expected to deliver more mode shift to biking and micro-mobility sooner, and significantly contribute towards the 2035 ERP VKT and emissions reduction targets.

#### 2.10.4. Transitional project examples

##### Anzac Parade and Grey Street project

A successful example of a reactive / opportunistic project are the transitional style improvements recently installed on Anzac Bridge, Anzac Parade and Grey Street. The programmed reseal of the corridor was brought forward to align with the installation of a water main upgrade. When reinstating the pavements, the road space within the existing kerb-lines was reallocated to provide improved levels of service and safety to cyclists along the corridor.

As shown in Figure 17 and Figure 18 improvements were relatively low-cost line markings, signs and flexi post (flexible bollard) delineators. These were cost effective through implementing the bike facilities as part of a bigger work package, and therefore lower cost as they were an incremental addition and benefited from efficiencies such as working within the wider project's traffic management plans.

This transitional approach to delivery enables a faster achievement of the biking and micro-mobility programme outcomes through these cost efficiencies, enabling a faster delivery of the biking and micro-mobility network and improving safety outcomes, while acknowledging that levels of service are not optimal due to the constraints of the corridor. The alternatives would have been either to do nothing at this location, or to spend considerably more money here for a higher quality facility with more community disruption. Both alternative approaches would have slowed down overall delivery of the biking and micro-mobility network, and the benefits sought from the investment.

Ideally where such responsive opportunities arise, the biking and micro-mobility improvements should preferably be a permanent upgrade. In this above example the changes were intended to be temporary as the corridor is envisaged to be upgraded as part of the City Centre to University link corridor and will likely receive a multi-modal improvement in the next decade.

Figure 17 – Grey Street between Anzac Parade and Clyde Street



Figure 18 – Grey Street and Clyde Street intersection



## Ward Street project

Transitional style approaches were also used with the recent reconfiguration of Ward Street to include directional cycle lanes as shown in Figure 19. Car parking was used to provide protection to cyclists including a safety buffer between the parked cars and the cycle lane to allow for the opening of passenger doors, and provide a space for car passengers to step into.

Figure 19 – Low cost separation with parking protection along Ward Street



## 2.11. 2050 demand assessment

Flow Transportation Specialists was commissioned to develop an updated estimate of the 2050 forecast biking and micro-mobility potential within Hamilton for the *Connected Neighbourhoods* Vision. This was based on the Strategic Network Plan (Figure 13) and land use estimates from the MSP PBC.

The demand estimate was undertaken for two purposes: to understand the network wide origin-destination demands for biking and micro-mobility; and to help prioritise which corridors should be included in the 10 year programme. A technical note describing the demand model development has been included as Appendix F.

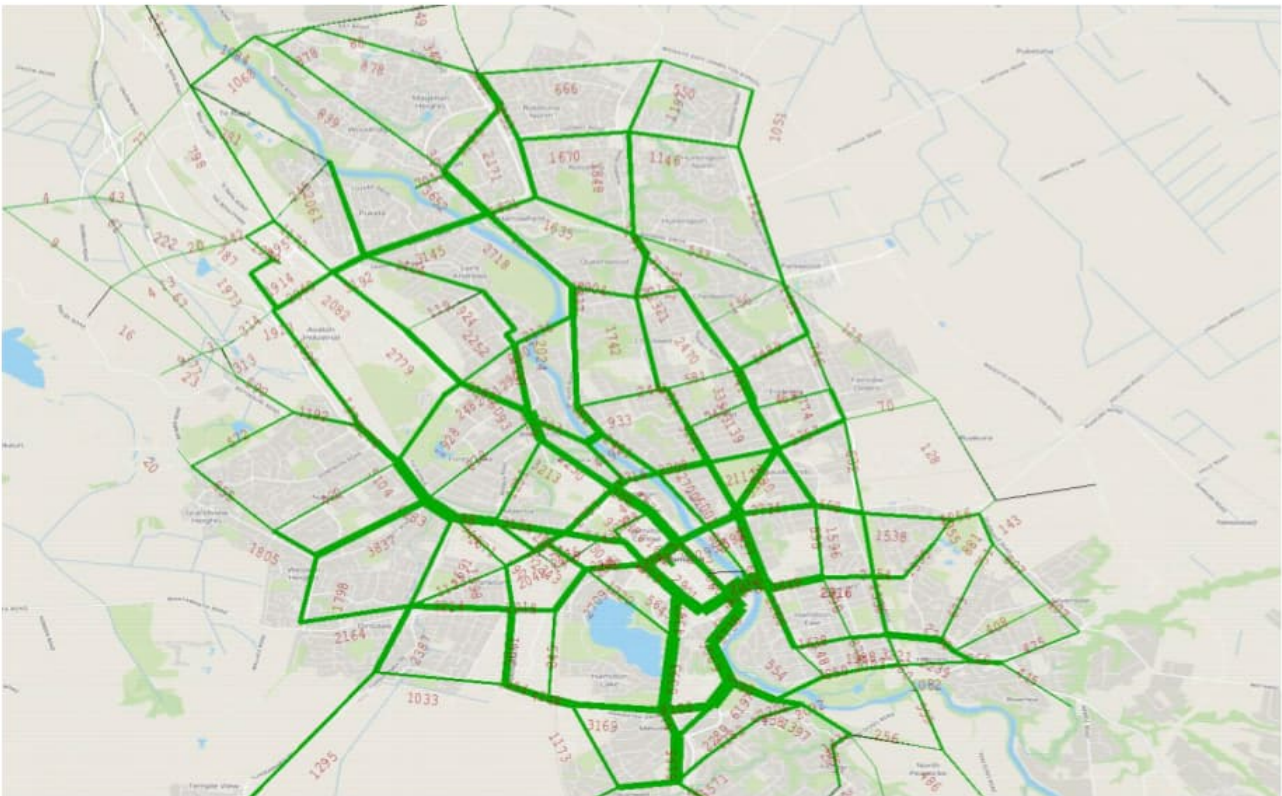
Three scenarios were developed:

1. 2050 Business as usual: Assuming the existing biking network with no further investment
2. 2050 Strategic Biking and Micro-mobility Network: Should the Strategic Network Plan in Figure 13 be implemented, cycle mode shares of 18% for trips to work and 25% for trips to education are forecast – a weighted average of 22% for all trips, and
3. 2050 “Cycletopia”: Should a complete network be provided in the future that connects all origins and destinations via best practice infrastructure, mode shares of 24% (trips to work) and 32% (trips to school) are forecast with a weighted average of 28% for all trips.

Scenario 2 reflects the long term *Connected Neighbourhoods* Vision, which is estimated to produce a mode split of around 22% of daily trips in 2050. Scenario 2 forecasts that there will be 96,000 daily trips and a total of 398,000 km cycled daily, an increase of 74,000 trips and 311,000km per day over the Do Minimum (Scenario 1). Scenario 2 uses an average of 4.2km per trip and for the purposes of health benefits and emissions reductions calculations, has been assumed to apply to conventional bicycles, e-bikes and e-scooters.

Figure 20 shows 2050 forecast daily biking and micro-mobility trips in Hamilton for the Journey to Work (JTW) and Journey to Education (JTE) trip purposes.

Figure 20 – 2050 JTW and JTE biking and micro-mobility trips in Hamilton (daily)



### 2.11.1. Limitations

The demand estimating tool has some known limitations, and therefore the demand estimates need to be interpreted before conclusions can be drawn on total forecast demands, and the merits of routes and corridors for biking and micro-mobility.

These limitations include:

1. Undeveloped future growth areas such as Peacocke, Ruakura and Rotokauri aren't included in the 2018 census information used by the demand analysis tool, so demand forecasts on links between these areas and the rest of the city are under-represented and would be expected to be higher in reality
2. Representation and aggregation of census information into zones does not accurately represent the location of key trip generators in some places, and need interpretation. Related to 3.
3. Combined with 2. the locations where trips load onto the network, and the routing between trip origins and destinations may not represent how the network operates in some areas, and interpretation of the results are needed, and
4. The demand assessment was based only on the JTW and JTE data from the 2018 census and does not represent all trip types and purposes. Therefore, it underestimates the biking and micro-mobility demands.

### 2.11.2. Expansion to all trips

Limitation 4 above identifies that the Flow demand assessments are based on JTW and JTE, and therefore underestimate the true biking and micro-mobility demand by all trip types and purposes. The SSBC would benefit from being able to estimate the true demand, however no data exists for Hamilton or for New Zealand to estimate an expansion factor from JTW and JTE trips to total biking and micro-mobility trips per day.

Table 10 shows the estimated number of trips by all modes in 2018 is 642,000, as estimated from the 2018 Census and factors from the New Zealand Household Travel Survey 2015 – 2018. Assuming the number of trips per household stay constant in the future, an estimate of all trips by all modes in 2050 is 1.124m.

Table 10 – 2050 Estimate of all daily trips

Description	2018 Census	2050 Estimate
Population	161,000	282,000
Households	55,000	96,000
All trips by all modes	642,000	1,124,000

The Flow demand assessment estimates 96,000 JTW and JTE biking trips per day in 2050 for Scenario 2.

Figure 21 shows that there is a significant opportunity for more trips to be completed by biking and micro-mobility modes if safe, connected, and convenient biking and micro-mobility networks are provided. The number of biking and micro-mobility users may not increase significantly over the Flow JTW and JTE demand forecast if all trip types are included. However, the number of trips per user per day can be expected to increase, as people that already use biking or other forms of micro-mobility as their main mode of transport are much more likely to undertake other trip types, such as shopping trips, using the same mode.

As shown by the red line in Figure 21, the 2018 Census shows that 60% of all trips by all modes are shorter than 5km, which translates to a 20-minute bike ride.

Figure 21 – Trip length distribution by all modes

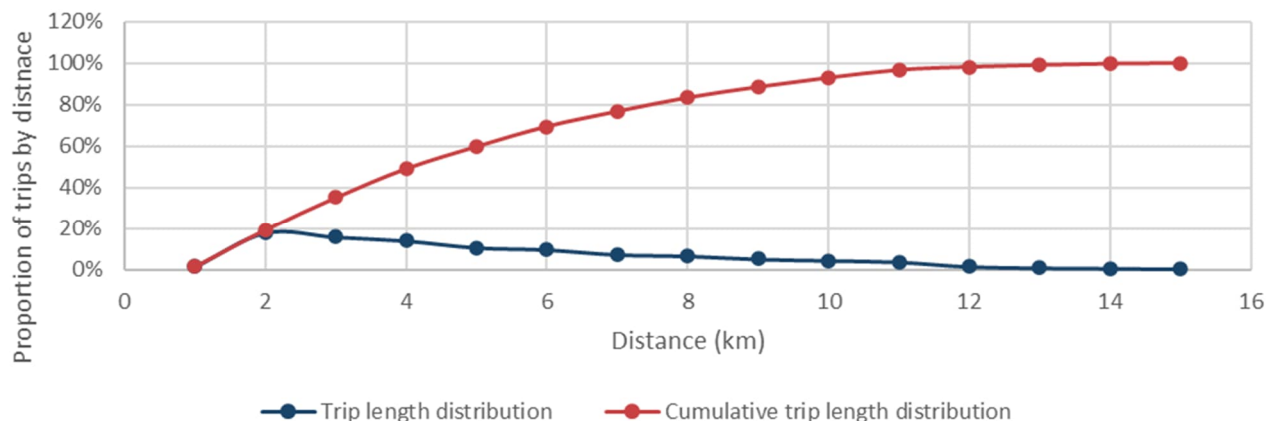


Table 10 shows that 1.124m trips in Hamilton are estimated by all modes in 2050. If 60% of these trips are shorter than 5km as shown in Figure 21, then around 670,000 trips could possibly be transferred to biking and micro-mobility modes. If half of these trips did transfer this would be more than 340,000 trips per day by biking and micro-mobility for all trip purposes, around 3.5 times the 96,000 trips Flow forecast for JTW and JTE.

Appendix F provides a more detailed discussion on the Flow demand forecasting and the all-trip demand estimates discussed above.

### 2.11.3. Benchmarking

The forecast mode share of 22% in 2050 was benchmarked against several cities for which consistent data on mode share, length of cycle network and population could be obtained. As shown in Table 11, a proportional relationship between mode share over length of bike lanes per 100,000 population was established, with an average across six cities being 0.3.

Table 11 – Benchmarked cities for population, length of cycle network and mode share

Benchmarked Cities	Population	Biking mode share (%)	Bike lanes (km)	Bike lanes / 100k pop.	Mode share%/(km/100k pop.)
Utrecht, Netherlands	360,000	30.0%	353	98	0.31
Oulo, Finland	200,000	20.0%	600	300	0.07
Seville, Spain	700,000	8.9%	193	28	0.32
Vitoria, Spain	249,176	12.3%	124	50	0.25
Barcelona, Spain	1,620,000	5.0%	228	14	0.35
Madrid, Spain	3,223,000	4.0%	268	8	0.48
Average					0.30

While this statistic is not meaningful and does not account for all factors that influence modal choice (i.e., parking costs and availability etc.), it does provide a useful benchmark comparison for the *Connected Neighbourhoods* vision. With the provision of 218km of Tier 1 and Tier 2 facilities in the Strategic Network Plan, the ratio for Hamilton is forecast to be 0.28 and therefore *Connected Neighbourhoods* is in about the right place in terms of network quality and coverage for the forecast population, to achieve the predicted mode share as measured against JTW and JTE trips.



## 10 YEAR PROGRAMME

This section describes the identification and prioritisation of key biking and micro-mobility routes, and the development of a 10 year investment programme for 2021 – 2031 based around the transitional approach to infrastructure delivery.

### 2.12. Prioritisation

The *Connected Neighbourhoods* 2050 vision described in Section 2.7.1 and Strategic Network Plan in Figure 13 is large in scale and scope. A prioritisation exercise was undertaken to identify which routes in the Strategic Network Plan were the highest priority for implementation in the 10 year programme, and where investment would yield the most benefits and outcomes in the short to medium term.

During late 2021, HCC and Waka Kotahi met to agree the prioritisation framework for the biking and micro-mobility programme. This framework was based on three key spatial datasets:

- Forecast demands – Based on the 2050 forecast biking and micro-mobility potential as described in Section 2.11, and interpretation considering the limitations of the demand estimate
- Forecast population densities – Based on HCC’s residential development outlook at the land parcel level, and then aggregated to the Census 2018 SA2 level. GIS analyses were undertaken to determine the links connecting the areas of highest population density, and
- Crash data – Based on GIS analysis of Waka Kotahi’s Crash Analysis System crashes involving cyclists between 2015 and 2019.

Figure 22 shows the forecast biking and micro-mobility demands, Figure 23 shows the population densities, and Figure 24 shows the crash hotspots. Figure 25 shows the overlaid demands, population densities and crash hotspots.

This information was workshopped with Waka Kotahi and HCC to identify the 12 priority routes, and rate them 1 (highest priority) to 12 (lowest of the priority routes) as shown in Figure 25.

The priority projects that are on their own funding pathways and are included in the Do Minimum as presented in Section 2.1 are shown **in red text** in Figure 25.

Figure 25 shows the twelve priority routes identified for investment are:

1. Hospital to City Centre
2. **City Centre to University Link corridor – West**
3. **School Link corridor**
4. Victoria Street
5. Killarney Road
6. Bader to Peacockes
7. Nawton to City Centre
8. **Ruakura to City Centre**
9. **City Centre to University Link corridor – East**
10. Boundary Road
11. Grey Street South, and
12. Rotorua to Chartwell.

Figure 22 – 2050 biking and micro-mobility trips in Hamilton (daily)

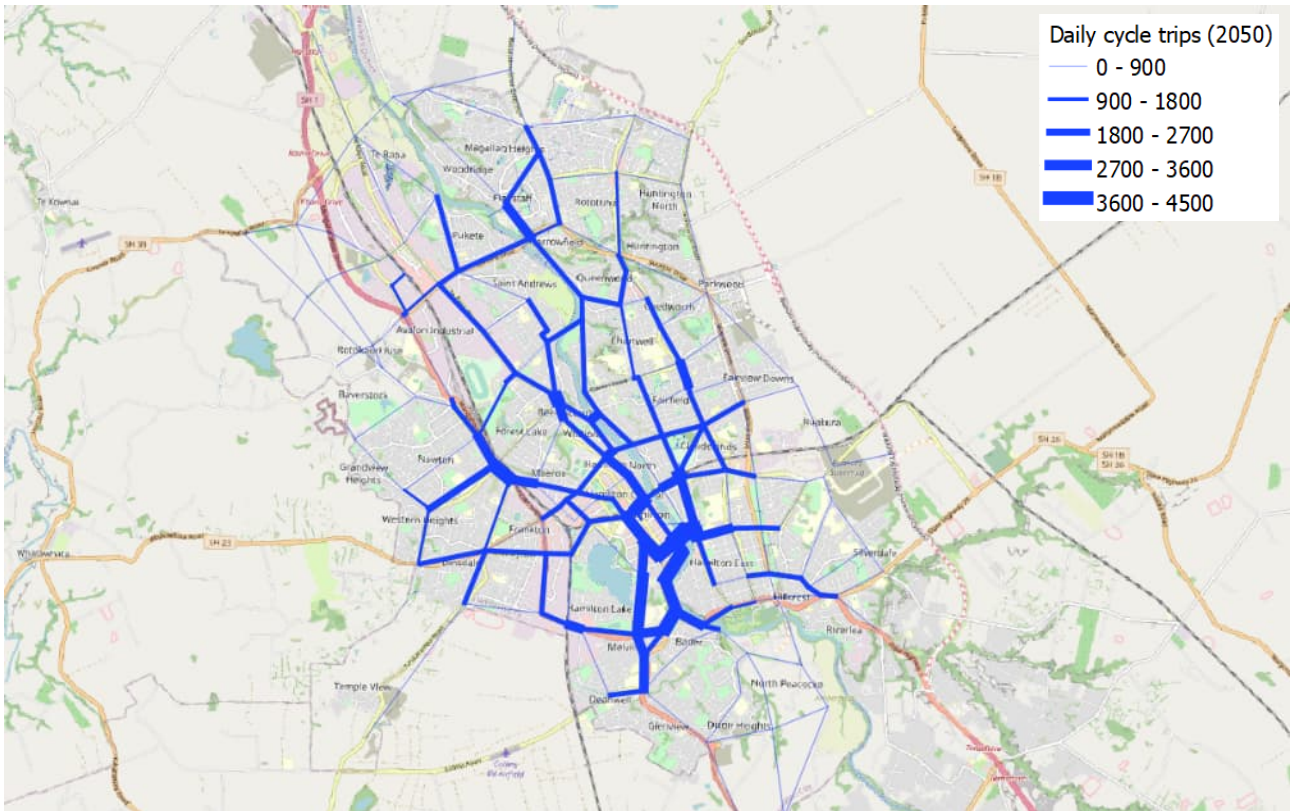


Figure 23 – 2030 forecast population densities

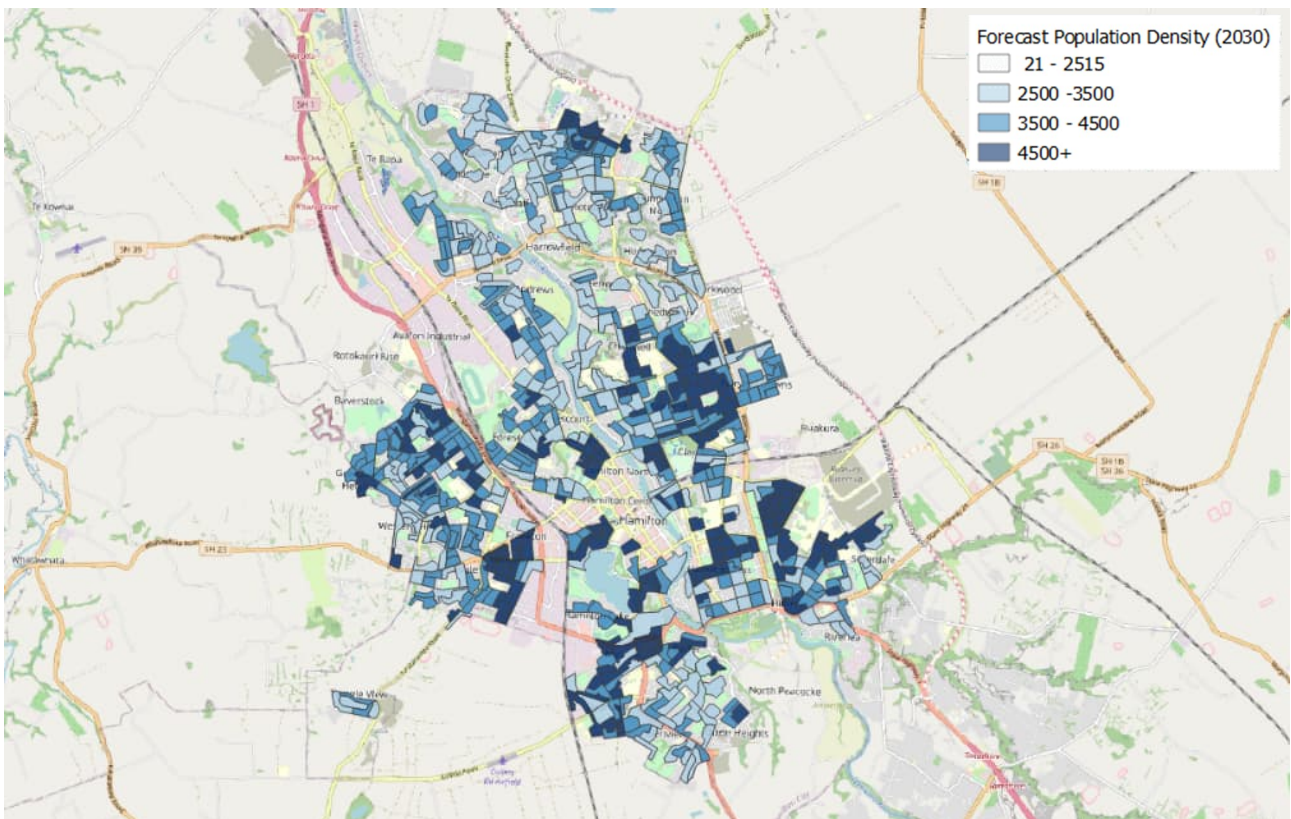


Figure 24 – Crash hotspots 2015-2019

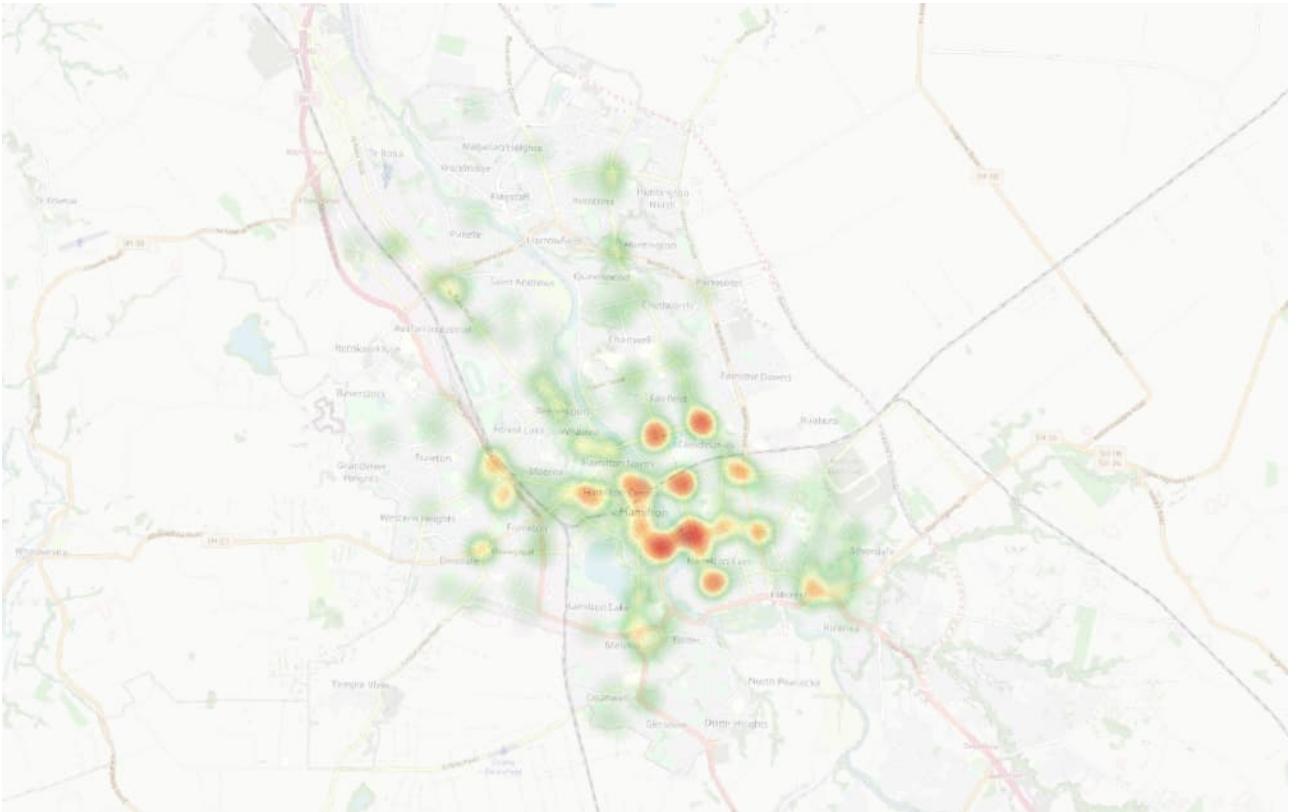
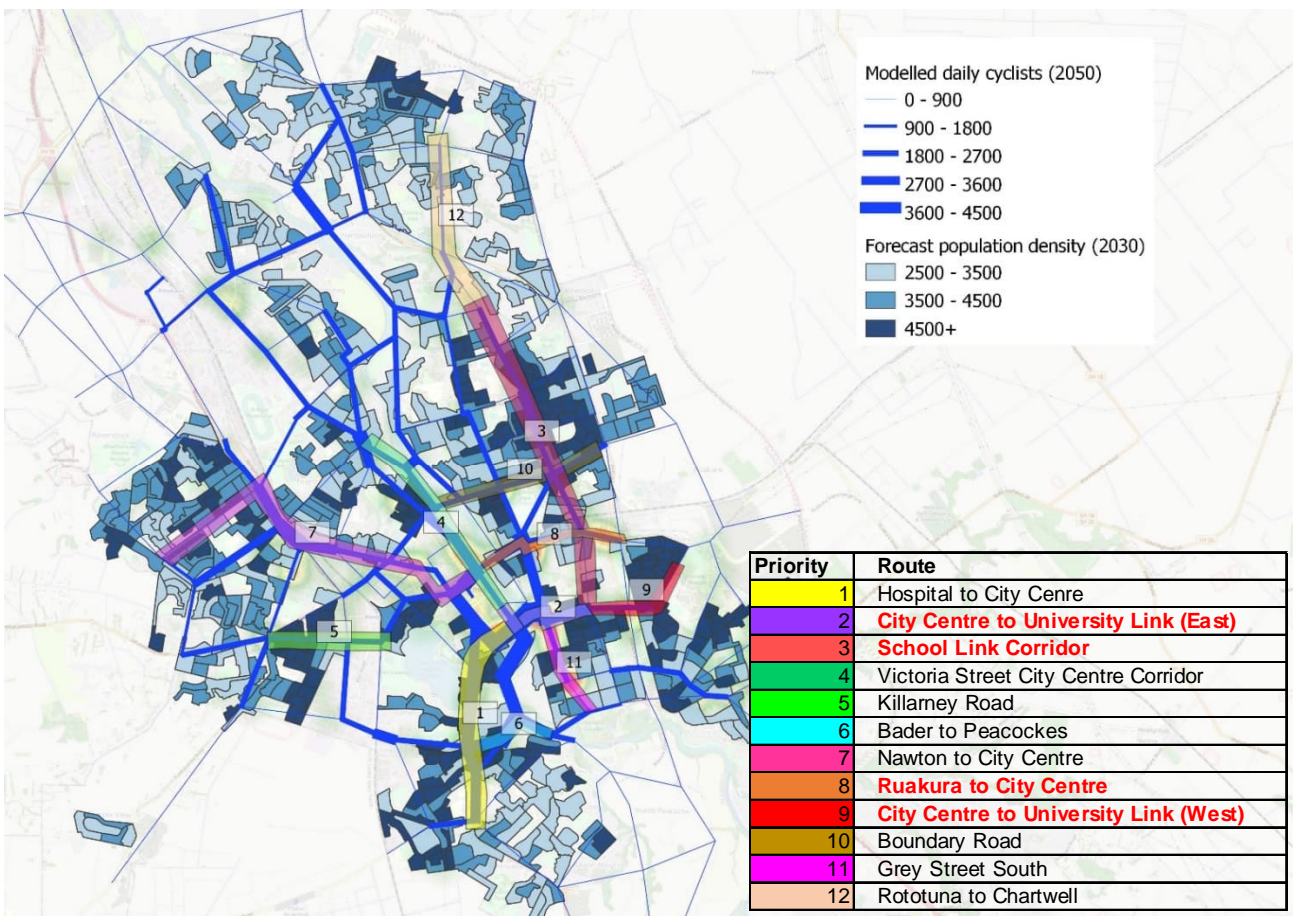


Figure 25 – Identified priority routes for investment



The Eastern Pathways School Link and City Centre to University Link projects are on separate funding pathways to this SSBC as outlined in Section 2.1. Therefore routes 2, 3, 8 and 9 are already being addressed through Eastern Pathways and as a result are not included in the 10 year programme, programme costs or benefits.

However, the prioritisation process has shown that routes 2, 3, 8 and 9 are key to the delivery of the 10 year programme and *Connected Neighbourhoods* vision. Therefore, the governance, management and delivery of these projects will be incorporated into the biking and micro-mobility programme structure as outlined in Section 2.1.

### 2.13. 10 year programme description

The biking and micro-mobility programme is proposed as an ongoing programme to govern, manage, and deliver biking investment in Hamilton. This section describes the 10 year programme for investment in biking and micro-mobility, which works towards the overall *Connected Neighbourhoods* vision.

A significant portion of the 10 year programme are projects which respond to opportunities that are unknown now, but will present over time. Therefore the programme management, monitoring and assurance activities proposed are critical to ensure opportunities to deliver biking and micro-mobility improvements alongside other HCC and Waka Kotahi programmes and investments are recognised and realised.

The 10 year programme for biking and micro-mobility includes:

- Planned projects: Eight priority routes as identified in Section 2.12 are planned projects to encourage people to change their preferred mode of travel to biking or other micro-mobility modes
- Responsive / opportunistic projects: Respond to opportunities which arise from activities being undertaken by other HCC programmes, land use development and business as usual activities etc.
- Area wide projects: Aim to slow, reduce or remove the conflicts with vehicle traffic on local roads within an area, including low traffic neighbourhoods
- End-of-trip facilities: Providing high quality end of trip facilities to make getting around by bike, e-scooter or e-skateboards more convenient
- Funded projects: The governance, management and delivery of the Eastern Pathways School Link and City Centre to University Link projects will be incorporated into the programme structure
- Design guidelines: Development of Hamilton specific biking and micro-mobility transitional and permanent design guidelines
- Kick start pre-implementation: Early investigations to ensure that the programme is ready to start implementation in 2024/25, including development of designs, cost estimates, safety audits, data collection, and stakeholder engagement
- Business cases: Three SSBCs have been allowed for to plan multi-modal corridor SSBCs for delivery after 2031
- Behaviour change activities: Staff to work towards social licence for city wide mode shift, pre and post project communications and engagement, and the management of community feedback during and post delivery
- Non-infrastructure activities: E-bike/bike borrow, purchase subsidies, and lock subsidies to make purchasing a bicycle or e-bike more affordable to a wider range of individuals
- Programme management and delivery: Resources to ensure the successful management, delivery and monitoring of the ongoing biking and micro-mobility programme, and
- Maintenance: An improved maintenance regime and development of an improved maintenance specification to ensure levels of service are maintained.

Each investment is outlined in the following sections, and further details on the activity costs are included in Appendix H.

### 2.13.1. Planned projects

The remaining eight priority routes identified in Section 2.12 are planned as transitional projects in the 10 year programme as shown in Table 12. This totals 25km of biking & micro-mobility improvements along routes expected to provide the highest benefits and outcomes. The proposed investment in each route is summarised in Table 12 and outlined in the following sections.

Table 12 – Planned projects (CAPEX \$m)

Priority	Description	Length (km)	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Hospital to City Centre	3.9	2024/25	4.2	5.4
4	Victoria Street	3.4	2025/26	2.5	3.3
5	Killarney Road	1.9	2026/27	1.8	2.3
6	Bader to Peacockes	2.6	2026/27	0.9	1.2
7	Nawton to City Centre	6.2	2027/28	2.7	3.6
10	Boundary Road	2.6	2028/29	1.1	1.5
11	Grey Street South	1.5	2029/30	0.4	0.5
12	Rototuna to Chartwell	2.7	2030/31	0.9	1.2
All	All priority routes	24.8	2024-31	14.6	19.0

Appendix H gives further detail on the cost ranges for planned projects.

#### Hospital to City Centre (Melville to City Centre via Hospital)

*Priority: 1      Implementation: 2024/25      Estimated cost: \$4.2-5.4m      2050 demand: 8,500 users*

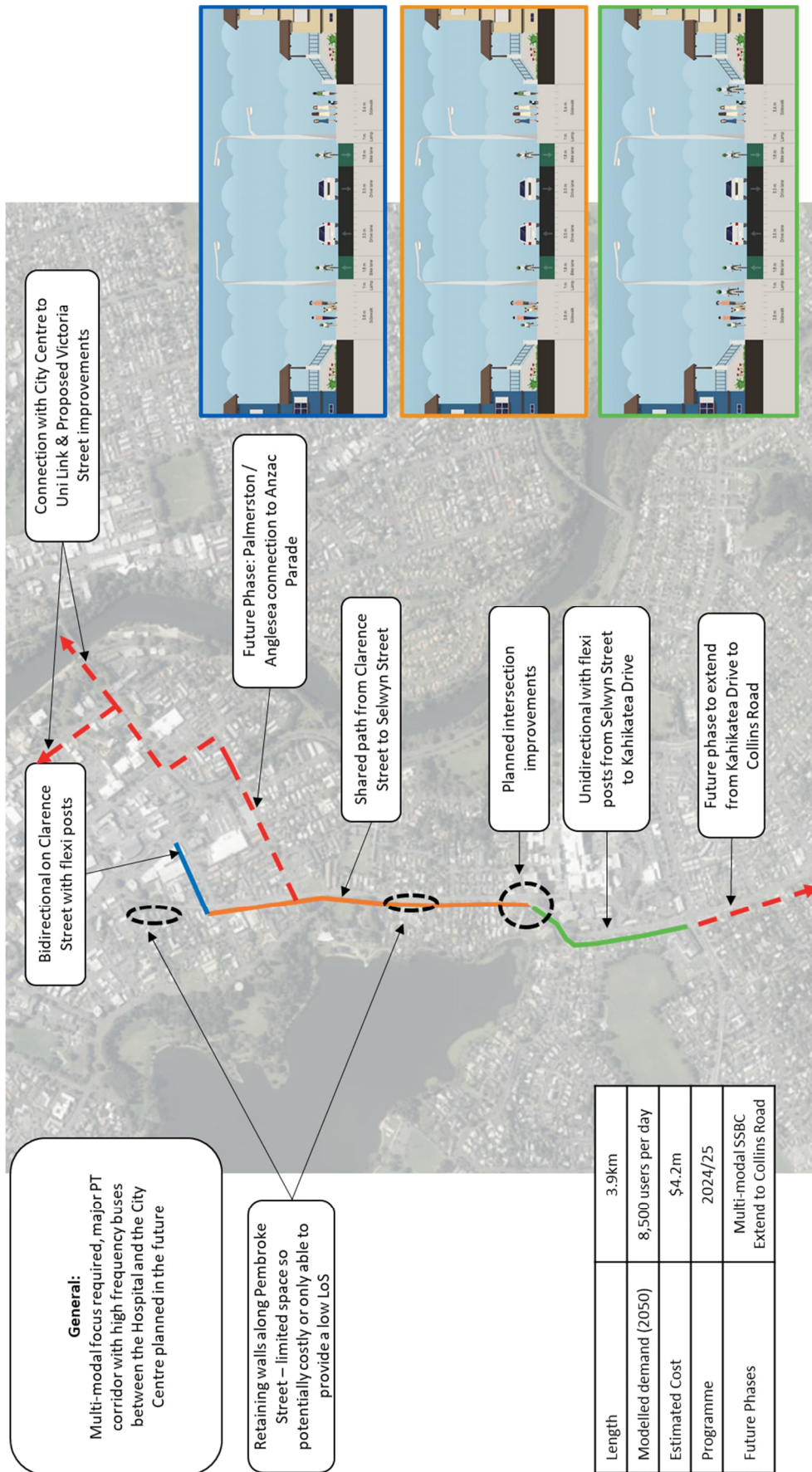
This priority route extends from the Kahikatea Drive/Lorne Street intersection just south of the Waikato Hospital to Hamilton's City Centre, along Pembroke Street to the north, onto Lake Crescent, and then Ohaupo Road to the south as shown in Figure 26. Hamilton's City Centre is to the north, the Waikato River is to the east, Melville is to the south, and Hamilton Lake is to the west.

This corridor has been identified through the MSP as a future Rapid Transit corridor, and therefore a multi-modal approach is required to futureproof road space through the corridor. In the interim, a transitional approach is appropriate here.

The corridor is constrained through several sections, exacerbated by a large retaining wall on the western side through the central section.

A shared path on the eastern side utilising the existing berm space, and widening/replacement of the footpath is proposed as a transitional improvement, which could potentially be revisited when the future Rapid Transit upgrades are introduced. Due to the cost of the project, \$200,000 has been allowed for an SSBC lite.

Figure 26 – Hospital to City Centre



Considering the public transport requirements and space constraints, the proposed treatment along this corridor includes a mix of typologies:

- Bidirectional bike lane on Clarence Street with flexi posts delineating the separation
- Shared path along the eastern side of Pembroke Street from Clarence Street to Selwyn Street
- Unidirectional bike lanes with flexi posts from Selwyn Street to Kahikatea Drive, and
- Planned intersection improvements at the Selwyn Street / Pembroke Street / Lake Crescent intersection.

Future extension opportunities include the Palmerston Street / Anglesea Street connection to Anzac Parade and the extension of the corridor to the south from Kahikatea Drive to Collins Road.

### Victoria Street

*Priority: 4      Implementation: 2025/26      Estimated cost: \$2.5-3.3m      2050 demand: 4,900 users*

Figure 27 shows this 3.4km long corridor runs the length of Victoria Street from where it intersects with Te Rapa Road to the north to Anzac Parade to the south. Victoria Street runs through Hamilton's City Centre with the Waikato River running parallel to the east.

The central section from Claudelands Bridge to Hood Street ( $\pm 600\text{m}$ ) is largely fit for purpose with 30km/h speed limits and Sharrows encouraging safe mixing of micro-mobility and vehicle traffic. Recommended future improvements along this section, once the parking management strategy is being enforced, is reallocating the kerbside parking and widening the footpaths (not part of this programme).

From Mill Street to Claudelands Bridge, and from Hood Street to Anzac Parade, Victoria Street has two lanes per direction - a remnant of its historical State Highway 1 status. Both these sections also have parallel parking on both sides. Reallocation of existing carriageway space through these two sections is recommended.

Further to the north from Mill Street to Te Rapa Road the corridor becomes more constrained, especially at Fairfield Bridge. Parking and some lane space will have to be reallocated to provide flexi post separated bike lanes. The section between the traffic signals at Fairfield Bridge and Awatere Avenue has a wide existing shared path.

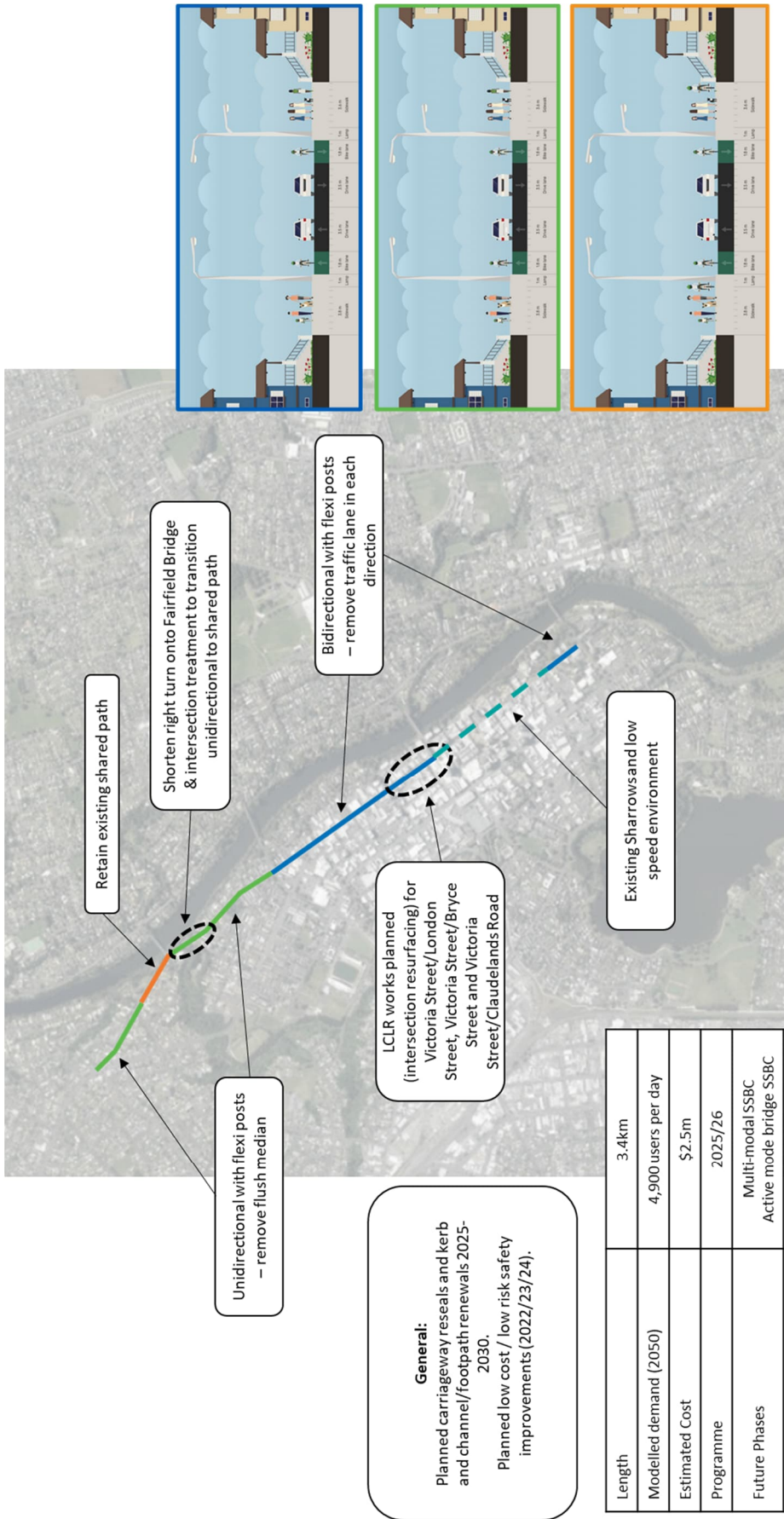
A combination of treatments are proposed along this corridor, including:

- Unidirectional bike lanes with flexi posts from Te Rapa Road to Awatere Avenue and Fairfield Bridge to Boundary Road
- Retain shared path from Awatere Avenue to Fairfield Bridge. Reconfiguration of traffic signal arrangements will be required at the Fairfield Bridge intersection to transition from uni-directional bike lanes to the shared path, and
- Bidirectional bike lanes for the rest of the corridor, aside from between Claudelands Bridge and Hood Street where the existing Sharrows and low speed environment can be retained.

There are low cost / low risk works planned during the next decade involving intersection resurfacing on several intersections along the corridor, including Victoria Street/London Street, Victoria Street/Bryce Street and Victoria Street/Claudelands Road.

Due to the cost of the project, \$200,000 has been allowed for an SSBC lite.

Figure 27 – Victoria Street





## Killarney Road

*Priority: 5      Implementation: 2026/27      Estimated cost: \$1.8-2.3m      2050 demand: 3,200 users*

Figure 28 shows that this 1.9km long corridor extends from the five-leg roundabout in Dinsdale to Hamilton Lake and Lake Domain Road. It intersects with State Highway 1 and the North Island Main Trunk Line (NIMTL).

A combination of bidirectional and unidirectional bike lanes are proposed for this route. From the roundabout to State Highway 1 bidirectional bike lanes with flexi posts are proposed, and from State Highway 1 to Lake Domain Drive is a unidirectional bike lane with flexi posts.

The five-leg roundabout in Dinsdale requires access rationalisation to determine how it will function in the future. There are planned works on Killarney Road, with a planned intersection safety upgrade at the intersection of Lake Domain Drive, with raised platforms and crossings on all approaches at the intersection of Queens Avenue.

There is an opportunity to transform the area to the north between Massey Street and Killarney Road into a low traffic neighbourhood, with rationalisation of the side road accesses to reduce both rat-running and facilitation of the use of Massey Road as the higher order corridor vs Killarney Road in terms of traffic throughput.

## Bader to Peacockes

*Priority: 6      Implementation: 2026/27      Estimated cost: \$0.9-1.2m      2050 demand: 6,200 users*

The 2.6km long corridor runs along State Highway 1 from Ohaupo Road and State Highway 3 intersection to Bader Street and along Bader Street as shown in Figure 29. This corridor runs through Bader from the Waikato Hospital to the Waikato River.

Unidirectional bike lanes with flexi posts are proposed for this corridor, which will need to connect with the potential future multi-modal link to Peacockes.

## Nawton to City Centre

*Priority: 7      Implementation: 2027/28      Estimated cost: \$2.7-3.6m      2050 demand: 6,300 users*

Figure 30 shows this 6.2km long corridor runs from Nawton in west Hamilton into the City Centre. This corridor runs along key roads, including Grandview Road, Avalon Drive and Norton Road.

A combination of treatments are proposed along this corridor, including:

- Bidirectional bike lane with flexi posts along Grandview Road and Avalon Drive
- Retain shared path on Lincoln Street
- Unidirectional bike lanes on Norton Road, Tristram Street till Bryce Street, and Bryce Street, and
- Sharrows on Bryce Street from Anglesea Street intersection to Victoria Street intersection.

An alternative route alignment was considered which would be generally off-road and quieter, through the open space north of the proposed corridor. This, however, would require a bridge over the NIMTL at Minogue Park.

Due to the cost of the project, \$200,000 has been allowed for an SSBC lite.

Figure 28 – Killarney Road

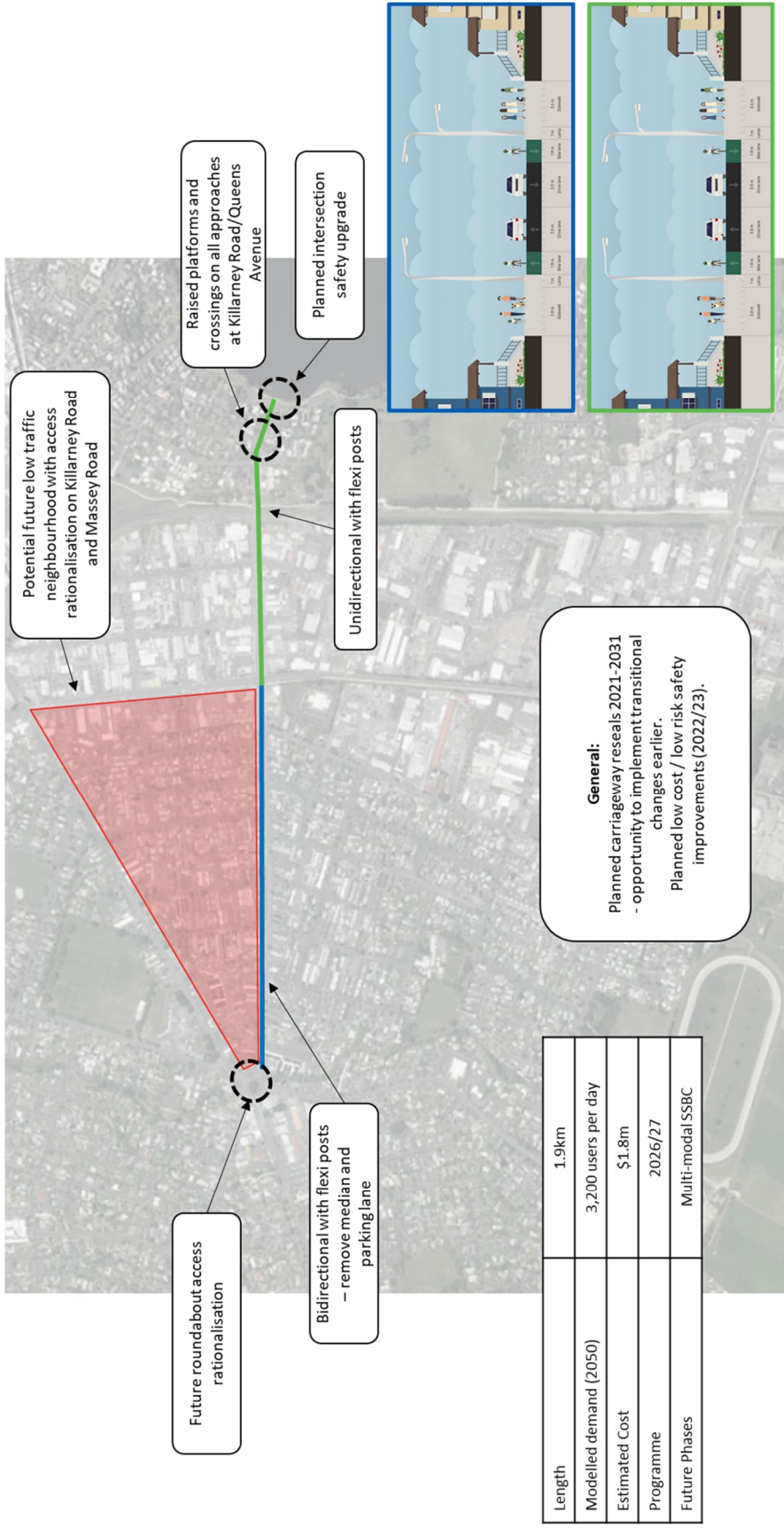


Figure 29 – Bader to Peacocks

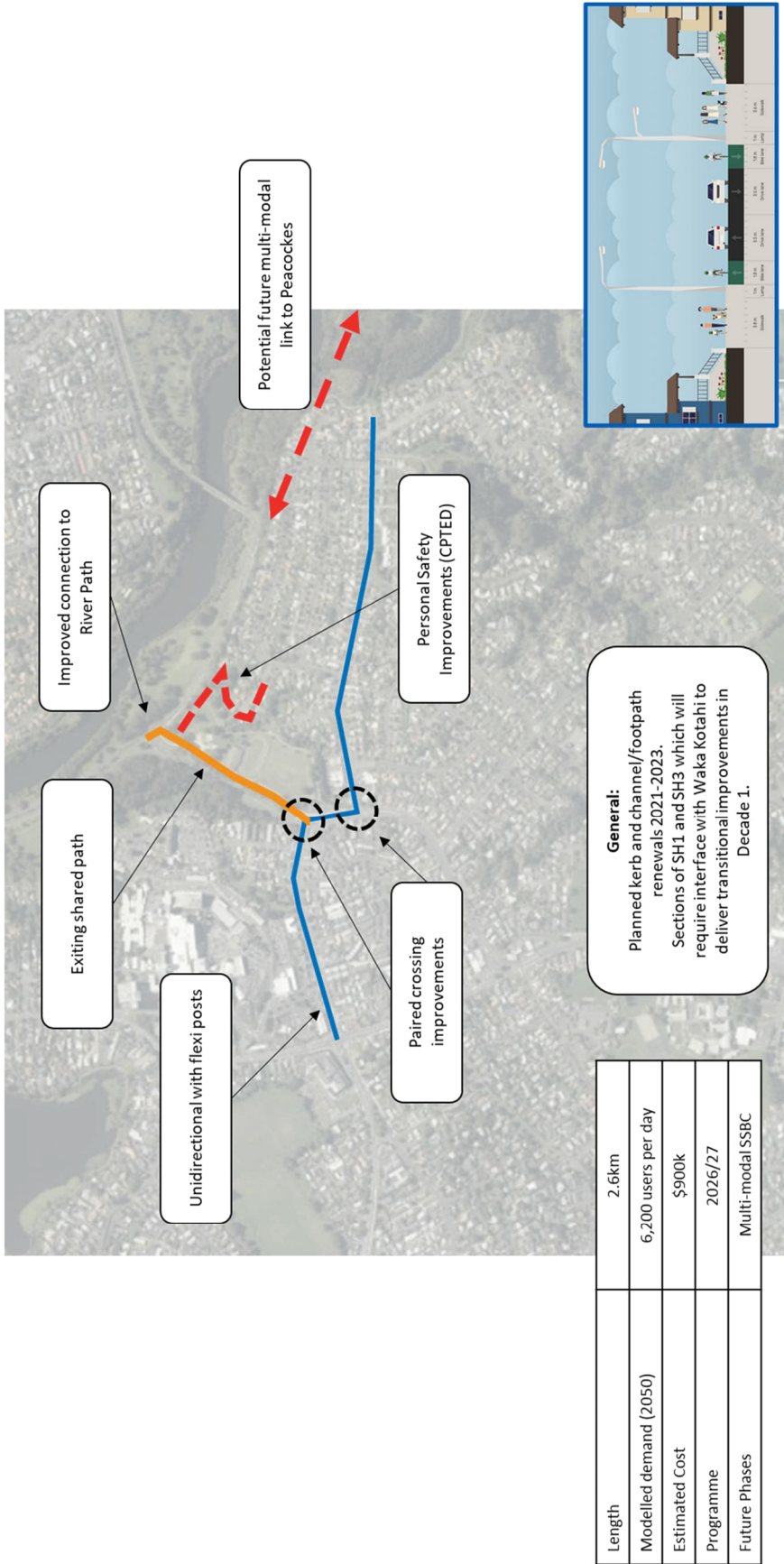
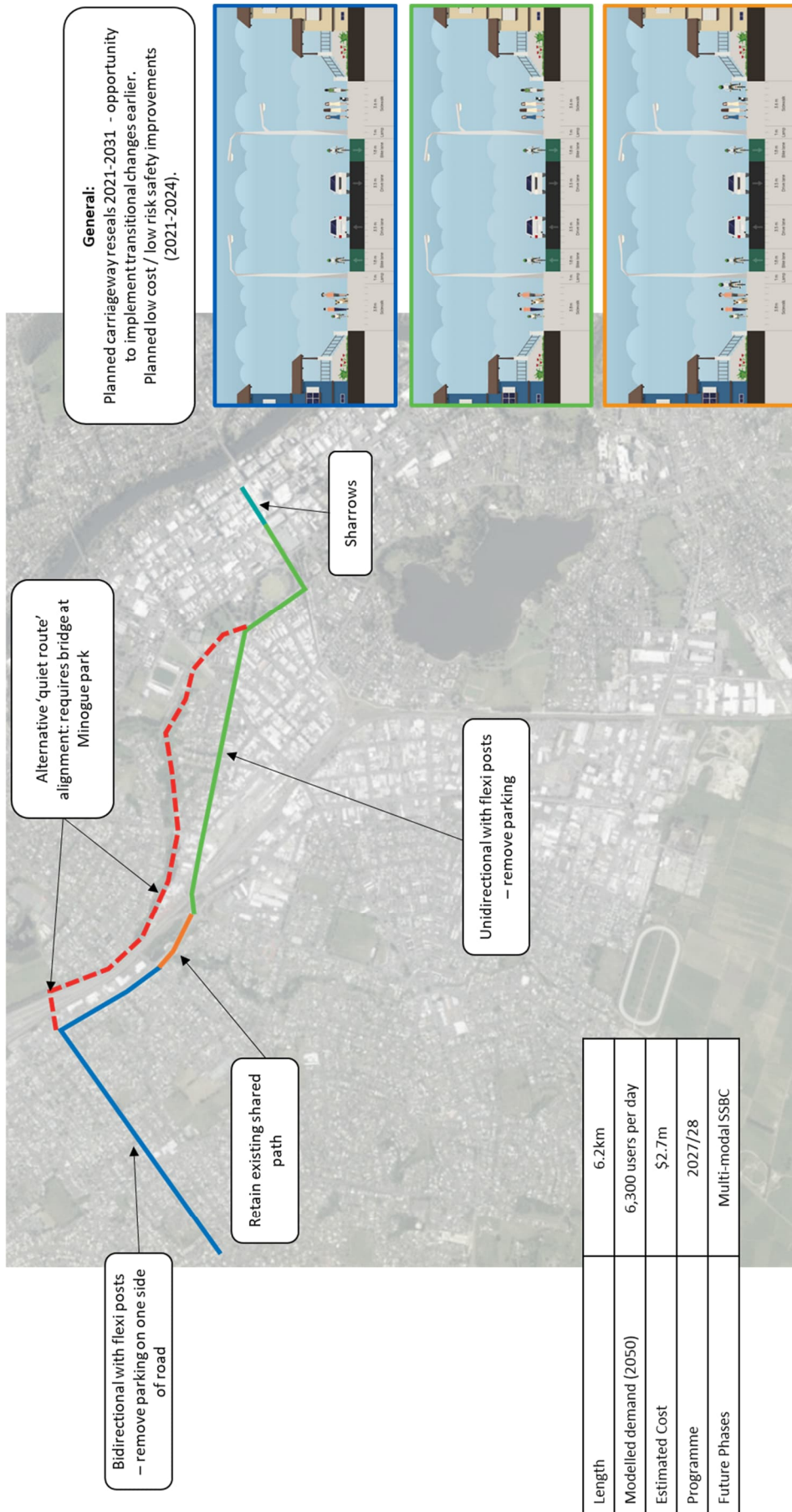


Figure 30 – Nawton to City Centre



## Boundary Road

*Priority: 10    Implementation: 2028/29    Estimated cost: \$1.1-1.5m    2050 demand: 3,300 users*

The 2.6km long corridor runs west to east along Boundary Road from its intersection with Victoria Street to Wairere Drive as shown in Figure 31.

