

## **IPENZ TRANSPORTATION GROUP CONFERENCE 2016**

### **Planning for Universal Access to Transport Services and Infrastructure**

#### **AUTHORS**

Roger Loveless B.Sc. Grad Dip Bus Studies MIPENZ MIET C.Eng.(UK): Access Coordinator: CCS Disability Action Roger.Loveless@ccsdisabilityaction.org.nz

Gerri Pomeroy NZCS (paramedical): Access Coordinator: CCS Disability Action. Gerri.Pomeroy@ccsdisabilityaction.org.nz

Susan Mellsopp NZLA Cert BA (Sociology) Grad Dip Arts MPhil (Distinction): Project Researcher: CCS Disability Action. chocolatsue@xtra.co.nz

Presented by Roger Loveless

#### **ABSTRACT**

Currently available data relating to persons with disabilities is insufficient to apply normally recognised benefit cost analysis to prioritise expenditure on transport services and infrastructure. Whilst costs are relatively simple to ascertain, the value of benefits are not well understood. This requires a cross agency approach that places a value on the greater participation in society by persons with disabilities that the removal of transport barriers facilitates. Our team of consultants, academics and others have been supported by the Ministry of Social Development's Think Differently Campaign. We have manually measured the presence of persons with disabilities in the community and are now working on automated methods of counting such persons using video recognition technology.

Highlights to date include:

- Successful demonstration that counting persons using visible aids shows differences between sites.
- Proof of concept that persons using visible aids can be determined from selected CCTV footage.
- Wider acceptance by the disability community of the value of involving transport professionals in driving change.
- TRAFINZ merit award in August 2015

This paper details progress to date, and identifies a number of challenges as we seek to identify the way forward to achieve our goal of a transport network that demonstrates inclusion for everyone.

#### **INTRODUCTION**

The New Zealand Government ratified the UN Convention on the Rights of Persons with Disabilities, UNCRPD, in 2006. Since then some progress has been made in making our transport systems more accessible to persons with disabilities, but in comparison to the USA, who have legislation to support the rights of such persons, progress towards a more accessible transport system has been slow. There appear to be some fundamental issues that are preventing change.

- Misconceptions of Disability

Despite having rights enshrined by legislation, persons with disabilities, and in particular Maori and Pasifika persons, are still severely disadvantaged within our society. Unfortunately many people making decisions that affect persons with disabilities do not have any understanding of the difficulties faced by persons with disabilities and often work within rules that place little or no value

on persons with disabilities. Often people only recognise a small subset of persons with disabilities as being disabled and fail to recognise that many do have the capability of being lawyers, engineers, teachers, accountants and other professionals. In a digital age, new opportunities for work not requiring physical attributes are available to everyone.

- A Collaborative Approach

In 2010, CCS Disability Action recognised that, despite lobbying Governments on the basis of the rights enshrined in the UNCRPD, all public transport, including fixed transport infrastructure, upgrades and improvements are subject to defined asset management processes. However these processes require access to data in appropriate form to enable the rules used to be applied. There is no data available to transport planners and engineers concerning many aspects of disability, so access improvements are often instigated by emotive stories of high profile access issues. In order to obtain this data collaboration with transport professionals was identified as essential to developing ways of providing the appropriate data.

Unfortunately all too often disabled persons organisations and their membership have failed to recognise the many competing pressures that legislators, planners, engineers and others must consider when making decisions. It is also unfortunate that many of these decision makers only see the costs of implementing these rights and associated infrastructure improvements as there is very little information on the benefits, presented in a format that fits with the processes they are obliged to use. The consequences can be limited acceptance of accessibility requirements; lack of awareness of the effect of built-environment barriers on participation by persons with disabilities, and reluctance by those decision makers to enter into meaningful dialogue with the disability community.

## THE CCS DISABILITY ACTION POSITION AND UNCRPD

CCS Disability Action firmly believes that the rights of persons with disabilities underpin the way we should be working. This is underpinned by Article 9 of the UNCRPD: Accessibility. It is also included as one of six CCS Disability Action's strategic work priorities for 2014-2019, aronga matua ā-rautaki.

**Accessible Environments:** We take action and encourage people and organisations to think and act in ways that include all people, and advocate for public facilities, homes, workplaces and outdoor environments to be designed for everyone to use.

