4.2.12 Owen Street

Owen Street is a local road in the District Plan. The high volume intersection with Constable Street is signalised; all other intersections are priority controlled. Low-profile speed humps encourage low vehicle speeds and reduce the attractiveness of this route for through traffic. This creates a slow-speed environment for access to adjacent properties. The existing road environment on Owen Street is shown below in Figure 41 and described in Table 13.

Figure 41 – Owen Street

Table 13 – Owen Street Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	14.8	15.3	-
Carriageway width	9.2	9.6	Carriageway restricted in locations by kerb buildouts
East footpath	2.5	3.0	-
West footpath	2.5	3.0	-
Boundary			Residential dwellings
Parking			Mixed time restricted (P10), residents, and unrestricted
Zoning			Inner Residential

4.2.13 Palm Grove

Palm Grove is a local road in the District Plan. Palm Grove is connected to Stanley Street via a 90-m-long, 1.8-m-wide asphalt pedestrian path (reserve width 2.9m). There are no lane markings except on the approach to Adelaide Road. There are speed humps to reinforce the slow-speed environment on the street. The existing road environment on Palm Grove is shown below in Figure 42 and described in Table 14.

Figure 42 – Palm Grove

Table 14 – Palm Grove Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	12.0	12.3	-
Carriageway width	8.0	8.4	-
North footpath	1.8	2.0	-
South footpath	1.8	2.0	-
Boundary			Residential dwellings
Parking			Unrestricted
Zoning			Inner Residential

4.2.14 Rhodes Street

Rhodes Street is a local road in the District Plan. The west end of Rhodes Street is controlled by a roundabout at Riddiford Street. The other two intersections with Ferguson Street and Daniell Street are priority controlled. There are no lane markings except on the approach to Riddiford Street. There are speed humps to reinforce the slow-speed environment on the street. The existing road environment on Rhodes Street is shown below in Figure 43 and described in Table 15.

Figure 43 – Rhodes Street

Table 15 – Rhodes Street Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	15.0	16.3	-
Carriageway width	10.0	10.5	-
North footpath	2.5	3.2	-
South footpath	2.4	2.6	-
Boundary			Residential dwellings and local businesses
Parking			Unrestricted
Zoning			Inner Residential and Business 1

4.2.15 Riddiford Street

In the District Plan, Riddiford Street is a principal road to the north of Rintoul Street and a collector road to the south. High-volume intersections with Adelaide Road, the hospital entrance, Hall Street/Mein Street, Rintoul Street/Emmett Street, and Constable Street are signalised. The intersection with Russell Terrae/Mansfield Street/Rhodes Street is controlled by a roundabout. The other intersections with lower volume side roads are priority controlled. The existing road environment on Riddiford Street is shown below in Figure 44 and described in Table 16.

Figure 44 – Riddiford Street

Table 16 – Riddiford Street Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	19.5	21.7	-
Carriageway width	10.5	15.0	Carriageway restricted in locations by kerb buildouts and pedestrian refuges.
Median	1.6	2.2	Varies
East footpath	2.0	4.5	-
West footpath	2.9	4.5	-
Boundary			Local businesses, Wellington Regional Hospital, New World supermarket at Newtown Street
Parking			Time restricted (P5, P10, P15, P30, P60),
Zoning			Centre and Institutional Precinct

4.2.16 Rintoul Street

In the District Plan, Rintoul Street is a collector road between Riddiford Street and Luxford Street, and it is a local road to the south of Luxford Street. Northbound vehicles are required to give way to turning traffic at Luxford Street. There are signalised intersections at Waripori Street and Riddiford Street; other intersection are priority controlled. The existing road environment on Rintoul Street is shown below in Figure 45 and described in Table 17.

Figure 45 – Rintoul Street

Table 17 – Rintoul Street Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	14.3	15.7	-
Carriageway width	8.0	10.0	Carriageway restricted in locations by kerb buildouts and pedestrian refuges.
East footpath	2.2	3.7	-
West footpath	2.6	3.3	-
Boundary			Residential dwellings, Wakefield Hospital, Village at the Park Retirement Village, businesses
Parking			Mixed time restricted (P15) and unrestricted
Zoning			Mostly Inner Residential, some Centre at Riddiford Street

4.2.17 Russell Terrace

Russell Terrace is a collector road in the District Plan. Northbound vehicles are required to give way to turning traffic at Waripori Street. The intersection with Riddiford Street/Rhodes Street/Mansfield Street is controlled by a roundabout. The existing road environment on Russell Terrace is shown below in Figure 46 and described in Table 18.

Figure 46 – Russell Terrace

Table 18 – Russell Terrace Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	11.9	15.2	-
Carriageway width	6.0	9.5	Carriageway restricted in locations by kerb buildouts and pedestrian refuges.
East footpath	1.5	2.8	-
West footpath	2.3	3.0	-
Boundary			Residential dwellings, Newtown Park
Parking			Unrestricted
Zoning			Inner Residential and Open Space C (Newtown Park)

4.2.18 Stanley Street

Stanley Street is a local road in the District Plan. There are no lane markings except on the approach to some intersections. Stanley Street has priority except at the cross intersection with Britomart Street. There are no lane markings except on the approaches to Britomart Street. The existing road environment on Stanley Street is shown below in Figure 47 and described in Table 19.

Figure 47 – Stanley Street

Table 19 – Stanley Street Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	14.6	15.1	-
Carriageway width	5.9	10.2	Carriageway restricted in locations by kerb buildouts and pedestrian refuges.
East footpath	1.4	2.9	-
West footpath	1.5	2.8	-
Boundary			Residential dwellings, Macalister Park, Berhampore Golf Course
Parking			Mixed time restricted (P15) and unrestricted
Zoning			Inner Residential and Open Space C (Macalister Park and Berhampore Golf Course)

4.2.19 Stoke Street

Stoke Street is a local road in the District Plan. There is one low profile speed hump to reinforce the slow speed environment. The existing road environment on Stoke Street is shown below in Figure 48 and described in Table 20.

Figure 48 – Stoke Street

Table 20 – Stoke Street Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	13.2	14.2	-
Carriageway width	9.1	9.4	Carriageway restricted in locations by kerb buildouts.
North footpath	1.5	2.5	-
South footpath	2.3	2.8	-
Boundary			Residential dwellings
Parking			Unrestricted
Zoning			Inner Residential

4.2.20 Taranaki Street

South of SH1, Taranaki Street is a collector road in the District Plan. An alternate north/south route for vehicles is local road Tasman Street (to the east). High-volume intersections with SH1 and Webb Street are signalised. Other intersections with lower volume side roads are priority controlled. The existing road environment on Taranaki Street is shown below in Figure 49 and described in Table 21

Figure 49 – Taranaki Street

Table 21 – Taranaki Street Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	14.6	22.2	-
Carriageway width	7.7	15.3	Carriageway restricted in locations by kerb buildouts and pedestrian refuges.
Median	0	1.6	Varies
East footpath	2.6	3.4	-
West footpath	2.5	3.5	-
Boundary			Businesses, Wellington High School, residential dwellings
Parking			Coupon
Zoning			Institutional Precinct, Central Area, and Inner Residential

4.2.21 Tasman Street

Tasman Street is a local road in the District Plan. Alternate north/south routes for vehicles include collector road Wallace Street/Taranaki Street (to the west) and principal road Adelaide Road (to the east). Low-profile speed humps located outside 103, 133 and 158 Tasman Street and the narrow carriageway encourage low vehicle speeds and reduce the attractiveness of this route for through traffic. This creates a slow-speed environment for access to adjacent properties. With the exception of Rugby Street, the adjacent side roads are short, no-exit roads with additional pedestrian connections for adjacent residential properties. The existing road environment on Tasman Street is shown below in Figure 50 and described in Table 22.

Figure 50 – Tasman Street

Table 22 – Tasman Street Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	8.9	17.1	-
Carriageway width	6.1	10.5	Carriageway restricted in locations by kerb buildouts and pedestrian refuges. Carriageway narrows between Coombe Street and Yale Road adjacent to bank approximately 7m high.
East footpath	2.4	3.2	-
West footpath	1.8	3.1	Raised footpath between Coombe Street and Yale Road provided along a bank approximately 7m high.
Boundary			Businesses, residential dwellings, Massey University, Pukeahu National War Memorial Park
Parking			Mixed time restricted (P15, P30), residents, and coupon
Zoning			Institutional Precinct (Massey University), Central Area, Centre, and Inner Residential

4.2.22 Wallace Street

Wallace Street is a collector road in the District Plan. An alternate north/south route for vehicles is local road Tasman Street (to the east). The intersection with Bidwill Street is signalised; all other intersections are priority controlled. The existing road environment on Wallace Street is shown below in Figure 51 and described in Table 23.

Figure 51 – Wallace Street

Table 23 – Wallace Street Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	14.5	18.1	-
Carriageway width	8.0	12.6	Carriageway restricted in locations by kerb buildouts and pedestrian refuges.
East footpath	1.8	3.2	-
West footpath	2.2	2.9	-
Boundary			Residential dwellings, Massey University
Parking			Mixed time restricted (P5, P10), residents, and coupon
Zoning			Institutional Precinct (Massey University) and Inner Residential

4.2.23 Waripori Street

Waripori Street is a local road in the District Plan. Its intersection with Rintoul Street is signalised; other intersections are priority controlled. There is pedestrian access but no vehicle connections along Waripori Street between Rintoul Street and Adelaide Road. The existing road environment on Waripori Street is shown below in Figure 52 and described in Table 24.

Figure 52 – Waripori Street

Table 24 – Waripori Street Layout

Element	Width (m)		Description
	Min.	Max.	
Road reserve	14.4	15.0	-
Carriageway width	9.4	10.0	No vehicle connection between Rintoul Street and Adelaide Road.
North footpath	2.1	2.5	-
South footpath	2.5	2.9	-
Boundary			Residential dwellings
Parking			Unrestricted
Zoning			Inner Residential

4.3 Crash Analysis

Crash records were obtained from the NZTA Crash Analysis System (CAS) database for the five-year period from 2012 to 2016 (inclusive).

A total of 1,042 crashes were reported along the study routes within the analysis period, resulting in two deaths, 42 serious injuries and 270 minor injuries. Some 69% of these crashes have rear end/obstruction (48%) and crossing/turning (21%) as the crash type. Common crash factors include poor observation/judgement, a failure to give way/stop and incorrect position on the road.

Of the 1,042 crashes reported during the analysis period, 16 involved cyclists. The following are key conclusions for crashes involving cyclists:

- Cyclists are under-represented in the crash history (3% of traffic but 1.5% of crashes).
- Cyclists are slightly over-represented in injury crash statistics (3% of traffic but 4.1% of injury crashes), indicating that when a cyclist is involved in a crash they are more likely to suffer injury.
- 81% (13) of crashes involving cyclists resulted in injuries (one serious and 12 minor injuries). No fatal crashes were reported and three non-injury cyclist crashes were reported.
- 47% (7) of crashes occurred during the weekday evening peak period (Monday to Friday, 3.00 pm to 6.00 pm).
- 13% (2) of crashes occurred during the weekday morning peak period (Monday to Friday, 6.00 am to 9.00 am).
- 81% (13) of crashes occurred at intersections.
- 40% (6) of crashes occurred when a cyclist was slowing on the approach to an intersection and was hit from by behind by a vehicle travelling too close or not paying adequate attention.
- 13% (2) of crashes occurred when a vehicle undertook a U-turn manoeuvre and was hit by a cyclist travelling from behind in the same direction. Both crashes occurred when the cyclist was travelling downhill.
- 20% (3) of crashes occurred when a right-turning vehicle failed to give way to an oncoming cyclist. All three crashes occurred on Rintoul Street, and all occurred when the cyclist was travelling downhill.

A collision diagram and full description of each cyclist crash is attached in Appendix B. As shown, the cycle crashes are evenly distributed through the study area.

4.4 Green Space

4.4.1 Basin Reserve

The Basin Reserve is zoned as Open Space A in the District Plan. It is a cricket ground located in the centre of the Basin Reserve roundabout that is also used for events such as concerts, sports games, and festivals. It has Historic Place status, as it is the oldest test cricket ground in New Zealand.

Figure 53 – Basin Reserve[53]

4.4.2 Berhampore Golf Course (Stanley Street)

Berhampore Golf Course is zoned as Open Space C in the District Plan. It is an 18-hole course located in the town belt and operated by WCC.

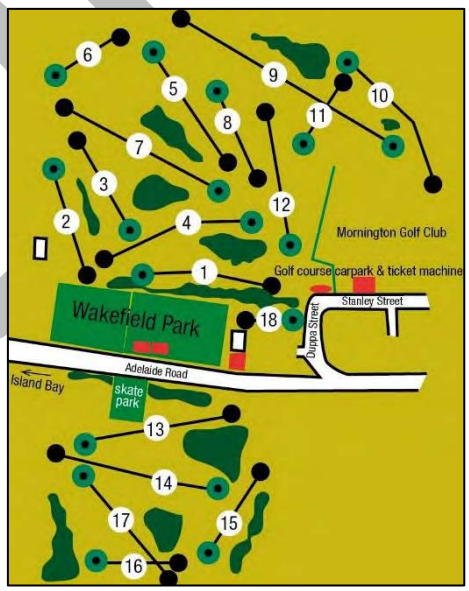

Figure 54 – Berhampore Golf Course[54]

[53] RNZ. (2015). *One day internationals to return to Basin Reserve*. Retrieved from: www.radionz.co.nz/news/sport/282588/one-day-internationals-to-return-to-basin-reserve
[54] Mornington Golf Club. *Course Information*. Retrieved from: www.morningtongolf.co.nz/course-info

4.4.3 Macalister Park (Adelaide Road)

Macalister Park is zoned as Open Space C in the District Plan. Ground types include formed playing fields, open grassland, and mature pine forest belts. There are multiple existing pedestrian and service vehicle tracks through the park. The park has changing rooms and provides an off-leash dog area to the south of the fields. The sportsfields are used for multiple sports, including football, rugby league, and cricket.

Figure 55 – Macalister Park[55]

4.4.4 Martin Luckie Park (Lavaud Street)

Martin Luckie Park is zoned as Open Space C in the District Plan. The park has changing rooms and formed fields and courts that are used for multiple sports, including tennis, softball, and ultimate Frisbee.

