Tonkin+Taylor

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Wellington City Urban Cycleways Programme

Design Report: Newtown Connections

November 2018

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1. Introduction

Wellington City Council (WCC) have engaged Tonkin & Taylor Ltd (T+T) and Studio Pacific Architecture (SPA) to develop the Newtown Connections cycleway project. The project is intended to provide greater cyclist connectivity for the southern suburbs of Island Bay, Berhampore, Newtown, and Mount Cook to the central city and within the suburbs. The purpose of the project is to design a cycle network that will connect with the existing cycleway on The Parade in Island Bay, the planned cycleway projects in Kilbirnie, and the central city. In addition, it is intended that the network will provide connections for the suburbs of Berhampore, Newtown, and Mount Cook.

This report outlines the process undertaken to assess the full range of cycle treatment and network options for this area by applying engineering and urban design best practice. From this independent assessment, T+T and SPA have identified three potential networks with associated treatments that meet design standards, project objectives, and community desires. At this stage of assessment, all options are conceptual—no design has been carried out yet. This design report details important background information, outlines the assessment process, and describes the three conceptual packages recommended for community engagement.

1.1 Purpose of this Report

The purpose of this report is to outline the assessment process for the Newtown Connections study as part of the WCC Urban Cycleways Programme (UCP). The report provides a summary of key aspects of the process including:

- Background of this site in relation to the WCC UCP;
- Issues, constraints, and opportunities;
- Community engagement process;
- Assessment process and methodology of selecting treatment and network options in terms of:
    - Options considered;
    - Options that were considered but not pursued;
    - How public feedback has been accounted for;
    - The assessment and selection process of treatment and network options;
    - The effectiveness of each option in meeting the WCC Cycling Investment Objectives and the community objectives;
    - The impacts of each option on the existing situation;
    - Design guidance, standards, and assumptions;
    - Rough order cost estimates for each of the shortlisted options; and
- The next steps for the project.

1.2 Project Objectives

The Newtown Connections cycleway project is part of WCC's investment in a safe and comprehensive cycle network to give people more transport choice, reduce congestion and emissions, and make Wellington a more attractive place to live, work, and visit. The primary objective is to identify cycleway

options that maximise benefits for all users and, in particular, improve the level of service for people who travel by bike.

The Wellington Cycle Network Programme Business Case[1] outlines the need for investing in cycling in Wellington. The business case outlines the following five investment objectives for cycle network improvements and associated activities:

- Provide a high Level of Service for people who bike within an integrated transport network;
- Improve cycling infrastructure and facilities so that cycling makes a greater contribution to network efficiency, effectiveness and resilience;
- Ensure cycling is a viable and attractive transport choice;
- Reduce the crash rate and the number and severity of crashes involving people on bikes; and
- Improve Wellington's sustainability, liveability, and attractiveness.

1.3 Project Area

The project area for the Newtown Connections cycleway extends approximately 3.5 kilometres through the suburbs of Island Bay, Berhampore, Newtown, and Mt Cook, from the intersection of The Parade and Dee Street in the south, to the Basin Reserve and Pukeahu National War Memorial Park in the north. Taranaki Street, Wallace Street, and the town belt bound the project area to the west and Coromandel Street and the town belt to the east. The Newtown Connections project has also considered connections to neighbouring feeder suburbs, including Kilbirnie, Melrose, Southgate, Houghton Bay, Kingston, Mornington, Vogeltown, and Te Aro.

The Newtown Connections project area abuts the Central Area Improvements study area and the Kilbirnie Connections study area, to the north and east respectively. The project area connects with an existing protected cycleway, Island Bay, to the south. The project area is shown on the following page in Figure 1.

[1] Wellington City Council. (2016). *Cycle Network Development Programme Business Case.* Wellington, New Zealand.

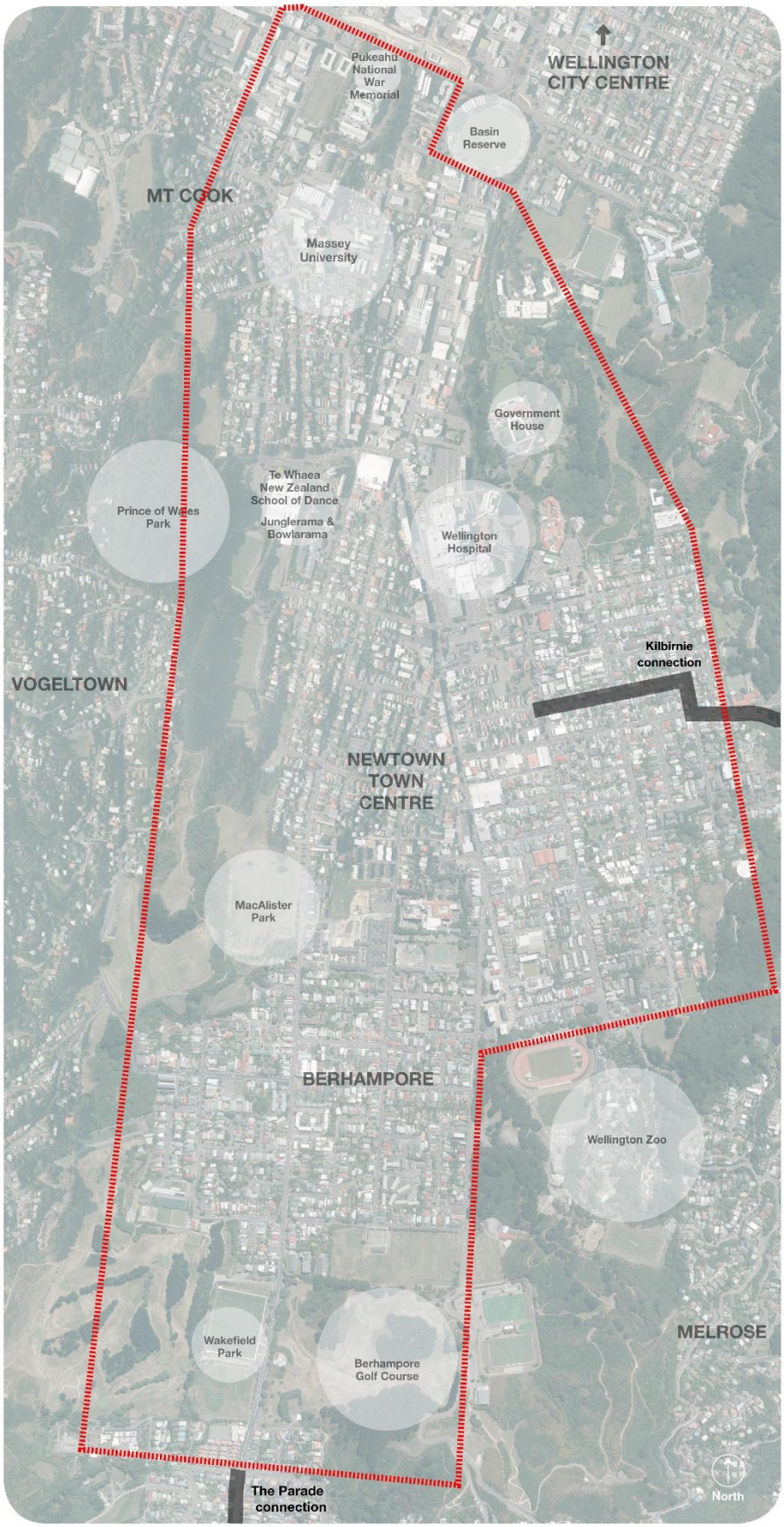


Figure 1 – Newtown Connections project area (shown in red)

2. Background

2.1 Cycling in Wellington

Wellington City's population of 200,000 people is forecast to grow by more than 25% over the next 30 years[2], placing extra pressure on the transport network. To address this pressure, WCC has established a sustainable transport hierarchy, which encourages walking, cycling, and public transport over other modes of transport (Figure 2). WCC proposes to develop a safe and comprehensive cycleway network that will reduce congestion, give people more transport choice, and make sure they can easily get to the central city and other important places around Wellington. The aim of this network is to contribute towards cycling becoming "safer and more convenient"[3] by increasing the level of service for people who use bikes. Cycleway development will be supported by promotional and safety schemes.

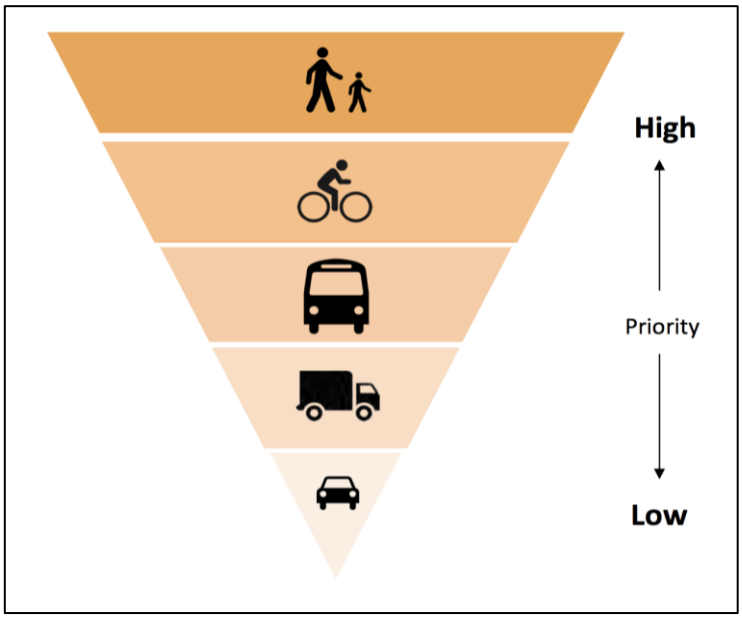


Figure 2 – WCC Sustainable Transport Hierarchy[4]

The percentage of people in Wellington who cycle as their primary means of commuting increased from 2.43% in 2006 to 4.04% in 2013[5]. Cycling has been growing steadily despite a lack of improvement in cycle infrastructure within the city. Transport monitoring surveys have shown an increasing trend in the number of people cycling along the main transport corridors in the city, as seen in Figure 3. The trends suggest that cycle use will increase further in Wellington, but improved cycling infrastructure will be required to ensure this growth continues.

[2] Wellington City Council. (2015). *Wellington Cycleways Programme Master Plan*. Wellington, New Zealand.
[3] Wellington City Council. (2008). *Cycling Policy*. Wellington, New Zealand.
[4] Wellington City Council. (2015). *Wellington Urban Growth Plan.* Wellington, New Zealand.
[5] Wellington City Council. (2015). *Wellington Cycleways Programme Master Plan*. Wellington, New Zealand.

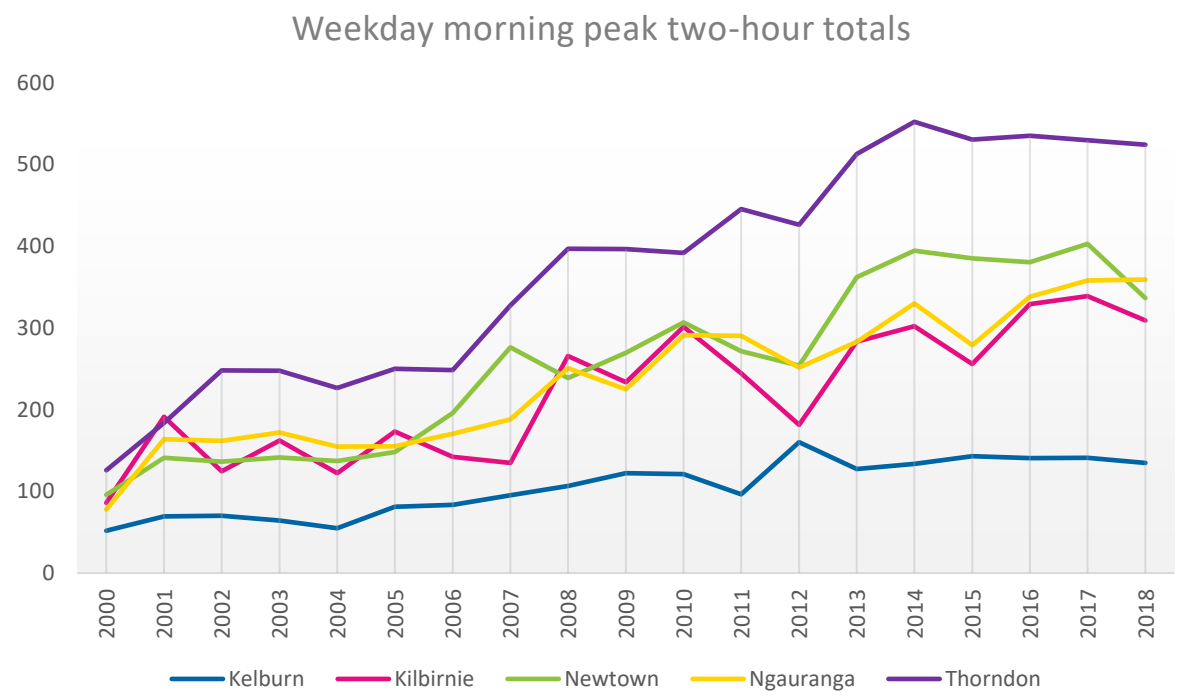


Figure 3 – Volumes of people cycling on the main cycle corridors in Wellington[6]

In order to provide cycling infrastructure that meets the needs of the Wellington community, it is important to understand the types of users who would consider cycling if safe infrastructure were provided. A 2014 study carried out by WCC identified the various groups of cyclists and their attitudes towards cycling and cycling infrastructure. Figure 4 displays the percent make-up of each group within Wellington.

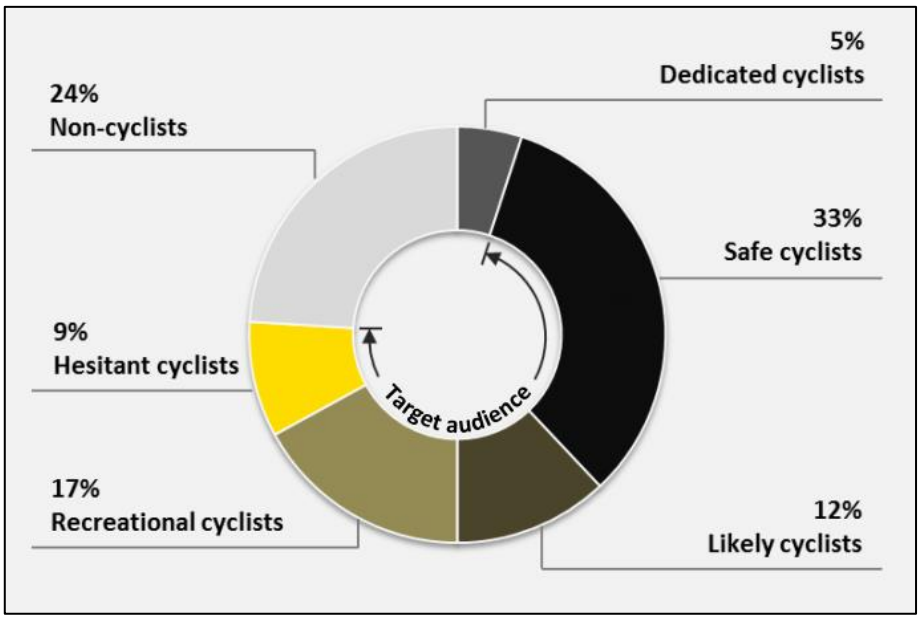


Figure 4 – Distribution of types of cyclists in Wellington[7]

[6] Traffic Design Group. (2018). *Wellington City Council Transport Monitoring Surveys: 2018 Summary*. Wellington, New Zealand.
[7] Wellington City Council. (2015). *Wellington Cycleways Programme Master Plan*. Wellington, New Zealand.

2.2 Funding

In the WCC Long-Term Plan 2018-2028[8], adopted in June 2018, Council allocated $74.6 million to deliver the Cycling Master Plan over a 20-year period. The plan includes the commencement of the network for the Newtown Connections project area—Berhampore, Newtown, and Mount Cook—within the first three years. In October 2018, Wellington City Councillors approved $8 million in ratepayer funding to improve connections in the south of city by 2021[9]. This includes improvements to Berhampore, Newtown, Mount Cook, and Island Bay. The Council also approved an approach that could potentially secure up to an additional $24 million in funding from the New Zealand Transport Agency (NZTA)[10].

2.3 Existing Situation

This section provides a summary of the existing situation in the Newtown Connections project area. The details provided include the recent population history of the area and some information around how people travel to, from, and around the project area. For further details on the existing situation, including information such as the road layouts, a crash analysis, and future land development, refer to the Newtown Connections – Issues Paper[11].

2.3.1 Population

The population of the suburbs served by the Newtown Connections cycleway project has been increasing. The total population increased by 20% between 1996 and 2013, from 20,505 to 24,261. The fastest growing suburb was Mount Cook, which saw a 66% increase. The slowest growing suburb was Island Bay, with an 8% increase. The population growth broken down by suburb is shown in Figure 5.