Unidirectional bike lanes with flexi posts are proposed for this corridor.

This corridor treatment will be supported by future intersection upgrades at the Heaphy Terrace roundabout and the Five Crossroads roundabout.

## Grey Street South

*Priority: 11    Implementation: 2029/30    Estimated cost: \$0.4-0.5m    2050 demand: 2,300 users*

Figure 32 shows that this 1.5km long corridor runs along Grey Street from Anzac Parade to the north to State Highway 1/Cobham Drive to the south. It runs through Hamilton East Village to the north.

Unidirectional bike lanes with flexi posts are proposed for this corridor, achieved by reallocating existing road space within the carriageway. This corridor treatment includes an upgrade to the Naylor Street roundabout, where all slip lanes will be removed and raised crossings will be installed.

Waka Kotahi are considering changes Grey Street/Cobham Drive intersection which may change the traffic environment of Grey Street.

The City Centre to University Link bike path is also proposed along Grey Street from Anzac Parade to Cook Street and along Cook Street to Wairere Drive.

## Rototuna to Chartwell

*Priority: 12    Implementation: 2030/31    Estimated cost: \$0.9-1.2m    2050 demand: 1,800 users*

The 2.7km long corridor runs along Hukanui Road from the Borman Road intersection to the north to the Wairere Drive roundabout to the south as shown in Figure 33.

Unidirectional bike lanes with flexi posts are proposed for this corridor.

Low cost / low risk safety improvements are also planned at the Thomas Road roundabout which will be incorporated into this corridor.

Figure 31 – Boundary Road

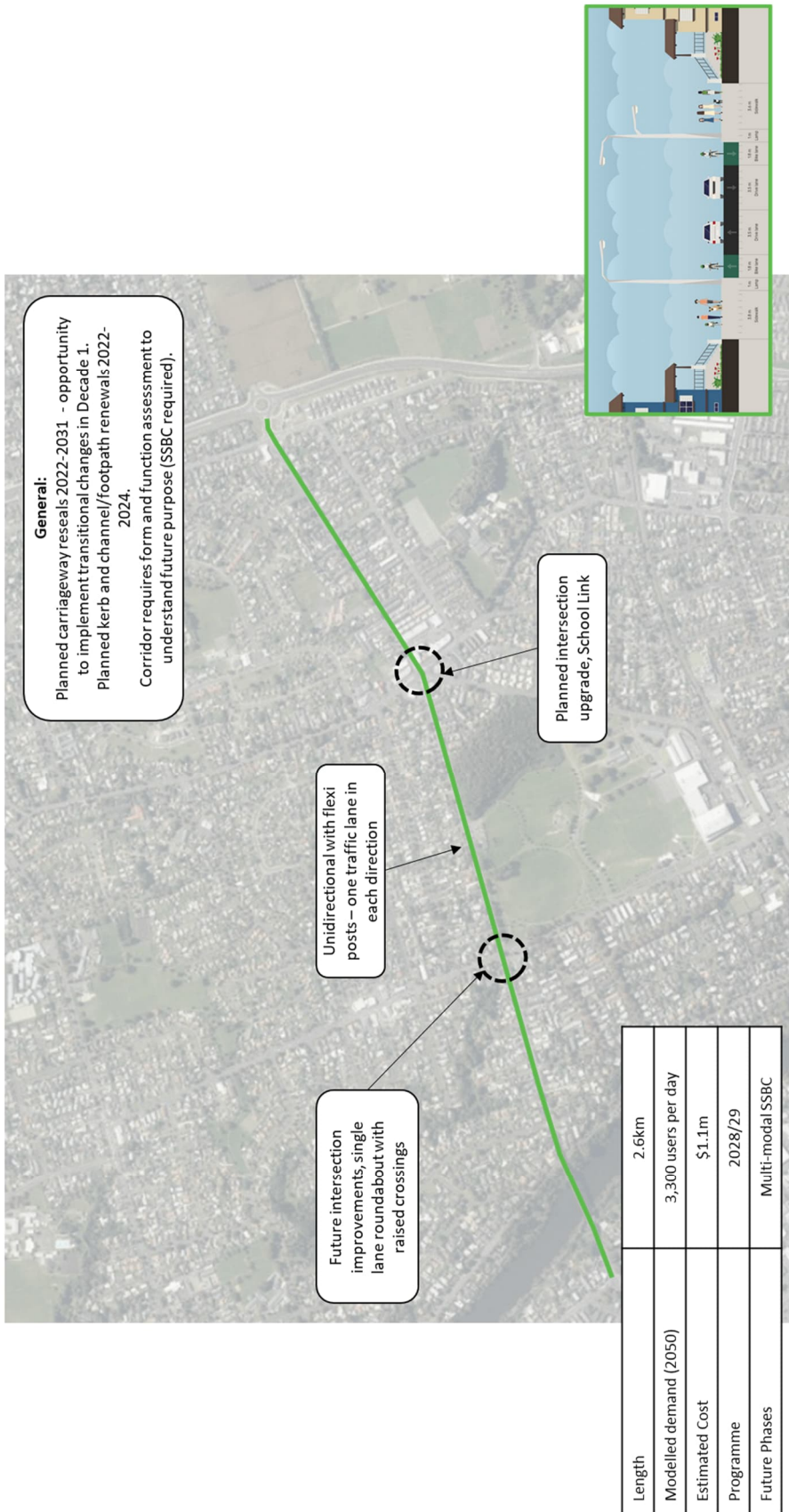
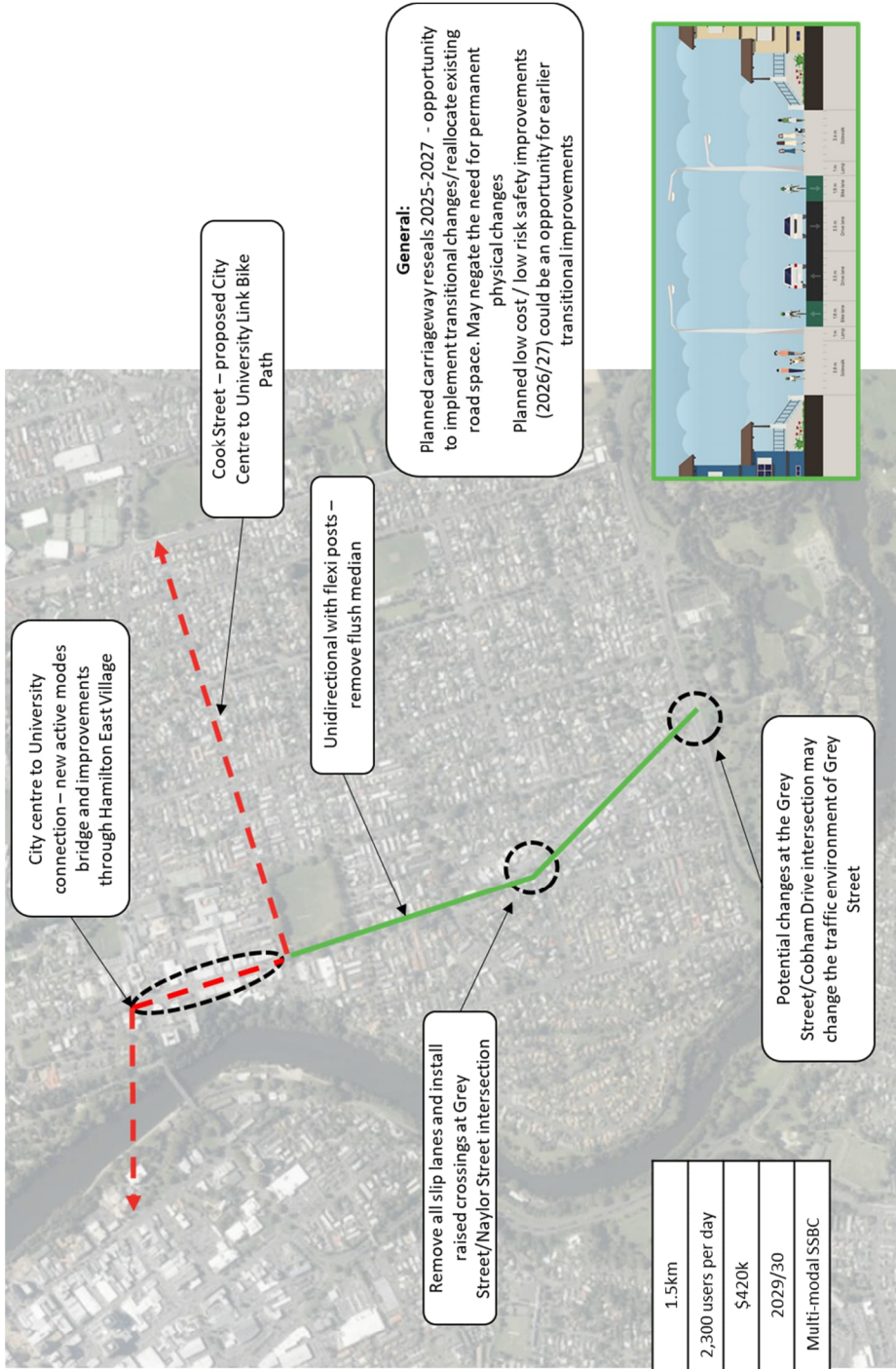


Figure 32 – Grey Street South



Length	1.5km
Modelled demand (2050)	2,300 users per day
Estimated Cost	\$420k
Programme	2029/30
Future Phases	Multi-modal SSBC

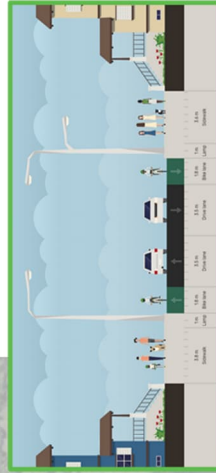
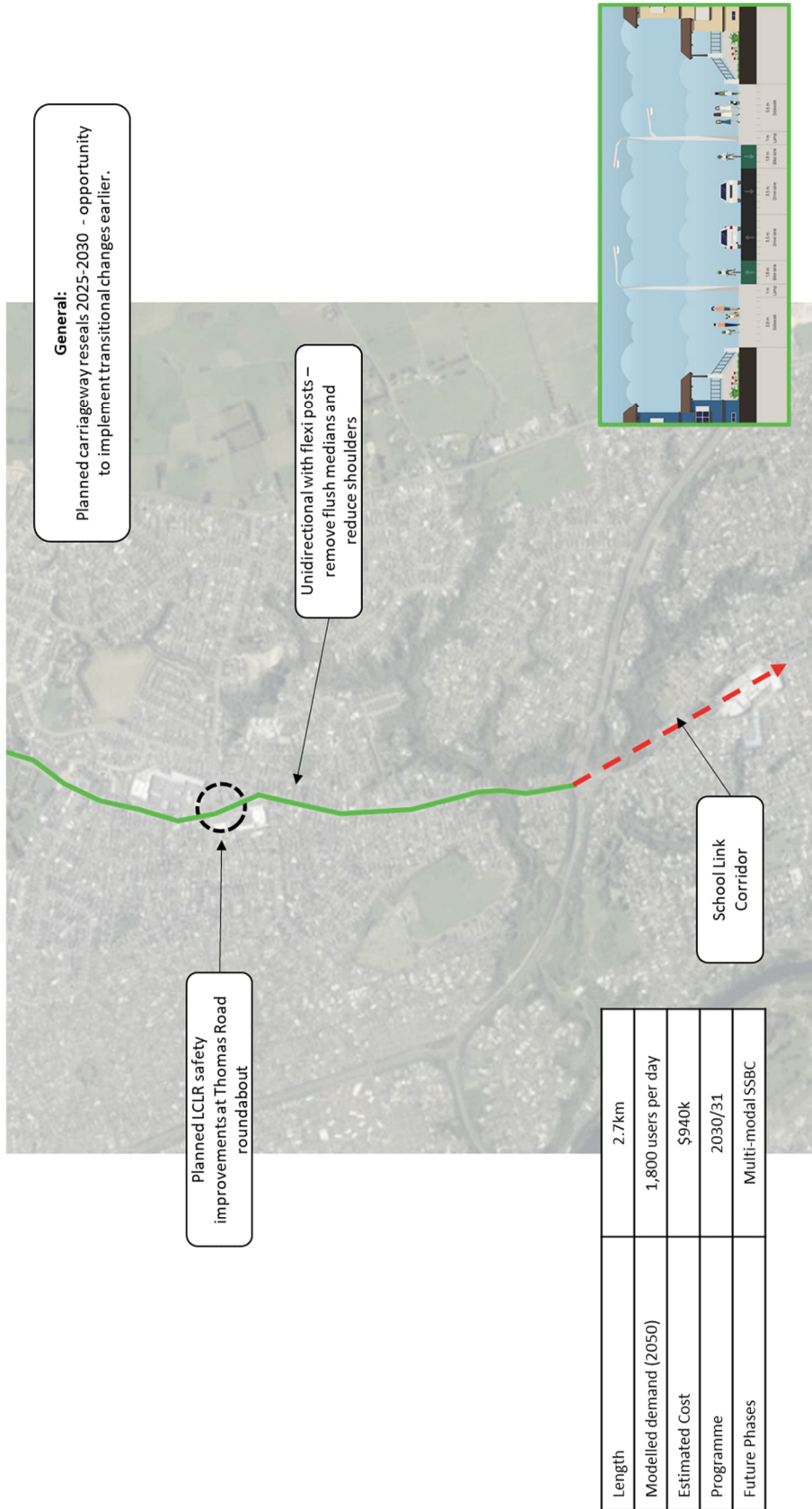


Figure 33 – Rototuna to Chartwell





### 2.13.2. Responsive / opportunistic projects

Reactive / opportunistic projects respond to opportunities to implement biking and micro-mobility improvements which arise from activities being undertaken by other HCC programmes, land use development and business as usual activities etc., and aim to capture opportunities where public or political support exists which may change in the future. These opportunities include:

- Programmed maintenance and renewals, including pavement, utilities and three waters works
- Reactive maintenance and renewals
- Low cost / low risk programmes for safety, walking and cycling
- Land use intensification and development on corridors and in suburbs
- Responding to public issues and concerns at a 'local corner' scale, and
- Protecting corridor space for future implementation of biking facilities.

The proposed investment in Responsive / opportunistic projects is summarised in Table 13.

Table 13 – Responsive / opportunistic projects (CAPEX \$m)

Item	Description	Length (km)	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
All	Responsive / opportunistic projects	59	2024-31	39.7	51.7

The 59km of responsive / opportunistic projects envisaged in the 10 year programme is roughly a third of the remaining Tier 1 and Tier 2 network (179km) after the priority projects have been accounted for. The implementation of responsive / opportunistic projects have been assumed at the same rate across three decades of the *Connected Neighbourhoods vision*, reflecting the strong links to the ongoing pavement maintenance and renewals programmes.

Responsive / opportunistic funding will be managed by the ongoing biking and micro-mobility programme, using the programme management, monitoring, delivery, assurance, and governance arrangements as outlined in the Management Case. This will ensure opportunities to deliver biking and micro-mobility 'associated improvements' alongside other HCC and Waka Kotahi programmes and investments are recognised and realised. Proactively banking some designs waiting for programme gaps will be a good strategy to maintain the overall delivery programme.

Reactive / opportunistic projects can be both transitional and smaller scale permanent improvements. Some projects will be delivered as low cost / low risk activities <\$2m, and therefore their delivery will be planned through the existing Activity Management Plan processes in the year prior to the 2024-27 NLTP. These projects will typically be designed and planned for delivery during the year before their implementation.

Some maintenance and renewals projects will be continuous programme activities, such as where kerb and channel replacements are needed these can be reinstated to enable biking and micro-mobility projects to proceed.

A successful example of a reactive / opportunistic project are the transitional style improvements recently installed on Anzac Bridge, Anzac Parade and Grey Street as summarised in Section 2.10. This project was driven by a water main replacement excavating in the street which required a pavement reseal on reinstatement, and realising the opportunity to improve biking and micro-mobility facilities while re-marking the street. These were relatively low-cost line markings, signs and delineators, and were cost effective through implementing the bike facilities as part of a bigger work package, and therefore lower cost as they are incremental additions to the work, and realised efficiencies such as working within the wider traffic management plans.

The Programme Director, together with the Programme Manager will be responsible for ensuring effective communication and reporting between the biking and micro-mobility programme and other HCC work programmes.

### 2.13.3. Area wide projects

Allowance has been made in the 10 year programme for the treatment of around 44km of local streets through area wide projects that aim to reduce or remove the conflicts with vehicle traffic, in alignment with the transitional cycling design guidance and the intervention hierarchy. The proposed investment in area wide projects is summarised in Table 14.

Table 14 – Area wide projects (CAPEX \$m)

Item	Description	Length (km)	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
All	Area wide projects	44	2024-31	29.4	38.3

Some of the responsive / opportunistic projects identified in Section 2.13.2 will include responses to area wide issues, for example where local residents want to slow down or stop through traffic using a suburb to 'rat-run'. Low Traffic Neighbourhoods (LTNs) are pockets of residential streets bordered by busier main roads where through traffic is discouraged or prohibited. People walking and biking have freedom to move through and spend time on local streets, while vehicle access is maintained to all addresses, albeit in some cases via longer, more indirect routes. LTN type treatments should be considered as one method to make walking and biking more attractive and time competitive relative to driving.

LTNs deliver a host of benefits to the streets they contain as well as the wider area. Walking and biking is made safer, easier and more pleasant, increasing community activity, local economic vitality and physical activity of residents, and reducing air, noise and water pollution. Car use is reduced by tipping the balance of convenience toward active modes, with flow on benefits for accessing public transport and reducing congestion. LTNs, while not always transitional in nature, are generally economical to build, especially when applying lighter, quicker, cheaper methods rather than fully permanent works<sup>69</sup>.

The Tier 3 routes identified in the Strategic Network Plan (Figure 13) can be implemented as part of wide area LTN projects. Modal filters could even be considered for some Tier 1 and Tier 2 routes, slowing or eliminating vehicle traffic instead of providing infrastructure to separate biking from walking and general traffic.

<sup>69</sup> Waka Kotahi (2021) *Low Traffic Neighbourhoods: a practical, interactive workshop*, 9 August 2021

### 2.13.4. End of trip facilities

To encourage people to cycle to work, school, or university – and even to the local shops – a quality network needs to be supported with end of trip facilities. You can only have so many people comfortably biking to destinations as there are places to store bikes and get ready for the next journey leg in a comfortable environment. This principle is highlighted in cycle network planning guidance, and in Waka Kotahi research where 34% of respondents identified lack of end of trip facilities being a barrier to cycling<sup>70</sup>. Better end of trip facilities were also strongly supported by feedback from stakeholder and community engagement at the long list and short list stages of this SSBC.

The end of trip facilities proposed as part of the 10 year programme are outlined below:

- Short stay bike parking – Streetscape bike racks similar to those that HCC are currently installing. Provision has been made for 4,000 bike parking capacity. HCC have installed 200 bike parking capacity over the last 18 months.
- E-bike & e-scooter charging stations – AC tower with 4 charging connections. 10 charging stations have been allowed for. The locations of these facilities will be confirmed through consultation and stakeholder engagement,
- Secure bike parking – Two 30 bike capacity secure parking facilities have been allowed for. HCC are currently completing a design for the implementation of a similar facility at Hamilton Lake. The locations for these two additional facilities are envisaged to be confirmed through engagement with stakeholders
- Bike repair stations – 50 bike repair stations to be provided along key routes throughout the city. HCC have installed two of these facilities over the last year, and
- Wayfinding – Deploying cycle wayfinding signage to help bikers use and navigate the biking and micro-mobility network between destinations.

The proposed investment in end of trip facilities is summarised in Table 15.

Table 15 – End of trip facilities (CAPEX \$m)

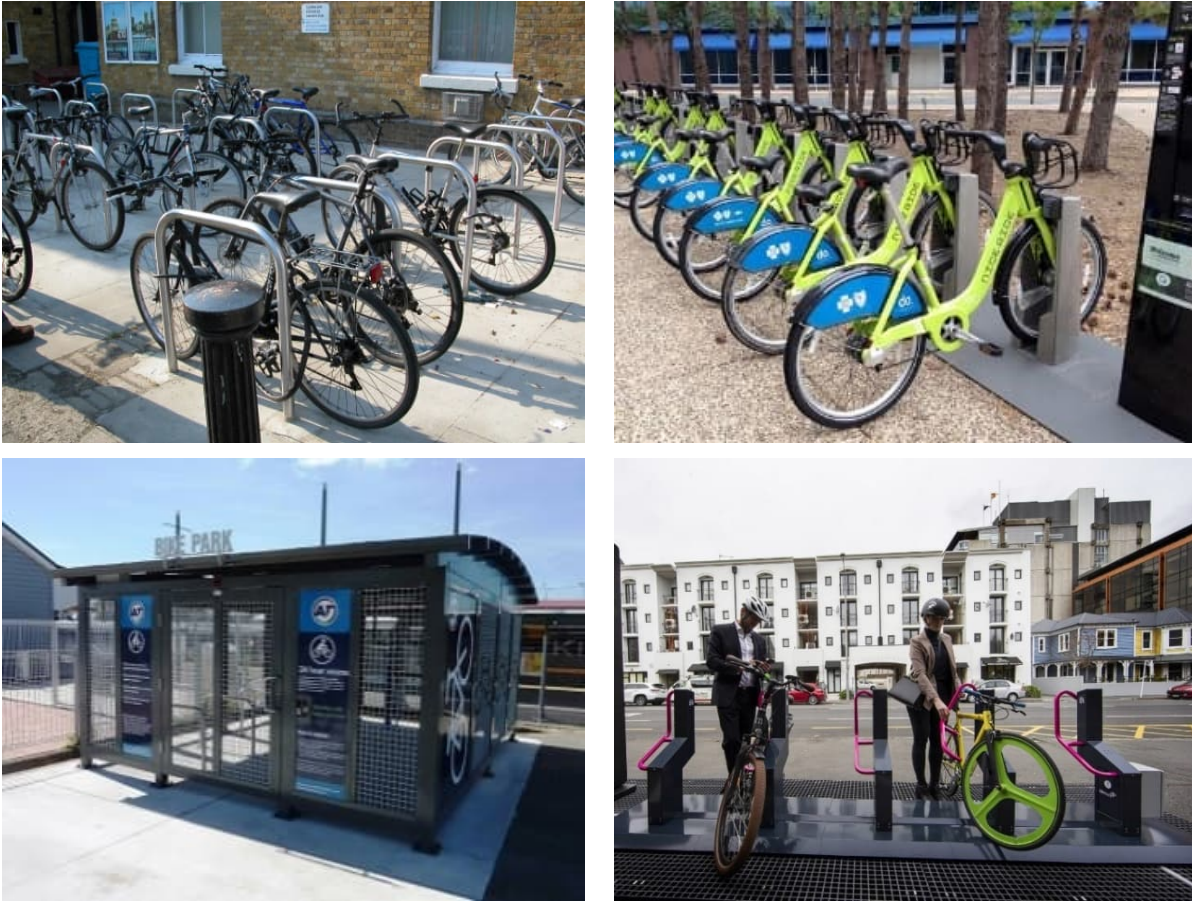
Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Short stay bike parking	2000	2024-31	2.16	2.80
2	e-bike/e-scooter charging facilities	10	2024-31	0.15	0.20
3	Secure bike parking (long stay parking)	2	2024-31	0.62	0.80
4	Bike repair stations	50	2024-31	0.19	0.25
5	Wayfinding	318 km	2024-31	0.44	0.57
All	End of trip facilities	All	2024-31	3.56	4.62

End of trip facilities will be delivered as low cost / low risk activities <\$2m, and therefore delivery will be planned through the existing Activity Management Plan processes in the year prior to the 2024-27 NLTP.

Figure 34 shows some photo examples of the proposed end of trip facilities.

<sup>70</sup> NZ Transport Agency (2018) *Understanding Attitudes and Perceptions of Cycling and Walking*, August 2018, <https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/NZTA-Attitudes-to-cycling-and-walking-final-report-2018.pdf>

Figure 34 – Examples of end of trip facilities



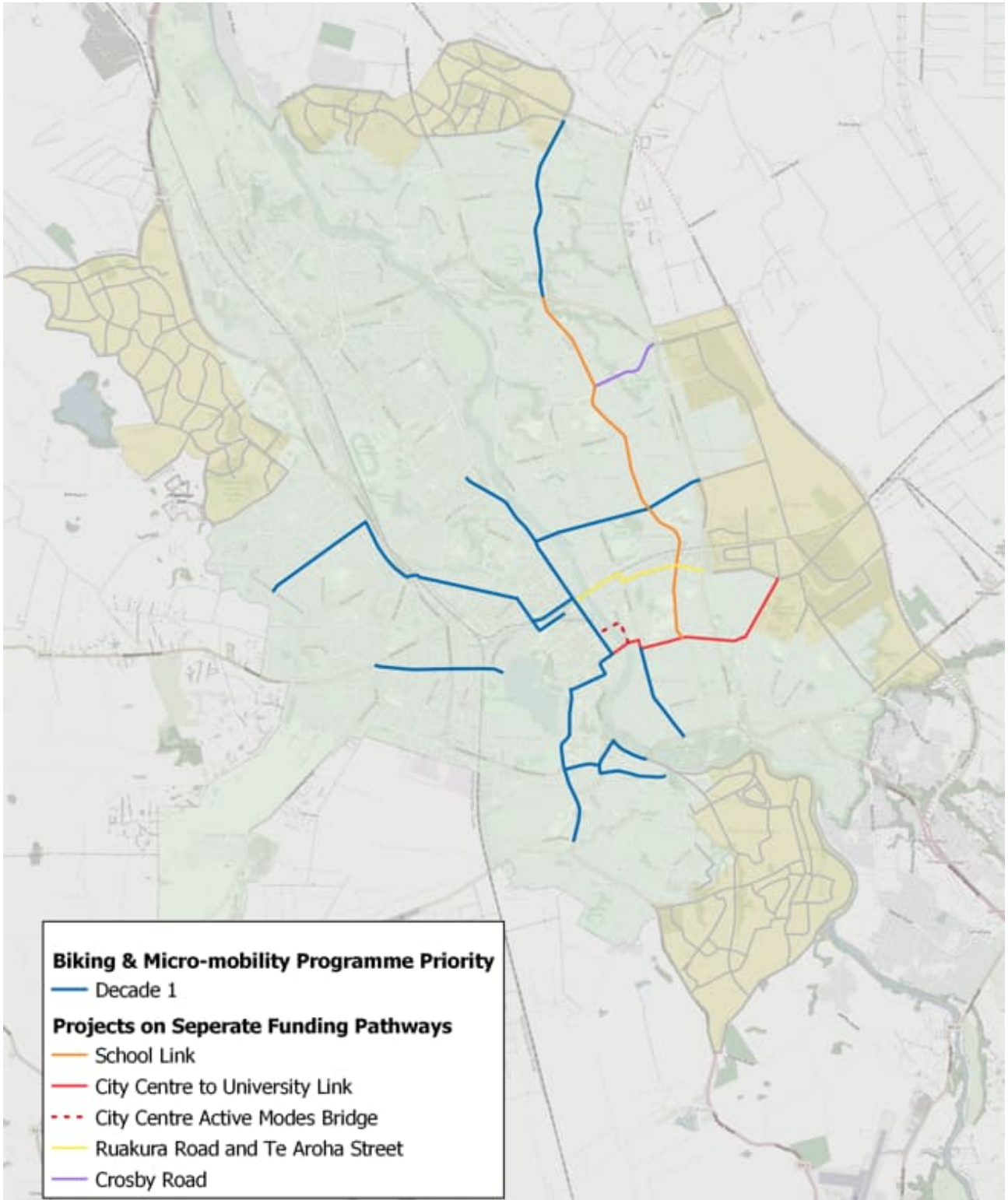
### 2.13.5. Funded projects

The Eastern Pathways School Link and City Centre to University Link projects are on separate funding pathways to this SSBC, and therefore are not included in the 10 year programme, programme costs or benefits as outlined in Section 2.12. The total length of these corridors is 14km.

These routes are key to the delivery of the 10 year programme and *Connected Neighbourhoods* vision. Therefore, the governance, management and delivery of these projects will be incorporated into the biking and micro-mobility programme structure.

Figure 35 shows the spatial relationship between these funded projects and the biking and micro-mobility planned projects outlined in Section 2.13.1. Figure 35 shows that the School Link and City Centre to University Link projects play an important role in filling out the biking and micro-mobility network in the east of Hamilton.

Figure 35 – Projects on separate funding pathways, relative to the 10 year programme priority projects



### 2.13.6. Design guidelines

The proposed investment in design guidelines is summarised in Table 16.

Table 16 – Design guidelines (CAPEX \$m)

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Transitional cycling design guidelines	1	2022/23	0.15	0.20
2	Design guidelines for inclusion in RITS and HCC District Plan	1	2022/23	0.15	0.20
All	Design Guidance	2	2022/23	0.3	0.4

Hamilton does not have any manuals or guidance specific to the planning and design of biking networks and infrastructure. The development of guidelines was highlighted by stakeholders as being critically important to ensure high quality, safe, coherent, and consistent planning and design of the biking and micro-mobility network.

HCC and Waka Kotahi have recently developed draft *Transitional Cycling Design Guidance* as summarised in Section 2.10.1 and included in Appendix E. This should be completed and published within the next year 2022/23 to provide HCC delivery teams with guidance on how to implement transitional projects, and how to make trade-offs between modes and priorities.

There are several sources of design guidance of high quality 'permanent' facilities from New Zealand and internationally that HCC should draw on for Hamilton. These include the NACTO<sup>71</sup> and CROW<sup>72</sup> documents and online platforms, as well as high quality New Zealand guidance from Waka Kotahi<sup>73</sup>, Auckland Transport<sup>74</sup> and Christchurch City Council<sup>75</sup>. We propose that Hamilton design guidelines should adopt from existing guidance as much as possible, or adopt guidance wholesale where appropriate, with an introductory section that considers Hamilton's unique political, geographical and demographic characteristics. The development of design guidelines would take 12 months to complete and should be completed within the 2022/23 financial year.

Design guidelines should be included in the Waikato LASS Regional Infrastructure Technical Standards (RITS), and referenced through the HCC District Plan and other relevant engineering and land development standards. This will ensure that new transport corridors in developer led 'greenfield' developments include the best possible levels of service for biking and micro-mobility.

### 2.13.7. Kick start pre-implementation

To ensure that the programme is ready to start implementation in 2024/25, an allowance has been made for 'kick start' pre-implementation activities to commence in 2022/23 as summarised in Table 17.

Table 17 – Kick start pre-implementation (CAPEX \$m)

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Pre-implementation	1	2022-24	0.8	1.04

<sup>71</sup> National Association of City Transportation Officials (2014) *Urban Bikeway Design Guide*, Second Edition, 24 March 2014

<sup>72</sup> CROW (2016) *CROW Design Manual for Bicycle Traffic*

<sup>73</sup> Waka Kotahi NZ Transport Agency (2022) *Cycling Network Guidance*, <https://www.nzta.govt.nz/walking-cycling-and-public-transport/cycling/cycling-standards-and-guidance/cycling-network-guidance/>

<sup>74</sup> Auckland Transport (2018) *Urban Street and Road Design Guide*, <https://at.govt.nz/media/1987453/urban-street-and-road-design-guide.pdf>

<sup>75</sup> Christchurch City Council (2013 & 2016) *Cycle Design Guidelines*, <https://www.ccc.govt.nz/assets/Documents/The-Council/Plans-Strategies-Policies-Bylaws/Strategies/ChristchurchCycleDesignGuidelinesWEB.pdf>

Kick start pre-implementation will include early work on 2024-27 NLTP activities to better understand transitional approach interventions and likely cost estimates, and the development of treatment typologies, concepts and standard designs. This may include initial investigations such as road safety assessments, parking and usage assessments, and some stakeholder engagement to understand community willingness in advance of project delivery starting in 2024/25. Pre-implementation activities will also help to prioritise the programme for 2024-27, and assist to scope those projects following the low cost / low risk funding processes.

### 2.13.8. Business cases

The proposed investment in business cases is summarised in Table 18.

Table 18 – Business cases (CAPEX \$m)

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Business Cases	3	2028-31	1.5	2.0

Allowance has been made for three corridor SSBCs, or contributions to multi-modal corridor SSBCs in the later years of the 10 year programme. This will enable projects that include significant proportions of biking facilities similar to the Eastern Pathways corridors to be planned for delivery after 2031 as part of the ongoing biking and micro-mobility programme.

### 2.13.9. Behaviour change activities

To further maximise the benefit of the investment in the physical network infrastructure and end of trip facilities, more will need to be done to promote biking and micro-mobility as a safe, fun, healthy and sustainable form of transport. The proposed investment in staff to perform behaviour change activities is summarised in Table 19, which includes annual and 10 year programme operating costs.

Table 19 – Behaviour change activities (OPEX \$m)

Item	Role description	No.	Start year	Annual costs		10 year programme	
				Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Transport stakeholder manager	1	2024/25	0.12	0.14	1.0	1.3
2	Communications and engagement advisor - responsive projects	1	2025/26	0.12	0.14	0.72	0.94
3	Communications and engagement advisor - planned projects	1	2023/24	0.12	0.14	0.96	1.25
All	Behaviour change staff	3	2023-26	0.36	0.43	2.69	3.49

The 10 year programme includes the recruitment of three behaviour change staff. The new Transport Stakeholder Manager will be responsible for coordinating all communications and engagement activities across the programme. This will broadly include

- Behaviour change – Hamilton wide education and promotion of biking and micro-mobility, including why mode shift is needed at a city scale to get social licence from the general public
- Planned projects – Pre-work to obtain social licence within the project area, and post-monitoring of satisfaction
- Responsive/ opportunistic / area wide projects – Identify projects from requests by the public, elected members, other HCC programmes including maintenance and renewals, and other opportunities. Manage any damage control from unpopular activities, projects and policies.

Two new Communications and Engagement Advisors are to be recruited. One to support the behaviour change and responsive / opportunistic / area wide projects, and the other to support planned project delivery. These roles will also facilitate volunteer / community groups advocating for biking and promoting biking related activities within the communities, and include the organising of social events, rides and get togethers, initiatives such as fixing bikes for free, teaching people how to fix their own bikes, organising bike donations, and similar activities.

Table 20 shows other supporting initiatives identified through the option assessment and engagement process to support the investment in biking and micro-mobility.

Table 20 – Behaviour change activities identified through engagement

Initiatives	Description
Travel planning	<p>This is an existing activity led by HCC's School Travel Planner/Coordinator who works with schools to focus on facilitating the implementation of practical programmes to increase the proportion of families who use alternative means of transport to school – including biking.</p> <p>This is currently being run by one person at HCC which creates a constrained delivery due to resource availability. It has been identified that there are opportunities to increase this effort to cover more of the city. HCC has indicated that the budget allocated to this activity could be increased to allow for two new roles. This would result in more effective delivery at a city-wide scale and for travel planning to include major employers, tertiary education centres, and new residential developments.</p>
Education programmes	<p>Education programmes, such as the 'Kids on Bikes' programme, are aimed at building the confidence of cyclists to enable them to safely navigate the biking and micro-mobility network.</p> <p>Educational programmes focussing on other user groups, such as parents or the elderly, should be expanded<sup>76</sup> or rolled out to instil the same level of confidence for these individuals to choose biking or micro-mobility as their preferred means of getting around town.</p> <p>Equally important is driver education which aims to create more awareness amongst drivers of the presence of biking and micro-mobility on the network and how the street space is to be shared.</p> <p>Bike repair programmes.</p>
Promotions	<p>Promotional campaigns to encourage more biking may include television and radio advertising campaign to create awareness of biking and micro-mobility and the facilities available.</p> <p>Initiatives to boost interest also include bike races, bike sale days, and bike day/week/month campaigns where people are incentivised to cycle or scooter for a specific period rather than use their cars.</p>

<sup>76</sup> The Settlement Centre Waikato is funded Hamilton City Council, supports the settlement of newcomers in Hamilton and offers adult bike training to people at any level of riding confidence.



A small capital allowance has been made to support the behaviour change activities, programmes and promotions as shown in Table 21. This includes costs related to holding HCC and volunteer organisation events, promotional collateral and branded giveaways etc.

Table 21 – Behaviour change activities (CAPEX \$m)

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Behaviour change activities	1	2024-31	0.35	0.46

### 2.13.10. Non-Infrastructure activities

The proposed investment in non-infrastructure activities to help activate the biking and micro-mobility programme are summarised in Table 22, and outlined in this section.

Table 22 – Non-infrastructure activities (OPEX \$m)

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Bike libraries	3	2024-31	0.4	0.5
2	Bike purchase / subsidy schemes	200	2024-31	0.4	0.5
3	Lock subsidy	500	2024-31	0.4	0.5
All	Non-infrastructure activities	703	2024-31	1.2	1.5

The 10 year programme includes non-infrastructure activities, to be administered by the behaviour change staff:

- Bike libraries – A bike library is a volunteer-run community initiative with an overarching aim of getting more people on bikes. The bike library repairs donated bikes and offers them to the public. Bikes are typically priced with a nominal deposit and checked out for a period (i.e. 6 months). When the bike is returned and is in good condition, the deposit is returned minus a small fee to cover administration costs. Alternately, the patron can choose to keep the bike and forfeit the deposit. It is recommended that a structured liaison should be established with these organisations such as Bike Waikato.
- Bike purchase / subsidy schemes – Funding to purchase or subsidise the cost of bikes, e-bikes or e-scooters is a way to remove barriers of affordability and support an equitable outcome by providing bikes to individuals, especially school students, who are not able to afford a bike.
- Lock subsidy – A big barrier to cycling to the City Centre for example and leaving one's bicycle parked in a public space is bicycle theft. A good quality lock, which is typically relatively expensive is a big deterrent to bicycle theft is considered a barrier, especially to individuals who lack the funding. A subsidy for quality locks is a simple yet effective way to enable people to leave their bikes parked safely with peace of mind.

The non-infrastructure activities described in this section are not eligible for NLTF funding, and therefore are funded from local share in the biking and micro-mobility programme.

### 2.13.11. Programme management and delivery

The biking and micro-mobility programme is proposed as an ongoing programme to govern, manage, and deliver biking investment in Hamilton. This includes the delivery of projects on separate funding pathways including School Link and the City Centre to University Link as part of the programme. Resourcing to deliver

more than the current works programme is a significant issue for HCC, who are short staffed in a number of departments delivering the current Transport Improvement Programme.

The 10 year programme includes a dedicated biking and micro-mobility programme management and delivery team, focussed on delivering programme benefits and outcomes. Figure 39 identifies seven new roles that are needed to deliver the additional investment for the 10 year biking and micro-mobility programme, including four roles in the management and delivery space. The proposed investment in programme management and delivery staff is summarised in Table 23, which includes annual and 10 year programme operating costs.

Table 23 – Programme management and delivery (OPEX \$m)

Item	Role description	No.	Start year	Annual costs		10 year programme	
				Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Programme manager	1	2023/24	0.15	0.18	1.44	1.87
2	Programme assurance	1	2024/25	0.12	0.14	1.01	1.31
3	Planned project manager	1	2023/24	0.12	0.14	1.15	1.5
4	Responsive projects engineer	1	2023/24	0.10	0.12	0.96	1.31
All	Programme management and delivery staff	4	2023-25	0.5	0.6	4.56	5.93

Delivery of physical projects is programmed to commence the first year of the 2024-27 NLTP, where most of the team will be in place. The Programme Manager, Planned Project Manager and Responsive Projects Engineer are expected to start early in 2023/24 to make sure projects will be ready for implementation to commence in the 2024/25 financial year.

Programme monitoring is critical for the delivery of this ongoing programme based around the transitional approach,. A small capital allowance has been made for programme monitoring to support the biking and micro-mobility programme as shown in Table 24.

Table 24 – Programme management and delivery (CAPEX \$m)

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Programme monitoring	1	2024-31	0.7	0.9

Programme monitoring activities will include before and after rider counts, network safety and quality assessments, user experience and satisfaction surveys etc. as summarised in Section 5.7. Lessons from where projects work well / do not work well will be used to shape future projects, and evolve the ongoing biking and micro-mobility programme.

HCC could collaborate with academic bodies to undertake independent monitoring as part of programme assurance.

### 2.13.12. Maintenance

The proposed 10 year investment in maintenance of the new projects, over and above that currently funded in the Do Minimum, is summarised in Table 25.

Table 25 – Maintenance (OPEX \$m)

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Maintenance	1	2025-31	1.4	1.8
2	Maintenance specifications	1	2024/25	0	0
All	Maintenance	2	2024-31	1.4	1.8

A high level of service on the biking and micro-mobility network will require an improved and mode specific maintenance regime to keep the new facilities at a basic level of service. This includes more regular sweeping of debris from the separated lanes/paths using specialist equipment, surface and road marking maintenance and maintenance of the end of trip facilities.

Network maintenance has been assumed as 0.5% of cumulative programme capital expenditure per year. Maintenance costs are considered conservative, as the shift from private vehicles to biking and micro-mobility is forecast to reduce the number of cars on the road and therefore reduce wear on the pavements, and therefore the frequency and costs of maintenance and renewals.

An improved maintenance specification will be developed and implemented by the programme manager in collaboration with the contracted maintenance and operations contractor to maintain the facilities to the required level of service. This specification will be included in the Activity Management Plan, and the development cost is included in the programme management and delivery time as summarised in Section 2.13.11.

### 2.13.13. Complementary activities

This section describes activities that contribute to the success of the biking and micro-mobility programme but are outside of scope for this single mode SSBC. These measures are key for encouraging mode shift to biking and micro-mobility in Hamilton, making the most of the proposed infrastructure investments, and decreasing reliance on private cars. This section acknowledges the importance of these activities that will be considered in higher level programmes such as the HCC District Plan, Metro Spatial Plan PBC, and Access Hamilton.

#### Parking management policy

The generalised cost of travel for any transport mode is the sum of the monetary and non-monetised costs of a journey, such as travel time, vehicle operating costs (fuel, maintenance, wear and tear, tyres, depreciation etc), and other costs (fares, parking costs, tolls, congestion charges etc.).

To make traveling by public transport, bicycle or foot more attractive compared to private vehicle travel, the generalised costs of travel need to decrease for alternative modes, or increase for private vehicle travel to make the generalised costs of alternative modes more equal and attractive.

Free and readily available car parking makes private vehicle travel a very attractive option compared to taking the bus or biking, even over relatively short distances. While reducing trip distances through urban form changes (summarised in the following section) help make walking and biking more attractive, unless private car travel is made less attractive, many people will continue to use it as their preferred mode of travel around Hamilton.

Reducing on-road car parking capacity is also a cost-effective way to free up road space within the carriageway to introduce fully separated biking facilities. Separated bike lanes are significantly less expensive to implement if kerbs, drains, services, structures etc. do not have to be relocated.

The price of retrofitting existing transport corridors to move kerbs and drainage to accommodate separated bike lanes is estimated to cost between \$9m and \$14m per kilometre depending on whether widening is required on both sides, and whether unidirectional, bi-directional, or shared path facilities are provided. Providing the same level of service facilities within the existing carriageway by reallocating parking, lanes or shoulder space, and not moving the kerbs, is estimated to cost between \$2.5m and \$4.5m per kilometre. Therefore removing parking should be considered wherever possible, with an estimated difference in cost of around \$6-10m per kilometre, depending on the corridor, surrounding land use context and location.

HCC is currently developing its Parking Management Policy which is being led by Phoebe Flaxman, Transport and Urban Mobility Manager. The vision is: *“The parking policy sets the guiding principles for parking in Hamilton city for the future to support broader objectives of accommodating population growth; making the city more people friendly; promoting wellbeing; supporting economic growth; whilst improving travel choice and supporting an overall emission reduction plan.”*

The policy should consider reducing the supply of parking and increasing the cost of parking as effective methods of making private car travel less attractive, and making alternative modes more attractive.

The Programme Director will be responsible for ensuring effective communication and reporting between the HCC work programmes.

#### Urban form

People are more likely to make the switch from private vehicle travel to walking or biking if the distances between where they live, work, go to school and play are shorter. Therefore, intensification and integration of land use is key to promoting trips by biking and micro-mobility.

The NPS-UD 2020 (Section 1.3.3) and Metro Spatial Plan (Section 1.3.4) seeks to address land use and transport integration by enabling higher densities within walkable and bikeable distances from key employment areas. The Hamilton City Centre and surrounding suburbs have been identified as areas for land use intensification, and changes to the District Plan to enable the desired growth in these areas are currently under development by HCC, led by Mark Davey, City Planning Manager.

The Programme Director will be responsible for ensuring effective communication and reporting between the HCC work programmes.

#### Road pricing

Traffic congestion happens when the demand for road space exceeds the supply, and mainly affects dense urban areas. With road user charges, fuel levies, vehicle registrations and licensing, road users only pay for a fraction of the full cost of providing, maintaining and using the transport network, particularly when the network is congested.

Road pricing (tolling or congestion charging) road users can place a portion of the economic, environmental and social cost of driving back onto road users. The main objectives of road pricing are to increase the generalised costs (explained in the parking management policy section above) of private car travel thereby reducing congestion, and to raise revenue which can be used to invest in behaviour change activities, and mode shift to walking, biking or public transport.

Pricing congestion would be key to support the behaviour change sought by the biking and micro-mobility programme, as it would encourage more people to bike instead of drive which would in turn make it easier to gain public support for proposed bike network infrastructure improvements.

Implementing road and congestion pricing requires a law change by central government, and is therefore outside HCC's direct ability to deliver. However the MSP PBC currently under development sees pricing as a key demand management tool for Hamilton, and therefore it is possible that this will be implemented as part of a higher tier programme. The MSP PBC is being led at HCC by Phil Haizelden, Transport Strategy Principal.

The Programme Director will be responsible for ensuring effective communication and advocating between the work programmes on the need for road pricing in Hamilton.

#### Vehicle and fuel pricing

Similar to road and congestion pricing, increasing central government fees and taxes on fuel excise duty (FED) and road user charges (RUC) could increase the generalised costs of private car travel, encourage mode shift to active modes and public transport, and help to fund investment in alternative modes. Auckland's 10 cent per litre regional fuel tax is an example of this mechanism.

Implementing higher fuel and road user charges also requires government legislation to implement, and therefore is outside HCC's ability to deliver. HCC can however seek to influence this over time, and the Programme Director will be responsible for ensuring effective communication and advocating between the work programmes on the need for FED and RUC increases in Hamilton.

The recent temporary reduction of FED by 25 cents per litre and RUC by 36% in 2022 as a result of high fuel prices in the global economy show that political will to implement these measures to produce modal shift is likely to be very low.

#### Network Operating Plan

The Hamilton Network Operating Plan (NOP) is an agreed plan of how the transport network is to be managed and operated by the time of day and weekday for the different modes. This intends to apply strategic intent into transport operations, and integrate planning and investment by implementing a road use hierarchy which identifies which transport modes would be prioritised on which routes, at particular time of day. The development of the NOP involved HCC, Waikato Regional Council and Waka Kotahi, resulting in a 'one-network' approach to road network optimisation and management within the HCC boundaries.

The NOP identifies primary and secondary biking routes on the transport network which was used as the basis of the Strategic Network Plan as shown in Figure 13. The NOP will need to be updated to reflect the content of this SSBC, and the biking and micro-mobility programme will need to acknowledge the modal priorities in the road corridors they are working in.

The Programme Manager and Project Managers will be responsible for ensuring that the biking and micro-mobility programme aligns with the principles and modal network priorities outlined in the NOP.

#### 2.13.14. Cost Rates

The 10 year programme has been developed assuming facilities will be implemented in line with the *Transitional Cycling Design Guidance* outlined in Section 2.10.1.

The unit rates from Appendix H were applied to estimate the cost of implementing the network components of the programme. For the planned priority corridors, the respective rates based on the envisaged treatments were directly applied based on the respective lengths of the corridor sections.

For the rest of the network treatments, an assumption was made based on the typology type splits in the priority corridors to estimate a weighted average cost rate for the responsive / opportunistic improvements and the area wide / LTN type improvements. The average cost of implementing these facilities is estimated to be between \$670,000 (P50) and \$870,000 (P95) per kilometre.

Refer to Appendix H for more detail on the unit cost rates per kilometre.

## 2.14. Investment outcomes

Table 26 shows the expected benefits and outcomes of investing in the 10 year programme, measured against the Do Minimum at a forecast year of 2031, and the following sections summarise the results.

The forecast 2050 outcomes for the *Connected Neighbourhoods vision* are also included in Table 26 to demonstrate the long term benefits of investment in biking and micro-mobility.

### 2.14.1. Improved safety and perception of safety

#### Improved safety

Table 26 shows that the introduction of safe bike routes with the 10 year programme is expected to reduce the number of DSI's involving cyclists and other micro-mobility users from 10 to 6 DSIs per annum in 2031, a reduction of 40% across Hamilton.

#### Improved perception of safety

The perceived safety of the network is highly influential in encouraging people to bike. Accounting for facilities where biking and micro-mobility are separated from general traffic, currently only about 6% of Hamilton's transport network is perceived to be highly safe for cycling, whereas the implementation of the 10 year programme will increase this to 24% of the network in 2031.

### 2.14.2. Increased micro-mobility access and use

#### Improved micro-mobility mode share

The investment in the 10 year programme is expected to encourage 21,600 people to make biking, e-scootering or e-skating their main means of transport in 2031, an increase of 15,700 'new' people. This is forecast to increase biking and micro-mobility mode share for journey to work (JTW) and journey to education (JTE) from 3.8% to 15% by 2031.

21,600 users per day are conservatively assumed to produce 43,000 JTW & JTE biking trips per day in 2031. Using the logic and 3.5 expansion factor from Section 2.11.2, daily trips by biking and micro-mobility for all trip purposes could exceed 150,000 per day – more than three times those explained by JTW & JTE alone.

#### Improved accessibility

Currently 10% of Hamilton's network has a high level of service for biking and micro-mobility users, which will increase to 21% for the 10 year programme.

### 2.14.3. Improved health and environmental outcomes

#### Improved health

Investment in the 10 year programme is forecast to encourage an additional 15,600 'new' people to make biking, e-scootering or e-skating their main means of transport by 2031. These new or additional users will have improved health outcomes from using biking as a form of exercise, as summarised in Section 1.5.3.

As shown in Section 2.11.2 the Flow demand forecasts may be underestimating the total number of biking and micro-mobility trips by a factor of around three and a half. Therefore, health benefits from biking are also likely to be underrepresented by a similar factor.

Table 26 – Expected outcomes from the 10 year programme

Benefit	KPI	Measure	2031 Do minimum	2031 10 year programme	2050 Do minimum	2050 Connected Neighbourhoods
Improved safety and perception of safety for micro-mobility users 30%	Improved safety 15%	1.1.3 Number of deaths and serious injuries	10 DSI's per annum	6 DSI's per annum	12 DSI's per annum	5 DSI's per annum
	Improved perception of safety 15%	2.1.1 Perception of safety and ease	6% of network perceived as high safety	24% of network perceived as high safety	6% of network perceived as high safety	51% of network perceived as high safety
Increased micro-mobility access and use 50%	Improved micro-mobility mode share 25%	10.1.1 Number of JTW & JTE users	5,900 users	21,600 users	11,000 users	48,000 users
		10.2.10 Mode share of JTW & JTE	3.8% biking mode share	15% biking mode share	3.4% biking mode share	22% biking mode share
	Improved accessibility 25%	10.1.4 Proportion of network meeting target LOS	10% of network at LOS A-B	21% of network at LOS A-B	10% of network at LOS A-B	44% of network at LOS A-B
Improved health and environmental outcomes 20%	Improved health 10%	3.1.1 Physical health benefits from active modes to new JTW & JTE users	0 'new' users in 2031	15,700 'new' users in 2031	0 'new' users in 2050	37,000 'new' users in 2050
	Reduced emissions 10%	8.1.1 Decrease CO <sub>2</sub> emissions	137k tonnes of CO <sub>2</sub> from motor transport per annum	128k tonnes of CO <sub>2</sub> from motor transport per annum	160k tonnes of CO <sub>2</sub> from motor transport per annum	133k tonnes of CO <sub>2</sub> from motor transport per annum
		8.1.2 Mode shift from private vehicle	526m private vehicle VKT	490m private vehicle VKT	697m private vehicle VKT	581m private vehicle VKT

Reduced emissions

In Hamilton 64% of our emissions are from transport, which can be transitioned to low carbon transport modes<sup>77,78</sup>.

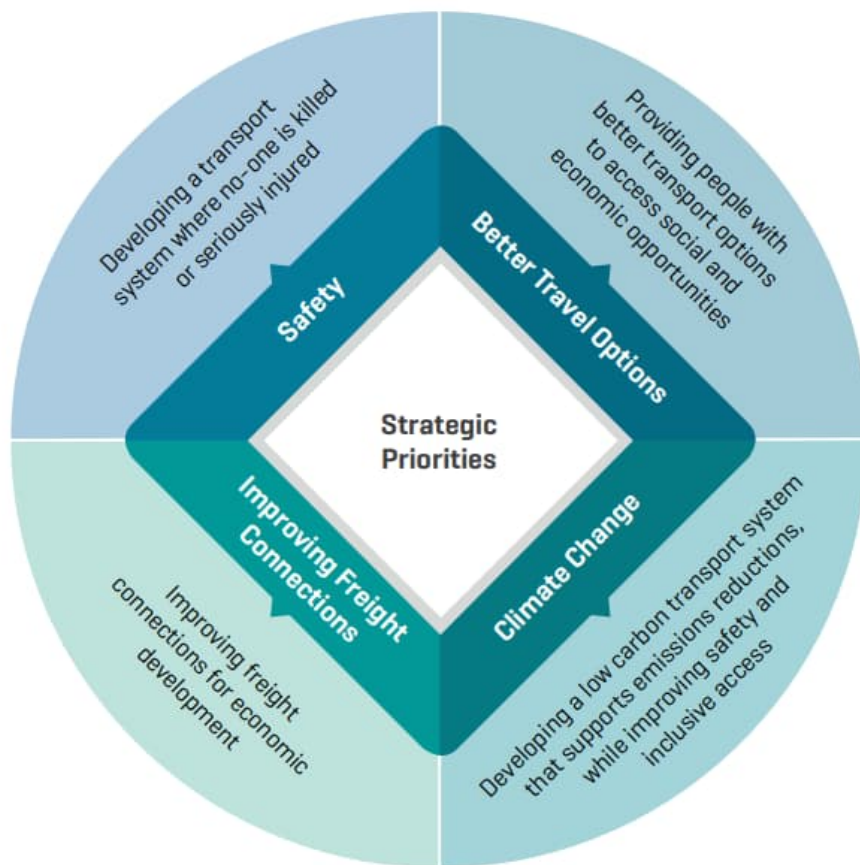
Investment in the 10 year programme is expected to reduce the transport contribution to Carbon Dioxide (CO<sub>2</sub>) emissions from 137,000 to 128,000 tonnes in 2031, a reduction of approximately 6.7%. Private vehicle VKTs are similarly forecast to decrease from 526m to 490m VKT, a reduction of 6.7%. Fewer VKTs travelled will result in less congestion, and travel times and vehicle operating costs are forecast to reduce by around 6% by conservative estimates.

Section 2.14.2 identified that daily biking and micro-mobility trips could exceed 150,000 per day. Assuming a conservative average trip length of 2km results in 300,000 person kilometres per day. Accounting for 1.4 people per private car<sup>79</sup> would result in a reduction of around 430,000 VKT per day, which is around 104m VKT per annum in 2031. This is a 20% reduction in VKT and carbon emissions.

