WAIHI ACCESSIBILITY AUDIT REPORT

CCS DISABILITY ACTION

TAYLORED ACCESSIBILITY SOLUTIONS LTD

DECEMBER 2014

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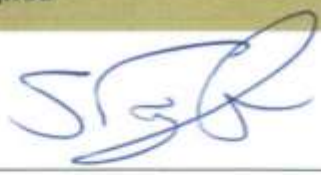
Prepared By	Steve Taylor		18/12/2014
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On behalf of	CCS Disability Action		

EXECUTIVE SUMMARY

Hauraki District Council (HDC) has requested an accessibility audit for the Central Business District (CBD) area of Waihi, with particular emphasis for disabled and elderly residents. The audit covers:

- Mobility Parking spaces;
- Kerb ramps;
- Tactiles;
- Footpaths;
- Road crossings;
- Street Furniture;
- Temporary Traffic Management;

While CCS Disability Action recognise that standards such as NZS 4121:2001 and the Department for Building and Housing Building Code Compliance Documents contribute to improving disabled access, there are often relatively small and inexpensive solutions that can remove significant barriers to access that are overlooked.

Waihi is located at the Southern end of New Zealand's Coromandel Peninsula. The population of Waihi is currently 4527, as recorded in the 2013 New Zealand Census. Waihi has 25.4% of Hauraki District's population.

246 residents in Waihi (5.4% of the population) have a Mobility Parking Permit. An estimated 190 people in Waihi use a mobility aid due to permanent disability. Some of these will have a Mobility Parking Permit and some will not.

CCS Disability Action is an organisation that supports people with disabilities to live independent lives. One of the many services CCS Disability Action provides is to work with communities to ensure that they are welcoming and inclusive of all people.

CCS Disability Action was chosen to conduct the audit as they make a significant contribution to mobility improvements in communities around New Zealand, and are an active partner in Hauraki District Disability work.

An estimated 1.1 million New Zealanders live with a disability, representing approx. 25% of the total population.

In Waihi, at the 2013 Census:

- 26.5% of people were aged 65 years and over. This is an increase from 21.8% in 2006, and compares to 14.3% for New Zealand as a whole.
- 19.3% of people were aged less than 15 years. This is a decrease from 20.8% in 2006, and compares with 20.4% for all of New Zealand.

The projected 2031 population of Hauraki District is 18,680 people, which is roughly the same as the current (2014) population. However, the proportion of people aged over 65 living in Hauraki is predicted to increase to approximately 34% by 2031.

The boundaries for the Geographic area of interest are:

- Kensington Road – Moresby Avenue to Seddon Avenue (SH.2);
- Seddon Avenue (SH.2) – Kensington Road to Kenny Street;
- Kenny Street – Seddon Avenue (SH.2) to Victoria Street;
- Victoria Street – Kenny Street to Roberts Street;
- Roberts Street;
- Quarry Road – Roberts Street to Silverton Road;
- Silverton Road – Quarry Road to Adams Street;
- Adams Street;
- Tauranga Road (SH.2) – Adams Street to Gilmour Street;
- Gilmour Street – Tauranga Road (SH.2) to George Street;
- George Street;
- Clarke Street – George Street to Kenny Street (SH.25);
- Kenny Street (SH.25) – Clarke Street to Gilmour Street;
- Gilmour Street – Kenny Street (SH.25) to Seddon Street;
- Seddon Street – Gilmour Street to Haszard Street;
- Haszard Street – Seddon Street to Martha Street;
- Martha Street; and
- Moresby Avenue – Martha Street to Kensington Road.

Access from Waihi Hospital to town was also assessed.

A specific community meeting for this project was held on the 7th May 2014 at the Waihi War Memorial Hall on Seddon Street. Following this meeting, site visits were completed. Feedback from the initial Community Consultation Meeting and subsequent site visits identified access issues for Waihi such as:

- Location of Mobility Spaces and access to the footpath;
- Lips and grades on kerb ramps;
- Road crossing opportunities, including intersections and pedestrian crossings;
- Lack of footpaths; and
- Street clutter (signage, wares for sale and alfresco dining furniture).

This report is intended to remain a 'living' document. In order to ensure on-going benefit from investment in access improvements it is recommended that Hauraki District Council regularly review the recommendations included within this report.

CCS Disability Action recognises that while all recommendations are important to providing a universally accessible network, cost implications may require the implementations to be staged in conjunction with Council's long-term planning processes.

Identified issues and recommendations are discussed throughout this report. For ease of reference and to assist in prioritisation, all recommendations are listed in Section 15 according to assessed priority for general and specific sites, and with indicative costs.

The specific recommendations are split into three categories:

- Serious Safety Risk – Where it is considered serious injury may occur if the issue is not addressed
- Significant Concern – Major inconveniences
- Minor Concern – Minor inconveniences

It is recommended that the Serious Safety Risk recommendations are implemented first, and that Significant and Minor concerns are addressed as part of longer term planning. The total estimated cost for the Serious Safety Risk items is $55,000.

Costs shown are indicative construction costs only and should only be used as a guide. They do not include Traffic Management Costs, consultation with affected parties, costs of design or any other professional service fees.

General Recommendations is provided in addition to immediate recommendations for improving infrastructure. These have no capital cost but are likely to result in improved accessibility outcomes for the people of Waihi through improved processes and practices more aligned with best-practice universal design and construction.

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1 INTRODUCTION

1.1 HAURAKI DISTRICT

The Hauraki District is located along the Hauraki Plains at the southern tip of the Firth of Thames. The population of the Territorial Authority decreased 0.3% between the 2006 census and 2013 census, to 17,808 residents[1]. This equates to approximately 0.4% of New Zealand's population. Main urban areas in the district include Waihi, Paeroa and Ngatea. The district covers an area of 1,269 square kilometres[2].

1.2 WAIHI

Waihi is located at the Southern end of New Zealand's Coromandel Peninsula. The township has a rich history in gold mining as well as radio and television development and manufacturing[3].

The population of Waihi is currently 4527, as recorded in the 2013 New Zealand Census. Waihi has 25.4% of Hauraki District's population.

1.3 CCS DISABILITY ACTION

CCS Disability Action is an organisation committed to supporting communities that include all people and ensure that they are welcoming and inclusive of everyone. This is achieved by using universal design principles in the built environment and including everyone in activities and events.

CCS Disability Action's role is to support people with disabilities to be 'in the driver's seat' of their life; to achieve their own dreams and aspirations. With sixteen offices around New Zealand, CCS Disability Action provides frontline support and services, and creates local awareness of and education around issues encountered by disabled people in their everyday lives.

CCS Disability Action works with government departments, local councils, building developers and owners on a range of issues that impact on the lives of disabled people. CCS Disability Action has expertise in ensuring public buildings, homes, amenities, walkways, streets and public transport more accessible for everybody.

[1] Statistics New Zealand – 2013 census URPC Tables
[2] Hauraki District Council/Our District
[3] Go Waihi

2 STATISTICS

2.1 DISABILITY IN NEW ZEALAND[4]

The first results of the Disability Survey as part of the 2013 National Census has recently been released by Statistics New Zealand.

An estimated 1.1 million New Zealanders live with a disability, representing approx. 25% of the total population.

In the 2006 census, 82% of people with disability were adults living in households, 5% were adults living in residential facilities and 14% were children (under 15 years) living in households.

The percentage of people with disability increased with age, from 10% for children aged less than 15 years to 45% for adults aged 65 years and over.

The most common disability types for adults are physical and sensory disabilities. 27% of all adults aged 15 years and over have a physical, sensory, or intellectual disability.

2.2 MOBILITY PARKING IN NEW ZEALAND[5]

Because of their disability, an estimated 129,100 adults and 8,700 children needed to park close to their destination in 2006. Among adults, the need to park close increased with age.

There are 246 residents in Waihi (5.4% of the population) that have a Mobility Parking Permit.

In the six months before the 2006 Disability Survey, an estimated 61,100 adults and 5,900 children had problems finding a carpark in New Zealand. The most common problems were:

- Finding a park close to their destination;
- Carparks meant for disabled people being used by non-disabled people; and
- The available carparks being too awkward to use.

31% of disabled adults and 15% of disabled children used taxis for short trips at least once in the 12 months prior to the 2006 Disability Survey. An estimated 1% of all disabled adults used taxis every day or almost every day.

[4] Statistics New Zealand – 2006 Disability Survey: Disability and Travel and Transport in New Zealand 2006

[5] Statistics New Zealand – 2006 Disability Survey: Disability and Travel and Transport in New Zealand 2006

The Total Mobility Scheme provides disabled people with vouchers for discounted taxi fares. At the time of the 2006 Disability Survey, parents/caregivers of 22% of disabled children and 34% of disabled adults had heard of the Total Mobility Scheme. An estimated 4% of disabled adults had used Total Mobility Scheme vouchers in the 12 months prior to the survey.

An estimated 8% of disabled children aged 5–14 needed special transport or help to get to school.

2.3 AGE IN HAURAKI DISTRICT

While mobility impairments are considered to primarily affect people with disabilities, older persons progressively experience a reduction in sensory and physical ability and children progressively develop decision making ability. The median age (half are younger, and half older, than this age) for people in the Hauraki District is 45.5 years[6]. The projected 2031 population of Hauraki District is 18,680 people, which is roughly the same as the current (2014) population. However, the proportion of people aged over 65 living in Hauraki is predicted to increase to approximately 34% by 2031.

2.4 AGE IN WAIHI

In Waihi, at the 2013 Census:

- 26.5% of people were aged 65 years and over[7]. This is an increase from 21.8% in 2006, and compares to 14.3% for New Zealand as a whole.
- 19.3% of people were aged less than 15 years[8]. This is a decrease from 20.8% in 2006, and compares with 20.4% for all of New Zealand.

Based on analysis of age and gender-specific rates of disability, an estimated 190 people in Waihi use a mobility aid due to permanent disability.[9]

2.5 OLDER PERSONS

When comparing to the Hauraki District and all New Zealand, Waihi has a higher percentage of persons aged 65+ (26.5%, compared to 21.9% for the district, and 14.2% for all New Zealand)[10].

[6] 2013 Census QuickStats about a place: Waihi
[7] 2013 Census QuickStats about a place: Waihi
[8] 2013 Census QuickStats about a place: Waihi
[9] Estimation methods based on Burdett (2014) Measuring Accessible Journeys: A tool to enable participation *Municipal Engineer*, In Press
[10] 2013 Census QuickStats about a place: Waihi; Statistics New Zealand, Tools and Services: Population Estimates and Projections

Many of the older persons are unable to access the community without some form of support, whether using mobility aids such as wheelchairs, mobility scooters etc., or simply requiring smooth, level surfaces to avoid tripping and falls. Some do not drive and therefore depend on safe and level footpaths to reach services essential to meet their everyday needs.

The Organisation for Economic Co-operation and Development (OECD) published a report in 2001 focusing on the effects of Older Persons and traffic.

Mobility is the key issue for an ageing society. OECD concluded[11]:

- Infrastructure design focused on technical efficiency and low costs is no longer sufficient;
- Standards based on fit young males are inappropriate in an ageing society;
- Involvement of older persons is encouraged in policy development;
- In Western Europe, 45% of pedestrian fatalities are aged 65 or more;
- Have educational campaigns to promote maximum mobility and safety for older people;
- Provision is required for suitable transport alternatives to the private vehicle (accessible buses, taxis, Dial a Ride etc.);
- Provide safer roads to accommodate pedestrians and users of scooters and wheelchairs; and
- More forgiving and predictable road design should be used to reduce the need to make complex decisions and performed time related tasks.

OECD stated that improvements in infrastructure that benefit older persons will benefit everyone.

HDC has a variety of pensioner housing available in Waihi. Currently there are 21 units provided for by the Council in the following locations:

- Seddon Street – Six units;
- Moresby Avenue – Four units;
- Moresby Avenue/Eliot Street – Seven units; and
- Kenny Street – Four units.

Waihi Hospital is an independent Rest Home, Hospital and Retirement Village located on the outskirts of Waihi. This is situated on Toomey Street and also has access from SH.2 along Village Way.

[11] Organisation for Economic Co-operation and Development – Ageing and Transport: Mobility Needs and Safety Issues.

2.6 YOUNGER PERSONS

Waihi has a lower percentage of persons aged below 15 when compared to the Hauraki District (19.3%, compared to 19.5% for the district)[13].

For this age group, early childcare and schooling facilities are the main destination points for travel.

A number of early education facilities are located in Waihi:

- ABC Waihi – 36 Galbraith Street;
- First Steps Waihi – 8 Mataura Road;
- Footprints Pre-school Limited – 7 Union Street;
- Kiwikidz Educare – 4 Russell Street;
- Pukewa Te Kohanga Reo – Cnr Victoria & Consolls Street;
- Somerset Early Learning Centre – 2 Somerset Street; and
- Waihi Free Kindergarten – Gladstone Road.

Three Schools are located in Waihi:

- Waihi Central School – Moresby Avenue;
- Waihi East School – Donnelly Street; and
- Waihi College – Kensington Road, Waihi.

A report commissioned by OECD in 2004[14] focused on keeping children safe in traffic. The areas the report focused on were:

- The scale and nature of the vulnerability of children in traffic environments;
- Children's behaviour, abilities, education, training, and publicity approaches;
- The role of the road environment in relation to child safety; and
- The role of legislation and standards in road safety equipment and vehicles.

OECD concluded that the best performing countries in keeping children safe have adopted a holistic approach using a wide variety of measures:

- Road Safety Policies include specific strategies and targets for improving child safety;
- Using education, practical training and publicity to encourage safe behaviour and providing young people with skills and strategies to manage risk; and
- Shifting the focus of responsibility away from children to parents, schools, drivers, policy makers, planners, and traffic engineers.

[13] 2013 Census QuickStats about a place: Waihi
[14] Organisation for Economic Co-operation and Development – Keeping Children Safe in Traffic: 2004

OECD recommends for the built environment:

- Young children need space for congregation, playing and physical activity;
- Older children require safe and secure routes to access school, playgrounds and other recreational destinations, both as pedestrians and cyclists;
- Traffic Engineers and Planners should take children's needs and abilities into account and incorporate them into road plans and traffic designs; and
- Cyclists and pedestrians need more priority through the use of traffic calming and facilities for walking and cycling.

3 AUDIT PURPOSE

Hauraki District Council (HDC) has requested an audit of transport infrastructure in Waihi with particular emphasis on accessibility for disabled and older residents. CCS Disability Action was chosen to conduct the audit as they make a significant contribution to mobility improvements in communities around New Zealand, and is an active partner in Hauraki District Disability work.

While CCS Disability Action recognise that standards such as NZS 4121:2001 and the Department for Building and Housing Building Code Compliance Documents contribute to improving disabled access, there are often relatively small and inexpensive solutions that can remove significant barriers to access that are overlooked.

It is envisaged that this audit will primarily be a tool for use by the Council. However, if accepted we suggest that it be made available to all interested parties.

4 GEOGRAPHIC AREA OF INTEREST

The geographic area of interest defined by HDC covers an area approximately 500m from the main Central Business District (CBD) of Waihi. Trip origins from adjacent residential areas, with particular emphasis on facilities for the very young and the elderly, as well as for people with disabilities were also considered in the review.

The boundaries for the Geographic area of interest are, and include:

- Kensington Road – Moresby Avenue to Toomey Street;
- Toomey Street – Kensington Road to Seddon Avenue (SH.2);
- Seddon Avenue (SH.2) – Kensington Road to Kenny Street;
- Kenny Street – Seddon Avenue (SH.2) to Victoria Street;
- Victoria Street – Kenny Street to Roberts Street;
- Roberts Street;
- Quarry Road – Roberts Street to Silverton Road;
- Silverton Road – Quarry Road to Adams Street;
- Adams Street;
- Tauranga Road (SH.2) – Adams Street to Gilmour Street;
- Gilmour Street – Tauranga Road (SH.2) to George Street;
- George Street;
- Clarke Street – George Street to Kenny Street (SH.25);
- Kenny Street (SH.25) – Clarke Street to Gilmour Street;
- Gilmour Street – Kenny Street (SH.25) to Seddon Street;
- Seddon Street – Gilmour Street to Haszard Street;
- Haszard Street – Seddon Street to Martha Street;
- Martha Street; and
- Moresby Avenue – Martha Street to Kensington Road.

A map of the geographic area for the audit is included as Appendix A.

During the site visit, the Geographic Area of Interest was extended to include the entrance at Village Way of Waihi Hospital.

5 AUDIT

5.1 COMMUNITY RELATIONSHIPS

It is evident that the Council have good working relationship with the residents of the town. The community clearly appreciates the efforts being made by Council to tackle social issues, and have pride in their community.

Shop owners take pride in the town by minimising footpath clutter and maintaining access routes. Council has contributed by installing a textured footpath surface on Seddon Street and Rosemont Road (SH.2).

Figure 1: Rosemont Road (SH.2)

5.2 CONSULTATION MEETINGS

Consultation with the community is vital for Council to gain an understanding of how the community use the facilities provided.

A specific community meeting for this project was held on the 7th May 2014 at the Waihi War Memorial Hall on Seddon Street.

The group of people that attended included a wide range of impairments. People with visual impairments, as well as age and mobility issues were present. People using wheelchairs and mobility scooters also contributed to discussion on the day. A representative from HDC also attended.

Following this meeting, site visits were completed. Feedback from the initial Community Consultation Meeting and subsequent site visits identified access issues such as:

- Location of Mobility Spaces and access to the footpath;
- Lips and grades on kerb ramps;
- Lack of safe road crossing opportunities;
- Lack of footpaths;
- Crossings at intersections and pedestrian crossings; and
- Street clutter (signage, wares for sale and alfresco dining furniture).

5.3 CO-OPERATION WITH NZTA

The Geographic Area of Interest includes SH.2 and SH.25, therefore HDC will need to liaise with NZTA for work on the state highway and any future funding opportunities in relation to any works in this area.

5.4 SITE INSPECTIONS

Following the consultation, site inspections were carried out in June and July 2014 by CCS Disability Actions' consultant, Taylored Accessibility Solutions Limited.

The audit inspected:

- Mobility spaces;
- Kerb ramps;
- Footpaths;
- Pedestrian crossing opportunities; and
- Street furniture.

6 CONTINUATION OF PROCESS

This report is intended to remain a 'living' document. In order to ensure the on-going success of investment in access improvements it is suggested that HDC regularly review the recommendations included within this report.

CCS Disability Action recognises that while all recommendations are important to providing a usable accessible network, cost implications may require the recommendations to be considered in council's long-term planning processes.

6.1 BUDGETS

The recommendations from this audit are seen as a long term investment for HDC to improve accessibility in Waihi. CCS Disability Action understands that the spending of ratepayer money is a sensitive issue and respects that all recommendations cannot be achieved immediately. By programming the recommendations into the regular maintenance programmes, HDC will be able to take advantage of any NZTA funding to maximise their investment.

CCS Disability Action therefore suggests setting a yearly budget for each section that is affordable and manageable for HDC and then using this audit to prioritise the order of works.

Recommendation 1 Assign annual budgets that are affordable for HDC to undertake the recommendations from this audit over a long term programme. Utilise regular maintenance programmes that maximise Council investment with NZTA subsidies.

6.2 MEASURING ACCESSIBLE JOURNEYS

In order to prioritise access improvements, it would be helpful for Hauraki District to collect data about the way people travel around Waihi. Although many Road Controlling Authorities collect traffic data, information about other modes of travel (particularly pedestrian trips) is rarely collected to the same level.

One method of data collection that can help to inform, justify and prioritise investment in accessible infrastructure is to count all people on a footpath or at a road crossing, and to include the proportion of those people who use mobility aids. By counting people on the streets of Waihi, Hauraki District Council can gain an understanding of pedestrian movements, especially the mobility impaired.

Recommendation 2 Select count sites in Waihi urban area to conduct regular pedestrian counts, including the proportion of people who use mobility aids.

7 FURTHER INVESTIGATION

This report covers access in the geographic area of interest as stated in Section 4: Geographic Area of Interest.

Further investigation will be required outside of this area to improve accessibility in wider Waihi and surrounding settlements.

Many issues raised during consultation were regarding footpaths and kerbs. It is suggested that consideration be given to a more formal method of setting priorities for the provision of kerb ramps and maintenance of footpaths. By identifying a risk and condition rating in conjunction with count data about existing use of the pedestrian network, a profile target can be developed that allows limited resources to address the most critical barriers first. Poor condition can be tolerated where there is little or no likelihood of use by the disabled and older persons.

Risk Modified Condition Assessment methodology prioritises upgrades to footpaths and kerb ramps so that those on routes used by the disabled on a regular basis are upgraded first. Refer to Appendix C for the calculation assessment.

This assessment designates footpaths and all potential kerb ramp locations within accessible routes a risk profile of Low, Medium or High as a high priority. A relatively simple set of KPIs can be formulated with condition ratings used to determine the profile.

Recommendation 3 Adopt the Risk Modified Condition Assessment methodology as a tool for future maintenance prioritisation.

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8 MOBILITY PARKING

8.1 THE NEED FOR ACCESSIBLE CAR PARKING[16]

Many people with impaired mobility depend on the use of a privately owned motor vehicle or a designated maxi-taxi for their transport needs. Both forms of transport are essential to enable them to participate fully in the everyday working, recreational, educational and social life of the community.

Many wheelchair users are able to drive a car either while still in their wheelchair or by transferring to the driver's seat. When transferring out of the wheelchair and into the driver's seat, the manual wheelchair is either carried inside the car or mounted on a roof hoist. However, a wider than normal car parking space is needed so that space is available to reassemble the wheelchair, if necessary, and place it alongside the car door so that the driver can then transfer to it from the driver's seat.

People who drive their vehicle while seated in their wheelchair generally access their vehicle either by using a side ramp which deploys to the adjacent footpath or by a rear hoist. A side ramp requires an area beside the car which is free from street furniture or other vehicles while a rear hoist requires the length of the hoist and manoeuvring space of the wheelchair behind the parked vehicle.

A pedestrian route that a wheelchair user can travel along without assistance (defined as an 'accessible route') is also needed from the parking space to the associated destination.

8.2 MOBILITY PARKING PERMIT ELIGIBILITY[17]

Having a medical condition or disability does not automatically entitle a person to a mobility parking permit.

The following criteria are used by medical professionals in determining the need for a mobility parking permit:

- The applicant is unable to walk and always require the use of a wheelchair; or
- The ability to walk distances is severely restricted by a medical condition or disability. For example, the applicant requires the use of mobility aids, experiences severe pain or breathlessness; or
- The applicant has a medical condition or disability that requires physical contact or close supervision to safely get around and cannot be left unattended.

[16] Department of Housing and Building with Barrier Free Trust: Accessible car parking spaces
[17] mobilityparking.org.nz/about-mobility-parking-permits/eligible-for-a-permit

8.3 MOBILITY PARKING IN WAIHI

As stated in Section 2: Statistics, 246 residents in Waihi have a Mobility Parking Permit.

HDC has provided seven public Mobility Spaces to service the shopping precinct on Seddon Street and Rosemont Road (SH.2). These are located on:

- Seddon Avenue (SH.2);
- Seddon Street (four);
- Haszard Street; and
- Silverton Road - Carpark.

There are also two Mobility Spaces located at the Golden Legacy Centre on Moresby Avenue. These were not considered as usable for users accessing the CBD due to the distance from the Golden Legacy Centre to town.

8.4 PARKING REQUIREMENTS[18]

Section 47A of the Building Act covers the need to provide car parks, parking buildings and parking facilities. Parking facilities or premises, whether private or public, shall provide the required number of accessible car park spaces.

Where parking is provided, spaces for people with a mobility permit should be provided to meet requirements defined in NZS 4121:2001. The standard recommends the following parking space ratio is to be provided to meet compliance with the Building Code:

Total number of car parks	Number of mobility spaces
1 - 20	Not less than 1
21 - 50	Not less than 2
For every additional 50 car parking spaces	Not less than 1

Table 1: Mobility parking ratio requirements[19]

Specific building types such as medical centres, entertainment centres and large retail facilities should provide greater numbers of accessible car parks than the minimum required.

[18] NZS 4121:2001 Section 5: Car parks
[19] NZS 4121:2001 Section 5: Table 1

There are approximately 150 formal carparks located on:

- Seddon Avenue (SH.2) – Silverton Road to Seddon Street/Moreby Avenue/Rosemont Road (SH.2);
- Seddon Street;
- Rosemont Road (SH.2) – Seddon Avenue (SH.2)/Moreby Avenue/Seddon Street; and
- Silverton Road – Carpark.