Article 9 Accessibility opens as follows:

1. *To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to, inter alia:*
  - (a) *Buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces;*
  - (b) *Information, communications and other services, including electronic services and emergency services.*

The text lists in some detail what the rights apply to and defines a series of mechanisms for

delivery. However it does not elaborate on what are deemed the “appropriate measures” to take. It appears different interpretations of this have “excused” more meaningful progress not only in respect to article 9, but also many other articles from the UNCRPD.

To CCS Disability Action there should be equal access to transport such that for anyone with a disability that wishes to travel, can use accessible local taxis, urban buses, school buses, urban trains, ferries, intercity trains, inter city buses, tour buses and aircraft. They should also have safe footpaths and other infrastructure to access these modes of transport.

## **Enabling Inclusion**

CCS Disability Action suggests that demand from persons with a disability is too late to benefit many such people. For the fullest possible participation, the transport industry must provide suitable transport options based on the potential demand so that those persons with a disability can take up opportunities to be more involved with society. Persons with disabilities, having adapted and “learnt” routes are not accessible, cannot be expected to change the ways they travel without support and encouragement. At present:

- It is deemed acceptable to provide a Total Mobility taxi scheme with commercial operators providing a very limited number of vehicles capable of transporting persons using wheelchairs, with the service often not available 24 hours per day and limited to main centres.
- There are still no legislated requirements for intercity and tour buses to make provision for wheelchair passengers.
- In rural communities, our most disadvantaged people must often rely on severely underfunded health shuttles to get to hospital and other health related appointments, with little provision for trips that are not health-based.

CCS Disability Action identified that the commercial model used by governments and business to allocate resources is based on priorities set within a cost/benefit framework. To increase the chances of a project proceeding, it must have a benefit/cost ratio above a threshold set by the particular limit on resources available.

Unfortunately the framework is flawed with respect to persons with disabilities. This is due to a lack of appropriate data both on the numbers of persons with disabilities excluded by inappropriate infrastructure and the lost value to society of that exclusion. Unless data is available clearly defining benefits and costs, work for improving access will be treated as low priority. Accessible environments are considered a “nice to have” but not as important as eliminating safety concerns, especially when it can easily be shown the risks of injury are reduced. However there is an increasing body of opinion that merely using data that is easy to collect is no excuse for not attempting to collect data that is of significantly more relevance, even if it is hard to collect. Another way of considering the problem is to define in more detail the term “reasonable accommodation” for persons with disabilities. CCS Disability Action maintains this requires the value of benefits to be wide ranging and inclusive of such things as health benefits, opportunities for social interaction, reduced carer support, and dependence on family.

## **THE VISION OF THE MEASURING ACCESSIBLE JOURNEYS PROJECT**

In order for CCS Disability Action to demonstrate how New Zealand society has inadvertently institutionalised discrimination within our transport networks, a simple vision was required to keep everyone focused. After discussion we settled on:

**An effective transport system that demonstrates inclusion.**

This is a vision that has taken some time to agree upon. Whilst across the disability sector

nationally there have been many different initiatives that address specific transport access concerns that affect persons with disabilities, we are not aware of any that attempt to measure how these transport initiatives impact on persons with disabilities. It is an unfortunate reality that resources are constrained and that there will be some limitations on the affordability of measures to increase accessibility. What this process does is encourage debate on where it becomes acceptable not to remove barriers to access. One view is that this should be based on the safety risk to a person with a disability that is acceptable, and another would be to define what services and activities should be available to persons with disabilities on an equal basis to all. It is clearly recognised that we do not place children in certain positions where they could be injured or at risk, and in a similar way we need to define those limits for persons with disabilities. However the wide variety of disabilities must be recognised, as what may be a barrier to one group may not be to another.

Measuring Accessible Journeys came out of recognising that professional planners have the task of analysing what projects should be funded from limited resources by using asset management practices.