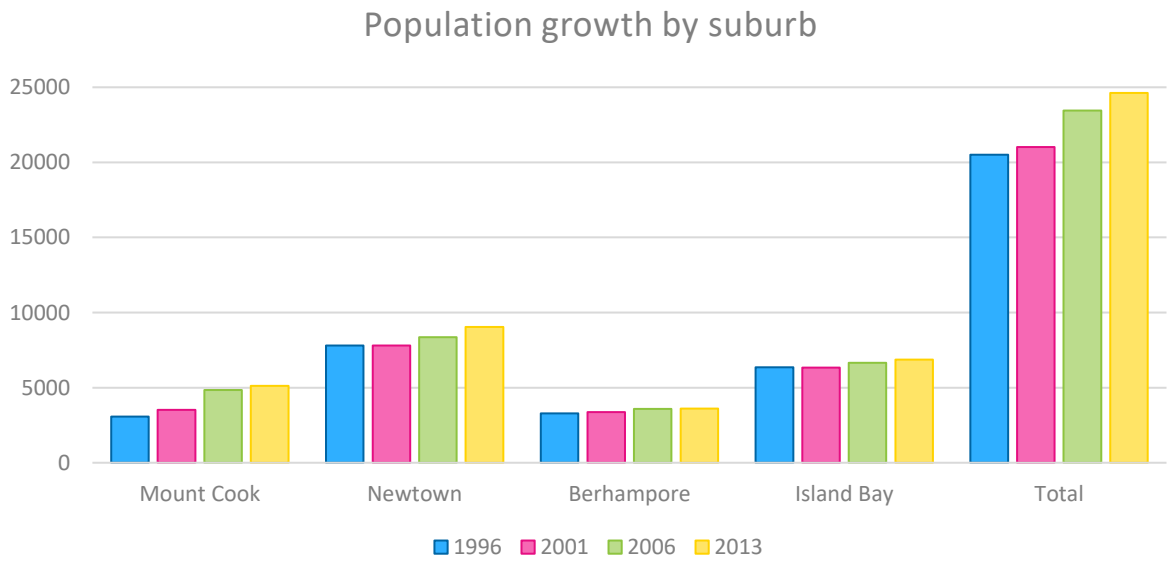


Figure 5 – Population growth in the project area by suburb, 1996-2013[12]

[8] Wellington City Council. (2018). *Wellington City Council's Long-Term Plan 2018–2028.* Wellington, New Zealand.
[9] Wellington City Council. (2018). *Funding prospect for walking and cycling in southern suburbs.* Retrieved from https://wellington.govt.nz/your-council/news/2018/10/cycleways-funding
[10] Wellington City Council. (2018). *Council to work with Government on walking and cycling.* Retrieved from https://wellington.govt.nz/your-council/news/2018/10/southern-cycleway-funding
[11] Tonkin & Taylor Ltd. (April 2018). *Newtown Connections - Draft Issues Paper, Revision 2.* Wellington, New Zealand.
[12] Data retrieved from Stats NZ: nzdotstat.stats.govt.nz

2.3.2 Transport

In 2013, more than 10,500 people who live in the project area regularly commuted for work or study. In the same year, more than 7,500 people regularly commuted to the project area. The main means of travel for people living and for people working or studying in the project area are shown below in Figure 6. More people travelled to the project area by motor vehicle than travelled from within the project area. For all other modes of transport, the majority of commuters live in the project area rather than travelling to the project area.

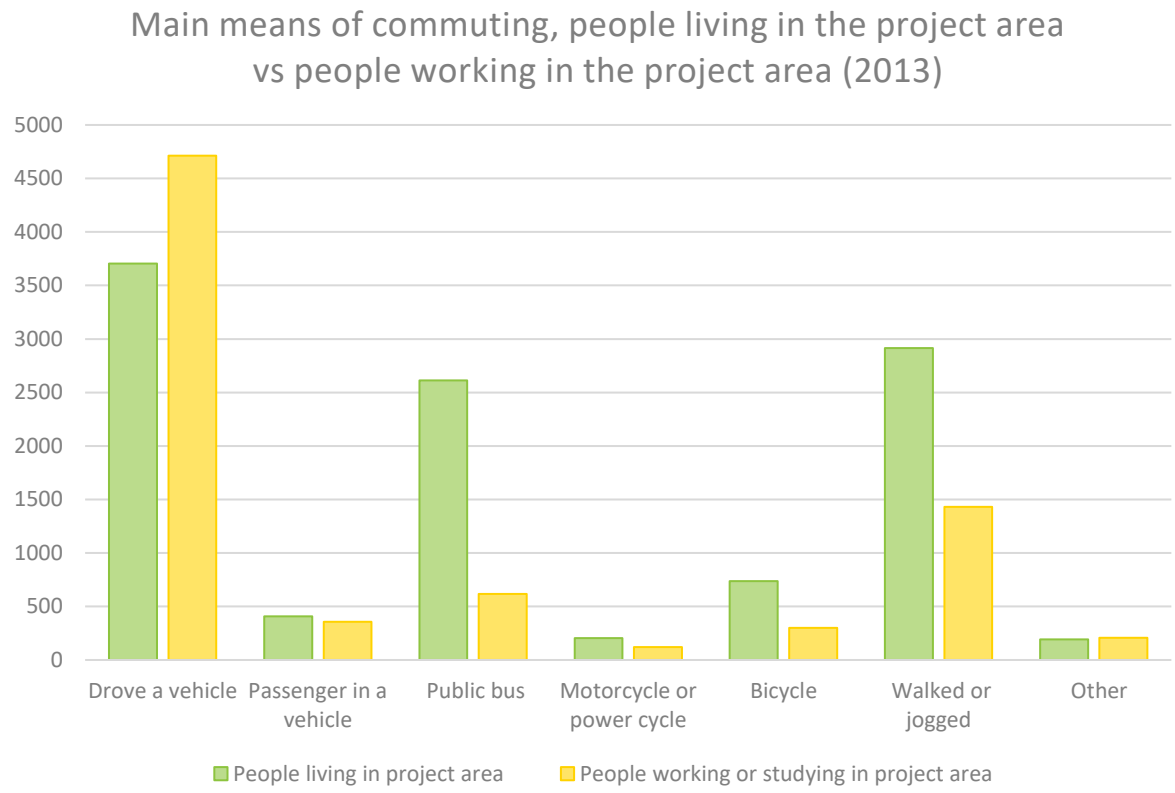


Figure 6 – Main means of commuting, comparison of those who live and those who work in the project area; 2013[13]

As of 2013, 24% of households in the project area did not own a motor vehicle and 49% owned only one motor vehicle[14]. The motor vehicle modal share has been decreasing for commuters to and from the project area since 2001. In contrast, walking/jogging and bicycle modal shares have both been increasing. The modal split trends for those who live in the project area and those who work in the project area are shown in Figure 7 and Figure 8, respectively, for 2001, 2006, and 2013.

[13] Data retrieved from Stats NZ: nzdotstat.stats.govt.nz
[14] Stats New Zealand. (2013). *2013 Census*. Retrieved from: nzdotstat.stats.govt.nz

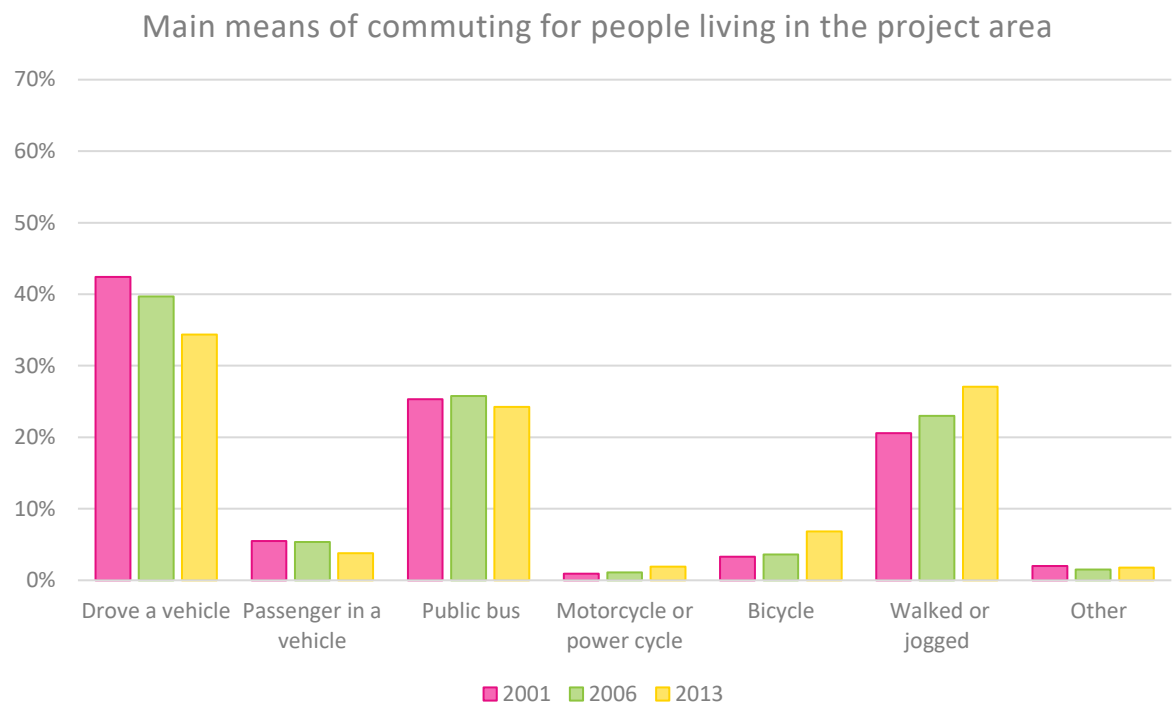


Figure 7 – Main means of commuting for those who live in the project area; 2001, 2006, and 2013[15]

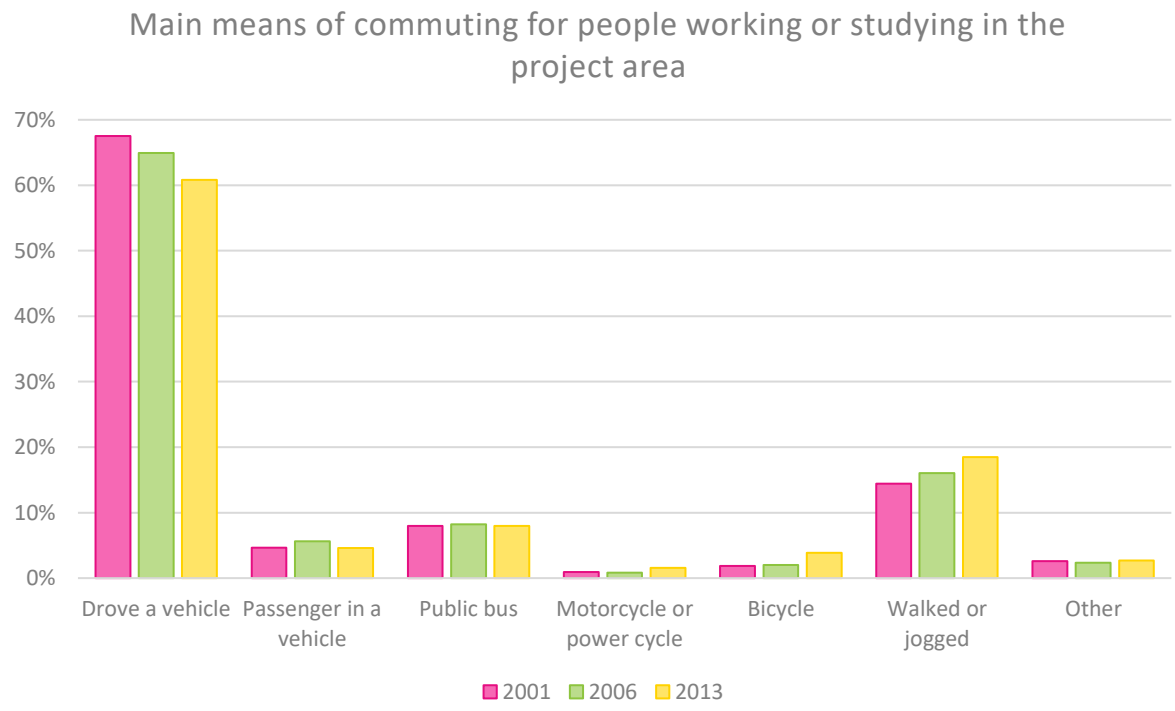


Figure 8 – Main means of commuting for those who work or study in the project area; 2001, 2006, and 2013[16]

[15] Data retrieved from Stats NZ: nzdotstat.stats.govt.nz
[16] Data retrieved from Stats NZ: nzdotstat.stats.govt.nz

2.4 Previous Studies

A number of past studies have been carried out on potential cycleway network options to connect Island Bay to the Wellington Central Business District (CBD). These studies have assessed potential routes and facility treatment options to encourage uptake in new commuter cyclists from the connecting suburbs. Some of the studies have recommended specific routes and/or treatment options, while others have only gone as far as to assess the impacts of select options without making a recommendation.

There is not a consistently recommended route option among the studies, nor a consistently recommended facility treatment option. However, there are design themes and recommendations that are consistent between the studies. Some of the key themes are as follows:

- It is important to provide a central spine route, running north to south to connect Island Bay to the CBD. Supplementary routes should be considered in the future to provide more connections, but the initial focus should be on a high-quality central spine.
- The most important factor that will affect new commuter cyclist uptake is safety (or perceived safety). In general, studies recommended protected cycle facilities or supplementary quiet, low-traffic cycle routes for less-confident cyclists where protected facilities were not provided on the main routes.
- Hill gradients and route directness were also important factors that would contribute to the success of a cycle facility.

For further details on the past studies carried out on cycleway network options to connect Island Bay and the CBD, refer to the Newtown Connections – Issues Paper[17].

2.5 Related Transport Projects

2.5.1 Ngauranga to Airport corridor strategy (2015)

The Ngauranga to Airport (N2A) corridor is one of four key transport corridors identified in the Corridor Strategies section of the Wellington Regional Land Transport Plan (2015) by Greater Wellington Regional Council (GWRC). The N2A corridor begins at the Ngauranga interchange, continuing through the Wellington CBD to Newtown, the eastern suburbs, and Wellington International Airport (as shown in Figure 9). It includes SH1, the local road network, the rail network terminating at Wellington station, and key routes for passenger transport, walking, and cycling.

The strategic principles for development of the N2A transport corridor are:

- A high quality and high frequency passenger transport ‘spine’;
- A reliable and accessible ‘ring’ or bypass route for vehicles;
- Inter-connected, safe, and convenient local street, walking, cycling and passenger transport networks; and
- Highly accessible and attractive ‘activity’ or shopping streets.

Specific to the Newtown Connections project, proposed N2A improvements include duplicating the Mount Victoria Tunnel, addressing conflicting transport demands at the Basin Reserve, and developing a high-frequency public transport spine from Newtown to the central city. These improvements are likely to affect travel times for private vehicles and public transportation users along

[17] Tonkin & Taylor Ltd. (April 2018). *Newtown Connections - Draft Issues Paper, Revision 2.* Wellington, New Zealand.

Adelaide Road and around the Basin Reserve. As a result traffic volumes and travel times on alternative routes, such as Taranaki Street and Tasman Street, may also be affected.

