

# A proposal for accessibility planning in NSW: research and policy issues

Rhonda Daniels<sup>1</sup> and Corinne Mulley<sup>2</sup>

<sup>1</sup>Institute of Transport and Logistics Studies, The University of Sydney

<sup>2</sup>Institute of Transport and Logistics Studies, The University of Sydney

Email for correspondence: [rhonda.daniels@sydney.edu.au](mailto:rhonda.daniels@sydney.edu.au)

## Abstract

Accessibility planning is a framework and process to use accessibility indicators as a basis for transport planning. The structured approach assesses actual accessibility at different spatial levels against indicators to identify accessibility inequities, and then develops and implements plans to improve accessibility. In this context, accessibility refers to spatial access rather than physical access. Accessibility planning has been introduced in the UK as a mechanism for achieving social inclusion by addressing inequities in access to goods and services using indicators of access to jobs, education, health facilities and retail facilities by public transport. The paper outlines a proposal for implementing accessibility planning in NSW. The paper explains the concept and significance of accessibility planning and the current context for accessibility planning in NSW. It identifies research and policy issues which would need to be resolved to implement accessibility planning in NSW including relationship with existing targets, determining accessibility indicators and standards, community engagement, governance and institutional frameworks, and funding and implementation.

## 1. Introduction

Accessibility is a key element of transport and a goal of transport planning. Strategic land use and transport plans often have an aim to improve accessibility, either implicitly or explicitly. Within transport planning, accessibility refers to the 'ease' of reaching destinations. Improved accessibility in this context relates to improved 'ease' of access or improved spatial access. It can be measured in time, distance or 'generalised' cost which is a combination of time and money. There are many different ways of measuring and referring to accessibility and as an example, the issues of defining accessibility to jobs or "jobs closer to home" were discussed by Daniels (2007). However many factors affect travel choices. Even when a service is spatially accessible, there may be other barriers to accessibility including cost, physical access, lack of information, and perceptions of safety and security.

Accessibility planning is a framework and process to use accessibility indicators as a basis for transport planning. The structured approach of accessibility planning assesses actual accessibility to opportunities such as work, education and health care at different spatial levels against indicators to identify accessibility inequities as the basis for developing and implementing plans to improve accessibility. Strategically, accessibility planning can form the basis of evidence-based decision-making in the allocation of resources to improve accessibility and improve social inclusion. As a means of providing equality of access, accessibility often focuses on public transport (and walking and cycling) rather than on access by private vehicles.

Chapman and Weir (2008 p. 7) define accessibility planning:

*Accessibility planning can be simply defined as a structured process for the assessment of, and planning for, accessibility. It uses quantitative and qualitative data and employs tools such as geographical information systems to systematically assess a range of accessibility-related information, including origins, the location and delivery of key activities and the*

*transport links to and from them, and to assist in the development of a set of accessibility indicators. This enables actual accessibility to be assessed against the indicators, which in turn allows accessibility problems to be identified, addressed and monitored. When fully developed the process is a continuous one and provides evidence of changes in accessibility over time.*

As a formal framework, the UK is the only country in which accessibility planning has been used. The importance of this framework approach is that it provides a benchmark measure of accessibility that can be used to identify problems and to assess the impact of solutions when implemented. Whilst the UK is perhaps unique in the application of this framework approach, the use of accessibility models to establish need is more widespread. In the environmental justice and reverse commute debates in the US, accessibility models are widely used to establish the nature of accessibility to public transport with the different methodologies and states of practice being well documented (Transportation Research Board 2004).

Elsewhere in Australasia there is increasing interest in the use of accessibility modelling as a way of establishing current levels of accessibility with New Zealand looking closely at the UK Accessibility Planning framework approach (Chapman and Weir 2008). Curtis and Scheurer (2009) have developed an accessibility model – the Spatial Network Analysis for Multimodal Urban Transport Systems (SNAMUTS) tool. This quantifies various elements of network accessibility and is designed to measure the impact of changes in transport infrastructure, land use and public transport intensity on public transport network accessibility. It has not been designed to measure and quantify transport disadvantage, but it could be used for this purpose. However, as in the use of accessibility models in the US, it has not been conceived as part of a process to examine and address transport problems and does not have the required governance framework. Other studies have used spatial modelling to establish accessibility deficits (Dodson et al. 2007) but again have not been proposed as part of a framework.

The paper outlines the concept of accessibility planning, accessibility planning in the UK, the context for accessibility planning in NSW including state, federal and local government frameworks, and research and policy issues for implementing accessibility in NSW including setting and calculating indicators, community engagement, governance and institutional frameworks, and funding and implementation issues.

## **2. Accessibility planning in the UK**

The UK leads the way in accessibility planning, following a major report on transport and social exclusion *Making the Connections* released in 2003. The UK Department for Transport (UK Department for Transport 2005) notes “Accessibility planning focuses on promoting social inclusion by tackling the accessibility problems experienced by those in disadvantaged groups and areas”, targeting access to those opportunities that are likely to have the most impact on life chances: employment, education, health care and food shops.

### **2.1 Accessibility indicators**

In the UK, there is a core set of accessibility indicators (see Table 1).

Each local authority can also identify other local accessibility indicators. Chapman and Weir (2008 p. 28) note that “Each indicator set is calculated using both threshold and continuous measures. Indicators are calculated for a ‘main’ population group and a particular ‘risk’ group within each category, with the exception of the further education category where only a main population group is examined. The risk groups provide a proxy for individuals/groups considered vulnerable to accessibility-related social exclusion.” The lower threshold represents a median travel time, as measured in the *National Travel Survey*. The upper threshold is set at twice the lower threshold so should incorporate the majority (80–90%) of trips.

