The accessibility sustainability connection: Exploring the links between accessibility and sustainability

Authors

Michelle Lewis
BA (Hons) Economics, Adv Dip Transport
Member of Chartered Institute of Logistics and Transport
Member Institute of Highways and Transportation (UK)
Member IPENZ Transportation Group
Principal Advisor: Land use and transport planning
New Zealand Transport Agency
Michelle.Lewis@NZTA.govt.nz
04 894 6441

and

Pania Elliot (Presenter)
BA Spol
Advisor: Travel planning
New Zealand Transport Agency
Pania.Elliot@NZTA.govt.nz
04 894 6444

Abstract

What is the potential to take a more holistic approach to enabling access to goods, services, facilities and activities?

This paper explores the potential role of accessibility planning in achieving the sustainability agenda, via:

- Examination of the roles and relationships between access, mobility and sustainability
- Examples and assessment of overseas practice
- Identification of barriers to access and approaches to addressing them
- A proposed framework for accessibility planning in NZ

The accessibility sustainability connection: exploring the links between accessibility and sustainability

Introduction

This paper discusses the concepts of accessibility and sustainability and examines the potential benefits of taking an accessibility planning based approach to addressing the economic, social and environmental challenges we face. It explores the role of accessibility in meeting the government's sustainability agenda for transport outlined in the NZTS and the Government Policy Statement on Land Transport Funding 2009/10 – 2018/19.

Defining accessibility and mobility, and accessibility planning

'Accessibility relates to ease of access', 'Accessibility should be distinguished from mobility, which relates to ease of movement rather than ease of reach'. Accessibility planning can be simply defined as: a structured process for the assessment of and planning for, accessibility' (Chapman, S., 2008).

Access via mobility - How have we planned for access in the past?

For the past 50 years, transport planning has focused on addressing our access needs through providing for mobility via the motor vehicle; appropriate in times of cheap oil, relative economic prosperity, population growth and urban expansion (Enoch, P.2005). More recently we have become aware that this approach is unsustainable in the face of increasing environmental, social and economic pressures. Planning for mobility has resulted in a number of undesirable effects including: increased congestion, transport emissions, motor vehicle facilities and injuries, reduced walking and cycling and public transport, access to key opportunities to those without cars and urban sprawl (Solomon, J., 2003) (Bannister, D., 2007).

How do we plan for accessibility?

Accessibility planning allows us to focus on the specific and varying needs of those within a spatial area and uses indicators to measure the levels of access by these groups have to social, educational and employment activities. Transport based accessibility focuses on addressing the barriers to accessibility including physical, geographical, facilities, economic, time based, fear based and space based (Chapman, S., 2008) (Solomon, J., 2003).

The central premise of accessibility planning is the focus on targeting and removing barriers that prevent people from being able to access the opportunities they need, and the potential for access to be provided through the location or relocation of activities to better reflect the requirements of groups that need to access them. Non-transport options are also conceivably part of planning for access; examples could include delivery of goods or services, provision of information via the internet (DFT, 2003).

Measuring accessibility

Accessibility assessment can be conducted on both a macro (national or regional) level, or on a micro (local or neighbourhood) level where accessibility to destinations by walking, and infrastructural barriers to access can be assessed - such as curb height, security issues and other route based factors) (Achutan, K.,et al., 2007).

Over the last decade planning for accessibility has become better enabled through and improved understanding of the concept and the creation of new technologies for assessment such as Geographic Information Systems and the identification of the link between poor

accessibility and poor social, economic and health outcomes (DFT, 2003). Key indicators used to measure accessibility levels include:

- *Transport System Access (TSA):* (commonly used in NZ) measures the ease of access of a network (usually public transport focused) such as the *'distance from home to the nearest bus/train stop.'*
- *Threshold or opportunity indicators:* combines multiple factors such as travel information, demographic information and destination characteristics. For example the '*percentage of people of working age within 40 minutes of work by public transport'* (Chapman, S., 2008).
- *Continuous/gravity indicators:* based on the 'relative attractiveness of activity type' and consider factors such as distance, travel time and cost. This enables the assessment of activities within a certain area, producing a continuous deterrence function or weighting of the desirability of an activity at one location when combined with deterrence factors such as time, distance, and cost. For example, '*the equivalent total number of jobs available throughout the entire study area from a given origin*' (LTPN, 2004).
- *Qualitative measures:* surveys and engagement with affected communities can also be employed as part of the assessment process (Chapman, S., 2008).