Figure 56 – Martin Luckie Park[56]

[55] Wellington City Council. (2017). Wellington Maps. Retrieved from: gis.wcc.govt.nz/LocalMaps/Viewer
[56] Wellington City Council. (2017). Wellington Maps. Retrieved from: gis.wcc.govt.nz/LocalMaps/Viewer

4.4.5 Newtown Park (Russell Terrace)

Newtown Park is zoned as Open Space C in the District Plan. The park has changing rooms, a 400-m all-weather running track, a grandstand, and functions rooms and provides an off-leash dog area in the pine plantation along Russell Terrace. The sportsfields are used for multiple sports.

Figure 57 – Newtown Park[57]

4.4.6 Wakefield Park (Adelaide Road)

Wakefield Park is zoned as Open Space C in the District Plan. It forms part of the Berhampore Golf Course. Ground types include formed playing fields, open grassland, and mature pine forest belts. There are multiple existing paved and unpaved pedestrian and service vehicle tracks through the park. The park has changing rooms and artificial all-weather sportsfields that are used for multiple sports, including football, cricket, and softball.

Figure 58 – Wakefield Park playing fields[58]

[57] Wellington City Council. (2017). Wellington Maps. Retrieved from: gis.wcc.govt.nz/LocalMaps/Viewer
[58] All Turf. (2017). Retrieved from: www.allturf.co.nz/gallery

4.5 Landscape and Urban Design Amenity

The Newtown Connections is being delivered under the umbrella of WCC's Wellington Cycleways Programme Master Plan, which is a guide for WCC to deliver new cycling infrastructure that best meets the community's needs. It identifies its purpose as to reduce congestion, give people more transport choice, and improve access around the city by building a safe and comprehensive cycle network. The plan recognises that the focus is not just on better cycle projects alone, but how they can benefit all transport users by improving safety and creating a more liveable city.

To become a world-class city, WCC needs to deliver projects that match their aspirations. As with other infrastructure, like roads or public buildings, cycling infrastructure is a physical intervention into the city's built environment. Thus, in the interest of producing a high-quality design outcome for Wellington, the cycleway programme should be forefront of urban design and infrastructure best practice. This means facilitating a design that responds to the social, contextual, and natural environmental conditions of the place.

Wellington has stiff competition from other New Zealand cities. In 2016, Auckland Light Path won a World Architecture Award for Transport. This was recognition on the world stage of their exciting new vision for active transport being realised (in part). It showed how a cycling project could uplift the community and become a powerful place-making tool in Auckland's vision to be the world's most liveable city. Auckland transport infrastructure still has a way to go before the city can be regarded as a world-leader.

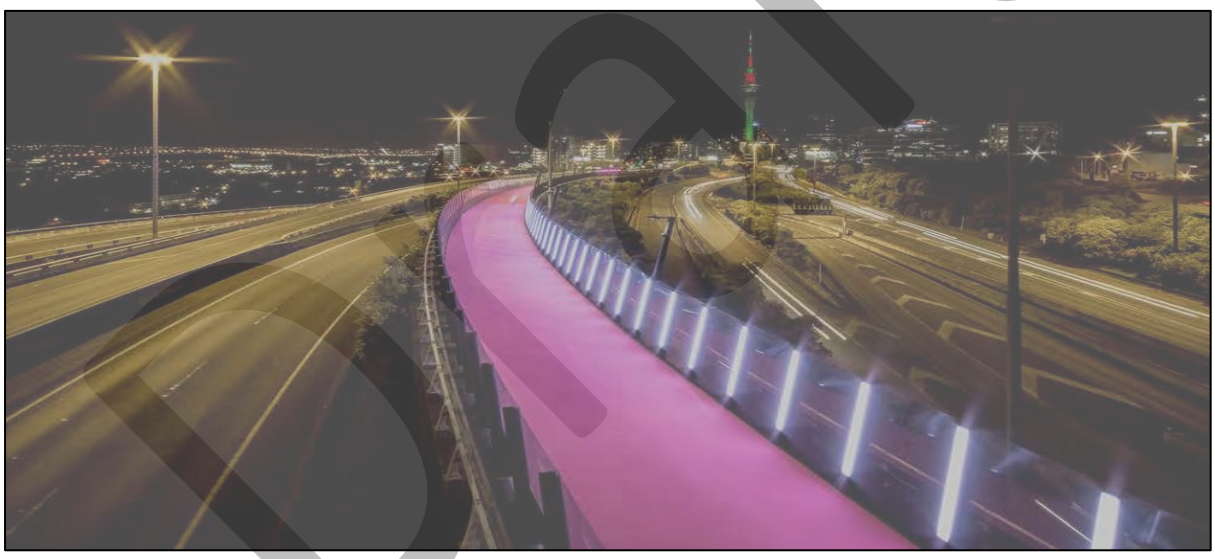

Figure 59 – Auckland Light Path: Winner of World Architecture Award for Transport[59]

In terms of a global vision for active and sustainable transport, the United Nations has clear goals for nations to strive to meet. Amongst the 17 target chapters, Chapter 11 Sustainable Cities and Communities identifies many targets for cities to achieve such as the following:

[59] LandLab. (2016). *Te Ara I Whiti – Light Path*. Auckland, New Zealand. Retrieved from: http://landlab.co.nz

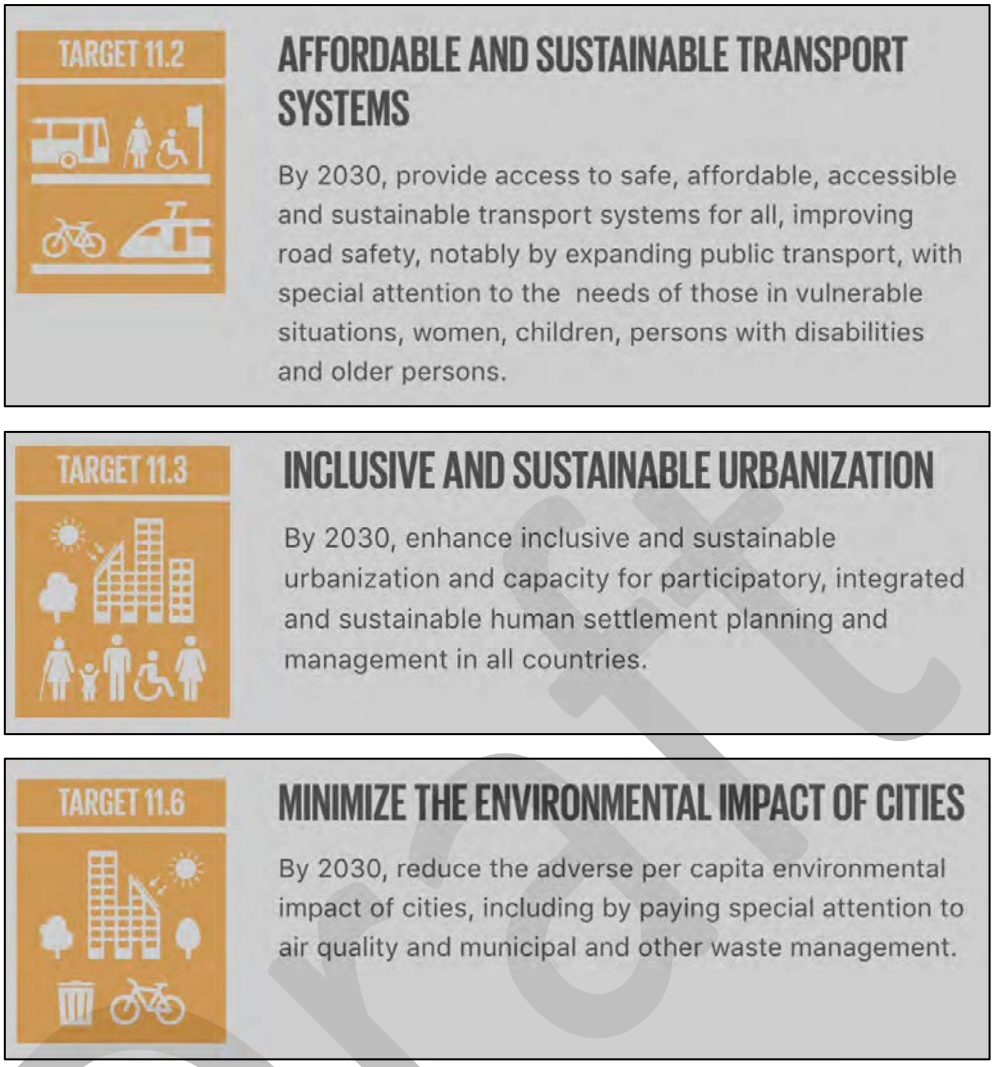

Figure 60 – Extract from the United Nations Sustainable Development Goals[60]

4.5.1 Landscape and Urban Design Themes

The Master Plan identifies that it is to be treated as a "living document" and should be developed within the context of other WCC strategic plans and policies including, but not limited to, the following:

- WCC Strategic Vision – Wellington Towards 2040: Smart Capital
- WCC Urban Growth Plan 2014-2043
- WCC Long-term Plan 2015-2025
- WCC Our Natural Capital – Wellington Biodiversity Strategy and Action Plan 2015
- WCC Our Living City

Repeating themes and strategic goals run throughout the abovementioned documents in terms of landscape, urban design, and quality of life. These include:

- The aim for Wellington residents to continue to enjoy a world-class quality of life
- The four main goals in the Long-term Plan for the city to become a:

[60] United Nations. (2017). *Sustainable Development Goals*. Retrieved from: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

  - People-centred city
  - Connected city
  - Eco-city
  - Dynamic central city
- Protecting and developing our urban nature, biodiversity and resilience
- Growing and enjoying our natural capital
- Transforming our economy and reducing impact
- Showing leadership
- Promoting Wellington as a biophilic city

Therefore, if the Urban Cycleways Master Plan, and the projects developed under this programme, including the Newtown Connections project are to satisfy the aspirations of the WCC's strategic plans and policies, the projects need to consider the above elements.

4.5.2 Environmental Quality

WCC's Urban Growth Plan recognises the importance of Wellington's natural environment:

"*Wellington's unique natural environment is critically important to the city's liveability and attractiveness. Its landscape, ecological and recreational values support both health and wellbeing and well-functioning environmental systems. This plan acknowledges the value of our closeness and connection to nature, how this makes Wellington unique, and aims to maximise the benefits of this setting.*"

4.5.2.1 Biophilic cities

In 2013, Wellington became a partner city to the global Biophilic Cities movement. This confirmed WCC's desire to embrace the biophilic principles and recognise the city as one that:

- Values, protects and actively restores local biodiversity
- Takes steps to actively support the conservation of global nature such as limiting the impact of resources use on nature and biodiversity
- Invests in the social and physical infrastructure that helps make people connect with and understand nature

According to Wellington Biophilic Cities, "much work is needed to find creative and effective means for incorporating it into urban environments."

One project that has been a multi-award winner and recognised for its design integration of ecology, recreation, water sensitive urban design, civic amenity, and place making is Waitangi Park. However, the park opened ten years ago and Wellington needs to keep building upon its legacy.

Figure 61 – Waitangi Park: A WSUD and biophilic response to urban public open space

4.5.2.2 Water-Sensitive Urban Design (WSUD)

The Urban Growth Plan is the Council's Strategy to manage growth sustainably and to integrate transport planning. One of the guiding principles of the Plan is to protect the City's natural setting and reduce the environmental impacts of development and transport. The Natural Environment section of the Plan describes how, to reduce the environmental impact of urban development and transport, we need to enhance and improve access to the city's natural "blue" environment; and take opportunities to increase the city's green infrastructure. This includes reducing contaminants within the city's water systems and making water-sensitive design common practice for all public works. Figure 62 highlights some key open spaces within the study area and shows where existing pipe streams are located.

Figure 62 – Streams in the Wellington City Area[61]

[61] Greater Wellington Regional Council. *Streams in the Wellington City Area*. Wellington, New Zealand.

4.5.3 Urban Character and Visual Amenity

To improve the quality and safety of the transport routes, consideration needs to be given to the urban design of the cycleway in a holistic approach.

When considering the cycleway options and their merits, design principles including character, scale, legibility, and amenity should be taken into account. Consideration needs to be given to how the design can enhance the existing urban character of the sections of the cycleway; and how the cycleway design can provide a legible navigation tool through the city. What is the experience along the route and how do people navigate their way through transition points and junctions? Liaising with adjacent UCP Package teams will be required to ensure that there is a shared vision in terms of the look and feel of the cycleway.

4.5.4 Access – Adjacent land use, transport modes, amenities, city/coast

Access is a principal consideration in the development of a successful cycleway scheme. Elements to consider include:

- Ease of entry and egress to the cycleway for people on bikes
- Ease of crossing the cycleway for people on foot
- Adjacent land uses and how the cycleway may affect their access
- Access to social infrastructure/ local amenities and recreational facilities along the route (for people on all modes of transport – walking, cycling and in vehicles)
- Accessibility for all ages and abilities
- Access to different areas of the city and surrounding landscape

4.5.5 Historic Features and Cultural Values

As part of the urban design approach, consideration should be given to the local historic features and cultural values of the area and to how a narrative of these can be told in the design of the cycleway and its associated features. This could be done through material and plant species selection and through including elements such as gateways or thresholds, for example.

4.5.6 Cycleway Design

Along with those elements described above, the cycleway design needs to consider the following factors:

- **Speed** – linked with accessibility, for example how we consider the different user groups including the following:
  - Slow – recreational/sightseers, small children, families, people texting
  - Medium-paced commuters
  - Fast commuters
  - Speedster lycra-clad fraternity
- **Width** – recommended minimum widths and how these fit with site constraints
- **Continuity** – a hugely important part of good cycleway design, critical to the success of a transport network
- **Space** – allocated for cycle parking at destinations, waiting areas at traffic lights, turning lanes at busy junctions, etc.
- **Access** – how junctions, transitions, priorities etc. are defined

4.5.7 Summary

The urban cycleway projects are clearly not just about cyclists. Its aims are much greater—to provide benefits to all transport users, to best meet the needs of the community, and to create a more liveable city.