2.14.4. Government Policy Statement on Land Transport 2021/22 – 2030/31

The expected outcomes from the 10 year programme strongly aligns with the Ministry of Transport’s Transport Outcomes Framework, and directly support the strategic priorities for GPS 2021 as described in Figure 36 and Table 27.

Figure 36 – Strategic priorities for GPS 2021<sup>80</sup>



<sup>77</sup> Waikato Regional Council (2020) *Waikato Region Greenhouse Gas Emissions Inventory, for the period July 2018 to June 2019*, April 2020, <https://www.waikatoregion.govt.nz/assets/WRC/WRC-2019/Waikato-Region-GHG-Inventory-18-19.pdf>

<sup>78</sup> Hamilton City Council, *Climate Change Flyer* [https://www.hamilton.govt.nz/our-services/environment-and-health/Documents/Climate%20Change%20Flyer\\_P10.pdf](https://www.hamilton.govt.nz/our-services/environment-and-health/Documents/Climate%20Change%20Flyer_P10.pdf)

<sup>79</sup> Waka Kotahi (2020) *Monetised benefits and costs manual*, December 2021, <https://www.nzta.govt.nz/assets/resources/monetised-benefits-and-costs-manual/Monetised-benefits-and-costs-manual.pdf>

<sup>80</sup> Ministry of Transport (2020) *Government Policy Statement on Land Transport 2021/22 – 2030/31*, September 2020, <https://www.transport.govt.nz/assets/Uploads/Paper/GPS2021.pdf>



Table 27 – Investment alignment to the GPS 2021 strategic priorities<sup>81</sup>

Strategic Direction	Alignment
<p>Safety</p> <p>Developing a transport system where no-one is killed or seriously injured</p>	<p>Separating bikes and micro-mobility from traffic and pedestrians, and providing roads where conflicts have been reduced or removed, is expected to significantly contribute towards the Vision Zero goal for road safety.</p> <p>The 10 year programme is estimated to:</p> <ul style="list-style-type: none"> <li>• Reduce DSIs of cyclists and micro-mobility users by 40%, and</li> <li>• Increase the proportion of the network perceived as safe for cycling from 6% to 24%.</li> </ul> <p>Investment in safer cycleways will give people a wider range of quality travel options, and contribute towards the co-benefit of Inclusive access.</p>
<p>Better travel options</p> <p>Providing people with better transport options to access social and economic opportunities</p>	<p>Providing a safe and complete biking and micro-mobility network that separates modes will improve travel choices for the people of Hamilton to get to the places they live, work and play, and ensure that the transport network is fit for purpose and fit for the future.</p> <p>The 10 year programme is estimated to:</p> <ul style="list-style-type: none"> <li>• Encourage 21,600 people to make biking, e-scootering or e-skating their main means of transport an increase of 15,700 'new' people by conservative estimates</li> <li>• Section 2.14.2 argues then daily trips could exceed 150,000 per day</li> <li>• Increase biking and micro-mobility mode share from 3.8% to 15%, and</li> <li>• Increase the proportion of Hamilton's network with a high level of service for biking users from 10% to 21%.</li> </ul> <p>Better travel options will contribute towards the Healthy and safe people co-benefit by supporting mental health, mode shift towards bikes, and improve air quality.</p> <p>People will have better options for low emissions travel, and reduced VKT and therefore congestion will contribute towards the Environmental sustainability and Economic prosperity co-benefits.</p>
<p>Climate change</p> <p>Developing a low carbon transport system that supports emissions reductions, while improving safety and inclusive access</p>	<p>Making biking safer and more accessible will provide more travel options, and encourage more people to use low emission bikes and micro-mobility. This will reduce dependence on private motor vehicles, and reduce greenhouse gas emissions.</p> <p>The 10 year programme is estimated to:</p> <ul style="list-style-type: none"> <li>• Encourage an additional 15,700 'new' people to make biking, e-scootering or e-skating their main means of transport, which will have improved health outcomes from using biking as a form of exercise,</li> <li>• Reduce the transport contribution to Carbon Dioxide (CO<sub>2</sub>) emissions from 137,000 to 128,000 tonnes, a reduction of approximately 6.7% by conservative estimates,</li> <li>• Private vehicle VKTs are similarly forecast to decrease from 526m to 490m VKT per annum, a reduction of 6.7% by conservative estimates., and</li> <li>• Section 2.15.3 argues that a 20% reduction in VKT and carbon emissions is more realistic representation of the 10 year programme.</li> </ul> <p>Investment in safer cycleways will give people a wider range of quality travel options, encourage mode shift towards lower emissions transport (Inclusive access), and reducing exposure to transport related air pollution (Healthy and safe people co-benefit).</p>

<sup>81</sup> Ministry of Transport (2020) Government Policy Statement on Land Transport 2021/22 – 2030/31, September 2020, <https://www.transport.govt.nz/assets/Uploads/Paper/GPS2021.pdf>

## 2.14.5. Emissions Reduction Programme

Section 1.3.2 summarises the ERP, with the key target relevant to the investment of biking and micro-mobility being: “Reduce vehicle kilometres travelled (VKT) by cars and light vehicles by 20% by 2035 through providing better travel options, particularly in our largest cities.”

Investment in the 10 year programme proposed by this SSBC is conservatively predicted to reduce VKT by 6.7% by 2031, about 34% of the 2035 ERP target. Section 2.15.3 argues that a 20% reduction in VKT and carbon emissions is more realistic representation of the programme, which would meet the ERP 2035 target.

This is an excellent contribution towards the total, and will assist the other ERP investments in public transport, reducing emissions in fuels, low and zero emission vehicles, tax incentives, congestion pricing and pricing tools etc. to achieve this target by 2035.

The 10 year programme and *Connected Neighbourhoods* vision strongly aligns with the ERP key strategies to achieve the ERP transport targets, as summarised in Table 28.

Table 28 – Investment alignment to the ERP key strategies<sup>82</sup>

Key Strategies	Alignment
Integrating land use, urban development and transport planning and investments to reduce transport emissions	Investment in biking and micro-mobility enables medium and high density mixed land use developments, and provides travel choice, improved safety and reduces VKT and congestion. This accommodates more people and businesses in Hamilton without increasing emissions.
Implementing mode-shift plans for larger cities	The <i>Connected Neighbourhoods</i> vision and the 10 year investment sought by this SSBC reinforce the Hamilton-Waikato Mode Shift Plan by <ul style="list-style-type: none"> <li>• Proposing cycling investment to deliver affordable growth</li> <li>• Determining key routes and the desired future primary, secondary, and supporting networks</li> <li>• Completing and connecting cycle networks</li> <li>• Includes traffic calming and low traffic neighbourhoods as supporting networks</li> <li>• Includes travel demand management and behaviour change initiatives</li> <li>• Prioritises the Eastern Pathways projects, and</li> <li>• Sets the management and governance framework for ongoing investment into biking and micro-mobility in Hamilton.</li> </ul>
Improving the reach, frequency and quality of public transport	For frequent high-quality public transit, a typical 10-minute walking catchment for a stop is round 800m while a micro-mobility catchment can extend this up to 3km <sup>83</sup> . More biking and micro-mobility supports the ambitions of the Hamilton-Waikato Metro Spatial Plan <sup>84</sup> for a radical transport shift by better connecting people with the transport network and enabling transit supportive urban form to function ahead of high frequency public transport.
Providing national direction to deliver a step-change in cycling and walking rates	Investment in the 10 year programme is forecast to increase biking and micro-mobility mode share from 3.8% to 15% by 2031, a considerable step change. Section 2.15.2 argues that daily biking and micro-mobility trips could exceed 150,000 per day.

<sup>82</sup> Ministry for the Environment (2021) *Te hau marohi ke anamata Transitioning to a low-emissions and climate-resilient future*, October 2021, <https://environment.govt.nz/publications/emissions-reduction-plan-discussion-document/>

<sup>83</sup> Victoria Transport Policy Institute (2020) Transportation Cost and Benefit Analysis II – Travel Time Costs. Retrieved from: <https://www.vtpi.org/tca/tca0502.pdf>

<sup>84</sup> Future Proof (2020) Hamilton-Waikato Metropolitan Spatial Plan, September 2020, <https://futureproof.org.nz/assets/FutureProof/H2A/Metro-Spatial-Plan/Hamilton-Waikato-Metropolitan-Spatial-Plan-Final-Low-Res.pdf>

Key Strategies	Alignment
Supporting local government to accelerate widespread street/road reallocation to support public transport, active travel and placemaking	The 10 year programme is based around the concept of reallocation of road space to enable safe cycling facilities along routes with the highest biking potential.
Implementing community-based solutions to make low-emission vehicles (such as bikes and e-bikes) more accessible	The 10 year programme includes community focussed initiatives to make bikes and e-bikes more accessible, including bike libraries, purchase / subsidy schemes, and lock subsidies.

## 2.15. Economic evaluation

This section summarises the economic appraisal of the 10 year investment programme undertaken in accordance with the Waka Kotahi Monetised Benefits and Costs Manual<sup>85</sup>, December 2021 update.

Economic benefits and costs have been calculated for the 10 year programme investments as described in Section 2.13 compared to the Do Minimum scenario as described in Section 2.1.

Full details of the evaluation are included in Appendix G.

### 2.15.1. Costs

Cost estimates for the proposed biking network were based on the network typologies, transitional and physical upgrades, with quantities derived from the Strategic Network Plan shown in Figure 13 for projects prioritised for investment in the first decade.

Costs were based on the Waka Kotahi *Cycle Facility Conceptual Cost Estimation Tool (v04 Sept 2020)*. Unit rates were included delivered projects, typologies were expanded to include costly activities such as services relocation, moving kerbs and drainage costs, and the costs were benchmarked against the Eastern Pathways business cases as well as the outturn costs of previous projects in Hamilton. Further detail on the development of cost estimates has been included in Appendix H for reference. WSP peer reviewed the cost estimates as summarised in Appendix L, and all peer review comments were adopted and incorporated into the estimates presented in the SSBC.

Recognising the high-level method of estimating capital costs for the programme, P50 expected estimates included a contingency allowance of 40% over the base estimates. P95 95<sup>th</sup> percentile estimates include a further 30% allowance for funding risk.

Table 29 provides a breakdown of the undiscounted capital cost estimate ranges (P50 to P95) to implement the 10 year programme.

Table 29 – P50 and P95 Capital costs (\$m)

Cost activity	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
Planned projects	14.6	19.0
Responsive / opportunistic projects	39.7	51.7
Area wide projects	29.4	38.3
End-of-trip facilities	3.5	4.6
Design guidelines	0.3	0.4
Kick start pre-implementation	0.8	1.0
Business Cases	1.5	2.0
Behaviour change activities	0.4	0.5
Programme management and delivery	0.7	0.9
Total	91.0	118.0

Table 30 provides a breakdown of the undiscounted maintenance and operational costs of implementing the 10 year programme over the 40 year analysis period, including network maintenance, non-infrastructure initiatives with staffing requirements, and supporting activities.

<sup>85</sup> Waka Kotahi (2020) *Monetised benefits and costs manual*, December 2021, <https://www.nzta.govt.nz/assets/resources/monetised-benefits-and-costs-manual/Monetised-benefits-and-costs-manual.pdf>

Table 30 – Maintenance and operating costs (\$m) over 40 years

Cost activity	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
Behaviour change	14.6	19.0
Non-infrastructure activities	7.4	9.7
Programme management & delivery	22.8	29.6
Maintenance	12.6	16.4
Total	57.4	74.7

The total discounted Net Present Value (NPV) costs are summarised in Table 31.

Table 31 – NPV Costs (\$m)

Cost source	NPV P50 costs	NPV P95 costs
Capital costs	75.6	98.3
Maintenance and operating costs	27.9	36.3
NPV Costs	103.5	134.6

Table 31 shows that the 10 year programme is expected to cost a P50 NPV of \$103.5m.

### 2.15.2. Benefits

Monetised benefits have been calculated for:

- Health benefits linked with the increase in bikers
- Safety benefits as a result of fewer biking related DSIs
- Greenhouse gas emission reductions because of fewer cars on the road, and
- Decongestion benefits because of reduced travel time and vehicle operating costs.

The total discounted Present Value (PV) benefits are summarised in Table 32.

Table 32 – PV Benefits (\$m)

Benefit source	10 year programme NPV benefits
Health benefits	684.7 (79%)
Safety benefits	51.8 (6%)
Emissions reductions	24.8 (3%)
Decongestion (travel time)	38.5 (4%)
Decongestion (vehicle operating costs)	62.3 (7%)
NPV Benefits	862.1

Table 32 shows that the bulk of monetised benefits are expected to come from health benefits at 79%, followed by decongestion vehicle operating cost savings at 7% for the 10 year investment programme.

### 2.15.3. Benefit Cost Ratio

The NPV costs and benefits and the Benefit Cost Ratio (BCR) for the 10 year programme are summarised in Table 33.

Table 33 – Benefit Cost Ratio Summary (\$m)

Description	10 year programme
NPV costs	103.5
NPV benefits	862.1
BCR	8.3
IAF Rating	'High'

Table 33 shows that the benefits of investing in the 10 year programme offer a good return on investment with a BCR of 8.3 which is rated as a 'High' under the Investment Prioritisation Method (IPM) for the 2021-24 National Land Transport Programme (NLTP).

Full details of the economic evaluation are included in Appendix G.

### 2.15.4. Sensitivity analysis

The sensitivity of the BCR was tested against a range of parameters, including the discount rate, cost estimate, and benefit capping as shown in Table 34.

Table 34 – 10 year programme BCR sensitivity testing

Sensitivity	Base assumption	Lower bound	Lower bound BCR	Upper bound	Upper bound BCR
Base case	All	8.3			
Discount rate	4%	6%	6.8	3%	9.3
Cost estimate	Expected cost estimates	P95 costs	6.4	-	-
Benefit interpolation	Extrapolated beyond 2050	Capped at 2030	6.3	-	-
Forecast bikers	100% of forecast at 2031	-20% bikers at 2031	6.4	+20% bikers at 2031	10.2

Table 34 shows that the BCR is relatively insensitive to changes in the critical parameters used in the economic evaluation, as the sensitivity results range between 6.3 and 10.2. Investors can have confidence that the IAF rating is in the 'High' range of 6.0 to 9.9 for the 10 year programme under all sensitivity tests.

## 2.16. Investment prioritisation profile

This section summarises the rating for the 10 year programme under the IPM which gives effect to the Government Policy Statement on land transport 2021 (GPS 2021) in the 2021–24 NLTP. As demonstrated in Section 2.14.4, investment in the biking and micro-mobility programme *Connected Neighbourhoods* vision will significantly contribute towards the Safety, Better travel options, and Climate change strategic priorities for GPS 2021.

### 2.16.1. GPS alignment

Table 35 shows the GPS alignment rating for the proposed 10 year investment programme and *Connected Neighbourhoods* vision.

Table 35 – GPS alignment

GPS alignment criteria		10 year programme	Connected Neighbourhoods Vision
Better travel options and climate change	Outcome	Biking and micro-mobility mode share moves from 3.8% to 15%, an 11.2% change	Biking and micro-mobility mode share moves from 3.4% to 22%, an 18.6% change
	Rating	Very High	Very High
	Criteria	>6% change in share of private passenger vehicle-based trips to other modes	>6% change in share of private passenger vehicle-based trips to other modes
Climate change: Impact on Greenhouse Gases	Outcome	Private car VKT reduces from 526m to 490m, a 6.7% change	Private car VKT reduces from 697m to 581m, a 16.8% change
	Rating	Very High	Very High
	Criteria	>6% reduction in private vehicle kilometres travelled	>6% reduction in private vehicle kilometres travelled
GPS alignment	Overall rating	Very High	Very High

Table 35 shows that the GPS alignment is rated as 'Very High' for both the 10 year programme, and the *Connected Neighbourhoods* vision.

The GPS alignment against Safety criteria are not well aligned with the programme wide approach proposed for the biking and micro-mobility programme. As shown in Table 26, the 10 year programme is expected to save 40% of DSIs at 2031, and therefore aligns the closest with a 'High' rating. This supplements but does not change the overall 'Very High' rating shown in Table 35.

### 2.16.2. Scheduling

Investment in biking and micro-mobility is needed "in order to deliver/ prepare for the remainder of programme/package where its implementation is to begin in the 2021–24 or early 2024–27 NLTP", which is rated a 'High' under 'Criticality'.

By design the biking and micro-mobility programme leverages co-investment opportunities with other HCC investment programmes to provide value for money. For example, integrating biking and micro-mobility improvements with maintenance and renewals and three waters asset works programmes etc. Therefore the 'High' Interdependency criteria also apply, being an "activity/combination of activities is part of a programme, package... and its delivery in the 2021–24 NLTP period is required to enable further implementation of that programme, package, or investment.", and "Non-delivery of the proposed activity in

*the 2021–24 NLTP has a significant impact on realising the estimated benefits of the programme/package, i.e. one or more benefits will not be achieved or will be delayed for more than three years.”*

This rating applies to both the 10 year programme and *Connected Neighbourhoods* vision.

### 2.16.3. Efficiency

The BCR for the 10 year programme is rated as a ‘High’ under the IPM for the 2021-24 NLTP as shown in Section 2.15.3. The complete *Connected Neighbourhoods* vision is also rated as ‘High’.

### 2.16.4. Investment prioritisation profile

Table 36 shows the resulting investment prioritisation profiles for the 10 year programme and *Connected Neighbourhoods* vision.

Table 36 – Investment prioritisation profile

Factor	10 year programme	Connected Neighbourhoods Vision
GPS alignment	Very High	Very High
Scheduling	High	High
Efficiency	High	High
Priority order	1	1

Table 36 shows that the 10 year programme has an IPM priority order of 1.

Completing the *Connected Neighbourhoods* vision for Hamilton also has a priority order of 1. This shows that the first decade of investment contributes towards an overall long term programme that is rated highly by the IPM.



## 3.0 FINANCIAL CASE

This section summarises the capital, maintenance and operating costs of the 10 year programme requiring funding, the financial implications and proposed funding arrangements.

### 3.1. Incremental costs

The cost estimates stated in this SSBC only include the increment to add the biking and micro-mobility facilities and investments over and above either the existing transportation network, or as a contribution to a multi modal project. For clarity, costs do not include improvements to accommodate other modes including public transport, replacing end of life storm water networks, and pavement reseals and rehabilitation, etc.

It is envisaged that when opportunities to co-invest arise alongside other HCC and Waka Kotahi delivery programmes, the biking and micro-mobility funding will be supplemented by other funding streams to deliver integrated improvements for Hamilton.

### 3.2. Cash flows

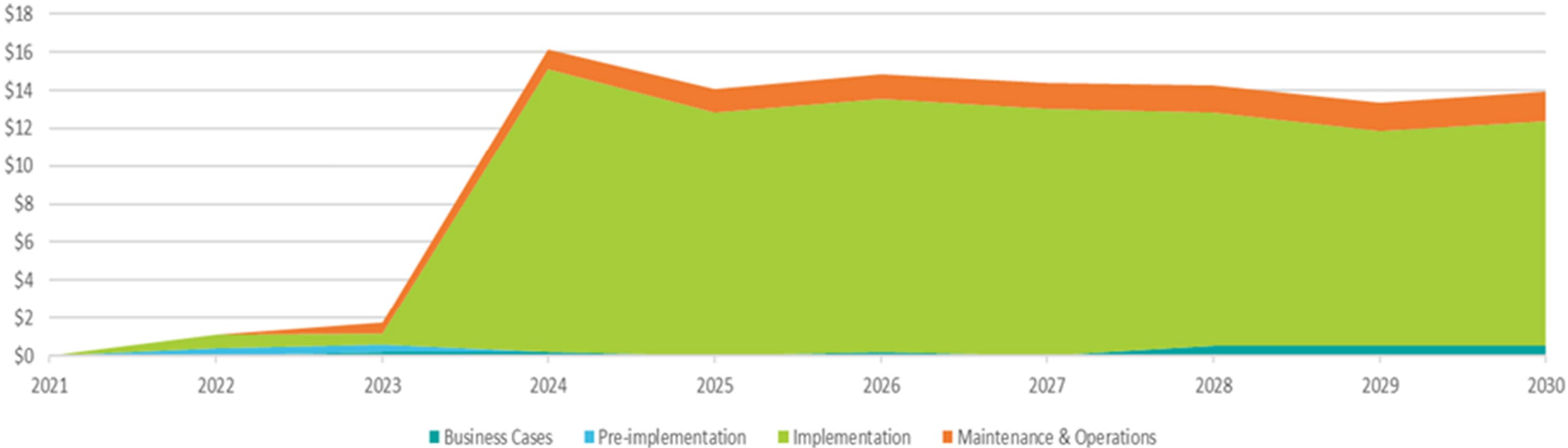
The P50 expected estimates for capital costs, and maintenance and operating cash flows for the 10 year programme are set out in Table 37, and shown in a lava diagram by project phase in Figure 37.

Table 37 shows that capital cost ranges P50 to P95 are expected to be \$91m to 118m over the 10 year programme 2021 – 2031, with maintenance and operating costs at \$10m to 13m. This produces a total cost range of \$100m to 131m over the 10 year programme.

Table 37 – 10 year programme costs per year (expected P50, not escalated \$m)

Component	2021 /2022	2022 /2023	2023 /2024	2024 /2025	2025 /2026	2026 /2027	2027 /2028	2028 /2029	2029 /2030	2030 /2031	Decade 1 2021 – 2031	
											P50	P95
Capital	0.0	0.7	0.6	14.9	12.8	13.4	13.0	12.4	11.4	11.9	91.0	118.3
Maintenance and operating	0.0	0.0	0.6	1.0	1.2	1.3	1.4	1.4	1.5	1.5	10.0	12.9
Total	0.0	0.7	1.2	16.0	14.0	14.7	14.4	13.8	12.8	13.4	100.9	131.2

Figure 37 – 10 year programme cash flows 2021 to 2031 (expected P50, not escalated \$m)



### 3.3. Cost breakdown

The 10 year programme focusses on the delivery of priority investments for 2021 – 2031, aligning to the Long Term Plan (LTP) 10 year funding horizon.

#### 3.3.1. Capital costs

Table 38 provides a breakdown of the capital costs for the 10 year programme (not escalated), the next stage for those projects, the pre-implementation and implementation estimates, and the expected sources of funding. The colour coded cells refer to the stages of project development: **business case**, **pre-implementation**, **implementation**, and **ongoing programme activities**. Table 38 shows that most projects are expected to be funded using the traditional 49% local share / 51% Financial Assistance Rate (FAR) from the NLTF administered by Waka Kotahi.

Table 38 shows that the 10 year programme capital costs (not escalated) are expected to range between \$91m to 118m for the P50 to P95 respectively. This is split \$45m to 58m from HCC local share, and \$46m to 60m from the NLTF.

#### 3.3.2. Escalated capital costs

Table 39 shows the same cost information as Table 38, with escalation applied to costs at a rate of at 8% in year 2, 6% in year 3, and 5% thereafter.

Table 39 shows that the escalated 10 year programme capital costs are expected to range between \$126m to 164m for the P50 and P95 respectively. This is split \$62m to 80m from HCC local share, and \$64m to 84m from the NLTF.

Table 39 shows that with the expected escalation in project costs over the next 10 years, the overall programme costs are expected to increase by \$35m to 46m, around 28%.

Table 38 – 10 year programme capital costs and funding sources (expected P50, not escalated \$m)

Project	Next Phase	Source	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2021 – 2031			
													P50	P95		
Hospital to City Centre	SSBC Lite	Total	-	-	0.20	4.00	-	-	-	-	-	-	-	4.20	5.46	
		Hamilton City Council	-	-	0.10	1.96	-	-	-	-	-	-	-	-	2.06	2.68
		Waka Kotahi	-	-	0.10	2.04	-	-	-	-	-	-	-	-	2.14	2.78
Victoria Street	Implementation	Total	-	-	-	0.20	2.30	-	-	-	-	-	-	2.50	3.25	
		Hamilton City Council	-	-	-	0.10	1.13	-	-	-	-	-	-	-	1.23	1.59
		Waka Kotahi	-	-	-	0.10	1.17	-	-	-	-	-	-	-	1.28	1.66
Killarney Road	Implementation	Total	-	-	-	-	-	1.80	-	-	-	-	-	1.80	2.34	
		Hamilton City Council	-	-	-	-	-	0.88	-	-	-	-	-	-	0.88	1.15
		Waka Kotahi	-	-	-	-	-	0.92	-	-	-	-	-	-	0.92	1.19
Bader to Peacockes	Implementation	Total	-	-	-	-	-	0.90	-	-	-	-	-	0.90	1.17	
		Hamilton City Council	-	-	-	-	-	0.44	-	-	-	-	-	-	0.44	0.57
		Waka Kotahi	-	-	-	-	-	0.46	-	-	-	-	-	-	0.46	0.60
Nawton to City Centre	Implementation	Total	-	-	-	-	-	0.20	2.50	-	-	-	-	2.70	3.51	
		Hamilton City Council	-	-	-	-	-	0.10	1.23	-	-	-	-	-	1.32	1.72
		Waka Kotahi	-	-	-	-	-	0.10	1.28	-	-	-	-	-	1.38	1.79
Boundary Road	Implementation	Total	-	-	-	-	-	-	-	1.10	-	-	-	1.10	1.43	
		Hamilton City Council	-	-	-	-	-	-	-	-	0.54	-	-	-	0.54	0.70
		Waka Kotahi	-	-	-	-	-	-	-	-	0.56	-	-	-	0.56	0.73
Grey Street South	Implementation	Total	-	-	-	-	-	-	-	-	0.40	-	-	0.40	0.52	
		Hamilton City Council	-	-	-	-	-	-	-	-	-	0.20	-	-	0.20	0.25
		Waka Kotahi	-	-	-	-	-	-	-	-	-	0.20	-	-	0.20	0.27
Rototuna to Chartwell	Implementation	Total	-	-	-	-	-	-	-	-	-	0.90	-	0.90	1.17	
		Hamilton City Council	-	-	-	-	-	-	-	-	-	-	0.44	-	0.44	0.57
		Waka Kotahi	-	-	-	-	-	-	-	-	-	-	0.46	-	0.46	0.60
Responsive / opportunistic projects	Implementation	Total	-	-	-	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	39.90	51.87	
		Hamilton City Council	-	-	-	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.79	19.55	25.42
		Waka Kotahi	-	-	-	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	20.35	26.45
Area wide projects	Implementation	Total	-	-	-	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	29.40	38.22	
		Hamilton City Council	-	-	-	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	14.41	18.73
		Waka Kotahi	-	-	-	2.14	2.14	2.14	2.14	2.14	2.14	2.14	2.14	2.14	14.99	19.49
End of trip facilities	Implementation	Total	-	-	-	0.70	0.50	0.50	0.50	0.70	0.40	0.40	0.40	3.57	4.64	
		Hamilton City Council	-	-	-	0.35	0.22	0.22	0.22	0.22	0.35	0.20	0.20	0.20	1.75	2.27
		Waka Kotahi	-	-	-	0.36	0.23	0.23	0.23	0.23	0.36	0.20	0.20	0.20	1.82	2.37
Design guidelines	Implementation	Total	-	0.30	-	-	-	-	-	-	-	-	-	0.30	0.39	
		Hamilton City Council	-	0.15	-	-	-	-	-	-	-	-	-	-	0.15	0.19
		Waka Kotahi	-	0.15	-	-	-	-	-	-	-	-	-	-	0.15	0.20
Kick start pre-implementation	Pre-implementation	Total	-	0.4	0.4	-	-	-	-	-	-	-	-	0.80	1.04	
		Hamilton City Council	-	0.2	0.2	-	-	-	-	-	-	-	-	-	0.39	0.51
		Waka Kotahi	-	0.2	0.2	-	-	-	-	-	-	-	-	-	0.41	0.53
Business cases	SSBC	Total	-	-	-	-	-	-	-	0.50	0.50	0.50	0.50	1.50	1.95	
		Hamilton City Council	-	-	-	-	-	-	-	-	0.25	0.25	0.25	0.25	0.74	0.96
		Waka Kotahi	-	-	-	-	-	-	-	-	0.26	0.26	0.26	0.26	0.77	0.99
Programme management and delivery	Implementation	Total	-	-	-	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.70	0.91	
		Hamilton City Council	-	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.34	0.45
		Waka Kotahi	-	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.36	0.46
Behaviour change activities	Implementation	Total	-	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.35	0.46	
		Hamilton City Council	-	-	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.17	0.22
		Waka Kotahi	-	-	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.18	0.23
Total Funding CAPEX	All	Total	-	0.70	0.60	14.96	12.80	13.40	13.00	12.36	11.35	11.85	11.85	91.02	118.33	
		Hamilton City Council	-	0.34	0.29	7.33	6.27	6.57	6.37	6.06	5.56	5.81	5.81	44.60	57.98	
		Waka Kotahi	-	0.36	0.31	7.63	6.53	6.83	6.63	6.30	5.79	6.04	6.04	46.42	60.35	

Table 39 – 10 year programme capital costs and funding sources (expected P50, escalated \$m)

Project	Next Phase	Source	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2021 – 2031			
													P50	P95		
Hospital to City Centre	SSBC Lite	Total	-	-	0.23	4.81	-	-	-	-	-	-	-	5.04	6.55	
		Hamilton City Council	-	-	0.11	2.36	-	-	-	-	-	-	-	-	2.47	3.21
		Waka Kotahi	-	-	0.12	2.45	-	-	-	-	-	-	-	-	2.57	3.34
Victoria Street	Implementation	Total	-	-	-	0.24	2.90	-	-	-	-	-	-	3.14	4.09	
		Hamilton City Council	-	-	-	0.12	1.42	-	-	-	-	-	-	-	1.54	2.00
		Waka Kotahi	-	-	-	0.12	1.48	-	-	-	-	-	-	-	1.60	2.08
Killarney Road	Implementation	Total	-	-	-	-	-	2.39	-	-	-	-	-	2.39	3.10	
		Hamilton City Council	-	-	-	-	-	-	1.17	-	-	-	-	-	1.17	1.52
		Waka Kotahi	-	-	-	-	-	-	1.22	-	-	-	-	-	1.22	1.58
Bader to Peacockes	Implementation	Total	-	-	-	-	-	1.19	-	-	-	-	-	1.19	1.55	
		Hamilton City Council	-	-	-	-	-	-	0.58	-	-	-	-	-	0.58	0.76
		Waka Kotahi	-	-	-	-	-	-	0.61	-	-	-	-	-	0.61	0.79
Nawton to City Centre	Implementation	Total	-	-	-	-	-	0.27	3.48	-	-	-	-	3.74	4.87	
		Hamilton City Council	-	-	-	-	-	-	0.13	1.70	-	-	-	-	1.83	2.38
		Waka Kotahi	-	-	-	-	-	-	0.14	1.77	-	-	-	-	1.91	2.48
Boundary Road	Implementation	Total	-	-	-	-	-	-	-	1.61	-	-	-	1.61	2.09	
		Hamilton City Council	-	-	-	-	-	-	-	-	0.79	-	-	-	0.79	1.02
		Waka Kotahi	-	-	-	-	-	-	-	-	0.82	-	-	-	0.82	1.07
Grey Street South	Implementation	Total	-	-	-	-	-	-	-	-	0.61	-	-	0.61	0.80	
		Hamilton City Council	-	-	-	-	-	-	-	-	-	0.30	-	-	0.30	0.39
		Waka Kotahi	-	-	-	-	-	-	-	-	-	0.31	-	-	0.31	0.41
Rototuna to Chartwell	Implementation	Total	-	-	-	-	-	-	-	-	-	1.45	-	1.45	1.88	
		Hamilton City Council	-	-	-	-	-	-	-	-	-	-	0.71	-	0.71	0.92
		Waka Kotahi	-	-	-	-	-	-	-	-	-	-	0.74	-	0.74	0.96
Responsive / opportunistic projects	Implementation	Total	-	-	-	6.85	7.19	7.55	7.93	8.33	8.74	9.18	-	55.79	72.52	
		Hamilton City Council	-	-	-	3.36	3.53	3.70	3.89	4.08	4.28	4.50	-	27.34	35.54	
		Waka Kotahi	-	-	-	3.49	3.67	3.85	4.05	4.25	4.46	4.68	-	28.45	36.99	
Area wide projects	Implementation	Total	-	-	-	5.05	5.30	5.57	5.84	6.14	6.44	6.77	-	41.11	53.44	
		Hamilton City Council	-	-	-	2.47	2.60	2.73	2.86	3.01	3.16	3.32	-	20.14	26.18	
		Waka Kotahi	-	-	-	2.57	2.70	2.84	2.98	3.13	3.29	3.45	-	20.96	27.25	
End of trip facilities	Implementation	Total	-	-	-	0.85	0.57	0.60	0.63	1.04	0.61	0.64	-	4.94	6.42	
		Hamilton City Council	-	-	-	0.42	0.28	0.29	0.31	0.51	0.30	0.32	-	2.42	3.15	
		Waka Kotahi	-	-	-	0.44	0.29	0.30	0.32	0.53	0.31	0.33	-	2.52	3.27	
Design guidelines	Implementation	Total	-	0.32	-	-	-	-	-	-	-	-	-	0.32	0.42	
		Hamilton City Council	-	0.16	-	-	-	-	-	-	-	-	-	-	0.16	0.21
		Waka Kotahi	-	0.17	-	-	-	-	-	-	-	-	-	-	0.17	0.21
Kick start pre-implementation	Pre-implementation	Total	-	0.43	0.46	-	-	-	-	-	-	-	-	0.89	1.16	
		Hamilton City Council	-	0.21	0.22	-	-	-	-	-	-	-	-	-	0.44	0.57
		Waka Kotahi	-	0.22	0.23	-	-	-	-	-	-	-	-	-	0.45	0.59
Business cases	SSBC	Total	-	-	-	-	-	-	-	0.73	0.77	0.81	-	2.30	2.99	
		Hamilton City Council	-	-	-	-	-	-	-	-	0.36	0.38	0.39	-	1.13	1.47
		Waka Kotahi	-	-	-	-	-	-	-	-	0.37	0.39	0.41	-	1.17	1.53
Programme management and delivery	Implementation	Total	-	-	-	0.12	0.13	0.13	0.14	0.15	0.15	0.16	-	0.98	1.27	
		Hamilton City Council	-	-	-	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08	-	0.48	0.62
		Waka Kotahi	-	-	-	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.08	-	0.50	0.65
Behaviour change activities	Implementation	Total	-	-	-	0.06	0.06	0.07	0.07	0.07	0.08	0.08	-	0.49	0.64	
		Hamilton City Council	-	-	-	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	-	0.24	0.31
		Waka Kotahi	-	-	-	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	-	0.25	0.32
Total Funding CAPEX	All	Total	-	0.76	0.69	17.98	16.16	17.76	18.09	18.06	17.41	19.09	-	125.99	163.79	
		Hamilton City Council	-	0.37	0.34	8.81	7.92	8.70	8.86	8.85	8.53	9.35	-	61.73	80.25	
		Waka Kotahi	-	0.39	0.35	9.17	8.24	9.06	9.23	9.21	8.88	9.74	-	64.25	83.53	

### 3.3.3. Maintenance and operating costs

Table 40 provides a breakdown of the maintenance and operating costs for the 10 year programme (not escalated). Items that do not qualify for FAR include programme management and delivery, and behaviour change staff, and non-infrastructure activities.

Table 40 shows that the 10 year programme maintenance and operating costs (not escalated) are expected to range between \$9.8m to 12.8m for the P50 and P95 respectively. This is split \$9.2m to 11.9m from HCC local share, and \$0.7m to 0.9m from the NLTF.

### 3.3.4. Escalated maintenance and operating costs

Table 41 shows the same cost information as Table 40, with escalation applied to costs at a rate of at 8% in year 2, 6% in year 3, and 5% thereafter.

Table 41 shows that the escalated 10 year programme maintenance and operating costs are expected to range between \$13.8m to 17.9m for the P50 and P95 respectively. This is split \$12.8 to 16.6m from HCC local share, and \$1m to 1.3m from the NLTF.

### 3.3.5. Cost range summary

Figure 38 shows the P50 to P95 cost ranges for the 10 year programme, both escalated and not escalated.

Figure 38 – 10 year programme cost range summary (\$m)

Costs	Source	2021 – 2031 cost range Not escalated		2021 – 2031 cost range Escalated	
		P50	P95	P50	P95
Capital costs	HCC	45	58	62	80
	Waka Kotahi	46	60	64	84
	Total	91	118	126	164
Maintenance and operating	HCC	9	13	13	17
	Waka Kotahi	1	1	1	1
	Total	10	13	14	18
Total costs	HCC	54	71	75	97
	Waka Kotahi	47	61	65	85
	Total	101	131	140	182

Table 40 – 10 year programme maintenance and operating costs (expected P50, not escalated \$m)

Project	Source	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2021 – 2031	
												P50	P95
Programme management and delivery	Total	-	-	0.44	0.59	0.59	0.59	0.59	0.59	0.59	0.59	4.57	5.94
	Hamilton City Council	-	-	0.44	0.59	0.59	0.59	0.59	0.59	0.59	0.59	4.57	5.94
	Waka Kotahi	-	-	-	-	-	-	-	-	-	-	-	-
Behaviour change activities	Total	-	-	-	0.26	0.38	0.38	0.38	0.38	0.38	0.38	2.54	3.30
	Hamilton City Council	-	-	-	0.26	0.38	0.38	0.38	0.38	0.38	0.38	2.54	3.30
	Waka Kotahi	-	-	-	-	-	-	-	-	-	-	-	-
Non-infrastructure activities	Total	-	-	-	0.20	0.20	0.20	0.20	0.20	0.20	0.20	1.40	1.82
	Hamilton City Council	-	-	-	0.20	0.20	0.20	0.20	0.20	0.20	0.20	1.40	1.82
	Waka Kotahi	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance	Total	-	-	-	-	0.07	0.13	0.20	0.26	0.31	0.36	1.33	1.73
	Hamilton City Council	-	-	-	-	0.03	0.06	0.10	0.13	0.15	0.18	0.65	0.85
	Waka Kotahi	-	-	-	-	0.04	0.07	0.10	0.13	0.16	0.18	0.68	0.88
Total Funding OPEX	Total	-	-	0.44	1.05	1.24	1.30	1.37	1.43	1.48	1.53	9.84	12.79
	Hamilton City Council	-	-	0.44	1.05	1.20	1.23	1.27	1.30	1.32	1.35	9.16	11.91
	Waka Kotahi	-	-	-	-	0.04	0.07	0.10	0.13	0.16	0.18	0.68	0.88

Table 41 – 10 year programme maintenance and operating costs (expected P50, escalated \$m)

Project	Source	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2021 – 2031	
												P50	P95
Programme management and delivery	Total	-	-	0.50	0.71	0.74	0.78	0.82	0.86	0.91	0.95	6.28	8.16
	Hamilton City Council	-	-	0.50	0.71	0.74	0.78	0.82	0.86	0.91	0.95	6.28	8.16
	Waka Kotahi	-	-	-	-	-	-	-	-	-	-	-	-
Behaviour change activities	Total	-	-	-	0.31	0.48	0.50	0.53	0.56	0.58	0.61	3.57	4.65
	Hamilton City Council	-	-	-	0.31	0.48	0.50	0.53	0.56	0.58	0.61	3.57	4.65
	Waka Kotahi	-	-	-	-	-	-	-	-	-	-	-	-
Non-infrastructure activities	Total	-	-	-	0.24	0.25	0.27	0.28	0.29	0.31	0.32	1.96	2.54
	Hamilton City Council	-	-	-	0.24	0.25	0.27	0.28	0.29	0.31	0.32	1.96	2.54
	Waka Kotahi	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance	Total	-	-	-	-	0.09	0.17	0.28	0.38	0.48	0.58	1.97	2.57
	Hamilton City Council	-	-	-	-	0.04	0.08	0.14	0.19	0.23	0.28	0.97	1.26
	Waka Kotahi	-	-	-	-	0.05	0.09	0.14	0.19	0.24	0.30	1.01	1.31
Total Funding OPEX	Total	-	-	0.50	1.26	1.57	1.72	1.91	2.09	2.27	2.46	13.78	17.92
	Hamilton City Council	-	-	0.50	1.26	1.52	1.63	1.76	1.90	2.03	2.17	12.78	16.61
	Waka Kotahi	-	-	-	-	0.05	0.09	0.14	0.19	0.24	0.30	1.01	1.31

## 4.0 COMMERCIAL CASE

This section outlines the proposed procurement arrangements for the implementation of the 10 year programme.

### 4.1. Procurement plan

The biking and micro-mobility programme is proposed as an ongoing programme to govern, manage, and deliver biking investment in Hamilton. The approach to implement the 10 year programme is based on an expansion of the Eastern Pathways programme delivery model, being a blended HCC-led multi-consultant delivery team. HCC propose to transition this to a city-wide delivery model to deliver the biking and micro-mobility programme.

A programme procurement plan will be developed by the Programme Manager once the programme structure has been established in 2023/24 to align with HCC procurement policies and processes. Project specific procurement plans will be developed for projects of appropriate size and scale within the programme by the project managers. Principles for delivery will be to maintain momentum in alignment with the community and their level of readiness, staging delivery to avoid excessive community disruption, and minimising impacts on the transport system from concurrent works being delivered in the same areas of Hamilton.

A key consideration for all procurement and delivery of works will be employing local resources where possible to maximise benefits to the local and regional community. This extends to employing locally based companies and encouraging contractors to employ and train local staff. Employing locally will build local market capacity, which is expected to deliver cost savings as the programme continues.

The programme procurement plan will leverage the existing procurement framework and processes HCC has in place to deliver biking and micro-mobility improvements in Hamilton. The approach outlined below will form the basis of the programme procurement plan, and will deliver value for money and ensure activities are delivered on time by:

- Alignment to HCC procurement and delivery policies and processes
- HCC staff managing all programme activities, regardless of how they are resourced at a project or delivery level
- Using the HCC Professional Services Panel for investigation and pre-implementation resources to help deliver if HCC staff are stretched. Panellists have already proven their skills and track record, submitted panel rates, and their capacity and availability can be tested when proposals are sought from panellists. Many panellists can access resources and specialists from around New Zealand if these services cannot be resourced locally
- Using the HCC minor works contractor for delivery of low cost / low risk projects <\$2m. This contract is currently being re-tendered, and therefore the contractor will have demonstrated their skills and track record, and submitted market tested unit rates ensuring value for money
- Using the HCC Infrastructure Alliance to deliver lower value projects related to maintenance and renewals work. Unit rates for works are included in the contract
- Packaging projects together where appropriate, and
- Leveraging works being done for other HCC programmes. For example coordinating construction of responsive and opportunistic biking and micro-mobility projects where pavement rehabilitations and reseals, or where underground utilities are already working in the corridor. Liaison between the programmes has already yielded savings, as noted in Section 2.10.4.



#### 4.1.1. Procurement approach

The broad approach to procurement for the 10 year programme is outlined in Table 42, which shows the proposed approach to procure professional services (investigation and pre-implementation), and implementation. HCC biking and micro-mobility programme staff will manage all programme activities, regardless of how they are resourced at a project or delivery level.

Table 42 – High level programme procurement approach

Investments	Professional Services	Implementation
Planned projects	HCC Professional Services Panel	Open tender for higher value projects >\$2m HCC minor works contractor for LCLR <\$2m HCC Infrastructure Alliance for low value projects related to maintenance and renewals
Responsive / opportunistic / area wide projects	HCC Professional Services Panel	HCC minor works contractor for LCLR <\$2m HCC Infrastructure Alliance for low value projects related to maintenance and renewals
End of trip facilities	HCC Professional Services Panel	Minor works for LCLR <\$2m HCC Infrastructure Alliance for low value projects
Behaviour change	HCC internal staff	HCC internal staff
Non-Infrastructure	HCC internal staff	HCC internal staff
Complementary activities	HCC internal staff	HCC internal staff
Business cases	HCC Professional Services Panel	Not applicable
Maintenance	Not applicable	HCC Infrastructure Alliance

Professional services for planned projects, responsive / opportunistic / area wide projects and end of trip facilities can be procured using the HCC Professional Services Panel where more resource is needed, and / or where HCC staff with the needed skills are not available. Open tenders are proposed for implementation of planned projects greater than \$2m, where appropriate and in alignment with HCC procurement processes. The HCC minor works contractor will be used for low cost / low risk investments <\$2m, and using the HCC Infrastructure Alliance for smaller value projects related to maintenance and renewals. This is largely the current practice for these kinds of biking and micro-mobility investments.

Behaviour change, non-infrastructure, and complementary activities will not be delivering infrastructure, and will be resourced and delivered internally by HCC staff as outlined in Section 4.5.1.

An allowance has been made late in the 10 year programme for unspecified business cases, to prepare for the next tranche of large projects beyond 2031 as necessary, using the HCC Professional Services Panel.

Maintenance and renewal activities will continue to be delivered by the HCC Infrastructure Alliance as they are now.

## 4.2. Consenting plan

This SSBC presents a 10 year investment programme in biking and micro-mobility based on a transitional approach to deliver safer biking facilities on corridors, by reallocating existing road space between the existing kerbs, or shared paths on the verges. Therefore, few effects requiring consents are expected for most projects as the works will largely be within the corridor designation. The programme can prioritise projects that do not require consents, or where achieving consents are not expected to be difficult to optimise delivery in the early years.

Consenting plans will be developed for projects of appropriate size and scale within the programme alongside the technical assessments, design and delivery of individual elements. The detail needed to develop consenting for individual projects has not been worked through at this early stage.

## 4.3. Property plan

As for consents, the 10 year programme has been based on the transitional approach using reallocation of existing road space, or shared paths within existing designations. As a result significant property purchase is not envisaged within the delivery programme.

## 4.4. Communications and engagement plan

A programme level communications and engagement plan will be prepared by the Transport Stakeholder Manager and Programme Manager to cover the broad approach to partner and stakeholder engagement in 2024/25. HCC, Waka Kotahi and Iwi will remain as project partners, and the key stakeholder groups summarised in Section 1.6 remain relevant to the ongoing nature of the biking and micro-mobility programme.

The programme communications and engagement plan will seek city wide social acceptance of biking and micro-mobility in the early years of the programme, by engaging residents in the need for change and why the status quo of car dominated travel in Hamilton cannot continue. This must happen in advance of changes starting on-street that may be viewed negatively by local people, such as the reallocation of road space away from private car, the removal of parking, speed limit reductions and access restrictions etc.

Project specific communications and engagement plans will be developed for projects of appropriate size and scale by the Transport Stakeholder Manager to align with the programme level communications and engagement plan.

Two Communications and Engagement Advisors will assist to deliver the communications and engagement activities to deliver behaviour change, planned projects and responsive / opportunistic / area wide projects as outlined in Section 2.13.

A summary of the engagement undertaken for this SSBC has been included in Section 2.6, with details included in Appendix D.

## 4.5. Required services

The successful planning and delivery of the biking and micro-mobility programme will require a range of services, including staff resources, programme delivery, and project services.

### 4.5.1. Staff resources

Seven new staff roles that are needed to deliver the additional investment for the 10 year biking and micro-mobility programme. These staff will need to be internally or externally recruited, ideally with knowledge of Hamilton's transport system so they have an appreciation for local conditions and challenges.

- Programme manager
- Project manager
- Programme assurance
- Project engineer
- Transport stakeholder manager, and
- Behaviour change advisor– two new roles

### 4.5.2. Programme delivery services

The programme will require a range of delivery services, including:

- Procurement – of services to support the investigation, design, and delivery of the programme
- Professional services – for investigation and design of biking and micro-mobility investments
- Contractors– to deliver physical projects, and
- Communications and engagement – to liaise with stakeholders and the community on the proposed projects, and those under construction.

### 4.5.3. Project services

Individual projects may need services for:

- Business case: Investigation, transport planning, cost estimation, economics, communications and engagement;
- Pre-implementation: Detailed design, communications and engagement, environmental compliance and consenting, geotechnical investigation, lwi consultation, project management, procurement;
- Implementation: MSQA, construction monitoring, project management; and
- Construction: Earthworks, drainage, pavements and surfacing, traffic services (signals and line-marking), lighting, services relocation, urban services renewals, landscaping, traffic management, project management.

## 4.6. Contract provisions

This SSBC presents a 10 year investment programme in biking and micro-mobility, and the detail needed to develop contract provisions for individual projects has not been worked through at this early stage.

## 5.0 MANAGEMENT CASE

This section describes the programme structure, governance and delivery arrangements for the successful delivery of the biking and micro-mobility programme, and to manage programme risks.

### 5.1. Governance arrangements and management structure

The biking and micro-mobility programme is proposed as an ongoing programme to govern, manage, and deliver biking investment in Hamilton. As described in earlier sections, this includes the 10 year investment programme, and the delivery of projects on separate funding pathways including School Link and the CBD to University Link.

#### 5.1.1. Structure development

A workshop was held with HCC and Waka Kotahi on 30 March 2022 to develop the management and governance framework for the delivery programme. This structure was based on:

1. Identifying key programme delivery risks
2. Activities and tasks to manage those risks, aligned to the size of the 10 year programme
3. What staffing requirements and programme roles are required to deliver
4. Reporting lines for programme staff and management of the programme, and
5. Governance of the programme, including reporting and escalation.

Appendix I includes a diagram outlining the workshoped logic between ongoing programme delivery risks > activities and tasks > programme roles > escalation / governance. This is based on the delivery risks identified at the workshop:

- Political / Social / Cultural / Public risk
- Cost management
- Benefits management
- Programme integration with other programmes, and
- Safety.

The logic shown in Appendix I resulted in the programme resourcing and delivery structure as shown in Figure 39.

### 5.2. Programme governance

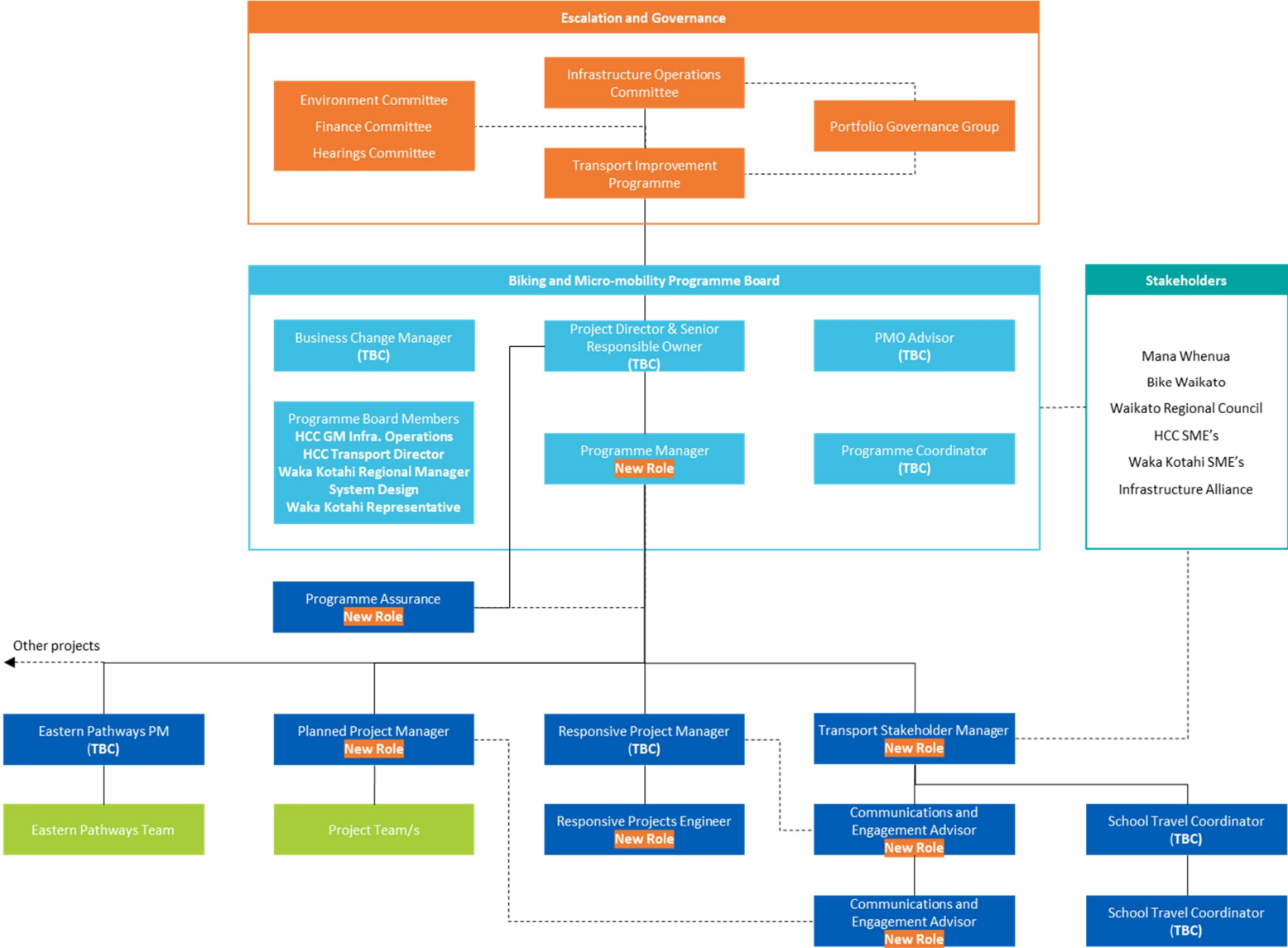
The biking and micro-mobility programme will be governed by a Programme Board as shown in Figure 39.

The Programme Director is the Senior Responsible Owner (SRO) and chair of the Programme Board which will report to the Transport Improvement Programme (Sponsoring Group), and ultimately the Infrastructure Operations Committee. Given the strong climate change links of the programme, it is likely that the Environment Committee will also need appropriate briefing as well as the Finance Committee and Hearings Committee on topics of interest.

The Programme Director will be supported on the Programme Board by a Programme Coordinator, a Programme Management Office (PMO) Advisor, and a Business Change Manager. A new Programme Manager will be responsible for the day-to-day leadership of the programme to ensure that the programme's projects deliver a set of benefits and outcomes. In line with the partnership approach, Waka Kotahi will be represented in the PSG by the Regional Manager System Design, and another nominated senior representative, joining the HCC General Manager Infrastructure Operations and HCC Transport Director.

Section 5.4 outlines the key roles and responsibilities for the biking and micro-mobility programme governance and management roles.

Figure 39 – Biking and micro-mobility programme delivery structure



### 5.2.1. Programme Director

The Programme Director and Senior Responsible Owner will be accountable for the successful delivery of the outcomes of the programme, including:

- Setting the programme strategy and plans
- Monitoring the programme's performance: namely, delivery of new capabilities and realisation of outcomes of benefit on a 'plan / do / review' loop
- Championing continuous improvement within the programme
- Engaging with other HCC staff and programmes to ensure that opportunities for co-delivery of micro-mobility are realised
- Guiding delivery of the design standards in 2022/23
- Ensuring engagement with the sponsoring group, and
- Making decisions regarding high-impact programme risks.

### 5.3. Continuous improvement and programme assurance

Continuous improvement in administering the programme is a key feature of the ongoing programme, and therefore an independent Programme Assurance role has been included in Figure 39, reporting to the Programme Director. This role will ensure that the data collection and monitoring of project level outcomes are measured, as well as being responsible for the benefit management of the overall programme. Initially this may be a part time role in the early years of the programme, although funding has been included for a full time role for budgetary purposes.

The Programme Assurance role will work with the Programme Director and Programme Manager to prepare a Benefits Management Plan in 2023/24, to make sure that programme and project outcomes are being measured and achieved. Where they are not achieved, future projects may need to be changed, scoped up or down, re-prioritised, or abandoned as necessary to maximise value and outcomes from the available funding envelope. Project and programme assurance activities are further outlined in Section 5.7.

### 5.4. Key role responsibilities

This section outlines the responsibilities for the biking and micro-mobility programme governance and management roles.

#### 5.4.1. Sponsoring Group

Governance group with delegated authority to govern and direct the programme:

- Ensuring alignment of the programme objectives with the strategic direction of the organisation
- Responsible for the scope of the programme investment
- Achieving the expected outcomes of the investment
- Setting overall programme priorities
- Reconciling conflicts between the programme's priorities and other programmes and with BAU
- Appointing the SRO and delegating decision-making authority to the SRO and programme board
- Monitoring progress against the programme objectives
- Being aware of the overall risk landscape of the programme and deciding how to act to keep exposure to risk within risk appetite, and
- Taking decisions to keep the programme on track, or to close.

#### 5.4.2. Senior Responsible Owner / Project Director

Chair of the Programme Board. Accountable for the successful delivery of the outcomes of the programme:

- Setting the programme strategy and plans
- Monitoring the programme's performance: namely, delivery of new capabilities and realisation of outcomes of benefit on a 'plan / do / review' loop
- Championing continuous improvement within the programme
- Engaging with other HCC staff and programmes to ensure that opportunities for co-delivery of micro-mobility are realised
- Guiding delivery of the design standards in 2022/23
- Ensuring engagement with the sponsoring group, and
- Making decisions regarding high-impact programme risks.