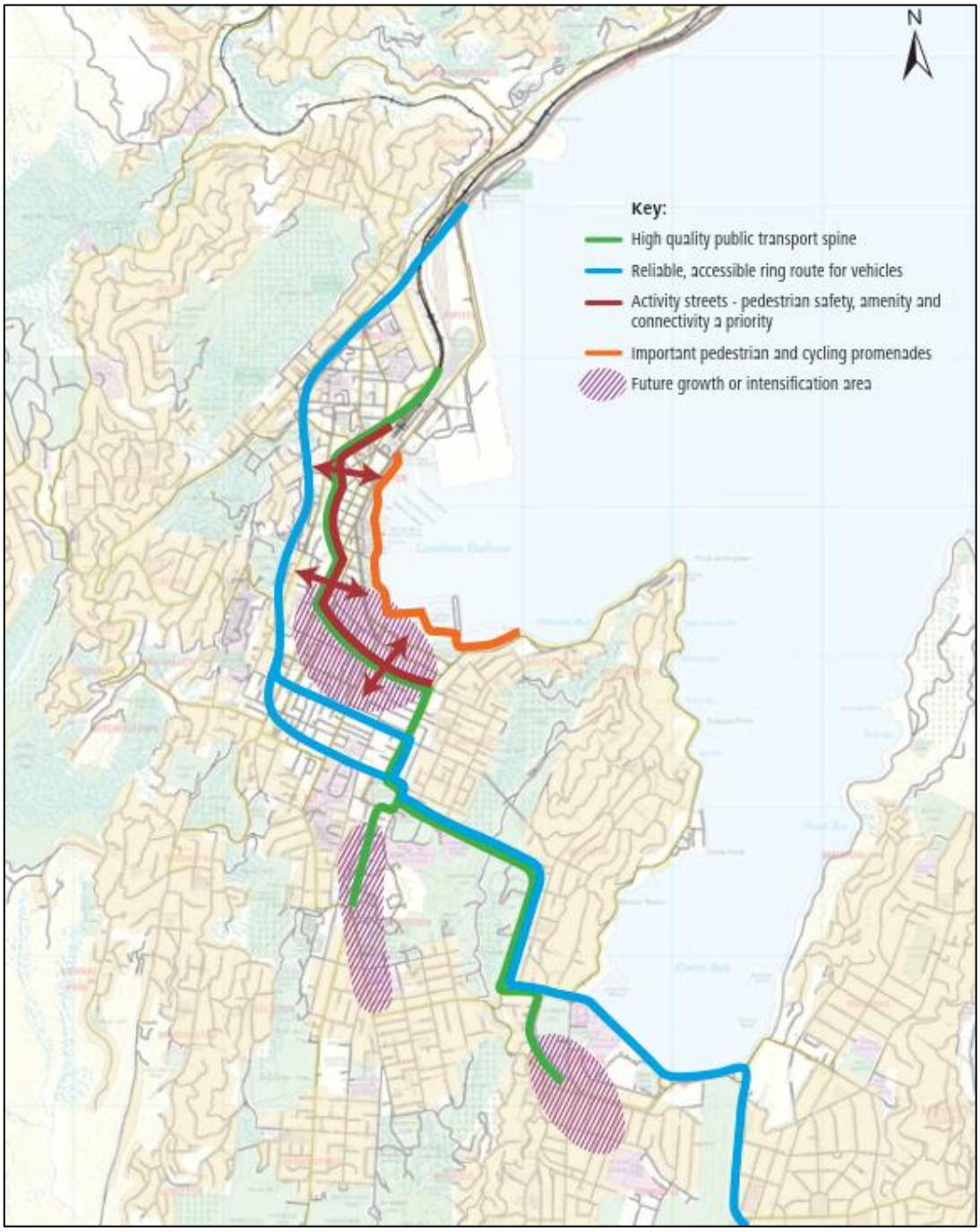


Figure 9 – Ngauranga to Airport Corridor: Strategic principles[18]

2.5.2 Let's Get Wellington Moving

An alliance was established between WCC, the NZTA, and GWRC to develop an integrated multi-modal solution for Wellington's transport needs. The focus is on the area from Ngauranga Gorge to

[18] Greater Wellington Regional Council. (2015). *Wellington Regional Land Transport Plan*. Wellington, New Zealand.

the Airport, encompassing the Wellington Urban Motorway and connections to Wellington Hospital and the eastern and southern suburbs. This alliance is called Let's Get Wellington Moving (LGWM)[19].

The transport improvements illustrated in this report and engagement will integrate with the work of Let's Get Wellington Moving. Parts of the Newtown Connections area are likely to be impacted by transport changes recommended in the future by LGWM.

2.5.3 Kilbirnie Connections

The Kilbirnie Connections improvement project will identify solutions to make it easier and safer for people to walk and bike within Kilbirnie and to adjacent suburbs, including Lyall Bay, Rongotai, Newtown, and the central city. The routes included in the Kilbirnie Connections network are shown below in Figure 10. Routes shown in solid lines are approved projects, while routes shown in dotted lines are proposals that are yet to be progressed. The Newtown Connections project will need to consider connections to the approved project on Wilson Street.

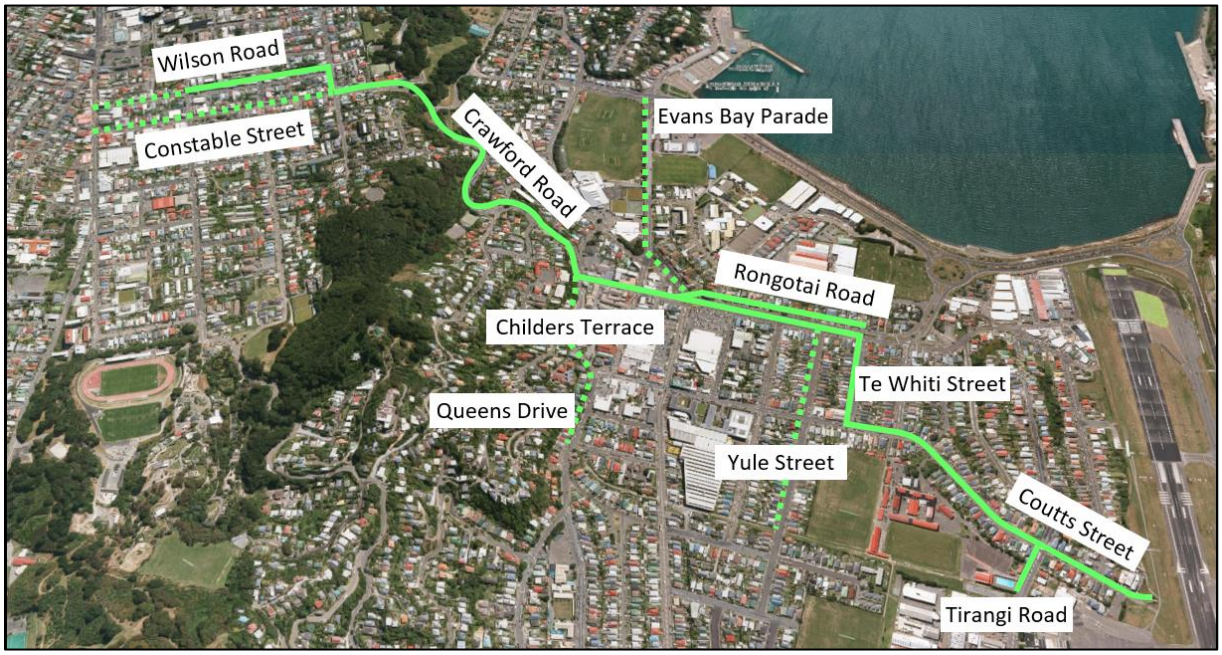


Figure 10 – Kilbirnie Connections cycleway routes[20]

2.5.4 The Parade, Island Bay

In September 2017, WCC councillors agreed on a redesign of The Parade in Island Bay, including bike paths. The concept design provides a consistent layout of the road, footpaths, and bike paths from just north of Reef Street to just south of Dee Street, with some variation through the main shopping area. The northern extent of the improvements at Dee Street will connect with the southern extent of the Newtown Connections project area. The location of the improvements along The Parade is shown below in Figure 11 and the existing layout is shown in Figure 12.

[19] NZTA, GWRC, WCC. (2018). *Let's Get Wellington* Moving. Retrieved from http://www.getwellymoving.co.nz/
[20] Google. (2018). *Google Maps*.

Figure 11 – Extent of proposed work on The Parade, Island Bay[21]

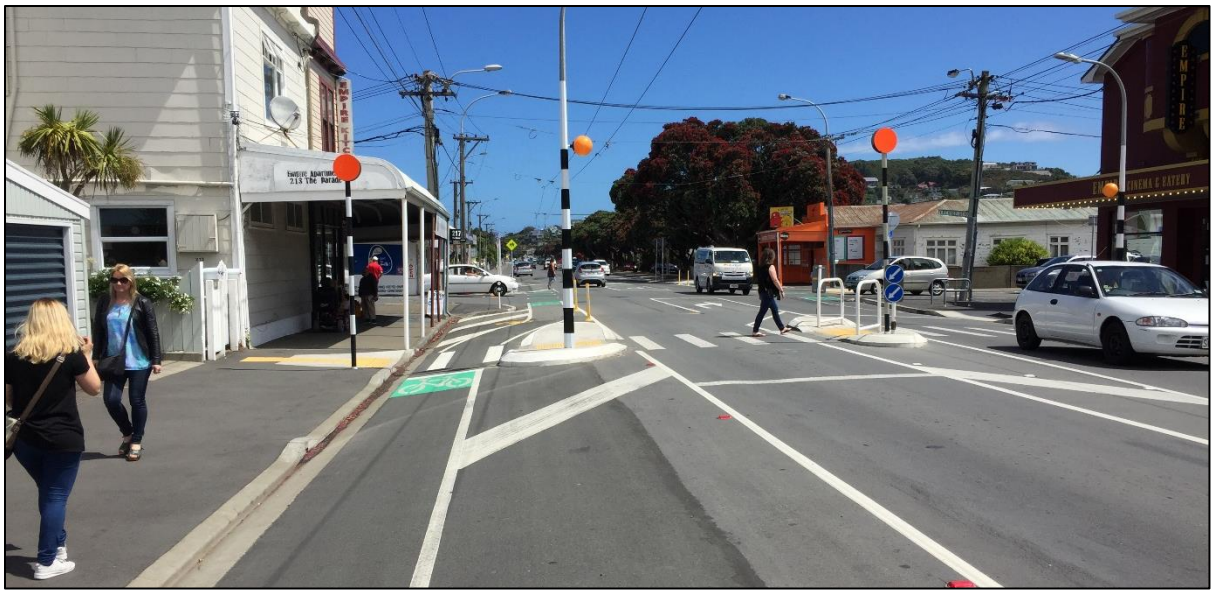


Figure 12 – Existing layout of The Parade, Island Bay

[21] Google. (2018). *Google Maps*.

2.5.5 Central City cycleway projects

The Central City projects will identify upgrades to the cycle network within the central city. Cycling will be considered as part of the wider transport improvements options through LGWM[22]. In the short term, $1.5 million has been allocated from the Government-funded UCP[23] and the Wellington City Cycleways Programme to provide smaller improvements throughout the central city. The study area being considered for the Central City projects is shown below in Figure 13.

Figure 13 – Central Area Improvements cycleway project[24]

2.5.6 Rugby Street

As part of the central area improvements, a new one-way bike lane was installed on Rugby Street in 2018. The 1.6-m-wide bike lane is on the south side of Rugby Street, from Adelaide Road to Tasman Street, as shown in Figure 16. The bike lane improves safety for cyclists travelling from Adelaide Road towards the city by providing dedicated cyclist space.

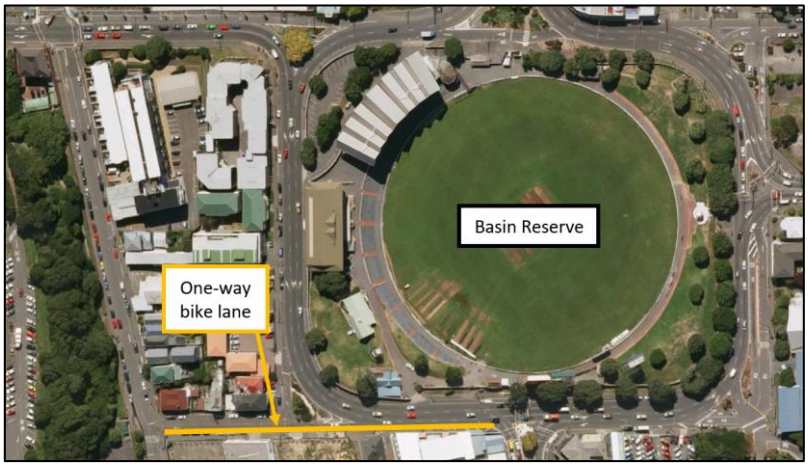


Figure 14 – Location of new bike lane to be installed on Rugby Street[25]

[22] Let's Get Wellington Moving
[23] Urban Cycleways Programme
[24] Google. (2018). *Google Maps*.
[25] Google. (2018). *Google Maps*.

3. Issues, Constraints, and Opportunities

3.1 Issues Paper Summary

The Newtown Connections – Issues Paper[26], provides the background information to develop and guide future assessment of improvement options for cycling and other road users throughout the suburbs of Berhampore, Newtown, and Mount Cook. The paper outlined the plans and policies applicable to the project area, the current level of service for cyclists along this route, and the adequacy and safety of interactions between cyclists, pedestrians, buses, and other vehicles. This includes understanding the existing use of the roads in this area and the crash risk.

The paper identified issues, constraints, and opportunities for the suburbs of Berhampore, Newtown, and Mount Cook from sources including:

- District and Regional Plans, WCC policies and previous studies;
- Related transport projects;
- Existing road corridors (classification, zoning, road layout, and parking);
- A crash analysis outlining the current crash rate and key conclusions for cyclist crashes;
- Existing green spaces (zoning and use), urban design and future land development; and
- Walking, cycling, driving, and bus passenger demand.

The full list of issues, opportunities, and constraints identified can be found within the Issues Paper.

The issues, constraints, and opportunities identified inform the decisions made by the project team throughout the design process, including route selection, the multi-criteria assessments of options, and future detailed design of the preferred option.

3.2 Wellington Cycle Network Investment Objectives

The UCP[27] Programme Business Case (PBC) submitted to the NZTA for NLTF[28] funding outlines the strategic context and case for investment in the Wellington cycleway network. It states that investment in cycling will improve safety for cyclists, increase transport choice, and lessen environmental impact and traffic congestion by reducing the number of vehicles on the road. As a result, the UCP has high strategic fit with stakeholder partners, including WCC, GWRC, and NZTA in terms of economic growth, urban regeneration, and improved accessibility. The following investment objectives were identified for the PBC:

- Achieve a high level of service for cyclists within an integrated transport network
- Improve cycling infrastructure and facilities so that cycling makes a much greater contribution to network efficiency, effectiveness and resilience
- Cycling is a viable and attractive transport choice
- The crash rate, number and severity of crashes involving people on bikes is reduced
- Providing transport choices by increasing the opportunity for people to ride bikes so as to improve the sustainability, liveability and attractiveness of Wellington

[26] Tonkin & Taylor Ltd. (April 2018). *Newtown Connections - Draft Issues Paper, Revision 2.* Wellington, New Zealand.
[27] Urban Cycleways Programme
[28] National Land Transport Fund

4. Community Engagement

Community engagement was undertaken on the Newtown Connections project to inform the assessment process and to ensure that the outcomes meet community expectations. An initial phase of engagement was run from June to July 2018, where feedback was collected from people who live in, work in, or travel to or through the Newtown Connections project area. The engagement sought to understand how people use the area, their experiences in the area, and what key locations and elements were important to consider during the assessment process. As part of the engagement, WCC reached out to schools, community groups, businesses, and other organisations in the area to let them know about the project and the engagement. In addition, WCC officers met with some stakeholder organisations to discuss the engagement process and encourage participation.

4.1 Community Objectives

WCC developed a set of community objectives for the Newtown Connections project using information gathered from the initial phase of community engagement. The objectives will help to determine what changes are made as part of the project. Options considered for the project will be assessed against the defined community objectives. The community objectives determined for the Newtown Connections project are as follows:

The project is primarily about making biking safer and easier for more people. There were two primary community objectives developed in relation to this.

A. Provide facilities for people biking through and around Newtown, Mt Cook and Berhampore
B. Provide safe cycle facilities

In addition to the above, nine additional community objectives were developed that focused on other aspects of the project.

1. Improve the safety of facilities for people walking through and around the area
2. Make it easier and safer for people to cross roads in the area
3. Contribute to reducing car congestion in the area by creating better facilities that encourage more people to bike, walk, and take the bus
4. Minimise the impact on parking, especially for residents and businesses
5. Encourage more people to use the bus by providing bus lanes, rationalising bus stop locations, and creating opportunities to let buses go first at some traffic lights
6. Create opportunities to improve safe access, seating and shelter at bus stops
7. Preserve, or create opportunities to enhance, the special character of the Newtown, Berhampore, and Mount Cook area
8. Create opportunities to improve the key locations identified in data analysis from the Newtown Connections community engagement, including:
    - The Basin Reserve roundabout
    - The Adelaide Road/Riddiford Street/John Street intersection
    - Around the Wellington Regional Hospital
    - Newtown town centre, including the intersections of Mein Street, Rintoul Street, and Constable Street

- Berhampore town centre

9. Create opportunities to improve the key streets identified in data analysis from the Newtown Connections community engagement, including:
    - Adelaide Road
    - Riddiford Street
    - Mein Street
    - Rintoul Street
    - Constable Street

5. Multi-Criteria Analysis

A Multi-Criteria Analysis (MCA) is a tool that can be used to evaluate different options. An MCA evaluates a range of options against a set (or multiple sets) of criteria. The outcome of an MCA allows assessors to compare the effectiveness of each options at meeting each criterion.

To assess the options considered for the Newtown Connections cycleway project, multiple MCAs were used at different phases of the evaluation. This section outlines the general process used in an MCA and the criteria chosen for this project. The full assessment process used to evaluate concept options for the Newtown Connections project is outlined in Section 6.

5.1 MCA Process

An MCA acts like a filter, with a large number of options—the long list— at the top, distilled down to a select few options that pass the criteria assessment—the short list. The short list represents the best-fit options, as per the chosen criteria.