Using Table 1 above, this meets the requirements in NZS 4121:2001 for overall numbers.

8.5 LOCATION OF MOBILITY SPACES

Where car parking is provided by the local authority and not the building owner, then the required spaces shall be in the vicinity of the site or building and shall be connected to the site or building by an accessible route[20].

Seddon Street is considered the main street of Waihi. Town Central is situated along Seddon Street, from the roundabout at Seddon Avenue/Rosemont Road (SH.2) and Moresby Avenue to Gilmour Street.

Four Mobility Spaces are situated on Seddon Street at:

- War Memorial Hall;
- 68 Seddon Street – BNZ;
- 67 Seddon Street – Bargains 'n' More; and
- 98 Seddon Street – McLean's Shoes.

Figure 2: Mobility Space at the War Memorial Hall, Seddon Street

[20] NZS 4121:2001 Section 5: Carparks - 5.2.2 Council Provision

A Mobility Space is also located at 16 Seddon Street (Waihi Community Link), 22 Haszard Street (Tandoori Chambers), and in the carpark on Silverton Road.

Figure 3: Mobility Space on Haszard Street

Although the overall total of Mobility Spaces comply when compared to the overall total of parking spaces, when the parking spaces are broken down into specific areas, the following areas do not comply:

- Seddon Street – Mueller Street to Gilmour Street (22 parking spaces) – Install one Mobility Space;
- Silverton Road Carpark (40 parking spaces) – Install one more Mobility Space.

A member of the public has requested a Mobility Space outside Westpac at 78 Seddon Street.

The nearest Mobility Space is situated approx. 55m to the east outside 98 Seddon Street. Relocating this space to outside 78 Seddon Street will reduce the ability for mobility users accessing businesses at the eastern end of the block. If Council wishes to install a Mobility Space outside 78 Seddon Street, it is recommended that the one outside 98 Seddon Street is also retained.

The Mobility Space at 68 Seddon Street (outside the BNZ) is located at the end of the block, near Haszard Street. This increases the distance to the shops near SH.2. Relocating this Mobility Space to 42 Seddon Street (outside Tropical Flair) will 'split' the distance along this block.

The positioning of the Mobility Space in the Carpark on Silverton Road requires rear loading vehicle users to try and avoid catchpits at the rear of the parking space. The situating of the Mobility Space is ideal for access to the Medical facility nearby. Relocating this space to the east away from the catchpits will improve the usability of the Mobility Space.

Figure 4: Silverton Road Carpark

Recommendation 4 Install a Mobility Space at 78 Seddon Street (outside Westpac) and retain the Mobility Space outside 98 Seddon Street (McLean's Shoes).

Recommendation 5 Relocate the Mobility Space at 68 Seddon Street (outside BNZ) to 42 Seddon Street (outside Tropical Flair).

Recommendation 6 Relocate the Mobility Space at the Carpark on Silverton Road to the east to avoid the catchpits at the rear of the existing space.

As HDC cannot control the turnover of businesses in a specific site, as part of the consent process, HDC can explore the options of developers providing Mobility Spaces if the business is considered to have the potential for access customers. Types of businesses that may attract a relatively high proportion of access customers include (but not limited to):

- Supermarkets and Fruit and Vegetable Shops;
- Specialist Health Care Centres, Medical Centres, and Chemists;
- Banks;
- Cafes; and
- NZ Post Offices.

Recommendation 7 Consider Mobility Space placement during the consenting process.

8.6 CONNECTION TO FOOTPATH

A common concern with mobility spaces is the lack of access to the footpath. Easy access is important as the user can quickly move to the safety of the footpath.

NZS 4121:2001 states:

"People with disabilities shall not have to pass behind parked cars when moving to an accessible route or when approaching an entrance."[21]

By installing full length kerb ramps, all types of access users will be able to access the footpath quickly and safely, limiting the time needed to use the live traffic lane. Full length kerb ramps also allow vehicle passengers to safely transfer to their wheelchair without risk of 'tip-over' as all wheelchair wheels are able to be placed on a level surface. Drainage channels often prevent wheelchairs from having all four wheels safely on a level surface as wheelchairs frequently move during transfer, even when brakes have been applied.

Two of the four Mobility Spaces on Seddon Street have access to the footpath on both sides of the space. These are situated at:

- The War Memorial Hall; and
- 68 Seddon Street – BNZ.

This is good practise as it allows for access to the footpath for both mobility user drivers and passengers. Installing full length ramps at the remaining Mobility Spaces on Seddon Street, Haszard Street and Seddon Avenue (SH.2) will complete access to the footpath.

Figure 5: Mobility Space at 68 Seddon Street (BNZ)

Recommendation 8 Install full length kerb ramps at the remaining Mobility Spaces in Waihi to provide quick, easy access to the footpath.

[21] NZS 4121:2001 – Section 5: Car Parks - 5.7.2 Access from Carpark

8.7 DIMENSIONS

One type of mobility space does not fit all users. Access to the vehicle for an access user can be via the drivers' seat, front passenger seat, rear passenger seat, or rear entry to the vehicle. As such, a combination of parallel and angle parking is advised to cater for as many users as possible.

There are four commonly used methods of transporting people who use wheelchairs:

- Wheelchair user transfers from wheelchair to driver position (independently drives);
- Wheelchair user transfers from wheelchair to front passenger position;
- Wheelchair user remains in wheelchair and uses passenger side entrance to enter vehicle (ramp or hoist); and

- Wheelchair user remains in wheelchair and uses rear of vehicle to enter vehicle (most commonly by hoist).

Figure 6: Rear Loading Wheelchair Van

By planning and designing a range of mobility spaces which allow for these four methods, barriers and hazards can be minimised for the wheelchair user. Allowance for these methods can be achieved by lengthening parallel parks, widening parking spaces, removing obstacles beside the carpark (gardens, street furniture, signs etc.) and, for angle parking, allowing space between the rear of the vehicle and the live traffic lane.

There is a conflict of standards between NZS 4121:2001 and the Traffic Control Devices (TCD) Manual when determining the dimensions of a mobility parking space.

NZS 4121:2001 requires an angle parking width of 3.5m[22] and a length of 5m[23]. For vehicles that operate a rear-mounted hoist, a further 1000 – 1300mm is required.

[22] NZS 4121:2001 – Section 5.5.1.2: Angle Parking
[23] NZS 4121:2001 – Section 5.5.2: Length

The width allows the car and the wheelchair to be on the same level when a person is transferring from one to the other. When two Mobility Spaces are located next to each other, the 'extra' 0.5m width can be shared by the two spaces, allowing a total width of 6.5m.

The TCD Manual allows a 3.0m wide angle space, which does not allow for transferring to the wheelchair, and 5.4m length[24].

For parallel parking, the TCD Manual has adopted the NZS 4121:2001 minimum allowance of 5m in length, and recommends 6m in length as good practice[25].

Recommendation 9 Adopt the recommended minimum length in the TCD Manual Part 13: Parking Control of 6m for parallel parking with a further 1.5m allowance for the hoist.

Recommendation 10 Adopt the recommended minimum width in NZS 4121:2001 of 3.5m and the minimum recommended length in the TCD Manual Part 13: Parking Control of 5.4m for angle parking. Allowance of at least 1.5m should be considered between the parking space and the live traffic lane to provide safety for wheelchair users who use rear loading vehicles.

The Mobility Space at 67 Seddon Street is below the recommended 3.5m in width (2.7m). A driveway is to the east of the Mobility Space and is used to access the footpath. Widening the space to 3.5m by removing the carpark to the west of the Mobility Space will greatly improve access for wheelchair users to quickly and safely access the footpath.

Figure 7: Mobility Space outside Bargains' n' More

Recommendation 11 Remove a carpark and widen the Mobility Space at 67 Seddon Street to achieve better access for mobility users.

[24] TCD Manual Part 13: Parking Control – Section 5.3.2 – Table 5.3
[25] TCD Manual Part 13: Parking Control – Section 5.3.1 – Table 5.2

The two Mobility Spaces at the Golden Legacy Centre measured at a total of 5m wide for the two spaces.

Figure 8: Mobility Spaces at Golden Legacy Centre, Moresby Avenue

Recommendation 12 Widen the two Mobility Spaces at the Golden Legacy Centre to a minimum total width of 6.5m.

8.8 MARKINGS

The Land Transport Rule: TCD Amendment 2010 allows a road controlling authority to mark, on an area of roadway that is reserved for parking by the holders of approved disabled persons' parking permits, a blue surface texture or colour[26].

A report in The Gisborne Herald concluded an approximate 50% reduction was achieved in mobility parking infringements once the blue colouring was installed and infringement fee increased[27]. A similar result was achieved in Hamilton and other district councils have reported similar trends.

While full blue coverage is preferred for marking mobility parking spaces, in the interest of maintenance and costs, consideration could be given to only partially colouring the mobility space as shown in Figure 9.

A 1m strip for the length of the road edge of the carpark will provide visual notice to road users, reduce installation costs, and reduce the need for repair when replacing kerb and channel etc.

During previous consultation processes where this has been suggested, concern was raised about visibility of the mobility parking space from the footpath. Installing a blue coloured metal plate or a blue strip on the top of the kerb will aid pedestrians to 'police' the spaces.

[26] TCD Amendment 2010 Rule 54002/4 – Sections 2.6 and 2.19
[27] Gisborne Herald – 18th June 2012

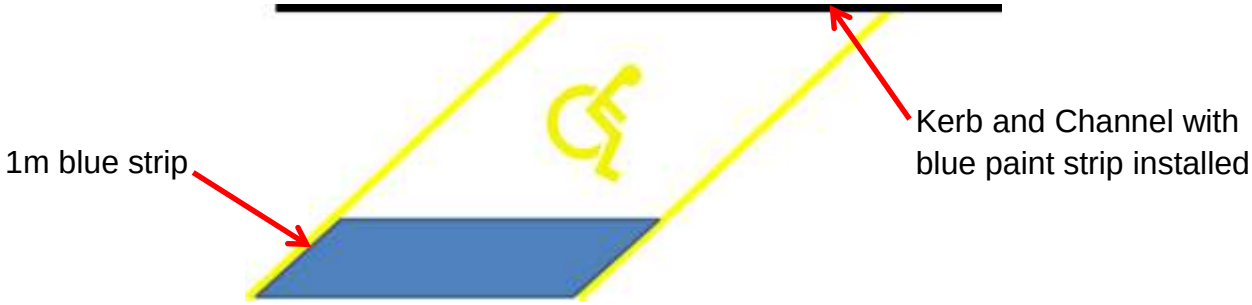


Figure 9: Mobility Space with blue surfacing design

Recommendation 13 Install blue marking as per figure 9 will aid with maintaining a non-slip surface with the colour of both the surface and the marking to comply with Land Transport Rule: Traffic Control Devices 2004.

Note: Hauraki District Council has provided blue markings for two Mobility Spaces in Paeroa.

8.9 SURFACE

NZS 4121:2001 states the surface for a Mobility Space shall provide a stable, firm, slip resistant flat surface with a slope not exceeding 1 in 50 (2%)[28]. This slope on on-street spaces is difficult to achieve, so an absolute maximum grade of 1 in 12 (8.3%) should be adhered to.

Overall, the condition of the Mobility Spaces provided in Waihi is good with crossfall on all Mobility Spaces except for one measuring below 1 in 14 (7.1%).

The Mobility Space at the War Memorial Hall had a crossfall of 1 in 10.2 (9.8%). This creates a particular problem for manual wheelchair users as it is difficult to maintain the wheelchair in the one spot while transferring from the vehicle. The speed hump at the rear is also an obstacle for rear loading mobility users as they try to access the footpath.

Relocating this Mobility Space to the other side of the crossing facility, outside 47 Seddon Street (outside Waihi Leader) will create an opportunity to address the crossfall on the carriageway and remove the speed hump as a barrier.

Recommendation 14 Relocate the Mobility Space outside the War Memorial Hall to 47 Seddon Street to improve the crossfall of the space and remove the speed hump as a barrier.

[28] NZS 4121:2001 Section 5: Car Parks – 5.6 Surface

9 KERB RAMPS

Footpaths for mobility impaired users are just like roads are for vehicles. If one road does not connect to another road, the usefulness of the footpath is decreased. Kerb ramps are used just as intersections are used for roads.

Kerb ramps are a vital component for mobility access. As they provide access to the safety of the footpath, a relatively small fault can become a serious hazard. Without them, mobility scooters, pushchairs, and wheelchair users are often forced into live traffic lanes to the nearest driveway before accessing the footpath.

When designing kerb ramps, it is important to ensure that[29]:

- If there is a kerb ramp on one side of the roadway, there is also one on the other to prevent pedestrians being 'stranded' on the roadway itself; and
- There are no low points in the gutter where water and silt can collect.

The Pedestrian Planning and Design Guide (PPDG) states the following guidelines when designing kerb ramps[30]:

- Ramp – Normal maximum gradient 1 in 12 (8.33%), Maximum gradient 1 in 8 (12.5%). A gradient of 12.5% should only be considered for constrained situations where the vertical rise is less than 75mm;
- Maximum crossfall of 2%; and
- Minimum width of 1m, 1.5m is recommended. Maximum width to equal the width of the approaching footpath.

While these guidelines provide a good starting point, some are still not accessible by disabled people with impaired mobility.

While 1 in 12 is recommended by the PPDG, manual wheelchair users still struggle to manage this grade. A desirable maximum grade of 1 in 14 is more usable. A grade of 1 in 8 is not usable by most people using mobility devices so an absolute maximum of 1 in 12 should be adopted instead of 1 in 8.

For the kerb and channel itself:

- Maximum gradient is 5%. Anything greater can cause wheelchair users to lose their balance at the transition; and
- Transition between kerb and channel and ramp or carriageway should be smooth with no vertical face. Milling of the carriageway at the channel may need to be performed so this does not inadvertently happen when the roadway has been resurfaced.

[29] Pedestrian Planning and Design Guide – Section 15.6.1: Kerb ramps
[30] Pedestrian Planning and Design Guide – Table 15.2

Kerb flares (transition from full kerb face to cut-down kerb) is to have a maximum gradient of 1 in 6 (16%).

The PPDG recommends kerb crossings should be installed wherever a footpath crosses an intersection and at every pedestrian crossing point[31]. Kerb ramps should be installed at every kerb crossing where the grade changes as pedestrians step onto the roadway. They should guide pedestrians to the safest place to cross.

Tactile paving should be used at kerb crossings so that visually impaired pedestrians are aware of the change from footpath to roadway (discussed in Section 9: Tactiles).

The width of 1.8m for the cut down allows the user to access the footpath without the need for slowing down in the carriageway to negotiate footpath access, particularly if the crossing direction is at an angle to the kerb.

Recommendation 15 Adopt the Pedestrian Planning and Design Guide for Kerb Ramps with the following changes:

- Ramp – Normal maximum gradient to be 1 in 14 (7.14%), with the absolute maximum gradient to be 1 in 12 (8.33%); and
- Minimum cut down width of 1.8m.

Note: Tactile Ground Surface Indicators (“Tactiles”) form an integral part of kerb ramp quality and effectiveness. Tactiles in Waihi are discussed in Section 9: Tactiles.

Recommendation 16 Replace all kerb ramps as required during the maintenance programme to a minimum width of 1.8m and a maximum grade of 1 in 14 (7.1%).

9.1 INTERSECTIONS

People with impaired mobility rely on kerb ramps to safely cross the road. They provide the vital link from one footpath to the other. Without them, the link between footpaths is broken and mobility impaired users are then often required to use the live carriageway instead.

A steeply graded kerb ramp or a lip in the channel is often as bad as not having one at all. As stated above, if the grade is to steep, then people in wheelchairs and mobility scooters are not able to safely and quickly negotiate the obstacle. A lip in the channel is when a small vertical face is situated at the invert of the channel and prevents users from being able to use the kerb ramp.

This is particularly important at intersections where drivers have to be aware of multiple actions.

[31] Pedestrian Planning and Design Guide – Section 6.4.5: Kerb crossings

9.2 SH.2 INTERSECTIONS

SH.2 is a major highway for the North Island. It provides a connection from Auckland to Tauranga, through to Napier/Hastings, then on to the Wairarapa and ends at Wellington.

NZTA has a traffic volume measuring station located 40m south of Crean Road[32]. In 2013, the Annual Average Daily Traffic Count (AADT) was 9467 vehicles with 9.7% heavy vehicles.

SH.2 runs through the heart of Waihi. Without proper crossing connections, this can create a severance through the middle of Waihi. There are a number of intersections along the length of SH.2:

- Seddon Avenue – Village Way, Toomey Street, Kenny Street, Victoria Street, Featon Road, Martin Road, Baber Street, School Lane, Moreby Avenue, and Seddon Street; and
- Rosemont Road – Kenny Street (SH.25), Johnston Street, Consols Street, Rosemont Road, Union Street, Haszard Street, Christensen Street, Evans Street, Mueller Street, Adams Street; and Gilmour Street.

The following kerb ramps on SH.2 have a grade greater than 1 in 8 (12.5%):

- Kenny Street SH.25 (north/west crossing Kenny Street) – 1 in 7.8 (12.8%);
- Rosemont Road (south/east crossing Rosemont Road) – 1 in 6.1 (16.4%); and
- Mueller Street (north/east crossing Mueller Street) – 1 in 6.9 (14.4%).

Recommendation 17 Replace the kerb ramps to a maximum grade of 1 in 14 (7.1%) at the intersections of SH.2 with:

- Kenny Street (SH.25, north/west crossing Kenny Street);
- Rosemont Road (south/east crossing Rosemont Road); and
- Mueller Street (north/east crossing Mueller Street).

The following kerb ramps on SH.2 have a grade greater than 1 in 12 (8.3%):

- Village Way (east crossing Village Way) – 1 in 8.2 (12.2%);
- Victoria Street (south/west crossing Victoria Street) – 1 in 9.4 (10.6%);
- Seddon Street (south/east crossing SH.2) – 1 in 11 (9.1%);
- Kenny Street SH.25 (south/east crossing SH.25) – 1 in 10.2 (9.8%);
- Kenny Street SH.25 (south/west crossing Kenny Street) – 1 in 9.4 (10.6%);
- Johnston Street (south/west crossing Johnston Street) – 1 in 9.4 (10.6%);
- Union Street (north/east crossing Union Street) – 1 in 10.1 (9.9%);

[32] State Highway Traffic Data Booklet 2009 - 2013

- Union Street (north/west crossing Union Street) – 1 in 11.2 (8.9%);
- Union Street (south/west crossing Union Street) – 1 in 8.7 (11.5%);
- Christensen Street (south/west crossing Christensen Street) – 1 in 8 (12.4%); and
- Christensen Street (south/east crossing Christensen Street) – 1 in 10.4 (9.6%).

Recommendation 18 Replace the kerb ramps to a maximum grade of 1 in 14 (7.1%) at the intersections of SH.2 with:

- Village Way (east crossing Village Way);
- Victoria Street (south/west crossing Victoria Street);
- Seddon Street (south/east crossing SH.2);
- Kenny Street SH.25 (south/east crossing SH.25, and south/west crossing Kenny Street);
- Johnston Street (south/west crossing Johnston Street);
- Union Street (north/east, north/west, and south/west crossing Union Street); and
- Christensen Street (south/west and south/east crossing Christensen Street).

A number of kerb ramps along SH.2 crossing the side roads have lip kerbs (a small vertical face at the invert of the channel):

- Village Way (north/west crossing Village Way);
- Victoria Street (south/east crossing Victoria Street);
- Devon Street (south/west and south/east crossing Devon Street);
- School Lane (north/east crossing School Lane);
- Moresby Avenue (north/east crossing Moresby Avenue);
- Seddon Street (pedestrian crossing Seddon Street – both sides; south/west crossing SH.2);
- Kenny Street SH.25 (north/east and north/west crossing SH.2);
- Johnston Street (north/east and south/east crossing Johnston Street);
- Haszard Street (south/east crossing Haszard Street);
- Mueller Street (south/east crossing Mueller Street); and
- Evans Street (north/west and south/west crossing Evans Street).

Figure 10: Lip Kerb at SH.2/School Lane

Recommendation 19 Replace the lip kerb ramps to flush and a maximum grade of 1 in 14 (7.1%) at the intersections of SH.2 with:

- Village Way (north/west crossing Village Way);
- Victoria Street (south/east crossing Victoria Street);
- Devon Street (south/west and south/east crossing Devon Street);
- School Lane (north/east crossing School Lane);
- Moresby Avenue (north/east crossing Moresby Avenue);
- Seddon Street (pedestrian crossing Seddon Street – both sides; south/west crossing SH.2);
- Kenny Street SH25 (north/east and north/west crossing SH.2);
- Johnston Street (north/east and south/east crossing Johnston Street);
- Haszard Street (south/east crossing Haszard Street);
- Mueller Street (south/east crossing Mueller Street); and
- Evans Street (north/west and south/west crossing Evans Street).

The grade of the carriageway is just as important as the grade of the kerb ramp. The following intersections on SH.2 had gradients on the carriageway greater than 1 in 12 (8.3%):

- School Lane (north/west crossing School Lane) – 1 in 11 (9.1%);
- Moresby Avenue (north/west crossing Moresby Avenue) – 1 in 8.5 (11.7%); and
- Johnston Street (south/west crossing Johnston Street) – 1 in 5.5 (18.1%).

Recommendation 20 Re-grade the carriageway to a maximum grade of 1 in 14 (7.1%) at the intersections of SH.2 with:

- School Lane (north/west crossing School Lane);
- Moresby Avenue (north/west crossing Moresby Avenue); and
- Johnston Street (south/west crossing Johnston Street).

Other kerb ramps of minor concern at intersections along SH.2 are:

- Johnston Street (north/west crossing Johnston Street – footpath needs repair);
- Union Street (north/east and south/east crossing Union Street – Carriageway needs repair); and
- Adams Street (north/west crossing Adams Street – remove kerb ramp).

Recommendation 21 Repair the kerb ramps at the intersections of SH.2 with:

- Johnston Street (north/west crossing Johnston Street);
- Union Street (north/east and south/east crossing Union Street); and
- Remove the kerb ramp at Adams Street (north/west crossing Adams Street).

Other kerb ramps of significant concern at intersections along SH.2 are:

- Baber Street (south/west and south east kerb ramps do not line up);
- Kenny Street SH.25 (north/east crossing SH.25 uses the vehicle entrance to a Service Lane); and
- Rosemont Road (south/west crossing Rosemont Road uses a vehicle entrance to a private property).

These crossing opportunities are discussed further in Section 12: Crossing Opportunities.

Of greatest concern is the lack of crossing opportunities of SH.2. For the Seddon Avenue section of SH.2, the crossing opportunities provided for mobility impaired users are:

- Mid-block crossing with refuge island at Victoria Park; and
- Seddon Avenue / Moresby Avenue / Seddon Street / Rosemont Road roundabout.

Figure 11: Mid-block crossing opportunity on SH.2 to Victoria Park

On the Rosemont Road/Tauranga Road section there are crossing opportunities at:

- Seddon Avenue / Moresby Avenue / Seddon Street / Rosemont Road roundabout; and
- Kenny Street intersection (north side).

By providing kerb ramps at more intersections, more crossing opportunities will become available. Further analysis of specific crossing opportunities and treatments for SH.2 is discussed in Section 12: Crossing Opportunities.

9.3 SH.25 INTERSECTIONS

SH.25 starts at Thames, continues around the Coromandel Peninsula to Whangamata, and finishes as Kenny Street in Waihi at the intersection with SH.2.

NZTA has a traffic volume measuring station located north of Gladstone Rd. In 2013, the AADT was 2514 vehicles with 9.2% heavy vehicles.

The volume of traffic on SH.25 increases considerably in the summer months, so the average vehicles per day reading is not a true reflection on the nature of this road.

The following roads intersect with SH.25:

- Haszard Street;
- Mueller Street;
- Gilmour Street; and
- Clarke Street.

The following kerb ramps on SH.25 have a grade greater than 1 in 8 (12.5%):

- Haszard Street (north/west crossing Haszard Street) – 1 in 4.8 (20.7%); and
- Gilmour Street (south/west crossing Gilmour Street) – 1 in 6.3 (16%).

