The Hamilton City Accessible Journey Trial

An evaluation

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Prepared for
The Hamilton City Accessible Journey Trial Project Team
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Human Rights Commission

Executive summary

Introduction: Hamilton's disabled community has been advocating to relevant authorities for many years for an accessible public land transport system. This, together with the Human Rights Commission's inquiry into accessible public land transport for people with disabilities, inspired the Hamilton city Accessible Journey Trial's project team to modify two medium buses servicing the inner city route and provide changes to five on-route bus stops in an effort to improve public land transport accessibility for people with disabilities in Hamilton and in doing so improve access for all.

This evaluation documents the approach undertaken by the project team and reports the impact of the modifications from the project team's and consumer's perspective.

Background: Transport is critical to participation in society. Disabled people in New Zealand have never had a public transport system that is accessible and affordable.

The Human Rights Commission began an inquiry in 2003 prompted by the experiences and concerns of disabled people seeking enforcement of their right not to be discriminated against in the provision of public transport.

The framework for the Inquiry was the concept of the accessible journey which is described as all the steps needed for a person to get from their home to their destination and back.

The inquiry lasting two years, made 19 recommendations for changes; many of which appear in an implementation timetable in five-year progressive steps.

Evaluation aims: Evaluation aims were to:

- Determine the overall effectiveness of the Hamilton city Accessible Journey Trial,
- Determine the extent to which design modifications and infrastructure at bus stops improved access to and usage of Hamilton's inner-city shuttle route for disabled community members, and
- Inform national Vehicle Quality Standards/guidelines for buses from a disabled user's perspective.

Method: This evaluation was qualitative in nature and involved sourcing and synthesizing primary and secondary data. The evaluation undertaken by Girls on Coffee Ltd was completed in January 2009.

Findings: Evaluation data from passengers suggests the accessibility trial:

- Improved access for all users (disabled, elderly, parents/caregivers with children, tourists),
- Increased the overall use and confidence in passenger use of public land transport,
- Identified preferred seating options for those in wheelchairs and numbers of spaces required on each bus,
- Identified best facilities at bus stops,

- Identified preferred kerb heights and tactile treatments, and
- Confirmed the value of installing real-time information and next-stop announcement audio and visual systems.

With regard to changes to the infrastructure passengers:

- Rated the Les Mills, Victoria Street bus stop as having the best overall facilities,
- Considered the real-time information systems helpful,
- Found the Caro Street bus stop to have the best kerb height, and
- Rated the yellow polyurethane tactile studs as the most popular.

With regard to changes to the buses passengers:

- Approved of the widened aisles,
- Preferred the forward and rearward facing seating positions, and
- Thought the new seat belt system was either excellent or good.

Overall, passengers thought improvements to bus driving could be made along with greater awareness of and sensitivity to people's disabilities.

Project team members reported that strong working relationships and an absence of *egos* and *personal agendas* contributed to the project's success. A reported highlight was the submission to the New Zealand minimum standards for urban buses, based on the outcomes of the Trial.

Passengers and project team members identified a number of areas for improvement and these have formed the basis of the recommendations.

Recommendations:

Recommendations 1-3

These recommendations have application for the local authority and regional council.

> **It is recommended that accessibility specifications for all new footpaths, kerbs and channelling and improved accessibility as footpaths, kerbs and channelling are renewed or maintained, be included in Council's Development Manual.**
>
> **It is recommended that the local authority takes responsibility for coordinating the work to ensure the prioritisation of public transport accessibility occurs.**
>
> **It is recommended that the regional council together with the local authority continue to seek out new links to the CBD Shuttle and the Orbiter service.**

These recommendations simply mean that the local authority takes responsibility for developing accessibility specifications in line with relevant findings from the trial and existing conditions like road camber and that they coordinate the work to prioritise public transport accessibility.

It is acknowledged that planning for new links to the CBD shuttle and the Orbiter occurred in the project's infancy and recently resulted in a new link being established at Bridge Street. Recommendation 3 simply draws attention to the importance of continuing to seek new opportunities for links wherever possible.

Recommendations 4-6

These recommendations have application for regional council.

> **It is recommended that future regional council contracts for public land transport services stipulate accessibility features and requirements similar to those provided by the current CBD Shuttle, as a minimum for urban buses.**
>
> **It is recommended that future regional council contracts for public land transport services stipulate ongoing disability awareness and competency training requirements as a minimum for drivers.**
>
> **It is recommended that regional council introduce policies that improve the current audio messaging system on board urban buses. This could include**

consistent audible volume, physical landmarks of bus stops, or any additional information that will improve accessibility and/or user confidence.

These recommendations simply ensure that the successful accessibility features from the Trial are maintained and replicated in all urban buses[1] and that drivers receive ongoing training. Many passengers took the opportunity to comment on the quality of driving they experienced. While some comments were positive, most passengers thought improvements to driving could be made together with greater awareness of and sensitivity to peoples' disabilities. Simple improvements to the current audio messaging systems would help improve the quality of information delivered to passengers.

Recommendation 7

This recommendation has application for regional council, the local authority and the transport agency.

It is recommended that key agencies continue to include the participation of disabled people/agencies in planning processes to ensure access to public land transport remains a core requirement of public land transport planning, funding and operations in Hamilton.

Non-disabled planners, designers and operators cannot deliver a fully accessible journey alone. Direct input from disabled people is needed. One of the strengths of this project has been in the strong working relationships between all project members. Relationships were strengthened during the development of the city's Disability Strategy and project success has been attributed to these relationships and an absence of *egos* and *personal agendas*. This recommendation simply ensures these partnerships continue.

[1] It is acknowledged that Environment Waikato has already put this in place in their recent tender for service process.

Table of Contents

1.0 Introduction

The Hamilton city Accessible Journey Trial grew primarily out of the Human Rights Commission inquiry into accessible public land transport for people with disabilities.

The aim of the Hamilton city Accessible Journey Trial was to improve public land transport accessibility for people with disabilities and in doing so improve access for all. A priority for the Project Team was to have findings from the Trial inform the New Zealand National Minimum Standards for Urban Buses.

The project was a joint initiative involving Hamilton City; Environment Waikato, bus operators Go Bus Transport Ltd, the New Zealand Transport Agency, the Royal New Zealand Foundation of the Blind, CCS Disability Action, and the Human Rights Commission.

The Trial set out to:

- Increase user-ability of the inner city shuttle route for wheelchair and blind users,
- Improve the perceptions of user-ability and service quality, and
- Increase the number of boardings by people with access disadvantages[2].

The Hamilton City Accessible Journey Trial involved:

- Design modifications to two medium-buses (CBD shuttle) servicing the inner city route,
- Tactile treatments at five on-route bus stops,
- Provision of *real time* information at selected bus stops and on the CBD buses in both visual and auditory formats,
- Information and promotion of the service, and
- The provision of feedback forms for passengers to evaluate the effectiveness of the changes made to bus stops and on the CBD buses.

Girls on Coffee Ltd the research evaluation group, was contracted to carry out an evaluation of the Accessible Journey Trial and to assist the Project Team prepare a submission for the NZTA '*A New Zealand national minimum standard for urban buses*' consultation document (Appendix 1). The evaluation set out to:

- Determine the overall effectiveness of the Hamilton City Accessible Journey Trial,
- Determine the extent to which design modifications and infrastructure at bus stops improved access to and usage of the inner-city shuttle route for disabled community members, and
- Inform national Vehicle Quality Standards/guidelines for buses from a disabled user's perspective[3].

The evaluation was qualitative in nature and involved the gathering of primary and secondary data. Primary data sources included:

[2] Land Transport New Zealand Project Brief, 2007.

[3] Land Transport New Zealand Project Brief, 2007.

- Discussions and meetings with the Project Manager and members of the project team,
- Data obtained from a focus group discussion with key project team members, and
- Feedback from the Operations Manager, *Go Bus* Transport Ltd.

Secondary data involved:

- Sourcing and synthesizing information from literature, relevant documents and reports provided by project team members;
- Viewing information collected from the post-retrofit feedback forms, and
- Viewing information contained in the minutes of meetings and progress reports.

The evaluation was completed in January 2009.

1.1 Literature Review

Transport is critical to participation in society. Transport that is affordable and reliable is needed to access family; education, health services, employment, social and entertainment services. Disabled people in New Zealand have never had a public transport system that is accessible and affordable.

The Human Rights Commission began an inquiry into accessible public land transport for people with disabilities in 2003. The inquiry was prompted by the experiences and concerns of disabled people seeking enforcement of their right not to be discriminated against in the provision of public transport[4].

The framework for the Inquiry was the concept of the accessible journey. The accessible journey is described as all the steps needed for a person to get from their home to their destination and back. All the steps in the accessible journey are interlinked and of equal importance. If one step in the journey is inaccessible or inadequate the whole journey may become impossible[5].

The report *The Accessible Journey* released in September 2005, made nineteen recommendations for changes that will over time ensure disabled people are no longer subject to barriers that unfairly prevent them from going to work, to school, enjoying community activities or fully participating in life[6].

1.1.1 Disability defined

Just how disabled is disabled? There appears to be a current lack of a shared definition of disability amongst regulators, planners, funders and operators. Disability, defined by the Human Rights Act 1993 is a "physical disability or impairment, physical illness, psychiatric illness, intellectual or psychological disability or impairment, any other loss or abnormality or psychological, physiological

[4] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005.
[5] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005.
[6] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005.

or anatomical structure or function, reliance on a guide dog, wheelchair or other remedial means, and the presence in the body of organisms capable of causing illness"[7].

The New Zealand Building Code defines a disabled person as "a user of a wheelchair, walking frame or guide dog".

Hamilton city operates its Disability Strategy from the social model of disability which is consistent with the approach undertaken by the New Zealand Disability Strategy 2001 and defined as "...not having something individuals have. What individuals have are impairments. They may be physical, sensory, neurological, psychiatric, intellectual or other impairments. Disability is the process which happens when one group of people create barriers by designing a world only for their way of living, taking no account of the impairments other people have"[8].

Simply put; the social model of disability purports that it is society that makes it difficult or sometimes impossible for those with disabilities to live their lives how they choose[9].

1.1.1.1 How many disabled people are there?

According to the 2001 Statistics New Zealand's Disability Survey, one in five New Zealanders has a disability. The Midland region, of which Waikato is a part, is thought to have the lowest number of people living with a disability; around 19% or 134,900 people. It is difficult to quantify the numbers of people living with a disability in Hamilton but within the Waikato District Health Board population, approximately 65,000 people are thought to have some type of functional disability, and 12% or 39,401 people are thought to have a disability that requires assistance. Furthermore, 56% of the population over 65 years of age are expected to have some type of functional disability with three-quarters requiring assistance[10].

The demographic forecast predicts that over the next 50 years the proportion of people over 65 will more than double; from 12% in 1999 to 26% in 2050. By 2051 it is predicted that 50% of the population will be over 46 years of age and those aged 85 and over will have increased to around 300,000[11].

In Hamilton almost half the population is made up of people under the age of 29. Hamilton also has a higher proportion of 15-34 year olds than the national average and only 10% of Hamilton's population are 65 and over. The national average is around 12%. However, the numbers of people aged 85 plus increased by 36% during the 1996-2001 census period and the 70 to 79 age group increased by 19% during the same census period[12].

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[7] Cited in The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005, pg 109.
[8] The New Zealand Disability Strategy, 2001
[9] Hamilton City Council. Disability Strategy. 2005-2010
[10] Waikato District Health Board, 2005, Health Needs Assessment and Analysis 2005, www.waikatodhb.govt.nz
[11] Davey Judith A., Gee Susan. 2002. Life at 85 plus: A statistical Review. New Zealand Institute for Research on Aging, School of Social and Cultural Studies, Victoria University of Wellington, New Zealand.
[12] People in New Zealand. *Quality of Life in New Zealand's Eight Largest Cities*, 2003.