The MCA starts with a fatal flaws assessment and flows through key criteria, defined in advance through collaborative engagement with WCC and the community and through the application of best practice, sound engineering judgement, and feasibility principles. A simplistic representation of the evaluation process and the criteria chosen for the Newtown Connections project are presented below in Figure 15.

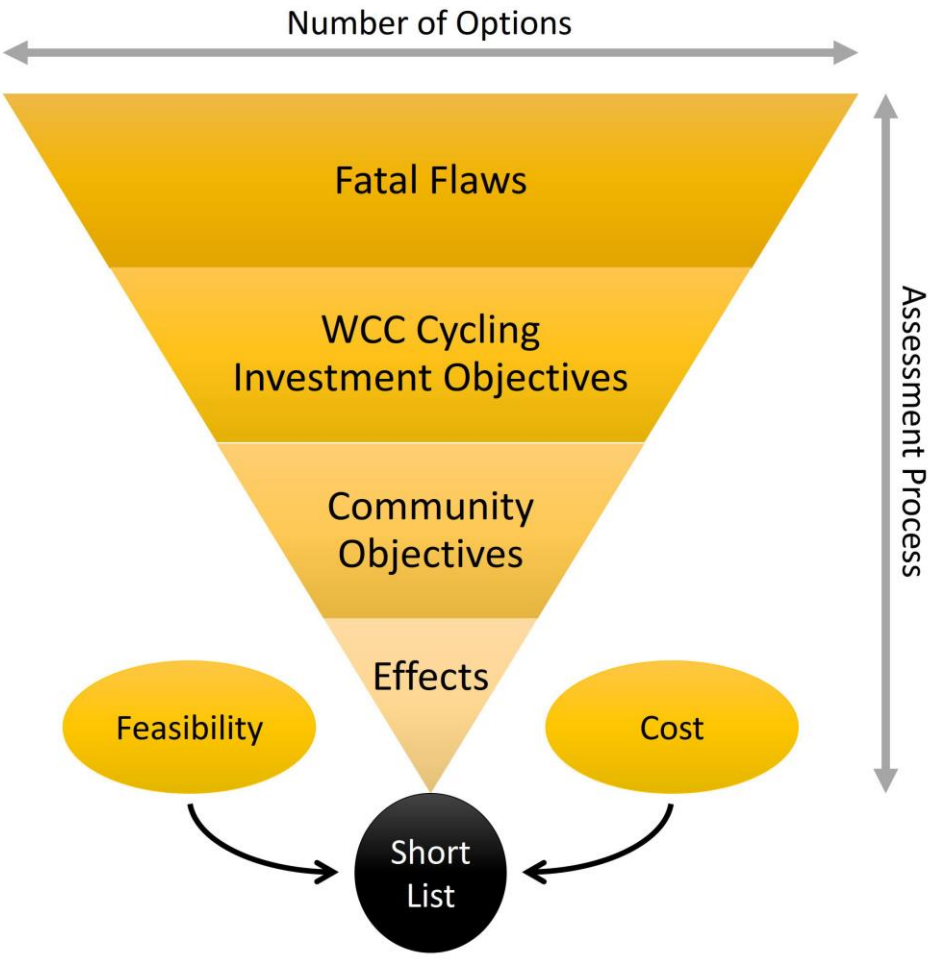


Figure 15 – MCA evaluation process and assessment criteria

For this project, each option that was assessed in an MCA was scored against each criteria on a seven-point scale (as described further in Section 5.3). The assessment of each criterion varies slightly between the different levels of assessment, but all follow the same principle. Results are colour coded to assist in the ease of assessment across the options and criteria.

The process of evaluation is a simple pass–fail, based on the level of alignment with criteria as illustrated in the process map in Figure 16. If an option successfully meets the criteria at a filter level, it passes and moves onto the next filter. If it does not, the option fails and is rejected.

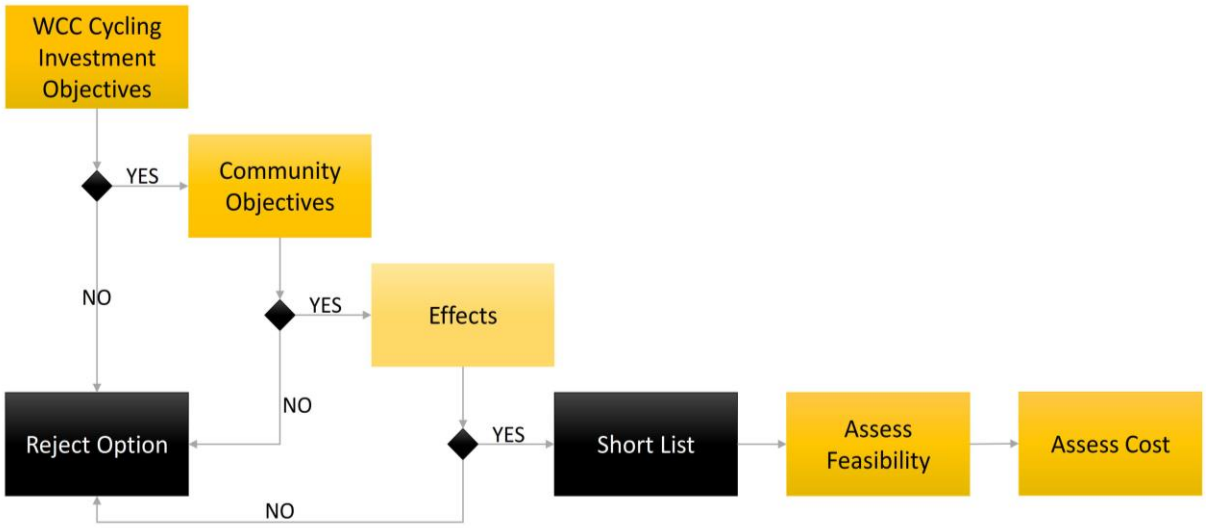


Figure 16 – MCA process map

In general, the pass/fail criteria are set so that any option that strongly detracts from any one criteria is an automatic fail, as well as any option with an overall assessment that is not positive (i.e. neutral or negative).

5.2 Fatal Flaws

A fatal flaw is an option that is considered but ruled out before the assessment process. The option has at least one element or impact that makes it highly undesirable, unrealistic, or possibly unfeasible. An example of a fatal flaw is an option that adversely affect an urupa (Maori burial site) or a heritage site. Cost was not considered a fatal flaw.

For this assessment, the following options were considered fatally flawed across all phases of assessment:

- Options that would result in an fundamentally unsafe environment for any user; and
- Options that detract from the principles and purpose of the project.

Furthermore, additional fatal flaws were considered at the individual assessment phases. These fatal flaws are outlined in Section 6.

5.3 MCA Criteria

The following section provides a brief explanation of the MCA criteria filters used for the Newtown Connections cycleway project. For a full list of the criteria categories and the considerations/objectives within each category, see Appendix D.

5.3.1 WCC Investment Objectives

To ensure consistency with the other WCC cycleway projects and to guarantee that the treatments chosen meet WCC's programme investment objectives, the following five WCC investment objectives were included in the options evaluation process:

- Achieve a high level of service for cyclists within an integrated transport network;
- Improve cycling infrastructure and facilities so that cycling makes a much greater contribution to network efficiency, effectiveness and resilience;
- Cycling is a viable and attractive transport choice;
- The crash rate, number and severity of crashes involving people on bikes is reduced; and
- Providing transport choices by increasing the opportunity for people to ride bikes to improve the sustainability, liveability, and attractiveness of Wellington.

The first objective was assessed based on the level of service[29] (LOS) rating of the option, as per the scale in Table 1.

Table 1 – LOS effectiveness scale

A	Very good LOS
B	Good LOS
C	Fair LOS
D	Poor LOS
E	Bad LOS
F	Very bad LOS

The other four WCC investment objectives were evaluated against a seven-point scale of effectiveness, as per Table 2.

Table 2 – WCC investment objectives effectiveness scale

+3	Highly contributes to achieving the desired outcome
+2	Contributes to achieving the desired outcome
+1	Partially contributes to achieving the desired outcome
0	Could detract from achieving the desired outcome but can be managed through design
–1	Partially detracts from achieving the desired outcome
–2	Detracts from achieving the desired outcome
–3	Significantly detracts from achieving the desired outcome

Only options that met the WCC investment objectives were progressed through analysis. Options that could not be supported by the investment objectives, and therefore would not attract funding, were

[29] Level of service describes the traffic quality as experienced by road users. When applied to cycling, the assessment of level of service takes into consideration elements of the cycle network such as perception of safety, comfort, and coherence.

rejected at this stage. The remaining options were progressed through to the next stage of the assessment.

5.3.2 Community Objectives

The community engagement process resulted in the following community objectives being developed (see Section 4) to be included in the MCA assessments:

A. Provide facilities for people biking through and around Newtown, Mt Cook and Berhampore

B. Provide safe cycle facilities

1. Improve the safety of facilities for people walking through and around the area
2. Make it easier and safer for people to cross roads in the area
3. Contribute to reducing car congestion in the area by creating better facilities that encourage more people to bike, walk, and take the bus
4. Minimise the impact on parking, especially for residents and businesses
5. Encourage more people to use the bus by providing bus lanes, rationalising bus stop locations, and creating opportunities to let buses go first at some traffic lights
6. Create opportunities to improve safe access, seating and shelter at bus stops
7. Preserve, or create opportunities to enhance, the special character of the Newtown, Berhampore, and Mount Cook area
8. Create opportunities to improve the key locations identified in data analysis from the Newtown Connections community engagement, including:
    - The Basin Reserve roundabout
    - The Adelaide Road/Riddiford Street/John Street intersection
    - Around the Wellington Regional Hospital
    - Newtown town centre, including the intersections of Mein Street, Rintoul Street, and Constable Street
    - Berhampore town centre
9. Create opportunities to improve the key streets identified in data analysis from the Newtown Connections community engagement, including:
    - Adelaide Road
    - Riddiford Street
    - Mein Street
    - Rintoul Street
    - Constable Street

The community objectives were evaluated against a seven-point scale of effectiveness, as per Table 3.

Table 3 – Community objectives effectiveness scale

+3	Highly contributes to achieving the desired outcome
+2	Contributes to achieving the desired outcome
+1	Partially contributes to achieving the desired outcome
0	Could detract from achieving the desired outcome but can be managed through design
–1	Partially detracts from achieving the desired outcome
–2	Detracts from achieving the desired outcome
–3	Significantly detracts from achieving the desired outcome

Only options that met the community objectives were progressed through analysis. One of the targets of the assessment was to seek options that align with community desires, as measured by the community objectives. Therefore, any options that did not achieve the community objectives were rejected. The remaining options were progressed through to the next stage of the assessment.

5.3.3 Effects

Options were assessed on criteria agreed upon with WCC that relate to the effects the options would have on the existing situation. The effects filter assessed the options against a range of criteria that included alignment to the wider transport network, the level of service and safety for all users, land use, access, and environmental effects.

The effects criteria were evaluated against a seven-point scale of effectiveness, as per Table 4.

Table 4 – Effects effectiveness scale

+3	Significant Positive Effect
+2	Moderate Positive Effect
+1	Slight Positive Effect
0	Neutral/No Effect
–1	Slight Negative Effect
–2	Moderate Negative Effect
–3	Significant Negative Effect

Only options that passed the effects criteria were progressed through analysis. This was the final stage of assessment in the MCA; any options that passed this stage were considered to have passed the MCA. Any options that passed at this stage were progressed to assess the implementation.

5.3.4 Implementation

The final set of criteria assessed as part of the MCA considered the implementation of an option. These criteria assessed the feasibility and the cost of an option. This stage of the MCA assessment did not act as a filter (i.e. no options were rejected at this stage). At this time in the project, the feasibility and cost of the passed options were assessed for information only.

For each option, the feasibility assessment considered the planning implications—how well the option aligns to planning requirements and the approvals risk—and the delivery implications—any disruption to traffic and businesses that would occur during construction. The feasibility criteria did not include an assessment of the constructability of options. All options that were considered and passed the MCA are practical options that can be constructed., with the MCA identifying the level of effect and likely consenting requirements of each option using a risk based assessment.

The feasibility criteria were evaluated against a four-point scale of effectiveness, as per Table 5.

Table 5 – Feasibility effectiveness scale

0	Neutral/No Risk
–1	Slight Negative Effect/Risk
–2	Moderate Negative Effect/Risk
–3	Significant Negative Effect/Risk

The cost of each option was evaluated against a four-point scale, as per Table 6. For more information on the cost estimates, see Section 6.6.4.

Table 6 – Cost assessment scale

	No cost
$	Low cost
$$	Medium Cost
$$$	High Cost

5.4 Resources

Multiple resources were used to assist in the options assessment for the Newtown Connections project. These resources included best practice guidance, which influenced the assessment of options against the objectives and effects, the Danish cycling LOS assessment method, used to determine the LOS of an option, and a parking survey, which provided an indication of the existing parking situation within the project area. This section provides further information on the referenced guidelines, the Danish LOS assessment method, and the parking survey, detailed below.

5.4.1 Cycle Design Guidance

Many of the MCA criteria were assessed based on recommendations and best-practice standards outlined in local and national guidance. The following list describes all of the standards that influenced the assessment process. Appendix D, Appendix F, and Appendix J include further details on which MCA criteria these standards were applied to and how each criterion was assessed as per the relevant standard(s).

Austroads LOS Metrics

The Austroads LOS Metrics report provides a LOS framework for network operations from the perspective of all road users. The framework provides guidance for assessing the LOS of each user type for five categories of needs—mobility, safety, access, information, and amenity. The framework

outlines the measures used to assess how well a facility meets these needs for each user group. These measures were integrated into the MCA assessment for the Newtown Connections project.

NZTA Cycle Network Guidance[30]

NZTA has an online resource to guide the design of cycle infrastructure called the cycle network guidance (CNG). The CNG aims to promote a consistent, best practice approach to cycling network and route planning throughout New Zealand. It outlines a principles-based process for deciding what cycling provision is desirable and provides best-practice guidance for the design of cycleways.

CROW Design Manual for Bicycle Traffic

The CROW Design Manual for Bicycle Traffic is a Dutch guide to incorporating cycling infrastructure into the transport network. The manual is intended to provide guidance, ideas, and tips that helps designers to provide effective cycling infrastructure and appropriate cycling facilities. For the Newtown Connections assessment, the CROW Design Manual was primarily used for guidance in the selection of viable and effective cycle network options.

Wellington City Council Cycling Framework[31]

The WCC Cycling Framework provides design guidelines and design principles for the implementation of a cycling network (i.e. what, where, when, how) in Wellington. The framework outlines the proposed citywide cycle network and describes the cycleway options (such as quiet routes, shared zones, protected lanes, or alternative paths) and their typical locations. Furthermore, it sets out decision-making thresholds for the delivery of each aspect of the cycle network, which were considered in the MCA assessment.

5.4.2 Danish Cycling Level of Service

The Danish Cycling LOS assessment method uses quantitative data to assess the LOS rating (A to F) for cyclists in a given road environment. This assessment method takes into consideration a wide range of factors that influence cyclist comfort and safety, including elements such as allocated space for cyclists, proximity to motor vehicles and pedestrians, motor vehicle speeds and volumes, and the presence of bus stop facilities. These variables factor into an equation, with which the LOS rating is calculated.

Whereas the Austroads LOS Framework (see Section 5.4.1) method assesses the LOS rating for each need of a user group, the Danish method provides one overall rating for the cyclist LOS. As part of the assessment for the Newtown Connections project, the Danish Cycling LOS assessment method was used to determine the cycling LOS to assess the first WCC cycling investment objective: "*To achieve a high level of service for cyclists within an integrated transport network.*"

5.4.3 Parking Survey

In order to assist with the assessment of the parking impacts of the options being considered for the Newtown Connections project, WCC commissioned a parking survey to be carried out within the project area. The survey was completed over two days—one weekday (Thursday 27 September 2018) and one weekend day (Saturday 29 September 2018). On both of the days, the number plates of vehicles parked on the streets within the survey area were collected every hour, from 6am to 8pm.

[30] New Zealand Transport Agency. (2018). *Cycling network guidance – planning and design.* Retrieved from: https://www.nzta.govt.nz/walking-cycling-and-public-transport/cycling/cycling-standards-and-guidance/cycling-network-guidance
[31] Wellington City Council. (2015) *Wellington City Council Cycling Framework 2015.* Wellington, New Zealand.

The following list outlines the information collected and the data analysis provided from that information.

- The total estimated number of parking spaces available on each street was recorded before the survey began along with the parking restrictions in place (if any). From this information, the total parking capacity or supply was determined.
- Between every hour (6am to 8pm), the number plates of every vehicle parked on the streets within the study area were recorded. The following data was provided from this information:
    - The total parking demand on each street during each hour.
    - The total resident parking demand[32] on each street during each hour.
    - The duration of stay for each vehicle in a parking space.