From a governance perspective, the WCC Urban Growth Plan sets out the four key objectives below:

- Keep the city compact, walkable and supported by an efficient transport network
- Maintain features that support residents' high quality of life
- Protect the city's natural setting and reduce the environmental impacts of development and transport
- Make the city more resilient to natural hazards, such as earthquakes and the effects of climate change.

The UCP addresses some aspects of this; however, the cycleway projects should not be limited to transport improvements alone. "*Protecting the City's natural setting and reducing the environmental impacts of development and transport*" needs to be considered**.**

A holistic urban design approach is needed to bring the UCP in line with WCCs' wider urban design policy objectives. In particular, we recommend that water sensitive urban design (WSUD) and ecological renewal be incorporated into the projects to ensure the UCP addresses Wellington's natural environment issues.

4.6 Existing Utilities and Services

A review of the WCC GIS database[62] identified the approximate locations and extent of services along study routes:

- **Potable Water:** Potable water pipes are shown along the majority of the roads in the study area, providing potable water to the adjacent properties.
- **Stormwater:** Stormwater pipes are shown along the majority of the study routes. There are two main stormwater catchments in the study area: Newtown to the north and east (draining to the north along Riddiford Street and Adelaide Road), and Island Bay to the south and west (draining to the south along Adelaide Road and The Parade). There are no known open streams/year-round surface water flows within the study area.
- **Wastewater:** Wastewater pipes are shown along the majority of the study routes, typically gravity-fed and serving adjacent residential properties. The exception is along Rintoul Street, where some pumping occurs to serve adjacent residential properties along Rintoul Street and Waripori Street.

  In the southern part of the study area beneath Wakefield Park is a pressure sewer line extending from Southern Landfill in the west to Moa Point Treatment Facility in the east. The depth of this sewer is not shown in the database.
- **Other Services:** Other services, such as power, gas, and telecommunications, are not shown in the WCC database. The locations and extents of these services will be confirmed where required during the design stage.

Wellington Water manage three waters infrastructure in the Wellington Region. WCC maintain a complaints register, from which water related issues are recorded and passed to Wellington Water for investigation. It is recommended Wellington Water and other service providers are consulted during the design process to identify any existing issues or future infrastructure upgrades proposed for the study area.

[62] Wellington City Council. (2018). *Wellington Maps*. Retrieved: http://wellington.govt.nz/webmap/wccmap.html

4.7 Future Land Development

4.7.1 Housing

Current WCC housing policy encourages medium density development in and around town centres. Most significantly, this is likely to result in infill development in Newtown (in the east of the study area) and adjacent to the Island Bay shops (south of the study area).

In addition to the town centres policy, WCC have created a number of Special Housing Areas with reduced consenting requirements to encourage development[63]. These include:

- 383-387 Adelaide Road (3,748 m^2)
- 175 Owen Street (2,565 m^2)
- 135 Britomart Street (2,022 m^2)
- 289-293 Mansfield Street (5,577 m^2)
- 48-62 Mein Street (6,323 m^2)
- Erskine College, Avon Street (18,001 m^2)

4.7.2 Hospital Expansions

There are currently three hospital development projects planned within the Newtown Connections study area:

- **Wakefield Hospital Redevelopment:** In 2017, plans were unveiled to redevelop the existing Wakefield Hospital site. The project would see 12 of the 16 existing buildings being demolished and replaced with one new building. The upgrade will include 64 single beds and 8 large operating theatres. The project is currently awaiting resource consent approval.[64]
- **Wellington Regional Hospital Expansion:** In 2017, Capital & Coast District Health Board announced and expansion for Wellington Regional Hospital. The expansion is planned to increase the ICU capacity from 18 beds to 24 by July 2018.[65]
- **Wellington Regional Children's Hospital:** The current Wellington Regional Children's Hospital has been deemed not fit for purpose and plans were announced in 2017 to construct a new children's hospital. Two existing buildings would be demolished to make room for the new facility, which is forecast to be complete by 2020.[66]

4.7.3 Salvation Army Hope Centre

The Salvation Army has plans to develop a new centre in Newtown within the block bordered by Riddiford Street, Normanby Street, and Donald McLean Street. The facility is set to include a main hall, community ministries/drop-in centre, a family store, addiction treatment centre, and an early education centre. Plans include 36 car parks with access from Donald MacLean Street.[67]

4.7.4 Mary Potter Hospice

The Mary Potter Hospice proposal is a six-storey building on Mein Street that houses 39 apartments – comprising 29 studios, seven one-bedroom and three two-bedroom units.

[63] Wellington City Council. (2018). *Special Housing* Areas. Retrieved from: http://wellington.govt.nz
[64] Wakefield Hospital. (2018). *Wakefield Hospital Redevelopment*. Retrieved from: www.wakefield.co.nz/development
[65] Capital & Coast District Health Board. (2017). *Bigger and better ICU for Wellington*. Retrieved from: www.ccdhb.org.nz/news-publications/news-and-media-releases/2017-08-14-bigger-and-better-icu-for-wellington
[66] Thomas, Rachel. (2017). *Plans reveal first lookat proposed $50m Wellington children's hospital*. Stuff.
[67] Newtown Residents' Association. (2015). *Salvation Army new building development.* Retrieved from: newtown.org.nz/2015/05/01/salvation-army-new-building-development

The building includes a 92-square-metre cafe on the second floor.

4.7.5 Vacant Sites

Two large vacant sites are also located within the study area. Any future development plans for these lots are unknown:

- **91-97 Hanson Street:** This site was previously a Tip Top bread factory. The building has sat empty since 2009; the property was sold to Ryman Healthcare in 2013 with initial plans to build a retirement village. However, progress has not been made on these plans and the site continues to sit vacant. The property is 6000 m^2.[68]

Figure 63 – 91-97 Hanson Street

- **45-83 Tasman Street:** Foodstuffs announced plans to construct a supermarket on this property in 2005 and demolished The Boys' and Girls' Institute indoor swimming pool located on the site in 2008. The property was then sold to the Chinese Government in 2014 with plans to build a new embassy. Currently, the site continues to sit vacant with no updates on construction plans. The property is 10,000 m^2.[69]

Figure 64 – 45-83 Tasman Street

[68] Winter, Chloe. (2017). *Bread factory in less than tip top shape*. The Dominion Post.
[69] Salter, Caitlin. (2015). *Former Wellington Foodstuffs sites in limbo*. Stuff.

- **224-234 Riddiford Street:** This site is a decommissioned petrol station. While there are plans for the site to be used for housing in the future, the owner of the site has temporarily given permission to Newtown community groups to use the property. The property will be used by groups including Mechanical Tempest, Rebicycle and Newtown Festival to provide space for multiple activities, including bicycle repairs, a children's bike track, and a dance-O-mat. The property is 1279m^2.[70]

Figure 65 – 224-234 Riddiford Street

4.8 Ground Conditions

The published geology of the area[71] indicates that the basement geology consist of grey sandstone-mudstone (greywacke) of the Torlesse Supergroup formation. Generally, the roads have been constructed to follow the existing topography, with minor cuts/fills within historic gullies.

The WCC GIS database shows Hanson Street (between Stoke Street and Hall Street) as a very high wind zone, with the remainder of the Newtown Connections study area being within medium or high wind zones.

The GWRC GIS database[72] shows Riddiford Street and Adelaide Road have a variable to moderate risk of liquefaction, with a low risk along the remainder of the Newtown Connections study routes.

There is a generally low risk of slope failure within the study area. A number of the roads, including Rintoul Street, Adelaide Road (north of Stoke Street), Riddiford Street, Constable Street, John Street, and Tasman Street are also shown as potential flood hazard areas.

[70] MacAndrew, Ruby. (2017). Former gas station getting a makeover just in time for a community Christmas. Stuff.
[71] Begg, J.G., Johnston, M.R. (compilers) 2000: Geology of the Wellington area. Institute of Geological & Nuclear Sciences 1:250,000 geological map 10. 1 sheet + 64 p. Lower Hutt, New Zealand. Institute of Geological & Nuclear Sciences Limited.
[72] Greater Wellington Regional Council. (2018). Retrieved from: http://mapping.gw.govt.nz/gwrc

5 People Walking

The following section provides an overview of the pedestrian movements through the Newtown Connections study area. A plan displaying peak hour pedestrian volumes is included in Appendix C.

5.1 WCC Transport Surveys

As a means of measuring the achievement of key strategic objectives of WCC's Transport Strategy, WCC commissions annual monitoring surveys in order to provide empirical data on pedestrian flows, cycle flows, and vehicle occupancy levels in and around the city. The latest survey was undertaken in March 2018[73]. However, commuter pedestrian data was only available from a previous survey undertaken in November 2015[74].

The monitoring surveys assessed pedestrian, cycle, and vehicle occupancy in the Wellington Central Business District as well as at city fringe and Central and Eastern locations. A summary of the relevant pedestrian surveys recorded is outlined below.

5.1.1 Commuter Pedestrian Survey

These surveys recorded the movements of pedestrians at five intersections beyond the CBD. The surveys were conducted during the weekday morning peak period. The survey was undertaken during the five working days from Monday 2 November to Friday 13 November 2015, between the hours of 7:00am and 9:00am. The only survey undertaken within the Newtown Connections study area was at the intersection of Adelaide Road, John Street, and Riddiford Street. A daily average of 648 pedestrians were recorded crossing at the intersection during the two-hour monitoring period.

5.1.2 CBD Cordon Surveys

These surveys recorded the numbers of pedestrians and cyclists entering and leaving the CBD at 28 separate locations during the weekday morning peak period. The survey was undertaken during five working days from Monday to Friday in March 2018, between the hours of 7:00am and 9:00am. Three of the survey locations are located within the Newtown Connections study area: Taranaki Street, south of Buckle Street; Tasman Street, south of Buckle Street; and Buckle Street, west of the Basin Reserve (Pukeahu National War Memorial Park). One survey location, on Cambridge Terrace north of the Basin Reserve, does not fall within the study area; however, this location captures counts for pedestrians and cyclists who travel north through the Basin Reserve from the study area.

On Taranaki Street, a daily average of 494 pedestrians were recorded during the two-hour monitoring period. Of these, 358 (72%) were travelling northbound towards the city, and the remaining 136 (28%) were travelling southbound into the Newtown Connections study area.

On Tasman Street, a daily average of 619 pedestrians were recorded during the two-hour monitoring period. Of these, 470 (76%) were travelling northbound towards the city, and the remaining 149 (24%) were travelling southbound into the Newtown Connections study area.

At Buckle Street (Pukeahu National Memorial Park), a daily average of 429 pedestrians were recorded during the two-hour monitoring period. Of these, 304 (71%) were travelling westbound towards the city, and the remaining 125 (29%) were travelling eastbound towards the Basin Reserve/Cambridge Terrace.

[73] Traffic Design Group. (2018). *Wellington City Council Transport Monitoring Surveys: 2018 Summary*. Wellington, New Zealand.
[74] Traffic Design Group. (2016). *Wellington City Council Transport Monitoring Surveys: November 2015 Survey Results*. Wellington, New Zealand.

On Cambridge Terrace, a daily average of 396 pedestrians were recorded during the two-hour monitoring period. Of these, 263 (66%) were travelling northbound towards the city, and the remaining 133 (34%) were travelling southbound towards the Basin Reserve/the Newtown Connections study area.

Pedestrian volumes trends at these locations are shown in Figure 66.

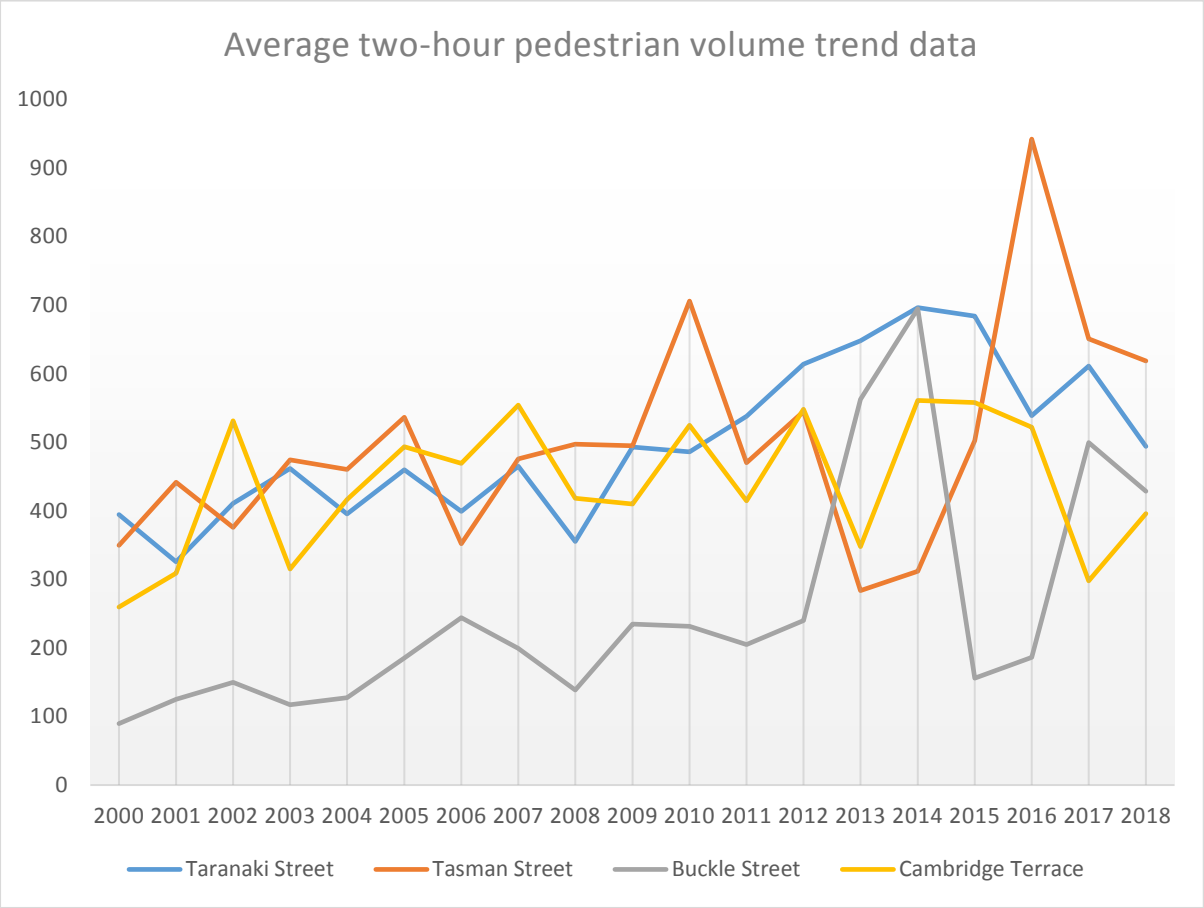

Figure 66 – Pedestrian cordon surveys trend data, average two-hour pedestrian volumes; 2000–2018[75]

5.2 Let's Get Wellington Moving Transport Surveys

A number of transport surveys were carried out to collect data for LGWM. The surveys assessed pedestrian, cycle, and vehicle occupancy in Wellington, with four of the survey locations located within the Newtown Connections study area. The surveys were undertaken in March 2016 on one weekday and on one Saturday. On the weekday, survey data was collected from 6:30 am to 9:30 am, from 11:00 am to 2:00 pm, and from 3:30 pm to 6:30 pm. On the Saturday, survey data was collected from 10:30 am to 2:30 pm. The results of the pedestrian survey are shown in Table 25.