Recommendation 22 Replace the kerb ramps to a maximum grade of 1 in 14 (7.1%) at the intersections of SH.25 with:

- Haszard Street (north/west crossing Haszard Street); and
- Gilmour Street (south/west crossing Gilmour Street).

The following kerb ramps on SH.25 have a grade greater than 1 in 12 (8.3%):

- Gilmour Street (north/west crossing Gilmour Street) – 1 in 8.4 (11.9%); and
- Gilmour Street (north/east crossing Gilmour Street) – 1 in 9.4 (10.6%).

Recommendation 23 Replace the kerb ramps to a maximum grade of 1 in 14 (7.1%) at the intersection of SH.25 with Gilmour Street (north/west and north/east crossing Gilmour Street).

The following kerb ramps along SH.25 crossing the side roads have lip kerbs:

- Haszard Street (both sides crossing Haszard Street); and
- Clarke Street (both sides crossing Clarke Street).

Recommendation 24 Replace the lip kerb ramps to flush and a maximum grade of 1 in 14 (7.1%) at the intersections of SH.25 with:

- Haszard Street (both sides crossing Haszard Street); and
- Clarke Street (both sides crossing Clarke Street).

Like SH.2 there is a concern of the lack of crossing opportunities of SH.25. For the Seddon Avenue section of SH.2, the crossing opportunities provided for mobility impaired users are:

By providing kerb ramps at more intersections, more crossing opportunities will become available. Further analysis of specific crossing opportunities and treatments for SH.2 is discussed in Section 12: Crossing Opportunities.

9.4 SEDDON STREET INTERSECTIONS

For the purposes of this report, Seddon Street Starts at the roundabout with SH.2/Moresby Avenue and Gilmour Street.

The following roads intersect with Seddon Street:

- Moresby Avenue;
- Haszard Street;
- Mueller Street; and
- Gilmour Street.

The following kerb ramp on Seddon Street has a grade greater than 1 in 12 (8.3%):

- Gilmour Street (south/west crossing Gilmour Street) – 1 in 9.5 (10.5%).

Recommendation 25 Replace the kerb ramp at the intersection of Seddon Street and Gilmour Street (south/west crossing Gilmour Street) to a maximum grade of 1 in 14 (7.1%).

The following kerb ramps along Seddon Street at the intersections with side roads have lip kerbs:

- Haszard Street (north/west crossing Seddon Street and refuge island);
- Haszard Street (north/west and north/east crossing Haszard Street);
- Haszard Street (south/west and south/east crossing Haszard Street and Seddon Street);
- Mueller Street (north/west, north/east, south/west, and south/east crossing Seddon Street and refuge island);
- Mueller Street (south/west and south/east crossing Mueller Street);
- Mueller Street (refuge island on Seddon Street); and
- Gilmour Street (north/east crossing Seddon Street).

Figure 12: Lip kerb at Seddon Street/Mueller Street Intersection.

Recommendation 26 Replace the lip kerb ramps to flush and a maximum grade of 1 in 14 (7.1%) at the intersections of Seddon Street with:

- Haszard Street (north/west crossing Seddon Street and refuge island);
- Haszard Street (north/west and north/east crossing Haszard Street);
- Haszard Street (south/west and south/east crossing Haszard Street and Seddon Street);
- Mueller Street (north/west, north/east, south/west, and south/east crossing Seddon Street);
- Mueller Street (south/west and south/east crossing Mueller Street);
- Mueller Street (refuge island on Seddon Street); and
- Gilmour Street (north/east crossing Seddon Street).

The intersection of Clarke Street/George Street and Clarke Street/Union (north/west) has kerb ramps of greater than 1 in 8 (12.5%). Improving the grades to a maximum grade of 1 in 14 (7.1%) will improve access in this area.

Recommendation 27 Improve the kerb ramps at the intersection of Clarke Street/George Street and Clarke Street/Union Street (north/west) to a maximum grade of 1 in 14 (7.1%).

The following intersections have lip kerbs:

- Gilmour Street/Wilson Street – Both kerb ramps crossing Wilson Street;
- Moresby Avenue/Eliot Street – North/west corner crossing Eliot Street;
- Russell Street/Picket Place –North/east kerb ramp crossing Russell Street; and
- Russell Street/Walker Street – North/west and north/east kerb ramps crossing Walker Street.

Recommendation 28 Replace the lip kerb ramps at the following intersections to flush and a maximum grade of 1 in 14 (7.1%):

- Gilmour Street/Wilson Street – Both kerb ramps crossing Wilson Street;
- Moresby Avenue/Eliot Street – North/west corner crossing Eliot Street;
- Russell Street/Picket Place –North/east kerb ramp crossing Russell Street; and
- Russell Street/Walker Street – North/west and north/east kerb ramps crossing Walker Street.

9.5 ALIGNMENT OF KERB RAMPS

The correct alignment of kerb ramps promotes universal access by providing a consistent message to all pedestrians about direction across a road. Correct kerb ramp alignment has particular benefit for blind and vision-impaired people to align themselves correctly with the crossing.

A common practise in the residential area of Waihi is to have the kerb ramps on the apex of the curve at an intersection. This is dangerous practise as it directs mobility scooters, wheelchair users and visually impaired users into the live carriageway.

Appendix B provides standard kerb ramp layouts for the various types of intersection in Waihi with minor variations to best fit the particular intersection.

The following intersections have kerb ramps greater than 1 in 8 (12.5%) with the recommendations of layout to be adopted at each intersection:

- Kensington Road/Rata Street – Layout B; and
- Moresby Avenue/Kensington Road – Layout A.

Recommendation 29 Improve the layouts on Kensington Road at the intersections with Moresby Avenue and Rata Street to improve access in this area.

The following intersections have kerb ramps greater than 1 in 12.5 (8.3%) with the recommendations of layout to be adopted at each intersection:

- Kensington Road/Macky Street – Layout D or E; and
- Kensington Road/Walker Street – Layout D or E.

Recommendation 30 Improve the layouts on Kensington Road at the intersections with Macky Street and Walker Street to improve access in this area.

The following intersections have kerb ramps with lip kerbs with the recommendations of layout to be adopted at each intersection:

- Gilmour Street/Johnston Street – Layout D or E;
- Gilmour Street/Union Street – Layout C;
- Kensington Road/Russell Street – Layout B;
- Kensington Road/Toomey Street – Layout B; and
- Mueller Street/Johnston Street – Layout D or E.

Recommendation 31 Improve the layouts of the following intersections to improve access in this area:

- Gilmour Street/Johnston Street – Layout D or E;
- Gilmour Street/Union Street – Layout C;
- Kensington Road/Russell Street – Layout B;
- Kensington Road/Toomey Street – Layout B; and
- Mueller Street/Johnston Street – Layout D or E.

9.6 RE-SEALING

Re-sealing the carriageway can create a small lip where joining the kerb channel. This can require a wheelchair user to stop in the channel before negotiating the barrier. Milling the seal edge before re-sealing can eliminate this problem.

Figure 13: Seal edge join after re-sealing

Recommendation 32 Adopt the practise of milling seal edges at the join of the seal and the kerb channel, especially at areas where a flush kerb cut down is present, in maintenance contracts.

10 TACTILES

10.1 USE OF TACTILES[33]

Tactile ground surface indicators (Tactiles) provide pedestrians with visual and sensory information. The two types of Tactiles are Warning Indicators and Directional Indicators.

Warning Indicators alert pedestrians to hazards in the continuous accessible path of travel. They are used to indicate that pedestrians should stop to determine the nature of the hazard before proceeding further. They do not indicate what the hazard will be.

Directional Indicators give directional orientation to blind and vision-impaired people and designate the continuous accessible path of travel when other tactile or environmental cues are insufficient.

When combined with other environmental information, Tactiles assist blind and vision-impaired people with their orientation and awareness of impending obstacles, hazards and changes in the direction of the continuous accessible path of travel.

10.2 VISUAL CONTRAST[34]

Research by Bentzen et al (Accessible design for the blind, May 2000) indicated that the colour 'safety yellow' is so salient, even to persons having very low vision, that it is highly visible even when used in association with adjoining surfaces having a light reflectance value differing by as little as 40%. Their research found that safety yellow Tactiles having a 40% contrast from new concrete was subjectively judged to be more detectable than darker Tactiles having an 86% contrast with new concrete.

Figure 14: Tactiles at SH.2/Seddon Street Roundabout

[33] RTS 14 Guidelines for Facilities for Blind and Vision-Impaired Pedestrians
[34] RTS 14 Guidelines for Facilities for Blind and Vision-Impaired Pedestrians – Section 4.3: Visual Contrast

Safety yellow is the recommended standard colour for Tactiles and should be the only colour used.

A good option if choosing to install a Tactile paver, is to consider a sealed Tactile paver similar to the product Freedom Strategies provide. A sealed paver will hold the colour longer, therefore increasing the life of the paver.

Other options include individual plastic domes which can then be positioned to suit the individual crossing point. If this option is chosen, a guarantee is essential and a regular maintenance programme will need to be developed with the installer to ensure domes are replaced when lost.

Recommendation 33 When installing Tactiles, ensure the Tactiles are safety yellow as recommended by the RTS 14 Guidelines for Facilities for Blind and Vision Impaired Pedestrians.

The following locations need to have the Warning Indicators replaced to a safety yellow standard:

- SH.2 mid-block pedestrian crossing (Seddon Street to SH.25);

Figure 15: SH.2 Pedestrian Crossing

- Mid-block crossing point on Seddon Street – outside the War Memorial Hall; and

Figure 16: Seddon Street crossing opportunity - War Memorial Hall

- Mid-block crossing point on Seddon Street – outside D.M Stuart Barristers & Solicitors.

Recommendation 34 Replace the Warning Indicators at the mid-block crossing opportunities on Seddon Street (SH.2 to Mueller Street) and at the pedestrian crossing on SH.2 (Seddon Street to SH.25) to safety yellow.

10.3 INSTALLATION OF WARNING INDICATORS[35]

Warning Indicators alert people who are blind or vision-impaired to pending obstacles or hazards on the continuous accessible path that could not reasonably be expected or anticipated using other tactile and environmental cues.

Warning Indicators shall be installed to inform blind and vision-impaired people of:

- Life threatening hazards where serious falls may occur;
- All pedestrian kerb crossing points (both formal and informal), paths cut through medians, and other places where the footpath is not separated from the roadway by an abrupt change of grade of at least 12.5% (or 1:8) or with a vertical kerb more than 70mm high;
- The presence of level railway crossings; and
- Overhead impediments or hazards other than doorways (e.g., wall mounted objects and archway structures), with a clearance of less than 2m from ground level, in an accessible open public space with no clearly defined continuous accessible path of travel.

Warning Indicators may also be installed to inform blind and vision-impaired people of:

- Vehicle hazards at busy vehicle crossing points such as: Shopping Centres, Bus Stations and large public car parks; and
- Street furniture inappropriately located in the continuous accessible path of travel and not detectable by a vision-impaired person using the aid of a white cane.

Warning Indicators shall be installed across the full width of all pedestrian kerb crossings (excluding cut down transitions) and paths cut through medians to ensure that all blind and vision-impaired people using these facilities encounter the Warning Indicators. They must also be installed with the front and back edges perpendicular to the crossing direction so that the domes are aligned with the direct line of travel across the road. This will enable blind and vision-impaired people to align themselves correctly with the crossing.

[35] RTS 14 Guidelines for Facilities for Blind and Vision-Impaired Pedestrians – Section 4.4: Where are Tactiles installed

Warning Indicators shall be installed[36]:

- Across the full width of all pedestrian kerb crossings (excluding kerb flares);
- Through medians to ensure that all blind and vision-impaired people using these facilities encounter the warning indicators;
- With the front and back edges perpendicular to the crossing direction to enable blind and vision-impaired people to align themselves correctly;
- So that the domes are aligned with the direct line of travel across the road;
- So that the front edge of the Warning Indicator is no closer than 300mm from the back of kerb;
- So that the front edge of the Warning Indicator is no further than 1000mm from the back of kerb, or to a point where a pedestrian could inadvertently bypass the Warning Indicator and enter the hazard (whichever is closer); and
- To a recommended depth of 600mm (This depth is required to prevent a pedestrian from inadvertently stepping over the Tactiles.)

For Waihi, Warning Indicators need to be installed at every crossing opportunity, including all intersections and mid-block crossing points. This is a considerable investment, so these should be installed as the intersections are upgraded in Section 9: Kerb Ramps. A partnership with the Royal New Zealand Foundation for the Blind will assist with setting priorities.

Initial priorities for the installation of Warning Indicators at all intersections and crossing opportunities on:

- Seddon Street;
- SH.2 – Waihi Hospital to SH.25;
- SH.25 – SH.2 to Gilmour Street; and
- Kenny Street – Victoria Park to SH.25.

10.4 INSTALLATION OF DIRECTIONAL INDICATORS

Directional Indicators shall be used to provide directional guidance where a person must deviate from the continuous accessible path of travel to gain access to:

- A road crossing point;
- Public transport access point; and
- Significant public facility e.g. public toilets or information centre.

[36] RTS 14 Guidelines for Facilities for Blind and Vision-Impaired Pedestrians – Section 4.5.1: Warning Indicators.

Where other environmental cues are insufficient, Directional Indicators may also be used to provide directional guidance:

- Across open space from one point to another; or
- Around obstacles in the continuous accessible path of travel (where warning tiles are not sufficient).

Where required, Directional Indicators shall be installed in conjunction with warning indicators where a road crossing point is not located in the continuous accessible path of travel and directional guidance is required.

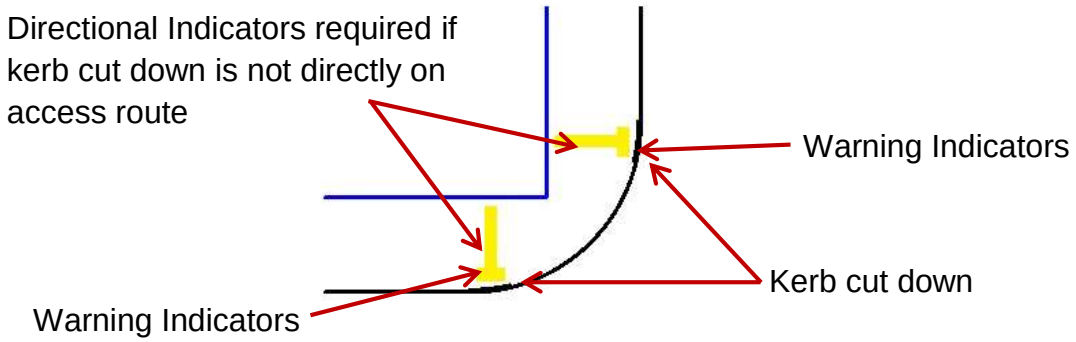


Figure 17: Preferred Layout of crossing points with Tactile Paving

Where required, Directional Indicators shall be installed[37]:

- In conjunction with Warning Indicators where a road crossing point is not located in the continuous accessible path of travel and directional guidance is required; and
- Across the full width of the path, with a minimum depth of 600mm to indicate a change in direction of the continuous accessible path of travel.

In Waihi, Directional Indicators need to be installed at every crossing opportunity which is not on the continuous access route. This includes all mid-block crossing points and intersection layouts as detailed in Section 9: Kerb Ramps.

The mid-block pedestrian crossing on Moresby Avenue has Directional Indicators already installed over half of the footpath. Extending the Indicators to the full width of the footpath and to the Warning Indicators will ensure all visually impaired users will not miss the pedestrian crossing.

[37] RTS 14 Guidelines for Facilities for Blind and Vision-Impaired Pedestrians – Section 4.5.2: Directional Indicators.

Figure 18: Mid-Block pedestrian crossing on Moresby Avenue

Recommendation 35 Extend the Directional Indicators at the mid-block pedestrian crossing on Moresby Avenue to be the full width of the footpath and to the Warning Indicators.

10.5 REFUGE ISLANDS AND SPLITTER ISLANDS

Warning Indicators shall be provided at all refuge islands and splitter islands. They shall cover the full width of the median cut through of the island. The layout of the Tactiles in the median will vary depending on the depth of the median and shape of the island cut through. See figure 28 in Section 12: Crossing Opportunities for further details.

Recommendation 36 Install Warning Indicators on all refuge and splitter islands.

10.6 WIDTH OF WARNING INDICATORS

It is important that the Warning Indicators are across the full width of the crossing point. Any gaps and the Warning Indicators could be missed, along with the vital information they provide.

As all kerb ramps at the intersections are under the recommended width, as recommendation 14 is carried out, Warning Indicators should be installed to the full width of the kerb ramp.

Recommendation 37 Ensure all Warning Indicators are installed to the full width of the kerb ramp as required in Recommendation 14.

10.7 ALIGNMENT OF TACTILES

As mentioned above, correct alignment of Tactiles enables blind and vision-impaired people to align themselves correctly with the crossing.

HDC has achieved a high standard with the alignment of Tactiles that are already installed in Waihi.

Recommendation 38 Ensure all Tactiles installed in future works align the user to the crossing alignment.

10.8 OTHER VISUAL CUES

Sometimes it is necessary to provide contrasting visual guidance without the need for installing Warning or Directional Indicators. A yellow guideline at the boundary or back of footpath of a vehicle crossing can aid visually impaired users to stay on the footpath. The guideline can also remind vehicle users of the footpath and the need to give way to pedestrians. An excellent example of the use of yellow guidelines is at Newmont Waihi Gold on Martha Street.

Figure 19: Yellow footpath guideline at Newmont Gold Waihi

The boundary or back of footpath requires delineation at:

- Mitre 10 – SH.2 (Baber Street to Devon Street);
- KFC/Commercial Hotel – SH.2 (Devon Street to Silverton Road);
- Mobil – SH.2 (Martin Road to School Lane);
- Countdown – SH.2 (Kenny Street to Johnston Street);
- BP – SH.2 (SH.25 to Johnston Street) and SH.25 (SH.2 to Haszard Street);
- Waihi Police – SH.25 (SH.2 to Haszard Street);
- Waihi Farm & Industrial Services and Waihi Fire Station – SH.25 (Haszard Street to Mueller Street); and
- Devon Street – Kenny Street to Spargo (10a Devon Street).

Figure 20: Footpath at Waihi Farm & Industrial Services on SH.25

Recommendation 39 Install yellow guidelines at the boundary or back of footpath:

- Mitre 10 – SH.2 (Baber Street to Devon Street);
- KFC/Commercial Hotel – SH.2 (Devon Street to Silverton Road);
- Mobil – SH.2 (Martin Road to School Lane);
- Countdown – SH.2 (Kenny Street to Johnston Street);
- BP – SH.2 (SH.25 to Johnston Street) and SH.25 (SH.2 to Haszard Street);
- Waihi Police – SH.25 (SH.2 to Haszard Street);
- Waihi Farm & Industrial Services and Waihi Fire Station – SH.25 (Haszard Street to Mueller Street); and
- Devon Street – Kenny Street to Spargo (10a Devon Street).

A footing of a sign at the Mobil Service Station on SH.2 protrudes the surface of the footpath at the School Lane end of the Service Station. Highlighting the footing in yellow will aid visually impaired users when navigating the sign in this location.

Figure 21: Sign at the Mobil Service Station on SH.2

Similarly, a power pole outside Countdown on SH.2 is in the middle of the footpath. This can create a hazard for visually impaired users and young children. A long term solution would be to request Powerco to re-locate the power pole to the rear of the footpath. A short term solution is to highlight the pole by painting the first two metres in yellow.

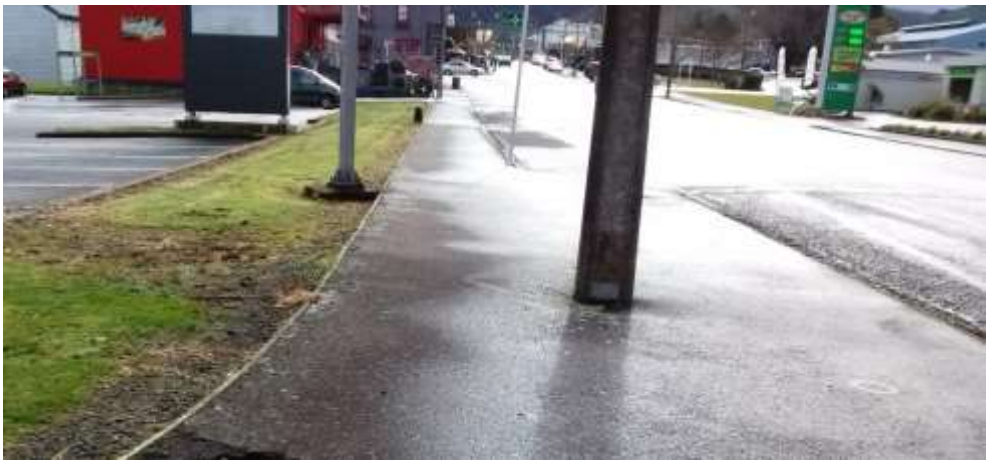


Figure 22: Power Pole outside Countdown on SH.2

Recommendation 40 Highlight the sign footing at the Mobil Service Station and the power pole outside Countdown on SH.2 in yellow to aid visually impaired users navigate these locations.

11 FOOTPATHS

11.1 PROVISION OF FOOTPATHS

Footpaths enable pedestrians to get to and from their place of work or school and move around the community to meet in social, sporting, work or cultural events. A safe and effective footpath with continuous connectivity provides good access to the community for the mobility impaired.

A number of improvements have been made to the footpaths in the main shopping centre of Waihi. As a result, a combination of Asphaltic Concrete with tiles has been laid to create a softer, more appealing environment.

Note: Care needs to be taken when the surface of the tiles is wet. Monitor the situation by recording complaints of slipping on the tiles to determine the continued use of these tiles.

Figure 23: Excellent footpath surface on Seddon Street

A very common practise in smaller urban settlements in New Zealand is to install footpath on one side only of the road. This is considered as the minimum provision and the road controlling authority should be able to demonstrate clearly why walking is not expected in that area. In the case of new developments, this responsibility passes onto the developer. Retro-fitting is costly to HDC, so the preferred standard is to install them in any new developments.[38]

[38] Pedestrian Planning Design Guidelines Section 14.1: Where Footpaths Should Be Provided

The PPDG provides guidance for providing footpaths:

Land Use	Footpath Provision			
	New Roads		Existing Roads	
	Preferred	Minimum	Preferred	Minimum
Commercial & Industrial	Both Sides		Both Sides	
Residential (on Arterials)				
Residential (on Collector roads)				
Residential (on Local Streets			Both Sides	One Side

Table 2: When to Provide Footpaths[39]

For the mobility impaired user, having a footpath on one side often means having to use the road for access. Ideally, footpaths should be provided on both sides of the road for full accessibility. In situations where a footpath is only on one side, regular connections should be made available for access to the footpath.

The existing footpath provisions assessed in the geographic area of interest is listed in Appendix D: Footpath Provisions.

Footpaths should be treated in the same vein as roads are for vehicles. With the increase of mobility scooters, the provision of footpaths are becoming more important as without them, mobility scooters users will often use the road instead of crossing over to the footpath on the other side.

When considering footpaths on minor roads, consideration should be given to achieving access to the existing footpath from the other side of the road and side roads.

The first priority is to complete the connections to ensure a continuous access route. This can be achieved by either installing new footpaths or providing crossing opportunities. Given the locality and traffic volumes along these roads, installing footpaths on both sides of local roads would be deemed a low priority, long term plan. The short term plan should be to ensure sufficient access across the road can

[39] Pedestrian Planning Design Guidelines Table 14.1: When to Provide Footpaths

be achieved. Crossing opportunities is discussed in Section 12: Crossing Opportunities.

Further consultation with the community is recommended to identify the priority of the installation of footpaths. The consultation should be done in this financial year, with the provision of a set yearly budget that is comfortable for Council to afford and will deliver the programme over an acceptable period. It is recommended HDC advise the community of the set budget so the expectations are not set too high within the community.

Recommendation 41 Consult further with the Waihi community to develop a long term programme for the installation of footpaths on both sides of the road.

HDC can also ensure that all future developments have footpaths installed on both sides as per table 2.

Recommendation 42 Ensure all future development in Waihi has footpaths installed on both sides of the new road.