The following are the risks and limitations associated with the collected parking data:

- In areas where the parking is unmarked, the number of spaces available depends on parking behaviour and can vary. For the purposes of the survey, the number of parking spaces in these areas was estimated from parking activity on site at the time of the survey. Because of this, the parking supply numbers are estimates only and may vary.
- Resident vehicles were determined based on the addresses registered to number plates. Vehicles that are used for residential purposes at one address but are registered to a different address would not have been captured in the residential parking demand.
- The survey timeframe was limited to two days. The data collected provides only a snapshot of the current parking situation in the study area. The results will vary on a day-to-day basis, and peak demand will be influenced by events and activities that occur within the survey area that did not take place during the survey dates.

The data collected from the parking survey was used to assess some of the MCA criteria. Appendix D, Appendix F, and Appendix J include further details on which criteria took into account the parking survey information and how the criteria were assessed. A reference map of the area and the streets included in the parking survey can be found in Appendix C.

[32] Resident parking demand was determined through the registered addresses for each number plate. After the data collection, the number plate data was used to source the street name of the registered address for each car. This information was sourced from NZTA databases. Cars were classified as resident vehicles if the number plate was registered to the street the car was parked on or to any adjacent streets.

6. Options Assessment

6.1 Introduction

The purpose of the Newtown Connections cycleway project is to provide a cycle network within the suburbs of Berhampore, Newtown, and Mount Cook. The assessment process required the evaluation not only of the cycle treatment types, but also of the network itself, as the routes were not previously defined. Because of this, these two elements of the cycle infrastructure needed to be separately assessed. The following terms have been defined for the purposes of the Newtown Connections assessment process:

- **Treatment:** A treatment is the way in which cycling is accommodated on a given route. A treatment could include specific cycle facilities, such as cycle lanes or paths. Alternatively, a treatment could consist of a general road environment that caters to cyclists' needs, such as a quiet route[33] or a shared zone.
- **Network:** A cycle network is made up of interconnected routes—roads or off-road paths—that are cycle-friendly. The intention of a network is to provide cyclists with safe, comfortable, and convenient routes that connect origins and destinations and that all link to each other.
- **Package:** A package consists of the combination of a cycle network with the associated treatments appropriate to each route within the network.

The evaluation of the options for the Newtown Connections project involved three phases: assessing the treatment options on each road, assessing network options, and assessing package options that combined the treatments and networks. These option evaluations were done using MCAs during each of the three phases of assessment (see Section 5 for more information on the MCA process). This section seeks to outline the three phases of the assessment process.

The approach aimed to achieve a degree of consistency with the rest of the UCP[34] and to incorporate the feedback received during public engagement undertaken for the project (refer to Section 4). Where possible, the assessment of each option was based on national and international best practice guidelines. The guidelines that were used are listed in Appendix A. In some instances, where guidelines were not applicable/appropriate, assessment relied upon the technical expertise of the assessors and the public feedback gathered from the engagement process.

6.1.1 Assumptions

Throughout the design process, assumptions have been made regarding the packages. The assumptions were made at the outset of, or during, the assessment process. The following assumptions have directed the development of the recommended packages:

- The assessment process to date has only considered conceptual options for treatments, networks, and packages—no detailed design work has been done;
- The packages will adhere, where practicable, to best practice guidelines, which have been drawn from standards that are outlined in Appendix A;
- The network will connect the existing and planned cycle infrastructure on The Parade (Island Bay connection) and Crawford Road/Constable Street (Kilbirnie connection) to the CBD;

[33] A quiet route is also known as a neighbourhood greenway, a quiet street, or a slow street. They are defined as streets with low volumes of motor vehicles travelling at low speeds, creating a pleasant cycling environment,
[34] Urban Cycleways Programme

- The network should provide connections between the suburbs of Berhampore, Newtown, and Mount Cook;
- The available road width is considered to be between the property boundaries. On most roads in the project area, the extent of the formed road aligns with the property boundaries. However, in some locations the width between the property boundaries is wider than the formed road. On these streets, options that would widen the formed road were considered;
- On-road treatments that require more width than the available road width will not be considered;
- Options outside of the road reserve that would provide links between routes in the network (for example, off-road routes) will be considered; and
- Urban design and landscaping features will be integrated into the packages regularly throughout the network.

6.1.2 Target Standards

A set of desirable minimum dimensions were determined for the various elements within the road corridor, including pedestrian, cycling, and motor vehicle facilities. The recommended standards were sourced from best-practice guidance and were agreed upon with WCC; further details on the reference guidance can be found in Appendix A. The chosen dimensions are listed in Table 7 on the following page.

Table 7 – Design dimensions and recommended dimensions for design elements

Element of Design		Desirable Minimum Dimension
Footpath	Residential	2.0 m
	Shopping centre: Collector road	2.5 m
	Shopping centre: Principal road	3.0 m
Cycle Lane	Unidirectional cycle lane	1.5 m
	Bidirectional cycle lane	2.5 m
	On-road shared cycle and parking lane	4.0 m
	On-road shared cycle and clearway lane	4.3 m
Separation Strip	Between cycle lane and traffic lane	0.6 m
	Between cycle lane and parallel parking	1.0 m
Shared Path	Varies, depending on pedestrian volumes	3.0 m – 5.0 m
Traffic Lane[35][36]	Local road	2.5 m
	Collector road	2.8 m
	Principal road	3.0 m
Bus Lane	Narrow lane[37]	3.0 m
	Wide lane[38]	4.2 m
Parallel Parking		2.0 m

6.2 Assessment Process

The purpose of this stage of the Newtown Connections cycleway project was to select multiple cycle packages (a cycle network with associated treatments) to be put forward for community engagement and feedback. Each package would consist of a cycle network for the project area and selected treatment types for each route within the network. The objective was to select packages that met the MCA criteria and would provide a high-quality cycle network within Berhampore, Newtown, and Mount Cook. In addition, the packages were intended to include a variety of treatments and networks to gain feedback from the community on a variety of choices.

As both the treatment types and the network needed to be selected, the assessment process involved three distinct phases to properly assess all of the options. The first two phases involved the assessment of the treatment types and the networks separately, while the third phase involved the

[35] The traffic lane widths were specified by WCC.
[36] No changes are proposed to existing traffic lanes widths where the lanes are narrower than the desirable minimum widths, except on bus routes where the widths will be a minimum width of 3.0 m.
[37] A narrow bus lane requires cyclists and buses to travel in single file.
[38] A wide bus lane is wide enough for cyclists to ride adjacent to buses, allowing for overtaking.

assessment of the package options. A diagram showing the progression of option identification is shown below in Figure 17. Each circle in the flow diagram represents an individual MCA process.

For the assessment process, there was the option to assess either the treatment types or the networks options first. Many of the streets within the Newtown Connections project area are quite narrow, or steep, or both. These factors could have a significant effect on the viability of a street to be included in a cycle network. Streets that are either too narrow to accommodate cycling infrastructure or too steep to be acceptable for cycling should not be considered as potential links within a network. The decision was therefore made to assess treatment options in the first phase. This would allow for any streets that were too narrow or too steep to be rejected at this phase and not be carried through to the network assessment. Additionally, assessing the treatments first meant that any route where none of the treatments passed the MCA criteria, leaving no appropriate cycling options on the route, could also be rejected. This assured that all of the streets within the long list of networks would have viable options to safely accommodate cyclists.

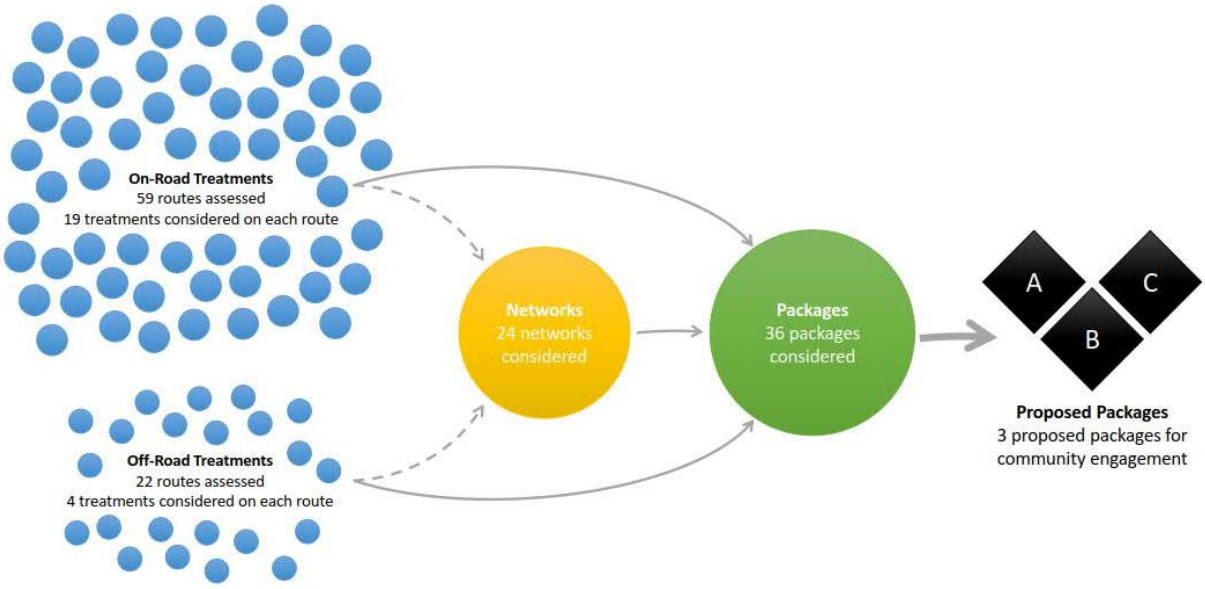


Figure 17 – Three-phase progression of options

In the first phase, multiple treatment options on both on-road and off-road routes were assessed. For on-road options, 19 treatment types were considered on 59 different routes. For off-road options, four treatment types were considered on 22 different routes. A separate MCA was carried out for each route option. For more information on Phase 1 and the assessment process, see Section 6.3.

In the second phase, 24 network options were considered on the long list. The results from the first phase informed the selection of the networks. One MCA was used to evaluate all of the network options against each other. For more information on Phase 2 and the assessment process, see Section 6.4.

In the third phase, 36 package options were considered on the long list. The results from both the first and second phases informed the selection of the packages. One MCA was used to evaluate all of the package options against each other. For more information on Phase 3 and the assessment process, see Section 6.5.

Figure 18 on the following page outlines the three-phase assessment and the MCA criteria and process used during each of the three phases.

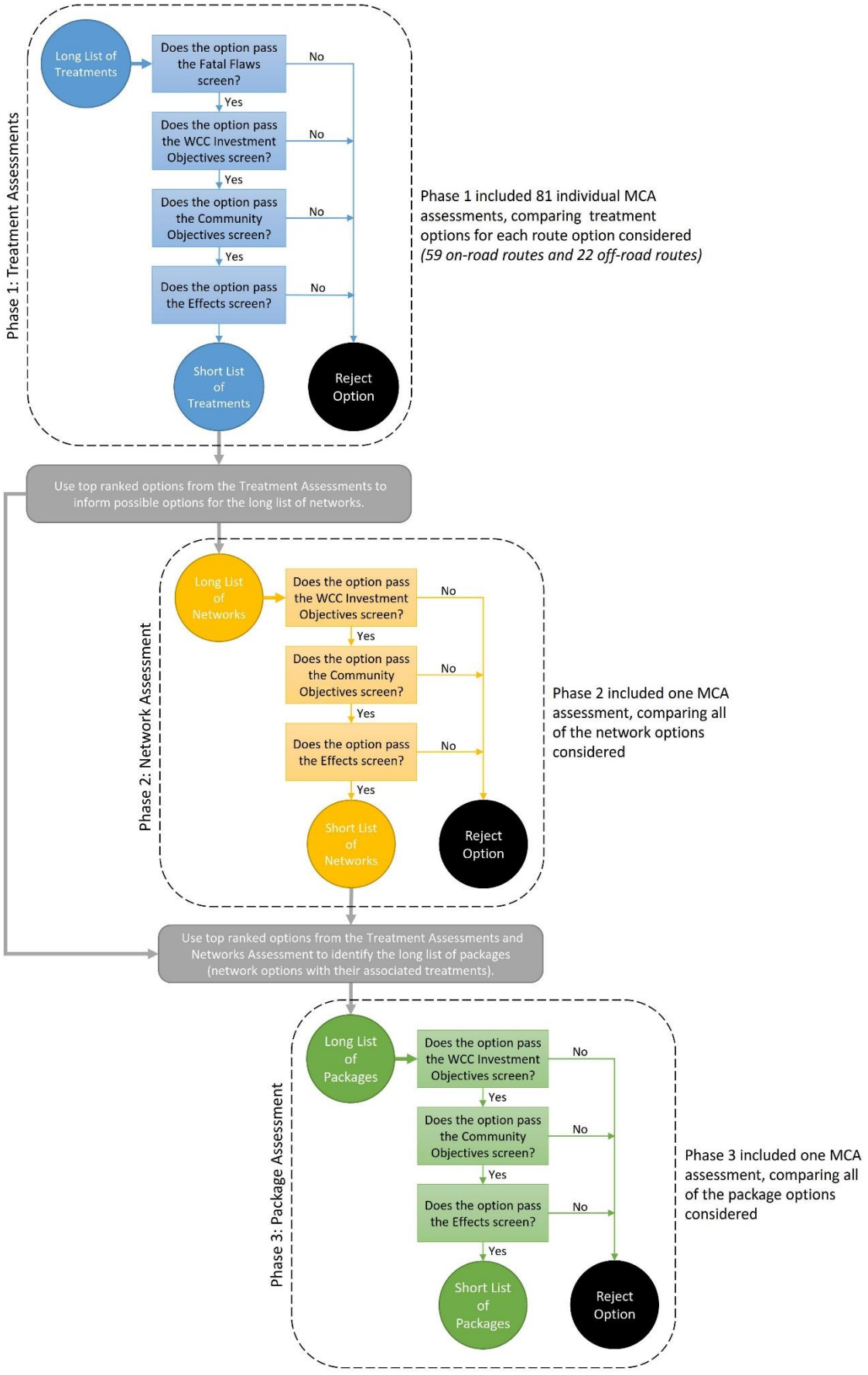


Figure 18 – Three-phase MCA process map

6.3 Phase 1: Treatment Assessments

6.3.1 Treatments: Options Identification (Long List)

The objective of the first phase of assessment for the Newtown Connections cycleway project was to assess treatment options across all routes that could have possibly be included in the cycle network. Options were considered across both on-road and off-road routes. Two long list were identified: a long list of treatment options and a long list of routes on which the treatments needed to be considered. This section outlines the identification of the long list of treatments for both on-road and off-road routes and the identification of the long list of routes to be considered for the network. Appendix E includes a full list of all of the treatments and routes considered on the two long lists.

Treatments

Through workshop sessions, and upon agreement with WCC, a long list of 23 possible treatment options was established. Of the 23 options, 19 were on-road treatments and four were off-road treatments. Within the treatment types considered, there were "families" of options. For example, one of the families considered for treatment types was "cycle lanes". Under the family of cycle lanes, however, there were seven unique ways in which cycle lanes may be provided on a route.

Below is a list of the families considered, the treatment types within each family, and accompanying descriptions of what the treatments would look like and how they would function. Photos showing examples of each of the treatment types can be found in Appendix E.

Separated Cycle Lanes/Paths

Separated cycle lanes or paths provide a protected bicycle facility next to the road. The cycle facility may be at road level (cycle lane) or raised above the road level (cycle path). The lanes or paths are separated from motor vehicles by a separation strip and through physical elements, such as a raised separator. The following separated cycle lanes/paths sub-options were considered in the long list:

1. **Separated Cycle Lanes/Paths**

   This option consists of cycle lanes or paths on both sides of the street, with cyclists travelling in the same direction as the adjacent traffic lane. Where there is kerbside parking, the cycle lanes or paths are located between parked cars and the footpath.

2. **Separated Cycle Lane/Path: Two way**

   This option consists of one two-way cycle lane or path on one side of the street. Where there is kerbside parking, the cycle lane, or path, is located between parked cars and the footpath.

3. **Separated Cycle Lane/Path: Two way down the centre of the street**

   This option consists of one two-way cycle lane or path down the centre of the street. The facility requires two separation strips, one on either side of the cycle lane or path between the traffic lanes.

4. **Separated Cycle Lane/Path: One lane uphill, sharrows downhill**

   This option consists of one cycle lane or path in the uphill direction and sharrows provided in the traffic lane in the downhill direction. Where there is kerbside parking, the cycle lane, or path, is located between the parked cars and the footpath.

5. **Separated Cycle Lane/Path: Contraflow lane**

   This option consists of one cycle lane on one side of a one-way street, with cyclists travelling in the opposite direction of motor vehicle traffic. Where there is kerbside parking, the cycle lane is located between the parked cars and the footpath.