[75] Traffic Design Group. (2018). *Wellington City Council Transport Monitoring Surveys: 2018 Summary*. Wellington, New Zealand.

Table 25 – LGWM Peak Hour Pedestrian Volumes

Intersection	Street	Weekday Peak Hour Pedestrian Volume
Taranaki Street/SH1	Taranaki Street (North)	440
	SH1 (East)	228
	Taranaki Street (South)	417
	SH1 (West)	124
Adelaide Road/Basin Reserve Roundabout	Basin Reserve Roundabout (East)	381
	Adelaide Road (South)	754
	Basin Reserve Roundabout (West)	166
Adelaide Road/Riddiford Street/John Street	Adelaide Road (North)	361
	Riddiford Street (East)	497
	Adelaide Road (South)	90
	John Street (West)	183
Riddiford Street/Constable Street	Riddiford Street (North)	364 (450 on weekend)
	Constable Street (East)	172 (284 on weekend)
	Riddiford Road (South)	617 (812 on weekend)

6 People Riding Bikes

The following section provides an overview of the cyclist movements through the Newtown Connections study area. A plan displaying peak hour cyclist volumes is included in Appendix C.

6.1 WCC Transport Surveys

Monitoring surveys, as described in Section 5.1, observed pedestrian flows, cycle flows, and vehicle occupancy levels in and around the city. Summaries of the relevant cycle surveys are outlined below.

6.1.1 Commuter Cycle Survey

These surveys recorded the movements of cyclists at five intersections beyond the CBD. The surveys were conducted during the weekday morning peak period. The survey was undertaken during the five working days from Monday 27 February to Friday 3 March 2017, between the hours of 7:00am and 9:00am. The only survey undertaken within the Newtown Connections study area was at the intersection of Adelaide Road, John Street, and Riddiford Street.

A daily average of 403 cyclists were recorded during the two-hour daily monitoring period. On the approach to the intersection, 239 (59%) cyclists approached from the southeast on Riddiford Street, 91 (23%) from the south on Adelaide Road, 43 (11%) from the north on Adelaide Road, and 30 (7%) from the west on John Street. On the departure from the intersection, 312 (78%) cyclists travelled northbound on Adelaide Road, 62 (15%) travelled south-eastbound on Riddiford Road, 23 (6%) travelled westbound on John Street, and 5 (1%) travelled southbound on Adelaide Road.

6.1.2 CBD Cordon Surveys

These surveys recorded the numbers of pedestrians and cyclists entering and leaving the CBD at 28 separate locations during the weekday morning peak period. The survey was undertaken during five working days from Monday to Friday in March 2018, between the hours of 7:00am and 9:00am. Three of the survey locations are located within the Newtown Connections study area: Taranaki Street, south of Buckle Street; Tasman Street, south of Buckle Street; and Buckle Street, west of the Basin Reserve (Pukeahu National War Memorial Park). One survey location, on Cambridge Terrace north of the Basin Reserve, does not fall within the study area; however, this location captures counts for pedestrians and cyclists who travel north through the Basin Reserve from the study area.

On Taranaki Street, a daily average of 53 cyclists were recorded during the two-hour daily monitoring period. Of these, 41 (77%) were travelling northbound towards the city, and the remaining 12 (23%) were travelling southbound into the Newtown Connections study area.

On Tasman Street, a daily average of 201 cyclists were recorded during the two-hour daily monitoring period. Of these, 165 (82%) were travelling northbound towards the city, and the remaining 36 (18%) were travelling southbound into the Newtown Connections study area.

On Buckle Street (Pukeahu National Memorial Park), a daily average of 54 cyclists were recorded during the two-hour daily monitoring period. Of these, 32 (59%) were travelling westbound towards the city, and the remaining 22 (41%) were travelling eastbound towards the Basin Reserve/Cambridge Terrace.

On Cambridge Terrace, a daily average of 218 cyclists were recorded during the two-hour daily monitoring period. Of these, 190 (87%) were travelling northbound towards the city, and the remaining 28 (13%) were travelling southbound into the Newtown Connections study area.

Pedestrian volumes trends at these locations are shown in Figure 67.

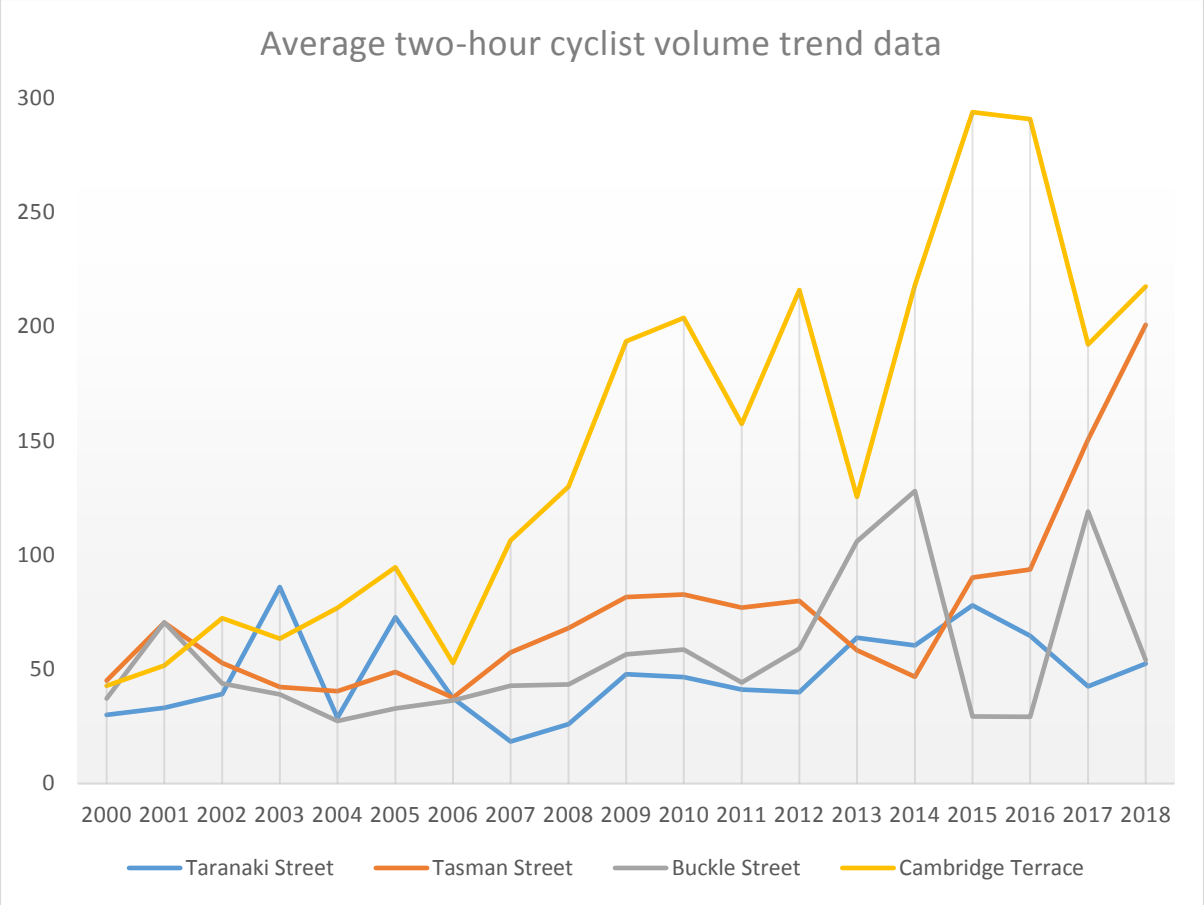

Figure 67 – Pedestrian cordon surveys trend data, average two-hour pedestrian volumes; 2000–2018[76]

6.2 Let's Get Wellington Moving Transport Surveys

A number of transport surveys were carried out to collect data for LGWM. The surveys assessed pedestrian, cycle, and vehicle occupancy in Wellington, with four of the survey locations located within the Newtown Connections study area. The surveys were undertaken in March 2016 on one weekday and on one Saturday. On the weekday, survey data was collected from 6:30 am to 9:30 am, from 11:00 am to 2:00 pm, and from 3:30 pm to 6:30 pm. On the Saturday, survey data was collected from 10:30 am to 2:30 pm. The results of the cyclist survey are shown in Table 26.

[76] Traffic Design Group. (2018). *Wellington City Council Transport Monitoring Surveys: 2018 Summary*. Wellington, New Zealand.

Table 26 – LGWM Peak Hour Cyclist Volumes

Intersection	Street	Weekday Peak Hour Cyclist Volume
Taranaki Street/SH1	Taranaki Street (North)	43
	SH1 (East)	29
	Taranaki Street (South)	37
	SH1 (West)	15
Adelaide Road/Basin Reserve Roundabout	Basin Reserve Roundabout (East)	41
	Adelaide Road (South)	130
	Basin Reserve Roundabout (West)	125
Adelaide Road/Riddiford Street/John Street	Adelaide Road (North)	205
	Riddiford Street (East)	182
	Adelaide Road (South)	55
	John Street (West)	62
Riddiford Street/Constable Street	Riddiford Street (North)	86
	Constable Street (East)	30
	Riddiford Road (South)	62

6.3 Cyclist LOS – Danish Method

The estimated Cyclist Level of Service (LOS) has been calculated using the Danish Method. This method measures how well a street accommodates pedestrian and bicycle travel. Variables that influence the level of satisfaction include motorised traffic volume and speed; urban land uses; rural landscapes; the types and widths of pedestrian and bicycle facilities; the number and widths of the drive lanes; the volumes of pedestrians, bicyclists, and parked cars; and the presence of medians and bus stops. A breakdown of each of the parameters used for analysis is attached in Appendix D.

At this stage, analysis was completed for select streets only within the Newtown Connections study area. On a rating scale of A to F, all streets that were analysed have a LOS of E or F. An LOS of E indicates that more than 50% of cyclists would be moderately or very dissatisfied with the route. An LOS of F indicates that more than 50% of cyclists would be very dissatisfied with the route.

Table 27 – Cyclist LOS using the Danish method

Street	LOS Rating
Adelaide Road (north of John Street/Riddiford Street, during bus lane hours)	E
Adelaide Road (north of John Street/Riddiford Street, outside of bus lane hours)	E
Adelaide Road (south of John Street/Riddiford Street)	F
Constable Street	F
Hanson Street	E
Luxford Street	F
Riddiford Street (north of Rintoul Street/Emmett Street)	E
Riddiford Street (south of Rintoul Street/Emmett Street)	F
Rintoul Street	E
Taranaki Street/Wallace Street	F
Tasman Street	E

6.4 Potential Types of Cycle Facility

One of the issues identified in this report is the lack of any current cycle facilities within the study area. When planning a cycle route, it is essential to select the most appropriate facility for any given situation. Guidance on the various facilities that may be considered when designing for bicycles is given in:

- The NZ Transport Agency Cycle Network Guidance (CNG);
- The Austroads Guide to Traffic Management, Part 4: Network Management; and
- The Cycling Aspects of Austroads Guides document.

The following diagram from the Cycling Aspects of Austroads Guides document has been used as guidance for the appropriate level of separation of cyclists and motor vehicles, in terms of the volumes and speed of motor vehicles along the selected streets within the Newtown Connections study area.

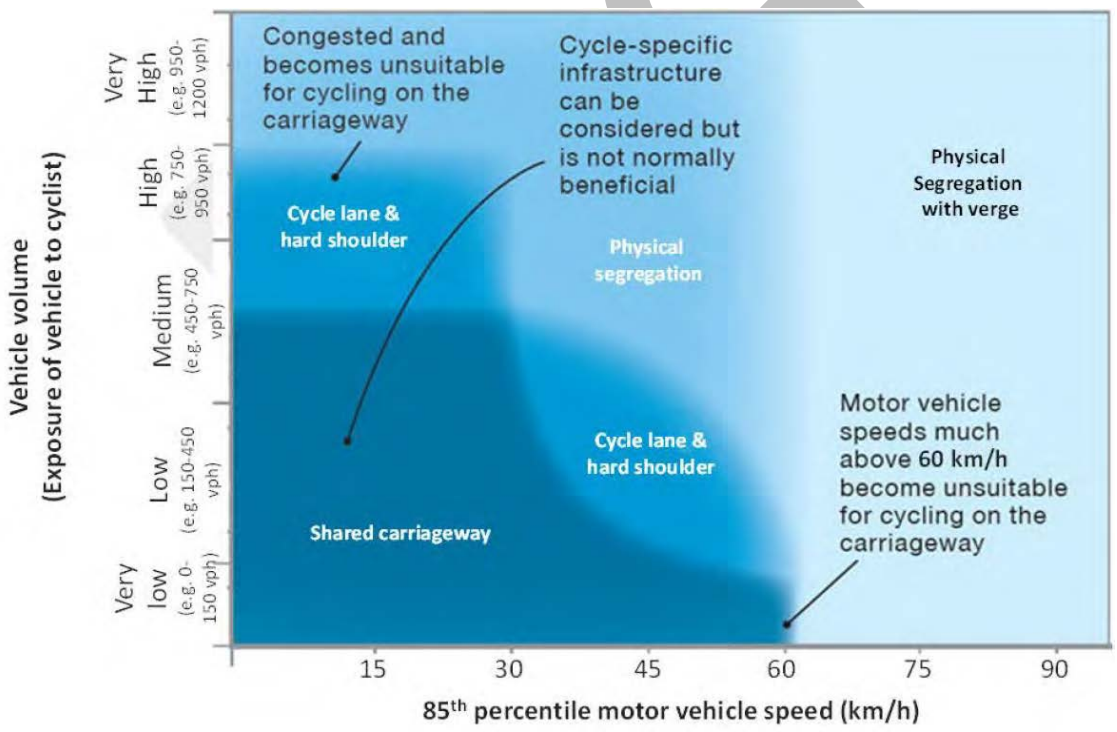

Figure 68 – Guidance on the separation of cyclists and motor vehicles for the preferred bicycle route. Source: Sustrans (2014) and Austroads Cycling Aspects of Austroads Guides 2017.