11.2 FOOTPATH WIDTH

Footpath width is often under-rated for accessibility. A wider footpath provides a safer passage of use for mobility scooters, wheelchairs, and pushchairs eliminating the requirement to use an uneven surface, such as a grass berm. The PPDG provides the following guidelines for the through route of footpaths:

Location	Maximum pedestrian flow	Through route width
Arterial roads in pedestrian districts; CBD; alongside parks and schools; other major pedestrian generators	80 p/min	>2.4m
Local roads in pedestrian districts; Commercial/ industrial areas outside the CBD; Collector roads	60 p/min	1.8 m
Local roads in residential areas	50 p/min	1.5 m
Absolute minimum*	50 p/min	1.5 m

Table 3: Minimum Footpath Dimensions

*Note: The absolute minimum width is only acceptable in existing constrained conditions and where it is not possible to reallocate road space.

Most of the footpaths in the geographic area of interest are below the absolute minimum of 1.5m. A narrow footpath creates difficulty for mobility scooters and

pushchairs to pass. With a steep crossfall, a narrow footpath can also limit recovery time if an access user loses control of their scooter or wheelchair.

Appendix D shows the current widths of footpaths in the Geographic Area of Interest.

The footpath width in the main shopping centre is excellent and allows for good pedestrian flow in this area. The concern for this area is shop signage and wares. This is discussed in Section 13: Street Furniture.

For the remaining area, a minimum of 1.5m needs to be achieved with the following exceptions:

- Kensington Road – Due to the location of Waihi College, the footpath on the east side of Kensington Road should be 1.8m. At the time of the site inspection, school children were observed walking in groups along Kensington Road, with some children walking on the edge of the carriageway;
- Moresby Avenue – Due to the location of Waihi College and Waihi Central School, the footpath north of the bridge on the south side should be 1.8m.
- SH.2 – With the location of Waihi Hospital, the footpath from Village Way to Kensington Road should be widened to 2.4m. The footpath south of Johnston St should also be widened to a minimum of 1.8m. The ideal width of footpath should be 2.4m.
- SH.25 – SH.25 provides the only connection to the east of Waihi. To encourage more pedestrian use, the footpath should be widened to 2.4m.

Recommendation 43 Widen the following footpaths to a width of 2.4m:

- SH.2 – Village Way to Kensington Road; and
- SH.25 – Mueller to Clarke Street on both sides and SH.2 to Mueller St on the south side.

Recommendation 44 Widen the following footpaths to a width of 1.8m:

- Kensington Road – East side from Toomey Street to Moresby Avenue; and
- Moresby Avenue – North of the bridge to Kensington Road on the south side.

Recommendation 45 Widen the footpaths in the geographic area of interest during the regular maintenance programme to a minimum width of 1.5m.

There are a number of bridges in Waihi with narrow footpath widths. These are short distances so installing signage advising of users to give way (similar to road signs RG 19.1) should be installed.

Recommendation 46 Install signage at bridges with narrow footpaths to advise pedestrians to give way.

11.3 VEGETATION

When narrower than standard footpaths are provided, extra consideration is required to maintain width by managing vegetation. Also, low hanging branches can cause injury or restrict sight visibility.

Vegetation in Waihi was a concern at the time of the audit, given the narrow footpaths. Maintaining the vegetation at these locations is vital in ensuring a usable footpath is always provided.

The following locations were identified as having vegetation growing over the footpath:

- 2 Clarke Street;
- 13 George Street;
- Gilmour Street – outside #7a, #15;
- 9 Haszard Street – on Wilson Street;
- Kenny Street – outside Mitre 10 and New World;
- Kensington Road - #16, #29;
- 14 Macky Street;
- 40a Martin Road;
- Mueller Street – intersection with Union St and #23;
- 26 Russell Street;
- SH.2 – outside #19, #53, #58, #61, and outside Bay Electrical;
- Union Street – at the intersection with Clarke Street, outside the Bridge Club and the school, #33;
- Victoria Street – Intersection with Consols St;
- Walker Street - #8 and #39; and
- Wilson Street – outside #19, and #25.

Recommendation 47 Liaise with adjoining land owners to trim vegetation extending from the boundary over the footpath as required.

11.4 SURFACE

An uneven surface of concrete and asphaltic concrete, due to tree roots, underground service work and basecourse failure can cause potential tripping hazards and cause injury to mobility users. Uneven surfaces can also cause mobility scooter users and wheelchair users to tip out of their mobility aid and be seriously hurt. Ponding issues can create a slippery surface.

The slope of berm, with the crossfall of the footpath, can force a mobility scooter, wheelchair user, or small children on bikes or scooters to fall into the carriageway. Just like clear zones for vehicles which provide an area for errant vehicles to

recover, a berm can provide the same zone. If the slope is greater than 1 in 8 (12.5%), then this opportunity is lost.

A low cost solution is to install a pedestrian fence at the edge of the footpath to stop mobility users from falling off the footpath. Two locations were identified as having a steep slope:

- SH.2/Gilmour St intersection; and

Figure 24: Steep berm at SH.2/Gilmour Street Intersection.

- Johnston Street/Mueller Street.

Recommendation 48 Install a pedestrian fence at the intersections of SH.2/Gilmour Street and Johnston Street/Mueller Street where the berm is greater than 1 in 8 (12.5%).

Berms lower than the footpath can also cause problems for mobility users. With the narrow width of the footpath, mobility scooter users and wheelchair users often have to use the berm to pass other users. A low berm can cause the mobility aids to tip over and cause serious injury.

The following locations were identified as having berms lower than the adjoining footpath:

- 35 Featon Road;
- 27 Tauranga Road (SH.2); and
- 3 Walker Street.

Recommendation 49 Raise the berm level to the adjoining footpath at:

- 35 Featon Road;
- 27 Tauranga Road (SH.2); and
- 3 Walker Street.

Lifting of the footpath at joints or by tree roots create tripping hazards, particularly for older persons.

The following locations were identified with lifting footpaths:

- 7a Gilmour Street;
- 22 Johnston Street;
- 2 Kenny Street;
- Martha Street – Tree outside Health+ Gym.
- SH.2 – West of Kensington Road, 3 Tauranga Road, outside Waihi Motel; and
- SH.25 – at power pole outside Waihi Baptist Church.

Recommendation 50 Repair the lifting footpath at:

- 7a Gilmour Street;
- 22 Johnston Street;
- 2 Kenny Street;
- Martha Street – Tree outside Health+ Gym.
- SH.2 – West of Kensington Road, 3 Tauranga Road, outside Waihi Motel; and
- SH.25 – at power pole outside Waihi Baptist Church.

Loose metal on the footpath for older persons is like walking on marbles. It also is difficult for manual wheelchair users to push through. Often, the main cause is metal from an adjoining driveway.

The following driveways had loose metal spilling out onto the footpath:

- 8 Featon Road;
- George Street – outside #5, #15, and #19;
- 32 Gilmour Street;
- 36a Martin Road;
- 35 Moresby Avenue;
- 59 Union Street;
- 16 Victoria Street; and
- 39c Walker Street.

Figure 25: Loose metal from a driveway on George Street.

Recommendation 51 Liaise with property owners at the following locations to maintain a surface free of loose metal:

- 8 Featon Road;
- George Street – outside #5, #15, and #19;
- 32 Gilmour Street;
- 36a Martin Road;
- 35 Moresby Avenue;
- 59 Union Street;
- 16 Victoria Street; and
- 39c Walker Street.

There are locations where HDC can repair the surface and eliminate loose metal and broken surfaces:

- 16 Gilmour Street;
- Johnston Street – Entire length from Mueller Street to Haszard Street (south side), #36, and #42;
- Kenny Street – opposite Devon Street to Baber Street, outside Safe & Sound, #12 to #18
- Kensington Road – SH.2 to Toomey Street;
- Martha Street – west of Newmont Waihi Gold driveway
- Moresby Avenue – outside Newmont Waihi Gold; Service lane behind Subway, outside Waihi Central School, opposite the Waihi Mine Lookout, #11, and #38;
- 14 Russell Street;
- Seddon Street – Light pole outside the Visitor Centre;
- SH.2 – outside RSA, driveway to Super Liquor;
- SH.25 – at the BP, #73, #75, #112 to #116;
- Union Street – Mueller Street to #32; and
- 17 Walker Street.

Figure 26: Footpath outside Newmont Waihi Gold on Moresby Avenue.

Recommendation 52 Repair the footpaths at the following locations:

- 16 Gilmour Street;
- Johnston Street - Entire length from Mueller Street to Haszard Street (south side), #36, and #42;
- Kenny Street – opposite Devon Street to Baber Street, outside Safe & Sound, #12 to #18
- Kensington Road – SH.2 to Toomey Street;
- Martha Street – west of Newmont Waihi Gold driveway;
- Moresby Avenue – outside Newmont Waihi Gold; Service lane behind Subway, outside Waihi Central School, opposite the Waihi Mine Lookout, #11, and #38;
- 14 Russell Street;
- Seddon Street – Light pole outside the Visitor Centre;
- SH.2 – outside RSA, driveway to Super Liquor;
- SH.25 – at the BP, #73, #75, #112 to #116;
- Union Street – Mueller Street to #32; and
- 17 Walker Street.

Uneven surfaces formed by depressions can cause ponding and cracks create future damage to the surface of the footpath. The following footpaths have an uneven or cracked surface:

- George Street – cracks all length;
- Kenny Street – Depression of trench west of crossing point near SH.25;
- Macky Street - #1a and #9;
- Moresby Avenue – At driveway to Waihi Central School, #16, #20, #32b, uneven driveways at #1, #3, and #7;
- Seddon Street – Depression at joint of AC and tiles at intersection with Mueller Street and the east end of the bus stop, patchy surface west of Gilmour Street and outside St John's;
- SH.2 – cracks outside Waihi Hospital near a seat, the seat at the intersection with Kensington Road, #38 and #42 Seddon Avenue, #27 Tauranga Road;
- SH.25 – Depression at Waihi Industrial & Farm Supplies, cracks outside the Waihi Rugby Club, #86 and #90;
- Union Street – Longitudinal joint crack outside the school; and
- Walker Street – Depression at the intersection with Martin Road, and #39.

Recommendation 53 Repair the surface of footpath at the following locations:

- George Street – cracks all length;
- Kenny Street – Depression of trench west of crossing point near SH.25;
- Macky Street - #1a and #9;
- Moresby Avenue – At driveway to Waihi Central School, #16, #20, #32b, uneven driveways at #1, #3, and #7;
- Seddon Street – Depression at joint of AC and tiles at intersection with Mueller Street and the east end of the bus stop, patchy surface west of Gilmour Street and outside St John's;
- SH.2 – cracks outside Waihi Hospital near a seat, the seat at the intersection with Kensington Road, #38 and #42 Seddon Avenue, #27 Tauranga Road;
- SH.25 – Depression at Waihi Industrial & Farm Supplies, cracks outside the Waihi Rugby Club, #86 and #90;
- Union Street – Longitudinal joint crack outside the school; and
- Walker Street – Depression at the intersection with Martin Road, and #39.

Service covers and repairs can create a tripping hazard by poor reinstatement of the footpath.

Recommendation 54 Ensure Service providers such as Spark, Powerco, Ultra-fast Broadband etc reinstate the footpath to a high standard.

The following service covers and reinstatements need repair:

- Haszard Street – Water meter outside SPCA Op Shop;
- Moresby Avenue – Water meter outside Subway, service cover outside #34;
- 33 Mueller Street – Service repair;
- 8 Pickett Place – FH cover;
- SH.2 – Cover the grate outside Rob Roy Hotel, water meter cover outside Super Liquor; and
- SH.25 – remove Catchpit in footpath east of Service Lane near SH.2, service cover east of Service Lane, service cover outside Barber Shop, service cover outside Waihi Rugby Club, service cover near Clarke Street, Spark Service Cover outside Sunray Products.

Recommendation 55 Repair the service covers and footpath reinstatements at the following locations:

- Haszard Street – Water meter at SPCA Op Shop;
- Moresby Avenue – Water meter outside Subway, service cover at #34;
- 33 Mueller Street – Service repair;
- 8 Pickett Place – FH cover;
- SH.2 – Cover the grate at Rob Roy Hotel, water meter cover at Super Liquor; and
- SH.25 – remove Catchpit in footpath east of Service Lane near SH.2, service cover east of Service Lane, service cover at Barber Shop, service cover at Waihi Rugby Club, service cover near Clarke Street, Spark Service Cover at Sunray Products.

11.5 LONGITUDINAL GRADIENT

Longitudinal gradient is a major concern for users with mobility devices.

As with kerb ramps, design standards regard longitudinal grades greater than 1 in 20 (5%) on footpaths as ramps[40]. CCS Disability Action considers '1 in 8 (12.5%) as an absolute maximum' too steep and unable to be independently and safely used by mobility scooters and wheelchairs. An absolute maximum grade of 1 in 12 (8.5%) is permissible on existing key pedestrian routes as grades steeper than this are generally not able to be negotiated.

Recommendation 56 Adopt an absolute maximum longitudinal grade of 1 in 14 (7.1%) for future proposed works.

The following footpaths were identified as having a steep longitudinal gradient:

- Gilmour Street – SH.25 to Seddon Street – 1 in 8.8 (11.3%);
- Martha Street – Moresby Avenue to Mine – 1 in 8.8 (11.4%);
- Moresby Avenue – Seddon Street to Kensington – 1 in 10.4 (9.6%);
- SH.2/Gilmour Street Intersection – 1 in 6.9 (14.4%); and
- SH2 – Baber Street to Victoria Park – 1 in 9.9 (10.1%).

Installing signage with the grade shown will aid mobility users in the decision process of using that particular stretch of road. If an alternative route is available, install a map with the sign identifying this route. Pedestrian signage is discussed further in Section 13: Street Furniture.

Recommendation 57 Install signage identifying longitudinal grades steeper than 1 in 12 (8.3%) with alternative routes if available.

[40] NZS 4121:2001 Section 6.2.3: Footpaths as ramps

11.6 CROSSFALL

As with longitudinal gradients, crossfall is a major concern for users with mobility devices. Design standards recommend a crossfall of between 1% and 2%[41]. A grade of greater than 1% requires people using wheelchairs and walking frames to use extra energy to resist the sideways forces. As the majority of footpaths drain to the road, this can lead to the user dropping over the kerb and into the live traffic lane.

The majority of footpaths in the geographic area of interest had a crossfall of greater than 2% with crossfalls of 1 in 10 (10%) on Haszard Street, outside the SPCA Op Shop and Waihi Budget Service.

Installing High Profile Kerb and Channel will improve the crossfall at these locations.

Recommendation 58 Install High Profile Kerb and Channel on Haszard Street, outside the SPCA Op Shop and Waihi Budget Service to improve crossfall.

Recommendation 59 Adopt 1% as the crossfall standard, and upgrade existing footpaths to this grade when replaced.

11.7 VEHICLES PARKING ON FOOTPATH

Cars parking on the footpath are always a concern for mobility users. Not only can they reduce the usable width of the footpath, but they also create sight line issues for people in wheelchairs and mobility users.

Pedestrians require differing spaces within which to manoeuvre. Newer wheelchairs are increasingly wider than their predecessors and this should be considered when designing for pedestrians. Mobility scooters are usually longer but the same width as manual wheelchairs.

A clear width of 1000 mm is adequate for people with ambulant disabilities. It just allows passage for 80 percent of people who use wheelchairs. People who use wheelchairs require a clear width of 1.2 metres[42].

While parking on the footpath was not observed during the site inspection, attendees of the Consultation Meeting reported a reoccurrence of parking on the footpath at Waihi Tyre Services.

Recommendation 60 Regularly control car parking on the footpath to maintain a clear, usable footpath.

[41] Pedestrian Planning and Design Guidelines Section 14.5: Crossfall and NZS 4121:2001 Section 6: Footpaths, Ramps, and Landings
[42] Pedestrian Planning & Design Guide Section 3.3: Physical Space Required

12 STREET CROSSINGS

12.1 PROVISION OF CROSSINGS[43]

Pedestrians cross the road an average of two to three times on every walking trip. Perceptions of the walking experience are focused on difficulties crossing roads. Any problems with this can cause delays and create a sense of insecurity. By providing effective crossings, the walking experience is enhanced and becomes more user-friendly.

There are four main reasons for installing pedestrian crossing facilities:

- Level of service – The crossing opportunities available to pedestrians;
- Safety – Crash records show that specific pedestrian crashes may be reduced by providing crossing assistance, or that perceptions of poor safety are discouraging walking;
- Specific access provisions – A particular group (e.g. young children, vision and mobility impaired people) crossing; and
- Integration – Part of integrating and reinforcing a wider traffic management plan for the area.

12.2 LEVEL OF SERVICE

The level of service for pedestrians is calculated by the time taken to safely cross the road, the volume of traffic, and physical aids to improve crossings. The longer it takes, the more frustrated pedestrians become, and the more likely they are to take risks by crossing with a smaller gap between vehicles.

NZTA has developed a Pedestrian Crossing Facilities Calculation Spreadsheet and is attached as Appendix D. The spreadsheet is also available on NZTA's website.

There are a number of pedestrian crossing facilities that are available to provide safe and effective opportunities for pedestrians to cross the road.

[43] Pedestrian Planning and Design Guidelines – Section 15: Crossings

The Pedestrian Crossing Facilities Calculation Spreadsheet considers the following methods of providing safety when crossing the road:

- Without Crossing Facility;
- Platform;
- Kerb extensions;
- Median Refuge;
- Combining Kerb extensions and median refuge;
- Zebra crossings;
- Traffic signals; and
- Grade separation.

Recommendation 61 Adopt the Pedestrian Crossing Facilities Calculation Spreadsheet for use when determining pedestrian crossing facilities.

12.3 KERB EXTENSIONS[44]

Kerb extensions are created by widening the footpath at intersections or mid-blocks, and extending it into and across parking lanes to the edge of the traffic lane. This improves visibility of pedestrians by traffic and reduces the distance to cross the road.

Advantages for kerb extensions are:

- Pedestrian safety is improved by kerb extensions – with an estimated pedestrian crash reduction of 36 percent (twice that of pedestrian islands alone). This is because pedestrians are more visible to oncoming drivers and pedestrians get a better view of approaching traffic;
- Pedestrian delay is reduced due to the shorter crossing distance and, therefore, crossing time which permits pedestrians to select a smaller gap (but to a much lesser extent than pedestrian islands);
- They can be retrofitted to existing roads;
- They create space for pedestrians to wait without blocking others walking past;
- They create space for installing kerb ramps;
- They physically prevent drivers from parking (and blocking) the crossing point;
- Road berms gain additional space which can be used for landscaping, cycle racks and street furniture (as long as visibility is maintained);
- The can help slow vehicle speeds;

[44] Pedestrian Planning Design Guide: Section 6.7.3 – Kerb Extensions

- They ensure that car parking does not obscure visibility for vehicles at intersections; and
- Signs and traffic signal displays can be located where they are easily seen by approaching traffic.

Disadvantages for kerb extensions are that they:

- Reduce on-street parking;
- Can force cyclists closer to motorised traffic on narrow roads;
- Can create drainage problems and rubbish can accumulate;
- Can create an obstruction that may be struck by cyclists and motorised vehicles.

Kerb extensions have particular safety benefits and also result in less delay for pedestrians. They will be most beneficial on roads with flows less than 500 vehicles per hour. They can be used on any class of road and can be retrofitted as necessary.

They are particularly useful when combined with pedestrian platforms, zebra crossings, traffic signals and, where there is sufficient room, pedestrian refuge islands.

12.4 PEDESTRIAN PLATFORMS[45]

Pedestrian platforms are raised and sometimes specially textured areas of roadway that act as a focus for crossings. However, they are part of the roadway and pedestrians have to give way to vehicles unless the platform is also marked as a zebra crossing.

Advantages of Pedestrian Platforms include:

- Emphasising pedestrian movements at the expense of vehicular traffic;
- Helping to focus traffic on pedestrians crossing;
- Being aesthetically pleasing;
- Reinforcing the slow speed message to drivers;
- Being highly effective at reducing vehicle speeds;
- Eliminating grade changes from the pedestrian route and, therefore, the need for kerb ramps; and
- More drivers yielding to pedestrians.

Disadvantages for Pedestrian Platforms are that they:

[45] Pedestrian Planning Design Guide: Section 6.7.4 – Pedestrian Platforms

- Only work effectively when vehicle speeds can be reduced to where drivers are able and prepared to slow or stop;
- Although still part of the roadway, may cause confusion as to who has the right of way;
- Can create discomfort for vehicle occupants, especially those in heavy vehicles (while platforms are less suited to bus routes, they can be designed to accommodate buses);
- Should preferably not be used in isolation; but form part of a larger (area-wide) scheme;
- May increase noise as vehicles brake, slow, pass over them and accelerate; and
- Vision impaired pedestrians and children may not be aware they are entering the roadway on a raised platform, so there needs to be clear discrimination between the road and footpath.

Platforms are generally installed on local roads and sometimes on collector roads. They are not installed on arterial roads except in major shopping areas where the need for traffic calming and pedestrian assistance exceeds the arterial function. They can be retrofitted at both intersections and mid-block and are particularly useful in traffic calmed areas (where they serve the same purpose as road humps). Where motorists need to stop and give way, the platforms should be marked as zebra crossings. In areas where heavy vehicles are part of the traffic, careful design and liaison will be necessary.

Do not use where traffic approach speeds exceed 50 km/h.

12.5 PEDESTRIAN REFUGE ISLANDS[46]

Pedestrian Refuge Islands are elongated, raised portions of pavement within the roadway that provide a place for pedestrians to wait before crossing the next part of the road. Crossing pedestrians only need to find a gap in one stream of traffic, meaning larger and more frequent gaps and significantly reduced crossing times.

Advantages for Refuge Islands are:

- Reduce the crossing area where pedestrians are in conflict with traffic;
- Can considerably reduce delays for pedestrians (by up to 90 percent);
- Can be retrofitted to existing roads;
- Are particularly helpful to pedestrians unable to judge distances accurately or who have slower walking speeds;

[46] Pedestrian Planning Design Guide: Section 6.7.1 – Pedestrian Islands

- Can improve safety with an estimated pedestrian crash reduction of 18% (or 32% when combined with kerb extensions);
- Pedestrians on the island are more visible to oncoming drivers, and pedestrians can see oncoming traffic better; and
- The localised roadway narrowing encourages lower vehicle speeds.

Disadvantages of Refuge Islands are that they:

- Restrict vehicle access to adjacent driveways;
- Can force cyclists closer to motorised traffic on narrower roads;
- Can disrupt drainage causing water to pond within the island or adjacent kerb ramps;
- Need a wide roadway to ensure adequate space after installation;
- Can be an obstacle which may be struck by motorised traffic if not particularly conspicuous.

Because the main effect of pedestrian islands is reduction in pedestrian delay, they are most useful where traffic flows exceed 500 vehicles per hour.

Pedestrian islands are nearly always highly cost effective in improving pedestrian safety and reducing delay. They can be incorporated whenever a raised island is created as part of a roading scheme, for example deflection and splitter islands.

Pedestrian islands can be combined with kerb extensions and platforms.

Flush medians should include regular pedestrian islands to reduce inappropriate motor vehicle use of the medians and to improve pedestrian feelings of security on them. Although they can be retrofitted, they should be considered as a matter of course in all new/improved roading schemes.

Pedestrian refuge islands should ideally be at least 1.8 metres wide (narrow refuge islands put pedestrians at risk of being hit by truck side mirrors) and can be part of an un-signalised pedestrian crossing[47]. This width also allows for a mobility scooter to fully park on the refuge island (most mobility scooters range from 1.3m to 1.5m in length).

Figure 27: Ideal pedestrian refuge island crossing facility

[47] International Road Assessment Programme – Road Safety Toolkit

Pedestrian refuge islands can be used where there is a demand for pedestrians to cross the road, but where the numbers of pedestrians are not high enough to warrant a signalised pedestrian crossing[48].

12.6 PEDESTRIAN ZEBRA CROSSINGS[49]

A pedestrian zebra crossing is a section of roadway running from kerb to kerb and marked with longitudinal markings. Drivers are required to give way to pedestrians on both sides of all zebra crossings unless the crossing is divided by a raised traffic island.

Advantages of a zebra crossing are that they:

- Provide the least delay for pedestrians;
- Can be retrofitted to existing roads;
- Create a clear focus for crossings; and
- If raised (as a platform), slow vehicle speeds and can improve safety.