As rates of disability increase with age and people lose their access to private transport, the need for accessible public land transport will increase.

1.1.2 Issues for disabled passengers

Disabled people in New Zealand have never had an accessible and affordable public land transport system.

The components of an accessible journey or transport system for disabled people include the footpaths, curb cuts, pedestrian crossings, signals at pedestrian crossings, bus stops and information systems at bus stops, access onto buses, coaches and carriages and information systems on these. If any one of these components is not usable by a disabled person then the whole system becomes inaccessible and unlikely to be used.

Many obstacles can impede disabled people's ability to travel. Problems with infrastructure have been reported as the most serious impediment to a fully accessible journey. Problems with infrastructure included the state of footpaths or no footpaths; kerb heights and cuts or no kerbs, and the presence of safe crossings including the time allowed at controlled crossings. The lack of tactile materials and audio as well as visual signals was also cited as an issue for many disabled people. The location, design and condition of bus stops were of concern particularly for older people[13].

Access to buses can be impeded by illegally parked cars or bus congestion resulting in a bus being unable to extend ramps or assume a 'kneeling' position. Once boarded, bus design can prevent accommodation of mobility aids such as guide dogs, pushchairs and Zimmer frames. Wheelchair space can often be inconsistent in size and location and some chairs do not fit in some gaps or be easily manoeuvred.

Information is a key link in completing a journey. Information that identifies which bus to board and where to get off was regarded as important. Information at pick up and drop off points needs to be set at a level a wheelchair user can read. Deaf passengers need visual information and blind or partially sighted people need suitably designed visual information as well as audio signals[14].

Similarly, many older people experience difficulties with bus services. Information from a review of the needs of older people living in Hamilton in March 2005 showed that many older people lacked confidence using public land transport, particularly with regard to the number of bus changes needed to reach their destination. Many experienced difficulty getting on and off buses and felt hurried. Experiencing abuse and/or intolerance from other passengers was of concern for many. The lack of bus shelters and seats were noted as barriers to accessibility i.e. once having walked to the bus stop there was nowhere to sit down and rest while waiting for the bus[15].

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[13] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005.

[14] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005.

[15] Kay Kristensen & Associates. *Living in Hamilton City: A review of the needs and issues of older people*. March 2005.

Disabled people in Hamilton had complained for a period of time that there weren't enough mobility taxis; they couldn't access taxis when they wanted them and the mobility taxis were very expensive to use[16].

1.1.3 Transport providers and operators

Much has changed since Stagecoach purchased 80 single-step urban buses in 1994. Complaints against this purchase resulted in the bus industry developing a protocol regarding their future investment in Super Low Floor (SLF) accessible buses. This protocol has been followed ever since and as urban buses were replaced from 1995, bus companies started introducing the super low floor buses into urban services. Low floor buses reduce the height differential between the kerb and the bus floor. This has allowed greater accessibility for people with disabilities as well as older people; people with young children in pushchairs and passengers with shopping or luggage[17].

Stagecoach New Zealand reported that 49% of its bus fleet is SLF and a further 177 buses will be replaced in the next three years. By 2014 the urban fleet will be fully accessible. Since 1996 the Bus & Coach Association has built more than 1566 buses for an investment of around $344million[18]. This signals a significant commitment to ensuring accessibility[19].

Around 90% of Hamilton's current urban bus fleet is SLF. This has been attributed to the strong collaborative working relationships between transport operators and disability organisations; good contracts and a good bus operator[20].

1.1.3.1 The issues

As well as ensuring greater accessibility for people with disabilities bus companies also had to factor in the general ageing of the population and the associated increase in the numbers of mobility devices used, and the increasing trend in individuals' size and weight[21]. The transport industry is not alone in having to address these changes. Hospitals, ambulances, airlines and building codes are also faced with similar issues e.g. door width clearances must be greater than 760mm to allow for self-propelled wheelchair users' hand clearance.

Mobility devices such as mobility scooters, wheelchairs, prams, buggies and strollers have improved in design and price making them more common forms of transport for people with disabilities; older people and parents of young children whose mobility is limited by age.

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[16] Anecdotal comment from Disabled Community Groups

[17] Bus and Coach Association. A Discussion Paper on defining what is meant by "wheelchair accessible" public passenger transport urban bus services: A proposal for consideration by regulators, providers and users. May 2007.

[18] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005.

[19] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005.

[20] Comment from focus group discussion participant. November 2008.

[21] The maximum road weight and GVM are major factors in design and road user charges. Operators seek to reduce the tare weight of the bus to maximise passenger capacity.

Modern buses with large wide and deep windscreens and rear engine covers often with heat extraction grids means that the old practice of pram hooks on the outside of buses has not been used for many years and is neither a safe nor practical alternative to taking the pram on board. SLF buses do not have external luggage lockers that were often used to stow folded wheelchairs, prams and buggies although there is usually some storage capability within the bus for small items of luggage and folded buggies.

As a result of these new designs, a range of agreed parameters was needed to define and establish what kind of mobility devices could be carried on buses and coaches. For example, mobility scooters are not designed nor intended for use on the public transport network largely because of their size and weight, and occupied prams and strollers are less manoeuvrable in confined spaces than wheelchairs because of their greater length.

Other concerns highlighted by transport providers were the links between the standard of infrastructure and the ability of the operators to provide an accessible service. For example, the placement of kerb protrusions and their relative position; the enforcement of parking restrictions, and the placement of street furniture like seats, timetable stands, lamp posts etc, make the use of ramps and kneeling devices difficult. The variability of kerb heights, the road camber and gradient all contribute to difficulties in providing an accessible service[22].

1.1.3.2 Driver Training

Bus operators have also identified driver training as a priority. Technical training in the operation of a vehicle and equipment including reducing 'rough driving', pulling in close to the kerb, and training in operating wheel chair ramps and other equipment is provided. Training on customer service including awareness and understanding of disabled people's needs is also a priority although aspects of this needed improvement.

Bus operators reported that there were limits to the level of service and assistance drivers could expect to provide e.g. carrying physically immobile passengers onto the bus. OSH guidelines require that drivers not be required to lift heavy weights (usually regarded as weights over 25kg)[23].

Bus operators report that at times there is an expectation that because the vehicle can carry wheelchairs, the wheelchair user has a right to have their travel needs accommodated. Often this is to the detriment of the driver or the operational needs of the service on which many regular dwellers rely. There has been an increased reporting of on-the-job back problems in relation to driver assistance with wheel chair users[24].

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[22] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005.
[23] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005.
[24] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005.

1.1.4 The *Accessible Journey*: Standards

Standards are typically a mixture of performance based statements and prescriptive requirements. A performance based statement is one that specifies for example, that passengers in wheelchairs or with mobility aids must be able to enter and exit a conveyance and position their aids in an allocated space. That the allocated space for a wheel chair or mobility aid must be a minimum of 1200mm x 700mm is an example of a prescriptive requirement.

The Inquiry found that a mix of these two types of standards gives providers, manufacturers and builders the greatest possible flexibility in designing conveyances, premises and infrastructure, while providing certainty for passengers.

International research and best practice indicates a clear trend toward mandatory standards as they ensure the provision of consistent accessible public land transport. However, affordability issues could undermine support for mandatory standards and in response; an implementation timetable in five-year progressive steps was recommended by the Inquiry.

Relevant items from the Inquiry's recommendations have been included in table 1 below[25].

[25] The Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Transport*. 2005. (pg 114-115).

Table 1: National Accessibility Design Performance Standards – Timetable for compliance

Items	After 5 years	10 years	15 years	20 years	30 years
Category: Buses and Coaches					
On-board signs, symbols	**100%**				
On-board information systems (GPS based, visual and audio)	**15%**	**35%**	**65%**	**85%**	
Grab rails, driver alert systems, fare payment systems, surfaces	**55%**	**75%**	**100%**		
Ramps and boarding devices, allocated space, security tie-downs, access paths	**25%**	**55%**	**100%**		
Category: Bus Stops					
Signs, timetable information, symbols	**100%**				
Tactile indicators, allocated space, street furniture, lighting, access space, boarding points	**25%**	**55%**	**80%**		
GPS-based information services (visual and audio)	**15%**	**35%**	**65%**	**85%**	
Category: Premises					
Signs, timetable information, symbols, alarms, visual and audio information	**55%**	**100%**			
Tactile and visual indicators, hearing augmentation, lifts, toilets, furniture access paths, lighting, manoeuvring areas, doorways, surfaces, resting points, ramps	**25%**	**55%**	**80%**	**100%**	
Fare-payment services	**55%**	**80%**	**100%**		
Category: Information Services					
Large print, Braille, on-line and telephone timetable information	**100%**				
Booking services by text, email and fax	**80%**	**100%**			
Guidelines for carriage of mobility aids	**55%**	**100%**			
Category: Streetscape					
Kerbs, channels, intersections, tactile indicators	**25%**	**55%**	**75%**	**85%**	

1.1.5 A New Zealand national minimum standard for urban uses

A project to develop an updated national minimum standard for urban buses was set up by NZTA in the latter part of 2007 to enhance the attractiveness of public transport vehicles throughout New Zealand; to encourage increased patronage, and to address operator concerns about the lack of consistency of vehicle quality standards across different regions in New Zealand. Updating national

minimum standards was also seen as an opportunity to improve the accessibility of buses used in urban public transport services, which is beneficial for all users of these services.[26]

NZTA released its consultation document in August 2008 for the purpose of seeking views from central government, government agencies, regional authorities such as regional councils, public transport operators, interest groups, the disability community and any other interested organisation or individuals on a draft New Zealand minimum standard for urban buses used in public transport services[27].

The review of vehicle quality standards is part of a wider review of procurement being undertaken by the NZTA. The final national minimum standard will form part of the procurement support guide being developed by NZTA and will become a condition for receiving NZTA funding for contracted public services[28].

Twenty-nine submissions were received by NZTA in early October 2008[29]. A submission document (Appendix 1) was submitted by the Hamilton city Accessible Journey Trial project team in October 2008. The aim of the submission was to have the relevant findings from the trial inform the 'Requirement for urban buses in New Zealand'.

1.1.6 The overseas perspective

The Bus and Coach Association of New Zealand report that internationally, operators face similar issues in their quest to meet the needs of the ageing and disabled populations and the need to provide 'barrier free' access.

The United Kingdom has a target to have all rail; bus and coach services wheelchair accessible progressively from 2015 with a completion target of 2020.

The United States has over six million registered wheelchair users and this is increasing rapidly with an ageing population and war injured personnel. As a result, a review of its overall disability policies including a review of the proposed mandate that common standard wheelchairs and some mobility scooters must be carried by rail and on some fixed bus routes and trams is being considered.

Canada has no national reference or requirement.

While Scandinavian countries are starting to require rail to accept any mobility aid that fits within a width of 700mm x length 1200mm x weight 250kg profile, no consistent agreement has been reached.

The Netherlands has a policy aimed at making public transport barrier free by 2010 and rail by 2030 and the dimensions that most public transport is expected to meet, posted on their website.

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[26] NZTZ. A New Zealand national minimum standard for urban buses. August 2008.
[27] NZTZ. A New Zealand national minimum standard for urban buses. August 2008.
[28] NZTZ. A New Zealand national minimum standard for urban buses. August 2008.
[29] NZTA. Letter to submitter: Requirements for urban buses in New Zealand, 28 October 2008

Germany and Austria recognise the problems of access to public transport and in many states prefer to provide free fares for all disabled persons including those who can dismount from their wheelchairs rather than regulating public transport to carry the majority of mobility aids. For those who are unable to use the standard SLF transport modes, generous remuneration schemes are offered for the provision of special vehicles.