Recent traffic volume and motor vehicle speed statistics along sections of these selected streets have been used to indicate the minimum facility appropriate for each of the identified streets.

Table 28 – Types of Appropriate Cycle Facilities

Street	Potential Cycle Facility Type
Adelaide Road (north of Douglas Street – Basin Reserve)	Physical segregation
Adelaide Road (north of Palm Grove – Berhampore)	Physical segregation
Adelaide Road (north of Dover Street – Wakefield Park)	Physical segregation
Constable Street	Physical segregation
Hanson Street	Cycle lane & shoulder
Luxford Street	Physical segregation
Riddiford Street (south of Green Street)	Physical segregation
Riddiford Street (south of Constable Street)	Cycle lane & shoulder
Rintoul Street (north of Colombo Street)	Shared carriageway
Rintoul Street (north of Waripori Street)	Cycle lane & shoulder
Taranaki Street/Wallace Street	Physical segregation
Tasman Street	Cycle lane & shoulder

The guidance would suggest varying levels of cycling infrastructure may be appropriate on streets, dependent on the traffic volume and speed.

6.5 Further Information

Further cyclist counts are recommended at intersections where changes are proposed to the existing facilities. Surveys for this data are recommended to be undertaken when route options are identified.

7 People Using Buses

There are multiple existing bus services within the Newtown Connections study area. From mid-2018, bus routes in Wellington will change to provide 'more routes, more often, with more options for customers.' Within the Newtown Connections study area, there are no significant changes to bus routes. However, there will be more frequent service to the local suburbs. Many bus patrons on minor routes from suburbs will transfer buses in Newtown to more frequent 'spine' services that go into the city via Cambridge Terrace and Taranaki Street.

Bus routes through the study area run on the following streets:

- Adelaide Road
- Taranaki Street
- Wallace Street
- John Street
- Riddiford Street
- Rintoul Street
- Constable Street
- Luxford Street
- Lavaud Street (for access to Southgate)
- Mansfield Street and Roy Street (for access to Wellington Zoo and Lyall Bay)

There is also a school bus service during term times for South Wellington Intermediate School (165 Rintoul Street).

The existing and proposed Wellington bus networks, with an outline of the Newtown Connections study area, are shown below in Figure 69 and Figure 70 respectively.

Figure 69 – Existing Wellington bus network schematic[77]

[77] Metlink. (2017). *Metlink Network Map*. Wellington, New Zealand.

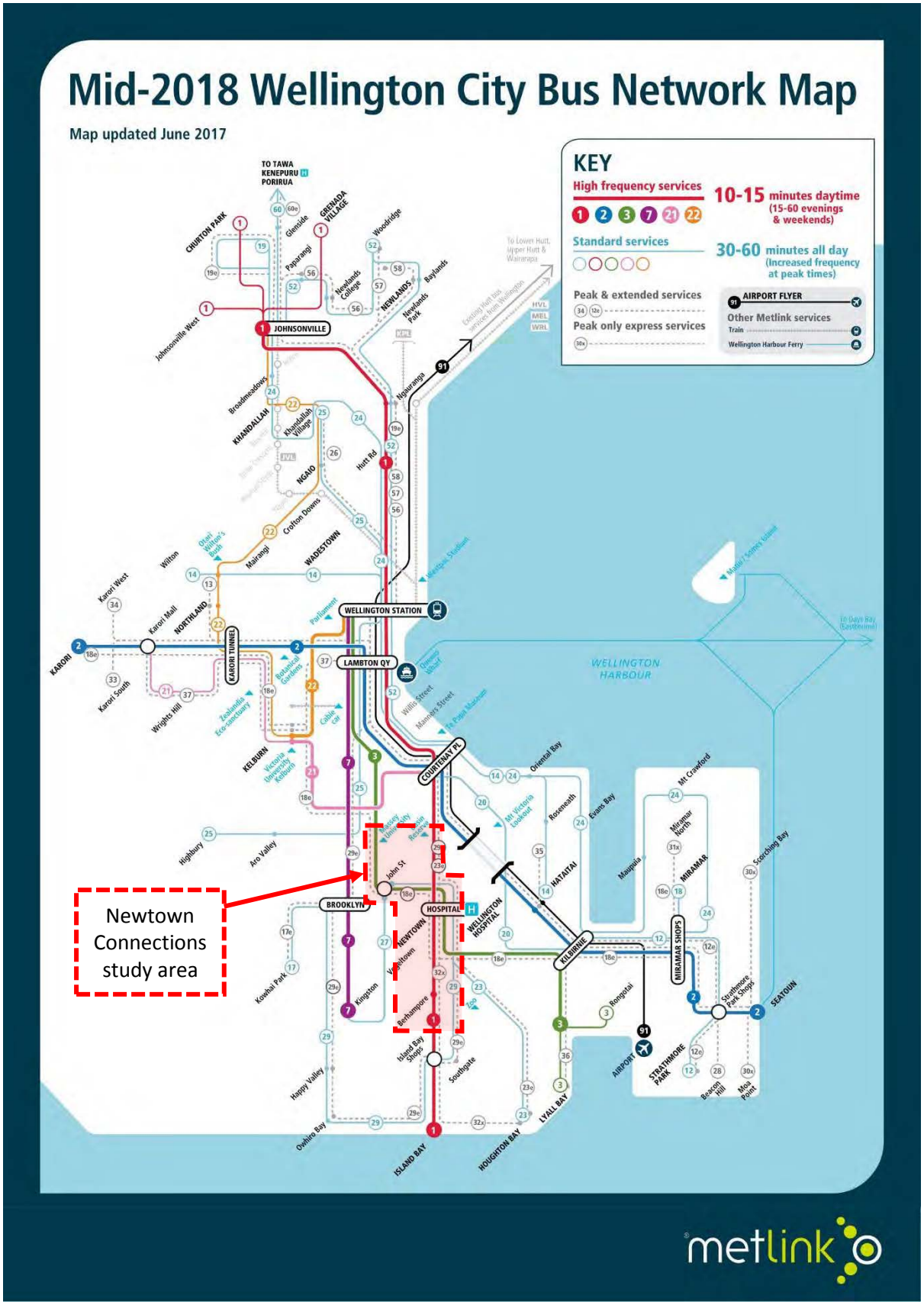

Figure 70 – Proposed future Wellington bus network schematic[78]

[78] Metlink. (2018). *New bus network for Wellington City coming mid-2018*. Wellington, New Zealand.

8 People Using Vehicles

The following section provides an overview of the motor vehicle movements through the Newtown Connections study area. A plan displaying peak hour vehicle volumes is included in Appendix C.

8.1 Existing Traffic Volumes

Traffic volumes and speeds have been obtained from tube count data, supplied by WCC for the study area, and from Mobile Roads. This data is provided below in Table 29.

Table 29 – Recorded Traffic Volumes[79]

Road	Count Location	Traffic Volume (vehicles/ day)	Peak Hour Traffic Volume, Weekday (vehicles/ hour)	Peak Hour Traffic Volume, Weekend (vehicles/ hour)	85th Percentile Speed (km/hr)	Count Date
Adelaide Road	19 m north of Douglas Street, outside #23	22,712	1,793 (AM)	1,668 (Sat)	45	Jun-17
	30 m north of Palm Grove, outside #44	10,160	850 (PM)	957 (Sat)	42	Aug-16
	150 m north of Dover Street, outside softball club	11,855	1,036 (PM)	1,360 (Sat)	58	Sep-17
Britomart Street	50 m west of Adelaide Road	4,559	461 (PM)	371 (Sat)	41	Dec-14
Constable Street	30 m west of Owen Street, outside #77	15,077	1,152 (PM)	1,264 (Sat)	43	May-15
Daniell Street	30 m south of Constable	4,669	457 (PM)	473 (Sat)	42	Mar-15
Donald Mclean Street	40 m east of Riddiford Street, outside #7	1,642	161 (PM)	224 (Sat)	38	Mar-15
Ferguson Street	40 m north of Rhodes Street, outside #17	166	19 (PM)	15 (Sat)	32	Mar-09
Hanson Street	150 m north of Hall Street, outside #111	4,633	622 (AM)	383 (Sat)	39	Mar-15
John Street	20 m east of Wallace Street	18,818	1,575 (PM)	1,378 (Sat)	40	Sep-11
Luxford Street	100 m east of Adelaide Road, outside #19	7,894	711 (PM)	789 (Sat)	49	Feb-15
Mein Street	70 m east of Riddiford Street, outside School Gate	6,963	654 (PM)	631 (Sat)	39	Mar-15
Owen Street	15 m south of Mein Street, outside #20	1,544	155 (PM)	145 (Sat)	20	Jul-17
Palm Grove	West of Adelaide Road	250 (est.)[80]				Feb-07
Rhodes Street	40 m east of Riddiford Street, outside #8	1,248	138 (PM)	131 (Sun)	43	Mar-15

[79] Data sourced from WCC traffic data unless otherwise noted
[80] Data sourced from https://mobileroad.org

Riddiford Street	30 m south of Green Street, outside #136	16,391	1,235 (PM)	1,343 (Sat)	36	Sep-17
	30 m south of Constable Street, outside #187	11,942	865 (PM)	959 (Sun)	33	Sep-17
Rintoul Street	30 m north of Colombo Street, outside #18	3,529	290 (AM)	286 (Sat)	30	Mar-15
	200 m north of Waripori Street, outside #130	2,944	296 (PM)	233 (Sat)	46	Feb-15
Russell Terrace	70 m north of Waripori Street, outside #46	9,714	825 (PM)	919 (Sat)	51	Mar-15
Stanley Street	20 m north of Morton Street, outside #28	1,079	175 (AM)	129 (Sat)	44	Jun-14
Stoke Street	40 m west of Adelaide Road, outside #45	956	152 (AM)	76 (Sun)	33	Mar-15
Taranaki Street	50 m north of Hankey Street, outside Wellington High School	16,825	1,318 (PM)	1,410 (Sat)	48	Aug-17
Tasman Street	50 m north of Coombe Street, outside #111	4,264	481 (AM)	317 (Sat)	41	Aug-17
Wallace Street	50 m north of Hargraves Street, outside #36	20,441	1,737 (PM)	1,748 (Sat)	46	Jun-16
Waripori Street	70 m east of Rintoul Street, outside #26	6,259	543 (PM)	613 (Sat)	38	Jun-14

The available traffic volume trend data along the main corridors (Adelaide Road, Riddiford Street, Tasman Street, and Wallace Street) is displayed below in Figure 71.

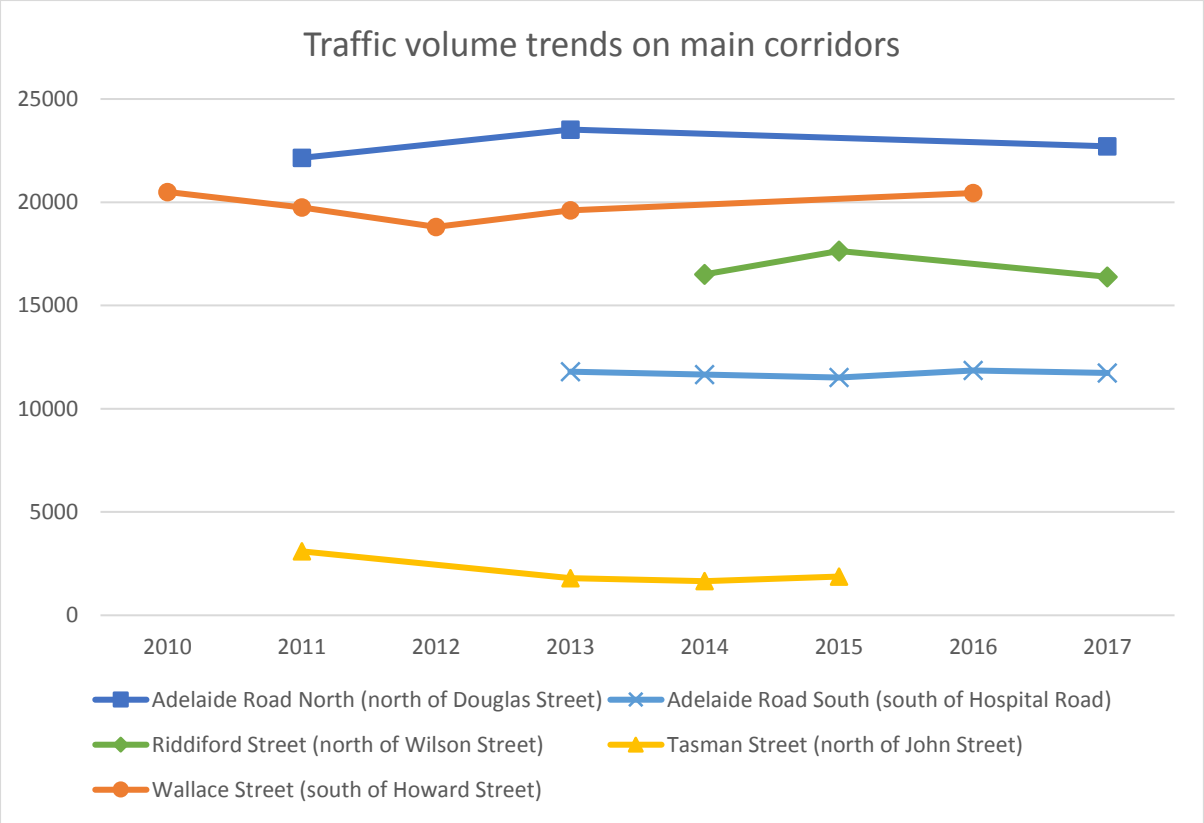

Figure 71 – Traffic volume trends on main corridors within the study area, 2010-2017[81]

[81] Data sourced from WCC traffic data

8.2 Vehicle Turning and Queuing at Intersections

No vehicle turning movement or queuing surveys have been undertaken for inclusion in this issues paper. Turning movement counts and observations of vehicle queuing are recommended at intersections where changes are proposed to the existing facilities. Surveys for this data are recommended to be undertaken when route options are identified.