Cycle Lanes

Cycle lanes are lanes located within the road. Space for cycle lanes is delineated separately from motor vehicles by road markings, with the opportunity to provide protection through narrow separators, such as bollards, where the lane is not next to kerbside parking. The following cycle lanes sub-options were considered in the long list:

6. **Cycle Lane**

   This option consists of cycle lanes on both sides of the street, with cyclists travelling in the same direction as the adjacent traffic lane. Where there is kerbside parking, cycle lanes are located between the traffic lane and parked cars with allowance for a painted safety strip between the cycle lane and parking.

7. **Cycle Lane: Two way**

   This option consists of one two-way cycle lane on one side of the street. When there is kerbside parking next to the cycle lane, the cycle lane is located between parked cars and the footpath and a safety strip would be required.

8. **Cycle Lane: Two way down the centre of the street**

   This option consists of one two-way cycle lane in the centre of the street.

9. **Cycle lane: One lane uphill, sharrows downhill**

   This option consists of one cycle lane in the uphill direction of the street and sharrows provided in the traffic lane in the downhill direction. Where there is kerbside parking, the cycle lane is located between the traffic lane and parked cars with allowance for a painted safety strip between the cycle lane and parking.

10. **Cycle Lane: Contraflow lane**

    This option consists of one cycle lane on one side of a one-way street, travelling in the opposite direction of motor vehicle traffic. Where there is kerbside parking, the cycle lane is located between the traffic lane and parked cars with allowance for a painted safety strip between the cycle lane and parking.

11. **Cycle Lane: Peak clearways/cycle lanes, off-peak parking/cycle lanes**

    Cycle lanes are provided in conjunction with clearways during peak periods, and with kerbside parking during off-peak periods. During peak periods, parking is restricted and a cycle lane is provided between the clearway and the kerb. During off-peak periods, kerbside parking is permitted and the cycle lane is located between the traffic lane and parked cars.

12. **Cycle Lane: Peak cycle lanes, off-peak parking**

    During peak periods, cycle lanes are located within the road between the traffic lane and the kerb. Space for cycle lanes is delineated separately from motor vehicles by road markings. During off-peak periods, kerbside parking is permitted and cyclists must share the traffic lane with motor vehicles.

Bus Lanes

Bus lanes are lanes located within the road that are exclusively for use by buses and cyclists. Bus lanes are delineated separately from motor vehicle lanes by road markings. The following bus lanes sub-options were considered in the long list:

13. **Dedicated Bus Lanes: Permanent narrow lanes**

    This option provides bus lanes at all times. Buses and cyclists must travel in single file, as the lanes are not wide enough to travel side-by-side.

14. **Dedicated Bus Lanes: Permanent wide lanes**

    This option provides bus lanes at all times. The lanes are wide enough for buses and cyclists to travel side-by-side, allowing overtaking.

15. **Dedicated Bus Lanes: Peak wide lanes, off-peak parking/cycle lanes**

    This option provides bus lanes during peak periods only. The lanes are wide enough for buses and cyclists to travel side-by-side. During off-peak periods, kerbside parking is permitted and cycle lanes are provided between the traffic lane and parked cars.

Other On-Road Options

16. **Shared Path**

    A shared path is a shared space separate from the road that may be used by pedestrians and cyclists.

17. **Quiet Route**

    Quiet routes are streets with low volumes of motor traffic travelling at low speeds. Quiet routes often incorporate low speed limits and include physical traffic calming elements to reduce vehicle speeds. Some examples of traffic calming elements that may be used on quiet routes include road hump or cushions, lane narrowing and kerb extensions, median treatments, or tactile surface treatments.

18. **Shared Zone**

    Shared zones eliminate the segregation of road user types—motor vehicles, cyclists, and pedestrians share the space. Shared zones are low speed environments where pedestrians are prioritised. They do not include typical street elements, such as kerbs and line markings, which encourages drivers to travel at slow speeds and proceed with caution.

19. **Pedestrian- and Cyclist-Only Street**

    Pedestrian- and Cyclist-Only streets remove access for motor vehicles. Cyclists give way to pedestrians, creating a very low speed environment that focuses on pedestrian experience.

Off-Road

20. **Off-Road Bike Path**

    An off-road bike path is a sealed path located outside of a road corridor that is available for the exclusive use of cyclists. The path would include provisions for lighting for the path to be used at all times.

21. **Off-Road Bike Track**

    An off-road bike track is an unsealed trail located outside of a road corridor that is available for the exclusive use of cyclists. The track would not include any provisions for lighting, making the path less accessible at night.

22. **Off-Road Shared Path**

    An off-road shared path is a sealed path located outside of a road corridor that is shared between pedestrians and cyclists. The path would include provisions for lighting for the path to be used at all times.

23. **Off-Road Shared Track**

    An off-road shared track is an unsealed trail located outside of a road corridor that is shared between pedestrians and cyclists. The track would not include any provisions for lighting, making the path less accessible at night.

Routes

Through workshop sessions, and upon agreement with WCC, a long list of 81 possible route options was established. Of these options, 59 were on-road routes and 22 were off-road routes.

The on-road routes included 37 different roads. Some of these roads were broken down into sections to create smaller routes, making up the 59 on-road routes. This was done to aid in the assessment process. On some roads, elements of the road environment can vary significantly along the length of the road. Differences between these elements include features such as speed limit changes, a change in the number or width of traffic lanes, a change in the road classification, or different motor vehicle volumes. These elements all have an impact on the assessment of the MCA criteria. For this reason, some roads were divided into sections and evaluated separately.

The off-road routes covered nine different and distinct off-road areas, including areas such as Berhampore Golf Course East, Wakefield Park, and Wellington Regional Hospital. The off-road routes were also broken down into smaller sections to aid in the assessment process. Instead of being divided based on the existing characteristics, off-road routes were divided into sections at any point where the route could connect to one of multiple off-road routes or connected to an on-road route. This was done to assist with the second phase of the assessment process, where networks are considered and only sections of any off-road route may be required.

A map showing all of the on-road and off-road routes on the long list can be found in Appendix E.

6.3.2 Treatments: Options Considered but Not Progressed

Two further treatment options were considered, but ruled out and therefore not progressed through the assessment. These options considered wholesale change to the function of the roading network to revert to one-way systems for either motor traffic or cyclists.

One-way System for Motor Traffic

A one-way system for motor traffic was identified at an early stage as a potential opportunity to provide additional road space for improved cycling facilities (multiple treatments) by removing one directional traffic lane. The most likely one-way route system for vehicles included Adelaide Road, Rintoul Street, and Riddiford Street between John Street and Luxford Street intersections.

The reasons for not progressing this option through assessment were:

- The redistribution of motor vehicle traffic on the one-way system would require multiple lanes in the same direction to maintain traffic capacity, removing the opportunity to reallocate road space;
- Access to property, business and major facilities such as Wellington Hospital would be more circuitous or indirect;
- A large number of intersections would require reconfiguration;
- There are only a limited number of side streets available and these would likely come under heavy demand as short cut routes (Hall Street, Colombo Street and Stoke Street); and
- Existing bus routes would require re-routing and accessibility to public transport would be reduced.

One-way System for Cyclists

Similar to the above option, a one-way system for cycling was also identified as a potential opportunity to reduce the space requirement of cycle facilities on streets, whilst still providing a quality standard of

cycle facility. This option would likely have utilised the Adelaide Road and Riddiford Street circuit between John Street and Waripori Street / Luxford Street.

The reasons for not progressing this option through assessment were:

- The option provided poor access and connectivity for cyclists;
- Cyclists would be unlikely to use the facility due to the large diversion circuit required to reach destinations within the route;
- The limited number of side streets available as connecting routes (Hall Street, Colombo Street and Stoke Street) are all steep and undesirable from a cyclist LOS, safety and comfort perspective.

6.3.3 Treatments: Fatal Flaws

A fatal flaws assessment was completed before the MCA process. Through this process, options were rejected before being assessed against any of the criteria. The following treatments were considered fatally flawed:

- Any on-road treatment on a street where the facility would not physically fit between the property boundaries without compromising on the minimum desirable dimensions[39];
- All of the treatments on any street that had a grade steeper than 12%, as this is deemed too steep for cyclists due to comfort when travelling uphill and safety concerns when travelling downhill;
- Uphill lanes/downhill sharrows on streets with grades lower than 3%;
- Bus lane options on streets where there is no bus route;
- Quiet routes on streets classified as Principal Roads;
- Shared zones and pedestrian- and cyclist-only streets on streets classified as Principal Roads or Collector Roads;
- Cycle lanes down the centre of the street on one-way streets (i.e. Wilson Street);
- Contraflow lanes on two-way streets; and
- Any off-road unpaved treatments on an off-road route where the route is already paved (such as the off-road route through Wellington Regional Hospital).

Out of the 1,209 options being considered (1,121 on-road and 88 off-road), 531 were considered fatally flawed (527 on-road and four off-road) and were not carried through the assessment process. This left 678 options (594 on-road and 84 off-road) to continue through the three stages of the treatment MCA.

Eight of the on-road routes were considered fatally flawed because they had a grade steeper than 12%, which excluded those routes from being included in any network options during Phase 2. On all other routes, multiple options remained that were not fatally flawed and were progressed through the first phase of assessment. For a list of the fatally flawed options, see Appendix H.

6.3.4 Treatments: MCA and Results

Following the fatal flaws assessment, 81 individual treatment MCAs were completed—one MCA assessment for each of the routes considered. Consistent measures were established ahead of the assessment process to ensure that all of the routes were being assessed equally. This ensured that

[39] See Section 6.1.1 for minimum desirable dimensions.

options across different routes that had similar impacts would be given the same ratings. The criteria established for the MCAs and the measures used to assess the criteria at a treatment level are described in Appendix F. The completed treatment MCAs are included in Appendix G.

Following the fatal flaws assessment, 678 options (594 on-road and 84 off-road) were assessed through the MCA process. The MCA assessment resulted in 234 options (all on-road) being rejected because they did not pass the MCA criteria. This left 444 acceptable treatments (360 on-road and 84 off-road) that could be considered as part of a package. All of the treatments failed on eight of the 59 on-road routes because the routes had a gradient steeper than 12%. These routes were the following:

- Colombo Street
- Hall Street (between Adelaide Road and Riddiford Street)
- Herald Street (between Adelaide Road and #67 Herald Street—at the stairs)
- Herald Street (between Rintoul Street and Russell Terrace)
- Lavaud Street (between Adelaide Road and Rintoul Street)
- Mein Street (between Daniell Street and Coromandel Street)
- Owen Street (between Constable Street and Manchester Street)
- Stoke Street (between Adelaide Road and Rintoul Street)

On each of the remaining routes, anywhere between two and ten treatments passed the MCA assessment. In general, on local roads the treatment that scored the best against the MCA criteria was a quiet route. On Collector and Principal Roads, the best scoring treatments varied between separated cycle lanes/paths, separated cycle lane/path: two way, and cycle lanes. For off-road options, an off-road shared path was the best scoring treatments. A summary of the results from all of the treatment MCAs is provided in Appendix H.

6.4 Phase 2: Network Assessment

6.4.1 Networks: Options Identification (Long List)

The objective of the second phase of assessment for the Newtown Connections cycleway project was to assess network options. As only eight routes were discounted during the first phase of assessment, this left 73 routes options to be considered in the networks that would make up the long list. With so many potential routes to be included in the networks, some criteria were established to help guide the creation of the long list.

First, options were only considered if they met the two following criteria:

- The network connects the existing cycle infrastructure on The Parade (Island Bay connection) and on Constable Street (Kilbirnie connection) to the central city. The connection to the central city could be provided via Adelaide Road, Tasman Street, Taranaki Street, or Belfast Street.
- The network provides the opportunity to deliver reasonably cohesive cycle infrastructure. Although the treatments on the networks were not selected at this stage, consideration was given to ensure that networks were only considered if the available treatment types on each route could integrate well with each other.

In addition to adhering to the above criteria, five distinct characteristics were chosen to guide the direction of the network creation. The following characteristics were chosen, each offering a distinct benefit for the network:

- **Direct:** Provide the most direct links between Island Bay, Kilbirnie, Berhampore, Newtown, Mount Cook, and the central city.
- **Connected:** Provide connections for the most people living within Berhampore, Newtown, and Mount Cook and links to the most origins and destinations within the project area.
- **Least Impact:** Provide a network that uses off-road routes where necessary and, where necessary, uses on-road routes with treatments that would have the least impact on the existing physical road environment (ex. quiet routes).
- **Low Impact:** Provide a network that minimises the impact on streets where possible and avoids areas where major impacts would be required (such as streets that would require significant removal of parking).
- **Minimal:** Provide a network that aims to have the best outcomes for cyclists (i.e. direct and connected) while providing the lowest number of connections necessary to avoid affecting a significant number of streets.

This process resulted in the creation of five “families” of networks. Each family contained anywhere between three and eight sub-options. In total, the long list included 24 network options to be assessed. Appendix I includes maps of all of options considered on the long list of networks.

6.4.2 Networks: Options Considered but Not Progressed

During the creation of the long list, some streets were not included in any of the long list network options. The list below includes these streets and provides details for why they were not included in any of the networks:

- The following streets were not included in any of the networks because they do not provide an integral connection within the project area. They either do not contribute to any of the guiding characteristics (i.e. direct, connected, least impact, low impact, and minimal) that were established or another street provides the same connection with increased benefits (such as a less steep gradient or a more direct link):
    - Chilka Street
    - Duppa Street
    - Hall Street
    - Lavaud Street
    - Palm Grove
- The following streets were not included in any of the networks because they do not provide a link within the project area. Instead, they form part of a link that would connect adjacent suburbs to the project area (such as Melrose):
    - Mansfield Street
    - Roy Street
- The following streets were not included in any of the networks because they would have had much more significant impacts on the existing road environment than alternative, parallel route

options (i.e. Tasman Street and Adelaide Road). While some treatments did pass on these streets, overall the highest rated options did not score as well as the treatments on the alternative routes. In addition, the gradient on this route would be worse for cyclists than the alternative routes:

- Taranaki Street
- Wallace Street

Even though they were not included in any networks, some of the streets listed above were included in a list of additional connections that could be added to any of the network options. The additional connection options are describer further in Section 0.

6.4.3 Networks: MCA and Results

One MCA assessment was completed to compare the long list of network options. Consistent measures were established ahead of the assessment process to ensure that all of the networks were being assessed equally. This ensured that networks that had similar impacts for a particular objective or effect would be given the same ratings. The criteria established for the MCAs and the measures used to assess the criteria at a network level are described in Appendix J.

Following the MCA assessment, two of the five family groups were rejected because they did not pass the MCA criteria. This meant that six of the 24 options were rejected, leaving 18 acceptable networks to be considered as part of a package in the third phase. The completed network MCA is included in Appendix K.

6.5 Phase 3: Package Assessment

6.5.1 Packages: Options Identification (Long List)

The objective of the third phase of assessment for the Newtown Connections cycleway project was to assess package options. The long list of packages was created by combining the treatments that passed the first phase of assessment and the networks that passed the second phase. All of the passed networks were carried through from the second phase to be included in the long list of packages. This meant that there were 18 unique networks to be considered as part of the long list.

To build the packages, each of the networks was combined with treatment types that passed the first phase of assessment. In general, the routes in each network were matched with one of the highest scoring treatments from the treatment MCA process. However, priority was placed on providing cohesive treatments across the network.

In all of the networks that advanced to the third phase of assessment, the primary spines of the networks were made up of one or more of the Collector and Principal roads within the project area (such as Adelaide Road, Rintoul Street, Riddiford Street, etc.). As explained in Section 6.3.4, the highest scoring treatments on the Collector and Principal roads were generally separated cycle lanes/paths, separated cycle lane/path: two way, and cycle lanes. These three treatments can be grouped into two categories when considering the cohesiveness of the treatments: unidirectional cycle lanes on either side of the street, following the same direction as the traffic flow, or one bidirectional cycle lane on one side of the street.

Since there were two treatment types that could be considered on the main spine routes of the networks, two package options were created for each of the networks—one option with mostly unidirectional (one-way) lanes, and a second with mostly bidirectional (two-way) lanes. The treatments on the remaining routes within the networks were chosen with consideration given to both

the cohesiveness with treatments on adjacent routes and the highest scoring options from the first phase of assessment. The other treatment types included in the packages included quiet routes, contraflow lanes, off-road shared paths, and off-road shared tracks.

The long list included 36 packages—18 networks considered with two different primary treatment types. Appendix L includes maps of all of options considered on the long list of packages.