Singapore places emphasis on overall improved SLF access for all in preference to focusing on the special requirements of wheelchair users.

Japan has a new law requiring barrier-free access on trains and the metro by 2020. Currently, buses are only required to carry non-powered standard wheelchairs and not any form of mobility scooter[30].

1.1.7 Summary points

The summary points emerging from the literature review were:

- Transport is critical to participation in society and disabled people have been historically and systematically excluded through lack of access to public land transport.
- The Human Rights Commission's inquiry into accessible public land transport for people with disabilities has been instrumental in promoting change throughout New Zealand and was the primary catalyst for the Hamilton city Accessible Journey Trial.
- There is a current lack of a shared definition of disability amongst regulators, planners, funders and operators.
- It is not clear how many people are living in Hamilton with a disability. What is known is that the rates of disability increase with age and as people lose their access to private vehicles the need for accessible public land transport will increase.
- Many obstacles impede people's ability to travel. If one aspect of a person's journey is inaccessible or inadequate, the whole journey may become impossible.
- The bus industry developed a protocol in 1995 to replace urban fleets with super low floors (SLF). Stagecoach New Zealand predicts that by 2014 its urban fleet will be fully accessible.
- Approximately 90% of Hamilton's urban fleet is SLF.
- Bus operators have identified driver training as a priority and many report this is an area that needs improving.
- There are limits to the level of service and assistance drivers can provide. OSH guidelines require drivers not to lift weights over 25kg. Consequently, drivers are not required to carry immobile passengers onto buses.
- Standards are a mixture of performance based statements and prescriptive requirements. The Inquiry's recommendations include an implementation timetable to phase changes in over the next 20-30 years.

[30] Bus and Coach Association. A Discussion Paper on defining what is meant by "wheelchair accessible" public passenger transport urban bus services: A proposal for consideration by regulators, providers and users. May 2007.

- In 2007, NZTA set out to update the 'national minimum standards' via a consultation document in an effort to improve accessibility of buses used in urban public transport services. The submission process attracted 29 submissions nation wide.
- Issues faced by the transport industry with regard to ensuring barrier-free access are similar all over the world although responses vary. In the USA for example, an ageing population and war injured personnel have increased the number of registered wheel chair users to over 6 million. This has necessitated a review of its overall disability policies. By contrast, Canada has no national reference or requirement.

2.0 The Hamilton City Accessible Journey Trial

2.1 Project Overview

The impetus for the Hamilton city Accessible Journey Trial stemmed from a number of key events. The first was the concern of long standing team members that disabled people had been historically and systematically excluded from participation in society through a lack of access to public land transport.

The second was the release of the Human Rights Commission Inquiry's Report entitled *The Accessible Journey* in 2005 and the third was an informal conversation between some members of Waikato's Regional Transport Committee and representatives from CCS Disability Action in July 2006 regarding progress against *The Accessible Journey's* recommendations.

This conversation evolved to discussing the need to establish national standards for urban buses and a suggestion to run an accessible passenger land transport trial in Hamilton city. LTNZ's Manager, Policy and Planning agreed and suggested a proposal be developed and presented back to the LTNZ management team. This occurred and the project was approved and funded. Work on the Hamilton city Accessible Journey Trial commenced in 2007.

The Hamilton city Accessible Journey Trial involved the evaluation and retrofit of two medium-buses servicing the Central Business District (CBD). The CBD Shuttle Service was chosen because the service is:

- Centrally located
- Links with the Transport Centre and covers a 5km circuit
- Has 12 bus stops of which three are also used by some of the urban routes[31]
- Utilised by approximately 22,000 passengers per month of differing mobility, ages and reasons for use.

Research on international best practice together with consultation with members of the disabled community assisted the project team identify current barriers to access and guide the retrofit recommendations.

A team of five people, consisting of three wheelchair users (2 manual, 1 power chair) from CCS Disability Action, an advisor and a visually impaired member of the Royal New Zealand Foundation of the Blind, and Environment Waikato's Transport Coordinator assembled to evaluate the accessibility of one of the city's buses used on the CBD Shuttle Service.

Bus measurements were taken from existing buses servicing Hamilton's CBD that were most likely to provide the best retrofit options for wheelchair users and also for visually impaired people with and

[31] Currently, there are 14 bus stops

without guide dogs. There was general agreement that modified buses would advantage many other groups of people like those using Zimmer Frames, tall people, mothers with prams and older people requiring more space and who may also benefit from improved audio/visual information.

It was decided that two medium-buses would be modified for the trial and each bus would be fitted differently to allow for best-option evaluation and comparison.
Seating options, visual and audio requirements and equipment, the removal of and refitting of seats, along with wheelchair restraint design was all discussed with the wider multi-stakeholder group, suppliers and specialist personnel before modification began. A range of different seating options were trialled to determine which option was the most comfortable and practical for wheelchair users.

Design modifications were completed in July 2008. The project launch on 25 July 2008 attracted high level attendance like politician Ruth Dyson and Hamilton's Mayor Bob Simcock.

The effectiveness of the modified buses was evaluated by a range of people with disabilities between July and November 2008[32].

2.2 The retrofit design

The Project Team identified issues with existing buses and bus infrastructure that impeded accessibility. Within existing buses:

- The front door width was generally too narrow to allow easy access for those in wheelchairs;
- The aisle width made it difficult for wheelchair users and parents with pushchairs to move around the bus freely, and
- The restraint and seating options were neither stable nor comfortable for those in wheelchairs and seating options only allowed for side-facing positioning.

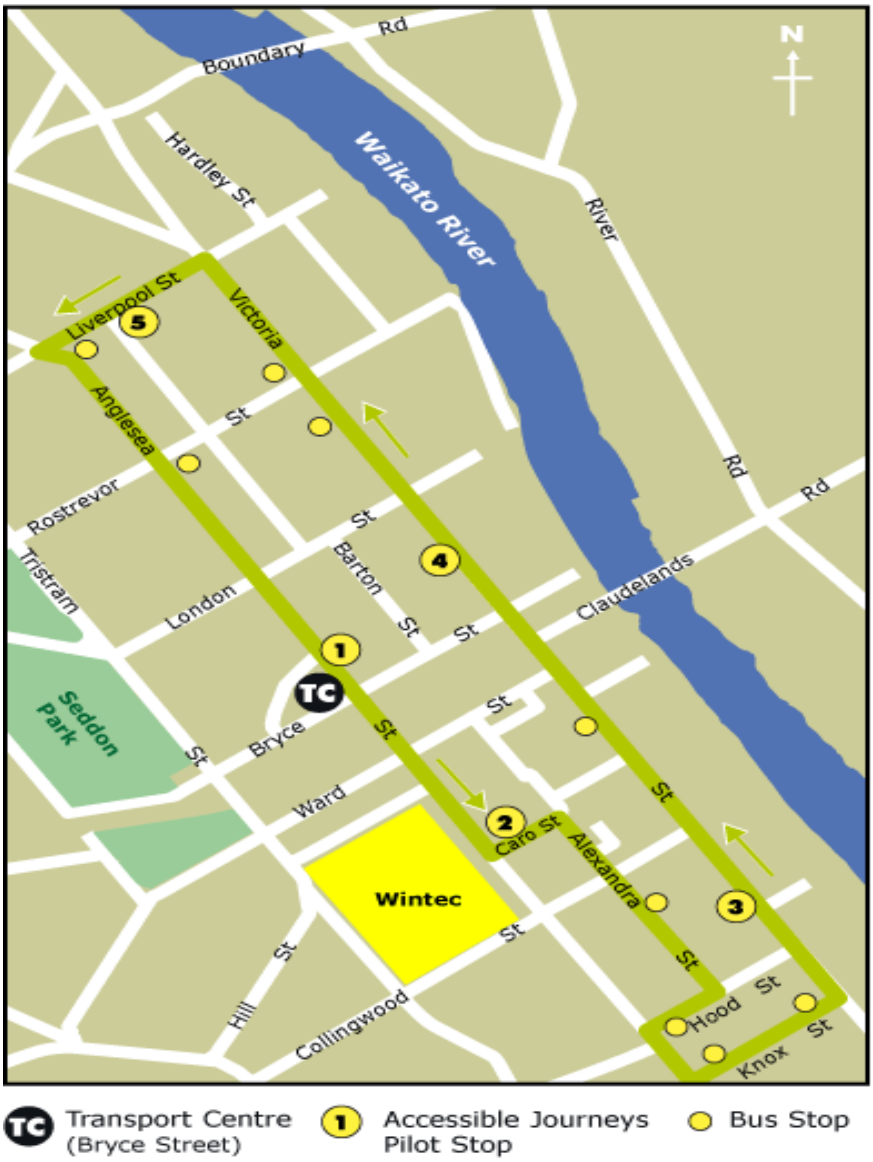
Within bus infrastructure:

- Lack of tactile use on pavements resulted in the vision impaired having difficulty finding bus stops,
- Lack of real-time information resulted in hearing impaired passengers experiencing difficulty getting off the bus at the correct stop, and
- The height of curbs/camber made boarding difficult or impossible for people in wheelchairs and those using walking frames.

This information together with international best practice became the basis for change at selected bus stops and on two existing buses.

[32] Environment Waikato, 2008. Hamilton Accessibility Project Summary Document.

Figure 1: CBD Shuttle Route



2.2.1 Changes to bus stop infrastructure

Different treatments to infrastructure were trialled at five bus stops on the CBD shuttle route. Changes occurred opposite the Transport Centre in Anglesea Street; Caro Street (outside RNZFB), Iguanas Restaurant (Victoria Street), Les Mills (Victoria Street), and Liverpool Street.

The Transport Centre in Hamilton links the whole Hamilton network. Changes to infrastructure opposite the Transport Centre included:

- Raising the kerb height to 140mm,
- Installing yellow polyurethane tactile studs, and
- Installing real-time

At the Caro Street bus stop (outside RNZFB) changes included:

- Raising the kerb height to 200mm, and
- Installing yellow polyurethane tactile studs, and
- A bench seat

At Iguanas Restaurant, Victoria Street, pre-formed yellow concrete tactile slabs were installed. The Les Mills bus stop in Victoria Street which links with several northern primary routes, also had pre-formed yellow concrete tactile slabs and real-time information installed.

The Liverpool Street stop received:

- Raised kerb heights to 240mm and a landing pad,
- Yellow polyurethane tactile studs,
- Real-time information, and
- A bench seat.

Although separate from the Accessible Journey trial, the Waikato Hospital bus stop provides a good example of an accessible bus stop (Figure 2). The Waikato Hospital bus stop received a raised kerb height of 220mm as part of the re-development of the hospital entrance, car parking and access routes[33].

[33] Information provided by the Transport Services Manager, Hamilton City Council

Figure 2: Waikato Hospital Bus Stop

2.2.2 Changes to existing buses

Two existing medium SLF buses were retrofitted for the trial. Modifications included:

- Removing the vertical floor-to-roof handrails (stanchions) to increase aisle width to 850mm between the wheel arches
- Widening the front door width to 995mm (Fig 3)
- Widening the aisle width
- Removing four existing seats to provide more space
- Trialling different seating positions e.g. one bus trialled one forward-facing and traverse seating option while the other trialled a forward-facing and rear-facing seating option (Fig 4)
- New restraint mechanisms in both buses were installed to reduce movement of wheelchairs during transit
- Installing next stop announcements audio and visual systems

2.3 Partnerships: EW and HCC - roles and responsibilities

Environment Waikato and Hamilton City Council are an integral partnership in this Accessible Journey Trial and within the roading network in general. Hamilton City Council is the roading authority for all roads except the state highways within the city limits as set out by national legislation. Hamilton City Council build and maintain the roads, footpaths and street furniture like signs, road markings, streetlights, bus stops/shelters, traffic lights, cycle lanes and the like. The network is run by setting speed limits, determining parking availability across the city and charging developers for the impact of their developments on the roading network. NZTA build and maintain the state highways although Hamilton City Council maintains the street furniture on these highways by local arrangement and invoice.