8.3 Parking Counts

The Newtown Connections study area has a mix of time-limited, residents-only, coupon, and unrestricted all-day kerbside parking. Off-street parking is also available in some areas.

Opus International Consultants[82,83] undertook parking analysis and mitigation studies in 2013 along Adelaide Road to assess the effects of alternate cycleway options on parking availability for five distinct sections, as shown in Figure 72 below.

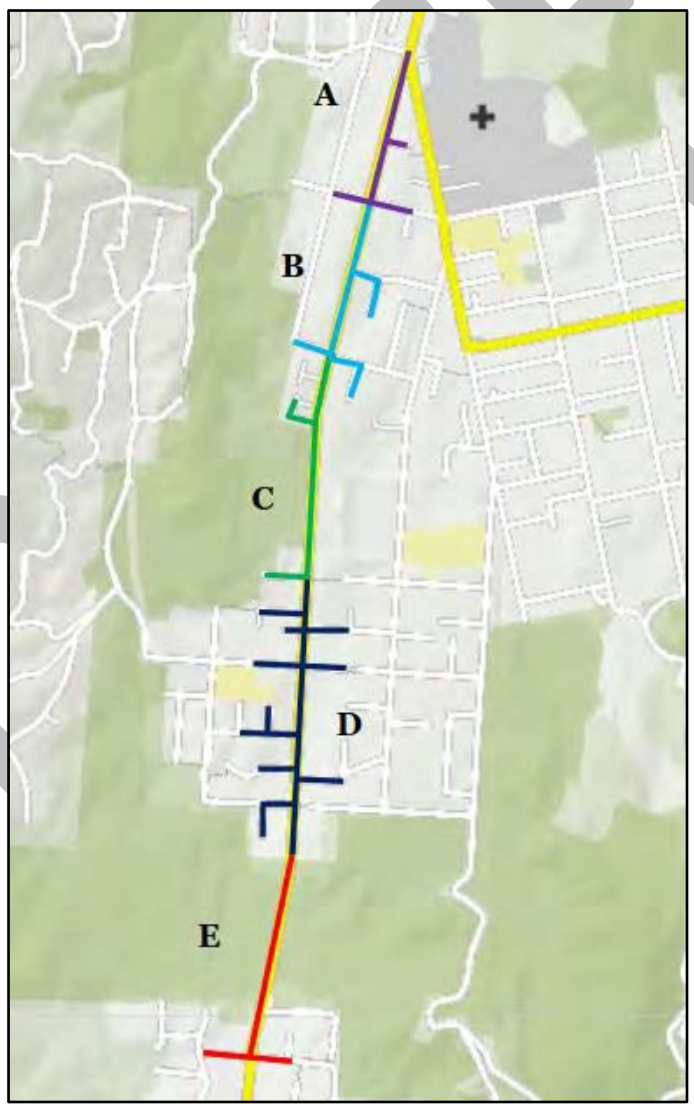

Figure 72 – Parking analysis areas[84]

[82] Opus. (2013) *Parking Analysis: Island Bay Cycleway Design Options, Dee Street to John Street*. Wellington, New Zealand.
[83] Opus. (2013) *Parking Mitigation: Island Bay Cycleway Design Options, Dee Street to John Street*. Wellington, New Zealand.
[84] Opus. (2013) *Parking Analysis: Island Bay Cycleway Design Options, Dee Street to John Street*. Wellington, New Zealand.

The following figure from the Opus report summarises the current parking demand on Adelaide Road by different users, in the grouped areas from Figure 72 above.

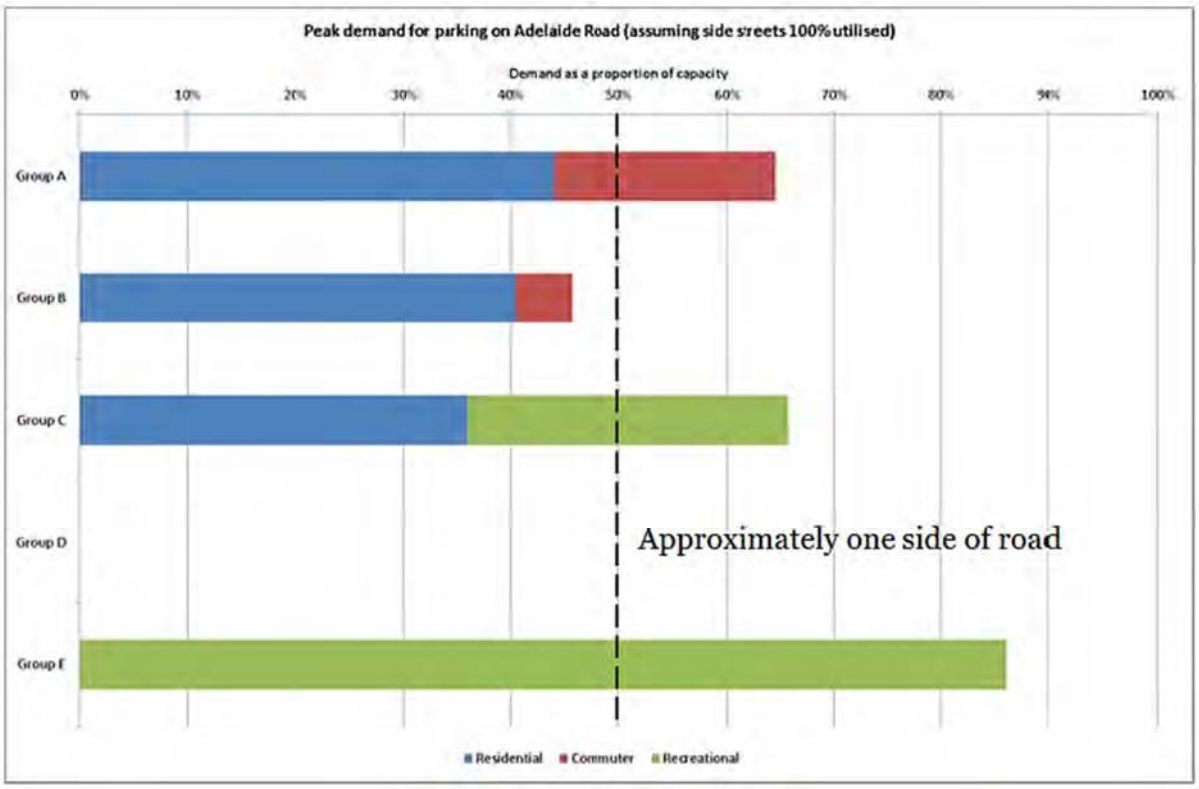

Figure 73 – Parking demand on Adelaide Road[85]

As shown above in Figure 73, parking demand occurs from a mixture of residential, commuter and recreational users.

In the north of the study area, commuter parking occupies between 5% and 20% of the available parking spaces. Commuter parking was not noted within the southern part of the study area. Residents parking demand is typically between 35% and 45% of the available spaces in residential areas. Recreational users were observed along Adelaide Road near Wakefield Park and Macalister Park. Other recreational areas along cycleway routes likely to attract recreational users include Martin Luckie Park (Lavaud Street) and Newtown Park (Russell Terrace).

The summary provided by Opus indicated that in some areas parking on both sides of the road is required to match the observed demand, however if commuter and recreational parking was excluded, parking on one side of the road would accommodate the residential demand.

The lack of results for Group D is indicative that the total observed parking demand (inclusive of all user types) could be accommodated by removing parking from one side of Adelaide Road.

The studies also explored the effects on parking of alternate cycle facilities along Adelaide Road. Provision of uphill cycle lanes only had a minimal effect on parking. Other options, including dual cycle lanes, wide shared lanes, and two-way cycle lanes, are likely to result in a parking shortfall of up to 130 spaces, with significant effects on parking availability and amenity for users.

Further parking surveys are recommended for each of the study routes subject to the design options assessed.

[85] Opus. (2013) Parking Analysis: Island Bay Cycleway Design Options, Dee Street to John Street. Wellington, New Zealand.

9 Issues and Opportunities

The issues and opportunities identified to date for the Newtown Connections cycleway study area are summarised as follows. It is envisaged that further issues will be identified through engagement with the local community and key stakeholders.

Table 30 – Newtown Connections study area issues and opportunities.

Section	Issue/Opportunity
WCC Plans and Policies	A number of previous investigations and subsequent recommendations have been made for cycle facilities within the Newtown Connections study area. This study shall look for opportunities to integrate and build on previous work from these studies where appropriate, and reduce redundant work.
	Other adjacent cycle projects, such as the Kilbirnie Connections, Island Bay, and Central Improvements projects, and the outcomes from the Ngauranga to Airport Corridor Study and Let's Get Wellington Moving will have an influence on options investigation for this study. Liaising with adjacent WCC Cycling Programme Package teams will be beneficial to ensure that there is a shared vision in terms of the look and feel of the route treatments.
	There are noted sites of significance (including Maori, heritage and special housing areas) within the study area that should be noted during option selection and design stages.
	There is future land development, population and employment growth planned for this study area, which will place increased demand for transport and parking. The existing demographics suggest that motor vehicle modal share has been decreasing for both commuters from and commuters to the study area since 2001. In contrast, walking/jogging and bicycle modal shares have both been increasing. Integrated land use and transport planning, and increase in alternative mode choice is needed to support integrated and sustainable future growth, and improved transport facilities are required to connect the growth areas for these alternative modes.
	Assessment of the proposed cycling facilities should also show how they achieve the strategic direction within such policy documents as the Wellington City Urban Growth Plan, Sustainable Transport Hierarchy, Low Carbon Capital Plan, Centres Policy and Parking Policy.
	A holistic urban design approach is needed to bring the WCC Cycling Programme in line with WCCs' wider urban design policy objectives. In particular, water sensitive urban design (WSUD) and ecological renewal could be incorporated into the Master Plan to ensure the WCC Cycling Programme addresses Wellington's natural environment issues.

Existing Road Corridor	Many roads throughout the study area have high concentrations of driveway crossings. These crossings increase the number of potential conflict points for cyclists on those roads.
	The topography throughout most of the study area is of steep grade. Consideration will need to be given to the gradients of the routes and the impact of the gradients on cyclists, type of cycling facility and likelihood of cycling uptake.
	Provision of turn lanes throughout the study area varies. An opportunity exists to investigate turn movement volumes and warrants for removal of turn lanes to re-allocate road space for other users.
	Hanson Street (between Stoke Street and Hall Street) is a very high wind zone, with the remainder of the Newtown Connections study area being within medium or high wind zones.
	A number of the roads, including Rintoul Street, Adelaide Road (north of Stoke Street), Riddiford Street, Constable Street, John Street, and Tasman Street are shown as potential flood hazard areas.
	The WCC Cycling Programme address some aspects of the WCC Urban Growth Plan, however, the project should not be limited to transport improvements alone. ***"Protecting the City's natural setting and reducing the environmental impacts of development and transport"*** needs to be considered**.**
	As part of the urban design approach, consideration should be given to the local historic features and cultural values of the area. The narrative of these can be told in the design of the cycleway and its associated features.
	There are a wide range of origins and destinations for people travelling to, from, and within the study area. The various desire lines of all transport modes will need to be considered during option evaluation.
	The roads within the study area are used in two main capacities. First, the higher volume roads are used to commute between the southern suburbs and the central city. Secondly, there are many local trips made to destinations within the study area. These different movements will need to be considered when evaluating route options.
	The existing road reserve widths on many of the roads are very narrow and constrained, affording little flexibility to provide cycle facilities without removing existing facilities (i.e. on-street parking).
	The Parade and Adelaide Road are designated over-dimension routes. Design options should take into account the requirements to maintain over-dimension vehicle access.

People Walking	There are areas of different concentrations of pedestrian activity, with both commuter and recreational movements along the route, as well as sites of congregation for shorter trips within residential and commercial areas.
	The demographic statistics show a high proportion of walk to work trips in the Southern Study Area. Cycling design options should take into account the requirements to maintain or improve pedestrian LOS, and potential increases in pedestrian demand on routes. Particular focus should be given to those areas of high pedestrian frequency or congregation such as town centres.
People Riding Bikes	There are different types of cyclist that travel along the route with varying levels of experience and confidence. Each user has a different trip purpose, travel speeds, and preference for facilities; one user may prefer an on-road facility where the other would prefer a shared path or off-road cycle facility. Consideration of the different user types when investigating options for cyclists will need to take into account the different desires of these users and the potential increase in demand of less confident cyclists due to facility improvements.
	Some cyclists (illegally) cycle along the footpath rather than using the on road cycle lanes where there is no shared path available.
	There are a large number of high-volume intersections within the study area. Intersections are the most dangerous location for cyclists; the level of service and safety for cyclists at intersections on the route options will need to be given careful consideration.
	There have been 16 crashes involving cyclists in the previous 5-year period (2012-2016). 81% of these cyclist crashes (13 of the 16) resulted in injuries to the cyclist. Some key statistics: • 81% (13) of crashes occurred at intersections. • 40% (6) of crashes occurred when a cyclist was slowing on the approach to an intersection and was hit from by behind by a vehicle travelling too close or not paying adequate attention. • 20% (3) of crashes occurred when a right-turning vehicle failed to give way to an oncoming cyclist. All three crashes occurred on Rintoul Street, and all occurred when the cyclist was travelling downhill.
	There are not currently any existing cycling facilities within the study area.
	It will be important to provide consistency and clarity between any cycle facilities within the study area or connecting into the study area. The existing corridor widths may preclude continuity of a single facility type along routes; maintaining LOS and connectivity between facilities will be key to the success of the project.