Disadvantages are:

- On their own, do not improve pedestrian safety and may even decrease it;
- Can lead to an increase in 'nose-to-tail' vehicle accidents.
- Drivers may not stop when pedestrians expect them to.
- High pedestrian flows can dominate the crossing and cause severe traffic disruptions.
- Wide markings can be slippery when wet for cyclists and motorcyclists.
- Pedestrians may step out without checking properly whether approaching vehicles are too close to stop.

Zebra crossings need to be combined with other measures to enhance their safety. Do not use zebra crossings on roads with speed limits over 50 km/h unless approval is obtained from Land Transport NZ as required by the Traffic Control Devices Rule.

Do not use zebra crossings for locations with fewer than 50 pedestrians per hour.

12.7 MID BLOCK PEDESTRIAN SIGNALS[50]

Mid-block pedestrian signals are installations that stop traffic so pedestrians can cross unimpeded. The signals are activated by pedestrians, vehicles are stopped, pedestrians cross and then vehicles are allowed to proceed.

[48] International Road Assessment Programme – Road Safety Toolkit
[49] Pedestrian Planning Design Guide: Section 6.7.5 – Pedestrian zebra crossings
[50] Pedestrian Planning Design Guide: Section 6.7.6 Mid-block Pedestrian Signals

Mid-block pedestrian signals can include intelligent features, such as extending the pedestrian phase for slow pedestrians and detecting that pedestrians have already crossed prior to the pedestrian phase being displayed.

Advantages for Mid-block Pedestrian Signals:

- Clearly show when to cross;
- Balance the delays to pedestrians and traffic;
- Can reduce community severance;
- Are very safe for pedestrians when used properly. Signals take the decision on when it is safe to cross away from the pedestrian. Pedestrians group together, rather than crossing intermittently.

Disadvantages for Mid-Block Pedestrian Signals include:

- Delaying pedestrians more than zebra crossings;
- Being more costly to install, operate and maintain than other crossing types;
- Being more disruptive to traffic flows than other crossing types apart from zebra crossings;
- Being more dangerous when crossing near the signals or against the signals.
- Slower pedestrians may find it difficult to cross within the allotted time. Intelligent features can assist this.
- Signal timings are frequently based on minimising vehicle delays which results in a poor level of service to pedestrians. Pedestrians having to wait for what seems to them an excessive time will take risks and cross against the signals. If all pedestrians have crossed before receiving a green signal, vehicles are required to stop anyway. Intelligent features can reduce this.

Figure 28: Pedestrian crossing warning sign

Use a traffic signals analysis package to model the expected delays to pedestrians and other users under signal operation. Compare the delay and safety performance with other options calculated using the Pedestrian crossing facilities calculation spreadsheet.

While pedestrian traffic signals would greatly enhance safe crossing, the practicalities of installing signals would be a huge investment by HDC.

An alternative solution would be the installation of an electronic pedestrian warning sign. Similar to cycle warning signs, the pedestrian warning signs can be activated by the pedestrian to warn on-coming motorists.

A number of options are available, and any sign installed would need to be approved by NZTA before installation.

12.8 DECISION PROCESS

There are four main reasons for choosing to improve facilities for pedestrians to cross roads[51]:

- Level of service: the crossing opportunities available to pedestrians are below the desired level of service.
- Safety: crash records show that specific pedestrian crashes may be reduced by providing crossing assistance, or that perceptions of poor safety are discouraging walking.
- Specific access provisions: a particular group (e.g. young children, vision and mobility impaired people) needs the improvements.
- Integration: it is part of integrating and reinforcing a wider traffic management plan for the area.

When considering how to best provide for pedestrians, consider the following questions (in this order):

- What is the road environment and the land use context, and who uses it?
- What are the appropriate physical aids to crossing?
- Is the control of the crossing point appropriate?
- How do we design the facility to fit into the environment?

This approach should be followed in all cases when providing crossing assistance for children.

12.9 VOLUME OF TRAFFIC IN WAIHI ON STATE HIGHWAYS

The volume of traffic is a major contributor to the safety of pedestrians crossing the road. The higher the volume, the fewer gaps are available for pedestrians.

Average Daily Traffic (ADT) volume is recorded by NZTA. These record either an estimate or actual measurement of vehicles over a period of 7 days, which is then calculated for the whole year.

[51] Pedestrian Planning Design Guide: Section 6.5 – Selecting the appropriate crossing facility.

12.10 EXISTING CROSSING OPPORTUNITIES

There are three different designated road crossing opportunities in the geographic area of interest:

- Kerb ramps at intersections (discussed in Section 9: Kerb Ramps and Section 10: Tactiles);
- Pedestrian refuge/splitter islands (visual appearance discussed in Section 10: Tactiles); and
- Pedestrian zebra crossings.

As discussed earlier, a splitter and refuge island should be 1.8m wide as a mobility scooter varies from 1.3m to 1.5m in length. Mothers with pushchairs also require the extra length for safety.

Recommendation 62 As splitter and refuge islands are replaced under normal maintenance, ensure they are replaced with islands that are at least 1.8m wide.

As discussed in Section 9: Kerb ramps and Section 10: Tactiles, the alignment of crossing points is important for visually impaired users to safely cross the carriageway.

The following crossing alignments need relocating:

- Seddon Street/Haszard Street – crossing point outside BNZ;

Figure 29: Crossing Seddon Street at Haszard Street Intersection.

- SH.2/SH.25 – crossing SH.25 uses the Service Lane vehicle entrance; and
- SH.2/Rosemont Road – Crossing Rosemont Road uses a private driveway on the west side.

Recommendation 63 Relocate the crossing point outside BNZ to line up the crossing opportunity west of Haszard Street.

Recommendation 64 Install a crossing point on the north side of SH.25 at SH.2 to remove the need for using the service lane driveway and on the west side of Rosemont Road to remove the use of a private driveway to access the footpath.

12.11 NEW CROSSING OPPORTUNITIES

Crossing opportunities provide linkage for pedestrians to each side of the road. In some cases, they complete links between footpaths, particularly if the street has a footpath on one side only. By providing kerb ramps, pedestrian refuge islands, and/or pedestrian crossings, safer connectivity can be provided for mobility impaired pedestrians.

The site inspection noted the following locations that require the investigation of new crossing opportunities:

- Featon Rd/Walker St – Install a kerb ramp on the north side of Walker St to connect to the footpath on Featon Road;

Figure 30: No footpath connection from Featon Road to Walker Street

- Haszard Street/Martha Street intersection – Install a kerb ramp opposite the footpath on the west side of Haszard Street to connect to the footpath on the north side of Martha Street.
- Kensington Road – The footpath finishes at the Waihi College. Install kerb ramps to connect to the footpath on the east side;
- Moresby Avenue/Savage Road – Install a kerb ramp on the south side of Moresby Avenue to connect to the footpath on Savage Road;
- Russell Street/Pickett Place – Install a kerb ramp on the south side of Russell Street to connect to the footpath on Pickett Place; and
- Union Street – The footpath finishes east of #49. Install kerb ramps to connect to the footpath on the south side.

Recommendation 65 Install kerb ramps at the following locations to complete connections between footpaths:

- Haszard Street/Martha Street – West side of Haszard Street to the north side of Martha Street
- Kensington Road –Waihi College to the east side;
- Moresby Avenue/Savage Road – South side of Moresby Avenue to Savage Road;
- Russell Street/Pickett Place – South side of Russell Street to Pickett Place; and
- Union Street –#49 to the footpath on the south side.

There is a crossing opportunity on Gilmour Street to link the footpath on the west side to Gilmour Reserve at the southern end. Installing a refuge island will provide a traffic calming opportunity for vehicles exiting at SH.2 onto Gilmour Street.

Recommendation 66 Install a refuge island on the southern end of Gilmour Street to connect the footpath on the west side of Gilmour Street to Gilmour Reserve.

12.12 STATE HIGHWAY 2 AND 25

As stated in Section 9: Kerb Ramps, SH.2 is a major highway for the North Island. It provides a connection from Auckland to Tauranga, through to Napier/Hastings, then on to the Wairarapa and ends at Wellington.

NZTA has a traffic volume measuring station located 40m south of Crean Road . In 2013, the Annual Average Daily Traffic Count (AADT) was 9467 vehicles with 9.7% heavy vehicles.

SH.25 starts at Thames, continues around the Coromandel Peninsula to Whangamata, and finishes as Kenny Street in Waihi at the intersection with SH.2.

NZTA has a traffic volume measuring station located north of Gladstone Rd. In 2013, the AADT was 2514 vehicles with 9.2% heavy vehicles.

The volume of traffic on SH.25 increases considerably in the summer months, so the average vehicles per day reading is not a true reflection on the nature of this road.

Figure 31: SH.2/Johnston Street Intersection.

There are very limited crossing opportunities along the State Highways away from the main shopping centre. Most intersections with side roads do not have crossing points to cross the State Highways.

Crossing opportunities, including refuge islands should be installed at:

- SH.2Devon Street, SH.25, Johnston Street or Union Street, and Adams Street; and
- SH.25 - Haszard Street, Mueller Street, and Gilmour Street.

Installing refuge islands at these points will aid in the management of traffic speed along the State Highways.

As these are State Highways, discussions with NZTA will be required for the installation of any refuge islands on the State Highway. A long term programme of the installation of one refuge island a year, will complete this project within seven years.

Recommendation 67 Liaise with NZTA for the long term installation of refuge islands (one per year) at the following locations:

- SH.2 – Intersections of Devon Street, SH.25, Johnston Street or Union Street, and Adams Street; and
- SH.25 - Haszard Street, Mueller Street, and Gilmour Street.

13 STREET FURNITURE

Well-designed public spaces play a decisive role in the comfort and safety of users. Street furnishings support people walking, cycling and those taking rest on their journey[52].

Street furniture should avoid interrupting pedestrian desire lines and be carefully selected and positioned to avoid cluttering the street. It needs to be mounted at a height that is usable for all users.

Street furniture includes rubbish bins, light and power poles, signage, seats, bus shelters, fencing etc.

13.1 PERMANENT SIGNAGE[53]

Signage plays a key role in access in the community. It provides confidence to the user that they are heading in the right direction and informs them of access conditions.

All road users need helpful guidance and direction to inform and warn them of the environment ahead. As pedestrians have different characteristics and routes from other road users, the following four specific measures are required:

- Providing directional information to pedestrians;
- Channelling pedestrian flows;
- Informing other road users of the presence of pedestrians; and
- Indicating to pedestrians and other road users who has priority at crossing points.

A planned and cohesive strategy for pedestrian signage usually reduces the number of signs and locations and minimises maintenance costs, clutter/obstruction and visual blight. Signage strategies should be based on locating signs at the following specific ‘decision points’ on the pedestrian network:

- Likely trip origins, that is, places where people join the pedestrian network such as transport interchanges/stops, car parks and key approaches.
- Likely trip destinations, as when visits to these locations are over they become trip origins. Examples include tourist attractions, community facilities and retail areas.

[52] North Shore City Council – Design of Streets: How should street furnishings be incorporated into street design?
[53] Pedestrian Planning and Design Guide – Section 16:Measures to Guide Pedestrians

- Locations with possible route ambiguity, including major junctions and open areas.
- On long routes where pedestrians may be uncertain that they have chosen the correct direction and need confirmation.

It can be used to identify barriers and inform users of other ways of accessing their destination.

A walking and cycling signage strategy can provide direction for the implementation and installation of signage, including location, height and font type/size criteria. Consultation with interested parties will assist in the implementation of such a policy.

Recommendation 68 Adopt a Pedestrian Signage Policy to inform users of their choices in accessing destination points.

13.2 TEMPORARY SIGNAGE, STOCK and AL-FRESCO DINING

Visually impaired access users require a clear access path to successfully negotiate an area. They generally use building and boundary lines to guide their way.

Businesses along Seddon Street regularly install street signage, stock and tables and chairs outside of their premises. This has implications for people with significant visual impairment as they frequently use environmental cues such as buildings to navigate around a community and they won't necessarily see stock that are low to the ground, they become a trip hazard.


Figure 32: Shop wares and signage on Seddon Street

By having obstacles on the shop boundary, visually impaired people are forced to use the kerb line as a navigation aid.

Recommendation 69 Liaise with business owners to retain clear access route widths and keeping the building line clear of al-fresco dining furniture, signage and stock for sale.

13.3 SEATING

There is a good amount of seating in the geographic area of interest. Seating is helpful for access users who are unsteady on their feet.

The availability of seating areas is generally viewed as a necessary urban feature for older people. It is difficult for many older people to walk around their local area without somewhere to rest[54].

The Inclusive Design for Getting Outdoors suggests the following requirements are beneficial for older persons[55]:

- The seat itself – There is a range of guidance on the style of seat and the appropriateness of a seat in meeting user needs especially given that users in public spaces will be so varied. There is a general consensus about: the provision of a back rest; mixture of seating with and without arm rests; the height of the seat from the floor (450 to 475mm, plus other heights where multiple seating permits this); constructed from a material which does not retain heat / cold; colour and luminance to contrast with the background environment.
- Positioning of the seat – The seating should be set back from a footway such that it does not cause an obstruction; there should be space for a wheelchair user to pull up alongside a companion; end parking on a firm surface for a wheelchair or scooter. The Department for Transport (UK) (2007) suggests that seating should be located where there is good lighting and natural surveillance because it can sometimes attract anti-social behaviour, and that consideration should be given to pedestrian desire lines.

Figure 33: Public seating on Port Road

Recommendation 70 Adopt the Inclusive Design for Getting Outdoors as part of its design for public seating.

[54] World Health Organisation – Global Age-Friendly Cities: A Guide
[55] Inclusive Design for Getting Outdoors: Design Guidelines

HDC have provided a great amount of seating in Waihi with the majority having armrests. The following seating was identified to have armrests installed at least at one end:

- 6 Russell Street;
- Seddon Street – one seat at Martha Court; and
- SH.2 – Outside Waihi Hospital, intersection with Kensington Road, and at the RSA.

Figure 34: Seating outside the RSA on SH.2

Recommendation 71 Install at least one armrest on the seating provided at:

- 6 Russell Street;
- Seddon Street – one seat at Martha Court; and
- SH.2 – Outside Waihi Hospital, intersection with Kensington Road, and at the RSA.

13.4 OBSTRUCTIONS AT CROSSING OPPORTUNITIES

It is common practise to locate rubbish bins, pedestrian fencing, and light and power poles on the side of the crossing opportunity that the traffic is approaching. This leads to limited sight visibility for both the mobility user and the vehicle user.

HDC has placed street furniture at good locations at crossing opportunities. Even though the black and white crossing identification pole is generally located on the side in which traffic is

Figure 35: Rubbish bin limiting sight visibility at SH.2/Seddon Street

approaching, there is good visibility around the poles for these to not cause a sight distance problem.

One rogue rubbish bin is placed on the approaching traffic side at the crossing point of SH.2 and Seddon Street. Relocating the rubbish bin to the other side of the crossing point will improve sight visibility.

Recommendation 72 Re-locate the rubbish bin at the crossing point of SH.2 at Seddon Street to improve sight visibility.

Two verandah supports are causing problems at two crossing opportunities:

- SH.2/Moresby Avenue – north/west side;
- SH.2 Pedestrian Crossing near SH.25 – west side.

Figure 36: Verandah support in crossing opportunity at SH.2/Moresby Avenue

Figure 37: Verandah support at SH.2 pedestrian crossing near Kenny Street

To fix the crossing point in figure 35, the kerb ramp will need to be relocated to the right of the verandah support.

Recommendation 73 Re-locate the kerb ramps at SH.2/Moresby Avenue to the right of the verandah support.

At the pedestrian crossing, the verandah support will need to be removed to improve access to the pedestrian crossing.

Recommendation 74 Remove the verandah support on the west side of the pedestrian crossing on SH.2, near Kenny Street.

14 TEMPORARY TRAFFIC MANAGEMENT

Where work activities in the road corridor affect pedestrians or cyclists, the Temporary Traffic Management (TTM) must ensure that[56]:

- Pedestrians are not led into direct conflict with the work operation or traffic moving through or around the worksite.
- If pedestrians are directed into live lanes they should be adequately protected from traffic by delineation and/or barriers and suitable warning signs.
- Safe impediment free temporary paths are provided where footpaths are blocked by the activity.

Pedestrians, including those with impaired vision or wheelchair users must be considered as part of the design, preparation, approval and implementation of the Traffic Management Plan (TMP).

Pedestrian management of the Code of Practise for Temporary Traffic Management (CoPTTM) is a nationwide problem which NZTA focuses on when training users of this manual. It was pleasing to see at the time of the audit that there were no serious instances of non-compliance in the geographic area of interest. This, however, is just one moment in time, and continued enforcement is necessary to maintain best practise.

Recommendation 75 Enforce Code of Practice for Temporary Traffic Management standards for pedestrian control as part of the TMP approval process and supervision.

Recommendation 76 Conduct regular 'random' audits of Temporary Traffic Management as part of the supervision process of Traffic Management Plans.

[56] Code of practice for temporary traffic management (COPTTM): Part 8 of the Traffic Control Devices manual (TCD Manual)

15 RECOMMENDATIONS

The following tables list the recommendations in order as set out in the report. Table 4 shows the general recommendations while Tables 5, 6, and 7 showing the site specific recommendations.

The specific recommendations are split into three categories:

- Serious Safety Risk – Where it is considered serious injury may occur
- Significant Concern – Major inconveniences
- Minor Concern – Minor inconveniences

The total estimated costs for the three categories are:

- Serious Safety Risk $ 55,000
- Significant Concerns $175,000
- Minor Concerns $135,000

Consideration should be given to a more formal method of setting priorities for provision of kerb ramps and maintenance of footpaths over a wider area as members of the disability community will clearly have preferred routes into the areas covered by this report. By identifying a risk and condition rating, a profile target can be developed that allows limited resources to address the most critical barriers first. Poor condition can be tolerated where there is little or no likelihood of use by the disabled and elderly.

We suggest HDC designate footpaths and all potential kerb ramp locations within a risk profile of minor, significant or serious with accessible routes as high priority. A relatively simple set of KPI's could then be formulated with condition ratings say 1 - 5 used to determine the profile.

Costs shown in Tables 5, 6, and 7 are indicative construction costs only and should only be used as a guide[57].They do not include Traffic Management Costs, consultation with affected parties, or design costs. All project costs will need to be finalised as design is completed for each.

[57] Costs are based on rates from Rawlinsons New Zealand Construction Handbook 2013/14 – 28th Edition

15.1 GENERAL RECOMMENDATIONS

Table 4: General Recommendations

It is recommended HDC:

No.	Pg.	Description
1.	11	Assign annual budgets that are affordable for HDC to undertake the recommendations from this audit over a long term programme. Utilise regular maintenance programmes that maximise Council investment with NZTA subsidies.
2.	11	Select count sites in Waihi urban area to conduct regular pedestrian counts, including the proportion of people who use mobility aids.
3.	12	Adopt the Risk Modified Condition Assessment methodology as a tool for future maintenance prioritisation.
7.	17	Consider Mobility Space placement during the consenting process.
9.	20	Adopt the recommended minimum length in the TCD Manual Part 13: Parking Control of 6m for parallel parking with a further 1.5m allowance for the hoist.
10.	20	Adopt the recommended minimum width in NZS 4121:2001 of 3.5m and the minimum recommended length in the TCD Manual Part 13: Parking Control of 5.4m for angle parking. Allowance of at least 1.5m should be considered between the parking space and the live traffic lane to provide safety for wheelchair users who use rear loading vehicles.
13.	22	Install blue marking as per figure 9 will aid with maintaining a non-slip surface with the colour of both the surface and the marking to comply with Land Transport Rule: Traffic Control Devices 2004.
15.	24	Adopt the Pedestrian Planning and Design Guide for Kerb Ramps with the following changes: • Ramp – Normal maximum gradient to be 1 in 14 (7.14%), with the absolute maximum gradient to be 1 in 12 (8.33%); and • Minimum cut down width of 1.8m.
16.	24	Replace all kerb ramps as required during the maintenance programme to a minimum width of 1.8m and a maximum grade of 1 in 14 (7.1%).
32.	33	Adopt the practise of milling seal edges at the join of the seal and the kerb channel, especially at areas where a flush kerb cut down is present, in maintenance contracts.
33.	35	When installing Tactiles, ensure the Tactiles are safety yellow as recommended by the RTS 14 Guidelines for Facilities for Blind and Vision Impaired Pedestrians.

No.	Pg.	Description
38.	40	Ensure all Tactiles installed in future works align the user to the crossing alignment.
41.	45	Consult further with the Waihi community to develop a long term programme for the installation of footpaths on both sides of the road.
42.	45	Ensure all future development in Waihi has footpaths installed on both sides of the new road.
45.	46	Widen the footpaths in the geographic area of interest during the regular maintenance programme to a minimum width of 1.5m.
54.	52	Ensure Service providers such as Spark, Powerco, Ultra-fast Broadband etc reinstate the footpath to a high standard.
56.	53	Adopt an absolute maximum longitudinal grade of 1 in 14 (7.1%) for future proposed works.
59.	54	Adopt 1% as the crossfall standard, and upgrade existing footpaths to this grade when replaced.
60.	54	Regularly control car parking on the footpath to maintain a clear, usable footpath.
61.	56	Adopt the Pedestrian Crossing Facilities Calculation Spreadsheet for use when determining pedestrian crossing facilities.
62.	63	As splitter and refuge islands are replaced under normal maintenance, ensure they are replaced with islands that are at least 1.8m wide.
68.	68	Adopt a Pedestrian Signage Policy to inform users of their choices in accessing destination points.
70.	69	Adopt the Inclusive Design for Getting Outdoors as part of its design for public seating.
75.	72	Enforce Code of Practice for Temporary Traffic Management standards for pedestrian control as part of the TMP approval process and supervision.
76.	72	Conduct regular ‘random’ audits of Temporary Traffic Management as part of the supervision process of Traffic Management Plans.