#### 5.4.3. Business Change Manager

Member of the Programme Board. Responsible for the successful day-to-day adoption of the new capabilities to support realisation of the outcomes of benefit:

- Agrees leading indicators to provide early information on the success of change activities
- Plans and delivers specific change activities
- Regularly solicits feedback from internal and external stakeholders, and
- Identifies risks and issues that relate specifically to the ability of the organisation to adopt changed ways of working on time.

#### 5.4.4. Programme Manager

Member of the Programme Board. Responsible for day-to-day leadership of the programme to ensure that the programme's projects deliver a set of benefits and outcomes:

- Defines and maintains an integrated programme delivery plan, monitors actual progress to date and forecasts progress in future tranches
- Defines and maintains a programme budget baseline, monitors actual expenditure to date and forecasts expenditure for future tranches
- Monitors and reports overall performance of the programme, including stakeholder engagement, risk management and benefits realisation
- Identifies and resolves programme-level issues
- Identifies and delegates project-level issues to the appropriate project manager, and
- Identifies and escalates organisational-level issues to the SRO.

#### 5.4.5. PMO Advisor

Member of the Programme Board. Provide assurance that the programme is operating in line with PMO policies and procedures:

- Accountable for providing or recommending assurance for the programme and projects at key points;
- Provide advice on programme management methodology, decision-making and change management;
- Support the Business Change Manager to monitor the benefits during and after project closure;
- Ensure that the programme is managed through Psoda;
- Advise on the Gate Review approval process for the programme and projects; and
- As part of the Programme Board, the PMO Manager/Advisor will approve Business Cases, Programme Management Plans, Change requests and Programme closure.

### 5.4.6. Programme Board

Members of the Programme Board. Govern the programme and ensure delivery against expected benefits:

- Is the governance board with delegated authority to drive delivery of the outcomes of the benefit within the defined constraints. Consists of a group of senior managers who are accountable to the sponsoring group (via the SRO). They are responsible for developing, implementing and maintaining the programme strategy
- Ensure the goals of the programme are aligned to the organisation’s strategic vision, and capital portfolio objectives and benefits
- Provide oversight and monitoring so programme benefits are planned, measured and achieved;
- Authorise or recommend appropriate funding and resources across the programme
- Monitor opportunities for savings and revenue across the programme
- Escalate risks and issues outside the members’ delegations to the Sponsoring Group
- Ensure engagement of key stakeholders and that stakeholder requirements are being met
- Is informed about project gate progression e.g. project management plans, business cases, procurement plans, project closure
- Approve or recommend escalated project changes
- Ensure appropriate project and programme risk and issue management, and
- Authorise Project Closure.

The terms of reference for the Programme Board are included in Appendix J for reference.

### 5.5. Delivery resources

Resourcing to deliver more than the current works programme is a significant issue for HCC, who are short staffed in a number of departments delivering the current Transport Improvement Programme. Figure 39 identifies seven new roles that are needed to deliver the additional investment for the 10 year biking and micro-mobility programme as shown in Table 43 , with their expected start year. These staff will need to be internally or externally recruited, ideally from Hamilton so they have an appreciation for local conditions.

Table 43 – Delivery resourcing and timing

Resource	NLTP	2021-24 NLTP			2024-27 NLTP		
	Financial year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
Programme manager	2023/24						
Programme assurance	2024/25						
Planned project manager	2023/24						
Responsive projects engineer	2023/24						
Transport stakeholder manager	2024/25						
Communications and engagement advisor – planned projects	2025/26						
Communications and engagement advisor – responsive projects	2023/24						



Delivery of physical projects is programmed to commence the first year of the 2024-27 NLTP, being year 4 of the programme, where most of the team will be in place. The Programme Manager and Planned Project Manager are expected to start early in 2023/24 to make sure projects will be ready for implementation to commence in the 2024/25 financial year.

The Communications and Engagement Advisor – Responsive Projects will also start in 2024/25 to commence Hamilton wide behaviour change education and promotion of biking and micro-mobility to build social licence from the public. The Communications and Engagement Advisor – Planned Projects will commence in 2025/26 once workload builds sufficiently to need two advisors.

Staffing costs have been included in the operational costs for the 10 year programme.

#### 5.5.1. Planned Project Manager

As shown in Figure 39, a new Planned Project Manager will lead project teams and be responsible for the delivery of planned corridor projects set out in Section 2.13.1:

- Hospital to City Centre
- Victoria Street
- Killarney Road
- Bader to Peacockes
- Nawton to City Centre
- Boundary Road
- Grey Street South, and
- Rototuna to Chartwell.

The Eastern Pathways programme will have its' own project manager which is being procured separately under its own funding stream, but the project will deliver from within the biking and micro-mobility programme structure.

#### 5.5.2. Responsive Projects Engineer

A new Responsive Projects Engineer will be the Responsive Project Manager with the delivery of responsive / opportunistic and area wide traffic management projects as set out Section 2.13.2. This role will also assist to deliver end of trip facilities as outlined in Section 2.13.4 as part of the programme.

#### 5.5.3. Transport Stakeholder Manager

The new Transport Stakeholder Manager will be responsible for coordinating all communications and engagement activities across the programme. This will broadly include

- Behaviour change: Hamilton wide education and promotion of biking and micro-mobility, including why mode shift is needed at a city scale to get social licence from the general public
- Planned projects: Pre-work to obtain social licence within the project area, and post-monitoring of satisfaction
- Responsive/ opportunistic / area wide projects: Identify projects from requests by the public, elected members, other HCC programmes including maintenance and renewals, and other opportunities. Manage any damage control from unpopular activities, projects and policies.

The Transport Stakeholder Manager will also be responsible for delivery of the e-bike borrow / subsidy schemes described in Section 2.13.10.

#### 5.5.4. Communications and Engagement Advisors

Two new Communications and Engagement Advisors are to be recruited and will be dedicated to the biking and micro-mobility programme. One to support the behaviour change and responsive / opportunistic / area wide projects communications and engagement activities, and the other to support planned project delivery as outlined in Section 5.5.3.

### 5.6. Stakeholder engagement plan

A programme level stakeholder engagement plan will be prepared by the Transport Stakeholder Manager and Programme Manager to cover the broad approach to stakeholder engagement in 2024/25 as summarised in Section 4.4. Detailed communications and engagement plans will be prepared for planned projects where appropriate to the size and scale of the project.

A summary of the engagement undertaken for this SSBC has been included in Section 2.6, with details included in Appendix D.

### 5.7. Benefits realisation management plan

As outlined in Section 5.3, continuous improvement is key feature of the ongoing biking and micro-mobility programme and will be led by the Programme Assurance role. Programme Assurance will prepare a Benefits Management Plan in 2023/24 to plan the measurement and achievement of outcomes for the ongoing programme.

Table 44 outlines the basis of the benefits realisation management plan for the overall biking and micro-mobility programme, including the methods and responsibilities for the reporting of benefits. Benefit monitoring will be at two levels, project level and programme level, and many KPIs will need to be measured at both levels as indicated in Table 44. Table 44 shows that KPI measures at a programme level have been based on existing sources of information that are continuously updated, and therefore no new data collection projects are needed to measure the effectiveness of the programme.

#### 5.7.1. Programme benefits realisation

Programme Assurance will monitor overall programme effectiveness and outcomes across all activities, to ensure that the programme elements are delivering the predicted outcomes and benefits, and value for money is being achieved.

Programme Assurance will:

- Develop interim KPI measure targets for the short and medium term aligning with the NLTP periods and the six year review cycle used for the RLTP, to identify early on if the programme is on track to deliver the longer term expected outcomes
- Identify surrogate measures to quantify interim targets if necessary
- Ensure that responsive opportunities to co-invest with other HCC ongoing programmes are identified in a timely manner, and realised through delivery as outlined in Section 2.13.2
- Review the procurement of services and contractors and how effective these were. Identify where improvements and efficiencies can be made for upcoming procurement
- Review the delivery and timeliness of programme activities and how effective these were. Identify where improvements and efficiencies can be made for upcoming project delivery
- Regularly review the programme risk register
- Monitor programme costs and budgets, identifying under and overspends, and where changes can be made for upcoming activities. Are contingency allowances sufficient?

Table 44 – Benefits realisation management plan

Benefit	KPI	Measure	Description	2031 Target	2050 Target	Responsibility for monitoring
Improved safety and perception of safety for micro-mobility users 30%	Improved safety 15%	1.1.3 Number of deaths and serious injuries	Number of deaths and serious injuries involving a cyclist or micro-mobility user, reported to Police, and accessed through the Waka Kotahi Crash Analysis System.	6 DSI's per annum	5 DSI's per annum	Programme Assurance
	Improved perception of safety 15%	2.1.1 Perception of safety and ease	Proportion of the coverage of the segregated biking network, out of the total Hamilton street network.	24% of network perceived as high safety	51% of network perceived as high safety	Programme Assurance
Increased micro-mobility access and use 50%	Improved micro-mobility mode share 25%	10.1.1 Number of users	Number of bike and micro-mobility users for journeys to work and education, from census data.	21,600 users	48,000 users	Programme Assurance (programme) Project Manager (project level)
		10.2.10 Mode share	Proportion of bike and micro-mobility users for journeys to work and education, from census data.	15% biking mode share	22% biking mode share	Programme Assurance
	Improved accessibility 25%	10.1.4 Proportion of network meeting target LoS	Proportion of the biking network at LOS A-B, out of the total Hamilton street network.	21% of network at LOS A-B	44% of network at LOS A-B	Programme Assurance
Improved health and environmental outcomes 20%	Improved health 10%	3.1.1 Physical health benefits from active modes	Number of additional 'new' bike and micro-mobility users for journeys to work and education as a result of this investment, from census data.	15,700 'new' users in 2031	37,000 'new' users in 2050	Programme Assurance (programme) Project Manager (project level)
	Reduced emissions 10%	8.1.1 Decrease CO <sub>2</sub> emissions	Tonnes of CO <sub>2</sub> from motor transport, estimated from the number of new biking and micro-mobility users.	128k tonnes of CO <sub>2</sub> from motor transport per annum	133k tonnes of CO <sub>2</sub> from motor transport per annum	Programme Assurance (programme) Project Manager (project level)
		8.1.2 Mode shift from private vehicle	Vehicle Kilometres Travelled (VKT) by private vehicles on the Hamilton, street network from the Waikato Regional Transport Model.	490m private vehicle VKT	581m private vehicle VKT	Programme Assurance (programme) Project Manager (project level)

- Monitor public sentiment in Hamilton on biking and micro-mobility. Where are we getting public pressure where are we not? What is the secret behind those projects that have an easy path to delivery and are viewed favourably, versus those that are not?
- Review the user experience, facility quality and delivery standards for completed projects. What is working well for bikers and what could have been better? What to motorists think could have been done differently or improved?

Key questions Programme Assurance need to ask at a programme level are:

- Did the projects work as planned?
- Are we missing opportunities?
- What is not working?
- Do we need to change future projects or the overall programme in response? and
- Are we achieving what we set out to achieve?

### 5.7.2. Project benefits realisation

At a project level, the Programme Assurance will need to ensure the effectiveness of each project is being monitored to inform the programme level monitoring as summarised in Section 5.7.1. This includes before and after monitoring of:

- Safety and the perceived safety of projects
- Biking and micro-mobility ridership through biking and traffic counts:
  - Before construction
  - Two months after opening
  - One year after opening, and
  - Five years after opening.
- VKT estimates
- Estimates of CO<sub>2</sub> emissions (calculated from VKT)
- Biking facility quality and delivery quality
- User experience and satisfaction
- Public sentiment, i.e. was this project considered successful or not and why?
- Experience of affected parties including motorists, and
- Cost estimates versus outturn costs.

Monitoring at a project level is key to ensure that lessons are learned and the programme is successful. Lessons from where projects work well / do not work well can be used to shape future projects, particularly for transitional treatments as predicting how successful these will be at encouraging increased biking and micro-mobility use has not been well evidenced.

## 5.8. Risk management

Table 45 summarises the key risks for the approval and delivery of the biking and micro-mobility programme.

Table 45 – Key risks

Main risks	Current risk level	Mitigation strategy	Residual risk level
IF the programme exceeds available Waka Kotahi and / or HCC funding, THEN this may lead to delay or abandonment of the investment programme.	Very high	Stage programme over time. Match first decade to draft LTP funding. Engage with Waka Kotahi. Actively seek alternative funding sources.	Medium
IF project scope is increased to benefit other modes or opportunities beyond biking, THEN this may lead to delays or abandonment of projects, reductions in scope and outcomes / benefits.	Very high	Aligning with the renewals and maintenance activities. Being clear that this funding only relates to biking and micro-mobility investment, but there are opportunities for efficiencies with other planned investments and programmes.	Medium
IF the 'transitional' approach to delivery is not as effective as traditional approaches, THEN this may lead to reductions in scope and outcomes / benefits.	Very high	Sensitivity testing of the economic evaluation. Ongoing programme approach has monitoring and assurance activities to ensure that outcomes are achieved, and where they are not the programme can change to better achieve planned outcomes.	Medium
IF Waka Kotahi or HCC do not support the outcomes of the business case, THEN this may lead to delays in funding approvals and resulting implementation.	High	Early and consistent updates with Waka Kotahi throughout the business case, seeking 'incremental approval'.	Medium
IF the method used to estimate costs results in underestimation, THEN this may lead to delays or abandonment of projects, reductions in scope and outcomes / benefits.	High	Baselining against previously completed projects. Allowance for 40% contingency and 30% funding risk in cost estimates. Peer reviewed.	Medium
IF currently supportive people for the programme are affected by localised project impacts, THEN this may lead to delays or abandonment of projects, reductions in scope and outcomes / benefits.	High	All communications and engagement will be aimed at as broad a range of the community as possible – not just cycling advocates. Avoid language that positions this as tribal, i.e. cyclists, drivers, and messaging will emphasise benefits of options to all road users, not just direct users.	Medium
IF the forecast numbers of biking and micro-mobility users are not achieved, THEN this may lead to reductions in scope and outcomes / benefits	High	Sensitivity testing of the economic evaluation. Ongoing programme approach has monitoring and assurance activities to ensure that outcomes are achieved, and where they are not the programme can change to better achieve planned outcomes.	Medium

The risk register is included in Appendix K for reference. Table 45 shows that there are considerable risks around funding and approvals that will need to be actively managed throughout the Biking and Micro-mobility programme.

On programme initiation, the Biking and Micro-mobility Programme Manager will facilitate a risk workshop and prepare a programme risk register to be maintained for the duration of the programme in accordance with HCC risk management framework (D-2729329, July 2020). This will be integrated with HCC's project management systems using Psoda.

## 5.9. Programme assurance arrangements

This section briefly describes the assurance tools to ensure delivery of the 10 year biking and micro-mobility programme and that investment objectives are met.

### 5.9.1. Quality assurance

HCC standard project and programme management practices, assurance and acceptance, cost management and approval procedures will be applied implementing the programme.

### 5.9.2. Programme assurance

As outlined in Sections 5.3 and 5.7, continuous improvement is key feature of the ongoing biking and micro-mobility programme and will be led by the new Programme Assurance role.

### 5.9.3. Peer review

WSP was commissioned by HCC to peer review this SSBC, including review of the cost estimates and economic evaluation.

The central issues raised by WSP related to the demand forecasting, and the effectiveness of the transitional approach, both of which may affect the economics and outcomes from the biking and micro-mobility programme. These items have been included in Table 45 as risks which have been managed through sensitivity testing (Section 2.15.4), and the monitoring and assurance activities proposed as part of the ongoing programme approach outlined in the Management Case (Section 5.0).

In summary, WSP concluded:

*“Overall, the business case provides a credible case for investment in biking and micro-mobility in Hamilton and strongly aligns with GPS objectives. The transitional approach will provide a more affordable approach for the network to be implemented over time. Accordingly, the peer review recommends that the SSBC is suitable to progress to IQA assessment for Waka Kotahi endorsement.” WSP Peer Review*

The peer review report is included in Appendix L for reference.

### 5.9.4. Parallel cost estimates

A parallel estimate has not been developed for the biking and micro-mobility programme. The high-level cost estimates presented were based on the Waka Kotahi *Cycle Facility Conceptual Cost Estimation Tool (v04 Sept 2020)*, incorporating unit rates from previous projects delivered, and benchmarked against other completed projects. P50 expected estimates included a contingency allowance of 40% over the base estimates, and 95<sup>th</sup> percentile estimates include a further 30% allowance for funding risk to give investors' confidence.

Parallel estimates will be performed as part of the appropriate future phases for the larger infrastructure corridors and intersection elements, where these exceed the cost triggers for a parallel estimate, or where the Programme Manager considers it necessary as risk mitigation for challenging projects.

#### 5.9.5. Road safety audit

A road safety audit has not been performed on the biking and micro-mobility programme, given the programme does not include designs.

A safety audit will be needed on the proposed Design Guidelines and Transitional Guidelines, to ensure that the proposed palette will prioritise safety for people on bikes, and all road users.

Safety audits for projects will be undertaken at the appropriate design and implementation phases for all infrastructure construction projects. This will be as part of the appropriate business case phases for the larger infrastructure corridors and intersection elements.

## NEXT STEPS

It is recommended that Hamilton City Council and the Waka Kotahi Board:

1. Endorse the *Connected Neighbourhoods* vision “I can go anywhere on my bike”
2. Endorse the Strategic Network Plan as shown in Figure 13
3. Endorse the establishment of the biking and micro-mobility programme as an ongoing programme with the governance and management arrangements, and delivery structure as described in Section 5.0
4. Endorse the 10 year biking and micro-mobility programme for the purpose of informing the 2024-27 NLTP as described in Section 2.13, and costs as summarised in Section 3.0
5. Approve \$1.9m of funding in the 2021-24 NLTP to kick start the biking and micro-mobility programme ready for delivery in the 2024-27 NLTP as shown in Table 46

Table 46 – Biking and micro-mobility programme funding for 2021-2027 (\$m)

Component	2021 /2022	2022 /2023	2023 /2024	NLTP 2021-24	2024 /2025	2025 /2026	2026 /2027	NLTP 2024-27	Total
Capital P50	-	0.7	0.6	1.3	14.9	12.8	13.4	41.1	42.4
Maintenance and operating	-	-	0.6	0.6	1.0	1.2	1.3	3.5	4.1
Total	0.0	0.7	1.2	1.9	16.0	14.0	14.7	44.7	46.6



# APPENDIX A

## National and regional policy alignment

## National and regional policy alignment

Document	Intent	Relevance to this project
National scale documents		
MOT Transport Outcomes Framework	<p>To improve our wellbeing and liveability, transport needs to make a positive contribution across the 5 core outcomes.</p> <ul style="list-style-type: none"> <li>• Inclusive access</li> <li>• Healthy and safe people</li> <li>• Economic prosperity</li> <li>• Environmental sustainability</li> <li>• Resilience and security</li> </ul>	<i>Active modes contribute to all core outcomes. Infrastructure needs to allow for a wide range of ages and abilities and forms of bikes and micro-mobility; separated cycling facilities will improve safety and mode shift outcomes.</i>
GPS on Land Transport (2021)	<p>Sets out the Government's strategic direction for the land transport system over the next 10 years. Strategic priorities include:</p> <ul style="list-style-type: none"> <li>• Safety – developing a transport system where no-one is killed or seriously injured</li> <li>• Better travel options – providing people with better transport options to access social and economic opportunities</li> <li>• Climate Change – developing a low carbon transport system</li> </ul>	<i>The GPS on Land Transport encourages activities to improve uptake of safe biking and micro-mobility use in support of all three of these objectives.</i>
Keeping Cities Moving	<p>Waka Kotahi's plan to improve travel choice and reduce car dependency to increase the wellbeing of New Zealand's cities. One way to achieve this is by making active modes more attractive.</p>	<i>Improved travel choice involves optimising the existing system, investment in new infrastructure and services, and providing better connections between shared and active modes.</i>
Climate Change Response (Zero Carbon amendment Act)	<p>The Government has committed to reaching Net Zero emissions of long-lived gases by 2050. Making biking easier with good cycleways is an element of the draft advice and evidence reports from the Climate Change Commission. There needs to be much more walking, cycling and use of public and shared transport.</p>	<i>Investing in making walking and cycling easier with good cycleways and footpaths aligns with intent of Net Zero by 2050. Investment Objective 3 around greenhouse gas reduction represents this.</i>
Arataki – Version 2	<p>Identifies changes in existing responses that Waka Kotahi considers are needed to deliver on the government's current direction and long-term outcomes for the land transport system. Transforming urban mobility is identified as a needed step change, meaning a growing share of travel by public transport, walking, and cycling.</p>	<i>Make active modes of transport more attractive by improving the quality, quantity and performance of cycling facilities so more people use them. The Waikato Regional Summary supports separated facilities for cycling.</i>
Road to Zero: New Zealand's road safety strategy 2020–2030	<p>Road to Zero vision is "a New Zealand where no one is killed or seriously injured in road crashes". It is based on Vision Zero and sets out a target to target to reduce road user death and serious injuries by 40% by 2030.</p>	<i>Biking and micro-mobility programme needs to result in safety improvements.</i>

Document	Intent	Relevance to this project
Urban Growth Agenda	Remove barriers to the supply of land and infrastructure and make room for cities to grow up and out. This is supported by wider objectives to improve choices for location and type of housing, improve access to opportunities, assist emission reductions, and enable quality urban environments without unnecessary urban sprawl.	<i>An improved biking and micro-mobility mode share will help achieve the wider objectives. Noted emphasis on connecting people with opportunities and enabling quality compact urban form.</i>
NPS-Urban Development 2020	Identifies policies to support well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future. Encourages greater urban intensification in areas with higher accessibility or demand. Removes the use of minimum carparking requirements, except for accessible carparks, in District Plans.	<i>Biking and micro-mobility will be increasingly important to supporting well-functioning urban environments. Removal of car parking minimums could support mode shift outcomes over time. Focus is towards central city intensification within walkable catchment.</i>
Regional scale documents		
Future Proof Strategy: Planning for Growth (2017)	A 30-year growth management and implementation plan specific to the Hamilton, Waipa and Waikato sub-region. Notes a growth target of 50% infill for Hamilton. Improved opportunities for cycling are desired and support for implementing Access Hamilton is an action.	<i>Hamilton City will continue to intensify, and biking and micro-mobility are part of the intended urban mobility solution to support this growth.</i>
Hamilton-Auckland Corridor Plan & Implementation Programme	This plan develops an integrated spatial plan and establishes an ongoing growth management partnership. It outlines key housing, employment, social, environmental and network infrastructure priorities for the corridor over the next 30 years to successfully accommodate growth and address levels of service, remedial or renewal needs.	<i>Transport choice is a noted problem and an active mode network is a key enabler of aspirations for the Hamilton-Waikato metropolitan area.</i>
Hamilton-Waikato Metropolitan Spatial Plan	The Hamilton Waikato Metropolitan Spatial Plan (MSP) is a vision and framework for how Hamilton City and the neighbouring communities within Waipā and Waikato districts will grow and develop over the next 100+ years creating one of the most liveable places in New Zealand. Six transformational moves are noted, including 'a radical transport shift' and 'a vibrant metro core and lively metropolitan centres'.	<i>More biking and micro-mobility will support the intended transport shift and sought-after health outcomes. A success indicator is increasing cycling trips, and decreasing vehicle kilometres travelled.</i>
Hamilton-Waikato - Waka Kotahi Mode Shift Plan	This mode shift plan supplements the Urban Growth Agenda, and long-term transport and spatial planning. Spatial planning confirms the need to use appropriate public transport and walking/cycling investment to deliver affordable growth in employment and housing. Actions to: <ul style="list-style-type: none"> <li>• Deliver micro-mobility business cases in Hamilton which will determine key routes and desired future primary, secondary, and supporting networks.</li> <li>• Deliver the University and School Link projects</li> </ul>	<i>Identifies there are lots of short trips that can move to active modes. For cycling the key barrier to mode shift is safety. Focusing on schools trips can encourage wider mode shift.</i>

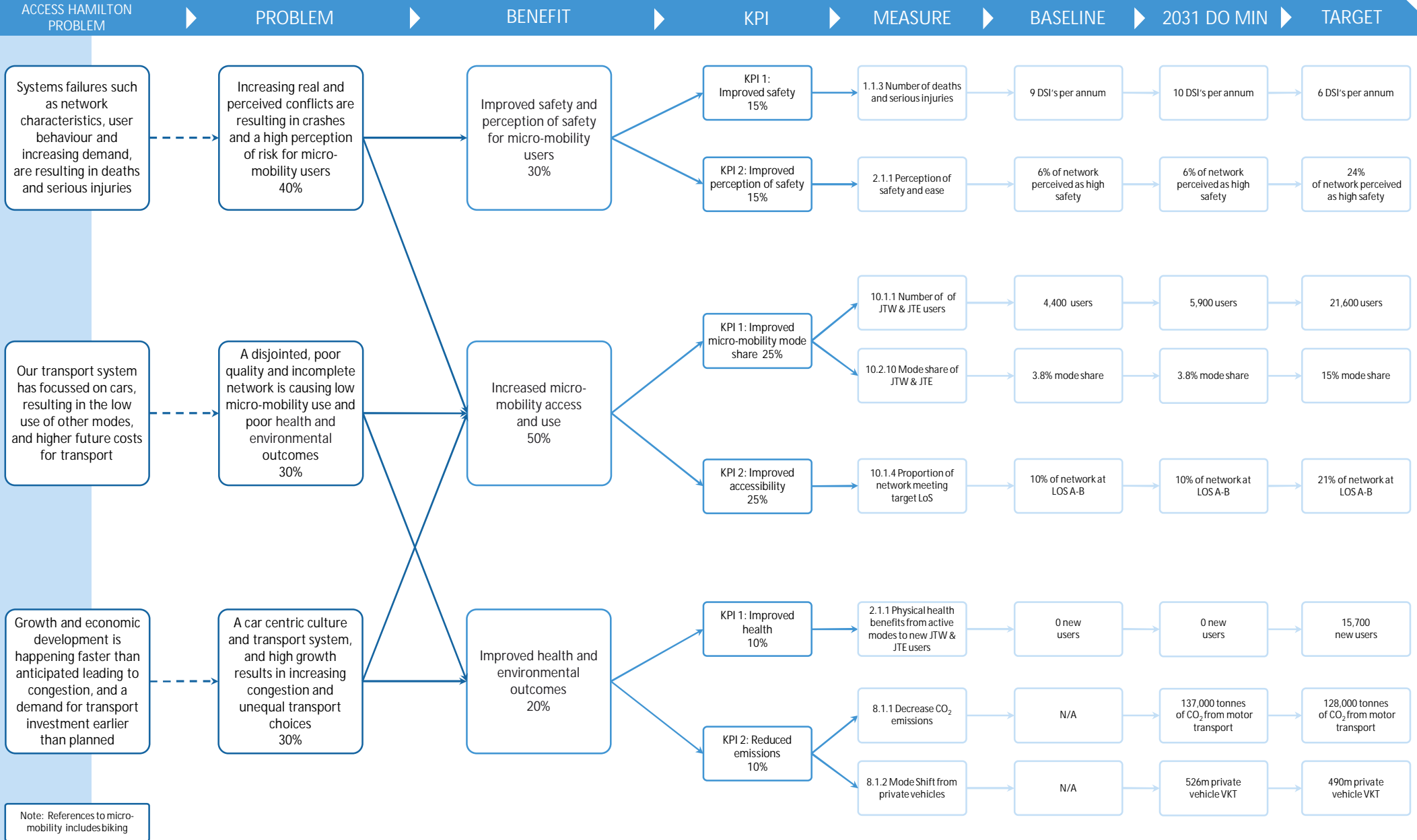
Document	Intent	Relevance to this project
Draft Regional Land Transport Strategy 2021-2051	Set out the policy framework and transport programme for land transport in the Waikato region. A target is that year on year, trips per capita by active modes significantly increase while trips per capita by private motor vehicles decrease. A priority is growing inter-connected cycle, micro-mobility and accessible pedestrian networks in urban areas.	<i>Mode shift is a noted priority for the Hamilton area</i>
Tai Timu, Tai Pari, Taiao Waikato Tainui Environmental Plan	Develop and manage transportation infrastructure to provide for social, cultural, spiritual, economic, and environmental needs. Sustainable transport options should be incorporated into subdivisions and developments including options for public transport, carpooling, walking, and cycling.	<i>The benefits of active modes support the intended management approach for transportation infrastructure</i>
Ngaati Haua Environmental Management Plan	Identifies a need to manage the potential effects of urban development and improve air quality, including reducing reliance on motor vehicles.	<i>Air quality and mode shift are important indicators.</i>

# APPENDIX B

## Investment Logic Map

# Maximising biking and micro-mobility in Hamilton

## INVESTMENT LOGIC MAP & BENEFIT MANAGEMENT PLAN



Note: References to micro-mobility includes biking

# APPENDIX C

## Option generation and assessment

7 June 2022

Martin Parkes  
(via email)

## Biking & Micro-mobility Business Case - Appendix C Options Generation & Assessment

### 1.0 Do Minimum

The Do Minimum forms the basis for comparison of the options in this section, and assumes that travel in Hamilton continues to be car dominated in the future as it is now. No new biking and micro-mobility facilities are introduced beyond those completed to date, existing infrastructure is maintained at current levels, non-infrastructure programmes such as school education and travel plan programmes continue as they currently do, low cost / low risk programmes continue at current levels, and no additional funding is sought or granted.

The Eastern Pathways School Link (funding approved) and CBD to University Link (SSBC in development) projects are on separate fundings pathways to this SSBC. While they have not been constructed yet, for the options assessment these projects are assumed to be part of the Do Minimum, because they are not included in the costs, benefits, and outcomes attributed to the investment sought from this SSBC.

These projects include:

- Eastern Pathways School Link Corridor (funding approved)
  - Peachgrove Road and Hukanui Road from Clyde Street to Wairere Drive
- Eastern Pathways City Centre to University Corridor (SSBC in development)
  - Central City active modes bridge connection
  - The preferred biking & micro-mobility corridor via Grey Street, Cook Street and Knighton Road
- Eastern Pathways Biking Connections (funding approved)
  - Ruakura to City Centre via Te Aroha Street, Ruakura Road, and Claudelands Road, and
  - Crosby Road from Hukanui Road to Wairere Drive.

### 2.0 Long list options identification

The ILM suggested that both infrastructure and other investments were needed to achieve the investment outcomes stakeholders want from this programme, and therefore we needed to cast a wide net to consider all the possible responses to achieve the potential benefits.

Two approaches were used to identify the long list of alternatives and options, 'bottom up' and 'top down'.

'Bottom up' ideas were collated from a variety of sources of information, including proposed projects, customer complaints, Bike Waikato activities, and previous stakeholder engagement as shown in Table 1.

**Table 1 – Information sources used in developing the long list options**

Source	Details
Proposed projects	Proposed projects from the <i>Hamilton Biking Plan 2015</i> .
	"Ungap the map": list of ideas and spatial suggestions developed by Bike Waikato for new infrastructure, facility enhancements, safety improvements, maintenance improvements and policy changes.
	Bridges that have been identified for cycling improvements through Access Hamilton and new bridges that have been identified through the LTP process and other business cases.
	Proposed projects and ideas from the Mode Shift Plan.
	Proposed improvements and ideas from the <i>Safe ways to school Hukanui Road – Community Insight Report</i> .



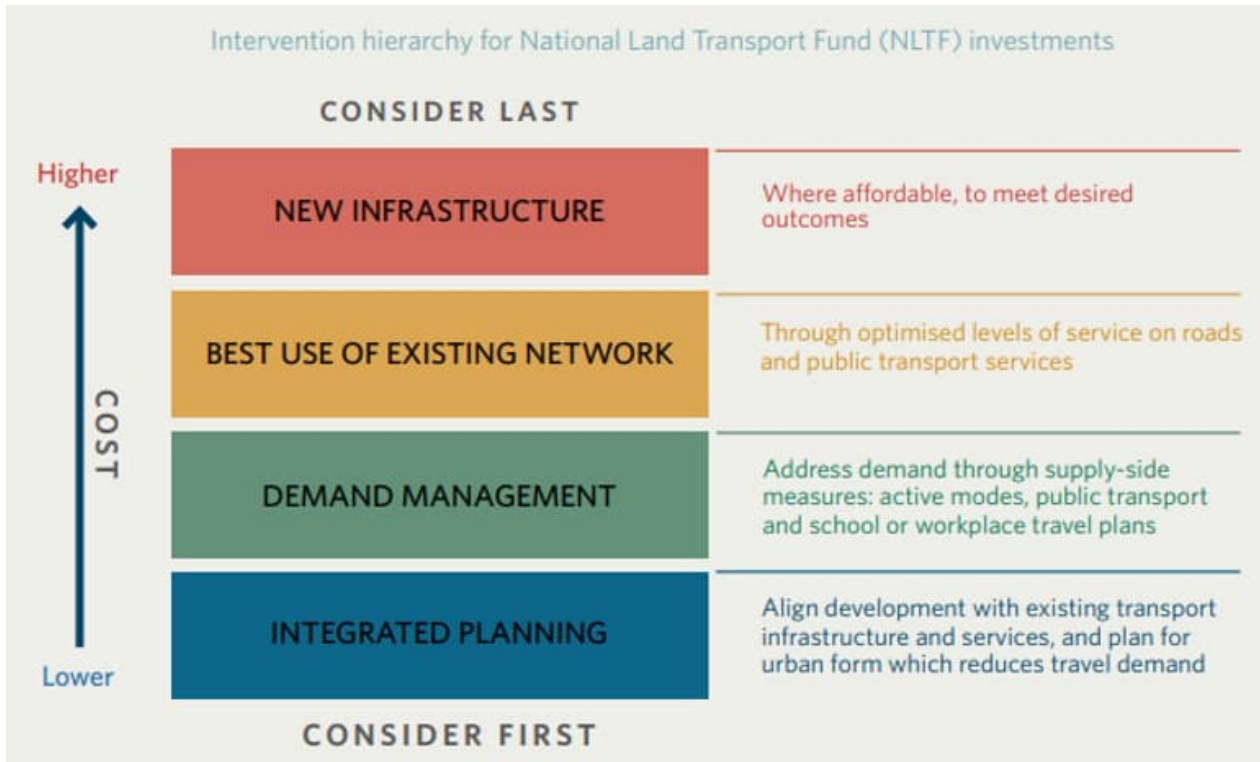
Source	Details
Complaints	Customer complaints and requests for cycling related network improvements and policy changes drawn from HCC's records.
	Emails from residents or agencies to councillors with suggestions for new and improved cycling infrastructure.
	Emails from residents or agencies to HCC technical staff with complaints about poor facilities and requests for improvements.
Bike Waikato activities	Bike Waikato Key Priorities February 2020.
	Discussions with Bike Waikato about existing and desired initiatives in the city.
Level of service assessment	A level of service assessment of existing cycling facilities was undertaken to determine which parts of the network need improvements to achieve the benefits sought by the business case.
User group needs	Waka Kotahi's Attitudes and Perceptions of Cycling and Walking information for Hamilton on user groups for biking and key barrier and motivators. <sup>1</sup>
Long list stakeholder drop-in sessions	Long-list stakeholder drop-in sessions were held June 24 and 25 2020. The purpose of these sessions was to validate the scope of the longlist. Invited attendees were asked what it would take to get them (or the people they represent) onto their bikes and e-scooters more often, and to define changes needed to make these modes of transport more attractive. More than 105 unique ideas were provided from attendees.

The ideas from Table 1 were categorised into more generalised options, grouped into alternatives and then aligned with the Intervention Hierarchy headings as shown in Figure 1 using the following logic.



<sup>1</sup> NZ Transport Agency (2018) *Understanding Attitudes and Perceptions for Walking and Cycling*, <https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/NZTA-Attitudes-to-cycling-and-walking-final-report-2018.pdf>

Figure 1 – NLTF Intervention hierarchy



The experience of the project team was used 'top down' to make sure all logical alternatives and options were included in the final list of options for assessment. This was reviewed and confirmed at the long list workshop on 27 July 2020.

### 3.0 Long list assessment

A long list assessment workshop was held with representatives from HCC and Waka Kotahi on 27 July 2020. The aim of this assessment was to establish a 'toolkit' of the most effective and complementary option treatments to develop the short list programme options. A 'fast-fail' approach using the Investment Objectives and Critical Success Factors were employed to assess the options as shown in Table 2.

Two critical success factors were used:

- **Consistency with Access Hamilton** – to ensure that the programme did not contradict the direction and outcomes sought from Access Hamilton PBC as the 'parent' business case, and
- **Within scope of the business case** – to ensure that the options were able to be influenced by this programme (e.g. redefining the future urban form of Hamilton was not within the scope of this investment).

Stakeholders were divided into three groups who separately scored the options against the Investment Objectives using a four-point scale:

0 - Neutral	1 - Minor positive	2 - Positive	3 - Major positive
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Stakeholders also assessed options against the critical success factors on a pass / fail basis.

The results from the stakeholder groups were combined into an overall assessment by the project team as shown in Table 2. Table 2 shows which options stakeholders considered would be most effective in achieving the investment outcomes, to inform the development of the short list.

Seven options were discounted from further consideration, mainly because the changes needed to implement the options were outside the scope of this project, or outside of the ability of HCC to control.

Activities that are key to the success of the biking and micro-mobility programme, but are outside of scope for this single mode SSBC, include:

- Parking management policy
- Urban form and land use / transport integration
- District Plan changes to enable intensified urban form
- Road pricing and congestion charging, and
- Vehicle and fuel taxes.

These measures are fundamental for encouraging mode shift to biking and micro-mobility in Hamilton, making the most of the proposed infrastructure investments, and decreasing reliance on private cars.

Table 2 – Long list option assessment

Intervention Hierarchy	Alternatives	Options	Investment Objectives			Critical Success Factors		Proceed to short list
			Improve safety	Mode share	Health and environment	Consistent with Access Hamilton	Inside scope?	
Integrated planning	Land use	Urban form – changes to the urban form and land use to increase densities and encourage shorter trips by walking and cycling	1	3	2	Yes	No	No
	Monitoring	Monitoring – improved monitoring facilities and activities to gauge efficiency of infrastructure being rolled out	0	1	0	Yes	Yes	Yes
	Strategy	Network planning – this business case and other strategic planning activities aimed at improving modal choice and shift	2	3	2	Yes	Yes	No*
		Transport / Land use Integration – i.e. changes to District Plan/RPS to support integration between land use and transport (active and public transport)	2	3	2	Yes	No	No
	Policy	Design standards / Guidelines – development/adoption of cycling specific design guidelines	2	2	2	Yes	Yes	Yes
		District plan – removal of minimum parking standards, NPS UD, amend district provisions to require developments to provide end of trip facilities / parking	2	2	1	Yes	No	No
Demand management	Regulation	By-law / restrictions – i.e., making the city centre a car free environment	3	3	2	Yes	Yes	Yes
		Law Amendments- banning of cars, internal combustion engine cars etc.	3	3	2	No	No	No
	Education	Educational programmes - Education programme for drivers and other road users on sharing the road with cyclists, Education programme for school children on cycling	2	2	2	Yes	Yes	Yes
		Community events – promotional events such as 'bike to work day' to elevate the profile of cyclists and cycling as a mode	1	1	1	Yes	Yes	Yes
	Policy	Parking – parking strategy/policy. Removal of parking to make car travel less attractive and to reallocate space to walking/cycling	1	3	2	Yes	Yes	Yes
		Road pricing – congestion charging	3	3	3	Yes	No	No
		Speed management – reduced speeds limits to discourage traffic and make cycling safer and more attractive	3	3	2	Yes	Yes	Yes
		Vehicle and fuel tax – increase costs of owning and driving vehicles to make cycling a relatively more attractive mode of transport	0	3	2	Yes	No	No
		Mode integration – provision of facilities to enable people to take their bikes and scooters on buses. Parking and bus hubs.	1	2	1	Yes	Yes	Yes
	Finance	Finance - Support/ policy for workplace purchase scheme for bikes/ scooters	0	2	1	Yes	Yes	Yes
	Support	Staff – increased staff numbers within council to deliver mode shift activities	1	2	1	Yes	Yes	Yes

Intervention Hierarchy	Alternatives	Options	Investment Objectives			Critical Success Factors		Proceed to short list
			Improve safety	Mode share	Health and environment	Consistent with Access Hamilton	Inside scope?	
Best use of existing network	Enhancement / modification	Intersection improvements – redesign of intersections to make it safer and more convenient for cyclists.	3	3	0	Yes	Yes	Yes
		Lighting – improved lightning to make cyclists more visible during dark hours	2	1	0	Yes	Yes	Yes
		Crossings – improved and more frequent crossing opportunities for walking and cycling across major roads	3	3	0	Yes	Yes	Yes
		Traffic calming / speed segregation - Provide traffic calming measures on road network to slow vehicle speeds	3	3	1	Yes	Yes	Yes
		Wayfinding information / journey planning – physical signage to support users to locate the best route to their destination. Can be complemented with online or phone application support / journey planning	1	2	0	Yes	Yes	Yes
		Space reallocation – taking away of space from parking and lanes and reallocating it to bike lanes or shared paths	3	3	1	Yes	Yes	Yes
		User experience (character & amenity) – streetscape improvements to make the journey / environment more visually appealing and attractive to users	0	2	1	Yes	Yes	Yes
	Maintenance	Maintenance – repaint cycle lanes, road markings, more regular sweeping and patching.	2	2	1	Yes	Yes	Yes
		Renewals – Ensuring cycle facilities have smooth service and high level of service	2	2	1	Yes	Yes	Yes
	New Infrastructure	Infrastructure	Biking alignments / corridors – separate facilities for biking and micro-mobility only. Not necessarily on existing road alignments	3	3	3	Yes	Yes
River / gully crossings – new crossings over the river, gullies and other physical barriers such as the rail			3	3	3	Yes	Yes	Yes
End of trip facilities – bike parking facilities, e-bike/scooter charging facilities, bike repair stations, secure parking facilities			1	3	1	Yes	Yes	Yes
Recreational / fun facilities – off-road bike tracks and circuits, i.e. pump tracks for more advanced users			1	1	2	Yes	Yes	Yes
Surveillance & security – improved crime prevention through environment design, active and passive surveillance, CCTV cameras, lighting etc.			2	1	0	Yes	Yes	Yes

\* Network planning represents the development of a strategic network plan for Biking and Micro-mobility, as part of this SSBC.

### 4.0 Short list options

After assessing the options at the long list workshop on 27 July 2020, workshop participants discussed ideas for how different programme ‘themes’ might be developed to achieve the investment outcomes. Using the most effective options from the long list assessment in Table 2, these ideas were developed into five short list options (and the Do minimum), as summarised in

Table 3.

Descriptions of how each short list option may impact a user are outlined below.

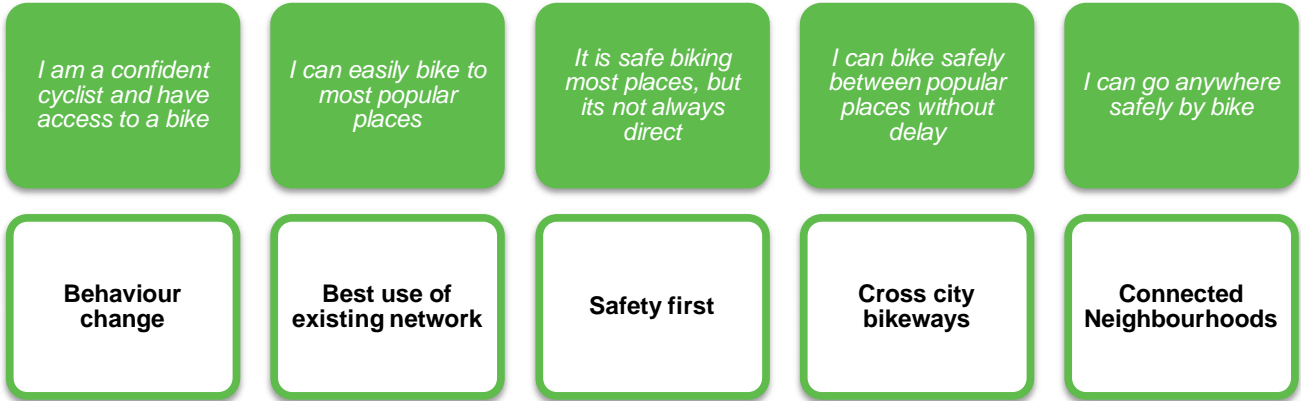
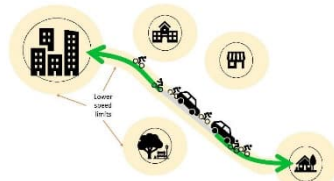

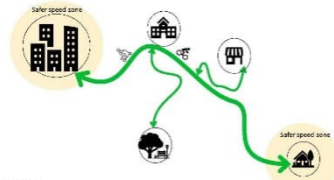
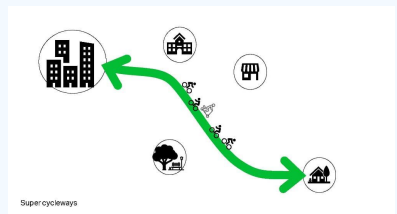
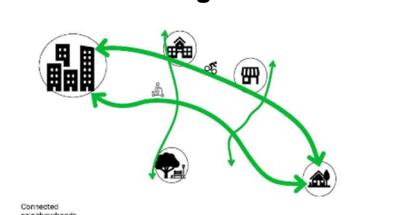


Table 3 – Short list option descriptions

Approach	Description
<b>Do minimum</b>	Existing biking network and facilities.
<b>Supporting behaviour change</b> 	<p><i>“I have access to a bike and feel confident using it”</i></p> <ul style="list-style-type: none"> <li>• Education programmes to raise awareness</li> <li>• Policies to facilitate and promote the wider uptake of biking and e-scooters, like higher parking costs or speed limit reductions</li> <li>• Increase access to bikes and e-scooters</li> <li>• Community biking hubs</li> </ul>
<b>Best use of the existing network</b> 	<p><i>“I know where to bike to get from A to B”</i></p> <ul style="list-style-type: none"> <li>• Fill in the gaps in the existing biking network</li> <li>• Reallocate existing road space to bikes and e-scooters, but minimise kerb changes</li> <li>• Provide a cycle network of consistent quality connections</li> <li>• Connect bike network to open space paths</li> </ul>
<b>Safety first</b> 	<p><i>“I can bike most places safely”</i></p> <ul style="list-style-type: none"> <li>• Fix areas known to be less safe for cycling before doing anything else</li> <li>• Provide separate space for pedestrians, bikes and cars on busy roads</li> <li>• Safer speed zones around schools and neighbourhood centres</li> <li>• Biking links are a bit less direct between popular destinations</li> </ul>

<p><b>Cross city bikeways</b></p>  <p>Super cycleways</p>	<p><i>"I can bike between popular places without any delays"</i></p> <ul style="list-style-type: none"> <li>• High quality separated bikeways between high demand destinations</li> <li>• Smaller destinations are less well connected to the bike network</li> <li>• Bikes and e-scooters get priority over cars at intersections on busy roads</li> </ul>
<p><b>Connected Neighbourhoods</b></p>  <p>Connected neighbourhoods</p>	<p><i>"I can go anywhere on my bike"</i></p> <ul style="list-style-type: none"> <li>• Quality separated biking facilities on busy roads</li> <li>• Local roads that are redesigned to be cycling friendly with slower speed limits</li> <li>• Connects neighbourhood centres and schools as well as large destinations</li> </ul>

#### 4.1 Amalgamation of Safety First and Connected Neighbourhoods

Partners and key stakeholders at the 11 September 2020 short list assessment workshop felt the *Safety first* and *Connected Neighbourhoods* approaches to be indistinguishable – and as a result they were amalgamated into a single *Connected Neighbourhoods* approach.

The short list approaches taken forward for assessment were:

- Supporting behaviour change
- Best use of the existing network
- Cross city bikeways, and
- Connected Neighbourhoods.

The alignment between the long list shown in Table 2 and the short list options is shown in Table 4.

#### 4.2 Implementation principles

Implementation principles for the programme were developed using the results of past engagement from the public and stakeholders as part of the long list process. These were confirmed with elected members as part of their involvement in the short list development in July 2020 and formed part of engagement with stakeholders and the public. These principles describe the intended approach to implementing the programme:

- Design for all ages and abilities
- Enhance the urban environment
- Safety in design throughout the design process
- Draw on best practice design and ideas
- Work with open space linkages
- Fair consideration of all transport modes
- Work with the community
- Quality first – do it once, do it right
- Quick progress
- Easy to navigate by bike
- Timely maintenance, and
- Improved end of trip facilities.

Table 4 – Long list to short list option alignment

Intervention Hierarchy	Alternatives	Options	Behaviour change	Best use of existing network	Cross City Bikeways	Connected Neighbourhoods
Integrated planning	Land use	Urban form	Land use changes are not within the scope of this business case but changes to land use will be influential in the outcomes Importance to be addressed in the preferred option			
	Monitoring	Monitoring	Improved biking and micro-mobility monitoring assumed to be part of all options			
	Strategy	Network planning	This business case is network planning for biking			
		Transport / Land use Integration	As with 'Urban form' - identified as having a significant impact on outcomes but not within the scope of the business case to change. To some extent taken into account with the integration of paths through green spaces and the provision of end-of-trip facilities.			
	Policy	Design standards / Guidelines	Design standards were excluded	Design standards to be developed		
District plan		Outside of scope - the outcome of the BC will be influential in updating the DP but changes to it are not considered part of the options.				
Demand management	Regulation	By-law / restrictions	Only applied to infrastructure options	By-laws and restrictions assumed to be applicable to all options.		
		Law Amendments	Set at a national level			
	Education	Educational programmes	Expanding on existing and introduction of new educational programmes aimed at biking skills and safety			
		Community events	Community events to raise awareness of biking as an alternative mode of transport			
	Policy	Parking	Parking prices and supply assumed to			
		Road pricing	Set at a national level			
		Speed management	Taken into account in the local link treatments but also assumed to be applicable in the			
		Vehicle and fuel tax	Set at a national level			
		Mode integration	No infrastructure changes assumed for this option.	No infrastructure changes assumed for this option.	End-of-trip facilities to compliment public transport and accessible on foot	
	Finance	Finance	Financial support for individuals, bike purchase schemes, subsidies etc. to reduce barriers to bike ownership and travel uptake			
Support	Staff	Dedicated staff for travel planning, educational programmes and programme management				
Best use of existing network	Enhancement / modification	Intersection improvements	No infrastructure changes assumed for this option.	No physical changes to intersections, road markings only where appropriate	Separation through intersections	
		Lighting	No infrastructure changes assumed for this option.	No infrastructure changes assumed for this option.	Commensurate with network treatment	
		Crossings	No infrastructure changes assumed for this option.	Raised crossings at key locations	Raised paired crossings at key locations. Signalized or zebra as appropriate.	
		Traffic calming / speed segregation	No infrastructure changes assumed for this option.	Low cost/low risk type treatments where appropriate	This option does not include local roads where traffic calming / speed segregation would be appropriate.	Local link treatments to improve biking safety. I.e. neighbourhood greenways, low traffic neighbourhoods
		Wayfinding information / journey planning	Already in place for existing network. Expanded ad hoc.	Expanded to accommodate new connections	Commensurate with network treatment	Commensurate with network treatment
		Space reallocation	No infrastructure changes assumed for this option.	No infrastructure changes assumed for this option.	Road corridor space reallocated to bike lanes as required	Road corridor space reallocated to bike lanes as required
		User experience (character & amenity)	No infrastructure changes assumed for this option.	No infrastructure changes assumed for this option.	For primary routes only	All routes
	Maintenance	Maintenance	No infrastructure changes assumed for this option.	Improved maintenance regime focussing on bike routes	Improved maintenance regime focussing on bike routes	Improved maintenance regime focussing on bike routes
		Renewals	No infrastructure changes assumed for this option.	Improved maintenance regime focussing on bike routes	Improved maintenance regime focussing on bike routes	Improved maintenance regime focussing on bike routes
	New Infrastructure	Infrastructure	Biking alignments / corridors	No infrastructure changes assumed for this option.	No infrastructure changes assumed for this option.	New routes where appropriate, not necessarily along road corridor
River / gully crossings			No infrastructure changes assumed for this option.	No infrastructure changes assumed for this option.	Includes new bridge crossings	Includes new bridge crossings
End of trip facilities			Considered important even in no/low infrastructure options to maximise mode shift potential			
Recreational / fun facilities			No infrastructure changes assumed for this option.	No infrastructure changes assumed for this option.	Focussed on efficient, wide and direct facilities rather than recreational	Integrated with routes and connections with paths through green space where appropriate



	Surveillance & security	No infrastructure changes assumed for this option.	No infrastructure changes assumed for this option.	Active surveillance at key locations along the bike routes
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### 4.3 Draft network

A three-tier biking and micro-mobility network was developed to test the effectiveness of different short list options, ensuring that the differences between the short list options was restricted to the type and level of treatment between programmes. Each approach also included non-network infrastructure such as bike racks and non-infrastructure interventions such as behaviour change activities aimed at improving the convenience, safety and attractiveness of biking and micro-mobility.

### 5.0 Short list assessment

#### 5.1 Assessment criteria

A short list assessment workshop was hosted on 11 September 2020, where participants scored the approaches in a multi-criteria assessment (MCA) against the Investment, Implementability and Assessment of Effects criteria in line with Waka Kotahi guidance, as shown in Table 5.

Table 5 – Short list assessment criteria

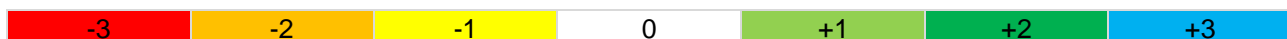
Category	Criteria	Description
Investment	Improving the safety of micro-mobility users	<ul style="list-style-type: none"> <li>Reducing deaths and serious injuries</li> <li>Improving the perception of safety</li> </ul>
	Increasing the accessibility of micro-mobility users	<ul style="list-style-type: none"> <li>Improving mode share by biking and micro-mobility</li> <li>Improving access to key destinations</li> </ul>
	Improving health and environmental outcomes	<ul style="list-style-type: none"> <li>Improving the physical health of the population</li> <li>Reducing citywide CO2 emissions</li> </ul>
Implementability	Feasibility	<ul style="list-style-type: none"> <li>Technical / constructability – technical risk in developing or implementing the option</li> <li>Designation and consenting risk – the relative level of complexity in gaining statutory approvals, extent of designation, considering any non-complying and prohibited activities</li> <li>Safety in design / zero harm – Health and safety risk in construction, operations, and maintenance</li> </ul>
	Affordability	<ul style="list-style-type: none"> <li>Capital cost</li> <li>Annual operational and maintenance costs</li> <li>Benefit / cost ratio</li> <li>Financial – is it funded in the NLTP</li> </ul>
	Stakeholder / customer	<ul style="list-style-type: none"> <li>How acceptable is this to the stakeholders and customers?</li> </ul>
Assessment of effects	Cultural	<ul style="list-style-type: none"> <li>How does this impact on Mana Whenua values?</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>How does this impact on the environment and / or landscape?</li> </ul>
	Community	<ul style="list-style-type: none"> <li>How will the community be affected?</li> </ul>

All criteria were scored by workshop participants relative to the Do Minimum option using a seven-point scale as detailed in

Table 6. The full short list MCA assessment has been included in Appendix C for reference, which for quantitative assessments includes definitions of what constitutes each score given in

Table 6.

Table 6 – MCA scoring scale



Significant Adverse - Impact or Risk	Moderate Adverse - Impact or Risk	Minor Adverse - Impact or Risk	Neutral	Minor Positive	Moderate Positive	Significant Positive
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**5.2 Assessment results**

Table 8 shows the assessment of the short list programme approaches against the assessment criteria.

The score sub-totals for the Investment, Implementability and Assessment of Effects categories are shown in Table 7.

**Table 7 – Short list multi criteria assessment scores**

Criteria	Do minimum	Supporting behaviour change	Best use of existing facilities	Cross city bikeways	Connected neighbourhoods
Investment	0	0	8	9	16
Implementability	0	-3	-5	-9	-8
Assessment of Effects	0	1	3	4	6
<b>Total</b>	<b>0</b>	<b>-2</b>	<b>6</b>	<b>4</b>	<b>14</b>

Table 8 and Table 7 show that the workshop participants scored the *Connected Neighbourhoods* programme approach most favourably against the MCA criteria, and as a result it is the emerging preferred programme option.

*Connected Neighbourhoods* scored the highest against the Investment criteria, indicating that this programme is the most effective at delivering the outcomes needed from the investment. This programme scored second lowest against Implementability criteria, mainly as a result of the large scale of the physical works and inclusion of a new bridge over the Waikato River which increases the cost and technical difficulty of this programme. *Connected Neighbourhoods* is rated highest in the Assessment of Effects criteria as a result of the likely impact on the environment and positive effects on the community.