Environment Waikato manages the transport services across the region in line with national legislation. In Hamilton, Environment Waikato levys a specific public transport rate on ratepayers to cover some costs like bus fares. Fares are deducted from the cost of service before rates are set.

Environment Waikato then receives a subsidy from the New Zealand Transport Agency (NZTA) to cover the deficit. District Councils are invoiced monthly for the cost of services. Environment Waikato organises tenders for the operation of public transport services to third parties like Go Bus Ltd who then purchase the buses, employ and train drivers, and set the salaries.

Figure 3: Doors at full width

Figure 4: Wheel chair measurements (1180mm)

3.0 Consumer feedback: What passengers said

A pilot feedback form developed by Environment Waikato's Transport team was distributed in multiple locations[34] as well as being available on Environment Waikato's *bus-it* website[35]. The purpose of the forms was to capture passenger feedback on the changes to the CBD shuttle service and in particular, changes to the bus stop infrastructure and changes on board the buses.

Data was collected from 64 passengers between July and November 2008[36].

3.1 What passengers thought about bus stop facilities

Overall, the bus stop at Victoria Street (outside Les Mills) was rated the highest in terms of overall facilities even though it had received very little treatment. The only real change to this stop was the insertion of pre-formed yellow concrete tactile slabs. 62% of passengers rated this stop as either good or excellent.

The Liverpool Street bus stop was also rated highly by passengers; 25% thought the facilities were excellent and 37% thought they were good. The Liverpool stop was moved 50metres to the east of Liverpool Street to provide better access for the bus to line up to the kerb. Other significant changes included raised kerb heights and a landing pad, yellow polyurethane tactile studs and real-time information. The Liverpool stop also has seating and shelter which appealed to passengers.

54% of passengers thought the Anglesea Street bus stop was either good or excellent. This stop received treatments such as a raised kerb height, yellow polyurethane tactile studs and real-time information. It also has a seat. Despite these changes, the main criticism of this stop was its close proximity to the Anglesea/Bryce Street intersection. One passenger made the following comment.

> ***The Transport Centre stop a hazard for all road users – proximity to lights, metered parking etc. ... there is generally poor visibility all around here and there will be a pedestrian incident*** (survey participant).

Of the four stops, the Caro Street stop was rated as having the least satisfactory facilities. Only 50% of passengers rated this stop as either good or excellent. Although the Caro Street stop has a raised kerb height and yellow polyurethane tactile studs, it does not have shelter. The Caro Street stop is surrounded by tall buildings which blocks it from the sun and channels the wind. One passenger thought Caro Street needed a shelter because "*when it rains it would also be cold and windy*".

As a general comment, passengers wanted more stops with shelter and seats. Following are the comments from two passengers.

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[34] Feedback forms were available onboard the shuttle service; the Transport Centre, Environment Waikato offices in Hamilton East, CCS Disability Action, Waikato District Health Board offices, and distributed at the Waikato Health and Disability Expo, the pilot's launch and at numerous presentation delivered by project team members.

[35] www.busit.co.nz

[36] Environment Waikato. *The Accessible Journey's Pilot Feedback Form Report.* November 2008

Wish there was some seating and shelter at every stop. It's so grim to stand in the rain especially because if it is wet I can't put my bags on the ground so have to hold everything while I wait which is awful (survey participant).

Really excellent, however shelters at certain pick-ups would be great (survey participant)[37].

The Caro Street bus stop did not have real-time installed. It was because of the tall buildings in Caro Street that a solar powered information system could not be installed.

Figure 5: Caro Street Bus Stop

Table 2: Overall rating of bus stop facilities by passengers

Bus Stop	Excellent	Good	Average	Poor	Very poor
Victoria Street	35%	27%	24%	12%	2%
Liverpool Street	25%	37%	22%	16%	0%
Anglesea Street	31%	23%	23%	15%	8%
Caro Street	27%	23%	29%	15%	6%

3.2 What passengers thought about real-time information

Real-time information has been installed at four of the five bus stops trialled. The purpose of real-time is to let passengers know when the bus is due to arrive. This provides an opportunity for the passenger to either organise another way of getting to their destination or free up time to do other things while they wait. When asked, 90% of passengers believed real-time was helpful. One passenger commented:

[37] Environment Waikato. *The Accessible Journey's Pilot Feedback Form Report.* November 2008

Helps reduce the anxiety – that I may have missed the bus, and lets me know how long I will need to wait (survey participant)[38].

3.3 What passengers thought about changes to kerb heights

Three different kerb heights were trialled in this pilot project; Anglesea Street (140mm), Caro Street (200mm) and Liverpool Street (240mm). Kerb height and/or road camber can significantly impede or assist access to public transport for those in wheelchairs, those using mobility aides such as walking frames, or older people in general. The standard height of a kerb is 100mm and this combined with the road camber can impact on the overall gradient a wheelchair, for example, would have to negotiate.

Of the three heights trialled, Caro Street (200mm) was rated the best (18 responses). Interestingly, Caro Street has the flattest angle, road to kerb of the three sites which allows for easier access. Liverpool Street with the largest kerb height (240mm) has a steep camber which negates the effect of having a raised kerb height.

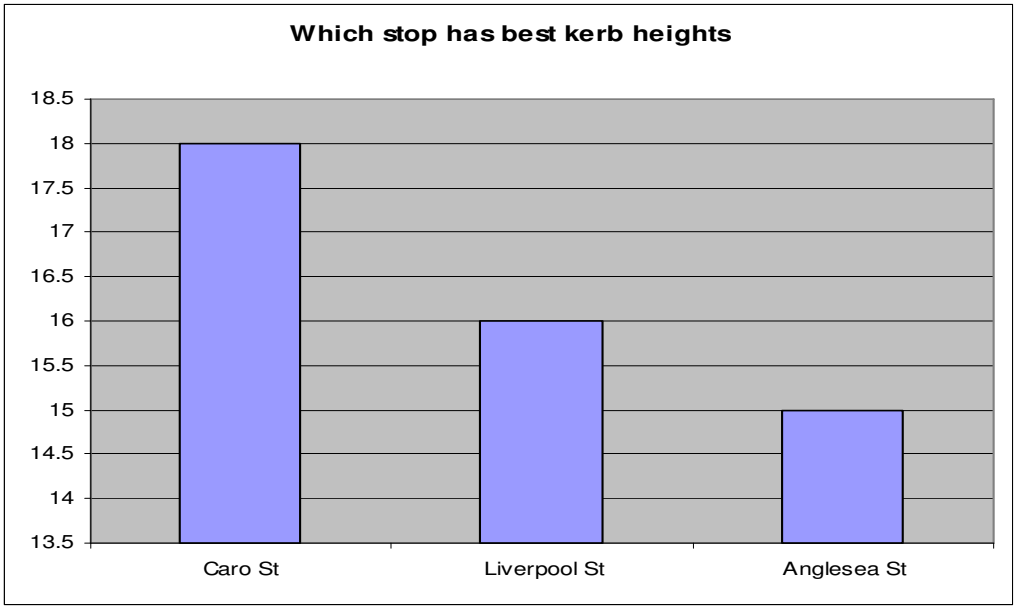
The Liverpool stop was rated the next most effective by 16 survey participants and Anglesea Street the least effective with 15 responses[39]. Passengers made the following comments:

Liverpool is disadvantaged because the road has a slight gradient (survey participant).

Anglesea Street stop felt to be too steep (survey participant)[40].

[38] Environment Waikato. *The Accessible Journey's Pilot Feedback Form Report.* November 2008
[39] Environment Waikato. *The Accessible Journey's Pilot Feedback Form Report.* November 2008
[40] Environment Waikato. *The Accessible Journey's Pilot Feedback Form Report.* November 2008

Figure 6: Which stop has the best kerb heights

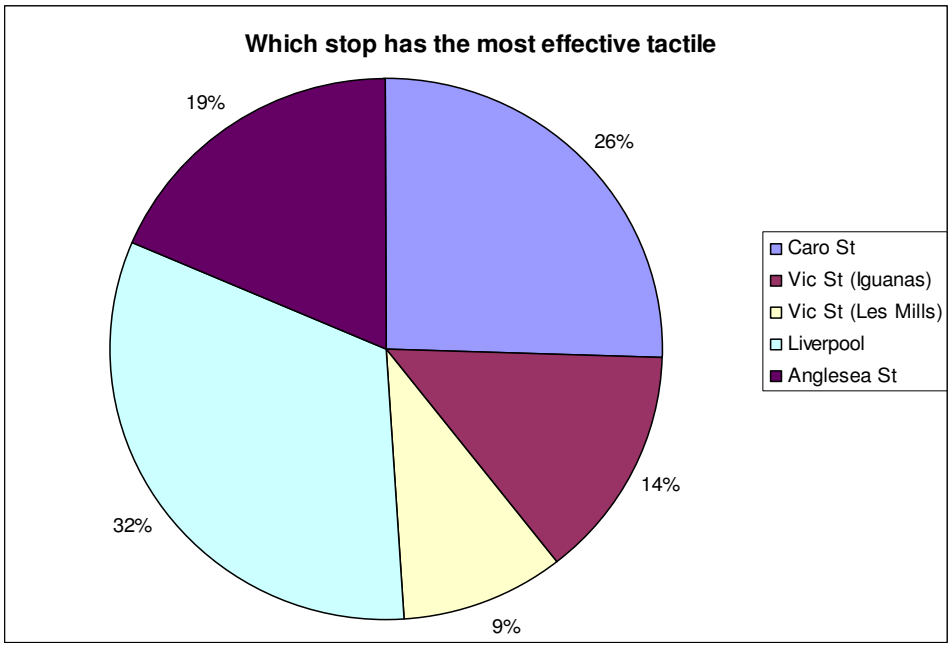


3.4 What passengers thought about the tactile arrangements

Tactile was laid at all five stops on the CDB Shuttle route in two different forms; yellow polyurethane tactile studs and pre-formed yellow concrete tactile slabs. Yellow polyurethane tactile studs were installed at the transport centre, at the Caro Street and Liverpool Street stops. The two stops on Victoria Street received the pre-formed yellow concrete tactile slabs.

The most popular with passengers was the yellow polyurethane tactile studs. These are glued to a flat asphalt surface making them much easier to identify. The pre-formed yellow concrete tactile slabs are inserted into the existing cobble stones and this may have made it harder to identify because of the texture of the cobbled pavement.

Figure 7: Which stop has the most effective tactile[41]



3.5 Changes on board the buses

3.5.1 Next stop announcements audio and visual

Video recorded audio and an LCD screen with the next stop displayed were installed on the CBD shuttle. Passenger feedback has been positive (refer Table 2).