## **APPLYING ASSET MANAGEMENT PRACTICE**

Whilst Article 9 of the UNCRPD requires appropriate measures to improve access, it is silent on how we invest in improvements to make journeys for persons with disabilities more accessible. Transport planners must use recognised evidence, including benefit/cost methods to prioritise limited funds and prove the cost of upgrade has benefits. Asset management systems have been developed under a number of jurisdictions, but they all incorporate the same basic functions. For example Monitoring, Evaluation, Reporting and Improvement (MERI)

The components of the Asset Management Process involve

- Level of service definition, which in this case would be based on article 9 of the UNCRPD.
- Measuring what level of service is actually being delivered.
- Identifying the gaps between desired and actual level of service.
- Identify, cost and prioritise methods to reduce the gaps.
- Determine the benefits in dollar terms of the greater level of participation in society enabled by removing barriers.
- Carry out access improvement work that meets agreed funding criteria based on rigorous cost / benefit analysis.

Key to this process working effectively is access to data. Because they have relevant data on the movement of motor vehicles, this is where traffic planners focus most of their attention, with projects that benefit persons with disabilities given low priority. There is data on accidents to pedestrians, but there is very little data relevant to persons with disabilities whose needs are often poorly recognised. Whereas an able bodied pedestrian can usually get out of harm's way quickly, those with impairments cannot, and hence they often avoid taking the risk entirely by isolating themselves. Initially it's not for want of wishing to get out and about, but as time passes their expectations drop. Hence asking persons with disabilities where improvements are necessary will under report the needs. Therefore planners may fall into the trap of thinking access improvements are not justified.

Hence the benefit / cost analysis must be well understood, with a robust definition of the desired level of service based on the longer term benefits. This is why we started on Measuring Accessible Journeys. Questions we seek to answer are:

1. How many persons with disabilities should we expect at key destinations in a barrier free world?
2. How many persons with disabilities are actually at those key destinations?

3. Why aren't they there? What are the barriers?
4. What will it cost to remove those barriers?
5. What are the benefits to society of removing those barriers?
6. What is the value, in monetary terms, of those benefits?

Our plan is to demonstrate that a supply/demand curve of accessible transport is feasible and to objectively demonstrate a way to compare increased accessibility to the cost of investment. It will use data about people drawn from multiple sectors of society, whether that data is immediately tangible or not.

A recent piece of work included in this project involved a survey of people using the CCS Disability Action Mobility Parking Scheme, which we now refer to as the Kiwi Transport Survey. This has brought in some 2000 plus responses which are now being analysed. It brings together what has previously been mostly anecdotal evidence, giving an opportunity to identify common themes of significant concern, and will give us some direction as to where there are gaps.

## **ASSESSING ACTUAL PRESENCE OF DISABLED PEOPLE**

Census data tells us that approximately 25% of New Zealanders report having a disability, defined as a long term limitation (resulting from impairment) in a person's ability to carry out daily activities. This can include sensory, physical, intellectual, psychiatric/psychological or learning impairments, many of which are invisible. However when nothing is being measured, it is a significant step to start measuring something. As we can't afford to stop and ask everyone passing over our cordons whether they have a disability, we only count those with a visible aid such as a walking stick, service dog, white cane, stroller or wheelchair. Although this doesn't count everyone with a disability, demonstration counts using volunteers have shown it is more than sufficient to provide a useful measure of accessibility.

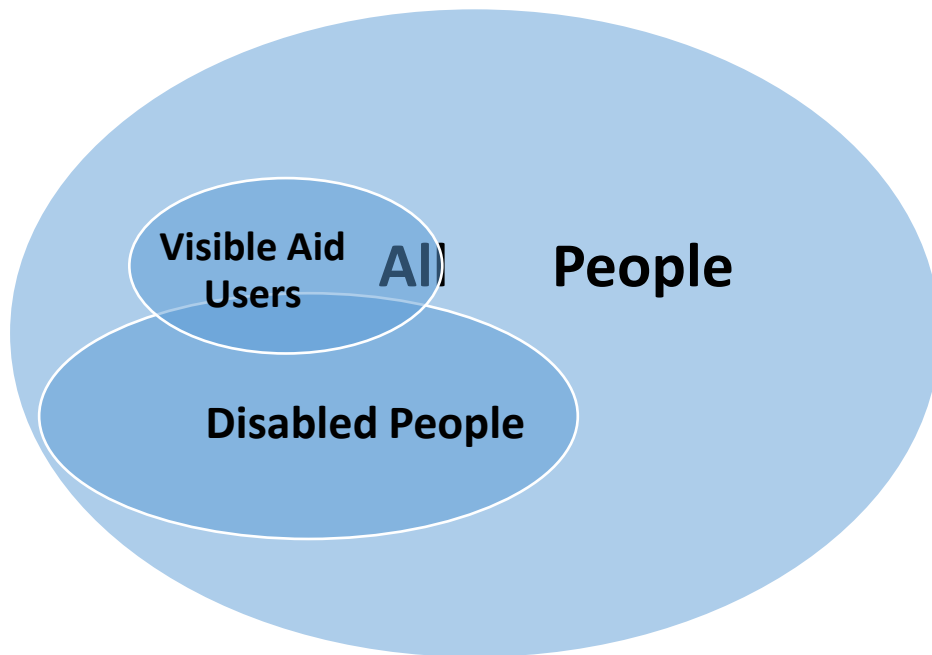
Having demonstrated that differences can be measured, there remain two further problems.