Table 8 – Short list option assessment

Criteria	Investment Objective	KPI	Measure / Description
INVESTMENT	To improve safety of micro-mobility users by	Reducing deaths and serious injuries	Deaths and serious injuries per year
		Improving perception of safety	Network coverage weighted by perceived safety
	To increase accessibility of micro-mobility users by	Improving mode share	Journey to work and education by car
		Improving access to key destinations	Network coverage weighted by LoS
	To improve health and environmental outcomes by	Improving physical health	Number of new users
		Reducing CO2 emissions	Tonnes of CO2

2050 Forecast Baseline	Do Minimum	Supporting behaviour change	Best use of existing facilities	Cross city bikeways	Connected neighbourhoods
89 DSIs forecast between 2020 and 2050	89 (no change)	80 (10% saving)	75 (16% saving)	69 (23% saving)	54 (40% saving)
	0	0	1	1	3
2% of network perceived as high safety	2% (no change)	2% (no change)	19% (+17%)	23% (+21%)	37% (+35%)
	0	0	2	2	3
75% of trips by cars, 3.8% by micro-mobility	75% (no change)	74% (-1%)	72% (-3%)	71% (-4%)	68% (-7%)
	0	0	1	1	2
18% network at LOS A-B	18% (no change)	18% (no change)	42% (+24%)	53% (+35%)	61% (+43%)
	0	0	2	2	3
9,600 daily bike trips	9.6k (no change)	11.5k (+20%)	18.2k (+90%)	20k (+117%)	28k (+193%)
	0	0	1	2	3
313k tons of CO2	N/A	309k (1% saving)	294k (6% saving)	285k (8% saving)	273k (13% saving)
	0	0	1	1	2
<b>Total</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>9</b>	<b>16</b>

IMPLEMENTABILITY	Feasibility	Technical / constructability	Technical risk in developing or implementing the option
		Designation and consenting risk	Relative level of complexity in gaining statutory approvals, extent of designation, considering any non-complying activities - no prohibited activities
		Safety in design / zero harm	H&S Risk in construction, operations and maintenance
	Affordability	Capital cost	Capital cost
		Operational / maintenance costs	Annual operational and maintenance costs
		Benefit / cost ratio	NPV benefits / costs
		Financial	Is this funded in the NLTP?
	Stakeholders / customers	Stakeholders / customers	How acceptable is this to stakeholders and customers?

N/A	Signs and lines, speed management etc.	Filling the gaps, improving LOS without moving kerbs	Significant corridor works, includes river crossing	Significant corridor works across city, includes river crossing	
0	0	-1	-3	-3	
N/A	Speed limit changes, removal of parking	Speed limit changes, removal of parking	Large property effects, bridge over river	Large property effects, bridge over river	
0	-1	-1	-2	-2	
N/A	Safety in design embedded in projects	Safety in design embedded in projects	Safety in design embedded in projects	Safety in design embedded in projects	
0	-1	-1	-2	-2	
N/A	\$10m	\$620m	\$760m	\$990m	
0	0	-2	-2	-2	
N/A	\$4m	\$2.9m	\$3.2m	\$3.8m	
0	-2	-1	-2	-2	
N/A	<1	<1	<1	<1	
0	0	0	0	0	
N/A	Not funded	Not funded	Not funded	Not funded	
0	0	0	0	0	
N/A	We know people want facilities, this isn't enough	Reallocation of road space, and lower LOS	Majority will be in strong support, but doesn't provide local connections	Majority will be in strong support	
0	1	1	2	3	
<b>Total</b>	<b>0</b>	<b>-3</b>	<b>-5</b>	<b>-9</b>	<b>-8</b>

ASSESSMENT OF EFFECTS	Cultural	Mana Whenua	How does this impact on Mana Whenua values?
	Environment	Built environment	How does this impact on the environment / landscape?
	Community	Social	How will this affect the community?

0	0	0	0	0	
N/A	No significant change	Minor streetscape improvements	Major corridor streetscape improvements	City wide streetscape improvements	
0	0	1	2	3	
N/A	Encourage social connectivity	Encourage social connectivity, doubling of users	Connects key sites, but not communities	Connecting neighbourhoods and communities, 3x users	
0	1	2	2	3	
<b>Total</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>6</b>

## 6.0 Short list engagement

### 6.1 Mana Whenua engagement

Mana whenua were asked for their feedback on the short list programme approaches at the Te Ngaawhaa Whakatupu Ake committee meeting on 02 October 2020. Their feedback strongly supported investment in biking and micro-mobility, and in the approaches where more and safer infrastructure is proposed but didn't indicate an absolute preference for a specific approach. They requested consideration of linking cultural sites to the proposed network at the implementation stages of the programme.

Mana whenua wanted to be involved when the biking network is being implemented at a project level. As Partners mana whenua are regularly involved as part of HCC's business processes regarding transportation projects and it is expected that these processes will apply for projects stemming from this SSBC. Examples include the cultural impact assessment developed for the School Link SSBC and the University to Central City SSBC and input by mana whenua to the design of the Ruakura Road urban arterial upgrade.

### 6.2 Elected Member involvement

A workshop with HCC Elected Members was held on 7 October 2020, where Councillors indicated a preference for a safety-based approach with cycleways separated from traffic. The general consensus from Elected Members was expressed for the *Connected Neighbourhoods* and *Cross city bikeways* approaches. Elected Members also expressed support and added to the implementation principles noted in Section 4.2.

### 6.3 Community engagement

The community and stakeholder engagement for the Biking and Micro-mobility Programme ran for a five-week campaign period from Thursday 22 October to Sunday 29 November 2020. Four themes aligned to the short list options were presented to the community to understand which approach they thought would best encourage them to regularly bike, e-scoot and e-skate around Hamilton.

The four themes are:

- **Supporting behaviour change** "I have access to a bike and feel confident using it"
- **Best use of the existing network** "I can bike to most popular places"
- **Cross city bikeways** "I can bike safely between popular places without delay"
- **Connected Neighbourhoods** "I can go anywhere on my bike safely"

Responses included:



385 'Have Your Say'  
Feedback Forms



189 email  
submissions



105 social media  
comments



1 written  
submission



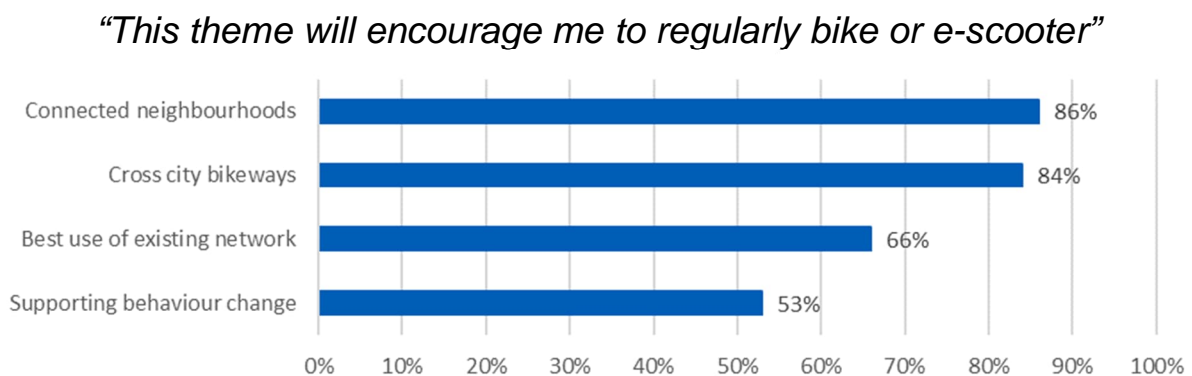
90%

We had 6 pop up events, engaging in more than 300 conversations

of respondents were residents of Hamilton

More than 84% of respondents **agree** or **strongly agree** that the *connected neighbourhoods* and *cross city bikeways* themes would encourage them to regularly bike or e-scooter as shown in Figure 2. Both themes include bikeways separated from traffic and pedestrians, and seek to improve user safety. Respondents were critical that the *best use of existing network* or *supporting behaviour change* themes would improve mode shift or improve safety.

Figure 2 – Community engagement results



Three key points we heard:

- Safety concerns, and the need for safety improvements to encourage more biking and e-scooting;
- The need for a well-connected citywide network for bike and e-scooters; and
- Strong support for dedicated infrastructure, in particular for separated bikeways.

The full results of the community engagement have been included in Appendix D

**7.0 Selection of preferred option**

On the basis of the short list option MCA assessment and consideration of mana whenua, Elected Member, community and stakeholder engagement feedback, the *Connected Neighbourhoods* programme was identified as the preferred option.

The *Connected Neighbourhoods* vision and principles were developed through the transitional approach to delivery, and prioritised to develop the 10 year programme as outlined from Section 2.9 in the SSBC.

# APPENDIX D

## Community engagement



# BIKING AND MICRO-MOBILITY PROGRAMME: ENGAGEMENT TACTICS AND SUBMISSIONS INSIGHTS

Report prepared by:  
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February 2021.

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February 2021



# EXECUTIVE SUMMARY

The Biking and Micro-mobility Programme community engagement campaign ran for five weeks, from 22 October 2020 to 29 November 2020.

The engagement materials presented the community with four different themes or areas to prioritise action and investment to developing a long-term, city-wide Biking and Micro-mobility Programme. This programme aims to encourage mode shift and bikes, e-scooters and e-skateboards as safe and attractive transport options.

The purpose of the engagement was to understand which of the four themes or priority areas the community felt would best support them to regularly bike, e-scoot and skate around Hamilton.

The four themes included:

- Supporting behaviour change
- Best use of the existing network
- Cross-city bikeways
- Connected neighbourhoods

After an overview of each theme, including benefits and costs, the community was asked to respond to the following statement in respect to each theme:

<b>This theme will encourage me to regularly bike or e-scooter.</b>				
<b>Strongly agree</b>	<b>Agree</b>	<b>Neither Agree nor disagree</b>	<b>Disagree</b>	<b>Strongly disagree</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Please explain why:</b>				

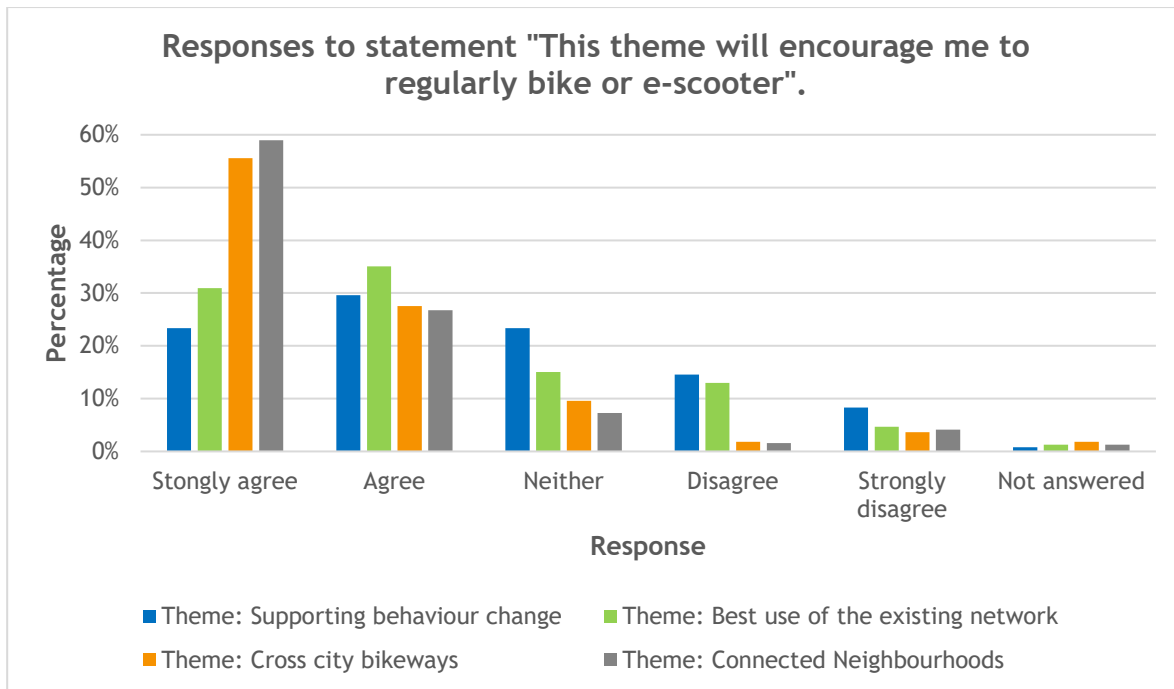
Respondents were also given the opportunity to provide any additional comments:

<b>Is there anything else you'd like to tell us?</b>
--

detailed conversations with approximately 300 people at six community events.

## HAVE YOUR SAY RESPONSES

As indicated by the graph below, the Have Your Say submissions indicated greater support for the *Cross-city bikeways* and *Connected neighbourhoods* themes, compared to the *Supporting behaviour change* and *Best use of the existing network* themes, with significantly more people responding to the statement with either “Strongly Agree” or “Agree”.



Three key points emerged consistently from the feedback on the different themes presented:

- Safety concerns, and the corresponding need for safety improvements in order to encourage more biking and e-scooting.
- The need for a safe connected network for bike and e-scooters.
- Support for infrastructure / physical works, in particular separated bikeways.

#### EMAIL AND WRITTEN RESPONSES

185 of the 189 email submissions were made via the Bike Waikato public co-submission webpage. All of the 185 email submissions;

- Disagree that the *Supporting behaviour change* and *Best use of the existing network* themes would encourage me to regularly bike, e-scooter, or skateboard.
- Strongly agree that the *Cross-city bikeways* theme would encourage me to regularly bike, e-scooter, or e-skateboard; and
- Agree that the *Connected neighbourhoods* theme would encourage me to regularly bike, e-scooter, or e-skateboard, with some exceptions.

The Waikato District Health Board (DHB) provided an email submission, strongly supporting the *Cross-city bikeways* and *Connected neighbourhood* themes. The DHB supports the *Supporting behaviour change* theme as part of an overall approach to increasing mode share and improving safety for vulnerable users, and considers that the *Best use of the existing network* theme has some value but will do little to encourage real mode shift or improve safety.

Three other email submissions were made by members of the community. These raised concerns around safety and maintenance of the network, the need for clear signage, and incentives to encourage students to bike and e-scooter.

# ENGAGEMENT TACTICS

## PURPOSE OF THE ENGAGEMENT

The purpose of this engagement was to understand the community's view on what should be prioritised and what would encourage them to bike or e-scooter, to inform the development of the long-term strategy to encourage biking and micro-mobility.

Possible ways to develop a programme were grouped into four different themes: *Supporting behaviour change*, *Best use of the existing network*, *Cross-city bikeways* and *Connected neighbourhoods*.

We asked people to indicate the degree to which each theme would encourage them to bike or e-scooter. Their feedback will help to shape the mix of projects and actions incorporated into the final programme.

## FEEDBACK MECHANISMS

The engagement ran for five weeks from 22 October to 29 November 2020. Council's Have Your Say online engagement portal was the primary engagement tool used to capture responses. Hard copy brochures and feedback form inserts were also produced, acknowledging people with limited online access may prefer to return written responses. These information brochures and feedback forms were available at the Municipal Building, the six library branches, and seven schools across Hamilton. Freepost information was provided on the forms, and they could be dropped into libraries and the Municipal Building.

A Biking and Micro-mobility Programme page was created on the Hamilton City Council website ([hamilton.govt.nz/bikingandmicromobility](https://hamilton.govt.nz/bikingandmicromobility)). As well as an outline of the programme, the website provided policy context, facts about biking and micro-mobility in Hamilton, and FAQ's for the programme. The webpage had a direct link to the Have Your Say online portal.

Six pop-up information events were held at various locations across Hamilton: The Base (29 October), Hamilton Zoo (1 November), Centre Place (5 November), Hamilton Gardens (7 November), Hamilton Farmers Market (8 November) and Your Neighbourhood at Steele Park (15 November). Details of the events were provided on the Have Your Say portal and advertised via social media channels, local newspapers and popular radio stations, including accurate traffic and time saver traffic bulletins. Hard copy feedback forms were available at the events and could be completed in person.

## PROMOTION OF THE ENGAGEMENT

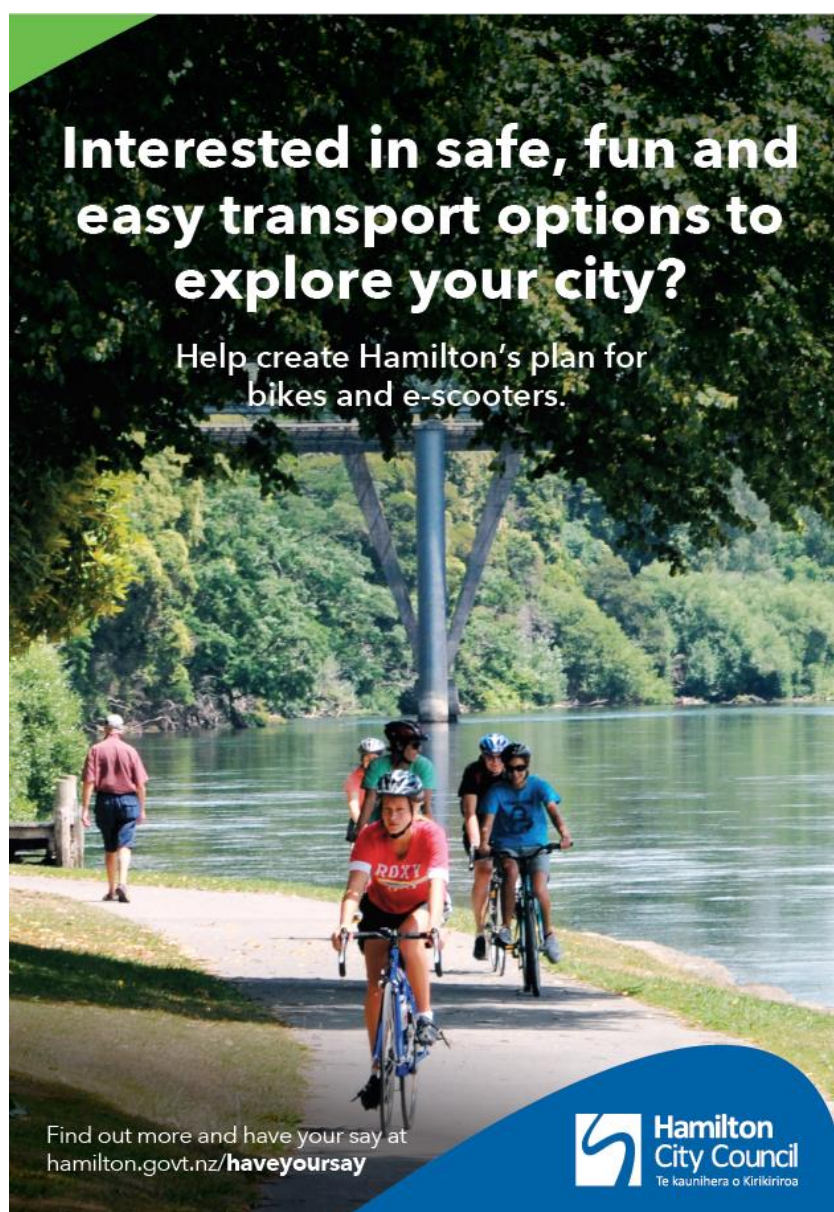
Opportunity to take part in community engagement and provide feedback was promoted via:

- Newspaper adverts in the Waikato News (30 October and 13 November 2020) and the Hamilton Press (4 November and 11 November 2020).
- Radio advertising (Accurate Traffic and 15 second advertisements) on stations including More FM, The Rock, The Edge, The Breeze, Mai FM and Magic Radio, between 26 October and 27 November 2020.
- Online advertising on the NZ Herald website, from 23-31 October and 4-27 November 2020.
- Social media campaign was run via Facebook, with five Facebook posts between 22 October 2020 and 26 November 2020.
- Hamilton City Council webpage and Our Hamilton stories, images, event postings, reminders, all linking to the Have Your Say page.
- Media releases/stories on the Council's Our Hamilton website, on [22 October](#) and [27 November](#) 2020.
- Pop-up information events (as outlined above).

- Promotion to school networks via:
  - Council’s school email database
  - Hard copy brochures available at seven schools
  - Messaging in Te Reo Māori to Māori medium education providers (primary and secondary schools).
- Meetings and targeted engagement with stakeholders, large employers and engineering consultants (both prior to and during the engagement period).
- Internal promotion to Council staff.

Campaign material largely directed people to the Have Your Say online portal, which received 1095 views. The Biking and Micro-mobility Programme page on the Hamilton City Council website was also promoted as a source for information, receiving 363 views.

Promotion of the engagement through social media reached 41,842 people with 957 engaging (i.e. commented, reacted, shared or clicked).



Newspaper advert

# Help create Hamilton's plan for bikes and e-scooters

[CLICK HERE](#)




Online NZ Herald advert

 **Hamilton City Council**  
October 22 · 🌐

Would you love to whip around our great river city on bike or e-scooter safely and easily? We want your feedback on how we can help make this happen!  
Let us know your ideas and thoughts by following the link below.



OURHAMILTON.CO.NZ

**What would get you on a bike or e-scooter? | Our Hamilton**  
The development of a long-term city-wide programme to encourage people to u...

👍❤️😄 42 51 Comments 7 Shares

👍 Like    💬 Comment    ➦ Share

Facebook post

# ENGAGEMENT RESULTS

## HAVE YOUR SAY

A total of 385 submissions were received through the Have Your Say engagement process, either via the online portal ([hamilton.govt.nz/haveyoursay](http://hamilton.govt.nz/haveyoursay)) or through hard copy feedback forms.

The bulk of the responses were online with 31 hard copies received. The online survey page was visited by 1,095 users, translating to a conversion rate of 34% - around 1 in 3 people who visited the page completed the survey.

Analysis of responses is provided on page 9.

## SOCIAL MEDIA

Posts about the engagement on Facebook generated 105 comments and replies to comments, demonstrating good community interest in the topic.

With 27,691 people following the Council on Facebook, this is a key channel for communicating engagement opportunities.

Post	Reach	Comments	Reactions	Shares	Post clicks
<a href="#">Facebook feed ad</a> – 26 November	3,370	0	7	1	48
<a href="#">Facebook feed ad</a> – 10 Nov	26,034	2	4	2	526
<a href="#">Facebook feed ad</a> – 10 Nov	Included above	51	60	9	0
<a href="#">Facebook feed ad</a> – 13 November	3,376	1	7	1	0
<a href="#">Facebook feed ad</a> – 22 October	9,062	51	42	7	139
<b>TOTAL</b>	41,842	105	120	19	713

- We reached a total of 41,842 people through this campaign.
- The campaign drove 713 people through to the Have Your Say online portal.
- The Facebook posts were simple and effective and performed well for the timeframe.
- It is noted that during this time there was three other consultations running ads at the same time (Steele Park, Peacocke Structure Plan and Rototuna Library).
- The social media campaign ran for just over two weeks (approximately 11 November to 29 November 2020).

## EMAILS / LETTERS

The campaign generated direct contact, via email (189 emails received) and in writing (one written comment was received at the Your Neighbourhood pop-up information event).

The majority of the emails (185) were from members of Bike Waikato, a local biking advocacy group, who made a public co-submission webpage available on their website (<https://action.bikewaikato.org.nz/>).

Of the remaining four email submissions:

- An email submission was provided by the Waikato District Health Board.
- Three emails were received from members of the community.

## **WEBSITE**

Campaign collateral directed the community to the project website ([hamilton.govt.nz/bikingandmicromobility](https://hamilton.govt.nz/bikingandmicromobility)) and the Have Your Say website ([hamilton.govt.nz/haveyoursay](https://hamilton.govt.nz/haveyoursay)) for further information.

## **POP-UP INFORMATION EVENTS**

The six pop-up information events held across Hamilton were used to promote the programme and encourage feedback. Members of the community were provided with brochures and hard copy feedback forms, and were also encouraged to provide feedback via the Have Your Say online portal. 20 hard copy feedback forms were completed and handed-in at the pop-up information events.

## **STAKEHOLDER WORKSHOPS**

Stakeholder workshops were held on 24 and 25 June 2020 and 3 and 4 November 2020. Attendees included members of 12 organisations and groups. The four possible themes for the biking and micro-mobility programme were discussed, and attendees were encouraged to provide contribute any other ideas or priorities relating to the future programme. The key matters raised in these workshops can be broadly summarised as follows:

- Ensuring accessibility for all
- Provision of additional bike lanes, including separated bike lanes
- Bike education programmes
- Provision of bike and e-scooter facilities, such as secure parking, end-of-trip facilities, repair hubs, gear lockers
- Removal of car parking spaces
- Creating a connected network
- Consideration of all transport modes
- Provision of lighting
- Need for safer intersections and bridges
- Street transformations
- Tactical urbanism (testing ideas through low-cost, temporary changes).

## SUBMISSIONS INSIGHTS

### FEEDBACK THROUGH HAVE YOUR SAY (ONLINE AND HARDCOPY FEEDBACK FORMS)

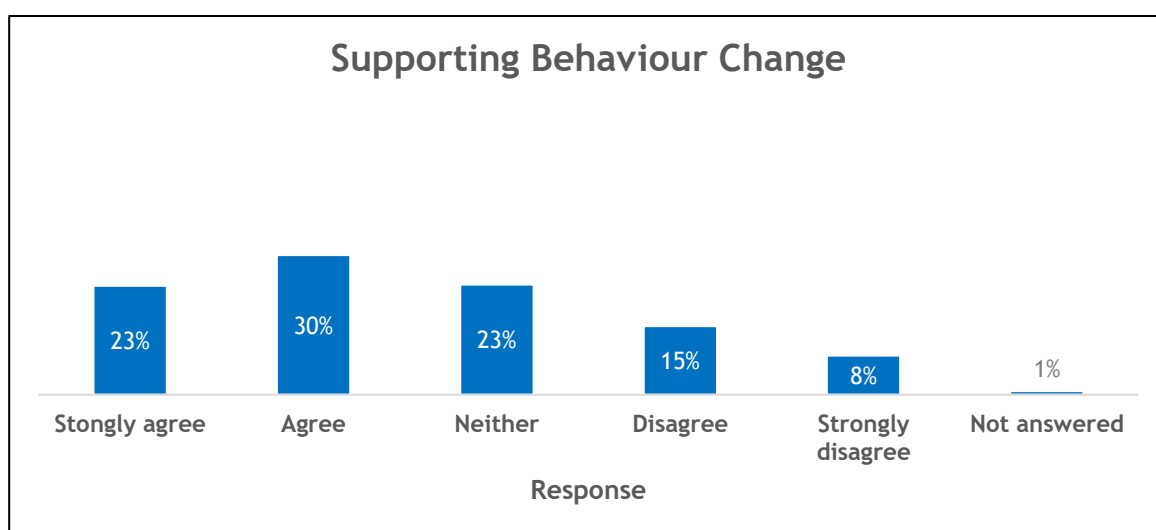
- 385 people responded to the survey through Have Your Say, either online or by completing a hardcopy feedback form.
- 345 of the respondents (90%) were Hamilton residents.

#### THEME: SUPPORTING BEHAVIOUR CHANGE

“I have access to a bike and feel confident using it”.

This theme focuses on promotions, education, policy and increasing access to bikes and e-scooters.

The responses to the statement “this theme will encourage me to regularly bike or e-scooter” are as shown in the following graph.



Consistent or commonly raised comments are summarised in the key matters table below. The total % of responses will not add to 100% as an individual’s comments may fit into more than one category, were not commonly held views and/or no comment was provided.

Key matters	No. of responses	% of responses
Road or bike network safety is the barrier to biking or e-scooting	60	16 %
Respondents already travel by bike or e-scooter often	38	10 %
Separated bikeways are needed to ensure user safety	22	6 %
Driver education would improve outcomes for users of other transport modes	22	6 %
General support for the theme	19	5 %
The components of the theme are not / will not address barriers to biking or e-scooting	18	5 %
Education has some place in the programme	15	4 %
Support for easier access to bikes and e-scooters	13	3 %
Infrastructure / physical works are needed to encourage more biking and e-scooting	12	3 %



Examples of verbatim comments:

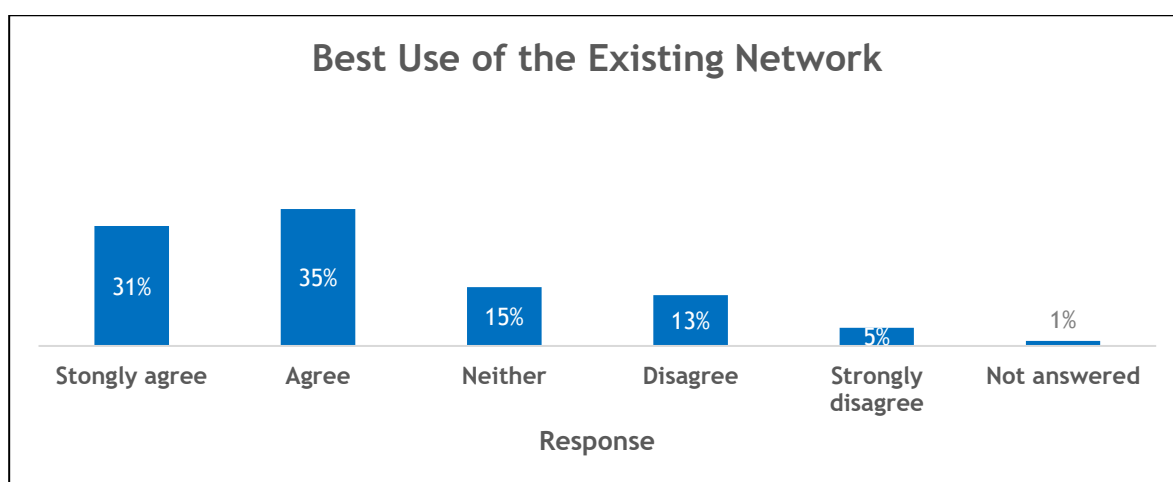
- *“You need to have completely separate areas for people on bikes and scooters and those using cars. No matter education around biking, it’s just fundamentally dangerous to have cars and bikes in the same space”.*
- *“Key things for me are safety improvement and education of motorists.”*
- *“Further and easy access to bikes can only increase the likelihood of a person biking.”*
- *“Education is very important, however many of our roads are not safe enough for both car and bike. and making the areas where bikes can ride very difficult.”*

**THEME: BEST USE OF THE EXISTING NETWORK**

“I can bike to most popular places”.

This theme focuses on reallocating existing street space, closing gaps in the bike network, and cleaner and tidier bike lanes.

The responses to the statement “this theme will encourage me to regularly bike or e-scooter” are as shown in the following graph.



Consistent or commonly raised comments are summarised in the key matters table below. The total % of responses will not add to 100% as an individual’s comments may fit into more than one category, were not commonly held views and/or no comment was provided.

Key matters	No. of responses	% of responses
More than on-road bike lanes are needed to ensure safety	74	19 %
Support for better connected bike networks	72	19 %
Separated bikeways are needed to ensure user safety	38	10 %
Supportive of safety benefits provided by the theme	42	11 %
Some support for the theme, but with remaining concerns	26	7 %
Maintenance issues with the existing network (e.g. glass, litter, tree branches, poor road surface)	16	4 %
General safety concerns	15	4 %
Safety improvements are needed at intersections	13	3 %
Infrastructure / physical works are needed to encourage more biking and e-scooting	12	3 %
Supportive of clearer signage / marking of bike lanes	12	3 %
Impracticalities of on-road bike lanes	11	3 %
Support re-allocation of road space to bikes and e-scooters	10	3 %

Examples of verbatim comments:

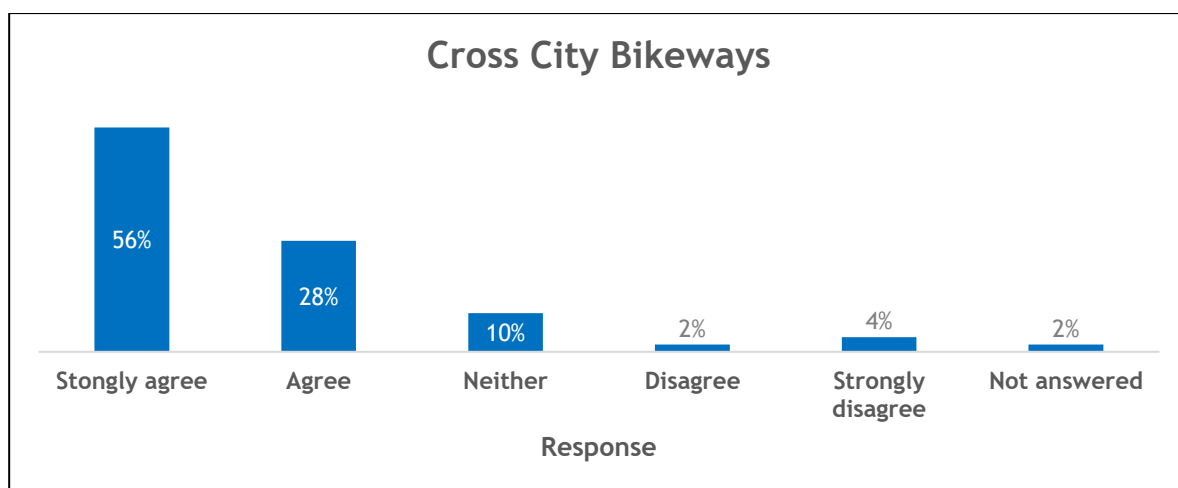
- *“There are limited bike lanes and some of the existing ones are just painted roads, so you still have to share the space with a car, especially on the bridges. I just don't feel safe riding my bike on Hamilton roads.”*
- *“Bike routes which connect together are really important - convenience has to be there for me to consider cycling.”*
- *“To bike regularly with my kids I need off-street cycle ways.”*
- *“Re-allocating road space is cheap and efficient. Also it would avoid some of the CO2-hungry infrastructure that more major options will require (of course those may be justifiable also).”*

**THEME: CROSS-CITY BIKEWAYS**

“I can bike safely between popular places without delay”.

This theme focuses on providing the highest quality bike and e-scooter facilities, connecting key city-wide destinations on selected routes.

The responses to the statement “this theme will encourage me to regularly bike or e-scooter” are as shown in the following graph.



Consistent or commonly raised comments are summarised in the key matters table below. The total % of responses will not add to 100% as an individual’s comments may fit into more than one category, were not commonly held views and/or no comment was provided.

Key matters	No. of responses	% of responses
Separated bikeways are needed to ensure user safety	103	27 %
Supportive of safety benefits provided by the theme	55	14 %
This theme would make biking and e-scooting more enjoyable, attractive, or will encourage more biking and e-scooting	53	14 %
General support for the theme	35	9 %
Support for better connected bike networks	27	7 %
Support safer access children / to schools	18	5 %
Consider a quicker commute to be a benefit of the theme	18	4 %
Support safer and/or easier access to key destinations	14	4 %
Support for giving bikes and e-scooters priority over cars	12	3 %
More than on-road bike lanes are needed to ensure safety	11	3 %
Hold concerns regarding the safety of shared paths	10	3 %

Examples of verbatim comments:

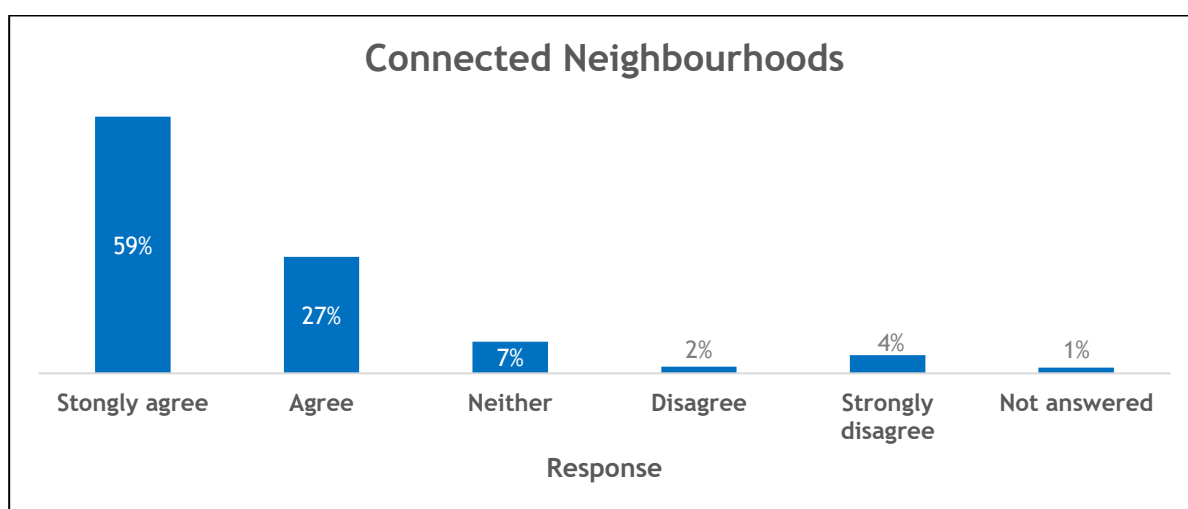
- *“These types of cycle ways are much safer and more accessible than the ‘lines on roads’ type, and encourage a wider range of people to cycle.”*
- *“We need to connect places of work and play with where we live, just as we do by car and try to by bus.”*
- *“Protected cycleways would make it both convenient and safe to commute across the city.”*
- *“This would definitely encourage me to bike more and I would feel safer biking with my kids.”*

### THEME: CONNECTED NEIGHBOURHOODS

“I can go anywhere on my bike safely”.

This theme focuses on safe door-to-door rides to schools, neighbourhood centres and key destinations.

The responses to the statement “this theme will encourage me to regularly bike or e-scooter” are as shown in the following graph.



Consistent or commonly raised comments are summarised in the key matters table below. The total % of responses will not add to 100% as an individual’s comments may fit into more than one category, were not commonly held views and/or no comment was provided.

Key matters	No. of responses	% of responses
Separated bikeways are needed to ensure user safety	62	16 %
This theme would make biking and e-scooting more enjoyable, attractive, or will encourage more biking and e-scooting	57	15 %
Support safer access children / to schools	52	14 %
Support for better connected bike networks	47	12 %
Supportive of safety benefits provided by the theme	45	12 %
General support for the theme	30	8 %
Consider the investment required to be worthwhile	12	3 %
Consider theme would bring about environmental benefits	12	3 %
Consider a quicker commute and/or reduced congestion to be a benefit of the theme	11	3 %
Consider theme would provide for health and fitness benefits	10	3 %
Raised concern regarding the cost of the theme	10	3 %

Examples of verbatim comments:

- *"It is fantastic as a novice knowing we can cycle or scoot at our own pace away from cars and knowing we do not have to annoy pedestrians who also want to enjoy their leisure."*
- *"As much as I know it is a huge investment this will increase the safety of cycling incredibly, and make it much more appealing."*
- *"Encouraging shorter trips by bike will reduce congestion on the road while also improving our wellbeing."*

## FEEDBACK THROUGH SOCIAL MEDIA

77 of the 105 comments and replies to comments on social media posts through Facebook were directly relevant to future biking and micro-mobility programme. Themes that emerged were:

- 24 people's comments raised concerns around the safety of the current transport network
- 18 people's comments supported more bike lanes, including separated bike lanes
- 5 people's comments expressed general support for the programme
- 5 people raised concerns around the safety of shared paths
- 4 people's comments raised need for a connected biking network
- 3 people's comments support provision of facilities/infrastructure such as bike hubs, buses fitted with bike racks, secure bike storage
- 3 people's comments raised concerns regarding cyclist behaviour
- 2 people's comments supported general bike safety improvement

Examples of verbatim comments:

- *"Fully connected and separate cycle lanes. Too many of them just stop suddenly leaving you stranded with nowhere to go, and cars often drive in them."*
- *"The roads in Hamilton give no room to bikes it is very dangerous getting to work."*
- *"More proper cycle paths please. None of the shared paths that stop at every intersection and none of the door zone cycle lanes. Proper safe infrastructure."*
- *"Need to be safe places to leave bikes - so that they don't get stolen."*

## FEEDBACK THROUGH EMAILS/LETTERS

### BIKE WAIKATO FEEDBACK

The submissions from Bike Waikato members contained common messages regarding the four themes for biking and micro-mobility, as summarised below:

- Disagree that behavioural change will encourage members to regularly bike, e-scooter, or skateboard.
  - Hamilton does not have a connected network for safe biking and micro-mobility. Supporting behaviour change only makes a marginal difference to the regular use of bikes.
  - Biking is seen as an unsafe, undermining initiatives to support behaviour change.
- Disagree that best use of the existing network will encourage members to regularly bike, e-scooter, or e-skateboard, with some exceptions.
  - Reallocating road space without making significant physical changes does not reduce the perceived risk of biking on Hamilton's roads. Separated cycle lanes are required, and this protection must be extended through high-risk areas such as intersections and roundabouts.
  - The addition of painted cycle lanes with no protection will not be enough to support a significant modal shift in the way people travel around the city.

- Connecting the bike network to open space paths is a good idea in principle, however the network leading to the open spaces needs to provide a safe, comfortable and ideally separated riding experience.
- Strongly agree that cross-city bikeways will encourage me to regularly bike, e-scooter, or e-skateboard.
  - Having wide, separated, cross-city bikeways between high-demand destinations gives people safe options for getting to key places of employment, education, and healthcare.
  - The prioritisation of people on bikes and e-scooters over cars will be significant in creating the desired mode shift by rewarding those users.
- Agree connected neighbourhoods will encourage me to regularly bike, e-scooter, or e-skateboard, with some exceptions.
  - There needs to be a focus on everyday streets that are safe for people to walk, bike and live.
  - While we support the development of separated bikeways to provide safe transport options for people who choose to leave the car at home, there needs to be a safe way to leave the front door.
  - Pathways in open spaces need to have safe access, but also be suitable for all users and not increase the risk of injury for those who are more vulnerable.
- Support was also voiced for:
  - Imminent funding in the Long-Term Plan should reflect the bold vision of this programme and emphasise that biking and micro-mobility are a priority for this Council.
  - Council’s Vision Zero goal when implementing Biking and Micro-mobility projects and citywide safety improvements, in particular, lowering vehicle speeds.
  - Improvements for public transport users - including being able to take bikes on buses, as we can do within the Waikato outside Hamilton, but not within Hamilton.

In addition to the above, some Bike Waikato members supplied individual comments in their submissions. The key matters raised have been summarised in the table below. The total will not add to 100% as an individual’s comments may fit into more than one category or were not commonly held views, or no comment was provided.

<b>Key matters</b>	<b>No. of responses</b>	<b>% of responses</b>
General safety concerns	60	32 %
Health and/or fitness benefits of biking and e-scooting	59	32 %
Environmental benefits of biking and e-scooting	58	31 %
Separated bikeways are needed to ensure user safety	39	21 %
Benefits for commuting and/or reducing congestion	39	21 %
Recreational and/or social benefits of biking and e-scooting	34	18 %
Support for urgent action to encourage biking and e-scooting	31	17 %
Benefits for future generations and/or the future of Hamilton	30	16 %
Support for safety improvements	26	14 %
Financial benefits of biking and e-scooting	25	14 %
Support for better connected bike networks	23	12 %
Infrastructure / physical works are needed to encourage more biking and e-scooting	21	11 %
Respondents travel by bike or e-scooter often	21	11 %
Safety improvements will encourage more biking and e-scooting	18	10 %
Supportive of accessibility / transport options for all	18	10 %

## **WAIKATO DISTRICT HEALTH BOARD SUBMISSION**

The submission from the Waikato District Health Board provided feedback on the four themes for biking and micro-mobility, as summarised below, as well as more general comments around health and wellbeing, active transport, safety and urban development:

### **Supporting behaviour change**

- Support an ongoing focus in supporting behaviour change as part of an overall approach to increase mode share and improve safety for vulnerable road users.
  - Recommend evaluating interventions to determine effectiveness, behaviours of micro-mobility users to determine if they increase safety risk to pedestrians.
  - Support increased access to bikes and e-scooters through initiative such as bike purchase assistance and bike libraries.

### **Best use of existing network**

- Agree that reallocating existing street space, closing gaps in the bike network and creating cleaner and tidier bike lanes, is more likely to provide a consistent standard of connection across the network, but will do little to encourage a real shift in travel mode or improve the safety of vulnerable road users.
  - Safety is the one of the greatest barriers to active transport.
  - A recent study by Midland<sup>1</sup> Trauma System found cycling safety measures aren't keeping pace with the push to get more people on bikes. This has led to increasing injury rates.

### **Cross-city bikeways**

- Strongly supports the development of high-quality bike and e-scooter facilities, connecting key city-wide destinations on selected routes such as the University of Waikato, city centre and Waikato Hospital. Sustained investment is required if we are to increase the numbers of those using active transport in Hamilton.

### **Connected neighbourhoods**

- Strongly supports the focus on safe door-to-door rides to schools, neighbourhood centres and key destinations.
  - Neighbourhoods should be designed with the pedestrian/cyclist in front of mind rather than the car to build the health and well-being of our communities. Those living in such neighbourhoods have better health profiles.

## **OTHER EMAIL / HARD COPY FEEDBACK**

Four other members of the community provided feedback by email or in writing. The key matters raised are summarised below:

- Maintenance issues with the existing network (in particular, overgrown vegetation).
- Need for clearer signage along bike lanes.
- Incentives for students (e.g. bike hire schemes, discounted bike parts, access to bike pumps).
- Safety concerns with the existing network.

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<sup>1</sup> Midland refers to the following five DHBs: Waikato DHB, Taranaki DHB, Lakes DHB, Bay of Plenty DHB, and Tairāwhiti Hauora

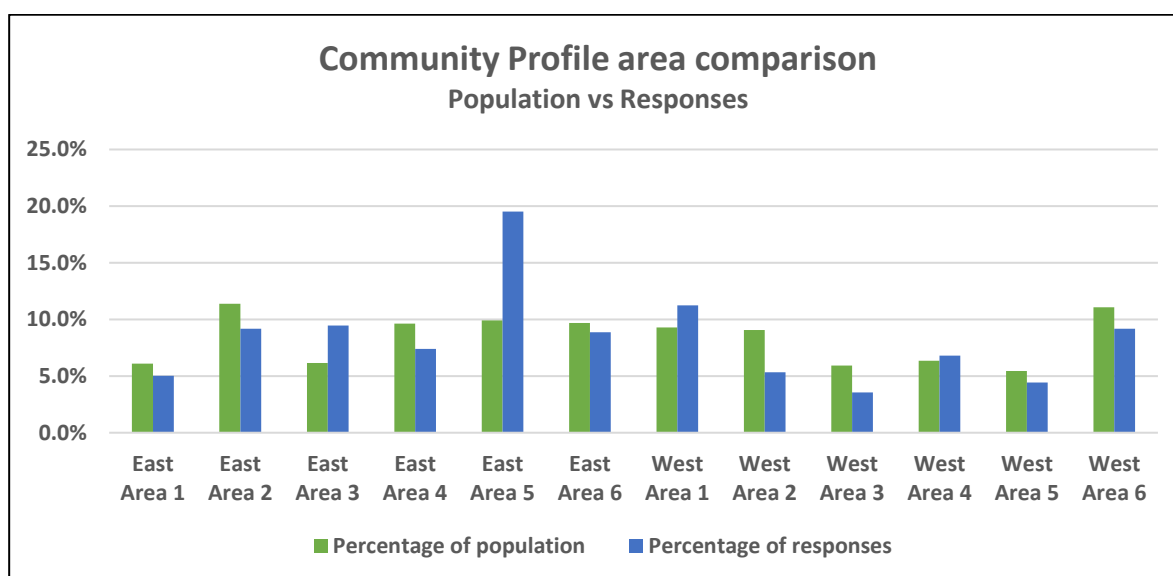
## DEMOGRAPHIC COMPARISON

The below statistics compare demographics of Hamilton city respondents from the online and hardcopy feedback forms to the city's population.

### RESPONDENTS VS HAMILTON CITY PROFILE\*- LOCATION

The highest representation was from East Area 3 (Chartwell, Chedworth, Harrowfield, Queenwood) and East Area 5 (Claudelands, Hamilton East, Peachgrove).

The lowest representation was from West Area 2 (Crawshaw, Grandview Heights, Nawton, Rotokauri, Western Heights), East Area 2 (Callum Brae, Huntington, Rototuna, Rototuna North) and East Area 4 (Enderley, Fairfield, Fairview Downs).



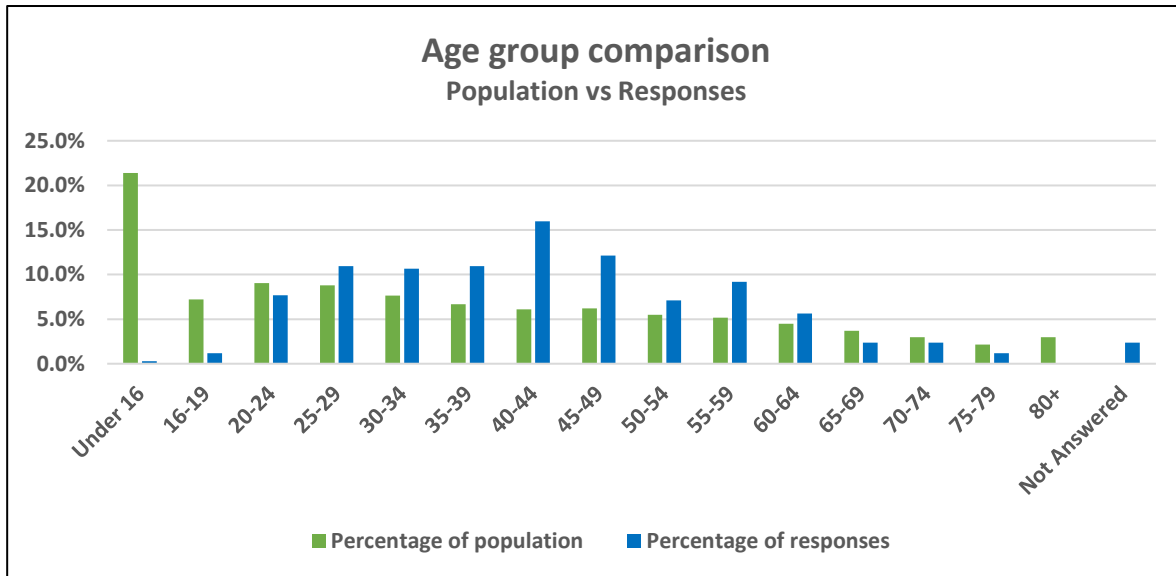
\*Hamilton city profile statistics are from the 2018 Census published by Stats NZ.

Community Profile Area	List of Suburbs
East Area 1	Flagstaff
East Area 2	Callum Brae, Huntington, Rototuna, Rototuna North
East Area 3	Chartwell, Chedworth, Harrowfield, Queenwood
East Area 4	Enderley, Fairfield, Fairview Downs
East Area 5	Claudlands, Hamilton East, Peachgrove
East Area 6	Hillcrest, Ruakura, Riverlea, Silverdale
West Area 1	Avalon, Beerescourt, Forest Lake, Northgate, Pukete, St Andrews, Te Rapa
West Area 2	Crawshaw, Grandview Heights, Nawton, Rotokauri, Western Heights
West Area 3	Aberdeen, Dinsdale, Temple View
West Area 4	Frankton, Maeroa, Swarbrick
West Area 5	Hamilton Central, Hamilton Lake, Hospital, Whitoria
West Area 6	Bader, Deanwell, Fitzroy, Glenview, Melville, Peacocke

**RESPONDENTS VS HAMILTON CITY PROFILE\*- AGE GROUP**

The lowest representation was from under-16 year olds and over-80 year olds, which was expected, and 16-24 year old people.

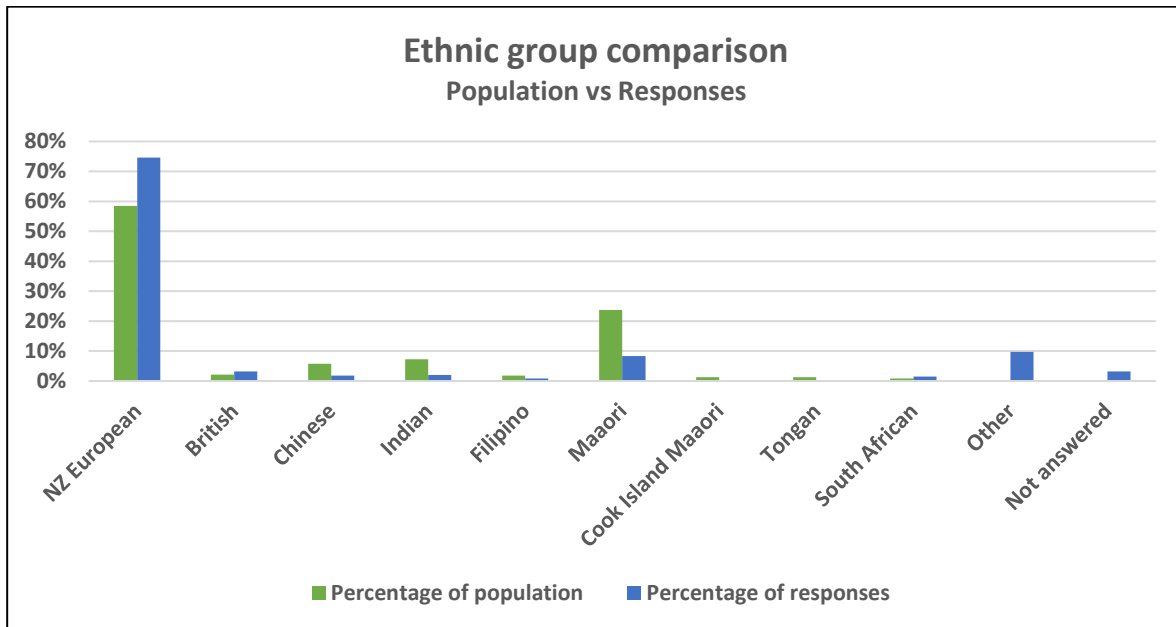
The highest representation was from 25-64 year old people.



\*Hamilton city profile statistics are from the 2018 Census published by Stats NZ.

**RESPONDENTS VS HAMILTON CITY PROFILE\*- ETHNIC GROUP**

We had a high representation from the NZ European, British, and South African ethnic groups.



\*Hamilton city profile statistics are from the 2018 Census published by Stats NZ.



## WHAT'S NEXT

The results from this engagement will be presented to Elected Members at an Infrastructure Operations Committee meeting mid-2021, with a recommended programme for future Biking and Micro-mobility for Hamilton.

The Council's decision on the final programme and how feedback helped shaped the final programme will be communicated to the community in the following ways:

- Our Hamilton story/ media release
- Facebook posts
- Emails to stakeholder groups
- 'We asked, You said, We did' section on the Have Your Say portal
- Updates to the Biking and Micro-mobility Programme webpage

In 2021 the city-wide, long-term programme of actions is expected to be confirmed, which will likely include a range of projects and initiatives such as infrastructure, education, policy, regulations and end-of-trip facilities.

# APPENDIX E

## Transitional cycling design guidance

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Hamilton City Council



# Transitional cycling design guidance

This guidance has been developed to assist in delivering cycling as part of every project.

Hamilton City Council

**Business Tagline or Motto**

Primary Business Address

Address Line 2

Address Line 3

Address Line 4

Phone: 555-555-5555

Fax: 555-555-5555

Email: [someone@example.com](mailto:someone@example.com)

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## PURPOSE

To provide a framework for the delivery of transitional cycling improvements that promote and improve cycling in Hamilton City.

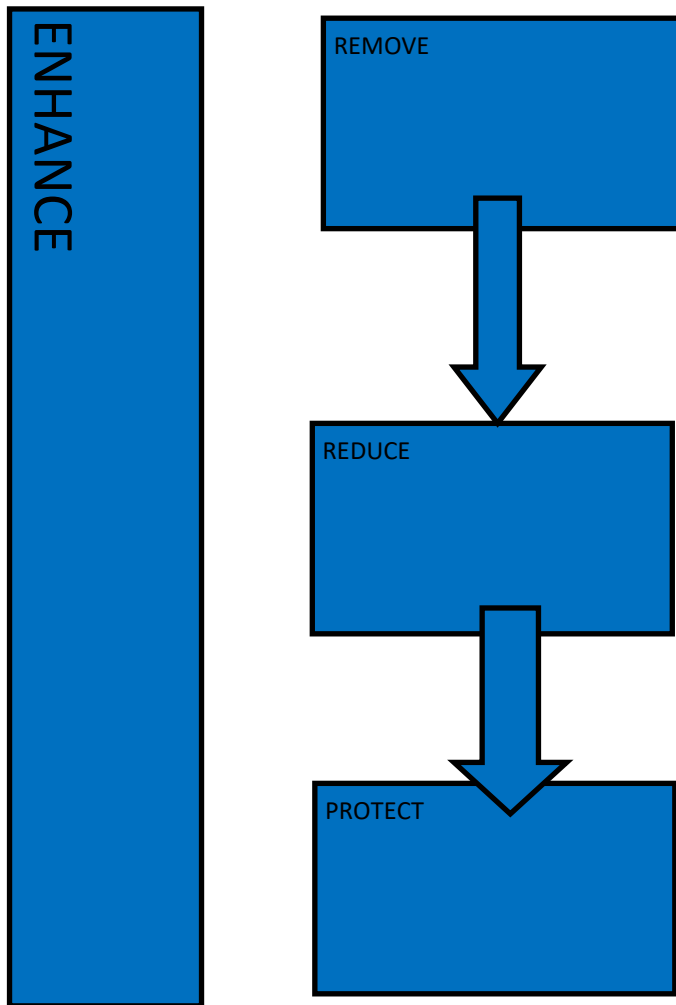
Transitional improvements are typically low cost, low risk (cost, scope and political). They do not seek to replace long term aspirations for more specific cycling enhancements and they may not always be suitable in every location.