One passenger made the following comment:

> ***This is really good especially for foreigners*** (survey participant)

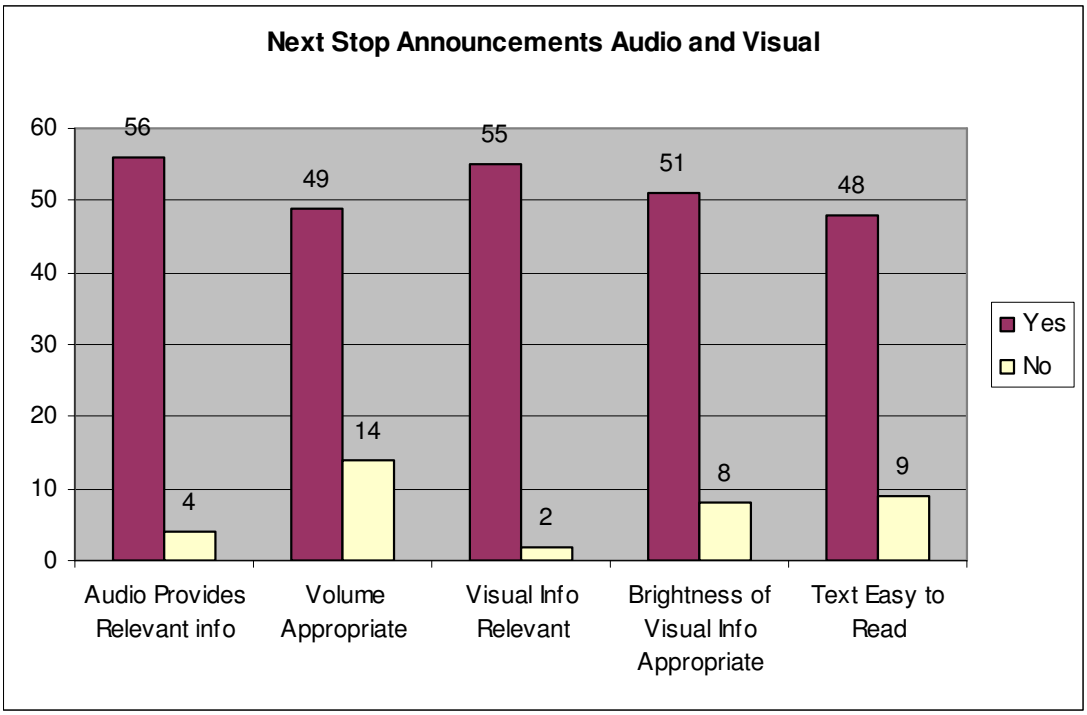
Some passengers thought the volume of the audio messages was not loud enough. Environment Waikato believes it is possible that drivers alter the settings. When first installed, the volume was tested and set at a level that could be heard over engine noise and people talking. Passengers made the following comments:

> ***Visually impaired user. Male voice may give more clarity and the volume could be louder. Visual displays are irrelevant in my situation*** (survey participant)

> ***I think all newer buses should have the video recorded Audio and LCD screens for the city buses*** (survey participant).

[41] Graphs have been taken from Environment Waikato's *The Accessible Journey's Pilot Feedback Form Report.* November 2008

Figure 8: Next stop announcement audio and visual[42]



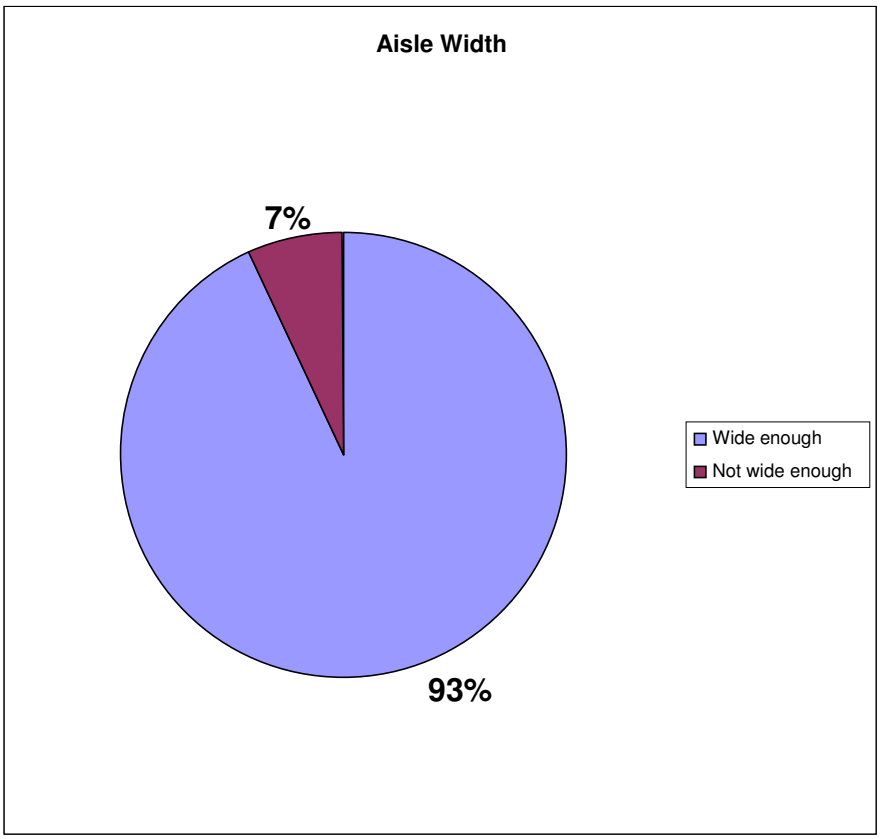
3.5.2 Aisle width

The width of the aisle has huge implications for accessibility. The width of the two existing medium-buses was widened by removing the vertical handrails (Stanchions). This increased the width by around 100mm. 93% of survey participants thought the aisle were wide enough as a result of these changes. Two survey participants made the following comments:

> ***Wide aisles are great for everyone especially if I'm carrying bags*** (survey participant).
>
> ***The width is fine as long as there are not two or more persons in wheelchairs or scooters*** (survey participant).

[42] Graphs have been taken from Environment Waikato's *The Accessible Journey's Pilot Feedback Form Report.* November 2008

Figure 9: Aisle width



3.5.3 Seating arrangements

A number of seating options were trialled on the buses. Both buses were given two wheelchair spaces; one with a forward and rear facing wheelchair option and the other with a forward and transverse option. The seating over the wheel archers was changed on both buses and visual and audio equipment was also installed in both buses.

There was a greater level of support from disabled passengers for the forward facing and rear facing options. Comments on the seating arrangements include:

> ***Love facing forward. Can see when the stop is coming up and I am the same as other passengers*** (feedback survey participant).
>
> ***Side facing option is not good for back. Side to side motion has detrimental effect on spine*** (feedback survey participant).
>
> ***Some elevated seating for those on crutches to swing legs in aisle. Some human bodies are longer than others*** (feedback survey participant).

3.5.4 New seat belt systems

New detachable self-locking belts that hold the wheelchair and the person independently were trialled. 32% of survey participants thought these were excellent and 48% thought they were good. A number of comments suggest alternative ways of mounting the belts.

> ***Would like to see attachment points higher, maybe under seats so that I can do it by myself*** (feedback survey participant).
>
> ***I'm aware that some wheelchair people cannot bend forward to lock their chairs in*** (feedback survey participant).

3.6 What passengers said about the bus drivers

Disabled passengers used opportunities like the focus group discussion in June 2008 and the post-retrofit feedback surveys to provide feedback about the bus service in general. Many took the opportunity to comment on the quality of the driving. Following is a range of comments:

> ***Drivers sometimes don't understand the effects of certain disabilities. Sometimes I ask the driver to drop me off as close to a place I need to go as possible and they just say "just press the button". They don't realise that I am visually impaired and can't necessarily see the bus stops. This sometimes means that I miss my stop and end up 500mtrs down the road*** (focus group participant).
>
> ***Very comfortable, smooth and safe. My driver would and should be much complimented for his performance*** (feedback survey participant).
>
> ***All three drivers forgot to kneel the bus, never notified us of feedback forms, driver didn't know how to operate the restraints*** (feedback survey participant).
>
> ***Excellent. Some drivers better than others – some have jerky stop & start; some don't bother to drop the floor when they see someone with a walking stick. If the step is too high it hurts on landing ...*** (feedback survey participant).
>
> ***... some drivers could be more ready to lower loading height for easier elderly access*** (feedback survey participant).
>
> ***Great service for young and old. Many thanks for Sunday services.... ratepayers value the service*** (feedback survey participant).
>
> ***... I was waiting at the stop on Liverpool Street to catch the Orbiter. Some other passengers climbed aboard in front of me. As I moved forward to climb onto the bus I put my cane forward to ascertain the height of the step and as I did so the door closed and the bus moved forward. My cane was stuck in the door and I was lucky it came free as the bus moved away. Maybe the drivers ought to be reminded to look carefully before closing the doors*** (RNZFB member).

3.7 Summary points

In summary, the main points emerging from how passengers evaluated changes to buses and bus stops is as follows:

- The Les Mills, Victoria Street bus stop was rated the highest in terms of the overall facilities it provides. This was followed by the Liverpool Street stop.
- Real-time information installed at four of the five stops was considered helpful to 90% of passengers.
- The Caro Street bus stop was rated as having the best kerb height. The Liverpool Street stop was rated the next most effective.
- The yellow polyurethane tactile studs were rated the most popular with passengers. Caro Street, Liverpool Street, and the Anglesea Street bus stops all received the tactile studs treatment.
- The widened bus aisles met the approval of 93% of survey participants.
- Wheelchair users preferred the rear and forward facing seating to the sideways option which was described as unsafe and uncomfortable.
- 80% of survey participants thought the new seat belt systems were either excellent for good.
- While some passengers complimented bus drivers on their driving, most passengers thought improvements to driving could be made together with greater awareness of and sensitivity to people's disabilities.

4.0 The project team's perspective on the Hamilton Accessible Journey Trial

4.1 Project Highlights

In relation to project highlights the following points were made:

- Established relationships between key agency stakeholders were viewed as a primary factor in the success of the project and also a project highlight. Stakeholders believe the project would not have happened without these relationships which were strengthened during the development of the city's Disability Strategy in 2005.

  We have a very motivated disability community. The Access for All group has been up and running for a while. The work done during the development of the city's disability strategy really helped grow the relationship (Project Team member).

- Despite balancing the multiple agendas of the agencies involved the project flowed smoothly. Progress was not hampered by 'egos' or feelings of individual 'patch protection'.

  There was no 'patch protection' amongst multi-stakeholders; no ego stuff whatsoever. Egos can get in the way of making progress and there was no issue at all with this (Project Team member).

- The chance conversation between CCS Disability and key members of the Regional Transport Committee regarding progress against the Accessible Journey Report's recommendations.

  The disabled community has a good relationship with HCC and EW; the pilot wouldn't have happened without that relationship. LTNZ, the city, EW have done all the hard work.... the ground work was already there in the sense they (the Regional Transport Committee) were very open to the idea and provided opportunities for the project to get off the ground (Project Team member).

- The Trial has had a flow-on effect. There continues to be strong national interest in the project and the project has attracted a lot of publicity; articles have appeared in national magazines and publications.

- The Project Team were invited to a meeting hosted by NZTA to comment and advise on the *National minimum standard for urban buses* prior to the draft document being released for consultation. The review of vehicle quality standards is part of a wider review of procurement being undertaken by the NZTA.

- Two members of the Project Team representing CCS have been invited to speak about Hamilton's Accessibility Trial at the Integrated Transport Summit in Auckland in February 2009.

- The CBD Shuttle experienced a record month for growth in October 2008 (approximately 33,000 boardings). This is attributed to increased accessibility brought on by changes to existing buses, improvements to infrastructure, and new links to the CBD Shuttle and the Orbiter at Bridge Street[43].