15.2 SPECIFIC RECOMMENDATIONS

Table 5: Specific Recommendations – Serious Safety Risks

It is recommended HDC:

No.	Pg.	Description	Indicative Cost
8.	18	Install full length kerb ramps at the remaining Mobility Spaces in Waihi to provide quick, easy access to the footpath.	$2,000
19.	27	Replace the lip kerb ramps to flush and a maximum grade of 1 in 14 (7.1%) at the intersections of SH.2 with: • Village Way (north/west crossing Village Way); • Victoria Street (south/east crossing Victoria Street); • Devon Street (south/west and south/east crossing Devon Street); • School Lane (north/east crossing School Lane); • Moresby Avenue (north/east crossing Moresby Avenue); • Seddon Street (pedestrian crossing Seddon Street – both sides; south/west crossing SH.2); • Kenny Street SH25 (north/east and north/west crossing SH.2); • Johnston Street (north/east and south/east crossing Johnston Street); • Haszard Street (south/east crossing Haszard Street); • Mueller Street (south/east crossing Mueller Street); and • Evans Street (north/west and south/west crossing Evans Street).	$13,000
24.	29	Replace the lip kerb ramps to flush and a maximum grade of 1 in 14 (7.1%) at the intersections of SH.25 with: • Haszard Street (both sides crossing Haszard Street); and • Clarke Street (both sides crossing Clarke Street).	$1,500

No.	Pg.	Description	Indicative Cost
26.	31	Replace the lip kerb ramps to flush and a maximum grade of 1 in 14 (7.1%) at the intersections of Seddon Street with: • Haszard Street (north/west crossing Seddon Street and refuge island); • Haszard Street (north/west and north/east crossing Haszard Street); • Haszard Street (south/west and south/east crossing Haszard Street and Seddon Street); • Mueller Street (north/west, north/east, south/west, and south/east crossing Seddon Street); • Mueller Street (south/west and south/east crossing Mueller Street); • Mueller Street (refuge island on Seddon Street); and • Gilmour Street (north/east crossing Seddon Street).	$10,000
28.	31	Replace the lip kerb ramps at the following intersections to flush and a maximum grade of 1 in 14 (7.1%): • Gilmour Street/Wilson Street – Both kerb ramps crossing Wilson Street; • Moresby Avenue/Eliot Street – North/west corner crossing Eliot Street; • Russell Street/Picket Place –North/east kerb ramp crossing Russell Street; and • Russell Street/Walker Street – North/west and north/east kerb ramps crossing Walker Street.	$5,000
31.	33	Improve the layouts of the following intersections to improve access in this area: • Gilmour Street/Johnston Street – Layout D or E; • Gilmour Street/Union Street – Layout C; • Kensington Road/Russell Street – Layout B; • Kensington Road/Toomey Street – Layout B; and • Mueller Street/Johnston Street – Layout D or E.	$20,000
34.	35	Replace the Warning Indicators at the mid-block crossing opportunities on Seddon Street (SH.2 to Mueller Street) and at the pedestrian crossing on SH.2 (Seddon Street to SH.25) to safety yellow.	$1,500
48.	48	Install a pedestrian fence at the intersections of SH.2/Gilmour Street and Johnston Street/Mueller Street where the berm is greater than 1 in 8 (12.5%).	$1,000

No.	Pg.	Description	Indicative Cost
49.	48	Raise the berm level to the adjoining footpath at: • 35 Featon Road; • 27 Tauranga Road (SH.2); and • 3 Walker Street.	$1,000
69.	68	Liaise with business owners to retain clear access route widths and keeping the building line clear of al-fresco dining furniture, signage and stock for sale.	$0

Total: $55,000

Table 6: Specific Recommendations – Significant Concerns

It is recommended HDC:

No.	Pg.	Description	Indicative Cost
6.	17	Relocate the Mobility Space at the Carpark on Silverton Road to the east to avoid the catchpits at the rear of the existing space.	$1,000
11.	20	Remove a carpark and widen the Mobility Space at 67 Seddon Street to achieve better access for mobility users.	$500
12.	21	Widen the two Mobility Spaces at the Golden Legacy Centre to a minimum total width of 6.5m.	$500
14.	22	Relocate the Mobility Space outside the War Memorial Hall to 47 Seddon Street to improve the crossfall of the space and remove the speed hump as a barrier.	$1,500
17.	25	Replace the kerb ramps to a maximum grade of 1 in 14 (7.1%) at the intersections of SH.2 with: • Kenny Street (SH.25, north/west crossing Kenny Street); • Rosemont Road (south/east crossing Rosemont Road); and • Mueller Street (north/east crossing Mueller Street).	$2,500
20.	27	Re-grade the carriageway to a maximum grade of 1 in 14 (7.1%) at the intersections of SH.2 with: • School Lane (north/west crossing School Lane); • Moresby Avenue (north/west crossing Moresby Avenue); and • Johnston Street (south/west crossing Johnston Street).	$2,500

No.	Pg.	Description	Indicative Cost
22.	29	Replace the kerb ramps to a maximum grade of 1 in 14 (7.1%) at the intersections of SH.25 with: • Haszard Street (north/west crossing Haszard Street); and • Gilmour Street (south/west crossing Gilmour Street).	$1,500
27.	31	Improve the kerb ramps at the intersection of Clarke Street/George Street and Clarke Street/Union Street (north/west) to a maximum grade of 1 in 14 (7.1%).	$1,500
29.	32	Improve the layouts on Kensington Road at the intersections with Moresby Avenue and Rata Street to improve access in this area.	$6,000
35.	39	Extend the Directional Indicators at the mid-block pedestrian crossing on Moresby Avenue to be the full width of the footpath and to the Warning Indicators.	$500
36.	39	Install Warning Indicators on all refuge and splitter islands.	$3,000
37.	39	Ensure all Warning Indicators are installed to the full width of the kerb ramp as required in Recommendation 14.	$0
39.	41	Install yellow guidelines at the boundary or back of footpath: • Mitre 10 – SH.2 (Baber Street to Devon Street); • KFC/Commercial Hotel – SH.2 (Devon Street to Silverton Road); • Mobil – SH.2 (Martin Road to School Lane); • Countdown – SH.2 (Kenny Street to Johnston Street); • BP – SH.2 (SH.25 to Johnston Street) and SH.25 (SH.2 to Haszard Street); • Waihi Police – SH.25 (SH.2 to Haszard Street); • Waihi Farm & Industrial Services and Waihi Fire Station – SH.25 (Haszard Street to Mueller Street); and • Devon Street – Kenny Street to Spargo (10a Devon Street).	$1,000
40.	42	Highlight the sign footing at the Mobil Service Station and the power pole outside Countdown on SH.2 in yellow to aid visually impaired users navigate these locations.	$500

No.	Pg.	Description	Indicative Cost
43.	46	Widen the following footpaths to a width of 2.4m: • SH.2 – Village Way to Kensington Road; and • SH.25 – Mueller to Clarke Street on both sides and SH.2 to Mueller St on the south side.	$85,000
44.	46	Widen the following footpaths to a width of 1.8m: • Kensington Road – East side from Toomey Street to Moresby Avenue; and • Moresby Avenue – North of the bridge to Kensington Road on the south side.	$45,000
47.	47	Liaise with adjoining land owners to trim vegetation extending from the boundary over the footpath as required.	$0
50.	49	Repair the lifting footpath at: • 7a Gilmour Street; • 22 Johnston Street; • 2 Kenny Street; • Martha Street – Tree outside Health+ Gym. • SH.2 – West of Kensington Road, 3 Tauranga Road, outside Waihi Motel; and • SH.25 – at power pole outside Waihi Baptist Church.	$3,000
51.	50	Liaise with property owners at the following locations to maintain a surface free of loose metal: • 8 Featon Road; • George Street – outside #5, #15, and #19; • 32 Gilmour Street; • 36a Martin Road; • 35 Moresby Avenue; • 59 Union Street; • 16 Victoria Street; and • 39c Walker Street.	$0

No.	Pg.	Description	Indicative Cost
55.	53	Repair the service covers and footpath reinstatements at the following locations: • Haszard Street – Water meter at SPCA Op Shop; • Moresby Avenue – Water meter outside Subway, service cover at #34; • 33 Mueller Street – Service repair; • 8 Pickett Place – FH cover; • SH.2 – Cover the grate at Rob Roy Hotel, water meter cover at Super Liquor; and • SH.25 – remove Catchpit in footpath east of Service Lane near SH.2, service cover east of Service Lane, service cover at Barber Shop, service cover at Waihi Rugby Club, service cover near Clarke Street, Spark Service Cover at Sunray Products.	$10,000
58.	54	Install High Profile Kerb and Channel on Haszard Street, outside the SPCA Op Shop and Waihi Budget Service to improve crossfall.	$1,500
63.	63	Relocate the crossing point outside BNZ to line up the crossing opportunity west of Haszard Street.	$1,000
64.	64	Install a crossing point on the north side of SH.25 at SH.2 to remove the need for using the service lane driveway and on the west side of Rosemont Road to remove the use of a private driveway to access the footpath.	$1,500
65.	65	Install kerb ramps at the following locations to complete connections between footpaths: • Haszard Street/Martha Street – West side of Haszard Street to the north side of Martha Street • Kensington Road –Waihi College to the east side; • Moresby Avenue/Savage Road – South side of Moresby Avenue to Savage Road; • Russell Street/Pickett Place – South side of Russell Street to Pickett Place; and • Union Street –#49 to the footpath on the south side.	$3,500

No.	Pg.	Description	Indicative Cost
67.	66	Liaise with NZTA for the long term installation of refuge islands (one per year) at the following locations: • SH.2 – Intersections of Devon Street, SH.25, Johnston Street or Union Street, and Adams Street; and • SH.25 - Haszard Street, Mueller Street, and Gilmour Street.	$0 – NZTA cost
72.	71	Re-locate the rubbish bin at the crossing point of SH.2 at Seddon Street to improve sight visibility.	$500
73.	71	Re-locate the kerb ramps at SH.2/Moresby Avenue to the right of the verandah support.	$1,500

Total: $175,000

Table 7: Specific Recommendations – Minor Concerns

It is recommended HDC:

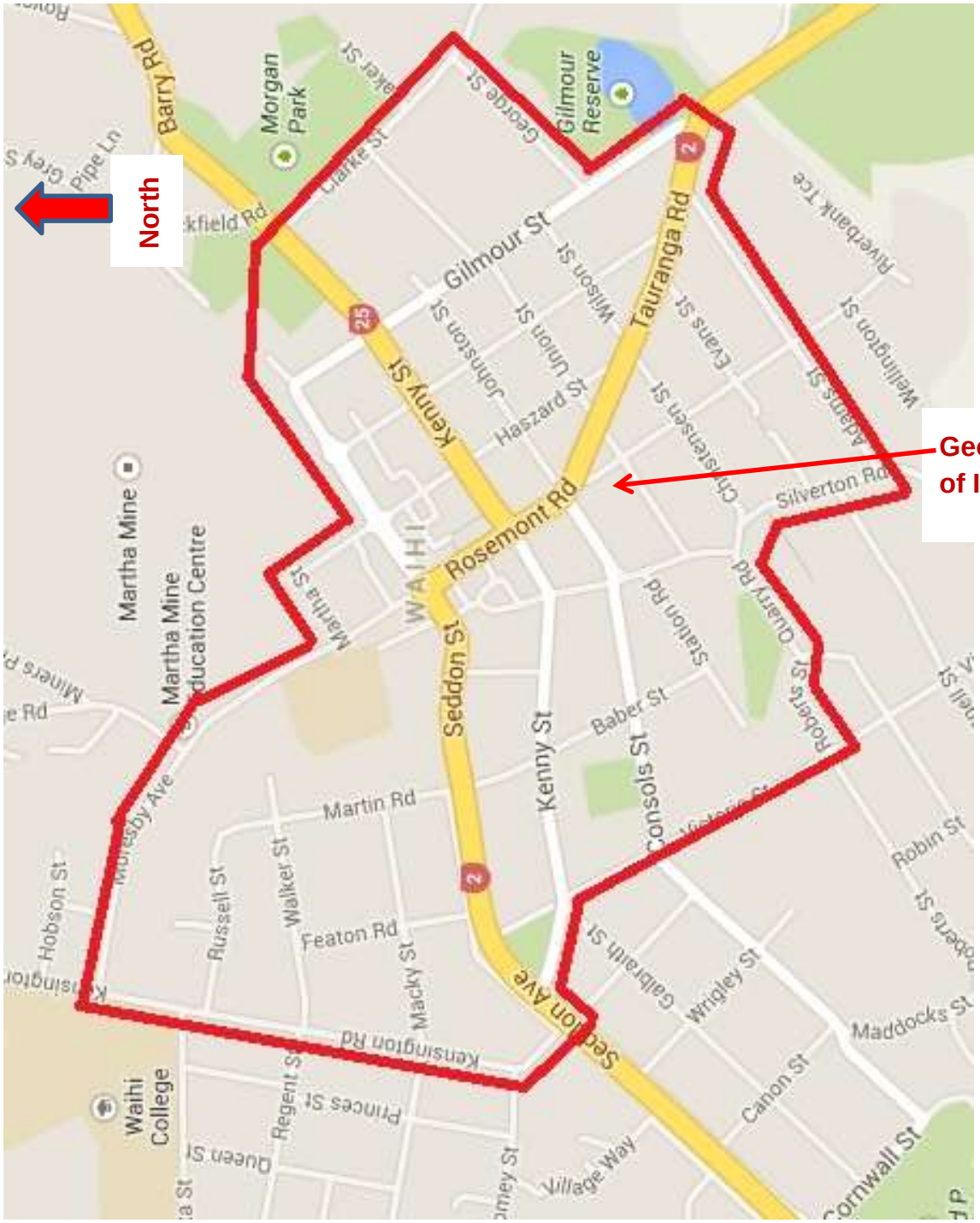
No.	Pg.	Description	Indicative Cost
3.	17	Install a Mobility Space at 78 Seddon Street (outside Westpac) and retain the Mobility Space outside 98 Seddon Street (McLean's Shoes).	$2,000
4.	17	Relocate the Mobility Space at 68 Seddon Street (outside BNZ) to 42 Seddon Street (outside Tropical Flair).	$1,500
17.	26	Replace the kerb ramps to a maximum grade of 1 in 14 (7.1%) at the intersections of SH.2 with: • Village Way (east crossing Village Way); • Victoria Street (south/west crossing Victoria Street); • Seddon Street (south/east crossing SH.2); • Kenny Street SH.25 (south/east crossing SH.25, and south/west crossing Kenny Street); • Johnston Street (south/west crossing Johnston Street); • Union Street (north/east, north/west, and south/west crossing Union Street); and • Christensen Street (south/west and south/east crossing Christensen Street).	$8,500

No.	Pg.	Description	Indicative Cost
20.	27	Repair the kerb ramps at the intersections of SH.2 with: • Johnston Street (north/west crossing Johnston Street); • Union Street (north/east and south/east crossing Union Street); and • Remove the kerb ramp at Adams Street (north/west crossing Adams Street).	$3,000
22.	29	Replace the kerb ramps to a maximum grade of 1 in 14 (7.1%) at the intersection of SH.25 with Gilmour Street (north/west and north/east crossing Gilmour Street).	$1,500
24.	30	Replace the kerb ramp at the intersection of Seddon Street and Gilmour Street (south/west crossing Gilmour Street) to a maximum grade of 1 in 14 (7.1%).	$1,000
29.	32	Improve the layouts on Kensington Road at the intersections with Macky Street and Walker Street to improve access in this area.	$12,000
45.	46	Install signage at bridges with narrow footpaths to advise pedestrians to give way.	$500
51.	51	Repair the footpaths at the following locations: • 16 Gilmour Street; • Johnston Street - Entire length from Mueller Street to Haszard Street (south side), #36, and #42; • Kenny Street – opposite Devon Street to Baber Street, outside Safe & Sound, #12 to #18 • Kensington Road – SH.2 to Toomey Street; • Martha Street – west of Newmont Waihi Gold driveway; • Moresby Avenue – outside Newmont Waihi Gold; Service lane behind Subway, outside Waihi Central School, opposite the Waihi Mine Lookout, #11, and #38; • 14 Russell Street; • Seddon Street – Light pole outside the Visitor Centre; • SH.2 – outside RSA, driveway to Super Liquor; • SH.25 – at the BP, #73, #75, #112 to #116; • Union Street – Mueller Street to #32; and • 17 Walker Street.	$40,000

No.	Pg.	Description	Indicative Cost
52.	52	Repair the surface of footpath at the following locations: • George Street – cracks all length; • Kenny Street – Depression of trench west of crossing point near SH.25; • Macky Street - #1a and #9; • Moresby Avenue – At driveway to Waihi Central School, #16, #20, #32b, uneven driveways at #1, #3, and #7; • Seddon Street – Depression at joint of AC and tiles at intersection with Mueller Street and the east end of the bus stop, patchy surface west of Gilmour Street and outside St John's; • SH.2 – cracks outside Waihi Hospital near a seat, the seat at the intersection with Kensington Road, #38 and #42 Seddon Avenue, #27 Tauranga Road; • SH.25 – Depression at Waihi Industrial & Farm Supplies, cracks outside the Waihi Rugby Club, #86 and #90; • Union Street – Longitudinal joint crack outside the school; and • Walker Street – Depression at the intersection with Martin Road, and #39.	$45,000
56.	53	Install signage identifying longitudinal grades steeper than 1 in 12 (8.3%) with alternative routes if available.	$500
65.	65	Install a refuge island on the southern end of Gilmour Street to connect the footpath on the west side of Gilmour Street to Gilmour Reserve.	$15,000
70.	70	Install at least one armrest on the seating provided at: • 6 Russell Street; • Seddon Street – one seat at Martha Court; and • SH.2 – Outside Waihi Hospital, intersection with Kensington Road, and at the RSA.	$500
73.	71	Remove the verandah support on the west side of the pedestrian crossing on SH.2, near Kenny Street.	$4,000

Total: $135,000

APPENDIX A: LOCATION MAP

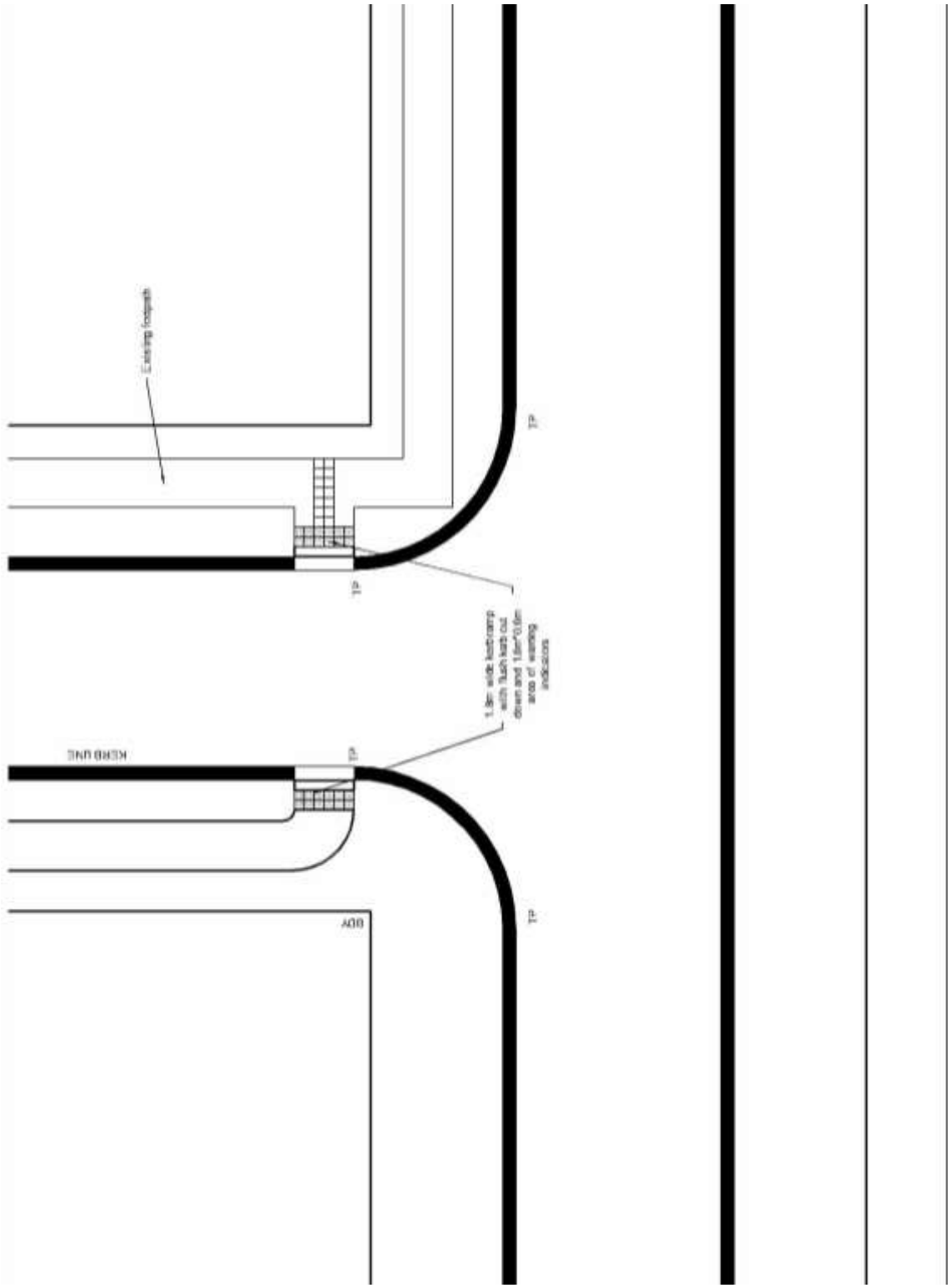


WAIHI GEOGRAPHIC AREA OF INTEREST

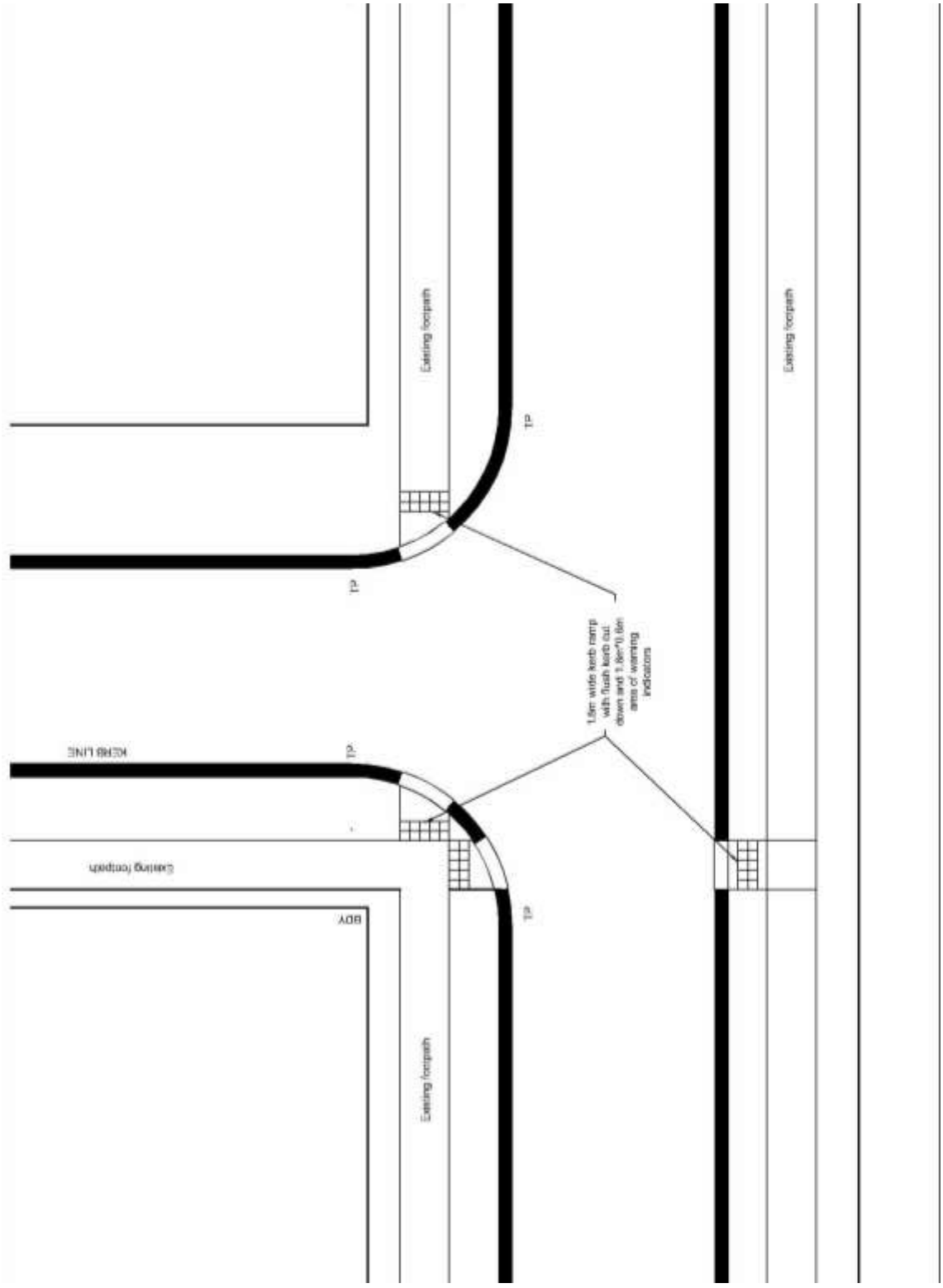
Date: May 2014

Scale: Not to Scale

APPENDIX B: INTERSECTION LAYOUTS



Layout A 'Tee Intersection'