6.5.2 Packages: Options Considered but Not Progressed

There are many treatments, across multiple routes that passed the first phase of MCA assessments but were not included in any of the package options. In general, the highest rated treatments on each route were included in at least one of the packages. However, this was not always the case. A treatment on a given route may not have been progressed to the long list of packages because of one or more of the following reasons:

- The treatment was suitable for the route, but did not align well to any of the suitable treatments on adjacent routes;
- The treatment passed the MCA criteria, but other treatments scored higher in the MCA process and were therefore favoured when determining the packages;
- A similar treatment that would provide more benefits passed the MCA. For example, a two-way cycle lane would require less width than a two-way separated cycle lane/path and, therefore, could potentially allow for more on-street parking. However, a two-way separated cycle lane/path provides better protection for cyclists. On a route where the two treatments would provide the same amount of on-street parking, a two-way cycle lane was not considered, as it did not provide any benefits over a two-way separated cycle lane/path.

These options were not rejected, and they are still acceptable options to be included in a package. As the design of the cycle package is progressed and community feedback feeds into the assessment process, there is the opportunity to consider some of the routes and treatments that were not included in any of the packages.

6.5.3 Packages: MCA and Results

One MCA assessment was completed to compare the long list of package options. The measures used to assess the packages against the MCA criteria were mostly a combination of the measures used for the treatment and the network assessments. For the criteria that were affected by both the treatment selection and the network selection, the package was assessed based on the average rating for the selected treatments and the rating for the selected network. For the criteria that were affected by only the treatment selection (such as the safety of the cycle facility) or only the network selection (such as the number of key locations that the network passes), the ratings were carried over from the respective MCAs. The criteria established for the MCAs and the measures used to assess the criteria at a package level are described in Appendix D.

The only criterion evaluated uniquely at the package assessment phase was the effect on the location of parking spaces relative to the current provisions. This criterion was assessed at the package level as it is affected by both the treatment and the network. The impact on the location of available parking was assessed based on two measures: the impact on residential parking demand and the impact on total parking demand. This was assessed using the information gathered from the parking survey (see Section 5.4.3). Table 8 and Table 9 outline the impact rating scales used for each of the parking assessment methods.

Table 8 – Rating scale for impacts on residential parking demand

Impact Rating	Residential Demand
No change	There are no proposed changes to the existing parking situation.
Low Impact	The peak residential parking demand is less than 95% of the proposed capacity[40].
Medium Impact	Peak residential demand can be accommodated within a walk of less than 160 metres (2 minutes)[41] compared to current provisions, provided that resident parking is prioritised.
High Impact	Parking changes will result in a walk of more than 160 metres (2 minutes) for residents during peak periods compared to current provisions, even if resident parking were prioritised.

Table 9 – Rating scale for impacts on residential parking demand

Impact Rating	Total Demand
No change	There are no proposed changes to the existing parking situation.
Low Impact	The peak total parking demand is less than 95% of the proposed capacity.
Medium Impact	Total peak demand can be accommodated within a walk of less than 160 metres (2 minutes) compared to current provisions.
High Impact	Parking changes will result in a walk of more than 160 metres (2 minutes) during peak periods compared to current provisions.

Further information on the parking impacts of the selected package is included in Section 6.6.

The packages consist of treatments and networks that all passed the MCA criteria during the first and second phases of assessment. Because of this, all 36 of the packages passed the package MCA. Therefore, the packages MCA was not used as a tool to reject options. The primary objective was to

[40] The WCC Cycling Framework includes a threshold that any cycleway proposal can result in parking occupancy in the suburbs being up to 95% of the provided parking capacity at peak times.
[41] The WCC Cycling Framework includes a threshold that any cycleway proposal can result in walks of up to 160 metres (approximately 2 minutes) for on-street parking compared to current provisions.

compare each of the packages in terms of how well they achieve each of the criteria. The completed package MCA is included in Appendix M.

6.6 Proposed Packages

Following the assessment of the packages, three proposed options needed to be further developed for community engagement. As all 36 of the packages passed the MCA assessment, any of the options would provide a cycle network that meets the criteria outlined in the WCC investment objectives, the community objectives, and the effects assessment. When deciding which options to select, two factors were considered. First, only packages that were among the highest scoring options were considered. Second, diverse options were chosen so that the three packages encompassed as many of the viable route and treatment combinations as possible. For example, the three packages include unique links from Kilbirnie to Newtown: via Constable Street, via Daniell Street and Emmett Street, and via Wilson Street.

The three packages that were ultimately selected achieved the best balance of providing diverse treatments and networks while still being among the highest ranked options. These three package are proposals only. As described in Section 6.5.2, there are treatments and routes that are not included in any of the proposed packages but may be reconsidered during future development of the preferred package. Likewise, some aspects of the three proposed packages are interchangeable and the preferred package may include elements of more than one of the packages.

All of the proposed packages include at least one off-road connection. The packages MCA includes a high-level assessment of the planning feasibility for each of the packages (see Appendix M). On many of the off-road routes included in the proposed packages, resource consent may be required depending on the primary function of the route (i.e. for recreation vs commuting). Upon identification of a preferred package, further consideration will need to be given to the off-road routes, their planning implications, and the requirements for resource consenting.

All three of the proposed packages include a level of parking loss. Mitigation for parking loss has not been identified at this stage. WCC may wish to consider mitigation for parking loss upon selection of the preferred package. The overall impacts to parking vary between the three packages. However, one common impact is that there are no proposed changes to parking through the Newtown town centre, on Riddiford Street between Russell Terrace and John Street.

The following sections describe in more detail the concept packages developed for community engagement and their relative impacts.

6.6.1 Package A

Package A includes a network from the “direct” group of network options. The package provides the most direct connections in and around Berhampore and Newtown, and to the central city and Kilbirnie.

The main route from Island Bay to the central city follows Adelaide Road. The main route from Kilbirnie to the central city follows Constable Street, Riddiford Street, and Adelaide Road. There is an additional connection from Kilbirnie via Daniell Street and Mein Street, which provides a link from to the planned quiet route treatment on Wilson Street. A route is provided between Berhampore and Newtown via Luxford Street, Rintoul Street, and Waripori Street. There is an alternative route from Island Bay to Newtown via an off-road path through Berhampore Golf Course and lanes on Russell Terrace.

The primary treatment type on the Package A network is unidirectional separated cycle lanes/paths. There are select streets through the Berhampore area where cycle lanes are proposed instead of

separated cycle lanes/paths. These streets include Adelaide Road (between Chilka Street and MacAlister Park), Luxford Street, Rintoul Street (between Luxford Street and Waripori Street), and Waripori Street (between Rintoul Street and Russell Terrace). This treatment was chosen for these streets because it would result in a lower impact on parking than unidirectional separated cycle lanes/paths would, particularly through the Berhampore town centre. Cycle lanes would align well with the unidirectional separated cycle lanes/paths and, on all of the streets, they passed the MCA assessment, which included an assessment of cyclist effects such as safety and suitability to the road environment. The treatments would be consistent with the cycle lanes and planned changes on The Parade and with the uphill bike lanes on Constable Street and Crawford Road.

This package would have the greatest impact on parking of all three of the packages. Overall, the on-street parking on affected routes would be reduced from approximately 1,120–1,220 spaces for parking to approximately 580–680 spaces for parking, a 44–48% reduction. The parking changes would not meet the thresholds for residential parking demand[42] outlined for parking in the WCC Cycling Framework (see Section 6.5.3). On Adelaide Road between Stoke Street and John Street, the parking changes would not be able to accommodate the existing peak residential parking demand within 160 metres (approximately 2 minutes) compared to the current provisions.

A map with the network and proposed treatments for Package A is shown in Figure 19. See Appendix O for a summary of the estimated impacts of Package A, including changes to on-street parking.

[42] Residential demand estimated based on parking survey data; see Section 5.4.3 for more information and the limitations of the data

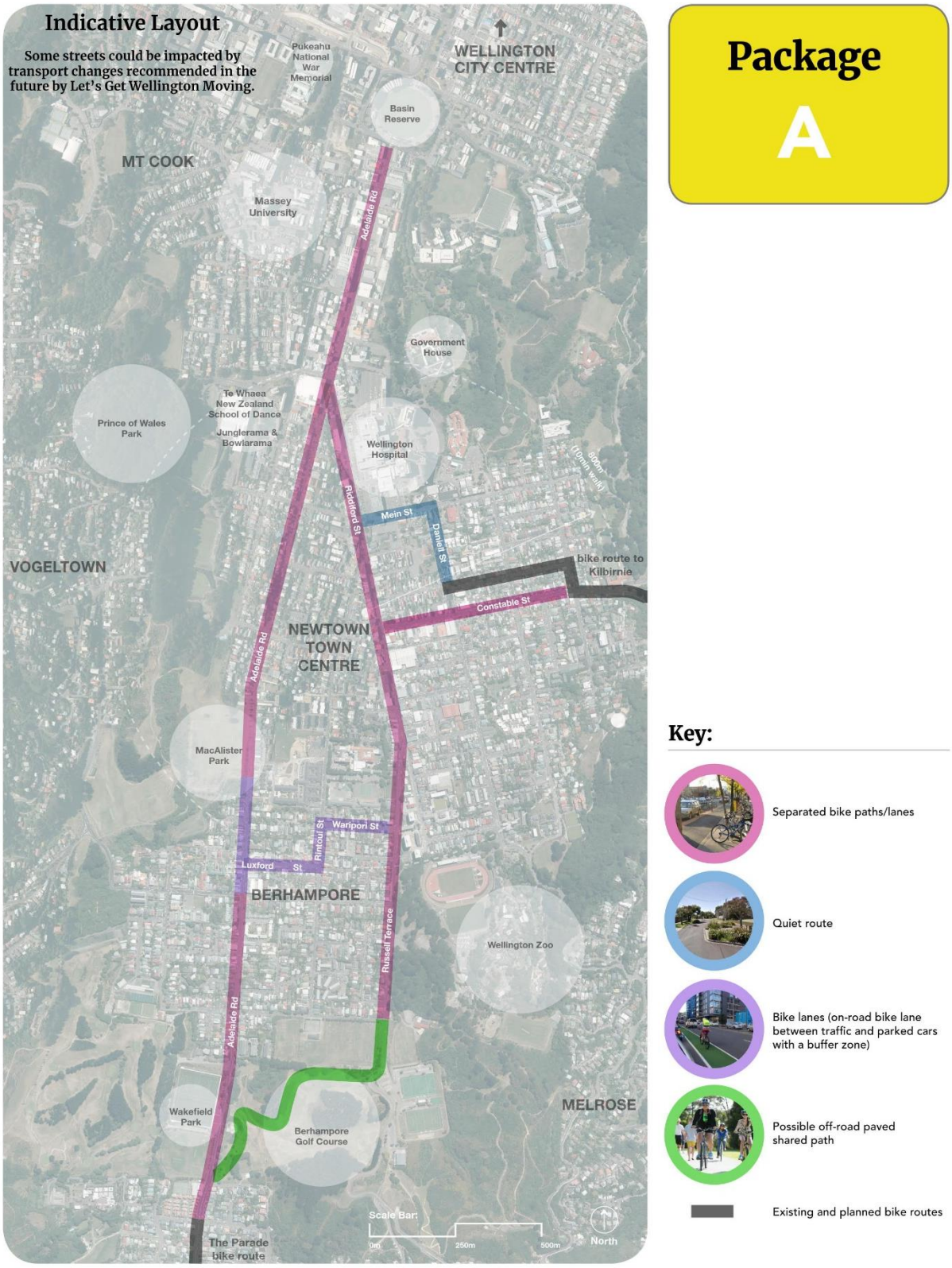


Figure 19 – Package A

6.6.2 Package B

Package B includes a network from the "minimal" group of network options. The package provides a minimal network in and around Berhampore and Newtown, and between Island Bay, Kilbirnie, and the central city. It links all of the key suburbs while only affecting a minimal number of routes, but also has the smallest catchment of all three of the packages.

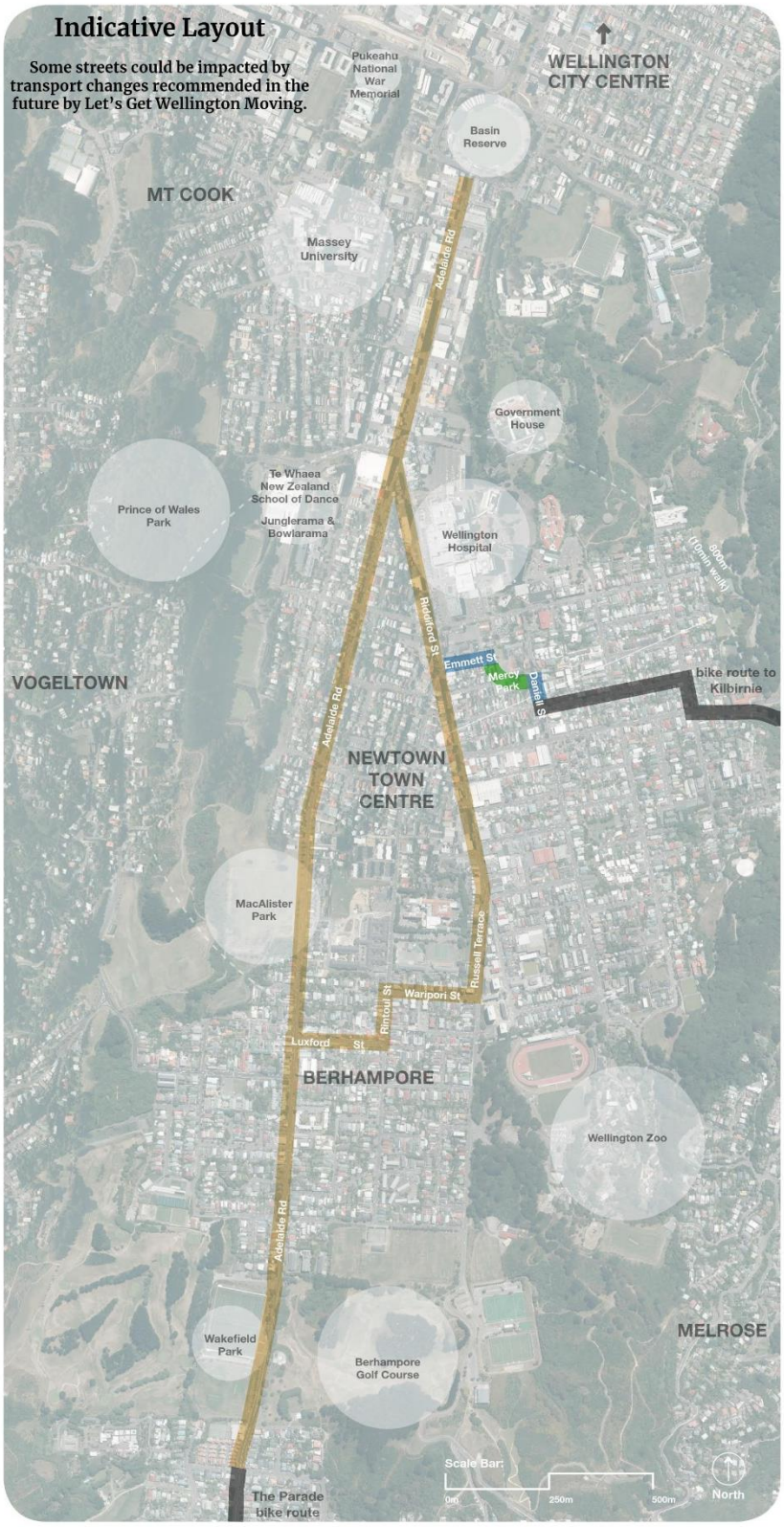
The main route from Island Bay to the central city follows Adelaide Road. The main route from Kilbirnie to the central city follows Wilson Street, Emmett Street, Riddiford Street, and Adelaide Road. A route is provided between Berhampore and Newtown via Luxford Street, Rintoul Street, and Waripori Street. The network includes a link across privately owned property at St Anne's church; further consideration would need to be given to the viability of this route.

The primary treatment type on the Package B network is bidirectional separated cycle lanes/paths. The treatment of a separated cycle lane/path on one side of the road would not be consistent with the cycle lanes and planned changes on The Parade or with the uphill bike lanes on Constable Street and Crawford Road. It is likely that the transition from the unidirectional lanes on The Parade to a bidirectional lane could occur anywhere on Adelaide Road between Dee Street and the Berhampore town centre. A benefit of this treatment type is that the impact on on-street parking is significantly reduced.

This package would have a similar impact on parking as Package C, but less impact than Package A. Overall, the on-street parking on affected routes would be reduced from approximately 850–950 spaces for parking to approximately 710–810 spaces for parking, a 12–21% reduction. The parking changes could meet the thresholds for residential parking demand[43] outlined for parking in the WCC Cycling Framework (see Section 6.5.3). The parking changes would be able to accommodate the existing peak residential parking demand within 160 metres (approximately 2 minutes) compared to the current provisions, if resident parking were prioritised over commuter and visitor parking.

A map with the network and proposed treatments for Package B is shown in Figure 20. See Appendix O for a summary of the estimated impacts of Package B, including changes to on-street parking.