  The CBD Shuttle is showing enormous growth. It's a free service so it is more difficult to get exact numbers of users but the combination of the accessible journey pilot and the connection with the Orbiter service means that it is one of the fastest growing services in Hamilton (Project Team member).

- Members of the disabled community report they now "have a life". Anecdotal data suggests the numbers of disabled people using the Shuttle Service has increased.

  ...People are saying "I've got a life now"; it's made a huge difference (Project Team member).

  ... the disabled community were saying that the cost and availability of taxis was expensive. The disabled community wanted to use the buses because they are around and more accessible and that's what we're hearing now; they can get out every day now if they want to, cost isn't a barrier as it was with the taxis (Project Team member).

  ...We don't have exact numbers but drivers are anecdotally saying there is a large growth in the numbers of mobility impaired users on that service (Project Team member).

  ...for some people their disability is not going to be obvious. A lot of foundation members don't use a white cane but are still quite impaired visually, so they are unlikely to be picked up in the numbers (Project Team member).

- Trialling seating positions on the buses; particularly the forward and rearward facing positions have proved popular and successful and it is the wish of the project team that two seating spaces either forward or rearward facing are adopted in the VQS.

  ... the sideways facing position doesn't feel secure (Project Team member).

  ... if we can get the importance of having a forward and rearward facing position adopted in the VQS then that will be a big plus for the group (Project Team member).

[43] Environment Waikato. Bus Patronage Report for October 2008. Presented to the Regional Transport Committee, November 2008.

People like to be sitting the same as everybody else (Project Team member).

- The real-time scheduling was also reported as a highlight.

  ... if you're not sure where the bus goes it's a real handicap for people; they have to ask people which bus it is or they stop all the buses to get the right one, so having the announcement is a real advantage. It gives people flexibility about travelling independently; they don't like to have to rely on other people (Project Team member).

- Recently, Environment Waikato advertised for tenders for the Orbiter inner (CBD Shuttle) and the Orbiter outer with the tenderer required to provide the same facilities on the Orbiter outer as is currently being provided by the Orbiter inner (CBD Shuttle). Project team members believe this is a direct result of the city's Accessibility Trial.

  ... the acquired tenderer is to provide the same facilities on the Orbiter outer ... the wider Orbiter service, which is probably the most successful bus service in the city will have the same wheelchair space, the same information on board; visual and audio ... it's a sign the project has generated some good ideas and those will definitely be continued over time (Project Team member).

- As a result of this trial, Hamilton city will include a recommendation for kerb heights in its development manual. This is set to be updated by the end of 2009.

- As a final comment, project team members wanted to stress that the project has improved access for all.

4.2 Areas identified for improvement

In relation to areas identified for improvement the following comments were made:

- Currently, there is no signage indicating 'priority seating'. The project team identified this as an area for improvement.

  If we go the way of priority seating for disabled users they would have to take priority. If someone was in that space they would have to vacate and the driver would have to enforce that (Project Team member).

  ... drivers would need to be supported to enforce priority seating (Project Team member).

  On the bus I travel there is one seat on the bus that says "if the lady with the dog gets on please give up your seat for her". ... again it comes down to relationships (Project Team member).

- Having more extensive use of *tactile* was also seen as a future forward step.

  We are committed to getting huge amounts of tactile throughout the city. There is an opportunity to experiment with some tactile styles and we have already done that with tactile in Victoria Street (Project Team member).

- Improvements to the audio messaging system onboard buses were also identified as needing improvement.

  When buses are busy and lots of young people are chattering on cell phones it's hard to hear the audio messages (Project Team member).

  More information is needed in the audio messages e.g. 401 Victoria Street doesn't tell you anything. It's better to use a landmark to give people a better idea of where they are e.g. buildings, businesses or intersections (Project Team member).

  If we took it a further step, we could say for example "Les Mills stop. Change here for bus no 2, 5 or 12". When thinking about the Orbiter there will be a number of stops that will connect to other services. It would also be useful for tourists coming to the city for the first time (Project Team member).

- Ideally, a hydraulic system fitted to buses was ideal so that drivers wouldn't have to leave their seats to lower the ramp.

We had a limited budget but we did well. It would be good to have hydraulics fitted to buses. Given the cost involved it wasn't an option with this project (Project Team member).

- Extending infrastructure treatments to the Orbiter outer would help improve access Hamilton wide.

- Developing guidelines for footpaths was also suggested. National and standardised guidelines would provide consistency for people and give councils something to work from.

4.3 Go Bus Transport Ltd

In relation to driver training Go Bus Transport Ltd made the following comments:

- Drivers receive a full two-week course from the day they start their employment. Training is performed by a fully qualified driving instructor. Included in this training is a session on customer service and the understanding of disabled people's needs. New drivers reported that the driver training scheme was very useful.

In relation to how drivers perceived changes to the shuttle service the following comments were made:

- Overall, there were no complaints from drivers regarding changes to the modified buses. Drivers reported that the new way of securing wheel chairs on buses was great.

- Difficulties in meeting schedules occurred mostly when one bus had a lot of passengers and another bus had to stop to maintain the gap. This was not as a result of an increase in disabled people using the buses. Drivers reported that the new bus lanes have helped keep buses to schedule.

- Issues faced by drivers were in relation to "*undesirables using the bus to just travel around and around for something to do*"[44].

[44] Information provided by Operations Manager, Go Bus Transport Ltd, Hamilton

4.4 Summary points

In summary, key points highlighted are as follows:

- Strong working relationships existed between stakeholder agencies. Relationships were strengthened during the development of the city's Disability Strategy. Project success was attributed in part to the strength of these relationships and an absence of 'egos' and personal agendas.
- The Trial has had a positive flow-on effect like early involvement in the development of NZTA's VQS consultation document and invitations to speak at the Transport Summit in Auckland in February 2009. The project has also attracted national interest and publicity. A submission to the VQS was submitted in October based on the outcomes of the city's Trial.
- Approximately 33,000 boardings were recorded for the CBD Shuttle during October 2008.
- Bridge street stop now provides a new link to the CBD Shuttle and the Orbiter.
- Anecdotal data suggested increased boardings by people with disabilities who report they now *have a life*.
- The rear and forward seating positions have proved popular and having two spaces included in the VQS would be a project plus.
- The real-time scheduling has been reported as successful and has provided many disabled people with travel flexibility.
- In its recent tender, Environment Waikato has asked that facilities provided by the CBD shuttle be replicated by the Orbiter outer.
- Drivers receive a two-week training course when they start employment.

Summary points relating to how the project team viewed future progress are as follows:

- Currently, there is no signage indicating 'priority seating' although one bus did have a sign up asking passengers to provide seating for a blind lady and her dog if she boarded. The Project Team believed drivers would need to be supported to enforce priority seating.
- A greater use of *tactile* was seen as a future step.
- Improvements to the current *audio* recordings were needed. Suggestions included the use of landmarks (buildings) and intersections in the recordings.
- Hydraulic ramp systems fitted to buses would be ideal.
- Extending infrastructure treatments to the Orbiter outer would help improve access Hamilton wide.
- Developing national Quality Standards and guidelines for footpaths was needed. This would create a framework from which councils can work and improve user confidence nationwide.

5.0 Concluding comments

The accessible journey has been described as all the steps needed for a person to get from their home to their destination and back. A fully accessible bus service is a critical element within the accessible journey. A fully accessible bus service will have:

- All stops along a bus route equally accessible,
- An urban bus fleet that is fully accessible,
- Technical training for bus drivers and training on customer service including awareness of disabled people's needs provided on a regular basis,
- Planners and engineers optimising the standard of infrastructure, and
- Enforcement to ensure bus stops are kept clear of parked vehicles.

New Zealand is working towards achieving this reality for all people using public land transport including those who are disabled. The Inquiry's recommendations and proposed timeframe for implementation provides a practical solution to the physical and economic costs of providing accessible public land transport.

Providing equitable access within Hamilton city's CBD shuttle service was the first step undertaken by the Accessible Journey Trial's Project Team. Findings from the Trial were used to inform the Requirements for urban buses in New Zealand during a recent consultation process and this together with the experience of other submitters will help fast forward access as a reality for all.

Evaluation data from passengers suggests the accessibility trial:

- Improved access for all users (disabled, elderly, parents/caregivers with children, tourists),
- Increased the overall use and confidence in passenger use of public land transport,
- Identified preferred seating options for those in wheelchairs and numbers of spaces required on each bus,
- Identified best facilities at bus stops,
- Identified preferred kerb heights and tactile treatments, and
- Confirmed the value of installing real-time information and next-stop announcement audio and visual systems.

Throughout the course of the evaluation passengers and project team members identified a number of areas for improvement. These will form the basis of the recommendations which are intended to provide a sound investment in the future of accessible transport that will continue to benefit all disabled and non-disabled people.

6.0 Recommendations

Recommendations 1-3

These recommendations have application for the local authority and regional council.

> **It is recommended that accessibility specifications for all new footpaths, kerbs and channelling and improved accessibility as footpaths, kerbs and channelling are renewed or maintained, be included in Council's Development Manual.**
>
> **It is recommended that the local authority takes responsibility for coordinating the work to ensure the prioritisation of public transport accessibility occurs.**
>
> **It is recommended that the regional council together with the local authority continue to seek out new links to the CBD Shuttle and the Orbiter service.**

These recommendations simply mean that the local authority takes responsibility for developing accessibility specifications in line with relevant findings from the trial and existing conditions like road camber and that they coordinate the work to prioritise public transport accessibility. Detail to quality is recommended.

It is acknowledged that planning for new links to the CBD shuttle and the Orbiter occurred in the project's infancy and recently resulted in a new link being established at Bridge Street. Recommendation 3 simply draws attention to the importance of continuing to seek new opportunities for links wherever possible.

Recommendations 4-6

These recommendations have application for regional council.

> **It is recommended that future regional council contracts for public land transport services stipulate accessibility features and requirements similar to those provided by the current CBD Shuttle, as a minimum for urban buses.**
>
> **It is recommended that future regional council contracts for public land transport services stipulate ongoing disability awareness and competency training requirements as a minimum for drivers.**

It is recommended that regional council introduce policies that improve the current audio messaging system on board urban buses. This could include consistent audible volume, physical landmarks of bus stops, or any additional information that will improve accessibility and/or user confidence.

These recommendations simply ensure that the successful accessibility features from the Trial are maintained and replicated in all urban buses[45] and that drivers receive ongoing training. Many passengers took the opportunity to comment on the quality of driving they experienced. While some comments were positive, most passengers thought improvements to driving could be made together with greater awareness of and sensitivity to peoples' disabilities. Simple improvements to the current audio messaging systems would help improve the quality of information delivered to passengers.

Recommendation 7

This recommendation has application for regional council, the local authority and the transport agency.

It is recommended that key agencies continue to include the participation of disabled people/agencies in planning processes to ensure access to public land transport remains a core requirement of public land transport planning, funding and operations in Hamilton.

Non-disabled planners, designers and operators cannot deliver a fully accessible journey alone. Direct input from disabled people is needed. One of the strengths of this project has been in the strong working relationships between all project members. Relationships were strengthened during the development of the city's Disability Strategy and project success has been attributed to these relationships and an absence of *egos* and *personal agendas*. This recommendation simply ensures these partnerships continue.

[45] It is acknowledged that Environment Waikato has already put this in place in their recent tender for service process.

Appendices

Appendix 1:

Submission to 'A New Zealand national minimum standard for urban buses'

A New Zealand national minimum standard for urban buses

A submission document

October 2008

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Table of Contents

1.0 Introduction

The information contained in this document has been derived from the 2007-2008 Hamilton City Accessibility Trial. The trial involved design modification to two medium buses that service the inner city route; pavement changes at three of five bus stops, and the provision of audio and visual real time information at bus stops. Information from a survey carried out with a number of disabled people using the buses post-retrofit has also been included.