- Data collection costs.
- Extrapolation to the full disability sector.

The transport industry has a well proven, efficient and nationwide network of automatic count sites for vehicular traffic, which can break down the results between different vehicle types. At a local level, some data is automatically collected on pedestrian flow, but there is nothing to break this data into categories. In conjunction with Traffic Design Group and Callaghan Innovation we have demonstrated CCTV camera footage can be used to generate individual picture files of pedestrians crossing defined cordons, which can then be analysed from a desktop. However this is still relatively expensive, and hence we successfully applied to Callaghan Innovation for funding for a PhD student who will be working on algorithms that will analyse the individual picture files to break down the numbers into categories, including persons using or carrying visible aids. This project has only recently commenced, but could be used to detect bicycle and persons with gait patterns that indicate some forms of impairment.

Extrapolation of count numbers to the full disability sector will require access to detailed and high quality data, which is an area that overlaps with another task, the assessment of benefits detailed below. As the primary focus of this project is to apply benefit/cost analysis to removal of physical barriers, it will be necessary to exclude persons facing psychological, financial or other barriers.

The following Venn diagram shows the measurement problem when using the presence of visible aid users to determine the presence of persons with disabilities. There may be some people apparently using a visible aid who may not have a disability, such as people carrying umbrellas, people using aids which are not visible, such as hearing aids, and those with disabilities not using a visible aid, such as people with cognitive or intellectual impairments and some people with sensory impairments.



## ASSESSING POTENTIAL PRESENCE OF PERSONS WITH DISABILITIES

In order to determine if there are significant barriers to persons with disabilities, it is necessary to know the incidence of disabilities within the local populations. We have some census data available at a macro level, but no such data is released for the local level due to privacy concerns. For local planning purposes it is necessary to come down almost to mesh block level. In this regard we face a further difficulty in that to include more useful data in a census we need to demonstrate the value of that data to justify the expense of its collection. Currently we must rely on local knowledge, but with some indication being derived from the age profile of a local population as we know the incidence of disability increases with age.

In normal asset management practice it should be possible to identify gaps by comparing actual and potential figures. Unfortunately we do not see this as immediately achievable, but by demonstrating differences in actual presence we introduce the idea into conversations which will influence planning processes.

## BENEFITS OF A MORE ACCESSIBLE PEDESTRIAN TRANSPORT SYSTEM

Whilst the costs of removing physical barriers and creating accessible environments can be easily determined, as the transport industry standards are well developed, the same cannot be said for the benefits. This is because the transport industry has built many of its business models around the reduction of risk, with the benefits being determined on the basis of avoided costs of accidents. In contrast to data on accidents, which is easy to collect, data on the benefits to persons with impairments is limited, if available at all. However we believe it is important to seek some data, albeit with deficiencies, than to avoid the issue and continue to use processes that are not inclusive of all people. With some data available, persons with disabilities are no longer totally invisible in the planning process.

When assessing benefits, it is also necessary to recognise the wide range of disabilities. What may be a barrier to some may not be to others. For example steps are a barrier to wheelchairs but not to most sensory impaired people. Hence the value of benefits of a particular intervention will vary depending on the person's impairment, and it may be necessary to initially focus on a specific group. The situation is further complicated by the fact that the benefits may also extend beyond the disability community, which is something outside the scope of this project.