What does sustainability mean?

The concept of sustainability or sustainable development is about meeting "*the needs and aspirations of the present without compromising the ability of future generations to meet their own needs*". The basic premise of this definition is that economic, social and environmental needs and aspirations of society are interdependent. We need to ensure that a balance can be achieved in planning to achieve desired and necessary outcomes in these areas (Bruntland, G.,1987).

Strategic context – the sustainability agenda

The government's vision for transport in 2040 is that: *'People and freight in New Zealand have access to an affordable, integrated, safe, responsive and sustainable transport system* .The NZTS identifies a number of key challenges that need to be addressed and the key components that will play an increasing role in meeting challenges we face and in achieving the government's vision for transport. The areas that accessibility planning can play a role in addressing are summarised in the table 1 below: (Ministry of Transport, NZTS, 2008)

Table 1: Potential contribution of accessibility planning in addressing the NZTS challenges

NZTS key component	NZTS challenge	Potential role of accessibility
Integrated planning	• Responding to climate change • Funding of investment in infrastructure and services while keeping transport affordable • Increases in the environment and social impacts of transport	• Provide a process and align the needs of communities through assessment of social need and barriers to access including distance, cost, security, geographical and physical. • Provides a tool to assess land use alternatives and the potential impacts on infrastructure prior to decision-making. As a measurement tool there is applicability to the Local Government Act 2002, and the Land Transport Management Act 2003. • Allows for a 'whole of journey' approach addressing minor barriers (infrastructural, cost, safety, and security issues) that can act as a major barrier to access.
Making the best use of existing networks and infrastructure	• Funding of investment in infrastructure and services while keeping transport affordable • Increases in the environmental and social impacts of transport	• Enable better targeting and prioritisation of the needs of communities and businesses as it is focussed on assessing the characteristics of the people and businesses in an area and identifies the barriers to achieving access.
Increasing the availability and use of public transport, cycling, walking and other shared and active modes	• Responding to climate change • Increases in the environment and social impacts of transport • Changing demands arising from the ageing of New Zealand's population	• Assessment of accessibility by shared and active modes to key opportunities • Enables targeted improvements to walking and cycling routes, public transport service and infrastructure provision in conjunction with the needs of a community. • Economic benefits may be derived by the application of accessibility planning methodology to freight transport. Particularly in relation to selecting locations for freight distribution centres.

Accessibility planning overseas

The USA, Holland and the United Kingdom provide examples of varying degrees of accessibility planning (comprehensive, regulatory and limited). Summaries of the approaches are provided below:

USA (Limited)

- based on the concept of 'social equity' measured by mode of travel (car and public transport), income class, ethnicity).

- no formal accessibility planning policy but a range of federal policies implemented over the past 20 years ensure transport agencies must consider accessibility as an influence on transport policy.

The Southern Californian Association of Governments (SCAG) oversees six southern Californian counties serves as an example of how accessibility planning works. Its approach to planning for accessibility is summarised as follows:

- equity assessments (accessibility focused) are conducted when developing mandatory 20 year Regional Transport Plans (RPT);

- accessibility outcomes are measured via system performance outcomes – in relation to minority or low income communities (USDT, 2003);
- baseline measures allow for comparison of the effectiveness of related provisions within the RPT in addressing desired accessibility outcomes (Chapman, S., 2008).

Holland (Regulatory)

Accessibility planning implementation occurs through ABC location policy. The primary aim is to reduce car mobility in urban areas with a view to enabling better access to these areas by public transport. Two key concepts are central to this approach:

- *the proximity principal:* origins and destinations should be grouped as closely together as possible (these are classified as A,B or C locations dependant on their accessibility by mode)
- *accessibility profiles:* businesses and developments should be located in places that best reflect transport needs (Chapman, S., 2008).