The Hamilton Accessibility Journey Pilot project involves representation from multiple organisations such as CCS Disability Action, Environment Waikato (EW), Hamilton City Council HCC), New Zealand Transport Agency (NZTA), Access for All, the Human Rights Commission (HRC) and the Royal NZ Foundation of the Blind.

The aim of this submission is to have the relevant findings from the Hamilton City Accessibility Trial inform the *New Zealand National Minimum Standards for Urban Buses in Public Transport Services.*

Responses have been made in line with the relevant sections of NZTA's *draft New Zealand national minimum standard for urban buses* document which include Section Three: Accessibility; Section Four: Passenger Safety, Section Five: Passenger comfort and use, Section Six: Facilities for passengers with disabilities and Section Eight: Existing buses.

1.1 The Hamilton City Accessibility Trial: Overview

The impetus for the Hamilton Accessible Journey Pilot project stemmed from a number of key events. Firstly, the disabled community had been advocating to relevant authorities for many years for an accessible public land transport system. In 2002 the Human Rights Commission decided to hold an inquiry into the accessibility of public land transport which was prompted by the experiences of disabled people who came to the Commission seeking enforcement of their right not to be discriminated against in the provision of public transport[46]. This inquiry resulted in a report entitled *The Accessible Journey*. A key finding of the inquiry was that disabled people felt disempowered in terms of participation in public land transport planning, funding and implementation as their needs are not considered to be a core requirement of the current statutory process[47]. This resulted in a recommendation to include disabled peopled in all levels of transport planning, funding and implementation processes at all government levels; local, regional, central[48].

Second, a conversation occurred between key personnel from Land Transport NZ and representatives from CCS Disability Action in 2006 over the need to establish national standards for urban buses and a suggestion to run an accessible passenger transport pilot in Hamilton city. This timely conversation occurred not long after The Accessible Journey report had been released. These early conversations and findings from the inquiry into accessible public land transport led to the

[46] Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Land Transport.* 2005

[47] Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Land Transport.* 2005

[48] Human Rights Commission. *The Accessible Journey: Report of the Inquiry into Accessible Public Land Transport.* 2005

funding of the Hamilton City Accessibility Trial which was completed and launched in July 2008. The modified buses and stops are currently being evaluated by members of all sectors of the community

The Hamilton City Accessible Trial involved the evaluation and retrofit of two medium buses servicing the Central Business District. The CBD Shuttle Service was chosen because the service is:

- Centrally located
- Links with the Transport Centre and covers a 5km circuit
- Has 12 bus stops of which three are also used by some of the urban routes
- Utilised by approximately 22,000 passengers per month of differing mobility, ages and reasons for using.

A team of five people, consisting of three wheelchair users (2 manual, 1 power chair) from CCS Disability Action, an advisor and a visually impaired person from the Royal New Zealand Foundation of the Blind, and Environment Waikato's Transport Coordinator assembled to evaluate the accessibility of one of the buses used on the CBD Shuttle Service.

Research on international best practice and consultation with members of the disabled community (direct communication, public meetings, emails and focus groups) helped identify current barriers to access and guide the retrofit recommendations.

Bus measurements were taken from existing buses servicing the CBD that would provide the best retrofit options for wheelchair users and also for visually impaired people with and without guide dogs. There was general agreement that modified buses would advantage many other groups of people like those using Zimmer Frames, tall people, mothers with prams and older people requiring more space and who may also benefit from improved audio/visual information.

It was decided that two buses would be retrofitted for the trial and each would be fitted differently to allow for best-option evaluation and comparison.

Seating options, visual and audio requirements and equipment, the removal of and refitting of seats, along with wheelchair restraint design was all discussed with the wider multi-stakeholder group, suppliers and specialist personnel before modification began. It was decided to offer a range of seating options in order to understand which is most comfortable for wheelchair users.

The modification of two medium buses was completed in July 2008. The buses are currently being evaluated by a range of people with disabilities[49].

Figure 1: Wheelchair in forward facing position

Figure 1 illustrates how the removal of the rearward facing seat allows for a wheelchair to manoeuvre to a forward facing position with plenty of foot space.

[49] Environment Waikato, 2008. Hamilton Accessibility Project.

Figure 2: Diagram of the CBD Shuttle bus including seating arrangement changes

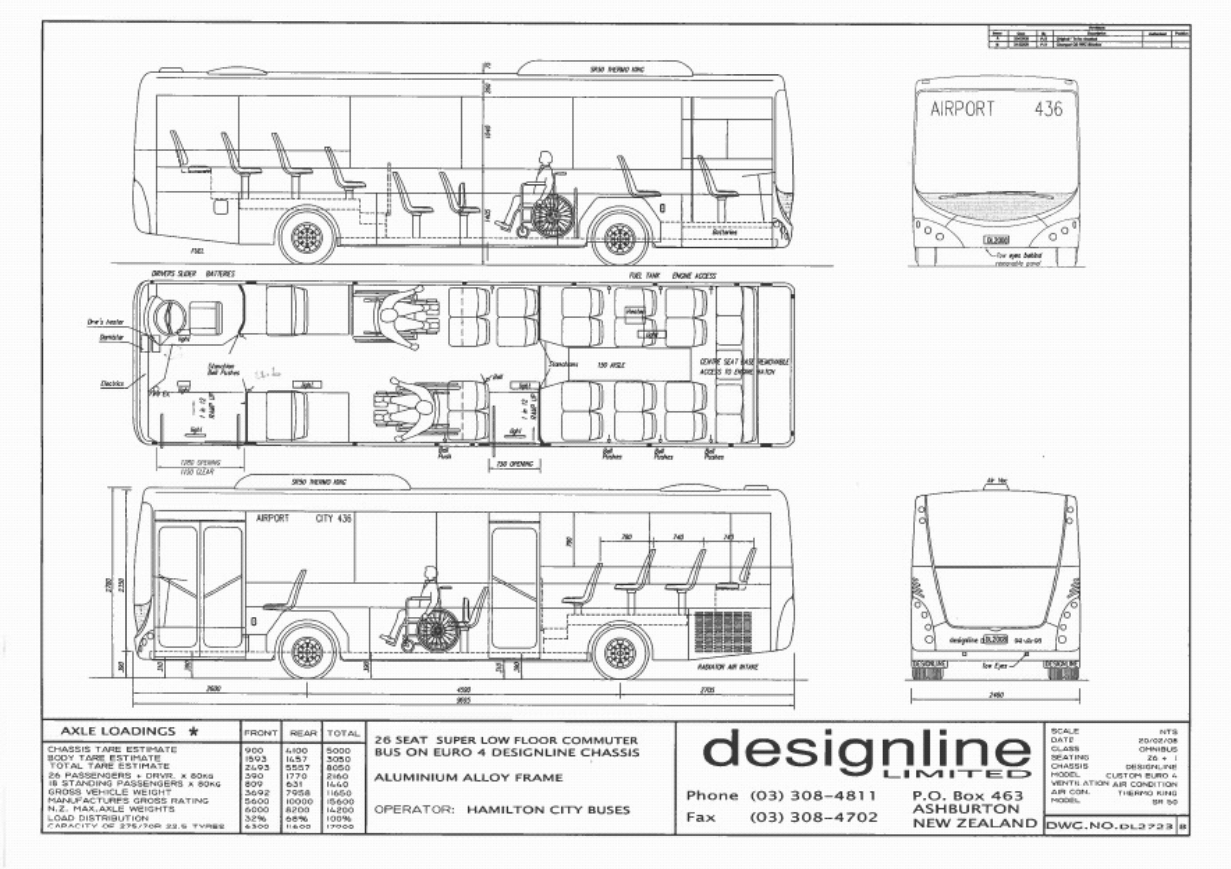


Figure 2 shows a diagram of the CBD Shuttle bus including seating arrangement changes that have allowed for a forward and rear facing wheelchair option.

Section Three: Accessibility

3.1 Introduction

The ease and speed of accessibility for passengers of all ages, sizes and mobility capability while both boarding and alighting a vehicle as well as the movement within the vehicle is of prime importance[50].

Doors and aisle width, step heights, interior floors, seating configuration and revenue collection area all impact on accessibility. The national standard assumes that boarding and revenue collection for all passengers of any mobility, including those in wheel chairs occurs through the front door[51].

Relevant findings from the Hamilton Accessibility Journey Pilot project are reported in the shaded area and correspond with the relevant sections in Section Three of the national guide (Appendix 1: Bus Audit Sheet).

[50] NZTA 2008. A New Zealand national minimum standard for urban buses.
[51] NZTA 2008. A New Zealand national minimum standard for urban buses.

3.2 Doors

Number	MB	2
Widths	MB	>1000mm double

Comment: The front door width of both buses post retrofit was **995mm**. This was the best fit achieved to existing buses but measurements were reported as being tight. We agree that this would be a good minimum standard.

Figure 3: Open doors on Shuttle Bus

Figure 3 shows the CBD Shuttle Doors open at full width

3.3 Step height/depths

Height

First Step MB	Measured from the ground to top of step nosing (without kneeling in operation) Front: **360mm** With kneeling Front: **270mm**
Comment:	Three bus stop kerb heights were altered from the standard 100mm for the Hamilton trial to 140mm, 200mm and 240mm. Experience, following completion of the trial suggests that a combination of kneeling buses and raising the height to at least **200mm** provided the best solution as it improves the approach angle for users of the ramp and makes access and egress safer. Road camber is very important in this as it directly affects the angle of the bus. The combination of the two should not lead to a ramp steeper than 1 in 12.

Figure 4: Caro Street Stop showing kerb height

Figure 4 provides an image is of the Caro Street Bus Stop and clearly shows the raised kerb height (200mm)

Figure 5: Liverpool Street Stop showing kerb height

The new Liverpool Street Stop (figure 5) is a very popular stop and has the highest kerb height alteration on Hamilton Accessibility trial (240mm)

Figure 6: Waikato Hospital Stop

The new Waikato Hospital bus stop (figure 6) represents the best example of an accessible stop in the Waikato.

3.4 Floors

We agree that non-slip flooring is important.

3.5 Aisle width

Front door entrance, fare paying and turning area and unimpeded through to rear of priority seating area **850 between wheel arches.**

Comment: We believe that 760mm is too narrow and that **850mm** should be the minimum. Customers agree that a wider aisle works well and helps to ensure a quick transition. The minimum turning circle for any wheelchair is in the region of **1200mm** with a minimum recommended in the Building Code of **1500mm.**

3.6 Seating Configuration

In the Hamilton Accessibility Journey pilot project, seats were removed to accommodate wheelchairs.