**Transitional arrangements should not be applied in locations where new infrastructure is being delivered. Where new transport networks are being designed and delivered the principles contained with the BMM 'Connected Communities' approach shall be used.**

This guide is designed for use by trained practitioners, typically transport planners and engineers. The guidance provides a framework for determining the suitability of transitional cycling measures with suggestions based on the latest design guidance from around the globe. The approach still requires detailed consideration on a site by site basis and inexperienced practitioners should always seek support from more experienced practitioners for developing schemes into delivery. It is recommended that you seek advice from those who have experience of cycling in particular.

## KEY PRINCIPLES OF TRANSITIONAL APPROACH

The approach to transitional improvements has been based on the standard risk management approach that would be applied in most circumstances. You will move through stages starting with removing the conflict/risk going towards protection/mitigation



Throughout the stages above and generally when looking at transitional improvements, it should be a key feature of your transitional network that opportunities to create faster corridors for those who bike over those who drive. This will promote cycling as a faster and healthier form of transport. Are there locations where you can create safe and fast links for cyclists that make cycling easier and more convenient than driving? This may mean small links are improved/enhanced so they are more visible. It may also mean creating more space for cyclists on certain sections of route that suffer with congestion to enable cyclists to bypass car drivers.

Most of the key concerns about people cycling are around safety—this relates largely to situations where they are negotiating with traffic on streets. In some locations you may be able to remove through movement traffic and this will remove the safety risk or you may be able to find a route that doesn't mix with traffic (ie through a park). Such approaches require careful consideration but in most cases should be the first place to begin.

Where there isn't scope to create traffic free/highly reduced situations, you may be able to find ways to reduce conflict or reduce the likelihood of a poor outcome from conflict. In many cases this will be through reducing traffic speeds or creating improved arrangements for cyclists and drivers to avoid conflicts.

In some locations—you may have to provide low cost interventions that help to protect cyclists (which in some cases will also protect pedestrians). This approach may include locations where concrete kerb build outs are installed, or specific filtering devices that create a buffer between cyclists and drivers. It may also mean moving cyclists onto lower risk areas such as shared paths but only where pedestrian conflict is likely to be low

REMEMBER THOUGH—TRANSITIONAL IMPROVEMENTS SHOULD BE LOW COST, LOW RISK BOTH IN TERMS OF DELIVERABILITY BUT ALSO IN TERMS OF POLITICAL IMPACT. FOR EXAMPLE: IF YOUR IMPROVEMENT INVOLVES CONTROVERSIAL CHANGES TO THE STREETScape THAT MAY HAVE LOTS OF OPPOSITION—MOVE ON OR RESCOPE. OVER TIME YOU MAY FIND CIRCUMSTANCES OR ATTITUDES CHANGE AND YOU CAN COME BACK.

## Considerations for suitable locations for transitional arrangements

Not suitable where you have recently undertaken heavy maintenance (unless works are extremely minor eg paint)

Avoid locations where you will be undertaking a large scale renewal (complete resurfacing or rehab) in the next three years

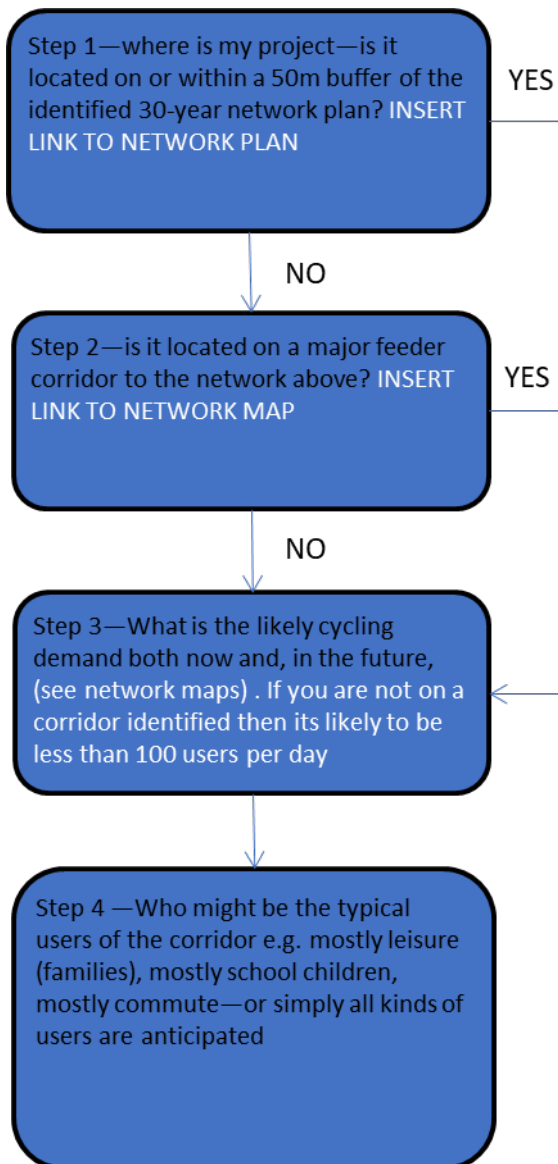
Avoid locations where you will be delivering MM projects in the next 3 years

THINKING ABOUT THE TRANSITIONAL AND HOPE IT WILL MARRY WITH THE FUTURE NETWORK

# How to use this guide

**THIS GUIDE IS FOR ANY PROJECT THAT TAKES PLACE WITHIN THE ROADING DESIGNATION—IF YOU ARE WORKING IN THIS SPACE YOU MAY HAVE THE OPPORTUNITY TO PROVIDE TRANSITIONAL INFRASTRUCTURE AT MINIMAL EXTRA COST.**

**THE CHART BELOW SHOWS THE PROCESS:**



Reason—its located which has been identified for investment—you should check whether there is a planned project already underway. If not you may be able to help provide transitional infrastructure or should be seeking to avoid delivering infrastructure that could reduce cycling/mm use.

Reason—your project may be justified on the basis of feeding into one of the key demand corridors. Local streets may be suggested for intervention that aren't on the core 'connected communities' network. If these locations come from community requests there may still be merit in delivering transitional infrastructure where they connect into the primary, secondary networks.

This will give you an idea of the potential scale of infrastructure required—in the early stages of transitional work this may not result in any bespoke changes—but in later phases you may need to widen approaches at intersections or think about overtaking for users if high numbers are predicted.

The network should be safe for all users but in delivering a transitional network it may be that some routes require compromises in the approach. In some cases those compromises might be ok as users will be adults who are regular users. In other locations where you can expect younger children or families to be using the infrastructure you may decide that minimal interventions would little additional benefit. An example might be where you have younger users on a route where you are unable to make suitable speed adjustments—in such cases the situation may not be feasibly improved by transitional measures. These circumstances are likely to be few.

Transitional Cycle Project			
Project location:	XXX Av between XXX Rd and XXX Dr		
Map/sketch showing extents:			
Is your site within 50m of a key 30 year network location:	YES/NO	Is it on a major connector to this network (eg collector/distributor):	YES/NO
If yes to the above what is the estimated demand:	Now: XXXX per day Future: XXXX per day If the location is not on the core network - demand assumed to be <100 cyclists per day. Cycle team to confirm.		
Anticipated user typology:	Leisure/Commute/School children/College/		
If not located in the locations listed above, why is this site a good site for intervention:	E.g. works in this area are taking place under TM that would allow improvements such as curb tightening, ped/cycle refuges, hit sticks, cycle lanes to be delivered at minimal additional cost. The project has been asked for by local residents/local biking group		
Is this project part of other works:	Yes: minor works...	No: stand alone opportunity	
Describe road character (reference transitional guide):	E.g. Route is arterial high traffic high HCV, minimal side access see page XXX of transitional guide		
Suggested transitional infrastructure:	Painted cycle shoulders, hit sticks at intersections. New connection along berm. (If available attach sketches)		
FOR CYCLE TRANSITION TEAM MEMBERS			
Approx Cost:	\$XX		
Risk profile:	E.g. low – all within designation – no accesses affected, minimal interactions within surrounding land owners		
Proposal reviewed by team:	YES/NO	Approved:	YES/NO
Date:	XX/XX/XXXX		
Cycle team liaison for this project:	INSERT NAME		
Once approved – scheme to be loaded in GIS for annual reporting and evaluation	IN GIS: DATE/REF		
Sent for Monitoring and evaluation:	YES/NO (if no explain why)	Date:	XXXXXXXX



# How to use this guide (cont...)

Having identified some key parameters for your possible transitional elements the next step is to look at the existing and medium term environment in which you are working.

This has been split into the following main headings below:

Roading typology

Intersection type

Other constraints/opportunities

Table 1 below guides the user to the relevant sections in this guide for the main typologies listed below.

Road Typology	Constraints/opportunities			
	Large Berms/Shoulder/ Footway	High Parking/small shoulder		
Arterial high traffic volume high HCV low access	See part 1	See part 2		
Arterial high traffic volume high HCV high access	See part 1	See part 2		
Arterial high traffic volume, low HCV, typical access	See part 3	See part 4		
Distributor (industrial)	See part 3	See part 4		
Distributor (Residential)	See part 5	See part 6		
Collector? (might be aligned to distribut- er ??				
Local street (residential)	See part 7	See part 7		
Local street (high street)	See part 8	See part 8		

Part 1—Arterial, high traffic, high HCV, low access

Examples:



Characteristics: limited access means limited access to property and land use—likely to have low demand as a local link—but may have high commuter demand as links are typically designed to be fast and direct. Limited access means that collision types with I/Cs would be low but fast and high traffic high HCV environment makes this poor for most cyclists. Transitional pieces unlikely to be effective in these environments. However potential may be available in wide berms or areas that have been allowed for expansion. These may not be cheap to install and so may not be transitional—care to be taken to create links in/out.

REMOVE

Not able to remove traffic—no remove options

REDUCE

Unlikely to be able to reduce speeds.

Conflicts are limited except at I/Cs

PROTECT

Given the characteristics of the environment—protection with hit sticks etc unlikely to assist—unless beffersize is large ie you have a large shoulder

ENHANCE

These corridors may provide speedy corridors with full separation is berm space is available—care to be taken that they link to locations of high travel

Part 5—Local Distributor (Residential)



REMOVE

In some locations if commercial/HCV traffic is a growing issue—you may want to start considering options to reduce permeability/slow traffic along the whole route

Avoid shared paths in sections with multiple driveway points with limited visibility to footway.

Create clearly marked bays for on-street parking and increase enforcement

REDUCE

Reduce vehicle speeds through changing line markings and moving parking nearer to driving lanes. Consider removal of painted central medians to create space for cycling and parking with a greater buffer

Increase narrow points—create pedestrian refuge points at regular intervals with narrow road widths and bypass lanes for MM

Reduce exit and entry speeds on side roads through tightening kerb radii and or speed tables

PROTECT

At busy intersections create hit stick or concrete protection to prevent vehicles moving into cycle lanes and cutting off cyclists

ENHANCE

At busy locations create suitable courtesies/ zebra/ controlled crossings for cyclists and pedestrians

Create space for cyclists to get to the front of the queues at intersections on the route (see part XX)

Consider smoother treatments in cycle parking sections of roading to allow cyclists a smoother path.

# APPENDIX F

## Demand assessment

Memorandum

To	Martin Parkes	Page	1
CC	Project Team		
Subject	Biking and Micro-mobility Programme Business Case Appendix F Demand Forecast		
From	Dirk du Preez		
File/Ref No.	60633211	Date	1-June-2022

**1.0 Cycling Demand/Potential Model**

A long-term cycling potential model was developed using a combination of census travel data, Waikato Regional Transport Model (WRTM) outputs and modelling tools developed for the Tauranga Cycle Model.

This model included the Tier 1 and Tier 2 (core network) biking and micro-mobility routes and estimated the potential for biking uptake if this was implemented by 2051. A number of demand scenarios were developed as detailed in the Technical Note by Flow Transportation Specialists (attached).

For the purposes of this business case, the central scenario “Strategic Cycling Network” was adopted as the demand scenario to input into the prioritisation framework, benefits realisation and economic assessment of the preferred programme.

This scenario forecast that the implementation of the strategic cycling network as detailed in the business case report would result in biking mode shares of 24% trips to work and 32% trips to education in 2051.

These mode shares were assumed to imply a combined mode share of biking and other micro-mobility modes such as e-scooters. In terms of overall mode share, this translates to a **22% mode share** of all daily trips in Hamilton by 2051 if the network were implemented, **96,000 daily trips** and **43,000 users** per day.

**Table 1 – Modelled network statistics from Flow cycle potential model (2051)**

Scenario	Observed	Modelled	Do Min	Strategic Cycling Network	Cycletopia
Daily Cycle Trips	6,575	7,600	22,000	96,000	123,000
Daily cycle-km	34,000	29,000	87,000	398,000	522,000
Cycle to work mode share	2.60%	NA	4%	18%	24%
Cycle to education mode share	5.60%	NA	6%	25%	32%
Weighted Average	4%		5%	22%	28%

**1.1 Limitations**

The demand estimating tool has some known limitations, and therefore the demand estimates need to be interpreted before conclusions can be drawn on total forecast demands, the merits of routes and corridors for biking and micro-mobility.

These limitations include:

1. Undeveloped future growth areas such as Peacocke, Ruakura and Rotokauri aren't included in the 2018 census information used by the demand analysis tool, so demand forecasts on links between these areas and the rest of the city are under-represented
2. Representation and aggregation of census information into zones does not accurately represent the location of key trip generators in some places
3. As a result of where the trips load onto the network, and the routing between trip origins and destinations may not represent how the network operates in some areas, and
4. The demand assessment was based only on the journey to work (JTW) and journey to education (JTE) data from the 2018 census and therefore does not represent all trip purposes.

## 1.2 Expansion to all trips

Not enough data exists for Hamilton (or even for New Zealand) that enables an estimate of the expansion or uplift from JTW and JTE trips to total trips per day by cycling specifically.

Analysing the New Zealand Household Travel Survey 2015 – 2018 trip proportions by trip purpose found that JTW comprises 13% of trips and JTE 5%. This however represents trips by all modes, and it is unknown what these proportions are for cycling.

Table 2 provides a breakdown of the proportion of trips by all modes and biking and the relationship between JTW, JTE and all trip purposes.

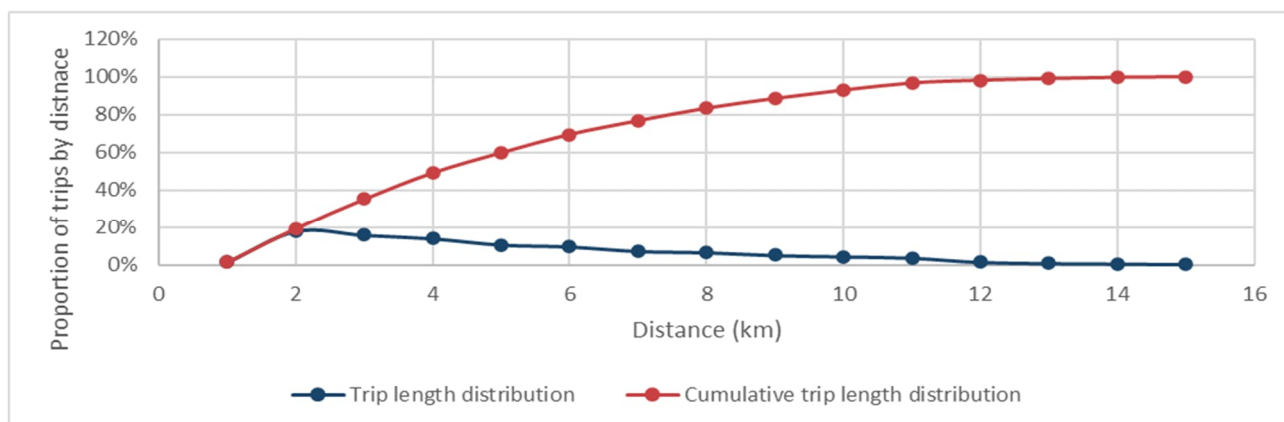
**Table 2 – Biking mode share in context of all daily trips (2051)**

Metric	Estimate
Forecast Population (2050)	281,790
JTW + JTE (all modes)	438,053
All trips by all modes	2,433,626
Modelling biking & micro-mobility trips per day (JTW & JTE only)	96,000
Biking mode share of JTW + JTE trips	22%
Number of daily users (JTW + JTE only)	48,000

The 96,000 JTW and JTE daily trips forecast estimates 2 trips by each user, i.e., the trip to work/education and the return trip later and therefore represents 48,000 people doing this daily.

It is however envisaged given that 50% of all trips are shorter than 4km and 60% shorter than 5km (15min and 20minute bike rides respectively), as shown by the red line in Figure 1, that a significantly higher proportion trips would be completed by biking and micro-mobility modes if safe and convenient facilities are provided.

Figure 1 – Trip length distribution by all modes (Source: Census 2018)



While the number of users is not expected to increase significantly over the modelled forecast, the number of trips per user per day can be expected to increase as people that already use biking or other forms of micro-mobility as their main mode of transport are much more likely to undertake other trips such as shopping trips using the same mode.

If 50% of all trips under 5km were undertaken by biking and micro-mobility in the 2051 forecast year this would be approximately than 250,000 trips per day, 3.5 times more than the 96,000 forecast for JTW and JTE trip purposes only.

### 1.3 Benchmarking

The forecast mode share of 22% was benchmarked against several cities for which consistent data on mode share, length (km) of cycle network and population could be obtained. A proportional relationship between length of bike lanes per 100,000 inhabitants and resultant mode share was established, with an average across six cities being **0.3** (% mode share / (km bike lanes per 100,000 inhabitants)).

Table 3 – Benchmarked cities for population, length of cycle network and mode share

Benchmarked Cities	Population	Biking Mode Share %	Km bike lanes	km bike lanes/100k	(Mode share)/(km bike lanes/100k)
Utrecht, Netherlands	360,000	30.0%	353	98	0.31
Oulo, Finland	200,000	20.0%	600	300	0.07
Seville, Spain	700,000	8.9%	193	28	0.32
Vitoria, Spain	249,176	12.3%	124	50	0.25
Barcelona, Spain	1,620,000	5.0%	228	14	0.35
Madrid, Spain	3,223,000	4.0%	268	8	0.48
<b>Average</b>					<b>0.30</b>

While this statistic is not meaningful and does not account for all factors that influence modal choice (i.e., parking costs and availability etc.), it does provide a useful benchmark comparison for the *Connected Neighbourhoods* vision. With the provision of 218km of Tier 1 and Tier 2 facilities the ratio for Hamilton is forecast to be **0.28** and therefore *Connected Neighbourhoods* is in about the right place in terms of network quality and coverage for the forecast population, to achieve the predicted mode share as measured against JTW and JTE trips.

**2.0 Interpolating for 2031 – 10 year investment programme**

For the 10 year investment programme, assumed to be implemented by 2031, which consists of implementing 98km of the tier 1 and tier 2 network facilities, 45% of the proposed 218 km of tier 1 and tier 2 routes in the strategic network, the daily users and mode shares were interpolated based on network length and forecast population.

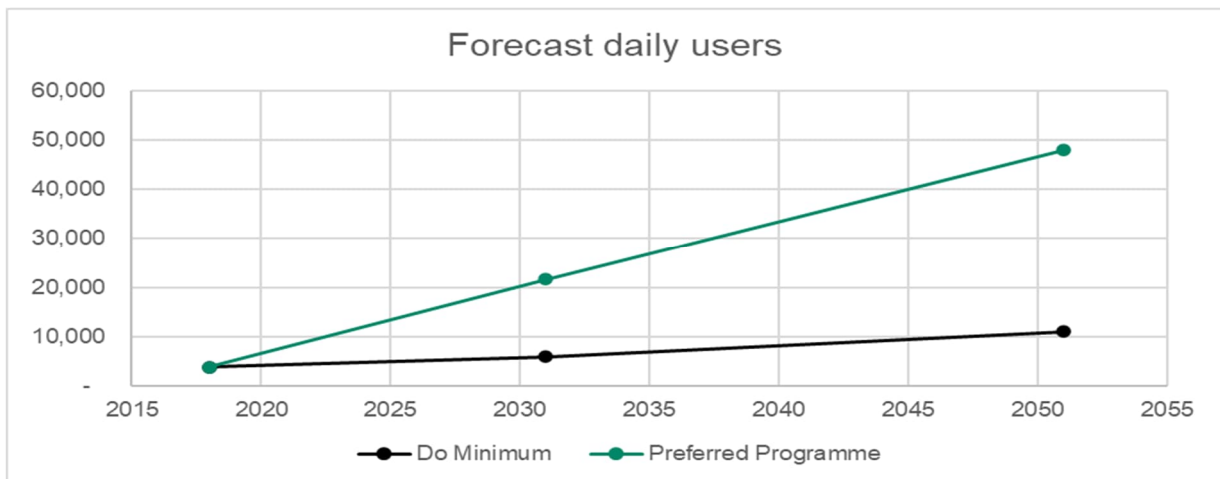
Table 4 shows the 2051 full strategic network and back-casted 2031 scenario based on 45% tier 1 and tier 2 being implemented, the population interpolated between 2051 forecast and 2018 Census population, and with the assumption that the normalised mode share indicator would be the same as with the 2051 scenario. This estimates that the mode share in 2031 would be 15% of daily trips by biking and micro-mobility.

**Table 4 – Relationship between mode share, population and cycle network length for Hamilton forecast scenarios**

Hamilton Scenarios	Population	Mode Share	km bike lanes	km bike lanes/100k pop	(Mode share) / (km bike lanes / 100k)
Hamilton 2031	189,604	15%	98	52	0.28
Hamilton 2051	281,790	22%	218	77	0.28

Figure 2 gives an overview of the forecast daily users for the Do Minimum and preferred programme in 2031 and 2051 based on JTW and JTE trip forecasts.

**Figure 2 – Demand Forecast**



Kind regards



A handwritten signature in blue ink, appearing to read 'Dirk du Preez', is written over a horizontal blue line.

Dirk du Preez  
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# APPENDIX G

## Economic evaluation

## Memorandum

To	Martin Parkes	Page	1
CC	Project Team		
Subject	Biking and Micro-mobility Programme Business Case Appendix E Economics Evaluation		
From	Dirk du Preez		
File/Ref No.	60633211	Date	29-June-2022

### 1.0 Benefit sources

The quantitative benefits accounted for in the assessment included health benefits, safety (reduction in DSIs), greenhouse gas (GHG) emission reductions and decongestion benefits – travel time costs (TTCs) and vehicle operating costs (VOCs)

#### 1.1 Health benefits

Health benefits for new cyclists were estimated using the recommended maximum annual health benefit from the MBCM. Both conventional biking and electric assisted biking (e-bike or e-scooter) benefits were included with the latter assumed to comprise 20% of the total biking and micro-mobility users. The value applied was \$2,400 per new bike user per year – a weighted average of \$2,500 per conventional bike user and \$2,000 per e-bike.

#### 1.2 Safety Benefits

Safety benefits were limited to the forecast reductions in biking deaths and serious injuries (DSIs) over the 40-year analysis period.

The network biking crash history was established by analysing Crash Analysis System (CAS) data for five years (2015-19). The total number of crashes at each intersection control type and different levels of road hierarchy was determined through GIS analysis to establish a crash rate for each network facility type.

These crash rates were assumed to remain constant over the analysis period in the absence of any meaningful network improvements (the Do Minimum).

Crashes were first factored up by an underreporting factor and then weighted to DSIs based on their economic valuation from the MBCM to establish a baseline biking DSI figure for each facility type for 2050.

Crash reduction factors were then applied for the preferred option to estimate the number of DSIs each programme is forecast to eliminate. The crash reduction factors for the different treatments of road links, intersections and crossings were derived from the Crash Compendium, other NZTA research reports<sup>1</sup>, and the iRAP Toolkit.

#### 1.3 Emission benefits

Emission benefits were calculated based on the MBCM valuation of CO<sub>2</sub> emissions shadow costs and costs increasing annually. CO<sub>2</sub> was used as a proxy estimate for all GHG emissions. The estimated total CO<sub>2</sub> per private vehicle per year was based on 257.4g/km<sup>2</sup> and vehicle kilometres travelled (VKTs) from the latest Waikato Regional Transport Model (WRTM) forecast 2050 scenario.

<sup>1</sup> <https://www.nzta.govt.nz/assets/resources/crash-reduction/docs/install-urban-intersections.pdf>

<sup>2</sup> <https://environment.govt.nz/publications/measuring-emissions-summary-of-emission-factors-2020/>

Private car occupancy was assumed to be 1.2 person per car (90% of cars trips have a single occupant)<sup>3</sup>. Each additional biking user was assumed to replace one private car occupant resulting in a reduction in emissions for each vehicle replaced.

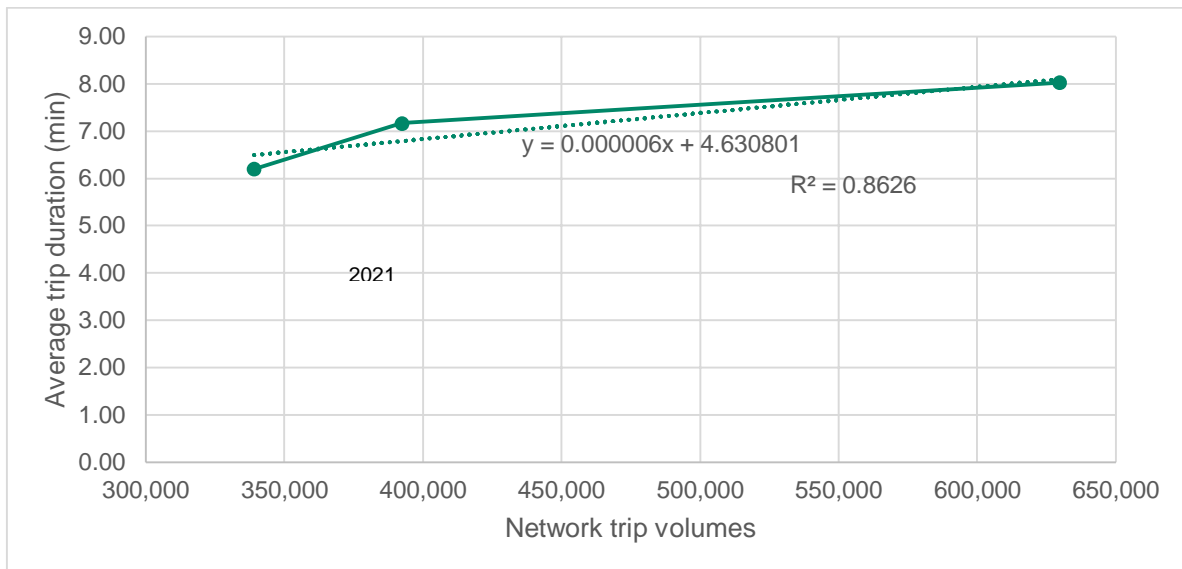
**1.4 Decongestion benefits**

Decongestion benefits (TTCs and VOCs) were calculated using outputs from the WRTM model runs and assuming that an uplift in biking would result in a commensurate decrease in private vehicle travel.

Model runs from 2013, 2021 and 2051 were used to determine a linear regression relationship (R<sup>2</sup>=0.86) between average private vehicle travel times and network traffic volumes. The relationship was based on AM, Interpeak and PM peak values, weighted and converted to average daily traffic volumes and travel times.

It was conservatively assumed that the Hamilton traffic would exhibit the same relationship between traffic demand and travel times as the rest of the Waikato whereas it is likely a significantly steeper graph for Hamilton given the known traffic congestion observable across periods of the day.

**Figure 1: Network demand and travel time relationship**



Travel times and vehicle operating costs for the Do Minimum and Preferred Option were calculated for each of the model years while values for the intermediate years were linearly interpolated.

Values for travel time<sup>4</sup> and vehicle operating costs<sup>5</sup> were obtained from the MBCM:

**Table 1: Values of travel time**

<b>Table 17: Composite values of travel time (2002)</b>	
Morning commuter peak	\$ 15.13
Daytime inter-peak	\$ 17.95
Afternoon commuter peak	\$ 14.96
<b>Weighted Average daily VOT</b>	<b>\$ 15.95</b>

An average VOC value assuming average speeds of 50km/h and 0 gradient was taken from MBCM Appendix 4: 21.8cent/km.

<sup>3</sup> Ministry of Transport (2008) The New Zealand Transport Strategy 2008, MoT, Wellington, page 87

<sup>4</sup> Table 17: Composite values of travel time (2002)

<sup>5</sup> Table A71: Passenger car VOC by speed and gradient (cents/km – July 2015)

Figure 2 – Vehicle operating costs assumed for decongestion benefit calculations

## Appendix 4: Vehicle operating cost tables

Table A71: Passenger car VOC by speed and gradient (cents/km – July 2015)

Speed (km/h)	Gradient in percent (both directions)												
	0	1	2	3	4	5	6	7	8	9	10	11	12
10	34.0	34.1	34.2	34.2	34.3	34.4	34.5	34.6	34.8	35.0	35.2	35.5	35.9
15	30.4	30.5	30.6	30.7	30.8	30.9	31.1	31.3	31.5	31.8	32.1	32.5	32.9
20	27.7	27.8	28.0	28.1	28.2	28.4	28.6	28.8	29.0	29.4	29.7	30.2	30.7
25	25.8	25.9	26.0	26.2	26.3	26.5	26.7	27.0	27.3	27.6	28.0	28.5	29.1
30	24.4	24.5	24.7	24.8	24.9	25.1	25.4	25.6	25.9	26.3	26.8	27.3	27.9
35	23.4	23.5	23.6	23.8	23.9	24.1	24.4	24.7	25.0	25.4	25.9	26.4	27.0
40	22.7	22.8	22.9	23.1	23.2	23.4	23.7	24.0	24.3	24.7	25.2	25.8	26.4
45	22.2	22.3	22.4	22.5	22.7	22.9	23.2	23.5	23.8	24.3	24.8	25.3	26.0
50	21.8	21.9	22.1	22.2	22.4	22.6	22.8	23.2	23.5	24.0	24.5	25.1	25.7

Each biking and micro-mobility trip was assumed to offset 0.3 private vehicle car trips (1 / (1.2\*2.82) to account for vehicle occupancy and trip purpose propensity<sup>6</sup>) resulting in lower TTCs and VOCs. These daily benefits were annualised based on 245 weekdays per year.

Additional TTCs of cycling has not been included in the calculation. The conservative assumption of Hamilton exhibiting a similar traffic/travel time relationship to the wider Waikato is considered to account for the additional travel time cost of the 16,770 daily biking and micro-mobility users (Appendix D).

### 2.0 Economic evaluation assumptions

- The base date for the evaluation is 1 July 2022;
- Time zero is 1 July 2022;
- The evaluation period is 40 years;
- The base assumption for the discount rate is 4%;
- Construction is assumed to commence on 1 July 2022 and completed linearly by 2050;
- Benefits will be accrued from 1 July 2024, and have been interpolated linearly between 2050 (calculated values) and 2022 (zero);
- All update factors, base value travel times, congestion relief values, vehicle operating costs etc. are from the MBCM (December 2021 Update).
- 1.3% per annum growth in cyclist numbers beyond 2030 has been assumed based on the growth rate from the WRTM 2021 to 2051 model trip totals.

### Annualisation factors

Vehicular benefits have been based on the extrapolation of the AM, Inter and PM Peak SATURN model outputs. 245 workdays have been assumed while public holidays and weekend days have been excluded.

### Benefit Capping

All vehicular benefits have been capped at 2030 levels. This applies to emissions and decongestion benefits.

<sup>6</sup> The relationship between trips other than JTE and JTW being undertaken by all modes vs biking

### 3.0 Summary of benefits

Table 2 provides a summary of the total benefits in each of the included categories for the 10 year programme. The benefits for the Eastern Pathways programme have been stripped out on a pro rata basis on the length of those corridors and an assumption that they would yield twice the benefits compared to the rest of the network.

**Table 2 – Summary of benefits**

Benefit	Undiscounted	Discounted
Health	\$1,702,225,751	\$ 748,631,735
Safety	\$ 128,651,236	\$ 56,616,835
Emissions	\$ 65,958,250	\$ 27,069,541
Decongestion (TTC)	\$ 93,361,592	\$ 42,132,402
Decongestion (VOC)	\$ 148,828,198	\$ 68,071,102
<b>Total</b>	<b>\$2,139,025,026</b>	<b>\$ 942,521,614</b>

### 4.0 Summary of costs

Table 3 shows the capital costs required to implement the biking and micro-mobility programme. This includes the design and investigation components of each capital cost category.

**Table 3 – Summary of capital costs**

Cost	Undiscounted	Discounted
Priority Corridors	\$ 14,600,000	\$12,560,122
Responsive projects	\$ 39,740,063	\$32,764,015
Area Wide Projects	\$ 29,447,660	\$24,278,361
End-of-trip facilities	\$ 3,118,500	\$ 2,596,127
Pre-implementation	\$ 800,000	\$ 784,615
Programme monitoring	\$ 700,000	\$ 577,121
Behaviour change activities	\$ 350,000	\$ 288,560
Wayfinding	\$ 437,360	\$ 360,585
Design Guidance	\$ 300,000	\$ 288,462
Business Cases	\$ 1,500,000	\$ 1,140,461
<b>Total</b>	<b>\$ 90,993,583</b>	<b>\$75,638,429</b>

Table 4 shows the operational costs include costs for maintenance of facilities, staff required to manage the biking and micro-mobility programme and supporting activities to promote biking and micro-mobility as viable modes of travel and transport.

**Table 4 – Summary of operational costs**

Cost	Undiscounted	Discounted
Network maintenance	\$ 12,608,599	\$ 5,717,387
Staffing requirements	\$ 37,380,000	\$18,532,865
Supporting activities	\$ 7,448,000	\$ 3,650,097
<b>Total</b>	<b>\$ 57,436,599</b>	<b>\$27,900,350</b>



**5.0 Economic evaluation results**

Table 5 provides a summary of the net present value (NPV) of benefits and costs and how this was applied to calculate the benefit-cost ratio (BCR) for the 10 year and 30 year programmes.

**Table 5 – Summary of economic evaluation (10yr Programme)**

	Benefits	NPV Benefits	
		Do Min	Preferred
1	Travel time savings	0	38,535,733
2	VOC savings	0	62,260,154
3	Crash cost savings	0	51,783,691
4	Vehicle emission reductions	0	24,758,726
5	Reduced driver frustration	0	0
6	Monetised external impacts (list)	0	0
	Public Transport Benefits		0
	Congestion Relief	0	0
	Trip Reliability	0	0
	Cycling Benefits	0	684,724,148
	Wider Economic Benefits	0	0
7	PV total net benefits	0	862,062,452
	Costs	NPV Costs	
		Do Min	Preferred
8	Investigation	0	357,231
9	Design	0	1,071,692
10	Property	0	0
11	Construction/ implementation (incl. preconstruction)	0	74,209,506
12	Maintenance	0	4,573,910
13	Renewal	0	1,143,477
14	Operating	0	22,182,962
15	Toll Revenue	0	0
16			
17			
18	PV total net costs	0	103,538,779
19		BCR = (7)/(18) = 8.3	

Table 5 shows that with the assumptions highlighted in this document, the PV benefits exceed the PV costs with a BCR of 8.3.



## 6.0 Sensitivity Testing

The sensitivity of the BCR was tested against a range of parameters, including the discount rate, cost estimate, and benefit capping as shown in Table 6.

Table 6 – 10 year programme BCR sensitivity testing

Sensitivity	Base assumption	Lower bound	Lower bound BCR	Upper bound	Upper bound BCR
Base case	All	8.3			
Discount rate	4%	6%	6.8	3%	9.3
Cost estimate	Expected cost estimates	P95 costs	6.4	-	-
Benefit interpolation	Extrapolated beyond 2050	Capped at 2030	6.3	-	-
±20% forecast users	All	-20% users at 2031	6.4	+20% users at 2031	10.2



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# APPENDIX H

## Cost estimates

29 June 2022

Martin Parkes  
(via email)

## **Biking and Micro-mobility Programme Business Case Appendix H Cost Estimates**

### **1.0 Overview**

Cost estimates for the proposed 10 year Biking & Micro-mobility programme were developed based on linear unit rates for network improvement typologies.

Cost estimates and assumptions were largely based on the Waka Kotahi Cycle Facility Conceptual Cost Estimation Tool (v04 Sept 2020), incorporating unit rates from previous projects and including extra cost allowances for investigation and design (10%), and preliminary and general costs (25%).

The unit rates and assumptions of activities incorporated into the cost estimate for each treatment were peer reviewed by WSP in April 2022.

Recognising the high-level method of estimating costs for the programme, P50 expected estimates included a contingency allowance of 40% over the base estimates. P95 95th percentile estimates include a further 30% allowance for funding risk.

### **2.0 Peer review**

The unit cost rates, assumptions and methodology were peer reviewed by Simon Drummond of WSP. Amendments to the assumptions and rates as recommended by WSP were directly incorporated into the cost estimate calculations and economics evaluation.

### **3.0 Unit Rates**

Table 1 provides a breakdown of the cost assumptions for several different methods of implementing the preferred network typologies.

All these cost items are per kilometre linear unit rates and include costs and assumptions for intersections, pedestrian crossings and allowances for things such as traffic management during construction.

**Table 1 – Biking & Micro-mobility route typology cost assumptions**

Intervention	Description	Assumption	ROC facility construction	P&Gs	Contingency	Construction Total	Design Fees	\$/km
Level 1a	Shared path on existing wide berm. Assumes widening existing footpath to a minimum 3m width shared path	New shared path in existing wide berm.	\$ 2,146,500	\$ 268,313	\$ 965,925	\$ 3,380,738	\$ 214,650	\$ 3,595,400
Level 1b	Shared path on existing wide berm. Assumes widening existing footpath to a minimum 3m width shared path	Footpath widened to 3m wide shared path	\$ 1,073,200	\$ 134,150	\$ 482,940	\$ 1,690,290	\$ 107,320	\$ 1,797,600
Level 1c	Neighbourhood greenway. Sharrows with speed management. Regulatory signage and speed restraint infrastructure.	Sharrows, speed management, signage and physical speed restraints	\$ 345,400	\$ 43,175	\$ 155,430	\$ 544,005	\$ 34,540	\$ 578,500
Level 2a	Buffered bidirectional bike path with flexi posts, no physical works. Removal of parking on one side	Transitional treatment within existing kerblines. Assumes reallocation of existing road space and no control type changes at intersections. Separation by cycle wands. Includes road markings & patching to improve surfacing	\$ 200,200	\$ 25,025	\$ 90,090	\$ 315,315	\$ 20,020	\$ 335,300
Level 2b	Buffered unidirectional bike path with flexi posts, no physical works. Removal of parking on one side	Transitional treatment within existing kerblines. Assumes reallocation of existing road space and no control type changes at intersections. Separation by cycle wands. Includes road markings & patching to improve surfacing	\$ 350,600	\$ 43,825	\$ 157,770	\$ 552,195	\$ 35,060	\$ 587,300
Level 2c	Add flexi posts to existing facilities Unidirectional bike path with flexi posts, no physical works.	Transitional treatment within existing kerblines. Assumes reallocation of existing road space and no control type changes at intersections. Separation by cycle wands. Includes road markings & patching to improve surfacing	\$ 206,100	\$ 25,763	\$ 92,745	\$ 324,608	\$ 20,610	\$ 345,200
Level 3	Kerb separated bi-directional bike path one side. Carriageway widened by 2m on one side	Move kerb & widen road by 2m on one side only to provide space for bidirectional bike path with physical concrete separator 800mm wide. Shape correction of road pavement & drainage relocation.	\$ 6,052,000	\$ 1,513,000	\$ 3,026,000	\$ 10,591,000	\$ 605,200	\$ 11,196,200
Level 3a	Kerb separated bi-directional bike path one side. Carriageway widened by 1m on one side	As with Level 3 but 1m widening only Kerb separated bi-directional cycleway one side Widen road by 1m on one side	\$ 5,262,000	\$ 1,315,500	\$ 2,631,000	\$ 9,208,500	\$ 526,200	\$ 9,734,700
Level 3b	Kerb separated bi-directional bike path one side. No widening	As with Level 3 but no widening Kerb separated bi-directional cycleway one side No widening	\$ 1,864,300	\$ 466,075	\$ 932,150	\$ 3,262,525	\$ 186,430	\$ 3,449,000
Level 3c	Parking separated bi-directional path one side. No widening	As with Level 3b but no widening & parking as separation	\$ 1,414,300	\$ 353,575	\$ 707,150	\$ 2,475,025	\$ 141,430	\$ 2,616,500
Level 4	Kerb separated uni-directional bike lane both sides. Carriageway widened by 1m on both sides	Move kerb & widen road on both sides by 1m to provide space for uni directional bike lanes at road level with physical separator 800mm wide. Shape correction of road pavement & drainage relocation.	\$ 7,193,100	\$ 1,798,275	\$ 3,596,550	\$ 12,587,925	\$ 719,310	\$ 13,307,200
Level 4a	Kerb separated uni-directional cycleway each side Widening by 2m on one side Assumes parking removal both sides	As with Level 4 but 2m widening one side only	\$ 6,653,100	\$ 1,663,275	\$ 3,326,550	\$ 11,642,925	\$ 665,310	\$ 12,308,200
Level 4b	Kerb separated uni-directional cycleway each side No widening Assumes parking removal one side	As with Level 4 but no widening	\$ 2,394,500	\$ 598,625	\$ 1,197,250	\$ 4,190,375	\$ 239,450	\$ 4,429,800
Level 4c	Parking separated uni-directional cycleway each side No widening	As with Level 4b but no widening & parking as separation	\$ 1,494,500	\$ 373,625	\$ 747,250	\$ 2,615,375	\$ 149,450	\$ 2,764,800
Level 5	Separated bi-directional bike path one side at kerb level. Carriageway width reduced by 2m on one side.	Move kerb & narrow road by 2m on one side only to provide 3m bidirectional bike path at kerb level.	\$ 6,312,000	\$ 1,578,000	\$ 3,156,000	\$ 11,046,000	\$ 631,200	\$ 11,677,200
Level 6	Separated uni-directional bike lane each side at kerb level. Carriageway width reduced by 1m on both sides.	Move kerb & narrow road by 1m on both sides to provide unidirectional bike path at the kerb level	\$ 7,678,100	\$ 1,919,525	\$ 3,839,050	\$ 13,436,675	\$ 767,810	\$ 14,204,500

#### 4.0 Planned Priority Corridors

The costs of the priority corridors were derived by applying the linear rates from Table 1 against the lengths along each corridor assumed to be treated as per the respective typology.

Table 2 provides a breakdown of the length of each corridor, proposed programme and the cost range of implementation.

**Table 2 – Planned projects (\$m)**

Priority	Description	Length (km)	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Hospital to City Centre	3.9	2024/25	4.2	5.4
4	Victoria Street	3.4	2025/26	2.5	3.3
5	Killarney Road	1.9	2026/27	1.8	2.3
6	Bader to Peacockes	2.6	2026/27	0.9	1.2
7	Nawton to City Centre	6.2	2027/28	2.7	3.6
10	Boundary Road	2.6	2028/29	1.1	1.5
11	Grey Street South	1.5	2029/30	0.4	0.5
12	Rototuna to Chartwell	2.7	2030/31	0.9	1.2
<b>All</b>	<b>All priority routes</b>	<b>24.8</b>	<b>2024-31</b>	<b>14.6</b>	<b>19.0</b>

**Figure 1 – Hospital to City Centre**

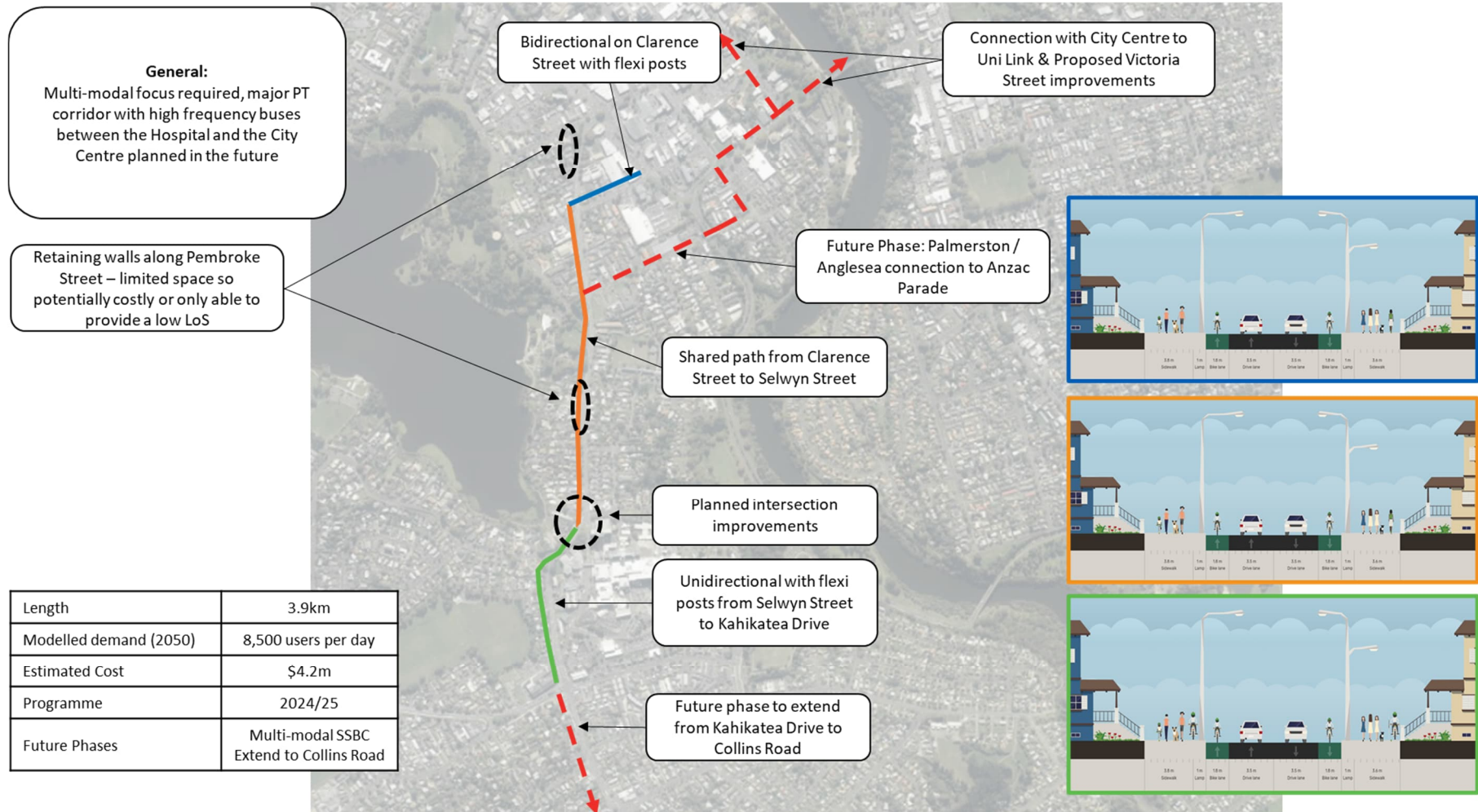


Figure 2 – Victoria Street

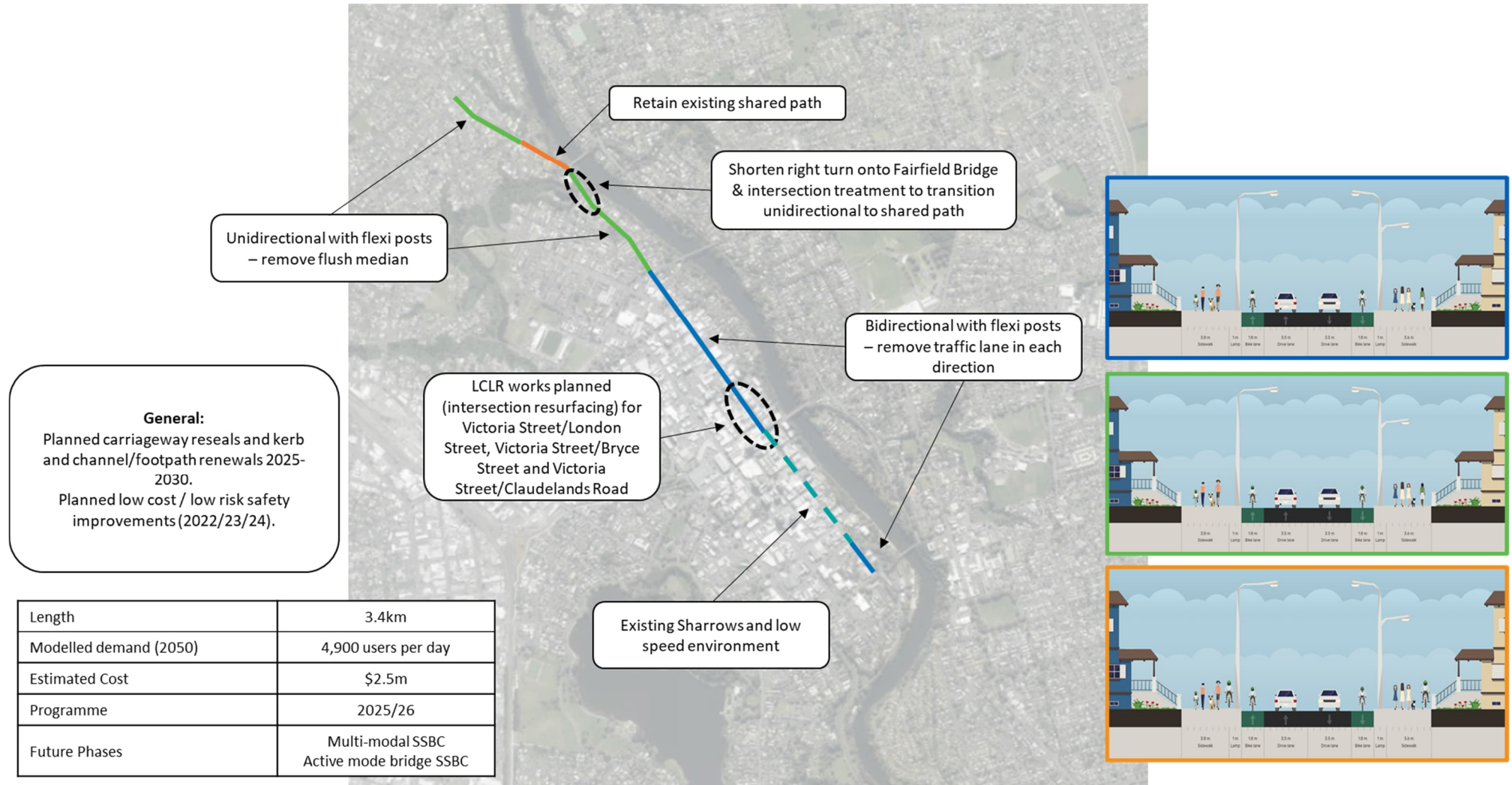


Figure 3 – Killarney Road

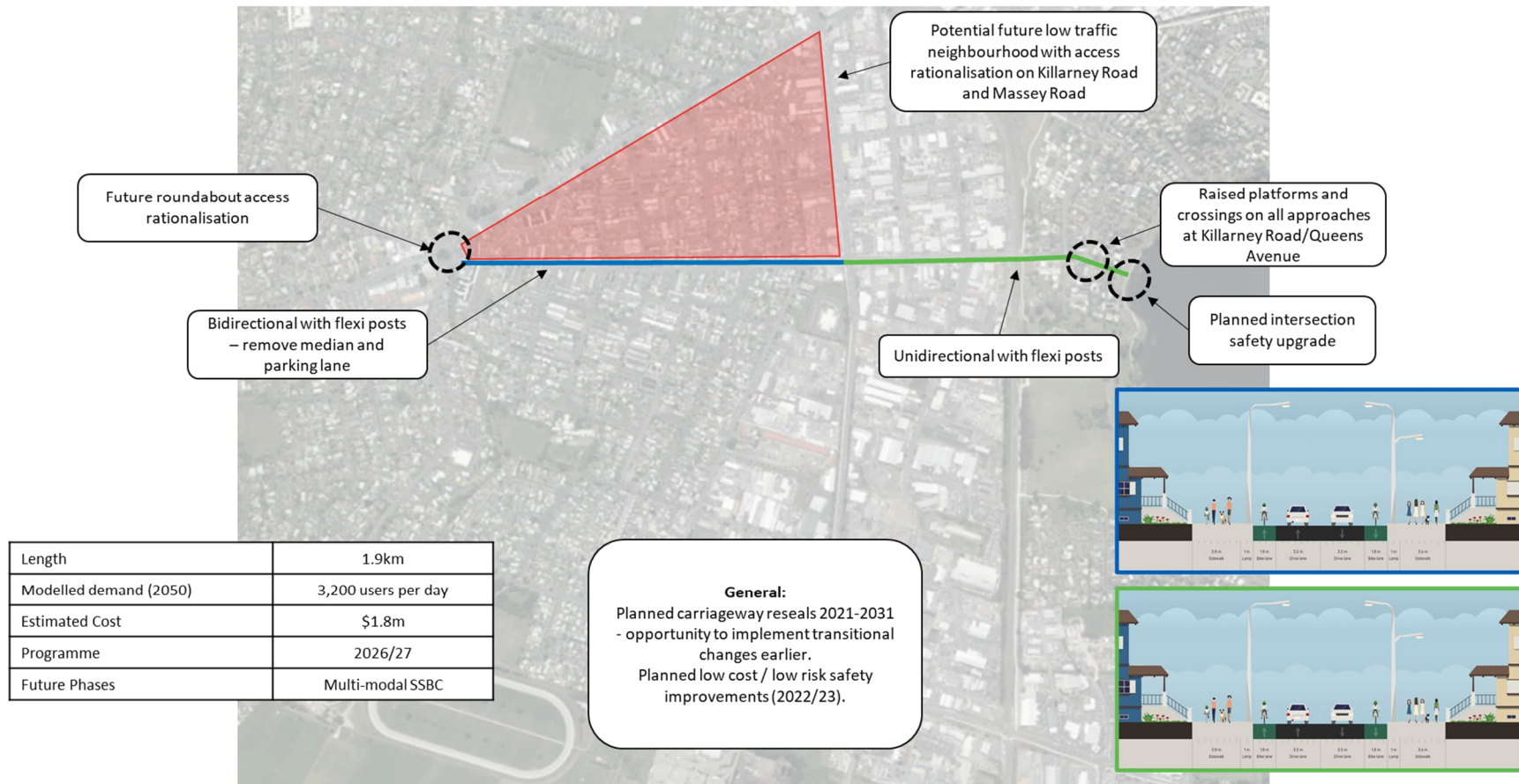
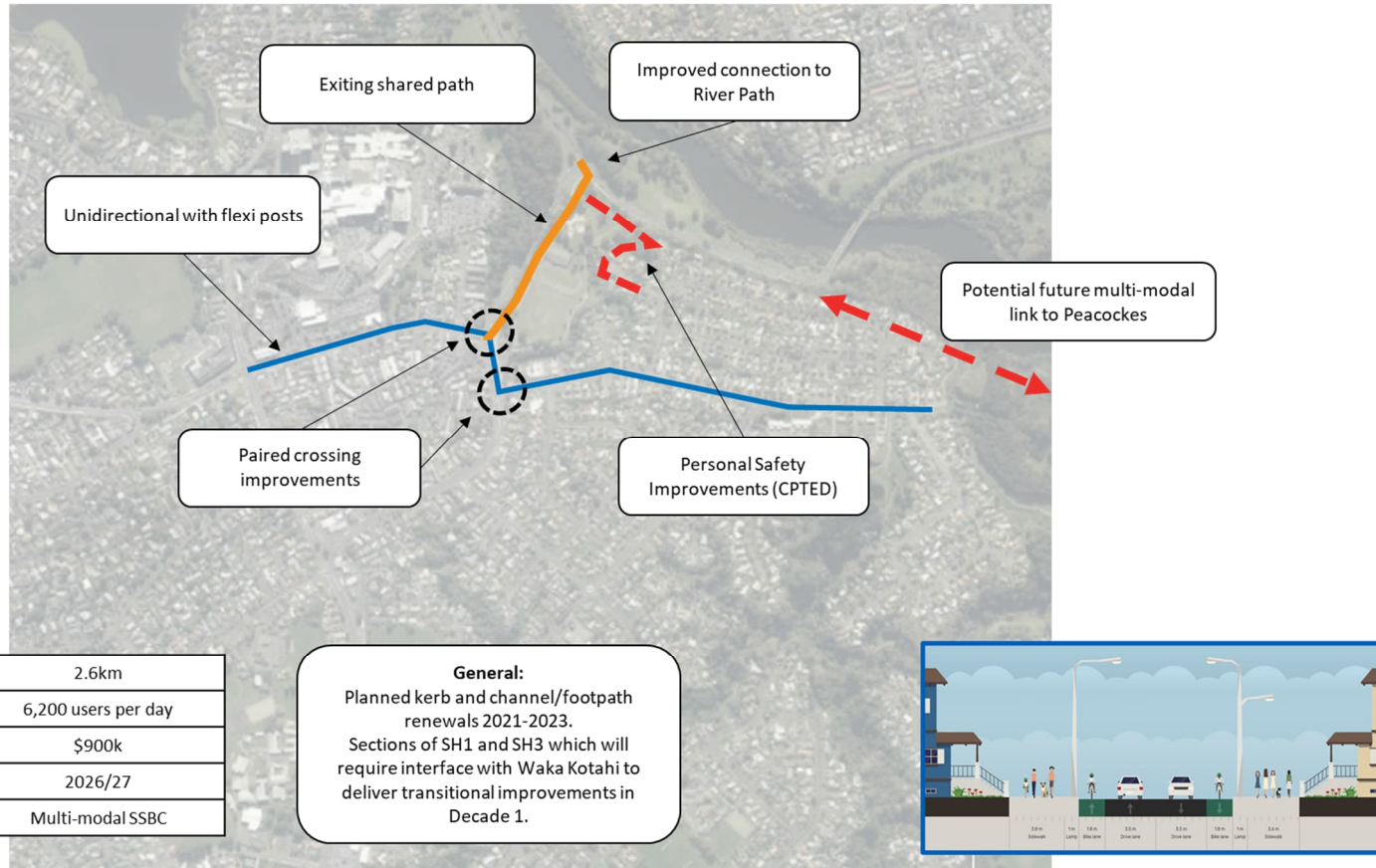




Figure 4 – Bader to Peacockes



Length	2.6km
Modelled demand (2050)	6,200 users per day
Estimated Cost	\$900k
Programme	2026/27
Future Phases	Multi-modal SSBC

**General:**  
 Planned kerb and channel/footpath renewals 2021-2023.  
 Sections of SH1 and SH3 which will require interface with Waka Kotahi to deliver transitional improvements in Decade 1.