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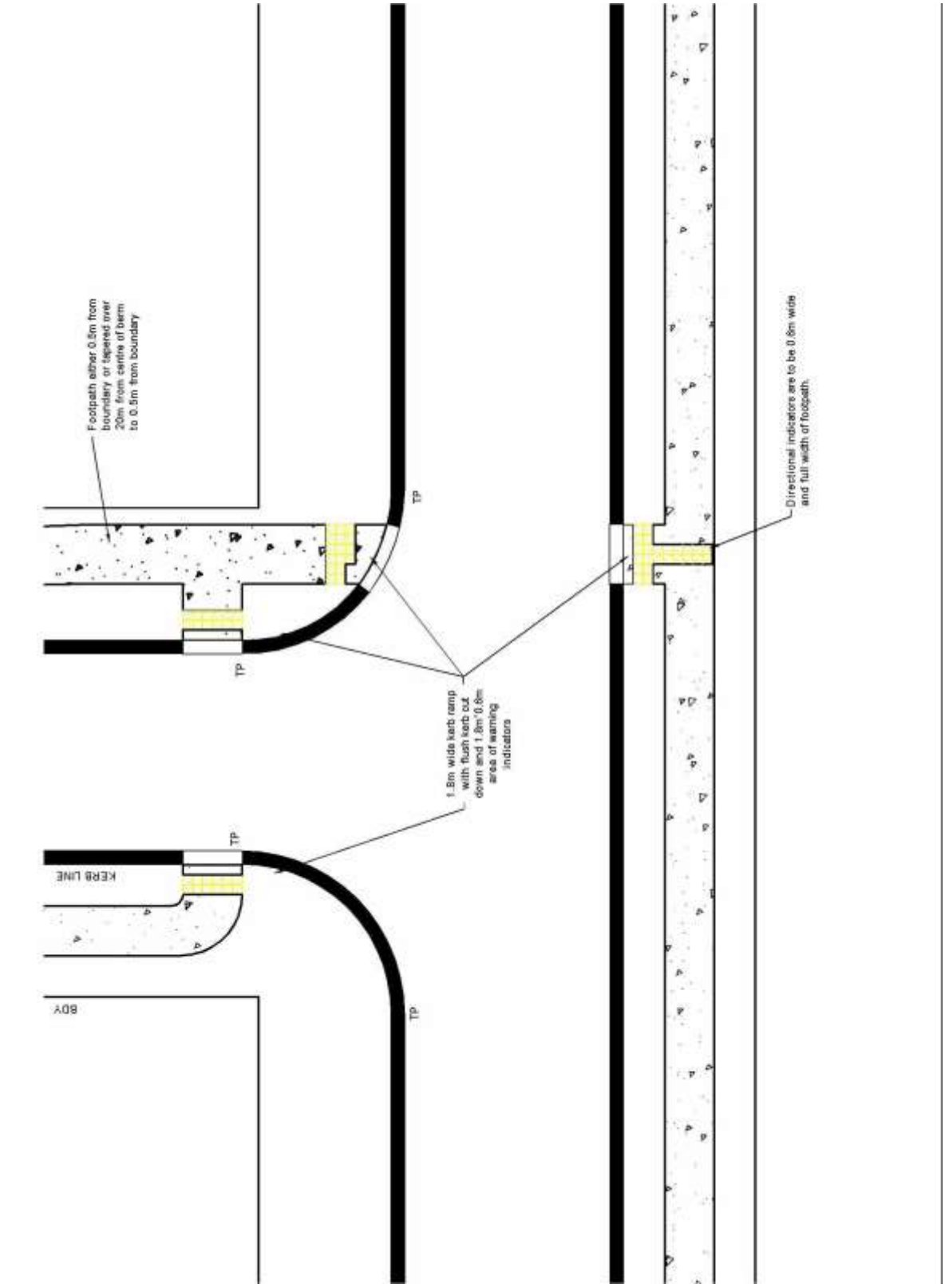
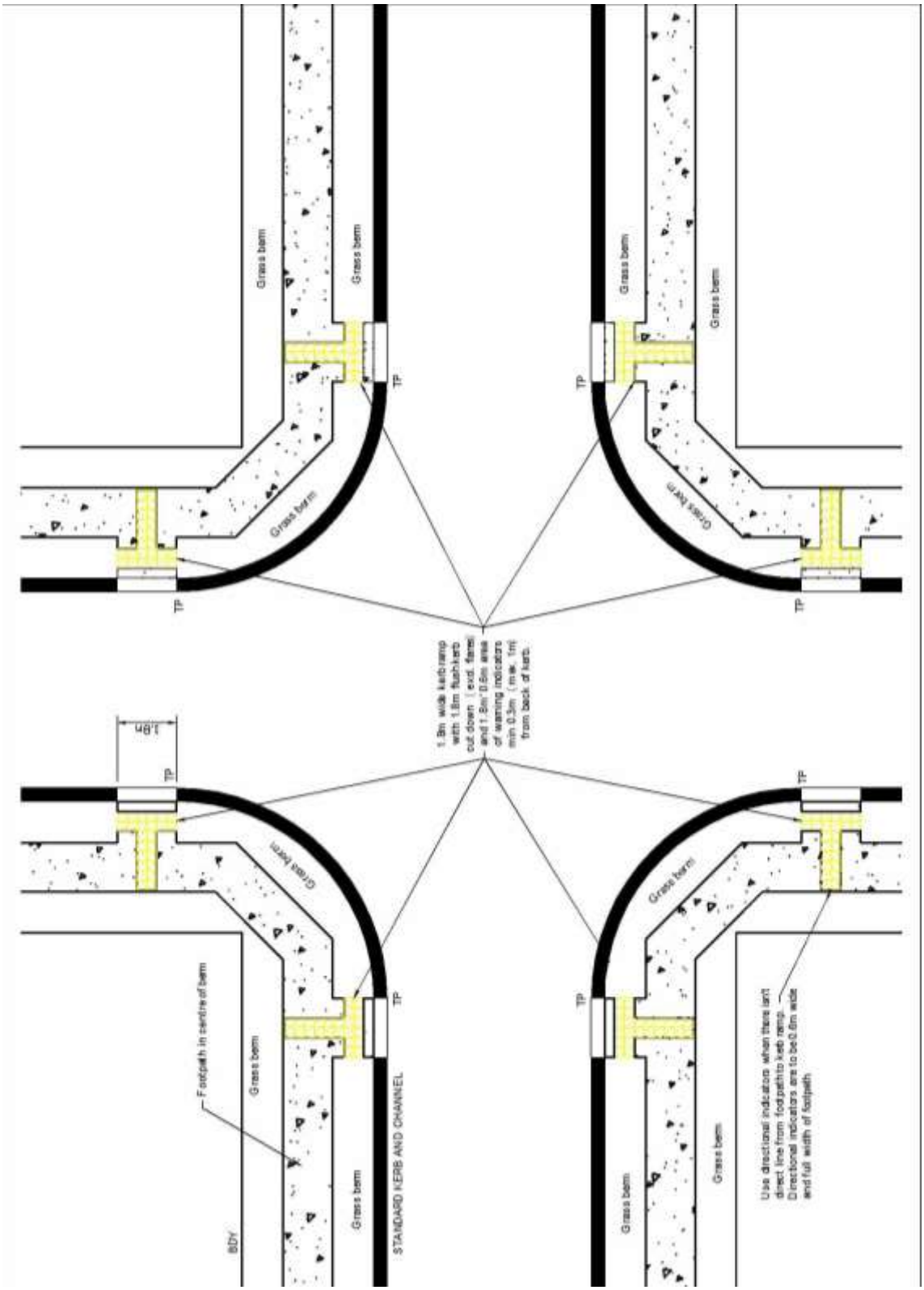
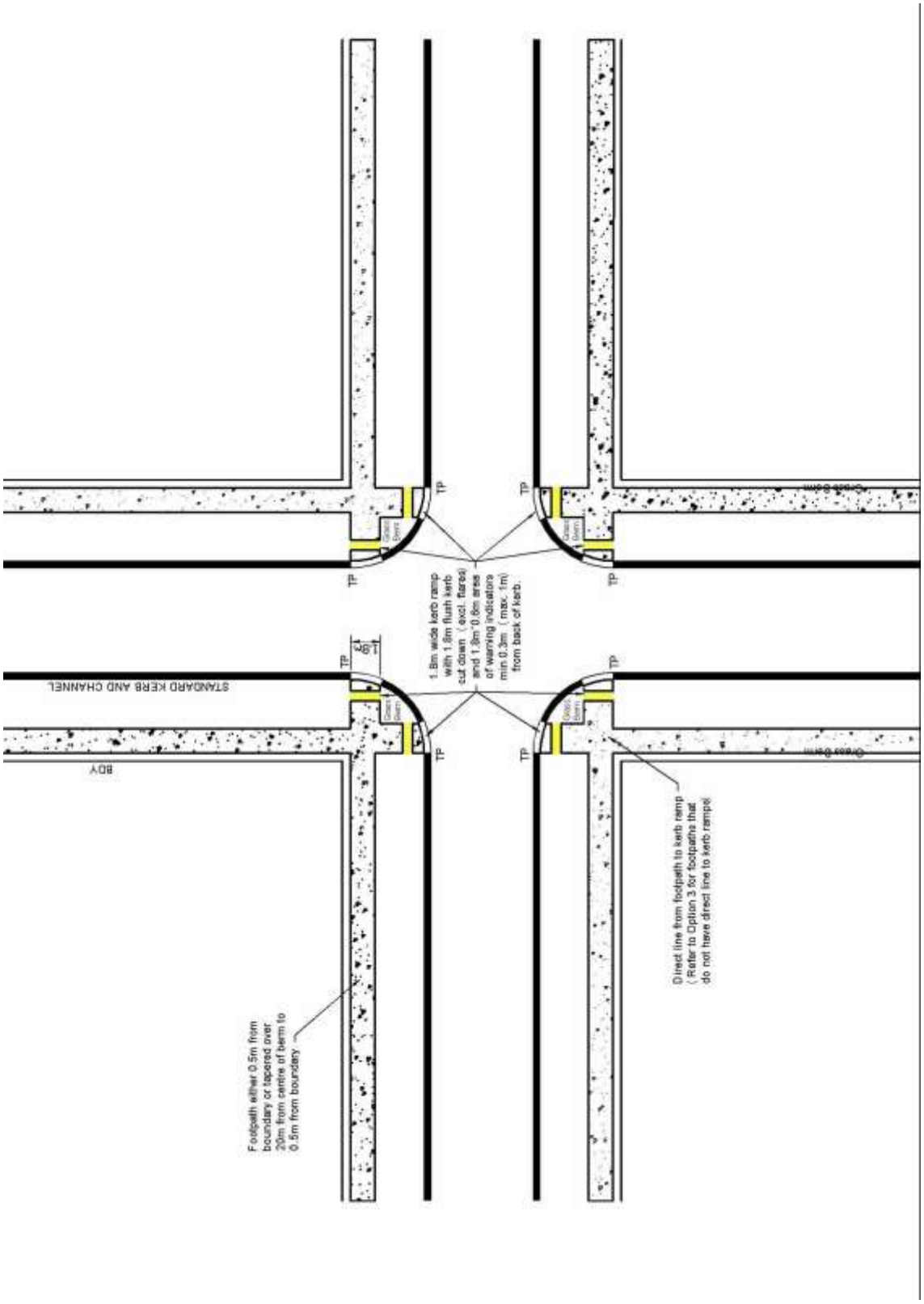


Layout C – 'Tee Intersection'



Layout D – Cross Intersection'



Layout E – 'Cross Intersection'

APPENDIX C: RISK MODIFIED CONDITION PROFILE

RISK MODIFIED CONDITION PROFILE

In order to provide a performance measure of the condition of footpaths and kerb ramps, it is necessary to combine the condition rating with a risk assessment to ensure the limited resources available achieve the maximum benefit for residents and other users.

The risk ratings are defined as follows:

Risk Level	Definitions	Risk Multiplier, R (%)
High	High level of foot traffic (commercial centre). Regular presence of people using walking aids, scooters or wheelchairs. Part of an accessible route for the disabled. Possible use by visually impaired	100
Medium	Regular presence of people using walking aids, scooters or wheelchairs. Presence of community facilities likely to be accessed by pedestrians. Part of an accessible route for the disabled.	60
Low	Very low pedestrian use. Absence of community destinations. No through traffic or low traffic count. Alternative routes available (e.g. opposite side of road)	30

Table 8: Risk Ratings

There are two measures to be analysed, being the footpaths and kerb ramps, with a minimum of 100 locations, selected in the same proportions as those within the defined risk categories, with the locations being chosen at random for assessment. Footpath sections should be at least 10m in length and kerb ramps should include the adjacent waiting area. Where a kerb ramp or footpath (for all or any part of a 10m section), is desirable but not built, a condition rating of 5 applies.

The profile score Pf for footpaths or Pk for kerb ramps for the defined area, with a total of “n” assessed sites is determined as follows:

$$Pf = \Sigma(1...n) / n \left| \frac{R_1 .....R_n}{C_1 \quad C_n} \right| \text{ x } 100\%$$

The maximum score will depend on the proportions of sections within the various risk categories and a further normalisation can be undertaken if desired. For example with a 40/30/30 % allocation to the high medium and low risk categories, the maximum score would be 67% (0.4x100% + 0.3x60% +0.3x30%) and normalisation could be undertaken to set the maximum at 100%.

FOOTPATH CONDITION RATING

Table 9: Footpath Condition Rating

Rating	Conditions
1	• Surface in good condition; • Kerb well defined; • Surface in good condition; • No trip hazards; and • No attention required.
2	• Good surface; • Minor Wear and Tear; • Crossfall evident; and • No immediate concerns.
3	• Surface adequate; • Trip hazard removed; • Minor defects; and • No immediate attention required.
4	• Poor surface condition; • Limited width; • Cracks appearing; and • No major trip hazards.
5	• Concrete cracked and likely to lift; • Surface Poor; and • Potential for trip hazards.

KERB RAMP CONDITION RATING

Table 10: Kerb Ramp Condition Rating

Rating	Conditions
1	• Good surfaces; • No trip hazards; and • No defects.
2	• Generally Complies with DBH D-1 Fig 9 and NZS 4121; • Minor wear and tear on concrete; and • No immediate attention required.
3	• Good level crossing; • Minor repair required; and • No immediate concerns.
4	• Rough concrete surface; • Steep ramp; • Inadequate waiting space; and • No major trip hazards.
5	• Poor surface condition • No defined waiting area • Potential trip hazards • Excessive slopes

APPENDIX D: FOOTPATH PROVISIONS

Table 11: Provision of Footpath in the Geographic Area of Interest

Road Name	Provision of Footpath
Adams Street	Westbound – Silverton Rd to Rosemont Rd (<1.5m width) Eastbound – Rosemont Rd to SH.2 (<1.5m width)
Baber Street	Northbound only – full length (<1.5m width)
Christensen Street	Eastbound – Silverton Rd to Rosemont Rd (<1.5m width) Westbound – Rosemont Rd to SH.2 (<1.5m width)
Clarke Street	Northbound – SH.25 to George St (<1.5m width)
Consols Street	Eastbound only – Victoria St to Johnston St (<1.5m width)
Devon Street	Southbound – full length (>2.4m width) Northbound – 10a Devon St to SH.2 (<1.5m width)
Evans Street	Eastbound – End to Rosemont Rd (<1.5m width) Westbound – Rosemont Rd to SH.2 (<1.5m width)
Featon Road	Northbound only – full length (<1.5m width)
Gilmour Street	Southbound and northbound – Seddon St to SH.25 (≥1.5m width) Southbound – SH.25 to Union St (<1.5m width) Northbound – SH.25 to SH.2 (<1.5m width)
George Street	Eastbound only – full length (<1.5m width)
Haszard Street	Southbound – Martha St to Seddon St, SH.25 to SH.2 (<1.5m width) Southbound – Seddon St to SH.25 (>1.8m width) Northbound – Martha St to 32 Haszard St (>1.8m width) Northbound – 32 Haszard St to Dairy at SH.2 (<1.5m width)
Johnston Street	Eastbound – Consols St to Mueller St (<1.5m width) Westbound – Consols St to Gilmour St (<1.5m width)

Road Name	Provision of Footpath
Kenny Street	Eastbound – Victoria Park to approx. 45m east of Silverton Rd (<1.5m width) Westbound – SH.2 to Victoria St, 42 Kenny St to Silverton Rd (<1.5m width) Westbound – Victoria St to 42 Kenny St, Silverton Rd to SH.2/SH.25 (>1.8m width).
Kensington Road	Northbound – SH.2 to Toomey Street (>1.8m width) Northbound – Toomey St to Waihi College (<1.5m width) Southbound – SH.2 to Moresby Ave
Macky Street	Eastbound only – full length (<1.5m width)
Martha Street	Eastbound – Moresby Ave to Haszard St (≈1.5m width) West bound – Haszard St to Martha Mine (<1.5m width)
Martin Road	Southbound – 45 Martin Rd to SH.2 (>1.5m width) Northbound – full length (<1.5m width)
Moresby Avenue	Southbound – Kensington Rd to #17 Moresby Ave, 35 Moresby Ave to Newmont Waihi Gold (<1.5m width) Southbound –Newmont Waihi Gold to Seddon St/SH.2 (>1.8m width) Northbound – Seddon St to Bridge (>1.8m width) Northbound – Bridge to Kensington Rd (<1.5m width)
Mueller Street	Southbound – Seddon St to SH.25 (>1.5m width) Southbound – SH.25 to SH.2 (<1.5m width) Northbound – Seddon St to Union St (≥1.5m width)
Pickett Place	Southbound only – Russell St to 8 Pickett Pl (<1.5m width)
Quarry Road	Both sides – full length (<1.5m width)
Roberts Street	Eastbound – full length (<1.5m width)
Rosemont Road	Southbound – SH.2 to 88 Rosemont Rd (<1.5m width) Northbound – Sh.2 to Adams St (<1.5m width
Russell Street	Westbound – full length (<1.5m width)

Road Name	Provision of Footpath
Seddon Street	Both sides – SH.2 to Gilmour St (>1.5m width)
Silverton Road	Both sides – 90m north of Kenny St to Kenny St (1.5m width) Southbound - Kenny St to Consols St (<1.5m width) Northbound – Kenny St to Consols St (>1.5m width) Both sides – Johnston Rd to Quarry Road (<1.5m width)
SH.2	Southbound – Village Way to Kensington Rd (<1.5m width) Southbound – Kensington Rd to Johnston St (≥2.4m width) Johnston St to Gilmour St (<1.5m width) Northbound – Victoria Park to Devon St (<1.5m width) Northbound – Devon St to Kenny St (≥2.4m width) Northbound – Kenny St to Johnston St (<1.8m width) Northbound – Johnston St to Adams St (<1.5m width)
SH.25	Eastbound – SH.2 to Mueller St (>2.4m width) Eastbound – Mueller St to Clarke St (≈1.5m wide) Westbound – SH.2 to Clarke St (<1.5m width)
Station Road	Eastbound – Baber St to Silverton Rd (<1.5m width) Westbound – 14 Silverton Rd to Silverton Rd (≈1.5m width)
Thomas Place	Eastbound – full length (<1.5m width)
Union Street	Eastbound – Silverton Rd to SH.2, Mueller to Gilmour St (<1.5m width) Westbound – SH.2 to Mueller St (>1.5m width)
Victoria Street	Northbound – Kenny St to Roberts St (<1.5m width) Southbound – Kenny St to Te Kohanga Reo (>2.4m width) Southbound – Te Kohanga Reo to Consols St (<1.5m width)
Walker Street	Eastbound only – full length (<1.5m width)
Wilson Street	Westbound only – full length (<1.5m width)

APPENDIX E: NZTA PEDESTRIAN CROSSING FACILITIES CALCULATION SPREADSHEET

Pedestrian Crossing Facilities Survey Sheet Page _____ of _____

Survey Location: _____
Surveyor(s): _____
Survey Date: _____
Uninterrupted/Interrupted Traffic Flow (Circle one)
85th % Vehicle Speed est/measured: _____
General Comments: _____

Drawing (include cross section, lanes, median, parking, etc)

Pedestrian Crossing Facilities Survey Sheet

Survey Location: _____
Survey Date: _____

Page _____ of _____

Time of Day (15min Intervals)	Vehicle Volume		Pedestrian Flow			Comments:
	Direction 1:	Direction 2:	Adults	Children (<12years)	Elderly/ Sensitive	

Pedestrian Crossing Facilities Calculation Spreadsheet

Summary Sheet

Project Name		**Date of Assessment**	
Project Location			

Field Data

Road Layout	(select an option)
Speed Limit (Environment)	(select an option)
Approach Speed (85th Percentile)	(select an option)

	Traffic Volume Average Peak (veh/hr)	No. of Trafficked Lanes	Flow Type	Crossing Distance, Without Aids (m)	Pedestrian Volume Average Peak Hour (ped/hr)
Direction 1	EnterNo.	(select an option)	select an optior		
Direction 2		(select an option)	select an optior		
Total	EnterNo.	(select an option)	select an optior		EnterNo.

Traffic Volume (AADT)		veh/day	Pedestrian Volume	peds/day

Physical Aid Benefits

	Total Crossing Distance (m)	Mean Pedestrian Delay (sec/ped)	LOS	NPV Pedestrian Delay Cost	NPV Safety Cost Saving	NPV Geometric Vehicle Occupant Delay	Appropriateness for Road Type & Speed
Without Crossing Facility					-	-	-
Platform					elect and optic		(select an option)
Kerb Extensions					elect and optic	-	(select an option)
Median Refuge						-	(select an option)
Kerb Extensions & Median Refuge						-	See result for individual facilities above

Facility Considered	(select an option)
NPV Total Benefits for Facility Considered	(select an option)
Construction Cost for Facility Considered	$ -
Benefit Cost Ratio for Facility Considered	

Zebra Crossings

Does the crossing meet the minimum volume requirement of 50 peds/hr?	Yes
Does the crossing meet the requirement of having less than two lanes in each direction?	(select an option)
Appropriateness of Zebra for Road Type & Speed	(select an option)

	Mean Pedestrian Delay (sec/ped)	NPV Safety Cost Saving	NPV Geometric Vehicle Occupant Delay	Appropriateness of Zebra, & of Physical Aid for Road Type & Speed
Without Crossing Facility		-	-	-
Zebra Only	-	select and optior	-	Yes
Zebra + Platform	-	select and optior		See result for individual facilities above
Zebra + Kerb Extensions	-	select and optior	-	See result for individual facilities above
Zebra + Median Refuge	-		-	See result for individual facilities above
Zebra + Kerb Extensions & Median Refuge	-		-	See result for individual facilities above

Facility Considered	(select an option)
NPV Total Vehicle Occupant Delay	
NPV Total Benefits for Facility Considered	(select an option)
Construction Cost for Facility Considered	$ -
Benefit Cost Ratio for Facility Considered	

Traffic Signals

Appropriateness for Road Type & Speed	(select an option)	
Pedestrian Delay (Average Peak)		hours/hour
Vehicle Occupant Delay (Average Peak)		hours/hour
NPV Pedestrian Delay Without Facility		
NPV Pedestrian Delay With Signals		
NPV Vehicle Occupant Delay With Signals		
NPV Safety Cost Savings With Signals	(select an option)	
NPV Total Benefits for Traffic Signals		
Benefit Cost Ratio for Facility Considered		

Grade Separation

Appropriateness for Road Type & Speed	(select an option)

Pedestrian Crossing Facilities Selection Guideline Spreadsheet Version 1.2 February 2007

Pedestrian Crossing Facilities Calculation Spreadsheet

Input Sheet

Reset Defaults | Reset Sheet | Find Errors

This spreadsheet is based on the Pedestrian Planning and Design Guide, and the Guidelines for the Selection of Pedestrian Crossing Facilities. Please refer to these documents on the Land Transport New Zealand website in the first instance for any clarification that is required.

Enter values in the white input boxes, working down the page. Please note that input boxes for each step must be filled in, because later steps use information provided in earlier steps.

The "Reset Defaults" button resets all values to defaults. The "Reset Sheet" button clears all input cells and resets all values to defaults. The "Find Errors" button displays messages detailing missing inputs.

All benefits are discounted over 25 years at 10% with zero growth to give the Net Present Value (NPV).

Inputs

Project Name

Project Location

Date of Assessment

If the reason for providing a pedestrian facility is for specific access provisions for a particular group (i.e. young children, visually impaired) or for integration and reinforcement of a wider traffic management plan then see the Pedestrian Planning and Design Guide for further guidance. If wanting to improve pedestrian level of service or address a crash risk issue then follow the steps below.

Step One: Which Facilities are Appropriate for the Road Type and Speed Environment?

Inputs

Road Layout: (select an option)

Speed Limit: (select an option)

Approach Speed (85th Percentile): (select an option)

Outputs

Appropriateness of Platforms	(select an option)
Appropriateness of Median Refuges	(select an option)
Appropriateness of Kerb Extensions	(select an option)
Appropriateness of Zebra Crossing	(select an option)
Appropriateness of Traffic Signals	(select an option)
Appropriateness of Grade Separation	(select an option)

Appropriateness of facility is for the entered road layout and highest speed

Refer to the Pedestrian Planning and Design Guide for appropriate design standards

Step Two: Enter Table Inputs

Five hours of surveys are required to capture peak times, but also to ensure that demand is maintained at other times.

It is possible to enter data for Direction 1 only i.e. for a one-way street. A one-way street can also be treated as having two flows/directions i.e. for a median refuge option.