	There are a number of routes that could provide different connections and LOS for cycling within the study area. A plan may incorporate a range of complementary short term and long-term facilities on separate routes that propose a staged approach to a cycling masterplan for the area.
	Future design options shall have an assessment of the impact on the existing cycling LOS to determine relative effectiveness and value for money investment.
	The adequacy of the existing cycle parking facilities should be considered.
	Census data and WCC cycling studies indicate that commuting trips by cycle have consistently grown in the previous 2005-2013 period. This in the absence of any cycling facilities. This growth is expected to continue to a point; however, improved cycling facilities would facilitate further growth and demand for improved cycling facilities.
People Using Buses	A significant proportion of the roads within the study area accommodate a bus route. There will be more frequent service to the local suburbs. Many bus patrons on minor routes from suburbs will transfer buses in Newtown to more frequent 'spine' services that go into the city via Cambridge Terrace and Taranaki Street. Opportunities to integrate cycle facilities with bus stops, and bus stop layouts that integrate cycle facilities should be considered.
People Using Vehicles	Some of the roads within the study area have high traffic volumes.
	All of the roads within the study area have on-street parking on at least one side of the road. On-street parking is a mix of time-restricted, residents, coupon, and unrestricted parking.
	The census statistics show a high proportion of people who work in the study area travel to work by private vehicle. The large employment centres such as Hospitals (x3), Wellington Zoo, Massey University etc. and recreational parks contribute to this. On-street parking demand occurs from a mixture of residential, commuter and recreational users. Further demand for on-street parking is expected to result from the proposed land developments outlined in this report. Cycling facility design option, including dual cycle lanes, wide shared lanes, and two-way cycle lanes, are likely to result in effects on parking availability and amenity for users. Further parking surveys are recommended for each of the study routes subject to the design options assessed. Assessment of the existing parking demand and likely impact of cycle facilities on on-street parking shall be undertaken. This shall also have reference to the WCC parking policy.

	Areas of existing kerbside parking have been shown to encroach onto the footpath to allow for enough space in the through lanes for vehicles to pass safely.

During past cycleway projects, issues and opportunities have been identified through engagement with stakeholders and members of the public. Additional issues and opportunities identified through this engagement that have not been covered previously within this report will be added in future report updates. Some of the issues and opportunities that have been raised during past projects include, but are not limited to, the following:

- Accommodating recreational activities that are unique to the project location;
- Providing connections to recreational hubs (i.e. dog parks, beaches, recreational clubs, etc.);
- Upgrading urban design facilities, including improved street lighting, landscaping, and pedestrian amenities such as seating, rubbish bins, and toilets;
- Designing for access and mobility;
- Ensuring infrastructure will accommodate future growth in pedestrian and cyclist demand; and
- Addressing site-specific concerns for pedestrian, cyclists, and motor vehicles

10 Applicability

This report has been prepared for the exclusive use of our client Wellington City Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Ltd

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Authorised for Tonkin & Taylor Ltd by:

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Ed Breese

Project Director

JASZ
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Appendix A: Location Plan and Previously Considered Routes

CONTEXT AND PREVIOUSLY CONSIDERED ROUTES

The project will look at potential options for safer cycle routes through:

- Berhampore
- Newtown and
- Mt Cook.

This includes cycle connections to adjacent suburbs, the central city via Pukeahu National War Memorial Park and/or the Basin Reserve, and other key destinations such as:

- shops
- schools
- hospitals
- community centres
- parks and sports facilities
- Massey University
- Wellington Zoo
- south coast.

KEY

- Previously considered route options (on-road)
- Previously considered route options (off-road)
- Other cycle route projects
- Extent of project
- District Plan Centre Zone
- Community / Education
- Healthcare
- Recreation
- Supermarket

Scale Bar: 0m 250m 500m

North

NZ TRANSPORT AGENCY WAKA KOTAHI

New Zealand Government

Absolutely Positively Wellington City Council
Me Heke Ki Pōneke

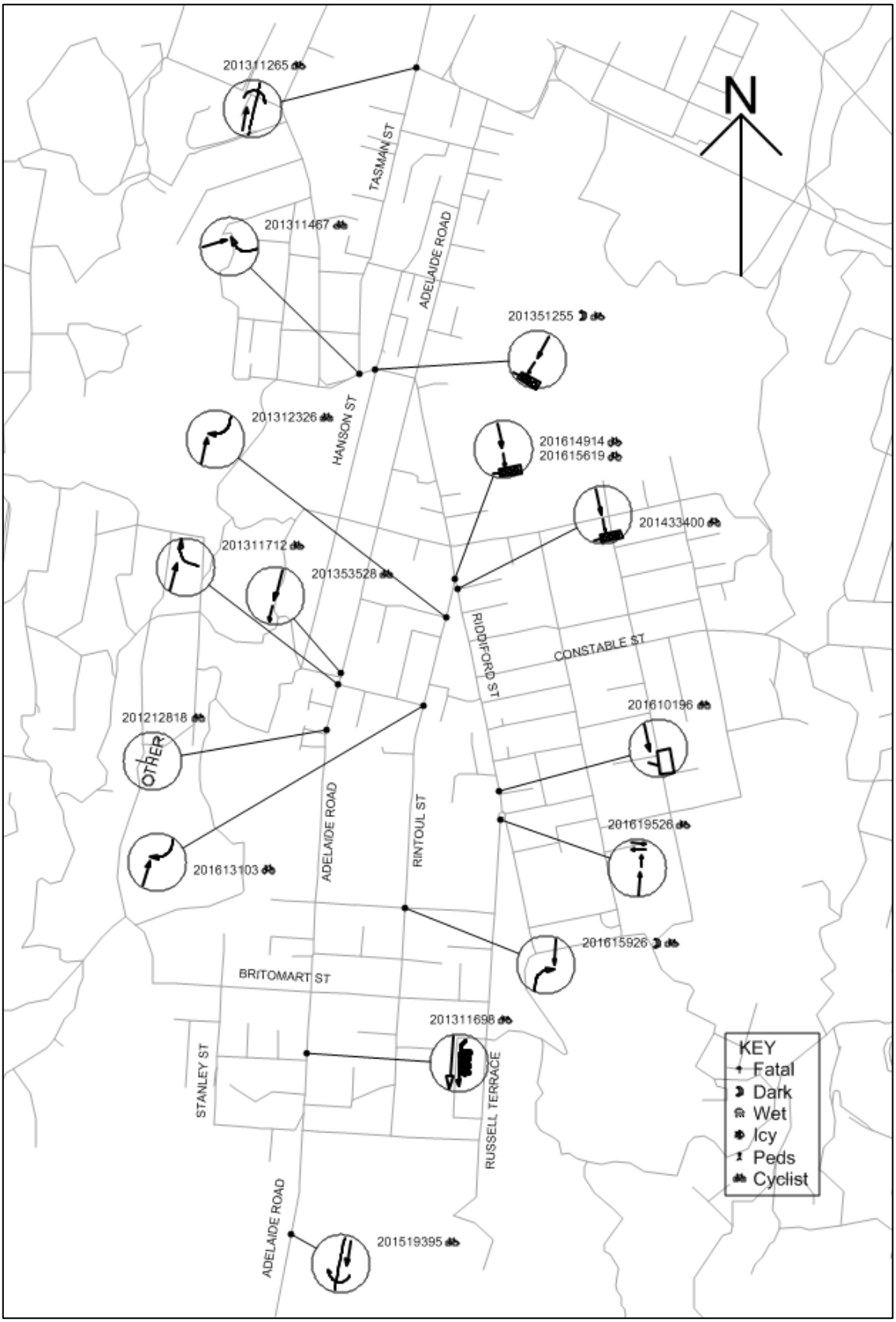
NEWTOWN CONNECTIONS

Tonkin+Taylor

studiopacificarchitecture

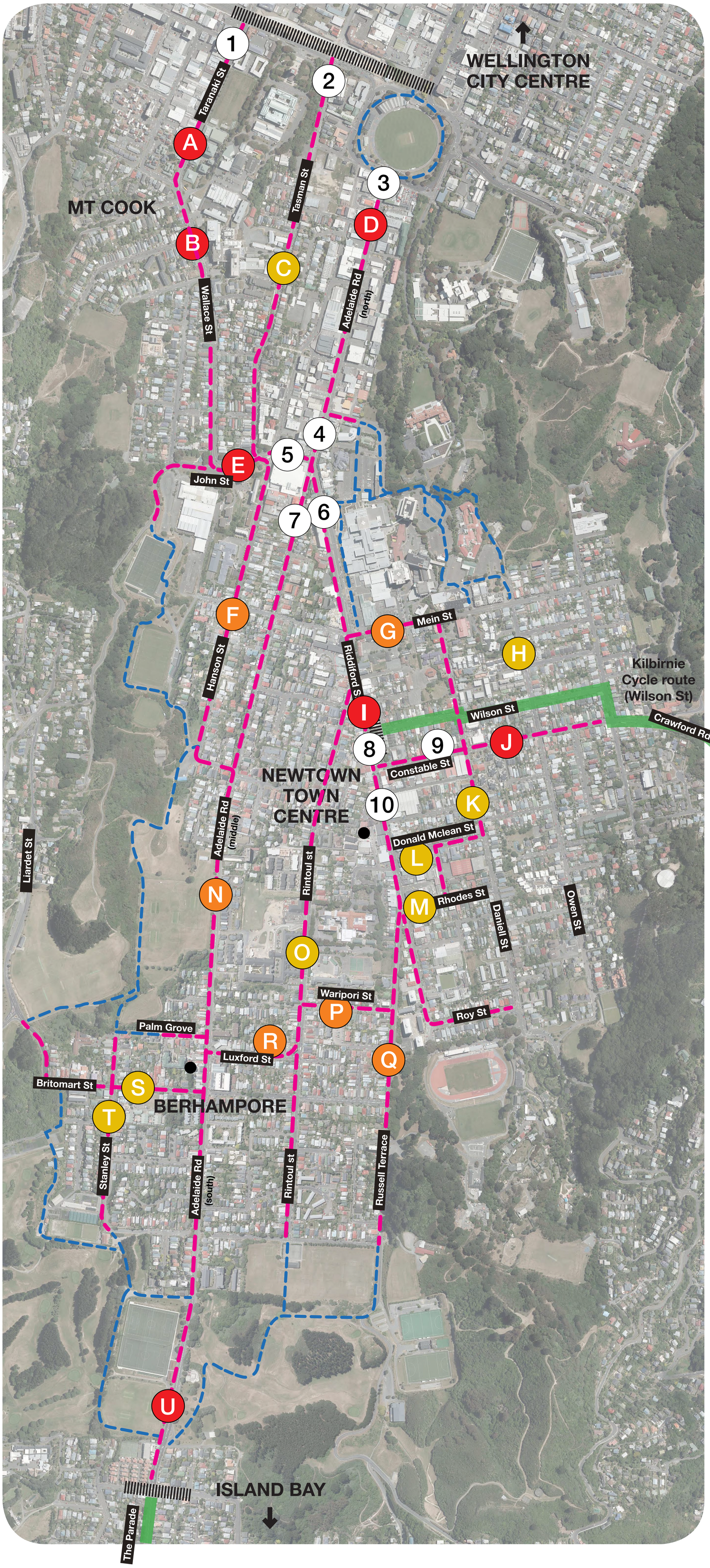
Appendix B: Cyclist Crash Data

The collision diagram displays cycle crashes within the study area from 2012 to 2016 (inclusive).