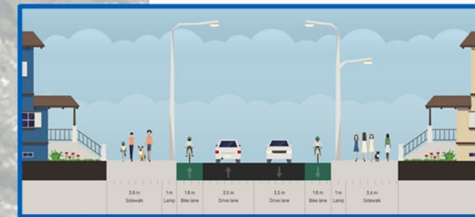


Figure 5 – Nawton to City Centre

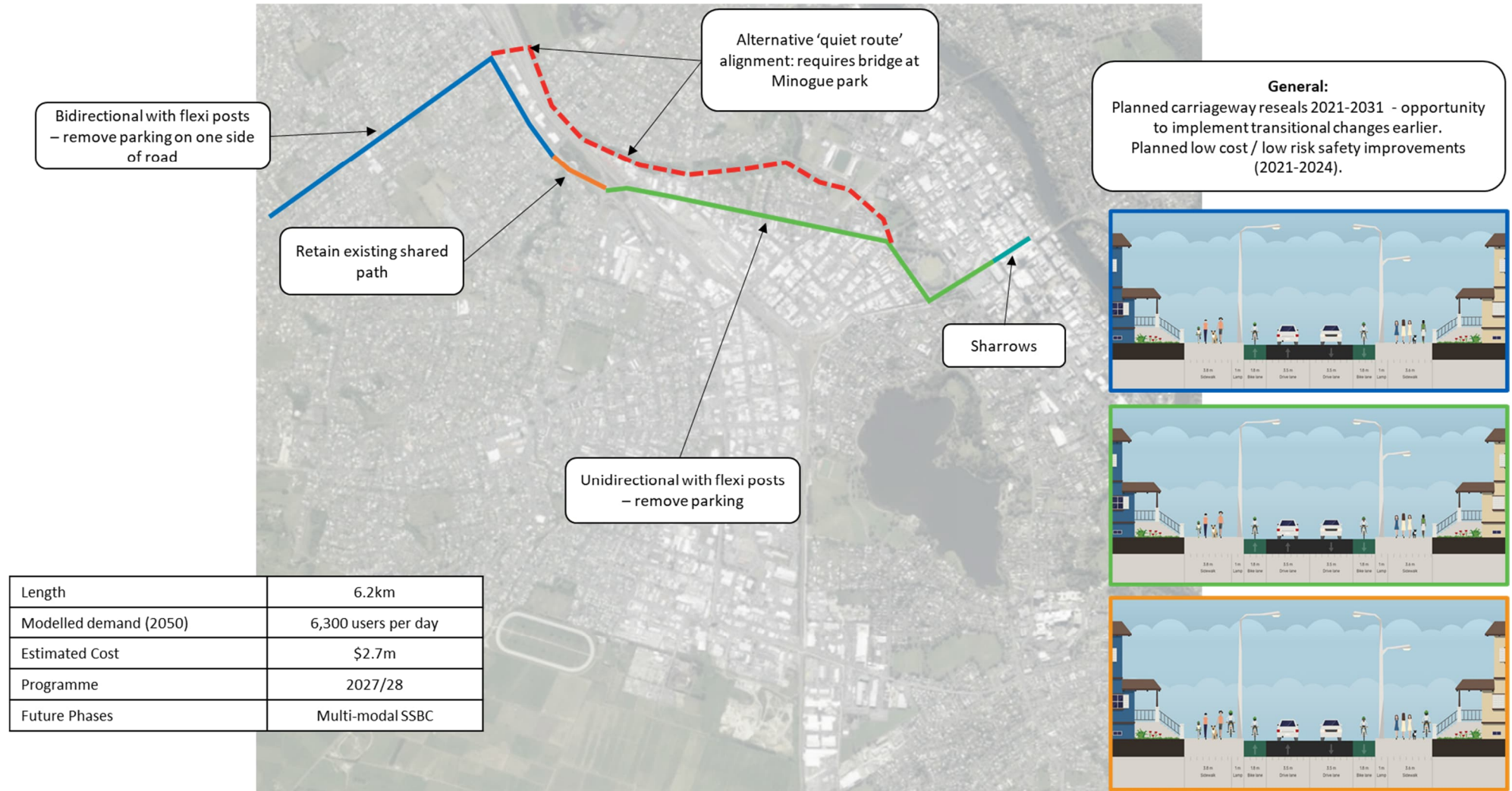


Figure 6 – Boundary Road

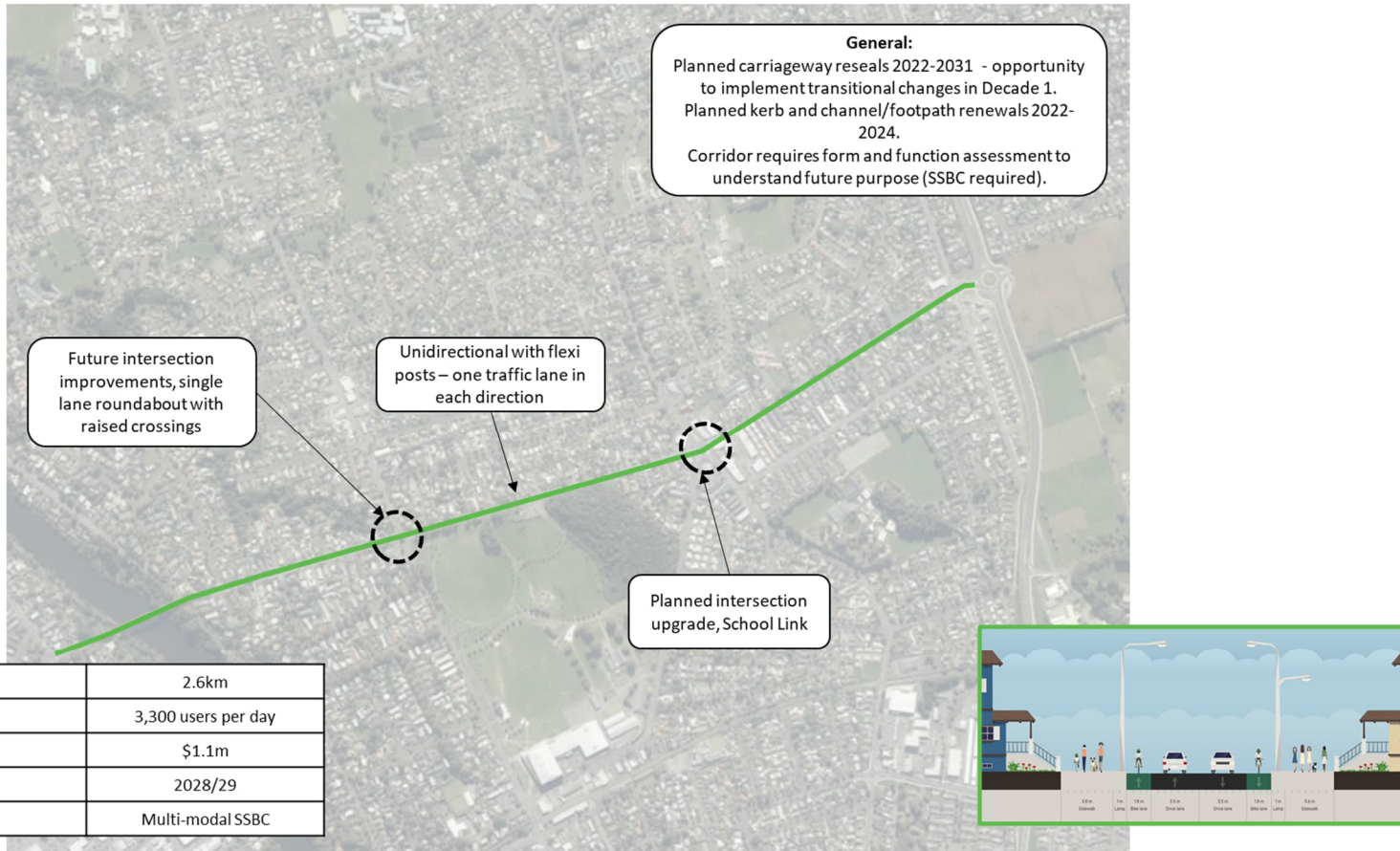
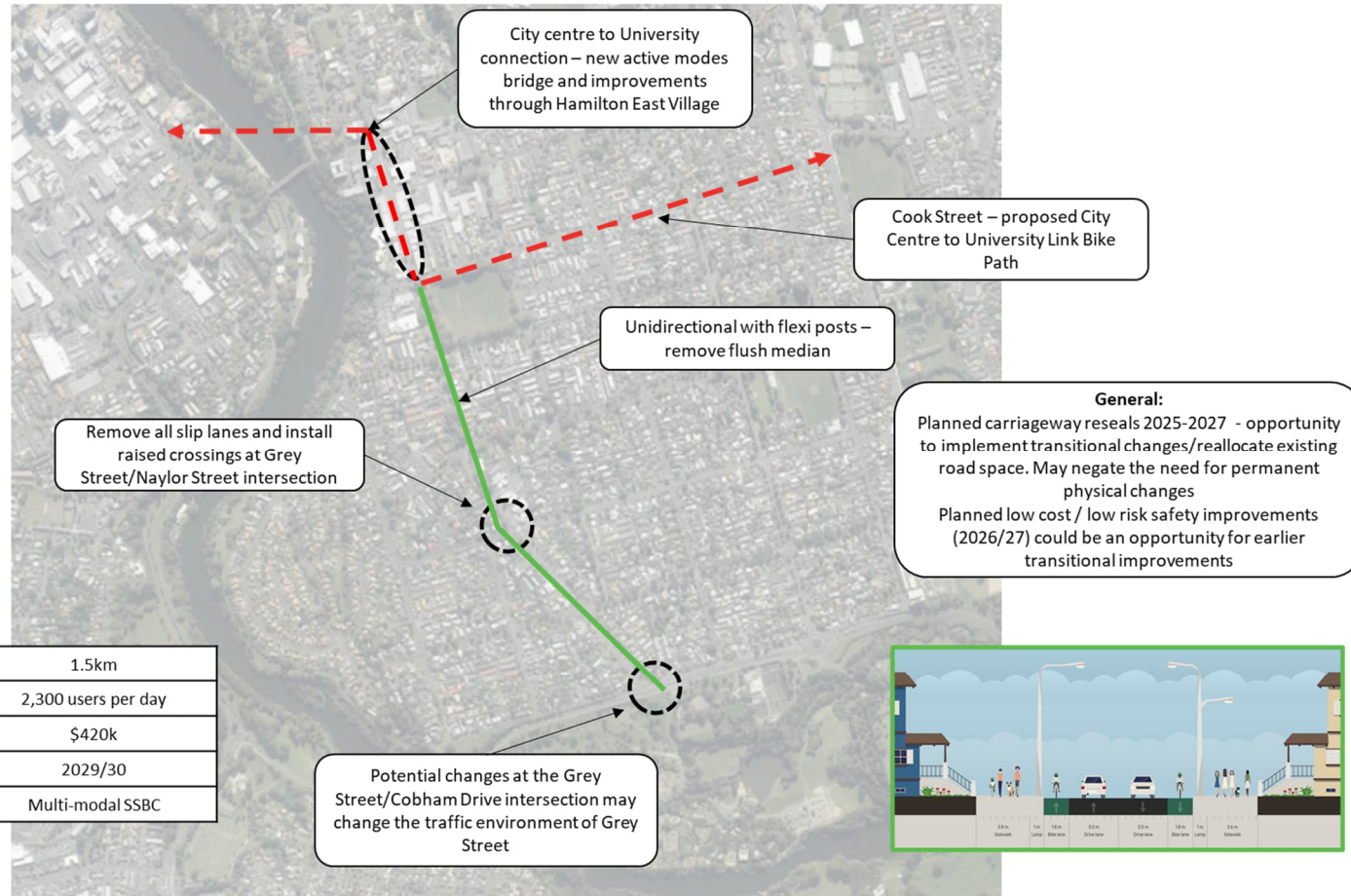
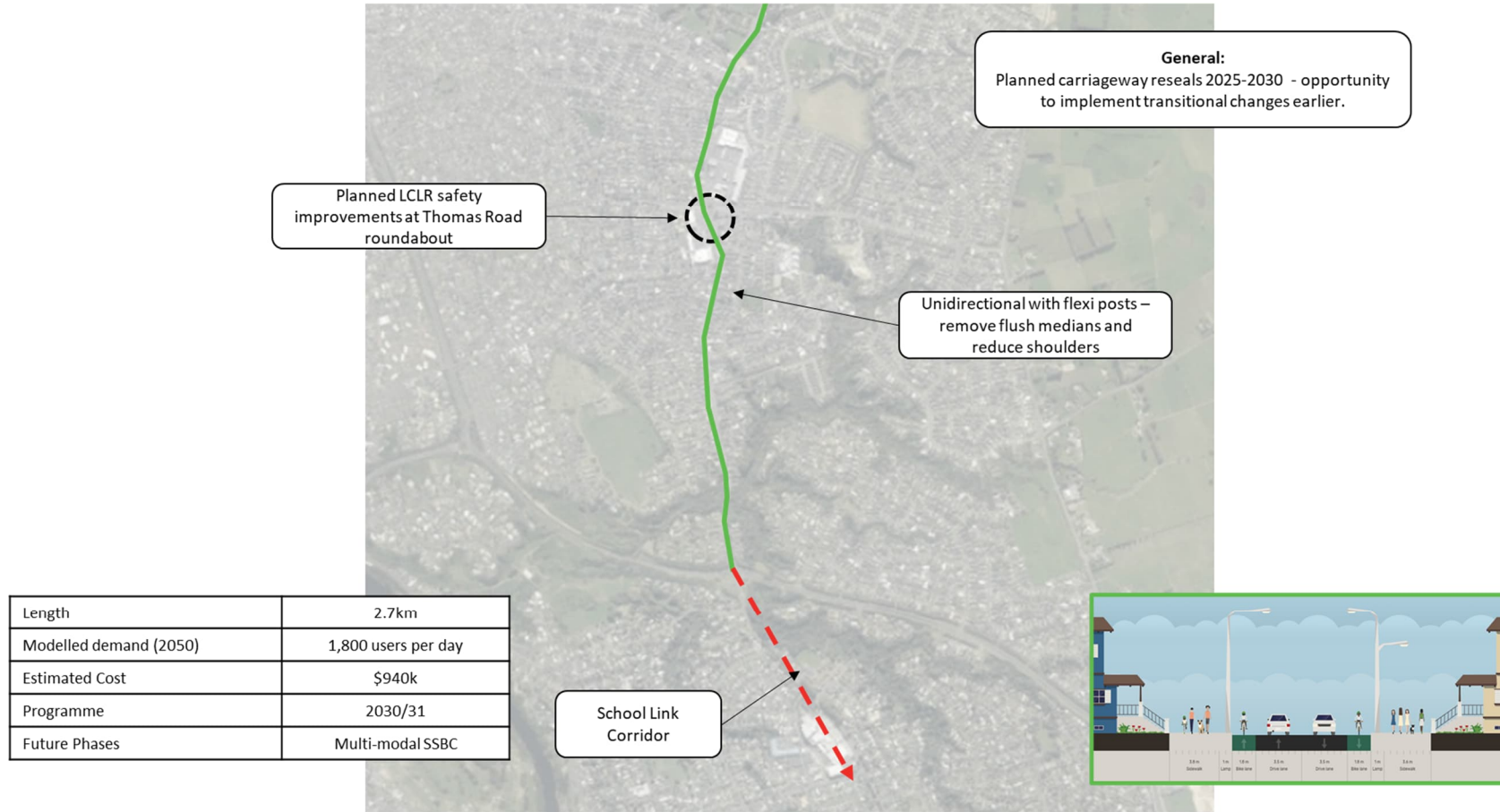


Figure 7 – Grey Street South



Length	1.5km
Modelled demand (2050)	2,300 users per day
Estimated Cost	\$420k
Programme	2029/30
Future Phases	Multi-modal SSBC

Figure 8 – Rototuna to Chartwell



## 5.0 Responsive/Oppportunistic Projects

Reactive / opportunistic projects respond to opportunities to implement biking and micro-mobility improvements which arise from activities being undertaken by other HCC programmes, land use development and business as usual activities etc. These opportunities include:

- Programmed maintenance and renewals, including pavement, utilities and three waters works
- Reactive maintenance and renewals
- Low cost / low risk programmes for safety, walking and cycling
- Land use intensification and development on corridors and in suburbs
- Responding to public issues and concerns at a 'local corner' scale, and
- Protecting corridor space for future implementation of biking facilities.

The proposed investment in Responsive / opportunistic projects is summarised in Table 3.

**Table 3 – Responsive / opportunistic projects (\$m)**

Item	Description	Length (km)	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
All	Responsive / opportunistic projects	59	2024-31	39.7	51.7

The unit rate assumed for these projects was based on a weighted average of the intervention types shown in Table 4 provides a breakdown of the facility typologies that are envisaged for the transitional type interventions.

**Table 4 – Facility typologies and assumed proportions assumed to make up the responsive and area wide projects**

Level	Facility provided	Intervention Level Assumptions	\$/km (P50)	Proportion
Level 1b	Transitional shared path (min width 3m)	Widened shared path	\$ 1,797,600	10%
Level 1c	Neighbourhood Greenways	Sharrows, speed management, signage and physical speed restraints	\$ 578,500	20%
Level 2a	Bidirectional bike path at road level	Transitional treatment within existing kerblines. Assumes reallocation of existing road space and no control type changes at intersections. Separation by cycle wands. Includes road markings & patching to improve surfacing	\$ 335,300	10%

Level 2b	Unidirectional bike path at road level	Transitional treatment within existing kerblines. Assumes reallocation of existing road space and no control type changes at intersections. Separation by cycle wands. Includes road markings & patching to improve surfacing	\$ 587,300	55%
Level 2c	Painted bike lanes at road level	Separated by flexi posts / cycle wands	\$ 345,200	5%

The 10 year programme has been developed assuming facilities will be implemented in line with the *Transitional Cycling Design Guidance*

The average cost of implementing these facilities is estimated to be **between \$670,000 (P50) and \$870,000 (P95) per kilometre**. With a network length of 59km proposed between 2024 and 2031 this is an expected cost **\$39.7m**. P95 costs are estimated at to **\$51.7m**

### 6.0 Area Wide Projects

Allowance has been made in the 10 year programme for the treatment of around 44km of local streets through area wide projects that aim to reduce or remove the conflicts with vehicle traffic, in alignment with the transitional cycling design guidance and the intervention hierarchy. The proposed investment in area wide projects is summarised in Table 5. The same rate as assumed for the responsive/opportunistic projects has been assumed to apply to these projects and distributed evenly across the 30 years.

Table 5 shows the expected costs for the 10 year investment programme.

Table 5 – Area wide projects (\$m)

Item	Description	Length (km)	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
All	Area wide projects	44	2024-31	29.4	38.3

## 7.0 End of trip facilities

The end of trip facilities proposed as part of the 10 year programme are summarised in Table 5.

**Table 6 – End of trip facilities (\$m)**

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Short stay bike parking	2000	2024-31	2.16	2.8
2	e-bike/e-scooter charging facilities	10	2024-31	0.15	0.2
3	Secure bike parking (long stay parking)	2	2024-31	0.62	0.8
4	Bike repair stations	50	2024-31	0.19	0.25
5	Wayfinding	318	2024-31	0.44	0.57
<b>All</b>	<b>End of trip facilities</b>	<b>All</b>	<b>2024-31</b>	<b>3.56</b>	<b>4.62</b>

## 8.0 Design Guidelines

Hamilton does not have any manuals or guidance specific to the planning and design of biking networks and infrastructure. The development of design guidelines was highlighted by stakeholders throughout the options assessment as being critically important to ensure high quality, safe, coherent, and consistent planning and design of the biking and micro-mobility network.

The proposed investment in design guidelines is summarised in Table 7.

**Table 7 – Design guidelines (\$m)**

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Develop Transitional Cycling Design Guidance	1	2022/23	0.2	0.26
2	Design guidelines for inclusion in RITS and District Plan	1	2022/23	0.1	0.13
<b>All</b>	<b>Design Guidance</b>	<b>2</b>	<b>2022/23</b>	<b>0.3</b>	<b>0.4</b>

## 9.0 Business Cases

The proposed investment in additional business cases is summarised in Table 8.

**Table 8 – Business cases (\$m)**

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Business Cases	3	2028-31	1.5	2.0



Allowance has been made for three corridor SSBCs, or contributions to multi-modal corridor SSBCs in the later years of the 10 year programme.

## 10.0 Non-Infrastructure activities

The proposed investment in non-infrastructure activities is summarised in Table 9.

**Table 9 – Non-infrastructure activities (\$m)**

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Bike libraries	3	2024-31	0.4	0.5
2	Bike purchase / subsidy schemes	200	2024-31	0.4	0.5
3	Lock subsidy	500	2024-31	0.4	0.5
<b>All</b>	<b>Non-infrastructure activities</b>	<b>703</b>	<b>2024-31</b>	<b>1.2</b>	<b>1.5</b>

## 11.0 Maintenance

The proposed 10-year investment in maintenance of the new projects, over and above that currently funded in the Do Minimum, is summarised in Table 10

**Table 10 – Maintenance (\$m)**

Item	Description	No.	Implementation year	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
1	Maintenance	1	2025-31	1.4	1.8
2	Maintenance specifications	1	2024/25	0	0
<b>All</b>	<b>Maintenance</b>	<b>2</b>	<b>2024-31</b>	<b>1.4</b>	<b>1.8</b>

A high level of service on the biking and micro-mobility network will require an improved and mode specific maintenance regime to keep the new facilities at a basic level of service. This includes more regular sweeping of debris from the separated lanes/paths using specialist equipment, surface and road marking maintenance and maintenance of the end-of-trip facilities.

An improved maintenance specification will be developed and implemented by the programme manager in collaboration with the contracted maintenance and operations contractor to maintain the facilities to the required level of service.

Network maintenance has been assumed as 0.5% of cumulative programme capital expenditure per year. Maintenance costs are considered conservative, as the shift from private vehicles to biking and micro-mobility is forecast to reduce the number of cars on the road and therefore reduce wear on the pavements, and therefore the frequency and costs of maintenance and renewals.

## 12.0 Programme management and delivery (OPEX)

The biking and micro-mobility programme is proposed as an ongoing programme to govern, manage, and deliver biking investment in Hamilton. This includes the delivery of projects on separate funding pathways including School Link and the City Centre to University Link as part of the programme. Resourcing to deliver more than the current works programme is a significant issue for HCC, who are short staffed in a number of departments delivering the current Transport Improvement Programme.

The 10 year programme includes a dedicated biking and micro-mobility programme management and delivery team, focussed on delivering programme benefits and outcomes, including four roles in the management and delivery space. The annual proposed investment in programme management and delivery staff is summarised in Table 11.

**Table 11 – Programme management and delivery (\$m)**

Item	Role description	No.	Start year	Annual expected estimate (P50)	Annual 95 <sup>th</sup> percentile estimate (P95)	10-year expected estimate (P50)	10-year 95 <sup>th</sup> percentile estimate (P95)
1	Programme manager	1	2023/24	0.15	0.18	1.44	1.87
2	Programme assurance	1	2024/25	0.12	0.14	1.01	1.31
3	Planned project manager	1	2023/24	0.12	0.14	1.15	1.5
4	Responsive projects engineer	1	2023/24	0.10	0.12	0.96	1.31
<b>All</b>	<b>Programme management and delivery staff</b>	<b>4</b>	<b>2023/24</b>	<b>0.5</b>	<b>0.6</b>	<b>4.56</b>	<b>5.93</b>

Delivery of physical projects is programmed to commence the first year of the 2024-27 NLTP, where most of the team will be in place. The Programme Manager and Planned Project Manager are expected to start early in 2023/24 to make sure projects will be ready for implementation to commence in the 2024/25 financial year.

### 13.0 Behaviour change activities (OPEX)

To further maximise the benefit of the investment in the physical network infrastructure and end-of-trip facilities, more will need to be done to promote biking and micro-mobility as a safe, fun, healthy and sustainable form of transport. The proposed investment in behaviour change activities is summarised in Table 12 , and outlined in this section.

**Table 12 – Behaviour change activities (\$m)**

Item	Role description	No.	Start year	Annual expected estimate (P50)	Annual 95 <sup>th</sup> percentile estimate (P95)
1	Transport stakeholder manager	1	2024/25	0.12	0.14
2	Behaviour change advisor	1	2025/26	0.12	0.14
3	Behaviour change advisor	1	2023/24	0.12	0.14
<b>All</b>	<b>Behaviour change staff</b>	<b>3</b>	<b>2023-26</b>	<b>0.36</b>	<b>0.43</b>

## 14.0 Total Costs

Table 13 provides a breakdown of the capital cost estimate ranges (P50 to P95) to implement the 10 year programme.

**Table 13 – P50 and P95 Capital costs (\$m)**

Cost activity	Expected estimate (P50)	95 <sup>th</sup> percentile estimate (P95)
Planned projects	14.6	19.0
Responsive / opportunistic projects	39.7	51.7
Area wide projects	29.4	38.3
End-of-trip facilities	3.5	4.6
Design guidelines	0.3	0.4
Business Cases	1.5	2.0
<b>Total</b>	<b>89.0</b>	<b>116.0</b>

Table 14 provides an annual breakdown of the P50 and P95 programme costs respectively including capital costs, and maintenance and operating costs.

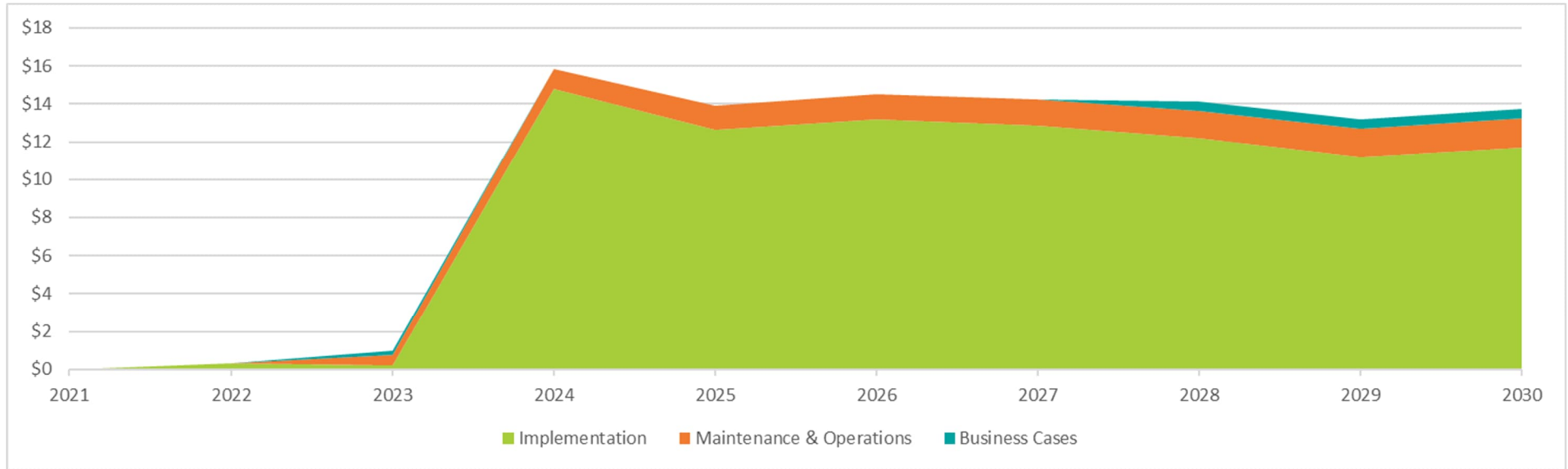
**Table 14 – P50 programme costs, CAPEX and OPEX (\$m)**

Component	2021 /2022	2022 /2023	2023 /2024	2024 /2025	2025 /2026	2026 /2027	2027 /2028	2028 /2029	2029 /2030	2030 /2031	Decade 1 2021 – 2031	
											P50	P95
Capital	0.0	0.3	0.2	14.8	12.7	13.2	12.9	12.2	11.2	11.7	89.1	115.9
Maintenance and operating	0.0	0.0	0.6	1.0	1.2	1.3	1.4	1.4	1.5	1.5	10.0	12.9
<b>Total</b>	0.0	0.3	0.8	15.8	13.9	14.5	14.2	13.6	12.7	13.3	99.1	128.8

Table 14 show that the total 10 year programme costs are estimated to range between **\$99.1m** and **\$128.8m** for **P50** and **P95** costs respectively.

Figure 9 provides a lava diagram of the P50 costs over the next decade.

Figure 9 – 10 year programme cash flows 2021 to 2031 (expected P50, not escalated \$m)



## 14.1 Capital costs

Table 15 provides a breakdown of the capital costs for the 10 year programme, the next stage for those projects, the pre-implementation and implementation estimates, and the expected sources of funding. The colour coded cells refer to the stages of project development: **business case**, **implementation**, and **ongoing programme activities**. Table 15 shows that most projects are expected to be funded using the traditional 49% local share / 51% Financial Assistance Rate (FAR) from the NLTF administered by Waka Kotahi. Items that do not qualify for FAR include end of trip facilities and non-infrastructure activities.

Table 15 shows that the 10 year programme capital costs are expected to range between **\$86m and \$111.5m** for the P50 and P95 respectively. This is split **\$42m – 55m** from HCC local share, and **\$43m – 56m** from the NLTF.

Table 15 excludes projects that are on their own funding pathways such as the Eastern Pathways School Link and City Centre to University Link corridors. These projects form part of the overall biking and micro-mobility programme delivery, but as funding is being sought separately those project costs are not included in the 10 year programme for this funding application. Similarly, biking and micro-mobility projects within the Peacocke, Ruakura, Rototuna and Rotokauri growth areas (and similar development areas) are funded through those programmes, which include a bespoke mix of funding from Government, HCC, NLTF and private sources.

## 14.2 Escalated capital costs

Table 16 shows the same cost information as Table 15, with escalation applied to costs at a rate of at 8% in year 2, 6% in year 3, and 5% thereafter.

Table 16 shows that the escalated 10 year programme capital costs are expected to range between **\$119m and \$156m** for the P50 and P95 respectively. This is split **\$59m – 76m** from HCC local share, and **\$60m – 78m** from the NLTF.

Table 16 shows that with the expected escalation in project costs over the next 10 years, the overall programme costs are expected to increase by **\$33m – 43m, around 28%**.

Table 15 – 10 year programme and capital funding sources (expected P50, not escalated \$m)

Project	Next Phase	Source	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2021 – 2031		
													P50	P95	
Hospital to City Centre	SSBC Lite	<b>Total</b>	-	-	0.20	4.00	-	-	-	-	-	-	4.20	5.46	
		Hamilton City Council	-	-	0.10	1.96	-	-	-	-	-	-	-	2.06	2.68
		Waka Kotahi	-	-	0.10	2.04	-	-	-	-	-	-	-	2.14	2.78
Victoria Street	Implementation	<b>Total</b>	-	-	-	0.20	2.30	-	-	-	-	-	2.50	3.25	
		Hamilton City Council	-	-	-	0.10	1.13	-	-	-	-	-	-	1.23	1.59
		Waka Kotahi	-	-	-	0.10	1.17	-	-	-	-	-	-	1.28	1.66
Killarney Road	Implementation	<b>Total</b>	-	-	-	-	-	1.80	-	-	-	-	1.80	2.34	
		Hamilton City Council	-	-	-	-	-	0.88	-	-	-	-	-	0.88	1.15
		Waka Kotahi	-	-	-	-	-	0.92	-	-	-	-	-	0.92	1.19
Bader to Peacockes	Implementation	<b>Total</b>	-	-	-	-	-	0.90	-	-	-	-	0.90	1.17	
		Hamilton City Council	-	-	-	-	-	0.44	-	-	-	-	-	0.44	0.57
		Waka Kotahi	-	-	-	-	-	0.46	-	-	-	-	-	0.46	0.60
Nawton to City Centre	Implementation	<b>Total</b>	-	-	-	-	-	0.20	2.50	-	-	-	2.70	3.51	
		Hamilton City Council	-	-	-	-	-	0.10	1.23	-	-	-	-	1.32	1.72
		Waka Kotahi	-	-	-	-	-	0.10	1.28	-	-	-	-	1.38	1.79
Boundary Road	Implementation	<b>Total</b>	-	-	-	-	-	-	-	1.10	-	-	1.10	1.43	
		Hamilton City Council	-	-	-	-	-	-	-	-	0.54	-	-	0.54	0.70
		Waka Kotahi	-	-	-	-	-	-	-	-	0.56	-	-	0.56	0.73
Grey Street South	Implementation	<b>Total</b>	-	-	-	-	-	-	-	-	0.40	-	0.40	0.52	
		Hamilton City Council	-	-	-	-	-	-	-	-	-	0.20	-	0.20	0.25
		Waka Kotahi	-	-	-	-	-	-	-	-	-	0.20	-	0.20	0.27
Rototuna to Chartwell	Implementation	<b>Total</b>	-	-	-	-	-	-	-	-	-	0.90	0.90	1.17	
		Hamilton City Council	-	-	-	-	-	-	-	-	-	-	0.44	0.44	0.57
		Waka Kotahi	-	-	-	-	-	-	-	-	-	-	0.46	0.46	0.60
Responsive / opportunistic projects	Implementation	<b>Total</b>	-	-	-	5.70	5.70	5.70	5.70	5.70	5.70	5.70	39.90	51.87	
		Hamilton City Council	-	-	-	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.79	19.55	25.42
		Waka Kotahi	-	-	-	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	20.35	26.45
Area wide projects	Implementation	<b>Total</b>	-	-	-	4.20	4.20	4.20	4.20	4.20	4.20	4.20	29.40	38.22	
		Hamilton City Council	-	-	-	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	14.41	18.73
		Waka Kotahi	-	-	-	2.14	2.14	2.14	2.14	2.14	2.14	2.14	2.14	14.99	19.49
End of trip facilities	Implementation	<b>Total</b>	-	-	-	0.7	0.5	0.5	0.5	0.7	0.4	0.4	3.57	4.64	
		Hamilton City Council	-	-	-	0.348	0.221	0.221	0.221	0.348	0.196	0.196	1.75	2.27	
		Waka Kotahi	-	-	-	0.362	0.230	0.230	0.230	0.362	0.204	0.204	1.82	2.37	
Design guidelines	Implementation	<b>Total</b>	-	0.30	-	-	-	-	-	-	-	-	0.30	0.39	
		Hamilton City Council	-	0.15	-	-	-	-	-	-	-	-	-	0.15	0.19
		Waka Kotahi	-	0.15	-	-	-	-	-	-	-	-	-	0.15	0.20
Business cases	SSBC	<b>Total</b>	-	-	-	-	-	-	-	0.50	0.50	0.50	1.50	1.95	
		Hamilton City Council	-	-	-	-	-	-	-	-	0.25	0.25	0.25	0.74	0.96
		Waka Kotahi	-	-	-	-	-	-	-	-	0.26	0.26	0.26	0.77	0.99
<b>Total Funding CAPEX</b>	<b>All</b>	<b>Total</b>	-	0.30	0.20	14.81	12.65	13.25	12.85	12.21	11.20	11.70	89.17	115.92	
		Hamilton City Council	-	0.15	0.10	7.26	6.20	6.49	6.30	5.98	5.49	5.73	43.69	56.80	
		Waka Kotahi	-	0.15	0.10	7.55	6.45	6.76	6.55	6.23	5.71	5.97	45.48	59.12	

Table 16 – 10 year programme and capital funding sources (expected P50, escalated \$m)

Project	Next Phase	Source	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2021 – 2031		
													P50	P95	
Hospital to City Centre	SSBC Lite	<b>Total</b>	-	-	0.23	4.81	-	-	-	-	-	-	5.04	6.55	
		<i>Hamilton City Council</i>	-	-	0.11	2.36	-	-	-	-	-	-	-	2.47	3.21
		<i>Waka Kotahi</i>	-	-	0.12	2.45	-	-	-	-	-	-	-	2.57	3.34
Victoria Street	Implementation	<b>Total</b>	-	-	-	0.24	2.90	-	-	-	-	-	3.14	4.09	
		<i>Hamilton City Council</i>	-	-	-	0.12	1.42	-	-	-	-	-	-	1.54	2.00
		<i>Waka Kotahi</i>	-	-	-	0.12	1.48	-	-	-	-	-	-	1.60	2.08
Killarney Road	Implementation	<b>Total</b>	-	-	-	-	-	2.39	-	-	-	-	2.39	3.10	
		<i>Hamilton City Council</i>	-	-	-	-	-	1.17	-	-	-	-	-	1.17	1.52
		<i>Waka Kotahi</i>	-	-	-	-	-	1.22	-	-	-	-	-	1.22	1.58
Bader to Peacockes	Implementation	<b>Total</b>	-	-	-	-	-	1.19	-	-	-	-	1.19	1.55	
		<i>Hamilton City Council</i>	-	-	-	-	-	0.58	-	-	-	-	-	0.58	0.76
		<i>Waka Kotahi</i>	-	-	-	-	-	0.61	-	-	-	-	-	0.61	0.79
Nawton to City Centre	Implementation	<b>Total</b>	-	-	-	-	-	0.27	3.48	-	-	-	3.74	4.87	
		<i>Hamilton City Council</i>	-	-	-	-	-	0.13	1.70	-	-	-	-	1.83	2.38
		<i>Waka Kotahi</i>	-	-	-	-	-	0.14	1.77	-	-	-	-	1.91	2.48
Boundary Road	Implementation	<b>Total</b>	-	-	-	-	-	-	-	1.61	-	-	1.61	2.09	
		<i>Hamilton City Council</i>	-	-	-	-	-	-	-	0.79	-	-	-	0.79	1.02
		<i>Waka Kotahi</i>	-	-	-	-	-	-	-	0.82	-	-	-	0.82	1.07
Grey Street South	Implementation	<b>Total</b>	-	-	-	-	-	-	-	-	0.61	-	0.61	0.80	
		<i>Hamilton City Council</i>	-	-	-	-	-	-	-	-	0.30	-	-	0.30	0.39
		<i>Waka Kotahi</i>	-	-	-	-	-	-	-	-	0.31	-	-	0.31	0.41
Rototuna to Chartwell	Implementation	<b>Total</b>	-	-	-	-	-	-	-	-	-	1.45	1.45	1.88	
		<i>Hamilton City Council</i>	-	-	-	-	-	-	-	-	-	-	0.71	0.71	0.92
		<i>Waka Kotahi</i>	-	-	-	-	-	-	-	-	-	-	0.74	0.74	0.96
Responsive / opportunistic projects	Implementation	<b>Total</b>	-	-	-	6.85	7.19	7.55	7.93	8.33	8.74	9.18	55.79	72.52	
		<i>Hamilton City Council</i>	-	-	-	3.36	3.53	3.70	3.89	4.08	4.28	4.50	27.34	35.54	
		<i>Waka Kotahi</i>	-	-	-	3.49	3.67	3.85	4.05	4.25	4.46	4.68	28.45	36.99	
Area wide projects	Implementation	<b>Total</b>	-	-	-	5.05	5.30	5.57	5.84	6.14	6.44	6.77	41.11	53.44	
		<i>Hamilton City Council</i>	-	-	-	2.47	2.60	2.73	2.86	3.01	3.16	3.32	20.14	26.18	
		<i>Waka Kotahi</i>	-	-	-	2.57	2.70	2.84	2.98	3.13	3.29	3.45	20.96	27.25	
End of trip facilities	Implementation	<b>Total</b>	-	-	-	0.85	0.57	0.60	0.63	1.04	0.61	0.64	4.94	6.42	
		<i>Hamilton City Council</i>	-	-	-	0.42	0.28	0.29	0.31	0.51	0.30	0.32	2.42	3.15	
		<i>Waka Kotahi</i>	-	-	-	0.44	0.29	0.30	0.32	0.53	0.31	0.33	2.52	3.27	
Design guidelines	Implementation	<b>Total</b>	-	0.32	-	-	-	-	-	-	-	-	0.32	0.42	
		<i>Hamilton City Council</i>	-	0.16	-	-	-	-	-	-	-	-	-	0.16	0.21
		<i>Waka Kotahi</i>	-	0.17	-	-	-	-	-	-	-	-	-	0.17	0.21
Business cases	SSBC	<b>Total</b>	-	-	-	-	-	-	-	0.73	0.77	0.81	2.30	2.99	
		<i>Hamilton City Council</i>	-	-	-	-	-	-	-	-	0.36	0.38	0.39	1.13	1.47
		<i>Waka Kotahi</i>	-	-	-	-	-	-	-	-	0.37	0.39	0.41	1.17	1.53
<b>Total Funding CAPEX</b>	<b>All</b>	<b>Total</b>	-	0.32	0.23	17.80	15.97	17.56	17.88	17.84	17.18	18.85	123.63	160.72	
		<i>Hamilton City Council</i>	-	0.16	0.11	8.72	7.82	8.60	8.76	8.74	8.42	9.23	60.58	78.75	
		<i>Waka Kotahi</i>	-	0.17	0.12	9.08	8.14	8.96	9.12	9.10	8.76	9.61	63.05	81.97	



## 14.3 Maintenance and operating costs

Table 17 provides a breakdown of the maintenance and operating costs for the 10 year programme (not escalated).

Table 17 shows that the 10 year programme maintenance and operating costs (not escalated) are expected to range between **\$9.8m to 12.8m** for the P50 and P95 respectively. This is split **\$5.5m to 7.2m** from HCC local share, and **\$4.3m to 5.6m** from the NLTF.

## 14.4 Escalated maintenance and operating costs

Table 18 shows the same cost information as Table 17, with escalation applied to costs at a rate of at 8% in year 2, 6% in year 3, and 5% thereafter.

Table 16 shows that the escalated 10 year programme maintenance and operating costs are expected to range between **\$13.8m to 17.9m** for the P50 and P95 respectively. This is split **\$7.8 to 10m** from HCC local share, and **\$6m to 7.8m** from the NLTF.

Table 17 – 10 year programme maintenance and operating costs (expected P50, not escalated \$m)

Project	Source	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2021 – 2031	
												P50	P95
Programme management and delivery	<b>Total</b>	-	-	<b>0.44</b>	<b>0.59</b>	<b>0.59</b>	<b>0.59</b>	<b>0.59</b>	<b>0.59</b>	<b>0.59</b>	<b>0.59</b>	<b>4.57</b>	<b>5.94</b>
	<i>Hamilton City Council</i>	-	-	<i>0.22</i>	<i>0.29</i>	<i>0.29</i>	<i>0.29</i>	<i>0.29</i>	<i>0.29</i>	<i>0.29</i>	<i>0.29</i>	2.24	2.91
	<i>Waka Kotahi</i>	-	-	<i>0.22</i>	<i>0.30</i>	<i>0.30</i>	<i>0.30</i>	<i>0.30</i>	<i>0.30</i>	<i>0.30</i>	<i>0.30</i>	2.33	3.03
Behaviour change activities	<b>Total</b>	-	-	-	<b>0.26</b>	<b>0.38</b>	<b>0.38</b>	<b>0.38</b>	<b>0.38</b>	<b>0.38</b>	<b>0.38</b>	<b>2.54</b>	<b>3.30</b>
	<i>Hamilton City Council</i>	-	-	-	<i>0.13</i>	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	1.24	1.62
	<i>Waka Kotahi</i>	-	-	-	<i>0.13</i>	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	1.30	1.68
Non-infrastructure activities	<b>Total</b>	-	-	-	<b>0.20</b>	<b>0.20</b>	<b>0.20</b>	<b>0.20</b>	<b>0.20</b>	<b>0.20</b>	<b>0.20</b>	<b>1.40</b>	<b>1.82</b>
	<i>Hamilton City Council</i>	-	-	-	<i>0.20</i>	<i>0.20</i>	<i>0.20</i>	<i>0.20</i>	<i>0.20</i>	<i>0.20</i>	<i>0.20</i>	1.40	1.82
	<i>Waka Kotahi</i>	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance	<b>Total</b>	-	-	-	-	<b>0.07</b>	<b>0.13</b>	<b>0.20</b>	<b>0.26</b>	<b>0.31</b>	<b>0.36</b>	<b>1.33</b>	<b>1.73</b>
	<i>Hamilton City Council</i>	-	-	-	-	<i>0.03</i>	<i>0.06</i>	<i>0.10</i>	<i>0.13</i>	<i>0.15</i>	<i>0.18</i>	0.65	0.85
	<i>Waka Kotahi</i>	-	-	-	-	<i>0.04</i>	<i>0.07</i>	<i>0.10</i>	<i>0.13</i>	<i>0.16</i>	<i>0.18</i>	0.68	0.88
<b>Total Funding OPEX</b>	<b>Total</b>	-	-	<b>0.44</b>	<b>1.05</b>	<b>1.24</b>	<b>1.30</b>	<b>1.37</b>	<b>1.43</b>	<b>1.48</b>	<b>1.53</b>	<b>9.84</b>	<b>12.79</b>
	<i>Hamilton City Council</i>	-	-	<i>0.22</i>	<i>0.62</i>	<i>0.71</i>	<i>0.74</i>	<i>0.77</i>	<i>0.80</i>	<i>0.83</i>	<i>0.85</i>	5.54	7.20
	<i>Waka Kotahi</i>	-	-	<i>0.22</i>	<i>0.43</i>	<i>0.53</i>	<i>0.56</i>	<i>0.60</i>	<i>0.63</i>	<i>0.65</i>	<i>0.68</i>	4.30	5.60

Table 18 – 10 year programme maintenance and operating costs (expected P50, escalated \$m)

Project	Source	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2021 – 2031	
												P50	P95
Programme management and delivery	<b>Total</b>	-	-	<b>0.50</b>	<b>0.71</b>	<b>0.74</b>	<b>0.78</b>	<b>0.82</b>	<b>0.86</b>	<b>0.91</b>	<b>0.95</b>	<b>6.28</b>	<b>8.16</b>
	<i>Hamilton City Council</i>	-	-	<i>0.25</i>	<i>0.35</i>	<i>0.36</i>	<i>0.38</i>	<i>0.40</i>	<i>0.42</i>	<i>0.44</i>	<i>0.47</i>	3.08	4.00
	<i>Waka Kotahi</i>	-	-	<i>0.26</i>	<i>0.36</i>	<i>0.38</i>	<i>0.40</i>	<i>0.42</i>	<i>0.44</i>	<i>0.46</i>	<i>0.48</i>	3.20	4.16
Behaviour change activities	<b>Total</b>	-	-	-	<b>0.31</b>	<b>0.48</b>	<b>0.50</b>	<b>0.53</b>	<b>0.56</b>	<b>0.58</b>	<b>0.61</b>	<b>3.57</b>	<b>4.65</b>
	<i>Hamilton City Council</i>	-	-	-	<i>0.15</i>	<i>0.24</i>	<i>0.25</i>	<i>0.26</i>	<i>0.27</i>	<i>0.29</i>	<i>0.30</i>	1.75	2.28
	<i>Waka Kotahi</i>	-	-	-	<i>0.16</i>	<i>0.24</i>	<i>0.26</i>	<i>0.27</i>	<i>0.28</i>	<i>0.30</i>	<i>0.31</i>	1.82	2.37
Non-infrastructure activities	<b>Total</b>	-	-	-	<b>0.24</b>	<b>0.25</b>	<b>0.27</b>	<b>0.28</b>	<b>0.29</b>	<b>0.31</b>	<b>0.32</b>	<b>1.96</b>	<b>2.54</b>
	<i>Hamilton City Council</i>	-	-	-	<i>0.24</i>	<i>0.25</i>	<i>0.27</i>	<i>0.28</i>	<i>0.29</i>	<i>0.31</i>	<i>0.32</i>	1.96	2.54
	<i>Waka Kotahi</i>	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance	<b>Total</b>	-	-	-	-	<b>0.09</b>	<b>0.17</b>	<b>0.28</b>	<b>0.38</b>	<b>0.48</b>	<b>0.58</b>	<b>1.97</b>	<b>2.57</b>
	<i>Hamilton City Council</i>	-	-	-	-	<i>0.04</i>	<i>0.08</i>	<i>0.14</i>	<i>0.19</i>	<i>0.23</i>	<i>0.28</i>	0.97	1.26
	<i>Waka Kotahi</i>	-	-	-	-	<i>0.05</i>	<i>0.09</i>	<i>0.14</i>	<i>0.19</i>	<i>0.24</i>	<i>0.30</i>	1.01	1.31
<b>Total Funding OPEX</b>	<b>Total</b>	-	-	<b>0.50</b>	<b>1.26</b>	<b>1.57</b>	<b>1.72</b>	<b>1.91</b>	<b>2.09</b>	<b>2.27</b>	<b>2.46</b>	<b>13.78</b>	<b>17.92</b>
	<i>Hamilton City Council</i>	-	-	<i>0.25</i>	<i>0.74</i>	<i>0.90</i>	<i>0.98</i>	<i>1.08</i>	<i>1.17</i>	<i>1.27</i>	<i>1.37</i>	7.75	10.08
	<i>Waka Kotahi</i>	-	-	<i>0.26</i>	<i>0.52</i>	<i>0.67</i>	<i>0.74</i>	<i>0.83</i>	<i>0.92</i>	<i>1.00</i>	<i>1.09</i>	6.03	7.84

**14.5 Summary**

The total estimated costs over the next decade of implementing and operating the Biking & Micro-mobility Programme are expected to be between

- **\$99m and \$129m** with no escalation assumed; and
- **\$137m and \$179m** with escalation applied

Figure 10 – 10 year programme cost range summary (\$m)

Costs	Source	2021 – 2031 cost range Not escalated		2021 – 2031 cost range Escalated	
		P50	P95	P50	P95
Capital costs	HCC	44	57	61	79
	Waka Kotahi	45	59	63	82
	<b>Total</b>	<b>89</b>	<b>116</b>	<b>124</b>	<b>161</b>
Maintenance and operating	HCC	5	7	8	10
	Waka Kotahi	4	6	6	8
	<b>Total</b>	<b>10</b>	<b>13</b>	<b>14</b>	<b>18</b>
<b>Total costs</b>	<b>HCC</b>	<b>49</b>	<b>64</b>	<b>68</b>	<b>89</b>
	<b>Waka Kotahi</b>	<b>50</b>	<b>65</b>	<b>69</b>	<b>90</b>
	<b>Total</b>	<b>99</b>	<b>129</b>	<b>137</b>	<b>179</b>

Yours faithfully

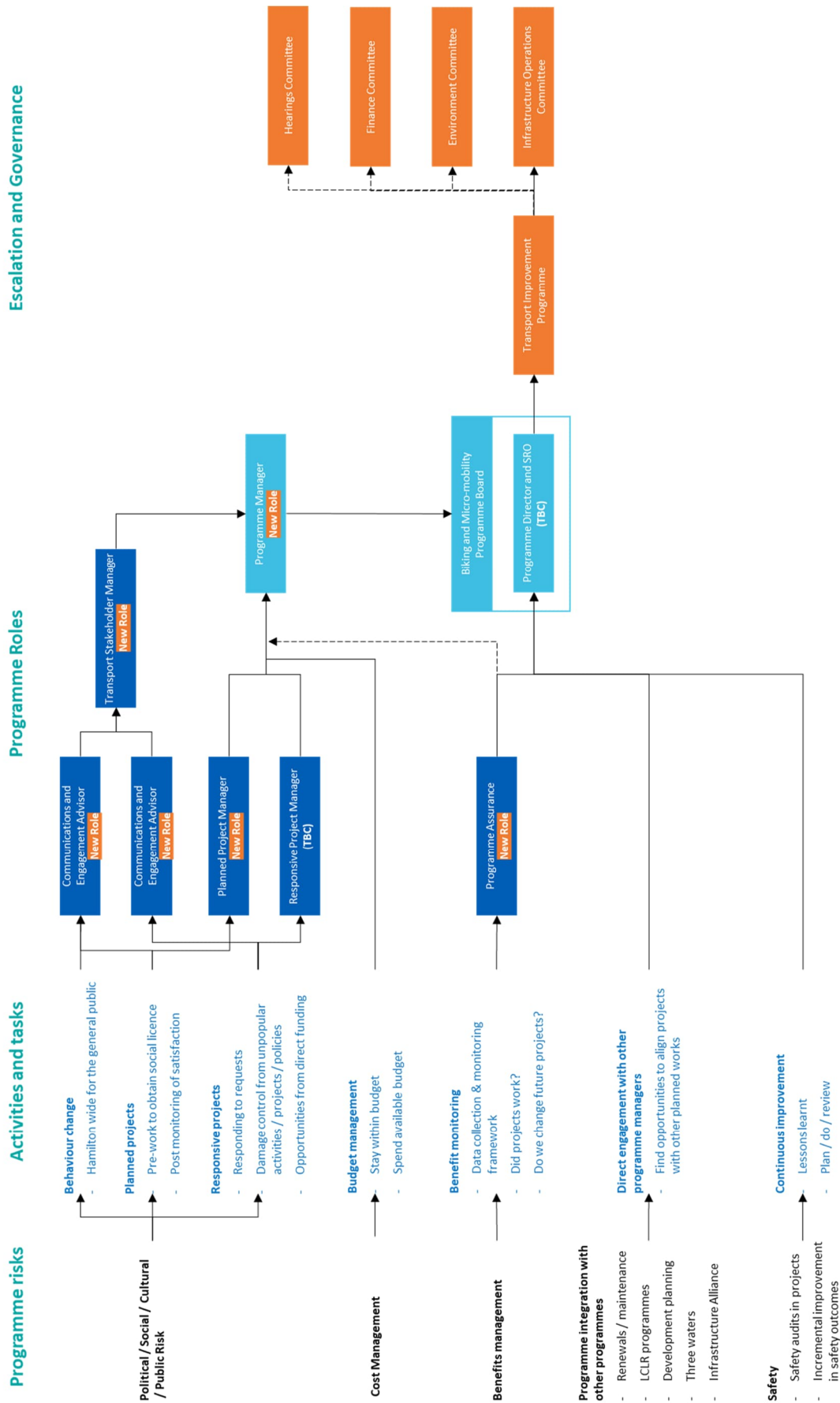


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## APPENDIX I

### Programme management and governance structure development

# Biking and micro-mobility programme management and governance structure development



# APPENDIX J

## Programme Board terms of reference

# Project Board Terms of Reference

Biking and Micro-mobility Programme

Trim document number: XXX

## Document Control

Version	Author	Description of Change	Date
1.0	Nathan Harper	Draft document for review	07/06/22

# 1 Purpose

The purpose of the Programme Steering Group is to be the governing body to ensure that the programme's objectives are being met. The objective of the Biking and Micro-mobility Programme is to improve biking and micro-mobility safety, increase mode share, improve public health and reduce emissions in Hamilton.