Survey of Traffic Volumes

Survey Date | Surveyor | Weather

	Traffic Volume (veh/hr) Survey1	Survey2	Survey3	Survey4	Survey5	Average Peak Hour	No. of Trafficked Lanes	Flow Type	Crossing Distance, No Treatment (m)
Hour Starting	0.00								
Direction 1						EnterNo	(select an option)	(select an option)	
Direction 2							(select an option)	(select an option)	
Total	EnterNo	EnterNo	EnterNo	EnterNo	EnterNo	EnterNo	(select an option)	(select an option)	

Comments/Notes

**interrupted: if within 500m of traffic signal or similar device which interrupts flow, and there is little scope for additional traffic to enter the stream and fill the gaps*

**crossing distance: from where pedestrian first exposed to traffic to where pedestrian is clear of passing traffic stream i.e. carriageway less kerbside parking*

Traffic Volume (AADT): veh/day

**two-way AADT*

Survey of Pedestrian Volumes

Survey Date | Surveyor | Weather

	Pedestrian Volume (ped/hr) Survey1	Survey2	Survey3	Survey4	Survey5	Average Peak Hour
Hour Starting	0.00					
Adult Pedestrians						EnterNo
Sensitive Pedestrians						EnterNo
Total	EnterNo	EnterNo	EnterNo	EnterNo	EnterNo	EnterNo

Comments/Notes

**sensitive pedestrians are the elderly, children <12 years of age, and disabled pedestrians*

Estimated Average Daily Pedestrian Volume: peds/day

**default value for CBD use 8.6 x total average peak hour*

**default value for suburbs use 6.6 x total average peak hour*

Step Three: Is a Pedestrian Facility Required?

Equivalent Crossing Distance and Time Calculation

Inputs			***Outputs***		
			Proportion of Sensitive Pedestrians		%
Walk Speed of 15th Percentile Adult Pedestrians	1.3 m/s	*default value 1.3m/s	Mean Walk Speed of 15th Percentile Pedestrians		m/sec
			Equiv. Crossing Time Without Aids, Direction 1		sec
Walk Speed of 15th Percentile Sensitive Pedestrians	1.0 m/s	*default value 1.0m/s	Equiv. Crossing Time Without Aids, Direction 2		sec
			Equivalent Crossing Time Without Aids, Total *Includes Factor of Safety of 1.1, and a confirmation time		sec
Walk Speed of Average Adult Pedestrians	1.5 m/s	*default value 1.5m/s	Mean Walk Speed of Average Pedestrians		m/sec
			Equiv. Crossing Time Without Aids, Direction 1		sec
Walk Speed of Average Sensitive Pedestrians	1.2 m/s	*default value 1.2m/s	Equiv. Crossing Time Without Aids, Direction 2		sec
			Equivalent Crossing Time Without Aids, Total *Includes Factor of Safety of 1.1, and a confirmation time		sec

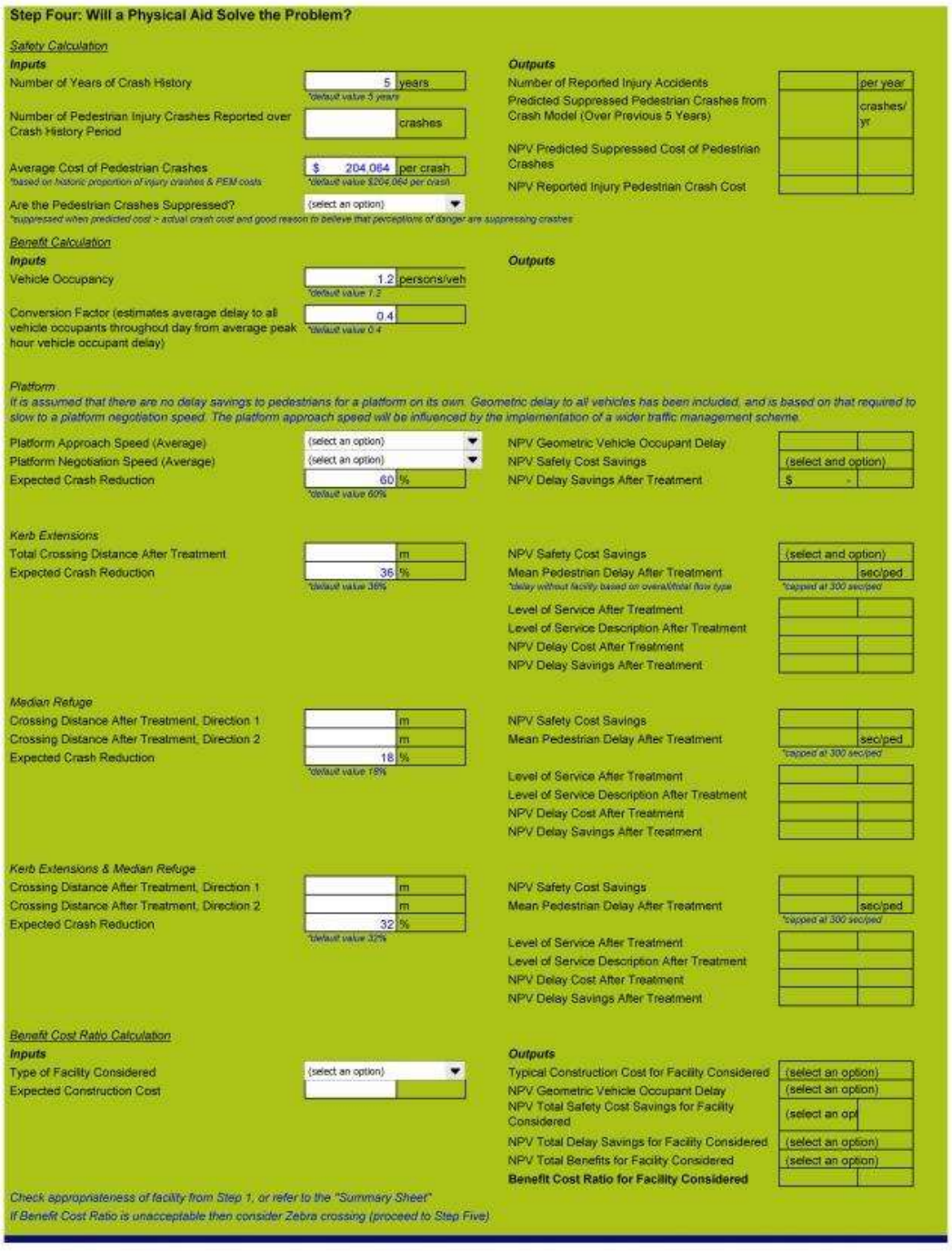
Adjust walk speeds when pedestrian density is high or crossing width limited (see Pedestrian Planning and Design Guide for details)

Delay Calculation

Mean pedestrian delay is calculated based on the time required to find a suitable gap in the traffic stream

Inputs			***Outputs***		
Economic Value of Delay	$ 16.27 per hr	*default value $16.27/hr (PEM Table A4.3)	Mean Pedestrian Delay, Without Facility *delay without facility based on overall/total flow type		sec/ped *capped at 300 sec/ped
Conversion Factor (estimates average pedestrian delay throughout day from average peak hour pedestrian delay)	0.6	*default value 0.6	Level of Service (LOS), Without Facility		
			Level of Service Description		
			Appropriate Situation		
Time Over Which Economic Assessment Applies	250 days/yr	*default value 250days/yr	NPV Delay Cost Without Facility		

A pedestrian facility is required if the level of service is unacceptable or if a safety problem has been identified at the site (proceed to Step Four)



Step Four: Will a Physical Aid Solve the Problem?

Safety Calculation

Inputs

Number of Years of Crash History: 5 years (*default value 5 years*)

Number of Pedestrian Injury Crashes Reported over Crash History Period: crashes

Average Cost of Pedestrian Crashes (*based on historic proportion of injury crashes & FEM costs*): $ 204,064 per crash (*default value $204,064 per crash*)

Are the Pedestrian Crashes Suppressed? (select an option) (*suppressed when predicted cost > actual crash cost and good reason to believe that perceptions of danger are suppressing crashes*)

Outputs

Number of Reported Injury Accidents	per year
Predicted Suppressed Pedestrian Crashes from Crash Model (Over Previous 5 Years)	crashes/yr
NPV Predicted Suppressed Cost of Pedestrian Crashes	
NPV Reported Injury Pedestrian Crash Cost	

Benefit Calculation

Inputs

Vehicle Occupancy: 1.2 persons/veh (*default value 1.2*)

Conversion Factor (estimates average delay to all vehicle occupants throughout day from average peak hour vehicle occupant delay): 0.4 (*default value 0.4*)

Outputs

Platform

It is assumed that there are no delay savings to pedestrians for a platform on its own. Geometric delay to all vehicles has been included, and is based on that required to slow to a platform negotiation speed. The platform approach speed will be influenced by the implementation of a wider traffic management scheme.

Platform Approach Speed (Average): (select an option)

Platform Negotiation Speed (Average): (select an option)

Expected Crash Reduction: 60 % (*default value 60%*)

NPV Geometric Vehicle Occupant Delay	
NPV Safety Cost Savings	(select and option)
NPV Delay Savings After Treatment	$ -

Kerb Extensions

Total Crossing Distance After Treatment: m

Expected Crash Reduction: 36 % (*default value 36%*)

NPV Safety Cost Savings	(select and option)
Mean Pedestrian Delay After Treatment (*delay without facility based on overall/total flow type*)	sec/ped (*capped at 300 sec/ped*)
Level of Service After Treatment	
Level of Service Description After Treatment	
NPV Delay Cost After Treatment	
NPV Delay Savings After Treatment	

Median Refuge

Crossing Distance After Treatment, Direction 1: m

Crossing Distance After Treatment, Direction 2: m

Expected Crash Reduction: 18 % (*default value 18%*)

NPV Safety Cost Savings	
Mean Pedestrian Delay After Treatment	sec/ped (*capped at 300 sec/ped*)
Level of Service After Treatment	
Level of Service Description After Treatment	
NPV Delay Cost After Treatment	
NPV Delay Savings After Treatment	

Kerb Extensions & Median Refuge

Crossing Distance After Treatment, Direction 1: m

Crossing Distance After Treatment, Direction 2: m

Expected Crash Reduction: 32 % (*default value 32%*)

NPV Safety Cost Savings	
Mean Pedestrian Delay After Treatment	sec/ped (*capped at 300 sec/ped*)
Level of Service After Treatment	
Level of Service Description After Treatment	
NPV Delay Cost After Treatment	
NPV Delay Savings After Treatment	

Benefit Cost Ratio Calculation

Inputs

Type of Facility Considered: (select an option)

Expected Construction Cost:

Outputs

Typical Construction Cost for Facility Considered	(select an option)
NPV Geometric Vehicle Occupant Delay	(select an option)
NPV Total Safety Cost Savings for Facility Considered	(select an op
NPV Total Delay Savings for Facility Considered	(select an option)
NPV Total Benefits for Facility Considered	(select an option)
Benefit Cost Ratio for Facility Considered	

Check appropriateness of facility from Step 1, or refer to the "Summary Sheet"

If Benefit Cost Ratio is unacceptable then consider Zebra crossing (proceed to Step Five)

Step Five: Will a Zebra Crossing Solve the Problem?

Inputs

Outputs

Is the crossing likely to be self enforcing (recommended numbers crossing >50ped/hr)? — Yes

Does the crossing meet the requirement of having less than two lanes in each direction? — (select an option)

Do not use zebra crossing if inappropriate (see Step 1), or if the above requirements are not met. Outputs are not provided if the above requirements are not met. Zebra crossings should not be used in isolation, and should only be used as part of an integrated traffic management plan. See Pedestrian Planning and Design Guide for details.

Benefit Calculation

Inputs

It has been assumed that there is no delay to pedestrians for a zebra crossing

Outputs

NPV Total Pedestrian Delay Savings

NPV Vehicle Occupant Delay

Zebra Only

Crash Reduction: -28 % (*default value -28%*)

NPV Safety Cost Savings — (select and option)

Vehicle Delay (Average Peak) — sec/veh

NPV Benefits After Treatment

Zebra + Platform

Crash Reduction: 88 % (*default value 88%*)

NPV Safety Cost Savings — (select and option)

NPV Geometric Vehicle Occupant Delay

Vehicle Delay (Average Peak) — sec/veh

NPV Benefits After Treatment

Zebra + Kerb Extensions

Crash Reduction: 44 % (*default value 29%*)

NPV Safety Cost Savings — (select and option)

Vehicle Delay (Average Peak) — sec/veh

NPV Benefits After Treatment

Zebra + Median Refuge

Crash Reduction: 18 % (*default value -6%*)

NPV Safety Cost Savings

Vehicle Delay (Average Peak) — sec/veh

NPV Benefits After Treatment

Zebra + Kerb Extensions & Median Refuge

Crash Reduction: 32 % (*default value 13%*)

NPV Safety Cost Savings

Vehicle Delay (Average Peak) — sec/veh

NPV Benefits After Treatment

Benefit Cost Ratio Calculation

Inputs

Type of Facility Considered: (select an option)

Expected Construction Cost

Outputs

Typical Construction Cost for Facility Considered — (select an option)

NPV Total Pedestrian Delay Savings

NPV Total Vehicle Occupant Delay

NPV Total Safety Cost Savings for Facility Considered — (select an option)

NPV Total Benefits for Facility Considered — (select an option)

Benefit Cost Ratio for Facility Considered

Check appropriateness of facility(ies) from Step 1, or refer to "Summary Sheet"

If Benefit Cost Ratio is unacceptable then consider traffic signals (proceed to Step Six)

Step Six: Will Mid-block Traffic Signals Solve the Problem?

If traffic signals are not appropriate (Step 1) then use physical aids or retain existing situation
Traffic signals should not be used in isolation, and should only be used as part of an integrated traffic management plan. See Pedestrian Planning and Design Guide for details
Where there is a need for special provision for the vision impaired and where a signalised mid-block crossing would get insufficient use, consider signalising a nearby intersection.
Consider mid-block signals (co-ordinated where appropriate) where the distance to an adjacent intersection exceeds 150m to 200m, otherwise consider signals at the intersection.

Traffic Signal Benefit Calculation

Analyse the peak performance using a model such as aaSIDRA, and weight the delay to reflect average levels of vehicle occupancy

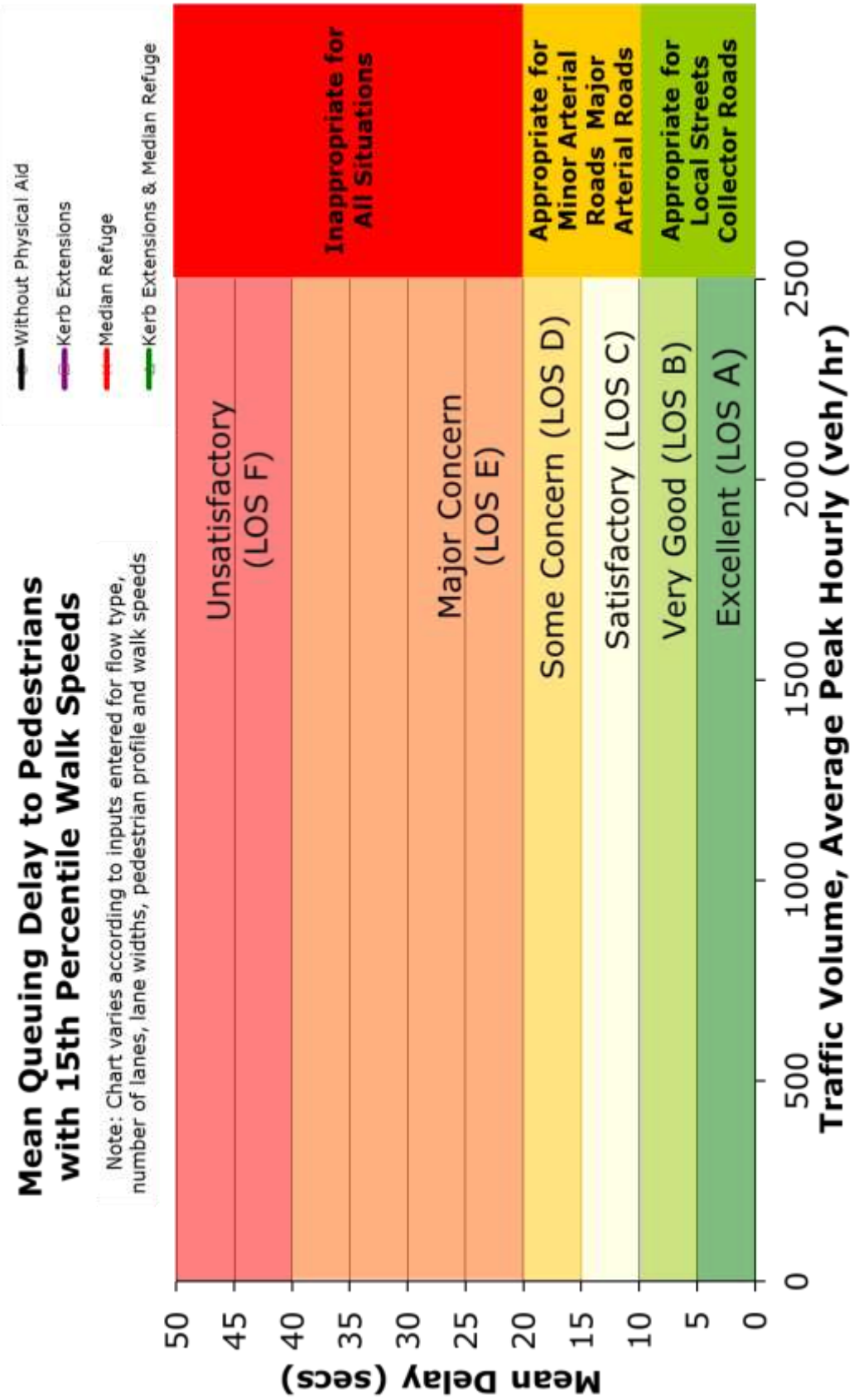
Inputs			**Outputs**	
Pedestrian Delay (Average Peak)		hours/hour	NPV Pedestrian Delay Without Facility	
Vehicle Occupant Delay (Average Peak)		hours/hour	NPV Pedestrian Delay With Signals	
Conversion Factor (estimates average delay to all users throughout day from average peak hour delay to all users)	2.5		NPV Vehicle Occupant Delay With Signals	
	default value 2.5			
Expected Crash Reduction	64	%	NPV Safety Cost Savings With Signals	(select an option)
	default value 45%			
Expected Construction Cost			NPV Total Benefits for Traffic Signals	
			Benefit Cost Ratio for Traffic Signals	

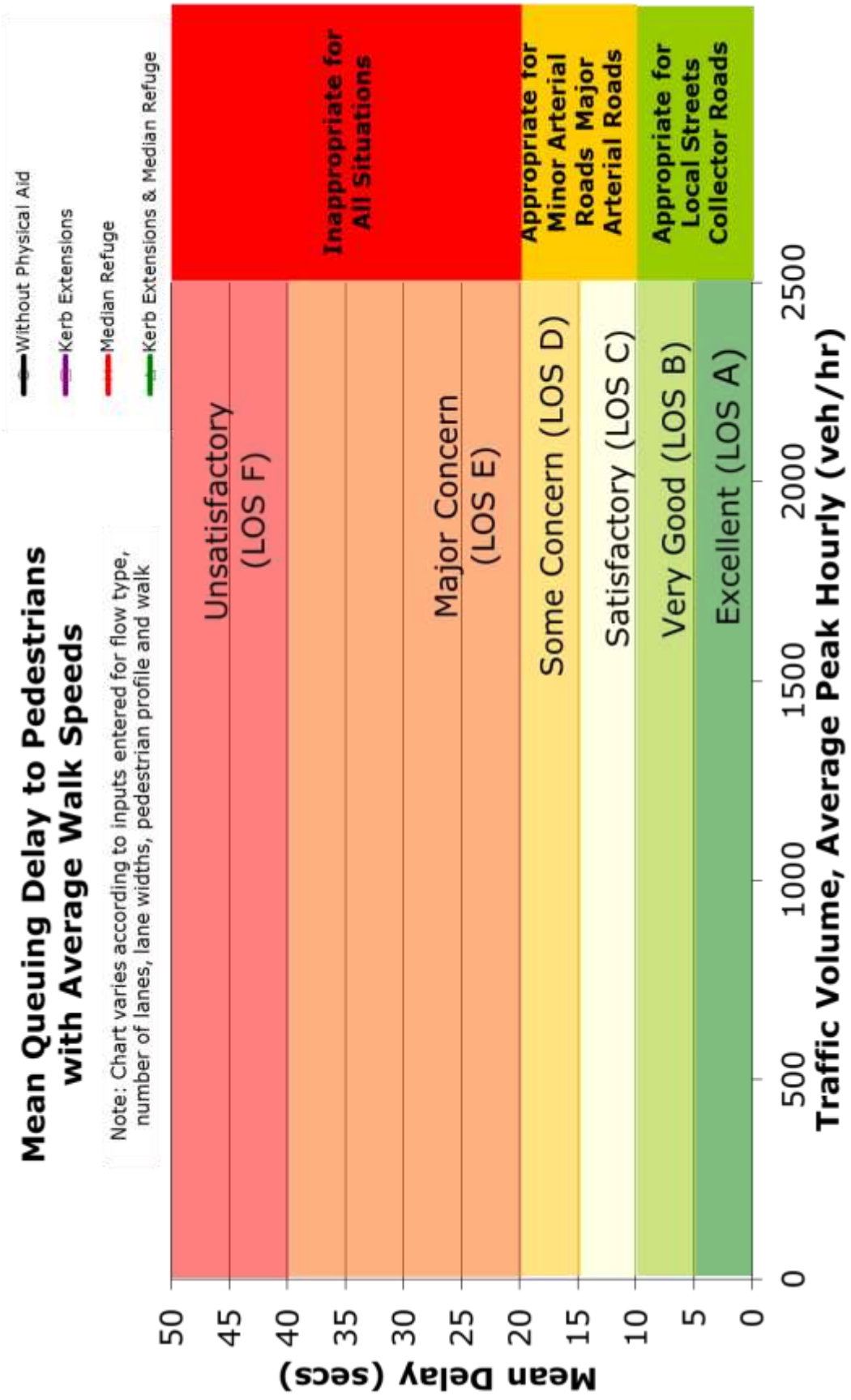
If Benefit Cost Ratio is unacceptable then consider grade separation (proceed to Step Seven)

Step Seven: Will Grade Separation Solve the Problem?

For grade separation (overbridges and underpasses) a full economic analysis is required
Expected crash reductions are 60%, and 70% with barrier fencing
To be more effective the path length at grade should be more than 2.5 to 3 times the path length using the facility
See the Pedestrian Planning and Design Guide for further guidance

Pedestrian Crossing Facilities Selection Guideline Spreadsheet Version 1.2 February 2007


Mean Queuing Delay to Pedestrians with 15th Percentile Walk Speeds
Note: Chart varies according to inputs entered for flow type, number of lanes, lane widths, pedestrian profile and walk speeds
Without Physical Aid
Kerb Extensions
Median Refuge
Kerb Extensions & Median Refuge
Inappropriate for All Situations
Appropriate for Minor Arterial Roads Major Arterial Roads
Appropriate for Local Streets Collector Roads
Unsatisfactory (LOS F)
Major Concern (LOS E)
Some Concern (LOS D)
Satisfactory (LOS C)
Very Good (LOS B)
Excellent (LOS A)
Mean Delay (secs)
0
5
10
15
20
25
30
35
40
45
50
0
500
1000
1500
2000
2500
Traffic Volume, Average Peak Hourly (veh/hr)


Mean Queuing Delay to Pedestrians with Average Walk Speeds
Note: Chart varies according to inputs entered for flow type, number of lanes, lane widths, pedestrian profile and walk
Without Physical Aid
Kerb Extensions
Median Refuge
Kerb Extensions & Median Refuge
Inappropriate for All Situations
Appropriate for Minor Arterial Roads Major Arterial Roads
Appropriate for Local Streets Collector Roads
Unsatisfactory (LOS F)
Major Concern (LOS E)
Some Concern (LOS D)
Satisfactory (LOS C)
Very Good (LOS B)
Excellent (LOS A)
Mean Delay (secs)
0
5
10
15
20
25
30
35
40
45
50
0
500
1000
1500
2000
2500
Traffic Volume, Average Peak Hourly (veh/hr)