Ultimately it may be possible to develop a more complete model, but it is still useful to be able to have an indication of the value to society of a more accessible transport network. Initially we propose a 'portfolio analysis' approach, which looks at a set of investments and the best value that can be gleaned from the whole (rather than analysing individual elements to some unnecessarily precise degree). For example, what package of improvements is likely to result in making an independent accessible journey possible, and what is the value of that journey? Even if it is only to get to the supermarket, there may be a benefit in avoided companion/carer costs.

## CONCLUSIONS

Applying recognised asset management practice to planning for a more accessible environment is a significant challenge. However the introduction of improved processes to build a more accessible environment will allow people with impairments to contribute in society to their full potential. This must have financial and other less tangible benefits. Our challenge is to establish suitable "building blocks" for the process and to recognise there will be compromises to enable use of data that is either readily available or economically possible to collect. We must not fall into the trap of using inappropriate, yet readily available data that excludes the 25% of our population who have some form of impairment.

It is essential that a multi-disciplinary approach is adopted and that there is collaboration between the disability sector, transport professionals, planners, government ministries and academia. This is because the benefits of accessible transport infrastructure, namely increased levels of health-supporting participation, sit largely outside of the transport sector.

By seeking to achieve meaningful progress, this project has identified a number of tensions that are not well understood:

- Although rights of disabled persons are recognised, these rights exist in the context of a resource constrained world, and this inevitably requires priorities to be set. Expecting to be treated fairly is what should be expected.
- The disability sector needs to engage with the transport planners and professionals to identify where their processes inadvertently make the disability sector invisible, particularly in respect to the failure to collect relevant forward-looking data.
- Different sectors of the disability community often find it difficult to relate to each other, particularly when a disability affects the ability to communicate.

As the project progresses, it is hoped the collection of data relating to the presence of persons with disabilities can be made economically possible by use of automatic video recognition, the benefits of a more accessible environment can be defined in a meaningful and inclusive way, and that this data becomes a requirement of the processes to allocate appropriate funding for improved access.

In addition to providing more inclusive processes for transport planners and engineers, the ideas presented will ensure better communication between the disability and transport sectors, allowing much improved collaboration.

Within a wider context, the asset management principles we have applied to the transport sector

can also be used elsewhere. There are international moves to apply an evidence-based approach to decision making, and key to this is having appropriate data. The approach could be used to justify expenditure on such things as publicly-funded vehicle modifications, sign language training for passenger service vehicle drivers, provision of mobility aids, and other support services.



## ACKNOWLEDGEMENTS

Ministry of Social Development: Think Differently Campaign  
Traffic Design Group: Hamilton  
Hamilton City Council  
New Zealand Transport Agency  
University of Waikato  
CCS Disability Action

## REFERENCES

### Book

CRANO WILLIAM D. (2012). *The Rules of Influence*, St. Martin's Press, New York

### Documents

AUSTRALIAN GOVERNMENT NATIONAL LANDCARE PROGRAMME. Monitoring, Evaluation, Reporting and Improvement (MERI) framework, viewed November 2015  
<http://www.nrm.gov.au/my-project/monitoring-and-reporting-plan/meri>

NEW ZEALAND NATIONAL INFRASTRUCTURE UNIT. Infrastructure Evidence Base 2015 Refresh viewed November 2015 <http://www.infrastructure.govt.nz/plan/evidencebase/2015-nip-evidence-overview.pdf>

UNITED NATIONS. Convention on the Rights of Persons with Disabilities.

### Journal Articles

ALDRED R. and WOODCOCK J. (2008). Transport: Challenging disabling environments, local environment. *The International Journal of Justice and Sustainability*, 13(6), 485-496.

BOCEREJO S and OVIEDO H. (2012). Transport accessibility and social inequities: a tool for identification of mobility needs and evaluation of transport investments. *Journal of Transport Geography*, 24, 142-154.

BURDETT B. (2014). Measuring accessible journeys: a tool to enable participation. *Proceedings of the Institute of Civil Engineers*, 1-8.

CASS N, SHOVE E, and URRY J. (2005). Social exclusion, mobility and access. *The Editorial Board of the Sociological Review*, Blackwell, 539-555.

MAYNARD A. (2009) Can measuring the benefits of accessible transport enable a seamless journey? *Journal of Transport and Land Use*, 2(2), 21-30.

PRESTON J., and RAJE F. (2007). Accessibility, mobility and transport-related social exclusion. *Journal of Transport Geography*, 15, 151-160.