UK (Comprehensive)

The United Kingdom provides the best example of where accessibility planning has been adopted comprehensively with the aim of addressing the issue of social exclusion (Chapman, S., 2008). Key features of the UK approach are:

- national priorities and related indicators are set by the Department for Transport ,
- Local Transport Authorities are required to prepare accessibility plans as part of their Local Transport Plans taking into account national and regional priorities (DFT, 2003).

Accessibility planning in the NZ context

The NZTS targets under *'*improving access and mobility' relate to public transport and cycling and are as follows:

- increased use of public transport to 7% of all trips by 2040
- increased walking and cycling and other active modes to 30% of total trips in urban areas by 2040 (NZTS, Ministry of Transport, 2008)

Potential indicators in the NZ context could include:

National*: Percentage of the population who can get to key locations door to door by public transport'* (TMIF, Ministry of Transport, 2008) and or *'percentage of the population who can get from key locations door to door by cycle in 30 - 60 minutes'*

Regional: ***'****Percentage of pupils of compulsory school age within 30 minutes of a primary school by PT/Walking or cycling'* and or '*Percentage of people of working age within 60 minutes of a hospital by PT'*

Local: *'Percentage of school age children able to reach school by walking/cycling/PT'* and or *'Number of elderly people with access to a local hospital by PT'*

Options for addressing these issues would then be weighed up with consideration given to: level of need, benefits and disbenefits, regulatory barriers, availability of resourcing of funding, geographic issues etc. From here an accessibility plan would be developed and

implemented; it is envisaged that the accessibility plan and indicators would evolve over time in line with national, regional and local priorities (Chapman, S. 2008)

Summary

What emerges in the updated NZTS and GPS is the need to employ more holistic approach in responding to the key challenges we face and in achieving the ambitious targets before us. The role of accessibility then is as a key enabler of sustainability, a focus on planning for better accessibility means that we need to view transport as a means to an end, instead of an end in itself. Alternatives to providing access via mobility will need to be utilised, as will improved integration between land use planning and transport, improved access to technology and rationalisation of service delivery where possible. Where access must be gained via mobility we need to ensure that barriers preventing use of shared and active modes can be assessed and improvements made that are appropriate to the needs of our communities and businesses.

References

ACHUTHAN, K., TITHERIDGE, H. and MACKETT, R.L. (2007), Measuring Pedestrian Accessibility, Proceedings of the Geographical Information Science Research UK (GISRUK) Conference 2007

BANISTER, D. (2007), The Sustainable Mobility Paradigm, Transport Studies Unit, Oxford University Centre for the Environment, Oxford, UK

BRUNTLAND, G. (ed) (1987), 'Our common future: The World Commission on Environment and Development', Oxford, Oxford University Press

CHAPMAN, S. (2008), 'Accessibility Planning Methods', Booz & Co, (For Land Transport NZ)

Department for Transport (DFT), (2003) 'Transport Planning and Accessibility', http://www.dft.gov.uk/pgr/regional/ltp/accessibility/overview/transportplanningandaccessib3649

ENOCH, M.P. (2005) Alternative Implementation Strategies for Radical Transport Schemes, Barriers to Sustainable Transport: Institution, Regulation and Sustainability, (ed.) Rietveld, P, Stough, R. R), Spon Press

HANDY, S. and CLIFTON, K. J. 'Evaluating Neighbourhood Accessibility: Possibilities and Practicalities, Journal of Transportation and Statistics, 2001, http://www.des.ucdavis.edu/faculty/handy/JTS_paper.pdf

Local Transport Planning Network, (2004) UK http://www.ltpnetwork.gov.uk/Documents/Document/Accessibility%20planning%20tech%20ann%201.pdf

Ministry of Transport (2008), New Zealand Transport Strategy (NZTZ), August 2008

Ministry of Transport, (2008) Transport Monitoring Indicators Framework, Version 1

SOLOMON, J. (2003), Delivering Sustainable Transportation: What is Transport Social Exclusion: A social Science Perspective, University of North London, Pergamon

United States Department of Transportation, Federal Highway Administration, http://www.fhwa.dot.gov/environment/ejustice/case/case4.html