First Street	Distance	C I R	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day	Time HHMM	Description of Events	Crash Factors (ENV = Environmental factors)	Road	Natural Light	Weather	Junction	Cntrl	Tot Inj F S M A E I T R N
ADELAIDE ROAD	10	N	BOYD TERRACE	201212818	22/09/2012	Sat	1706	CYCLIST1 (Age 24) NBD on ADELAIDE ROAD hit CAR2 turning right against	CYCLIST1 Driving or Riding in pedestrian space CAR2 did not see or look for other party until too late ENV: visibility limited, entering or leaving private house / farm	Dry	Overcast	Fine	Driveway	Nil	1
ADELAIDE ROAD	20	N	CHILKA ST	201311698	23/04/2013	Tue	1730	CYCLIST2 (Age 38) SBD on ADELAIDE ROAD lost control while being overtaken by BUS1	BUS1 overtaking, did not see or look for other party until too late, misjudged speed of own vehicle	Dry	Overcast	Fine	Unknown	Nil	1
ADELAIDE ROAD	250	N	DOVER ST	201519395	17/11/2015	Tue	1650	CYCLIST1 (Age 21) SBD on ADELAIDE ROAD hit CAR2 U-turning from same direction of travel	CAR2 inattentive, Did not check / notice another party behind	Dry	Bright	Fine	Unknown	Nil	1
ADELAIDE ROAD		I	STOKE ST	201311712	30/04/2013	Tue	0800	CYCLIST1 (Age 37) NBD on ADELAIDE ROAD hit MOPED2 merging from the right	MOPED2 failed to give way to traffic approaching or crossing from the left, Did not check / notice another party	Dry	Bright	Fine	T Type Junction	Nil	2
ADELAIDE ROAD N	10	N	STOKE ST	201353528	20/08/2013	Tue	1735	BUS1 SBD on ADELAIDE ROAD N hit rear end of CYCLIST2 stopped/moving slowly	BUS1 overtaking, following too closely	Dry	Bright	Fine	T Type Junction	Nil	
HANSON ST		I	JOHN ST	201351255	21/03/2013	Thu	2000	CAR1 SBD on HANSON ST hit rear end of CYCLIST2 stop/slow for signals	CAR1 following too closely CYCLIST2 Suddenly Braked	Dry	Dark	Fine	X Type Junction	Traffic Signal	
JOHN ST		I	TASMAN ST	201311467	07/03/2013	Thu	1742	CAR2 turning right hit by oncoming CYCLIST1 (Age 50) EBD on JOHN ST	CYCLIST1 overtaking on left CAR2 failed to give way when turning to non-turning traffic, didnt see/look when visibility obstructed by other vehicles	Dry	Bright	Fine	T Type Junction	Give Way Sign	1
RIDDIFORD ST		I	EMMETT ST	201433400	01/03/2014	Sat		CAR1 SBD on RIDDIFORD ST hit rear end of CYCLIST2 stop/slow for signals	CAR1 following too closely	Dry	Bright	Fine	T Type Junction	Traffic Signal	
RIDDIFORD ST	50	S	RHODES ST	201610196	03/03/2016	Thu	0915	VAN2 SBD on RIDDIFORD ST opened door into path of another party, CYCLIST1 hit Vehicle	VAN2 inattentive, Did not check / notice another party behind	Dry	Bright	Fine	Unknown	N/A	1
RIDDIFORD ST		I	RINTOUL ST	201615619	06/07/2016	Wed	1623	CAR1 SBD on RIDDIFORD ST hit rear end of CYCLIST2 (Age 39) stop/slow for signals	CAR1 did not stop at steady red light, failed to notice car slowing	Dry	Bright	Fine	T Type Junction	Traffic Signal	1
RIDDIFORD ST		I	RINTOUL ST	201614914	06/07/2016	Wed	1623	CAR1 SBD on RIDDIFORD ST hit rear end of CYCLIST2 (Age 39) stop/slow for signals	CAR1 failed to notice car slowing	Dry	Bright	Fine	T Type Junction	Traffic Signal	1
RIDDIFORD ST		I	RUSSELL TERRACE	201619526	13/06/2016	Mon	1730	VAN1 NBD on RUSSELL TERRACE hit rear end of CYCLIST2 (Age 40) stop/slow for cross traffic	VAN1 failed to notice car slowing	Unkno	Bright	Unknow	Roundabo	Give Way Sign	1
RINTOUL ST		I	COLOMBO ST	201312326	02/08/2013	Fri	1320	CAR2 turning right hit by oncoming CYCLIST1 (Age 30) NBD on RINTOUL ST	CAR2 failed to give way when turning to non-turning traffic, Did not check / notice another party	Dry	Bright	Fine	T Type Junction	Nil	2
RINTOUL ST		I	STOKE ST	201613103	24/05/2016	Tue	0845	CAR2 turning right hit by oncoming CYCLIST1 (Age 60) NBD on RINTOUL ST	CAR2 failed to give way when turning to non-turning traffic, inexperience	Dry	Overcast	Fine	T Type Junction	Nil	1
RINTOUL ST		I	WARIPORI ST	201615926	01/09/2016	Thu	1810	CAR2 turning right hit by oncoming CYCLIST1 (Age 44) SBD on RINTOUL ST	CAR2 failed to give way when turning to non-turning traffic, Did not check / notice another party	Dry	Dark	Fine	X Type Junction	Traffic Signal	1
TASMAN ST		I	RUGBY ST	201311265	25/02/2013	Mon	1010	CYCLIST1 (Age 16) NBD on TASMAN ST hit CAR2 U-turning from same direction of travel	CYCLIST1 another party wearing dark clothing CAR2 Did not check / notice another party behind, visibility limited	Dry	Bright	Fine	T Type Junction	Nil	1

Appendix C: Peak Hour Movement – Volumes



MOVEMENT (PEAK HOUR)

Previously considered route options (on-road)

Previously considered route options (off-road)

KEY	WALKING	CYCLING
1	420	40
2	450	100
3	750	130
4	360	210
5	180	60
6	500	180
7	90	60
8	(Weekend) 450	90
9	(Weekend) 660	30
10	(Weekend) 810	60

		VEHICLES
A	Taranaki St	1400
B	Wallace St	1800
C	Tasman St	480
D	Adelaide Rd (North)	1800
E	John St	1700
F	Hanson St	630
G	Mein St	660
H	Owen St	160
I	Riddiford St	1200
J	Constable St	1200
K	Daniell St	460
L	Donald Mclean St	170
M	Rhodes St	130
N	Adelaide Rd (Middle)	900
O	Rintoul St	310
P	Waripori St	560
Q	Russell Terrace	620
R	Luxford St	740
S	Britomart St	460
T	Stanley St	180
U	Adelaide Rd (South)	1100

Data Sources:

- Let's Get Wellington Moving transport surveys, March 2016
- WCC annual transport monitoring surveys, March 2018 & November 2015
- WCC traffic count database, 2009 to present
- Mobile Road website https://mobileroad.org

Appendix D: Cyclist LOS using the Danish Method

Tonkin+Taylor **Cyclist Level of Service (LOS) - Danish Method***

*Model as detailed in *Pedestrian and Bicycle Level of Service on Roadway Segments* , Jensen, 2007

Adelaide Road (north of John Street/Riddiford Street, during bus lane hours)			
Parameter	**Value**	**Unit**	**Description**
AREA	-0.34		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	1793		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	37		average motor vehicle speed
PED	750		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	0		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside[1]
ULAN	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	3.3	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	0	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	1		bus stop on road = 1, no bus stop = 0
LANE	1		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	***Cyclist LOS***	
1%	1%	Very satisfied
6%	5%	Moderately satisfied
16%	11%	Little satisfied
33%	17%	Little dissatisfied
66%	34%	Moderately dissatisfied
100%	34%	Very dissatisfied

LOS E

Notes:

1 *- This LOS model does not include a parameter for bus lanes. For this LOS calculation, two scenarios have been calculated—one for when the bus lane is in operation and is shared with cyclists (DBL = 3.3 m, ULAN = 0 m), and another for when the bus lane serves as kerbside parking (RBUF = 1.8 m, ULAN = 1.5 m).*

Adelaide Road (north of John Street/Riddiford Street, outside of bus lane hours)			
Parameter	**Value**	**Unit**	**Description**
AREA	-0.34		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	1793		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	37		average motor vehicle speed
PED	750		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	12		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside[1]
ULAN	1.5	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	3	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	1.8	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	1		bus stop on road = 1, no bus stop = 0
LANE	0		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	***Cyclist LOS***	
1%	1%	Very satisfied
4%	4%	Moderately satisfied
13%	9%	Little satisfied
27%	14%	Little dissatisfied
60%	33%	Moderately dissatisfied
100%	40%	Very dissatisfied

LOS E

Notes:

1 *- This LOS model does not include a parameter for bus lanes. For this LOS calculation, two scenarios have been calculated—one for when the bus lane is in operation and is shared with cyclists (DBL = 3.3 m, ULAN = 0 m), and another for when the bus lane serves as kerbside parking (RBUF = 1.8 m, ULAN = 1.5 m).*

Tonkin+Taylor **Cyclist Level of Service (LOS) - Danish Method***

*Model as detailed in *Pedestrian and Bicycle Level of Service on Roadway Segments* , Jensen, 2007

Adelaide Road (south of John Street/Riddiford Street)			
Parameter	**Value**	**Unit**	**Description**
AREA	0.0557		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	957		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	35	km/hr	average motor vehicle speed
PED	90		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	16		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside[1]
ULAN	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	2.8	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	2	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	1		bus stop on road = 1, no bus stop = 0
LANE	0		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	*Cyclist LOS*	
0%	0%	Very satisfied
2%	2%	Moderately satisfied
6%	4%	Little satisfied
14%	8%	Little dissatisfied
39%	25%	Moderately dissatisfied
100%	61%	Very dissatisfied

LOS F

Constable Street			
Parameter	**Value**	**Unit**	**Description**
AREA	-0.0334		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	1264		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	35	km/hr	average motor vehicle speed
PED	280		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	12		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside
ULAN	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	3	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	2	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	1		bus stop on road = 1, no bus stop = 0
LANE	0		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	*Cyclist LOS*	
0%	0%	Very satisfied
2%	1%	Moderately satisfied
5%	4%	Little satisfied
12%	7%	Little dissatisfied
36%	24%	Moderately dissatisfied
100%	64%	Very dissatisfied

LOS F

Tonkin+Taylor **Cyclist Level of Service (LOS) - Danish Method***

*Model as detailed in *Pedestrian and Bicycle Level of Service on Roadway Segments* , Jensen, 2007

Hanson Street

Parameter	Value	Unit	Description
AREA	0.0557		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	622		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	34		average motor vehicle speed
PED	90		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	16		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside[1]
ULAN	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	2.2	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	0	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	1		bus stop on road = 1, no bus stop = 0
LANE	0		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	*Cyclist LOS*	
1%	1%	Very satisfied
4%	3%	Moderately satisfied
11%	7%	Little satisfied
23%	13%	Little dissatisfied
55%	32%	Moderately dissatisfied
100%	45%	Very dissatisfied

LOS E

Notes:

1 *- Pedestrian volume data is not available for Hanson Street. The pedestrian volume (PED) has been estimated from the volume on Adelaide Road south of John Street/Riddiford Street, which runs parallel to Hanson Street and has similar roadside development.*

Luxford Street

Parameter	Value	Unit	Description
AREA	-0.34		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	789		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	43		average motor vehicle speed
PED	90		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	10		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside[1]
ULAN	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	4.5	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	2	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	1		bus stop on road = 1, no bus stop = 0
LANE	0		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	*Cyclist LOS*	
0%	0%	Very satisfied
2%	2%	Moderately satisfied
7%	5%	Little satisfied
16%	9%	Little dissatisfied
43%	27%	Moderately dissatisfied
100%	57%	Very dissatisfied

LOS F

Notes:

1 *- Pedestrian volume data is not available for Luxford Street. The pedestrian volume (PED) has been estimated from the volumes on nearby streets and streets in the area with similar roadside development.*

Tonkin+Taylor **Cyclist Level of Service (LOS) - Danish Method***

*Model as detailed in *Pedestrian and Bicycle Level of Service on Roadway Segments* , Jensen, 2007

Riddiford Street (north of Rintoul Street/Emmett Street)			
Parameter	**Value**	**Unit**	**Description**
AREA	-0.34		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	1343		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	28		average motor vehicle speed
PED	500		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	11		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside[1]
ULAN	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	3.8	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	2	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	1		bus stop on road = 1, no bus stop = 0
LANE	1		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	*Cyclist LOS*	
1%	1%	Very satisfied
4%	3%	Moderately satisfied
12%	8%	Little satisfied
26%	14%	Little dissatisfied
59%	33%	Moderately dissatisfied
100%	41%	Very dissatisfied

LOS E

Riddiford Street (south of Rintoul Street/Emmett Street)			
Parameter	**Value**	**Unit**	**Description**
AREA	-0.34		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	959		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	26		average motor vehicle speed
PED	810		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	10		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside[1]
ULAN	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	3.8	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	2	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	1		bus stop on road = 1, no bus stop = 0
LANE	0		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	*Cyclist LOS*	
1%	1%	Very satisfied
3%	2%	Moderately satisfied
9%	6%	Little satisfied
20%	11%	Little dissatisfied
50%	30%	Moderately dissatisfied
100%	50%	Very dissatisfied

LOS F

Tonkin+Taylor **Cyclist Level of Service (LOS) - Danish Method***

*Model as detailed in *Pedestrian and Bicycle Level of Service on Roadway Segments* , Jensen, 2007

Rintoul Street

Parameter	Value	Unit	Description
AREA	0.0557		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	296		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	38		average motor vehicle speed
PED	90		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	13		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside[1]
ULAN	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	2.5	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	1.9	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	1		bus stop on road = 1, no bus stop = 0
LANE	0		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	*Cyclist LOS*	
1%	1%	Very satisfied
3%	2%	Moderately satisfied
9%	6%	Little satisfied
20%	11%	Little dissatisfied
51%	31%	Moderately dissatisfied
100%	49%	Very dissatisfied

LOS E

Notes:

1 *- Pedestrian volume data is not available for Rintoul Street. The pedestrian volume (PED) has been estimated from the volume on Adelaide Road south of John Street/Riddiford Street which runs parallel to Rintoul Street and has similar roadside development.*

Taranaki Street/Wallace Street

Parameter	Value	Unit	Description
AREA	-0.0334		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	1748		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	39		average motor vehicle speed
PED	420		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	6		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside[1]
ULAN	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	3.5	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	2	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	1		bus stop on road = 1, no bus stop = 0
LANE	0		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	*Cyclist LOS*	
0%	0%	Very satisfied
2%	1%	Moderately satisfied
5%	3%	Little satisfied
12%	7%	Little dissatisfied
35%	23%	Moderately dissatisfied
100%	65%	Very dissatisfied

LOS F

Tonkin+Taylor **Cyclist Level of Service (LOS) - Danish Method***

*Model as detailed in *Pedestrian and Bicycle Level of Service on Roadway Segments* , Jensen, 2007

Tasman Street			
Parameter	**Value**	**Unit**	**Description**
AREA	-0.0334		type of roadside development or landscape (residential = 0.0557, shopping = -0.3400, mixed = -0.0334, rural fields = -0.0196, rural forest = 0.3369)
MOT	481		number of motor vehicles per hour in both directions
LBUF	0	m	width of buffer area between bicycle facility and drive lane on the nearest roadside
SPEED	35		average motor vehicle speed
PED	450		passed pedestrians per hour on nearest roadside at 20 km/h riding speed
PARK	15		number of parked motor vehicles on nearest roadside per 100 m
PATH	0	m	width of bicycle path/track on nearest roadside[1]
ULAN	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in urban areas
RSHO	0	m	width of bicycle lane/paved shoulder (at least 0.9 m wide) on nearest roadside in rural areas
DBL	2.8	m	width of nearest drive lane including bicycle lane/paved shoulder of less than 0.9 m width
RBUF	1.8	m	width of buffer area between footpath and bicycle facility/drive lane
SW	1		footpath on nearest roadside = 1, no footpath = 0
BUS	0		bus stop on road = 1, no bus stop = 0
LANE	0		4+ traffic lanes = 1, one to three lanes = 0

Cumulative Cyclist LOS	*Cyclist LOS*	
1%	1%	Very satisfied
4%	3%	Moderately satisfied
11%	7%	Little satisfied
23%	12%	Little dissatisfied
55%	32%	Moderately dissatisfied
100%	45%	Very dissatisfied

LOS **E**

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