# 2 Membership

The Programme Board comprises:

- 1) Senior Responsible Owner (Chair)
- 2) Programme Manager
- 3) PMO Advisor
- 4) Programme Coordinator
- 5) Business Change Manager
- 6) Programme Board Members – Four

Delegation can be made by these roles; however, the attendee should be provided with suitable delegation to enable decisions to be made.

A quorum of the Steering Group will be met by attendance of at least four members of the Group.

Additional Project Sponsors, Business Owners, Project Managers or other attendees may be invited to attend the meeting as required.

# 3 Programme Board role and responsibilities

The Programme Board has authority to govern the programme and projects within the programme, administer funding, and to ensure delivery against expected benefits within the defined constraints. They are responsible for developing, implementing and maintaining the programme strategy.

Responsibilities:

1. Ensure the goals of the programme are aligned to the organisation's strategic vision, and capital portfolio objectives and benefits
2. Provide oversight and monitoring so programme benefits are planned, measured and achieved
3. Authorise appropriate funding and resources across the programme under delegated authority from the Infrastructure Operations Committee
4. Agree all major plans
5. Confirm and communicate the programme vision
6. Monitor opportunities for savings and revenue across the programme
7. Escalate risks and issues outside the members' delegations to the Capital Management and Delivery Meeting
8. Ensure engagement and collaboration with key stakeholders and that stakeholder requirements are being considered and met where possible/agreed
9. Is informed about project gate progression e.g. project management plans, business cases, procurement plans, project closure
10. Approve escalated project changes
11. Ensure appropriate project and programme risk and issue management



## 4 Meetings

The Steering Group will normally meet every two months and will discuss the following:

- Minutes and actions of the previous meeting
- New or changed risks and issues including escalated project risks
- Change requests
- Health and Safety register
- Planning and consents register
- The overall programme
- Reporting and monitoring of benefits, and
- Project progress.

The PMO is responsible for formally recording Programme Board discussions and decisions.

## 5 Membership Approval

Member	Electronic Signature
Programme Director, Senior Responsible Owner & Programme Board Chair – TBC	
Programme Manager – TBC	
PMO Advisor – TBC	
Programme Coordinator – TBC	
Business Change Manager – TBC	
Programme Board Member – TBC GM Infrastructure Operations	
Programme Board Member – TBC Transport Director	
Programme Board Member – TBC Waka Kotahi Regional Manager System Design	
Programme Board Member – TBC Waka Kotahi	

# APPENDIX K

## Risk register

## Biking and Micro-mobility Programme Business Case

### Risk Register

Version: B

Date: 28/06/2022

Risk Ref	Title	Risk Cause(s)	Risk Consequence(s)	Category	Current Risk Consequence	Current Risk Likelihood	Current Controlled Risk Level	Strategy	Treatment plan(s)	Current Risk Score	Risk Owner	Post Mitigation Consequence	Post Mitigation Likelihood	Post Mitigation Risk Level	Current State	Post Mitigation Risk Score	Actions
BC-1	Government change at the 2020 General Election	Election results in a different government	Change in investment priorities, delay to funding approvals	Political	Serious	Possible	H	Mitigate	Ensure investment story is robust and convincing regardless of Govt, collect extra evidence	9	Ben Petch	Moderate	Possible	M	Closed	6	
BC-2	Lack of alignment between HCC, partners and stakeholders	Stakeholders do not agree on project outcomes	Delay to programme and approvals	Communication and Engagement	Serious	Possible	H	Mitigate	Comprehensive stakeholder engagement plan	9	Sarah Price	Minor	Unlikely	L	Closed	2	
BC-3	Lack of buy in from politicians and or senior management	Client does not agree with project outcomes	Delay or abandonment of programme	Political	Serious	Unlikely	M	Mitigate	Ensure Elected Members are welcomed and engaged into the project	6	Nathan Harper	Moderate	Rare	L	Open	2	
BC-4	Delays in contract start affecting programme	Delays in approving project start and Covid-19 lockdown	Pressure to accelerate programme	Project Schedule	Moderate	Unlikely	M	Mitigate	Actively manage programme as a weekly agenda item	4	Ben Petch	Minor	Unlikely	L	Closed	2	
BC-5	Distracted public and stakeholders can't engage	Covid-19 effects on peoples stress levels, and working from home	No engagement until at least Level 3, delay to programme	Communication and Engagement	Serious	Almost Certain	VH	Mitigate	Where possible piggyback meetings to minimise demand for interaction. Position project as a good news story. Change engagement approach to work on Zoom, or push out engagement as last resort.	15	Sarah Price	Minor	Unlikely	L	Closed	2	
BC-6	Wanted changes are out of scope	People want changes that are out of scope for the Business Case	Pressure to include options, or dissatisfaction in the project outcomes	Reputational	Serious	Unlikely	M	Mitigate	Communications needs to be upfront and open about level of influence for community and stakeholders alike.	6	Sarah Price	Moderate	Unlikely	M	Closed	4	
BC-7	'Bikelash' negative reaction	People react to proposed changes as being for cyclists only and believe these impact negatively on their own transport choices	Dissatisfaction in the project outcomes	Reputational	Serious	Unlikely	M	Mitigate	From the outset, all communications and engagement will be aimed at as broad a range of the community as possible – not just cycling advocates. We will avoid language that positions this as tribal, ie. cyclists, drivers, and messaging will emphasise benefits of options to all road users, not just direct users.	6	Sarah Price	Moderate	Unlikely	M	Closed	4	
BC-8	Biking engagement fatigue	People feel they've given feedback on cycling and micro mobility before, and don't understand why they're being asked again	Dissatisfaction in progress not being made faster, think we should be further along in the project	Reputational	Minor	Possible	L	Mitigate	Carry out a stock take on communications and engagement already done on these issues. Communications would acknowledge what has previously been heard from community and stakeholders. A CRM will be used to understand stakeholder positions throughout the life of the project.	3	Sarah Price	Minor	Unlikely	L	Closed	2	
BC-9	Perception that Council shouldn't do this right now	People feel that the council is tone-deaf as COVID-19 should be the top priority	Public dissatisfaction, local media coverage	Reputational	Moderate	Unlikely	M	Mitigate	Leverage this Business Case as another kick-start project for shaping the future Hamilton – planning that needs to start today.	4	Sarah Price	Minor	Rare	L	Closed	1	
BC-10	Waka kotahi buy in and funding approvals delay	Waka Kotahi do not support the outcomes of the business case and funding approvals are protracted	Delay to programme and funding approvals	Communication and Engagement	Serious	Possible	H	Mitigate	Early and consistent updates with Waka Kotahi throughout all stages of the business case, 'incremental approval'	9	Nathan Harper	Minor	Unlikely	L	Open	2	
BC-11	Staff resourcing shortage	Workload exceeds resource available, particularly in communications and engagement	Delay in programme	People, Resources, Materials, Equipment	Moderate	Possible	M	Mitigate	Bring in Crestani to assist with comms and engagement strategy, and workshops	6	Nathan Harper	Minor	Unlikely	L	Closed	2	
BC-12	People don't understand Business Case	People don't understand the business case process, purpose and it's outcomes	Dissatisfaction in progress not being made faster, think we should be further along in the project	Reputational	Minor	Possible	L	Mitigate	Communicate the process, where we are at in the process, where we will come back for feedback, and what the outcome will be.	3	Sarah Price	Minor	Unlikely	L	Closed	2	
BC-13	Constrained budget	Insufficient funding to complete business case as required	Business case is not completed, or not of the right quality	Financial	Moderate	Unlikely	M	Mitigate	Monitor and actively manage financials, seek overs and unders in tasks to cover scope changes.	4	Nathan Harper	Minor	Unlikely	L	Open	2	
BC-14	Programme of investment is unaffordable	Programme exceeds available funding	Delay or abandonment of programme	Political	Serious	Possible	H	Mitigate	Ensure project options respond to available funding, and stage programme to match funding availability	9	Nathan Harper	Serious	Unlikely	M	Closed	6	

Prog-1	Programme of investment is unaffordable	Programme exceeds available HCC and WK funding	Delay or abandonment of programme	Political	Serious	Likely	VH	Mitigate	Stage programme over time. Match first decade to draft LTP funding. Engage with Waka Kotahi. Pivot programme towards 'transitional' approach to delivery which seeks to deliver faster and cheaper. Actively seek alternative funding sources	12	Martin Parkes	Serious	Unlikely	M	Open	6
Prog-2	Waka Kotahi and HCC buy in and funding approvals delay	Waka Kotahi and HCC do not support the outcomes of the business case and funding approvals are protracted	Delay to programme and funding approvals	Communication and Engagement	Serious	Possible	H	Mitigate	Early and consistent updates with Waka Kotahi and HCC throughout the business case, seeking 'incremental approval'.	9	Martin Parkes	Moderate	Unlikely	M	Open	4
Prog-3	Underestimating costs	Cost estimation based on high-level information and unit rates are too low	Delay in implementation or abandonment of projects, reduction in scope and outcomes / benefits.	Financial	Serious	Possible	H	Mitigate	Baselining against prior projects. Allowance for 40% contingency and 30% funding risk. Peer reviewed.	9	Martin Parkes	Moderate	Unlikely	M	Open	4
Prog-4	'Bikelash' negative reaction	While people are supportive for biking and micro-mobility across the city for engagement, there is pushback at a project level on the basis of localised impacts that negatively affect on their own transport choices. E.g. reallocation of road space, loss of parking etc.	Delay in implementation or abandonment of projects, reduction in scope and outcomes / benefits.	Reputational	Serious	Possible	H	Mitigate	From the outset, all communications and engagement will be aimed at as broad a range of the community as possible – not just cycling advocates. We will avoid language that positions this as tribal, ie. cyclists, drivers, and messaging will emphasise benefits of options to all road users, not just direct users.	9	Martin Parkes	Moderate	Unlikely	M	Open	4
Prog-5	Integration during project implementation	Programme costs only include the biking portion of costs, and do not include desired improvements for other modes, utilities etc. which exceed project funding.	Delay in implementation or abandonment of projects, reduction in scope and outcomes / benefits.	Scope	Major	Likely	VH	Mitigate	Aligning with the renewals and maintenance activities. Being clear that this funding only relates to biking and micro-mobility investment, but there are opportunities for efficiencies with other planned investments and programmes.	16	Martin Parkes	Moderate	Unlikely	M	Open	4
Prog-6	Government change at the 2023 General Election	Election results in a different government	Change in investment priorities, delay to funding approvals	Political	Serious	Possible	H	Mitigate	Ensure investment story is robust and convincing regardless of Govt, collect extra evidence	9	Martin Parkes	Moderate	Possible	M	Open	6
Prog-7	Effectiveness of the 'transitional' approach	The 'transitional' approach to delivery is new, and we do not know if this will be as effective as traditional approaches	Reductions in scope and outcomes / benefits.	Scope	Major	Possible	VH	Mitigate	Sensitivity testing. Ongoing programme approach has monitoring and assurance activities to ensure that outcomes are achieved, and where they are not the programme can change	12	Martin Parkes	Moderate	Possible	M	Open	6
Prog-8	Forecast numbers of biking and micro-mobility users	Forecasting is uncertain, and user numbers may not be achieved	Reductions in scope and outcomes / benefits.	Scope	Serious	Possible	H	Mitigate	Sensitivity testing. Ongoing programme approach has monitoring and assurance activities to ensure that outcomes are achieved, and where they are not the programme can change	9	Martin Parkes	Moderate	Possible	M	Open	6

# APPENDIX L

## Peer review report

# HCC BIKING AND MICROMOBILITY PROGRAMME SINGLE STAGE BUSINESS CASE PEER REVIEW

27 JUNE 2022

# Question today Imagine tomorrow Create for the future

## BIKING AND MICROMOBILITY PROGRAMME SINGLE STAGE BUSINESS CASE PEER REVIEW

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REV	DATE	DETAILS
1	23/06/22	Draft for comment
2	27/06/22	Final

	NAME	DATE	SIGNATURE
Prepared by:	Siân Marek	27 June 2022	
Reviewed by:	Eric Whitfield	27 June 2022	
Approved by:	Eric Whitfield	27 June 2022	

This report ('Report') has been prepared by WSP exclusively for Hamilton City Council ('Client') in relation to the Peer Review of the Biking and Micromobility Programme Single-Stage Business Case ('Purpose') and in accordance with the service panel contract with HCC, and signed Instruction for Service (IFS) dated 7 March 2022. The findings in this Report are based on and are subject to the assumptions specified in the Report and the IFS. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

27 June 2022

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# 1 INTRODUCTION

Hamilton City Council (HCC) commissioned WSP to undertake a peer review of the Biking and Micromobility Programme Single-Stage Business Case (SSBC) and its compliance with the Waka Kotahi planning and investment assessment framework.

WSP have peer reviewed the Biking and Micromobility Programme SSBC, focussing and structuring the review on the three key aspects of the business case:

- The SSBC report and overall business case justification
- The recommended option economic appraisal
- The recommended option cost estimate

WSP undertook a first review of the draft SSBC (revD) received on 27 February 2022. Waka Kotahi and HCC also undertook this initial review and comments resulted in a change to a 'transitional cycleway approach'. The 'transitional cycleway approach' sought to make the recommended permanent infrastructure more temporary in nature, therefore reducing costs and making the overall programme more affordable.

Given the change in scope, Aecom proceeded to update the SSBC. The updated SSBC (revE) was received on 7 June 2022 whereby a further review was undertaken. Unless otherwise noted, this report focusses on the updated report.

## 1.1 PURPOSE OF REPORT

The purpose of the project is a peer review of a single stage business case. As such, this report summarises the findings of the three elements of the peer review, according to the requirements set out in Section 1.2.

The detailed comments provided on the SSBC report, economic evaluation and cost estimates are provided in the attached comments register/memo in Appendix A-C.

## 1.2 PEER REVIEW REQUIREMENTS

The over-arching requirements of the peer review are stated by Waka Kotahi through guidance information provided on the Waka Kotahi website<sup>1</sup>.

Based on the guidance, WSP have reviewed the Biking and Micromobility Programme SSBC, with consideration for the following aspects:

- Strength and clarity of the strategic case – the case for change
- Alignment of the business case against Waka Kotahi Investment Quality Assurance (IQA) requirements
- Other criteria specified by Waka Kotahi:
  - Conformity – is it fundable

---

<sup>1</sup> <https://www.nzta.govt.nz/planning-and-investment/planning-and-investment-knowledge-base/201821-nltp/2018-21-nltp-investment-assessment-framework-iaf/peer-review-of-proposals/>

- Credibility
- Choice of do-minimum
- Identification and selection of alternatives and options
- Results alignment rating (GPS Alignment rating)
- Cost Estimate (conferring with the parallel estimate)
- Cost-benefit appraisal rating (conferring with the economics review)
- Risk assessment, analysis, and mitigation
- Sensitivity analysis

The SSBC peer review also checked the general logic and rationale used within the business case and identified whether there is sufficient information and evidence to support any final recommendations.

### **Economics Peer Review**

The Economic evaluation peer review included:

- A review of the overall methodology to verify the correct procedure is used and sufficient consideration is included for the relevant quantifiable benefits
- A spot check of formulas used within the economics calculation, specifically checking for common areas for error, such as discount rate application.

### **Cost Estimate Review**

The cost estimate peer review was based on the cost estimate memorandum (Appendix F of the SSBC) provided and cost estimate spreadsheet, and included:

- The schedule of quantities within the cost estimate for the recommended option in the SSBC
- The supporting assumptions used to build up the cost estimate
- The rates provided and clarifications around the cost rates used to build up the costs

The cost estimate peer review included providing tabulated feedback on items of the cost estimate as necessary.

## **1.3 PEER REVIEW REPORT STRUCTURE**

This peer review report provides commentary ('WSP Initial Review') against relevant sections of the SSBC. Where relevant, a 'WSP Updated Review' has been provided on the updated SSBC based on the author's response to peer review comments.

## 2 SSBC DOCUMENT REVIEW

### 2.1 SCOPE OF THE SSBC

The Biking and Micromobility Programme SSBC seeks to outline an investment programme and targets for Hamilton for these modes of transport, building on the work from the Access Hamilton Programme Business Case. The SSBC seeks to:

- Improve safety
- Develop a Strategic Network Plan, providing a comprehensive biking and micro-mobility network
- Provide a prioritised 10-year programme of activities that give effect to the Strategic Network Plan
- Inform a future revision of the Access Hamilton programme

#### WSP Commentary

The scope of the SSBC outlines a need for investment in modes which serve as 'first and last mile' access to public transport stops and services. It is recognised that by outlining a Strategic Network Plan and 10-year programme, a strong narrative has been outlined for the need to invest in biking and micromobility infrastructure network. The 'transitional approach' to unlock funding through the prioritised 10-year programme is discussed throughout this report.

### 2.2 DOCUMENT STRUCTURE AND READABILITY

The report provides an Executive Summary and chapters for the Strategic Case, Economic Case, Financial Case, Commercial Case and Management Case. The structure follows a 5-case model, and the flow is structured well overall.

### 2.3 EXECUTIVE SUMMARY

The peer review found that in both reviews the executive summary was well written and concisely documented the purpose and outcomes of the SSBC. It was recognised that a slight update was made in the revised version to reflect the transitional cycleways approach. It is understood that the transitional approach is a developing framework and therefore the description in the executive summary was regarded as satisfactory to explain the approach within the context of this project.

### 2.4 APPENDICES

A sufficient range of appendices are provided with the report, with minor comments addressed and summarised in Appendix A. Appendices were also provided in direct relation to the economic evaluation and cost estimate peer reviews.

## 2.5 STRATEGIC CASE

The strategic case is summarised in Section 1 of the SSBC report.

### WSP Commentary

Minimal comments were made regarding the strategic case during the initial review. The peer review assessment determined that this section outlined a concise and compelling case for change. Strong alignment was evident through references to the Government Policy Statement (GPS), as well as a line of sight to the overarching 'Access Hamilton' PBC and other documents. The evidence provided for the problems and the overall Investment Logic Mapping process were viewed as robust.

One comment noted was that the Key Performance Indicators (KPIs) and potential outcomes outlined in Section 1.7 of the SSBC may need to be updated to reflect the outcomes from a transitional cycleway approach, compared to the original outcome of having a fully segregated network. The outcomes are further discussed in Section 2.6.6 of this report, whereby authors noted updates had been made to reflect the proposed 10-year programme by 2031 based on the transitional delivery approach.

## 2.6 ECONOMIC CASE

The economic case is summarised in Section 2 of the SSBC report.

### 2.6.1 *DO MINIMUM*

The Do Minimum is described in Section 2.1 of the report.

### WSP Commentary

The latest version of the report includes an explanation for the Do Minimum which had been updated to reflect the initial commentary. Eastern Pathways is acknowledged to be on a separate funding pathway, and no other additional biking and micro-mobility facilities are assumed as part of the Do Minimum. This assumption is viewed as a sufficient baseline for assessment.

### 2.6.2 *OPTIONEERING (LONGLIST TO PREFERRED OPTION)*

The optioneering and process to reach the preferred option is outlined in Section 2.2-2.8 of the SSBC report.

### WSP Commentary

The longlist and shortlist assessment provides a robust overview of the optioneering undertaken with stakeholders and through use of a Multi-Criteria Analysis (MCA) at each stage. Minor commentary was made requesting further details regarding detailed assessment of the options, and further wording was incorporated into the revised version of the SSBC. Overall, the optioneering process to reach the long-term preferred option (Connected Neighbourhoods) was viewed to be succinct and to have followed the overall process well.

### 2.6.3 *A NEW WAY FORWARD (TRANSITIONAL CYCLEWAY DELIVERY APPROACH)*

The transitional cycleway delivery approach, termed as 'a New Way Forward' is outlined in Section 2.9 to 2.11 of the SSBC report.

## WSP Commentary

This section outlines the 'transitional cycleway approach' and details why this method has been chosen for implementation of the project. The section includes details on how each section of the route will be progressed and includes case studies of similar transitional cycleways. Commentary was noted that this approach was being undertaken to see where investment would be less successful, and what the ramifications of this would be. Given the approach is relatively new to New Zealand, it was discussed with authors that the 'continuous improvement' programme approach is an important element within this SSBC to monitor outcomes.

Overall, the section is viewed as an approach which will better meet funding availability.

### 2.6.4 2050 DEMAND ASSESSMENT

The 2050 demand assessment is outlined in Section 2.11 of the report, which is included in the 'New Way Forward' section of the SSBC.

## WSP Commentary

During the initial review (revD), the demand assessment based on cycle estimation and a modelling exercise undertaken by Flow was outlined as a risk given this model hadn't been through a calibration and validation process but impacts the economics and benefits. This was discussed with the authors who noted that the forecasting approach had been discussed with HCC and Waka Kotahi, and despite being uncertain was considered an acceptable approach.

## WSP Updated Commentary

The Demand Assessment was raised again during this review for the updated report (revE) with similar concerns to the previous review, along with an additional issue that the demand had not been adjusted to account for the transitional nature of facilities. The demand did not differentiate between strategic or local roads, nor transitional or permanent facilities.

In response to the review, the authors have noted that there is insufficient evidence to expect transitional approaches to be less effective than others. A +/- 20% sensitivity testing was undertaken on the demand to allow for uncertainties and risks in the demand assessment.

Notwithstanding the sensitivity tests, there is a risk that the demands have been overestimated. This overestimation of cycling trips will influence the economics and assessment against the investment objectives. Further commentary is provided in Section 3 Preferred Option Economic Appraisal.

### 2.6.5 10 YEAR PROGRAMME

The 10-year programme is outlined in Section 2.12 – 2.16 of the SSBC report.

## WSP Commentary

This updated report outlined the prioritisation process with the additional layer of the transitional cycleways approach. The process was updated based on the previous report comments, with additional information requested on the 2031 forecast demand in addition to the 2050 demand. This issue was raised with authors, and it was viewed that the 2031 demand would not materially impact the prioritisation process, so therefore no further changes are expected to be made to the SSBC.

Overall, this section outlined the process clearly for prioritisation and was deemed to capture the longer-term benefits which was viewed as a sufficient assessment.

## 2.6.6 INVESTMENT PRIORITISATION ASSESSMENT

The findings of the Investment Prioritisation Method (IPM) profile are provided in Section 2.16 of the report, which is included in the '10-year programme' section of the SSBC. The profile was rated as 'Very High' for GPS alignment, 'High' for scheduling and 'High' for efficiency, giving an overall investment priority of 1.

### WSP Commentary

The IPM assessment was viewed as an appropriate rating given the assessment undertaken against the investment outcomes. In the updated version, the IPM has been assessed against the long-term vision (Connected Neighbourhoods) and the 10-year investment programme. Through the peer review it was noted that 'safety' could be included in the assessment given the alignment with outcomes sought from this work. Overall, any changes would not impact on the overall Government Policy Statement (GPS) alignment.

## 2.7 FINANCIAL CASE

The Financial Case is provided in Section 3 of the SSBC report.

### WSP Commentary

The financial case is structured well and outlines potential funding desires to implement the Connected Neighbourhoods programme. The financial case was updated during the review to outline the 10-year programme capital costs and funding sources in alignment with the Long-Term Plan.

## 2.8 COMMERCIAL CASE

The Commercial Case is provided in Section 4 of the SSBC report.

### WSP Commentary

The initial peer review (revD) raised that whilst property purchase is to be determined in subsequent SSBCs, a risk allowance should be incorporated into the cost estimate. Given that the programme has now transferred from permanent structures to a transitional cycleway approach, it is assumed that impacts to property are reduced. Overall, the commercial case is well developed and provides an appropriate level of detail for this stage of works.

## 2.9 MANAGEMENT CASE

The Management Case is provided in Section 5 of the SSBC report.

### WSP Commentary

The delivery structure and benefits realisation management plan in both iterations of the report are viewed to be well written and developed to an appropriate level of detail for this stage of works.

# 3 RECOMMENDED OPTION ECONOMIC APPRAISAL

A spreadsheet with the economic calculations and demand calculations was provided to WSP for review.

## WSP Initial Commentary

The Economic Appraisal review comments are shown in the comments register. Areas of comment include:

- Electric bike mode share
- Diversion from cars to bikes
- Daily trip numbers
- Benefits claimed per km of infrastructure being more in line with strategic only infrastructure rather than a mix of strategic and area wide treatments.
- Construction costs per km being skewed to a low value based on high area wide treatment component of the programme
- Investigation and design costs
- The transitional nature of the infrastructure affecting benefits claimed

## WSP Updated Commentary

Most of the Economic Appraisal review comments shown in the comments register have been adequately responded to by the business case authors.

Overall, the economics methodology is robust and follows the Waka Kotahi Monetised Benefits and Costs Manual. Our remaining concerns pertain to:

- Uncertainty of demands of area wide treatments over strategic network treatments – a demand estimate has been undertaken for a full 'Strategic cycle network' and we have concerns that these demands do not reflect the demand achievable by area wide treatments, which make up a significant proportion of the investment
- Uncertainty of the benefits and costs for transitional infrastructure – there is no evidence that transitional infrastructure will achieve the same level of benefit as permanent infrastructure, although we acknowledge there is also no evidence they will not achieve the same benefit. There is a risk of transitional infrastructure costing more as it progresses through design because of unforeseen costs or not achieving the benefit forecast.

Both the above concerns would result in the BCR dropping. However, even if the BCR was to drop to a medium BCR, the prioritisation score will remain the same. Therefore, we are comfortable with the investment prioritisation score reported even though we have concerns the benefits may be overestimated.

# 4 RECOMMENDED OPTION COST ESTIMATES

A cost estimate spreadsheet (based on the Waka Kotahi Cycle Facility Conceptual Cost Estimation Tool (v04 Sept 2020)) was provided for peer review.

## WSP Initial Commentary

A range of comments were provided on the overall estimate, as summarised in further detail in Appendix C.

The peer review assessed the high-level unit rates and provided commentary on various factors which influence the cost estimate. Comments noted for consideration included:

- Resurfacing areas instead of removing existing markings due to safety hazards and costing appropriately for this
- Consideration to be given to removing existing paths and replacing with wider paths given risks of widening existing paths which can create localised ponding of stormwater
- Service Relocation to be looked at in further detail for specific routes and factored appropriately

The review also raised that there was no funding risk to achieve a P95 estimate included.

In addition to the commentary, specific recommendations to the estimate were outlined through the peer review and presented through a revised cost estimate spreadsheet.

## WSP Updated Commentary

Cost estimates were not reviewed in depth following the updated version received. Appendix H of the SSBC states that 'the unit rates and assumptions of activities incorporated into the cost estimate for each treatment were peer reviewed by WSP in April 2022'.

P95 95<sup>th</sup> percentile estimates were adjusted to include a further 30% allowance for funding risk, and it has been assumed that other unit rates have been adjusted to reflect commentary made from the previous review.

Liaison with authors has confirmed that Appendix H of the SSBC and the SSBC main report will be updated where appropriate to ensure all previous comments are in effect.



# 5 CONCLUSIONS

Notwithstanding the comments raised in this peer review report and the attached comments register, it is considered that the business case provides a credible case for investment in the recommended programme. The business case authors have addressed many of the comments raised in the initial peer review.

The overarching issue raised through the business case and economic evaluation reviews include the reliability of the demand forecasting and the impact of the transitional approach which may result in demand being overestimated and thus impacting on the economics and outcomes assessment. These issues are noted to have been addressed largely through sensitivity testing having been undertaken and previous approval from Waka Kotahi and HCC of use of the demand forecast model.

Overall, it is considered that the economics methodology is robust and follows the Waka Kotahi Monetised Benefits and Costs Manual. Our remaining concerns pertain to:

- Uncertainty of demands of area wide treatments over strategic network treatments – a demand estimate has been undertaken for a full 'Strategic cycle network' and we have concerns that these demands do not reflect the demand achievable by area wide treatments, which make up a significant proportion of the investment
- Uncertainty of the benefits and costs for transitional infrastructure – there is no evidence that transitional infrastructure will achieve the same level of benefit as permanent infrastructure, although we acknowledge there is also no evidence they will not achieve the same benefit. There is a risk of transitional infrastructure costing more as it progresses through design because of unforeseen costs or not achieving the benefit forecast.

Addressing both above concerns would result in the BCR dropping. However, even if the BCR was to drop to a medium BCR, the prioritisation score will remain the same. Therefore, we are comfortable with the investment prioritisation score reported even though we have concerns the benefits may be overestimated.

Overall, the business case provides a credible case for investment in biking and micromobility in Hamilton and strongly aligns with GPS objectives. The transitional approach will provide a more affordable approach for the network to be implemented over time. Accordingly, the peer review recommends that the SSBC is suitable to progress to IQA assessment for Waka Kotahi endorsement.

# APPENDIX A – SSBC COMMENTS REGISTER

## Hamilton City Council. Biking and Micro-mobility Peer Review Comments Register



13-Jun-22

Revision E

Key:	
Minor	Immaterial to outcome but would aid the business case
Moderate	Potential impact to business case
Major	Potential material impact to business case

Item	Section	Page no.	WSP Comments	Significance	Author Response
1	General		General questioning around the transitional approach: is there a desire to ever build the links permanently? What are the metrics that they have 'failed', and what is the consequence if so?	Minor	The transitional approach is hard to describe, and the name 'transitional' isn't helpful in this regard as it implies we are implementing these facilities, before we do something else more final or permanent. In some cases the transitional facilities will be of a permanent standard including treatments that will be long lasting i.e. speed limit reductions, modal filters, concrete separators etc., but in all cases the transitional treatments will be relatively low impact, avoiding property effects, avoid moving kerbs and affecting services and drainage, and will not be highly landscaped, and therefore they will be relatively low cost. Safety will be assessed on a risk basis, and so should not be a tradeoff for cost.  'Failed' will be determined by the ongoing programme, but this could be on time, cost, quality, programme or outcomes. The consequence is that the approach for the next project would change, whether this is to do more, do less, do the same thing but in a better place, deliver in a different way, get more public support etc. This is why the biking and micro-mobility (BMM) programme has been set up as an ongoing 'continuous improvement' programme (plan / do / review), with programme management, supported by technical, delivery, communications and engagement and assurance staff resources.
2	Outcomes	page 11	What are the differences in mode share between separated and transitional? Have the outcomes been assessed against the transitional approach?	Moderate	See Item 6, relating to the effectiveness of transitional versus traditional approaches.  The outcomes all reflect the proposed 10 year programme at 2031 based on the transitional delivery approach.
3	2.10.1 Transitional Design Guidance	page 49	For the transitional 'fail fast' approach - does this mean that if the uptake of a cycle lane is too low then it will never be built? What are the ramifications for this?	Minor	It will depend on why the facility has low uptake. If it is because it is not perceived as safe enough then this may prompt further works to improve this perception, or a step change to a safer facility type. If it is in the wrong place to attract cyclists, then providing links to other facilities may be a response. So the ongoing 'continuous improvement' programme response with a strong Communications and Engagement component is critical here to understand why that facility is not successful. See Item 1.  Ridership is not the only criteria for success however. The BMM programme does need to be wary that there is a long term Connected Neighbourhoods Vision, which has a connected and coherent network as the end goal.
4	Section 2.10.4 Transitional project examples	page 51	What about examples that have failed? This approach speculates that transitional will show where things won't work too, do you have any examples of this?	Minor	We are not aware of any failed examples of transitional approaches as yet, as this is a relatively new approach in NZ.  Because this is new, the ongoing 'continuous improvement' programme approach is important, to learn from mistakes and if necessary change the programme or projects. See Item 1.
5	Section 2.11 2050 Demand Assessment	Page 54	The demand assessment is based on a cycle estimation / modelling exercise undertaken by Flow. The technical note from Flow notes that the modelling hasn't been through a calibration and validation process. It lists a number of limitations to the modelling which could have a material impact on the demand assessment which has then been used to assess the preferred option and undertake economic analysis etc. How have the limitations of the demand assessment been considered in the business case? ie high level of uncertainty of results, potential over or under estimation, applicability of TGA assumptions to HAM etc. And how might these be considered in sensitivity testing and risk analysis? NOTE: similar comment to rev D which we think is still relevant.	Major	Noted, although the Flow assessment is the best tool we have. Section 2.11.1 notes the limitations of the Flow demand assessment. While the demand assessment for Hamilton was not calibrated or validated, the approach has been validated in Auckland and Tauranga, and the equations from this proved approach used for Hamilton. Forecasting is inherently uncertain, time and budget were short, and therefore HCC and Waka Kotahi were willing to accept progress over perfection on this issue. Prior to the Flow assessment AECOM used a GIS buffer method, however Waka Kotahi guidance promotes and prefers the use of a demand model approach over a GIS distance based buffer assessment - this resulted in the Flow demand work.  Judgement of the combined AECOM and Waka Kotahi & HCC SME team was used to allow for the demand assessment limitations, particularly in the network prioritisation process outlined in Section 2.12. The Strategic Network Plan acknowledges that the routes are indicative is one key mitigation to any error in the routing / assignment of the Flow demand assessment.  We believe that the Flow demand assessment of Journey to Work and Journey to Education are significantly underestimating trips by all purposes as noted in Limitation 4, Section 2.11.1, and are therefore conservative. As noted in Section 2.11.2 if all trip types and purposes were included, this could increase the demands by more than 3 times. The programme outcomes and economics were based on the Flow estimates, to ensure these are conservative and defensible.  +/- 20% sensitivity testing on demands was included in Section 2.15.4 to allow for uncertainties and risk in the demand assessment.
6	Section 2.11 2050 Demand Assessment	page 54	It is noted that the Flow modelling demand is used for the 10-year transitional approach. However, these demands do not appear to account for the transitional nature of the facilities. The benefits seem to treat transitional facilities the same as permanent and strategic routes, and therefore be overestimating demand for the traditional nature of the facilities.	Major	As the transitional approach is relatively new, there is no NZ or international research available comparing the effectiveness of the transitional versus traditional approaches, and therefore no reasoning to think the transitional approaches were less effective. The ongoing 'continuous improvement' programme approach as outlined in Item 1, with programme management, communications and assurance will continuously evaluate the effectiveness of the projects and has licence to reprofile the programme as lessons are learnt.  +/- 20% sensitivity testing on demands was included in Section 2.15.4 to allow for uncertainties and risk in the demand assessment.
7	Section 2.11.2 Expansion to all trips	page 55	This section provides a high level estimation of cycling trips based on population and household forecasts with high level assumptions, and then compares to the Flow forecasts with some commentary that the Flow modelling could be underforecasting trips. Further to the comments above, it is considered that the modelling and other assumptions / assessments could be overestimating cycling trips. This will have a flow on effect to economics and performance against investment objectives / outcomes, ERP assessment etc.	Major	We believe that the Flow demand assessment of Journey to Work and Journey to Education are significantly underestimating trips by all purposes as noted in Limitation 4, Section 2.11.1.  The expansion factors estimated in Section 2.11.2 were used as context for what may be achievable if all trip types were included in the demand assessment. This information was only used as context for discussion of programme alignment to the GPS and ERP in Sections 2.14.4 and 2.14.5. The outcomes in Section 2.14 and economics in Section 2.15 were based directly on the Flow ITW and JTE demand assessment, without expansion.
8	2.13.1 Planned projects	page 61	These are all within the 10-year framework yet only 2050 demand is given. What is the expected impact by 2031 (i.e. will you be expecting uptake straight away)? Is demand expected to be as high for transitional cycleways rather than permanent structures?	Moderate	The only forecast we have is the 2050 Flow demand assessment. Interpolating 2031 demands from this was considered speculative at best, as this would be assumptions stacked on assumptions. Ultimately the 2031 demand on the corridor does not impact the prioritisation process, economics or the outcomes assessment.
9	2.15.1 Costs	page 91	How were the WSP cost review comments considered and what changes were made?	Moderate	Simon Drummond was engaged during the Revision D review, and his comments were all adopted / incorporated into the cost estimates for Revision E. Appendix H and the SSBC text will be updated with comments to this effect.
10	2.16.1 GPS alignment	page 94	Noted that the assessment doesn't include safety	Moderate	The GPS alignment criteria for safety don't align easily with a network wide programme (med-high/high collective risk corridors, speed limit changes etc).  Can add a comment that while these don't align well, the envisaged 40% DS1 reductions by 2031 for the 10 year programme aligns best with a 'High' Safety rating. This won't change the overall profile, as GPS alignment is 'Very High' elsewhere due to climate change and mode shift alignment.
11	Appendix F		Questioning around if the demands are a correct assumption based on the fact these are transitional (refer to comments)	Major	See Item 6.
12	Appendix C		Appendix concludes with 'Connected Neighbourhoods' being the preferred option. The preferred option is the 10-year transitional cycleway - clarity required on the step-process	Moderate	Will add a comment in Appendix C to set up for "plot twist" in the main SSBC document. Make it obvious that the selection of Connected Neighbourhoods at the short list stage was not the end of the programme development.
13	Appendix K		The risk register not been updated since last iteration - are there any risks associated with the transitional cycleways approach i.e. if these are deemed to fail, what will the impact be on further funding?	Minor	NH to review risk register with an eye on the impacts of the transitional approach.
14	Appendix I		Confirm if this is for management of the transitional cycleway or whole long-term programme	Minor	The figure shown in Appendix I is for the whole ongoing programme. It explains how the organisational structure was developed, responding to the risks and opportunities, what activities are required, and what staff, management and governance are needed.

## Hamilton City Council. Biking and Micro-mobility Peer Review Comments Register



11-Mar-22

Revision D

Key:	
Minor	Immaterial to outcome but would aid the business case
Moderate	Potential impact to business case
Major	Potential material impact to business case

Item	Section	Page no.	WSP Comments	Significance	Author Response
1	Executive Summary	Page 6	For the 'why now' section - some of the programme will be implemented in a transitional way. Consider slightly rewording to outline that this is a long-term investment which will require a mixture of transitional and new infrastructure.	Minor	Noted and agreed.
2	Executive Summary	Page 7	Connected neighbourhoods programme - is there any data to support the Mayor's claim that could be added in from elsewhere in the document? Whilst this is a strong statement to include, having something such as customer satisfaction insights to back this would strengthen this further	Minor	Noted. Section 1.2.2 Table 1, and 2.6.3 includes a summary of engagement addressing these issues, and reinforcing the Mayor's viewpoint.
3	1.2.1 Attitudes	Page 14	If attitudes are to have e-scooters for hire operating in city, could this be outlined as one of the interventions in the Preferred Option (section 2.8)? Alternatively, could this be a specific recommendation for the future city centre SSBC?	Minor	E-scooters for hire are already operating in Hamilton, and are therefore part of the Do Minimum. As part of micro-mobility, the programme seeks to provide facilities (i.e. parking & charging) for e-scooters, not invest in running an HCC managed hire scheme.
4	Table 5	Page 29	Improved health KPI - how many new users?	Minor	Table 5 refers to today's baseline of what is happening right now. This KPI addresses 'new users' over and above the Do Minimum as a result of the investment, and as this baseline is pre-investment the number of new cyclists is 0.
5	2.1 Do min	Page 36	The do-min assumes no new cycling infrastructure. However, are there already committed projects that would be included in the do-min? How is Eastern Pathways considered, if it's not in the option should it be in the do-min? Page 72 notes they are being delivered on separate funding pathways. This will affect the benefits assessment.	Major	Noted. We will need to address this, the change to the programme excluding Eastern Pathways was made late, and wasn't reflected in the Do Minimum.
6	2.3 Long List Assessment	Page 38	For the long-list interventions deemed out of scope, were any recommendations made on where else these would fit?	Minor	Noted. Some of these interventions were addressed in Section 2.10, but we could add some commentary on what programmes will address them. Mainly NPS-UD, Access Hamilton and the Metro Spatial Plan.
7	Table 14	Page 44	The short list assessment gives values for 2050 forecast baseline and assessed changes against do-min, for the IDs in particular. Where did the forecast and assessed changes come from? Is there a more detailed assessment that supports the figures? Looking for rationale to support the scores and hence help tell the story.	Moderate	Yes, all of the quantitative values in Table 14 have calculations behind them that is available to review. We note that this assessment was completed some time ago, and that the recommended programme assessment of KPIs has changed and become more sophisticated to inform Table 20.
8	2.8 Strategic Network Plan Development	Page 48	in this process there would have been many possible networks to satisfy that criteria. How did the workshop process determine the 'optimal' network? The text notes that the network is fairly indicative and subject to be confirmed in subsequent phases, but how sensitive would the preferred option analysis be to changes in this network? ie if links added or subtracted? additional travel distances (or shortening) etc?	Major	Noted. Any network is sensitive to the addition and removal of links. The workshop identified the key destinations, and looked to connect those destinations in two groups. These networks were remarkably similar, and converged together into the Figure 10 networks based on the combined Waka Kotahi and HCC stakeholder views. The demand analysis was completed using this network.
9	2.11 Demand Assessment	Page 62	The demand assessment is based on a cycle estimation / modelling exercise undertaken by Flow and documented in Appendix E. The technical note from Flow notes that the modelling hasn't been through a calibration and validation process. It lists a number of limitations to the modelling which could have a material impact on the demand assessment which has then been used to assess the preferred option and undertake economic analysis etc. How have the limitations of the demand assessment been considered in the business case? ie high level of uncertainty of results, potential over or under estimation, applicability of TGA assumptions to HAM etc. And how might these be considered in section 2.18 sensitivity testing and risk analysis?	Major	Noted. The demand analysis has limitations as noted in Section 2.11, which were acknowledged through the prioritisation in Section 2.12. Forecasting is inherently uncertain, time and budget were short, and HCC and Waka Kotahi were willing to accept progress over perfection on this issue. The judgement of AECOM and Waka Kotahi & HCC SME's was used to interpret and ground truth the modelling through the prioritisation process. The Strategic Network Plan acknowledges that the routes are indicative is one key mitigation. Can add further global factor sensitivity to demands in Section 2.18.
10	2.12 Programme Prioritisation	Page 64	This section briefly describes a prioritisation process involving stakeholders and results in 12 prioritised routes. The report describes the key datasets that fed into this analysis but does not explain how the 12 routes were arrived at or why they were prioritised in that order. This would be helpful to include to clearly explain the prioritisation / investment story. It notes a prioritisation framework but doesn't describe it.	Major	Noted. Essentially the prioritisation was workshoped with HCC and Waka Kotahi using the data sources. Can add more text here to describe the process, and we are planning to include a summary on each of the 12 projects to outline their situation and priority.
11	2.16 Transport Outcomes	Page 73	The PBC describes anticipated outcomes and gives the impression of quantitative analysis, but there is no documentation of that analysis. Can this be included to help substantiate the investment story?	Moderate	Noted. Yes quantitative analysis has been undertaken and can be provided for review.
12	2.16.1 Outcomes - increased micromobility	Page 73	For improved safety - why are any deaths predicted involving cyclists post-implementation of the segregated bike routes? Direct links to the methodology of how these figures were calculated would be useful and the findings in more detail. Are the DSIs occurring only for Tier 3 as these are on-street for example?	Moderate	Yes, Table 20 shows that we predict that DSIs will remain with the programme complete. As per item 11, qualitative analysis can be provided for review.  Crash reduction factors were applied based on literature, and are somewhat conservative. The proposed network does not cover all Hamilton Roads and cycling is likely going to continue on some of these, as well as the Tier 3 routes so DSIs are unlikely to be completely eradicated.
13	Table 23	Page 79	In Table 23, why have maintenance and operating costs been assessed over a 40 year horizon rather than 30 years as per programme?	Moderate	Table 23 reflects the costs used for the economic evaluation, which has a standard / default 40 year analysis period. Maintenance and operations will need to continue post implementation of the network for activities as outlined in Table 23.
14	Section 4.3 Property	Page 88	This section notes that the need for property would be determined at subsequent business case phases. Based on the work to date is there a reasonable likelihood for some property purchase and if so is there an allowance (or risk allowance) in the cost estimates?	Moderate	Noted. There are generous allowances for risk in the estimates, with 40% contingency for the expected estimates, and additional 30% funding risk in the 95th percentile estimates. The permanent facilities in the second and third decade do not assume land take, proposing the removal of parking, median and lane space to work within the existing carriageway as a general approach. Also we anticipate that the Biking and MM contribution will be included in wider multi-modal corridor permanent works where these are necessary through MSP or Access Hamilton, so any need for land purchase on those will be a shared cost / risk.

# APPENDIX B – ECONOMICS COMMENTS REGISTER

Economics - Peer Review Comments Register

Project: Micromobility Programme Business Case - Economics Review

Client: Hamilton City Council DATE: 21/06/2022

Item	File Ref / Document	Sheet Ref / Section	Cell Ref	Reviewer	Topic or Issue	Comments	Significance	Author Response	Status	Additional review comments	References
1	Appendix G Economic evaluation	1.1 Health benefits		NH	e-bike %	20% electric bike has been adopted, but no justification or sensitivity of this value. The value could be low and because health benefits are the main benefit claimed the BCR will be sensitive to this assumption. Surveys show good cycle infrastructure can have high e-bike mode shares (31% of peak period trips on Matthews farm cycleway were e-bikes in 2018 and Auckland data shows 25% of regular bike riders in Auckland used e-bikes - Hamilton could be expected to be similar with e-bikes growing in popularity this figure is expected to go up.	Moderate	Agree. Based on the cited e-bike shares, if 30% of the bikes were e-bikes the BCR reduces to 8.3.  We note that the effects are already captured within the +/- 20% sensitivity testing on demands, as included in Section 2.15.4 to allow for uncertainties and risk in the demand assessment.	Closed		
2	Appendix G Economic evaluation	1.3 Emission benefits and 1.4 decongestion benefits		NH	decrease in private vehicle travel	Section 1.3 states "Each additional biking user was assumed to replace one private car occupant resulting in a reduction in emissions for each vehicle replaced". Section 1.4 has a similar assumption. But this is a higher conversion rate than typical. The MBOM does not provide a diversion rate for cycling but the PT rate is 0.725. Some trip will convert from walking or PT, so a lower conversion rate would be expected. Emissions and decongestion are not large benefits so the BCR may not be sensitive to this assumption.	Moderate	Will add comments to clarify that a vehicle occupancy of 1.2 is allowed for based on Hamilton data. 1 bike trip therefore replaces 0.833 car trips.  As sensitivity test for a higher occupancy or lower diversion rate is not going to have a noticeable effect on the economics. The effects are already captured within the +/- 20% sensitivity testing on demands as included in Section 2.15.4 to allow for uncertainties and risk in the demand assessment.	Closed		
3	Appendix F Demand forecasts	1.0 cycle demand		NH	number of new cyclists	Daily cyclist have been assumed to be half the trips, which is an ok assumption if only looking at work and education trips, but not if benefits of other trips are also factored in through the mode share calculation. The average km travelled per cyclist per day of 8-11km also does align with only 2 trips per day per cyclist when international literature points to a lower cycle trip length of 2-3km. How were trip numbers and km derived? Was this from the WRTM? The WRTM is skewed to out of neighbourhood trips, because of zone sizes, so skewed towards longer trip distance.	Moderate	The mode share calculation was based on the Flow demand assessment forecasts which consider only Journey to Work and Journey to Education trips. We believe that the Flow assessment is significantly underestimating trips by all purposes as noted in Limitation 4, Section 2.11.1, and are therefore conservative. As noted in Section 2.11.2 if all trip types and purposes were included, this could increase the demands by more than 3 times. The programme outcomes and economics were based on the Flow estimates, to ensure these are conservative and defensible.  See Item 5 in the SSBC review comments.	Closed		<a href="https://www.landfast.co.nz/s/bafscs/620169/average-biking-distance-per-person-per-day-in-the-netherlands-by-gender/">https://www.landfast.co.nz/s/bafscs/620169/average-biking-distance-per-person-per-day-in-the-netherlands-by-gender/</a>
4	Preferred network benefits_v11	Demand estimate sheet and BCR (10yr) sheet		NH	benefits delivered per km	claiming 98 km delivered by 2031 (cell D36) to get demands, but it looks to be only 25km of a strategic network delivered with the remainder being area wide and responsive. There is no evidence the area wide treatment will deliver the same level of benefit as the strategic network. It's not clear if the km of cycle infrastructure in the international examples provided are strategic or area wide or both and therefore the validity of the mode share per km of its structure may not be comparable. Would be useful to see what proportion of benefits are for area wide vs strategic and what the BCR is for a strategic network only to understand how skewed the BCR is by the low cost area wide treatments. For clarity, we agree area wide treatments are a valid infrastructure response and may gain a higher BCR than a strategic network given the significantly lower costs; however, we do not think they are like for like and the strategic network would be expected to generate greater demand per km than area wide. 98km delivered (160 new users per km, which is reasonable for a strategic route but less likely on a small local road). Some explanation of the spill in demands / benefits would be useful e.g. are strategic routes expected to carry 400 new users per km, and therefore 70% of demands? This might be reasonable but needs explanation in the economic analysis.	Major	This is a point that was debated at length with Waka Kotahi and HOC. All network interventions target the strategic network, as presented in the Strategic Network Plan, including the area wide, and the responsive/opportunistic projects.  The area wide treatments aim to remove/reduce the conflicts, speed differences and exposure to motor traffic on the targeted portion of the strategic network. It was agreed with Waka Kotahi and HOC SMEs that this removal of conflict would result in a comparatively safe and attractive facility on a per kilometre basis. As the reviewer notes, the costs involved will be much reduced.  For the responsive projects, again the intent is to address the strategic network, but there may be opportunities to do more than the strategic network where we can capitalise on the renewals and other programmes to replace the status quo with a preferred biking and micro-mobility typology.  The effects on facility effectiveness are already captured within the +/- 20% sensitivity testing on demands as included in Section 2.15.4 to allow for uncertainties and risk in the demand assessment.	Pending	We still think this approach may be over estimating cycle demand (not within the Flow model but within the economics). The economics linearly integrate between the Flow model for the "strategic cycle network" and existing this implies the economics are claiming "strategic network" benefits for all km, despite only 25km of the 98km being a strategic cycle network. It's not clear if the Flow model included area wide treatments as part of the strategic network. The base BCR should be adjusted as the sensitivity test doesn't account for compounding nature of some of these review comments (eg lower demands = transitional benefit is lower).	
5	Preferred network benefits_v12	Demand estimate sheet and BCR (10yr) sheet		NH	cost per km	Construction costs on sheet BCR show the 98km delivered would equate to \$1million per km CAPEX, which seems very low. The low cost area wide and responsive seem to be skewing the costs estimate very low per km. Even a transitional style treatment with no kerb moving would be expected to cost at least 50% more than this based on current cost rates. This review comment is linked to the one above i.e. the benefits derived above seem more in line with a strategic network than area wide treatments but the costs are heavily skewed towards low cost solutions with no justification for the level of benefit claimed. A sensitivity test of construction costs of +50% (or more) would be useful to see how a low cost transitional style treatment across all 98km would affect the BCR given the demands claimed above seem more in line with a strategic network.	Major	As noted in Item 4, even the area wide treatments will be included on the strategic network, where these make sense considering the environment and context of the route.  The 25km of priority corridors was costed by applying the linear rates (peer reviewed by WSP) directly against the lengths that would be shared paths, flexible bollard separation etc. The preferred typologies for each section of these corridors was workshoped with Waka Kotahi and HOC.  The effects of increased costs are already captured within the sensitivity testing on PPS costs as included in Section 2.15.4 to allow for uncertainties and risk in the cost estimates. This reduced the BCR to 6.5 and remains a 'High'.			
6	Preferred network benefits_v11	BCR (10yr) sheet		NH	Investigation and design costs	Investigation and design costs of \$1.5million for the full 98km investment seem very low. Especially considering the detailed design budget is \$2million for Esplanade pathways alone.	Moderate	The linear rates per kilometre (peer reviewed by WSP) included an allowance for investigation and design in the project line item costings.  The \$1.5m is intended for additional business cases that may be required later in the 1st decade to set up projects for decade 2.	Closed		
7	Preferred network benefits_v11	BCR (10yr) sheet		NH		No WEB on large network of cycling infrastructure and no monetisation of pedestrian benefits is conservative.	Minor	Agreed. There will be further economic benefits from increased cycle activity and linked walking trips that have not been captured in the economics, particularly in the city centre, although these may offset decreases elsewhere in the city.	Closed		

8	Pedestrian network benefits_v11	Demand estimate sheet	NH	Transitional nature of infrastructure affecting benefits	<p>The transitional nature of the infrastructure has not been factored into the benefits derived. This implies the transitional infrastructure will have the same benefits as permanent. Although claiming most of the benefits is probably justified, I would have expected transitional cycling infrastructure to have lower benefits, as its likely to include more pinch points, and fewer safety infrastructure like raised tables and major intersection upgrades etc than permanent infrastructure</p>	Major	<p>The effectiveness of transitional versus traditional facilities was debated with Waka Kotahi and HCC SMEs - see item 6 on the SBC review comments. As the transitional approach is relatively new, there is no NZ or international research available comparing the effectiveness of the transitional versus traditional approaches, and therefore SME's maintained there was no reasoning to think the transitional approaches were less effective. Reviewing the 10 year programme projects, the transitional approach is expected to generate a comparable demand than with fully segregated and permanent facilities.</p> <p>Other factors that were considered in this assumption include:</p> <ul style="list-style-type: none"> <li>The demand assessment was considered conservative in that it only included JTW and JTE trips, not all trip types and purposes. See item 6 on the SBC review comments</li> <li>The most important facilities would be constructed in Decade 1 and these would generate higher demands on average compared to the rest of the Strategic Network Plan - this is why these corridors were prioritised in Section 2.12</li> </ul> <p>The effects on transitional facility effectiveness are already captured within the +/- 20% sensitivity testing on demands as included in Section 2.15.4 to allow for uncertainties and risk in the demand assessment.</p>	Pending	<p>As transitional infrastructure is relatively new, we would recommend the economists take a more conservative approach to benefits. We would recommend the base BC be adjusted rather than just running sensitivity tests as the sensitivity test don't capture the potential compounding nature of some of the comments raised (eg transitional benefits lower = demands lower)</p>
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# APPENDIX C – COST ESTIMATE MEMO





## Memorandum

To	Dirk Du Preez
Copy	Sian Marek
From	Simon Drummond
Office	Hamilton
Date	13 April 2022
File/Ref	W-LASS.FQ   00003
Subject	Draft HCC Cycling and Micromobility Peer Review

Hi Dirk,

Please find attached my review of the HCC Cycling and Micromobility estimate.

Consideration needs to be given to the following:

- Removal of existing road markings
  - This will create ghost markings which are a safety hazard. Consideration should be given to resurfacing these areas instead of just removing existing markings
- Level 1b path widening
  - Adding additional width of path whilst keeping the existing path creates issues and risks. It will be difficult to match the contours of the existing across the path. This will generate localised ponding of stormwater.
  - There is a risk that the 'join' will not match perfectly, creating trip hazards along the route
  - Consideration should be given to removing the existing path and replacing with one wider path
- Service Relocation
  - Certain areas will require significantly higher service relocations than others. It is recommended this is looked into in further detail for specific routes. This is particularly a problem when relocating electricity, especially if the solution is to underground existing overhead lines.
  - Consideration needs to be given as to how this degree of risk can be appropriately factored into the overall Expected Estimate
- Funding Risk
  - There is no provision for Funding Risk to achieve a P95 estimate. Is this a requirement?

Regarding the estimate, all changes made are outlined below. On sheet Summary, the original rates / values have been placed, for reference, from column N. All cells changed are highlighted yellow.

#### Summary Sheet

- P&G
  - Increased P&G to 25% for Intervention levels 3 and 4
    - It has not been assumed the work will be conducted by Infrastructure Alliance.
  - Intervention Levels 1 and 2 run at 12.5% due to minimal requirements of the works
- The Contingency is only applied to the ROC Facility Construction. It should be applied to the Physical Works total, which is ROC + P&G's. I have updated the formula to include the P&G's in the contingency calculation

#### From sheet "Item Rates Used":

- Increased New path inc basecourses, reinstate berm from \$114 to \$150
- Increased Conc infill from \$118.89 to \$135
- Increased New lane arrows from \$47.27 to \$150
- Increased Green surface colour from \$59.28 to \$80
- Increased Cycle symbols from \$57.41 to \$80
- Increased Path lighting including cabling from \$6000 to \$8000
- Increased 'Material Base Rates item AC from \$1000 to \$1300
- Increased 'Material Base Rates item Conc from \$ to \$650
- Increased 'Material Base Rates item Kerb from \$65 to \$125 to match \$ from Column B rates
- Increased 'Material Base Rates item K & C from \$90 to \$192 to match \$ from Column B rates
- Increased New sump from \$4500 to \$6000
  - Several new sumps will also require new manholes. Increased rate to cater for this
- The road pavement refers to AP20 as the tables are cloned layouts. The road will require AP40, which is a lot more expensive than the AP20. I have updated to say AP40 and adjusted the rate by placing the m<sup>3</sup> rate into the formula in lieu of the cell reference to the AP20rate

#### From sheet BMMBC rates used:

- Increased Modify Driveways (25m ctrs) from \$2,500 to \$5000
  - Most likely a complete new entranceway (limited to the footprint over the berm) will be required (as opposed to modifying the existing)
- Increased Traffic Management Level 1 Road to \$1,000
- Increased Traffic Management Level 2 Road to \$2,500
- Increased Traffic Management Level 3 Road to \$5,000