Post-retrofit: **27 seats - 1 forward, 1 rear facing**
29 seats – 1 forward, 1 transverse facing

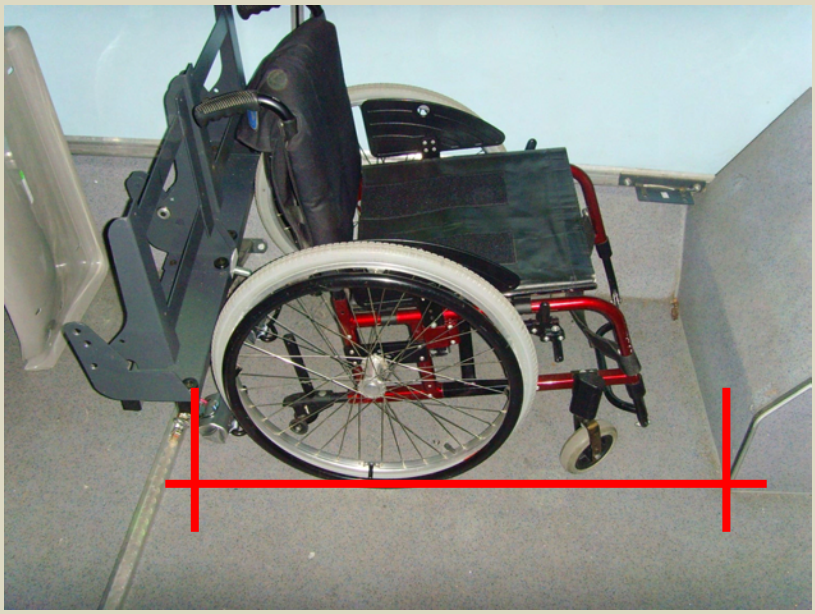
Our trial of rear-facing and traverse facing seats alongside forward facing seats showed that most chose to use the flexibility of the space provided to face forwards. This was supported by user feedback. We agree that at least 50% of the seats in the priority area should be front facing.

Seat unlocking mechanism: In the Hamilton study disabled passengers needed assistance to reach the restraint. The current position of the restraint was not ideal i.e. too low. The Hamilton study recommends that the restraint should be mounted slightly higher so that the mobility impaired can reach and operate it, for either a forward or rear facing position. Further study and research is needed to identify the ultimate solution to this.

Seat spacing: **1180mm in length folded chair to wheel arch.**

Comment: The available manoeuvring space into wheel chair parking zone has been recommended as 1200mm. We agree with this.

Figure 7: Wheel chair measurements



Our measurement between the red lines was 1180mm.

Section Four: Passenger Safety

4.1 Introduction

Passenger safety, speed and security of movement while boarding, accessing and leaving seated positions and alighting is paramount to the provision of a service that is attractive and timely to the public and one in which they can have confidence[52].

Relevant findings from the Hamilton Accessible Journey Pilot project are reported in the shaded area and correspond with the relevant sections in Section Four of the national guide (Appendix 1: Bus Audit Sheet).

4.3 Stanchions/handrails

Stanchion should not impede aisle width i.e. floor to roof mounting.

4.4 Grab handles

Comment: The Hamilton Trial agrees in general with the comments made under 4.4 Grab Handles in addition to the following points.

The Hamilton Trial recommends that for the wheelchair position a grab handle be mounted to the aisle sided seat and be to the side of the seated person rather than to either the front or back. This is because if it is set too far back the user would need to reach behind their body and this would be uncomfortable. In addition the grab handle should ideally be at least **700mm** long.

[52] NZTA 2008. A New Zealand national minimum standard for urban buses.

4.6 Fare paying area

The Hamilton Accessible Journey Trial pilot project recommends the clear space for fare paying be **820mm.** We believe 500 x 500mm is far too small.

Comment: A standard issue, removable rubbish holder on buses impedes access and comfort for those in wheelchairs i.e. scraps knuckles, and it is recommended that the removable rubbish holders be removed entirely to accommodate the actual action of manoeuvring a wheelchair.

Before the buses were retrofitted, a focus group discussion was carried out with a number of disabled people in June 2008 to identify issues experienced with the public transport system. Following is a comment made by a disabled person during the focus group discussion:

The other thing that I've noticed when being on the buses is that with the bigger wheel chairs and prams and stuff, when they get on they have trouble getting around the driver and the pay station. I think it needs to be wider there (focus group participant).

…it's just that there are different types of wheel chairs like sports wheelchairs, motorized wheelchairs and wheelchairs that are shaped different. Like I know that people with sports wheelchairs find it hard coz the wheels are really wide you know (focus group participant).

Section Five: Passenger comfort and use

5.1 Introduction

Comfort and ease of both the bus and the route features highly in the evaluation process of any potential passenger when comparing the attractiveness of the private motor vehicle to travel by urban public bus transport[53].

Relevant findings from the Hamilton Accessible Journey Pilot project are reported in the shaded area and correspond with the relevant sections in Section Five of the national guide (Appendix 1: Bus Audit Sheet).

5.5 Bus Stop signals

The Hamilton Trial found that the placement of the finger/thumb/knuckle push buttons on the bus side panels was placed incorrectly. It is recommended that the finger/thumb/knuckle push buttons be placed to the side of the seated passenger and behind the grab handle (see earlier comments about grab handles).

[53] NZTA 2008. A New Zealand national minimum standard for urban buses.

5.6 External Display system

While the Hamilton Accessible Journey pilot project did not specifically test the external system, although a high colour contrast is important. Comments were made during a focus group discussion with members of the disabled community in June 2008. Following are a couple of comments made by focus group participants:

Yeah, when they are working properly. Sometimes you press the button and it says 15 minutes then you press it again after 7 minutes and it says 15 minutes (focus group participant)

5.7 Internal information

It is important that this information cannot be turned off by the driver. A comment by a blind user was that a male voice is more easily understood due to the engine note.

Colour contrast is important. Angle of the screen and screen quality is important to reduce glare. Text size needs to be readable. Text and background colour should clearly contrast. The audio announcement should focus on place names as opposed to street addresses and numbers.

Drivers sometimes don't understand the effects of certain disabilities. Sometimes I ask the driver to drop me off as close to a place I need to go as possible and they just say "just press the button". They don't realise that I am visually impaired and can't necessarily see the bus stops. This sometimes means that I miss my stop and end up 500 metres down the road (focus group participant)

5.8 Luggage/stroller/prams/mobility devices

The Hamilton Trial found that sufficient space was created after the buses had been modified. The retrofit created lots of space including room for a guide dog

The larger the space provided the more multi purpose it can be.

Section Six: Facilities for passengers with disabilities

6.1 Introduction

Urban passenger transport's role is to provide/offer mass transport for both the able bodied and passengers with disabilities. However, there are practical limitations to the scale of disability that can be accommodated for design, safety and affordability reasons on an urban bus without introducing unacceptable limitations to bus capacity, boarding and alighting times etc which impact on the overall running times of the service, or the loss of passenger capacity (seated and standing) due to both weight and space requirements.

The aim of this standard is to provide for the majority of those with a disability or other limitations be they the elderly, parents with young children, people with mobility and/or sight or hearing impairment and those who may need to use wheelchairs for part or all of their daily movement requirement[54].

[54] NZTA 2008. A New Zealand national minimum standard for urban buses.

Relevant findings from the Hamilton Accessible Journey Pilot project are reported in the shaded area and correspond with the relevant sections in Section Six of the national guide (Appendix 1: Bus Audit Sheet).

6.2 Provision

The Hamilton Accessible Journey Pilot project supports the comments made under 6.2 Provision in the national minimum standards guide and that passengers are alerted to areas of priority seating via signs and symbols.

It is recommended that signage indicating priority seating be adequately displayed on the bus in the form of signage placed by the grab handles and painted wheelchair symbols in the floor material.

6.3 Wheelchairs

220kg including passenger is too light – should be at least **250kg**

700mm is too narrow – Hamilton pilot suggests at least **860mm x 1200mm.**

900mm is too short as most wheel chairs exceed this. This effectively rules out transverse seating as chairs will also restrict the aisle width. It is recommended that only front facing seating be provided for all passengers.

We believe that the backrest would not prevent significant injury and prevents usability of space for all wheelchairs. We recommend this be removed.

6.4 Boarding or alighting

Raised height of bus stops helps all users enter and exit the bus, including the elderly and those with pushchairs.

Bus drivers need to be aware of the needs of passengers, perhaps with specific training. The Hamilton Accessibility Trial supports recommendations in *The Accessible Journey* report that refers to bus providers providing driver disability awareness and competency training. It is suggested a quality standard be developed to ensure driver training occurs and that driving is of a consistently high standard.

6.5 Ramp

We believe that a manually operated ramp should be the minimum provided on every bus. The Hamilton Trial recommends that the width of the ramp be 805mm.

Drivers must be able to assist those that need it, or have a procedure to seek help from another driver or passenger. It is not acceptable that passengers could be left at the roadside.

Comment: It is thought that the length of the ramp is irrelevant as it is unlikely to impact on the gradient. However the width is important as indicated in the recommendation above.

Section Eight: Existing buses

8.1 Introduction

There are a large number of buses used in the urban bus fleets that have been purchased over the last 20+ years. Some of the more recent ones will meet or exceed all or most of the criteria listed in this document for new buses but many earlier purchases will not.

The NZTA encourages operators to speed up the replacement of the older 'less user or environmentally friendly' vehicles.

Therefore, the following will be the minimum standards acceptable for existing buses that are less than 10 years old submitted for service in any type of urban tender or bus operation as described in section 1.1 with effect from the date of introduction of this standard.

Further, with effect from 1 January 2010 all used buses must meet the minimum standards listed below[55].

Relevant findings from the Hamilton Accessible Journey Pilot project are reported in the shaded area and correspond with the relevant sections in Section Eight of the national guide (Appendix 1: Bus Audit Sheet).

8.2 Existing bus standards

The Hamilton Accessible Journey Pilot project supports the existing bus standards in its entirety and in particular the standards relating to **floor and levels** re: non-slip material being used in boarding and aisle area. The group believes this needs to occur as currently the Hamilton buses do not use this non-slip material in the boarding and aisle areas.

Any existing inaccessible bus with a door width of less than 800mm should be phased out and all new buses should be accessible.

[55] NZTA 2008. A New Zealand national minimum standard for urban buses.

Appendix 1: Accessible Passenger Transport Project Bus Audit Sheet

Accessible Passenger Transport Project

Bus Audit Sheet

Operator **Gobus CBD Shuttle** **Fleet Number** _____ **Date** **19th Sept 08**

Description	**Post Retrofit**	**Preferred**
Normal operating height front door lip to road. *(lowest height road to floor at entrance - mm)*	**360mm**	
Kneeling Capability height front door lip to road. *(lowest height road to floor at entrance - mm)*	**270mm**	Because Bus stop infrastructure will not change, it is suggested that buses kneel to the standard kerb height of around 200mm
Ramp *(width, lip or no lip, front or back door)*	**805mm w** **Front door**	-
Front Door Width	**995mm**	1000mm + at least
Back Door Width	**Non applicable**	

Front door entrance to aisle gradient	**?**	**As flat as possible.**
Back door entrance to aisle gradient	**?**	
Minimum clearance (through arc) from ticketing machine to start of Aisle Diagonally	**820mm**	
Identify hazards between the door to the beginning of the Aisle		
Minimum / Widest Aisle Width	**850 between wheel arches**	Important that stanchions do not impede the width of aisles
Floor form from start of aisle to wheel chair area (flat, angle [what degree) axle 'bump' [if so, how high and long], lip [how high, long])	**Floor – Flat** **Length – 1420**	
Available maneuvering space in to wheel chair parking zone - Width area (seats folded up)	**1180cm in length Folded chair to wheel arch**	
- Depth area (from backboard to first point where width no wider than 700mm)	**770cm**	
Chair Positioning/ Parking area (comments)		

Depth from Bus wall (backboard position) to Aisle		
Parking Position Face Forward/sideways/backwards	**1 Forwards** **1 Transverse**	
Chair Securing Devices (seatbelt, retractable or not, other device)	**Inertia reels and seat belt on the transverse arrangement**	
Audio next stop information	**Increase Volume**	
Audio next stop information		
Bus stop device general public (button, cord, push strip)	**Push Button**	
Bus stop device wheel chair passenger (button, cord, push strip)	**Push button on the underside of a folded up seat on the transverse. Also on the wall by a handle on the forward facing**	

Other comments	**Bus Stopping sign has been moved from behind the driver to above the windscreen to allow for the Display screen to fit.**	