[43] Residential demand estimated based on parking survey data; see Section 5.4.3 for more information and the limitations of the data



Package B

Key:

- Separated bike path: two-way
- Quiet route
- Possible off-road paved shared path
- Existing and planned bike routes

Figure 20 – Package B

6.6.3 Package C

Package C includes a network from the "connected" group of network options. The package provides the most connected network of routes in and around Berhampore, Newtown, and Mount Cook, and between Island Bay, Kilbirnie, and the central city. This network has the largest catchment of all three of the packages.

The main route from Island Bay to the central city follows Adelaide Road, Luxford Street, Rintoul Street, Riddiford Street, and Adelaide Road again—avoiding the steep gradients on Adelaide Road north of Luxford Street. The main route from Kilbirnie to the central city follows Wilson Street. A route is provided between Berhampore and Newtown via Luxford Street, Rintoul Street, and Waripori Street. This package also provides the best connection to Mount Cook, with a quiet route proposed on Tasman Street. In addition to these main routes, the network also includes many alternative routes using off-road tracks, quiet routes, and an off-road route through Wellington Regional Hospital.

The primary treatment type on the Package C network is bidirectional separated cycle lanes/paths. The treatment of a separated cycle lane/path on one side of the road would not be consistent with the cycle lanes and planned changes on The Parade or with the uphill bike lanes on Constable Street and Crawford Road. It is likely that the transition from the unidirectional lanes on The Parade to a bidirectional lane could occur anywhere on Adelaide Road between Dee Street and the Berhampore town centre. A benefit of this treatment type is that the impact on on-street parking is significantly reduced.

This package would have a similar impact on parking as Package B, but less impact than Package A. Overall, the on-street parking on affected routes would be reduced from approximately 1,470–1,570 spaces for parking to approximately 1,240–1,340 spaces for parking, a 12–18% reduction. The parking changes could meet the thresholds for residential parking demand[44] outlined for parking in the WCC Cycling Framework (see Section 6.5.3). The parking changes would not result in the peak residential parking demand being greater than 95% of the proposed capacity, if resident parking were prioritised over commuter and visitor parking.

A map with the network and proposed treatments for Package C is shown in Figure 21. See Appendix O for a summary of the estimated impacts of Package C, including changes to on-street parking.

[44] Residential demand estimated based on parking survey data; see Section 5.4.3 for more information and the limitations of the data

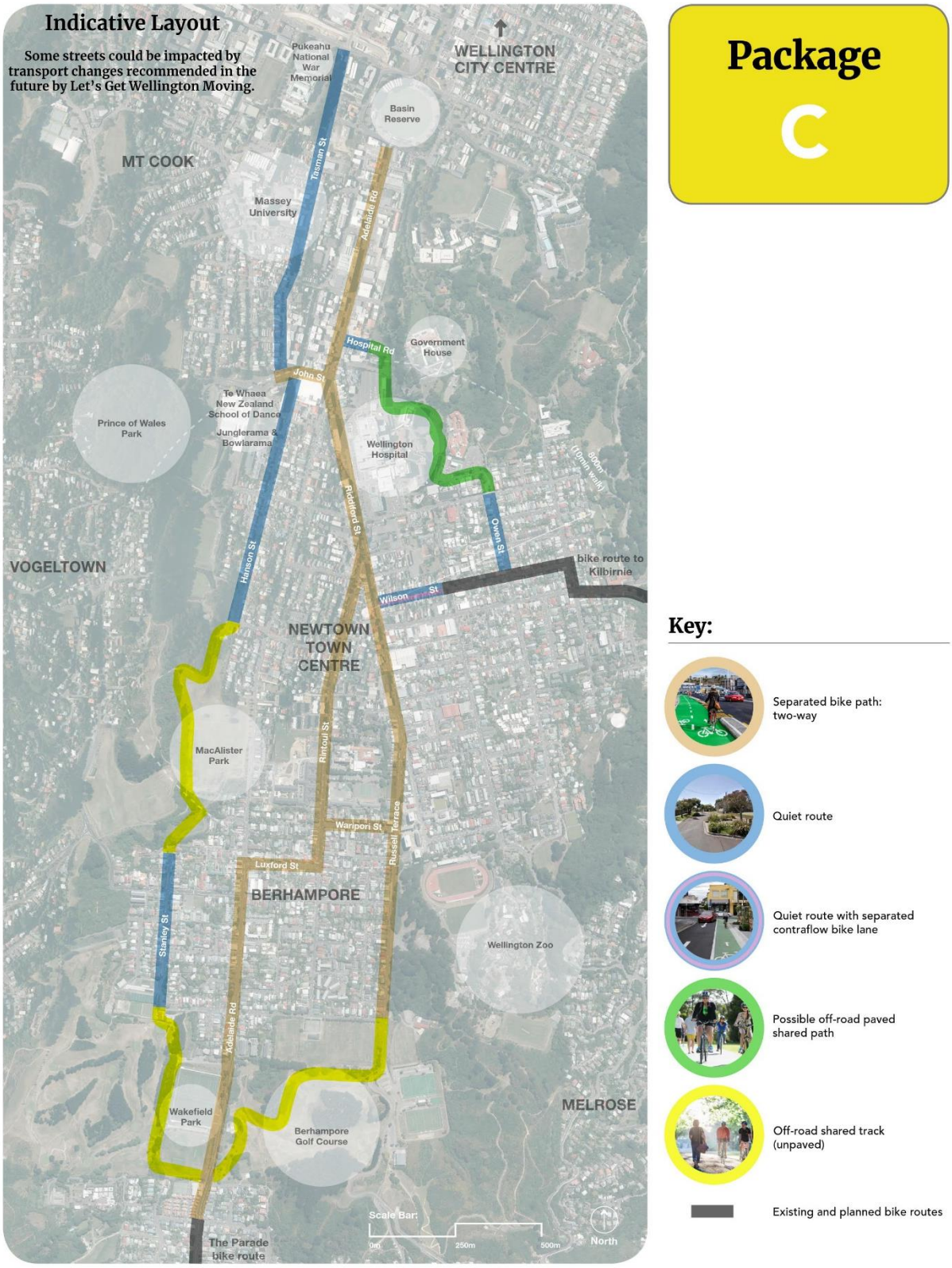


Figure 21 – Package C

6.6.4 Other Elements to Consider

There are elements of design that need further consideration and that could be integrated into any of the proposed packages. These elements include improvements that were identified through the community objectives and devices that could be implemented to improve the level of service for cyclists. These features have not yet been considered as they could be integrated into the design of any preferred package and need to be considered during the design phase.

Elements for future consideration identified through the community objectives:

- Improved pedestrian crossings and more pedestrians crossing locations
- Opportunities to preserve or enhance the special character of Newtown, Berhampore, and Mount Cook. This could include new public spaces through the transformation of road space.

Elements for future consideration that would improve the level of service for cyclists could include (but are not limited to):

- Vehicle volume and speed management, including lowered speed limits
- Changes to intersections:
    - Bicycle detection
    - Signalised cycle crossings
    - Protected right-turn bays for cyclists
    - Change in priority at intersections
- Traffic control adjustments during peak hours (signal phasing alternative routes)
- Bike network maps and wayfinding signs

6.6.5 Costing

Rough order cost range estimates for construction of the three proposed packages were prepared for the purposes of consultation. These rough order cost ranges are estimates provided to assist with the assessment and selection of a preferred package. It should be noted that these estimates are not based on detailed design; they are an indicative basis of costing based on broad ratios and should not be relied upon for budgeting. It is recommended that a detailed risk adjusted cost estimate of the preferred package be provided at a later stage of design for a more refined estimate to support the business case.

For each of the packages, the costs were estimated using typical per metre rates for each of the treatments. The cost estimates for all of the on-road treatments are based on the rates provided in the WCC Physical Works Supplier Panel. For specific items not included in the supplier panel, including the formation of off-road paths and tracks, rates for construction have been estimated from rates in previous projects undertaken by T+T.

A general contingency allowance has been applied to the cost range estimates to account for the uncertainty, risk, and lack of known details at this stage of the project. It is likely that these ranges and contingencies will change following the completion of a more refined cost estimate when more details on the preferred package are known.

For the purposes of the cost ranges, the following assumptions were made:

- Any option of separated cycle lanes or paths were assumed to be cycle lanes instead of paths as this option would results in the highest cost[45];
- All kerbs adjacent to separated cycle lanes are mountable;
- All roads would be resurfaced where any work is completed (for example, if separated cycle lanes were installed, the whole road would be resurfaced; but if quiet route treatments were installed, the road would only be resurfaced at the location of any works done to introduce traffic calming elements);
- No resurfacing of the footpath is required;
- Cycle lanes will be constructed with asphalt;
- All cycle lanes or paths would have consistent green surfacing;
- Cost estimates have excluded changes required to the existing utilities, except for the relocation of power poles where kerbs would need to be moved; and
- Cost estimates have excluded changes required to the existing stormwater system, except for the relocation of sumps where kerbs would need to be moved and the replacement of sump grates with cycle-friendly grates.

The following items (this is not an exhaustive list) also require estimation and inclusion in a detailed cost estimate at a later stage:

- Consultant design fees (detailed design, safety auditing, consenting, construction issue drawings, and procurement of civil contractor);
- Time and materials for community consultation on the preferred package;
- Traffic management plan and other statutory approvals; and
- Traffic resolution process.

The high-level estimated cost range of each option is provided in Table 10.

Table 10 – Rough Order Cost range estimates for Proposed Packages

	Rough Order Cost Estimate
Package A	$27M – $31M
Package B	$23M – $27M
Package C	$34M – $39M

The estimated cost ranges are for implementation of the packages presented. Options to stage the implementation of the packages may be required depending on the outcomes of the community engagement, the final preferred package option, and budget availability.

[45] Assuming that the kerb between the footpath and the cycle lane is replaced with a mountable kerb, new kerbs are installed between the cycle lane and the buffer and between the buffer and the road, and the road is resealed.

6.6.6 Additional Connections

While creating the long list of packages, there were multiple routes considered for the packages but not included because they did not provide connections within the project area. Instead, they provided the start of links from the project area to neighbouring suburbs. All of these links could be integrated into any of the packages. The following five routes were identified as potential additional connections to be considered for any of the packages or in future UCP projects:

- On-road link to Mount Cook and the central city via Wallace Street and Taranaki Street
- On-road link to Vogeltown via Hutchison Road
- Off-road link to Brooklyn via Prince of Wales Park and Central Park
- On-road link to Kingston and Vogeltown via Britomart Street
- On-road link to Wellington Zoo and Melrose via Mansfield Street and Roy Street

The additional connection are shown below in Figure 22.

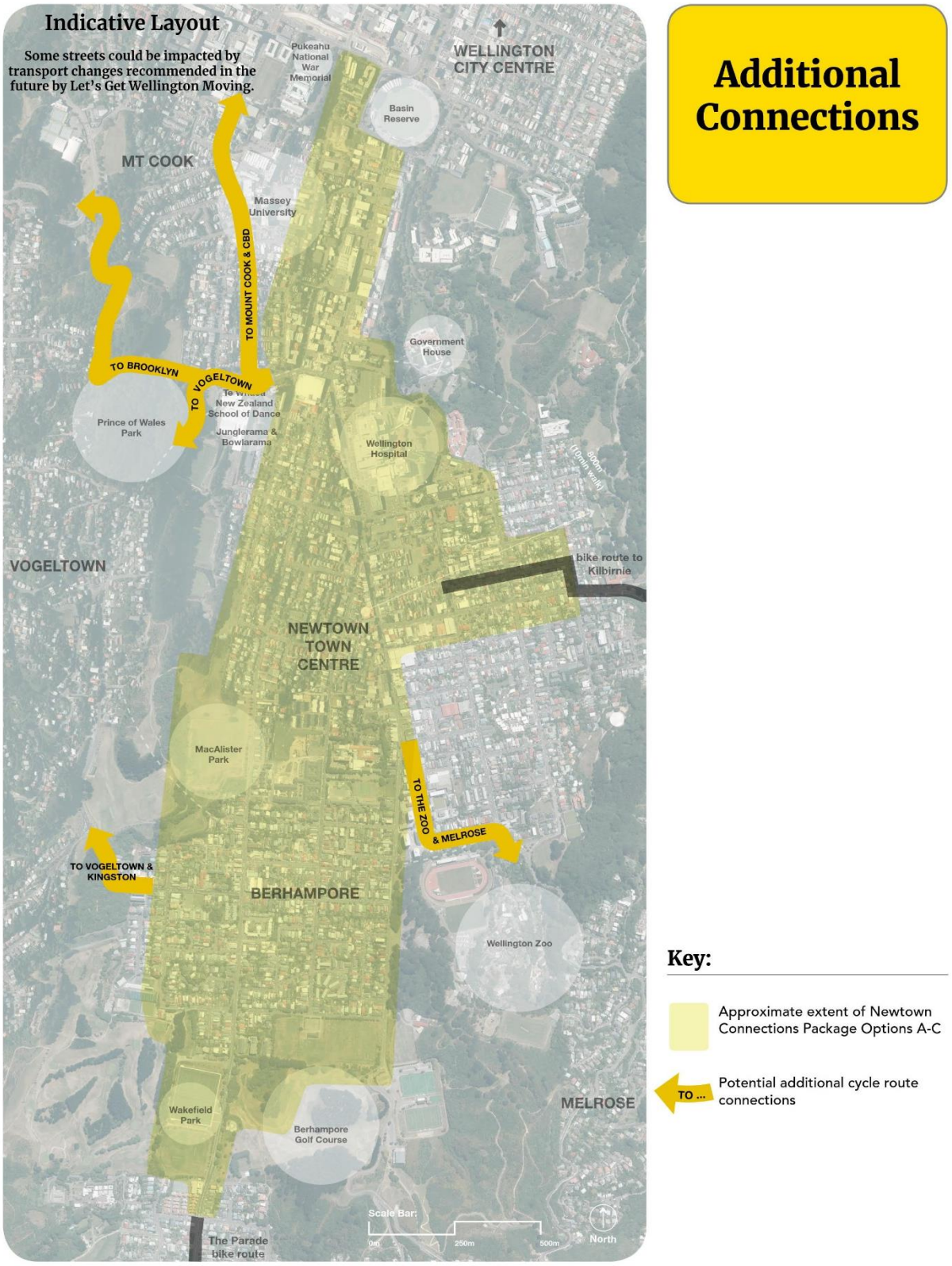


Figure 22 – Additional connections to consider for all packages

7. Next Steps

7.1 Engagement

WCC are holding a community engagement session on the three identified packages for the Newtown Connections during November and December 2018. The three packages offer a diverse range of treatments and networks of routes. The community will be asked to provide feedback on the three packages but also have the opportunity to suggest a preferred option that represents a mix of packages that best suits their needs; uses, and how they perceive the options might best reflect the community objectives.

From this feedback, WCC will be tasked with undertaking further work and analysis to determine a preferred package for consultation in mid-2019.

7.2 Design

As described earlier in this report, the packages developed are conceptual in nature, and have not been progressed through preliminary or detailed design stages. This is reflected in the lack of engineering plans for aspects that include, but are not limited to, the following:

- Kerb line layouts;
- Intersection treatments and design;
- Medians;
- Bus lanes and shelter locations;
- The side of the road that bidirectional facilities would be located on;
- Footpath widths; and
- Urban and landscape design details.

More consideration will need to be given to the above aspects during the detailed design process. Opportunities for improvements to bus facilities and for urban and landscape design are captured in the MCA analysis, but undefined in scope.

There are potential opportunities identified by the community objectives and elements that could be incorporated to improve the level of service for cyclists that will need to be considered in future design stages. Additionally, further consideration will need to be given to the planning implications of any off-road routes (see Section 6.6).

Road safety audits are typically undertaken at preliminary and detailed design stages to identify potential safety issues and risks that should be addressed through further design. A consenting strategy will also need to be developed to identify consenting risks, timeframes, and processes that are required to give the necessary approvals for the project construction.

7.3 Network Staging

High level cost range estimates have been prepared for the purposes of comparison between packages. It is recommended that these cost estimates are re-calculated once a preferred package is identified and further detail on the scope of the project is confirmed. It is possible that the Newtown Connections project will requiring staging of the project works over a number of funding periods to deliver the full network.

The transport improvements illustrated in this report and engagement will integrate with the work of Let's Get Wellington Moving (LGWM). Parts of the Newtown Connections area are likely to be impacted by transport changes recommended in the future by LGWM. Should this be the case, there may be sections of the Newtown Connections project that are delivered as short-term solutions in advance of potential changes implemented by LGWM.

7.4 Delivery

In mid-2019, WCC anticipate taking recommendations for the project implementation to elected members as part of a Traffic Resolution process. Public consultation on the recommended project option will be undertaken as part of this process.

An approved traffic resolution will form part of the Business Case for the Southern Area to seek funding from NZTA to design and deliver the project. If funding is approved, WCC will subsequently proceed to undertake detailed design, consenting, and construction of the project.