**Table 1: UK core accessibility indicators**

Category	Sub-group	Indicators and associated thresholds
Accessibility to school education	Primary	% pupils of compulsory school age within 15 minutes and within 30 minutes of a primary school by public transport (PT)/walking. % pupils of compulsory school age in receipt of free school meals within 15 minutes and within 30 minutes of a primary school by PT/walking.
	Secondary	% pupils of compulsory school age within 20 minutes and within 40 minutes of a secondary school by PT/walking and by cycling. % pupils of compulsory school age in receipt of free school meals within 20 minutes and within 40 minutes of a secondary school by PT/walking and by cycling.
Accessibility to further education		% 16-19 year olds within 30 minutes and within 60 minutes of a further education establishment by PT/walking and by cycling.
Accessibility to work (no differentiation between types)		% people of working age (16-74) within 20 minutes and within 40 minutes of a location with greater than 500 jobs by PT/walking and by cycling. % people in receipt of jobseekers' allowance (unemployment benefit) within 20 minutes and within 40 minutes of a location with greater than 500 jobs by PT/walking and by cycling.
Accessibility to a hospital		% households within 30 minutes and within 60 minutes of a hospital by PT/walking. % households without access to a car within 30 minutes and within 60 minutes of a hospital by PT/walking.
Accessibility to a doctor		% households within 15 minutes and within 30 minutes of a GP by PT/walking. % households without access to a car within 15 minutes and within 30 minutes of a GP by PT/walking.
Accessibility to a supermarket/food store		% of households within 15 minutes and within 30 minutes of a supermarket/food store by PT/walking and by cycling. % of households without access to a car within 15 minutes and within 30 minutes of a supermarket/food store by PT/walking and by cycling.

Source: Chapman and Weir (2008 p. 29)

## 2.2 Implementation of accessibility planning

Accessibility planning is implemented in the UK by local authorities through their Local Transport Plans. Local Transport Plans are statutory documents prepared by local transport authorities and required by the Transport Act 2000. Local Transport Plans must include an accessibility strategy, and focus on “those most in need”.

*Accessibility Planning Guidelines* (UK Department for Transport 2005a) is the key reference for local authorities with chapters on the background and purpose of the guidance, accessibility in local transport plans, policy context for accessibility, accessibility assessments, option appraisal and identifying resources, measures to tackle accessibility barriers, and measuring success. These are complemented by *Technical Guidelines* (UK DfT 2005b). In 2009 the methodology has been updated to reflect improvements in data and the inclusion of private car as a mode, a better way of measuring the frequency of public transport journeys, the inclusion of demand responsive transport as a public transport mode where it is available and the introduction of a minimum journey time (UK Department for Transport 2009).

The main stages of accessibility planning process are strategic accessibility assessment, local accessibility assessments, option appraisal, accessibility plan preparation, performance monitoring and evaluation. The UK Department for Transport provided a package of assistance for local authorities including access to accessibility planning software (Accession, developed by MVA), calculation of core accessibility indicators to jobs and services for each local authority, and a “withinreach” program supported by Steer Davies Gleave to provide support to authorities including training and advice. The UK DfT prepared

a set of publicly available core accessibility indicators for every local authority which has been added to each year, as a spreadsheet, so every authority can see all the data, to enable benchmarking.

### **2.3 Current status in UK**

Many of the first 5 year plans are coming to an end. In late 2008, the UK Department for Transport commissioned a 3 year review study to carry out a full process and impact study of accessibility planning. Lucas (2010) identifies that the interim report on a number of case studies confirms differences in approaches between local authorities with “some focussing more on targeting improved access at socially excluded groups and others on more universal measures for improved accessibility” (Lucas 2010, p16). It is likely that this study will be able to produce more robust quantification of the impacts of accessibility planning on increasing public transport use, or reducing social exclusion in the future.

Halden (2009) reviews 10 years of accessibility planning in UK and concludes that the presence of accessibility indicators has led to greater integration between the different levels of government, is having an impact on funding and planning decisions particularly in relation to informing ‘end to end’ journeys, and is providing a basis for improved dialogue between users and suppliers of transport. Accessibility plans are no longer compulsory and it will be interesting to see how many authorities still include accessibility targets in their planning.

Since the emergence of accessibility planning, concerns have been expressed about the appropriateness of single value accessibility indicators and the use of thresholds based on actual behaviour for guiding improvements to social inclusion since the needs and requirements of different community segments vary. Research is underway to understand the needs of different groups. For example, Titheridge et al. (2009) report on a project to develop and model an appropriate set of accessibility benchmarks for older people following a recognition that the core accessibility indicators were less relevant for evaluating the travel needs of elderly people. Solomon and Titheridge (2009) identify obstacles to setting accessibility indicators for social inclusion for different disadvantaged groups such as older people or lone parents because these groups have different transport requirements in order to be included in society.

## **3. Context for accessibility planning in NSW**

The identification and measurement of indicators of accessibility, and the relationship between accessibility and social exclusion, is well established in the literature. In Australia, research has identified the relationship between accessibility and social exclusion. Currie et al. (2007) is a major collection of papers discussing elements of transport and social disadvantage in Australian communities, including the important role of public transport. Hurni (2006) studied transport and social exclusion in western Sydney focusing on the impact of transport disadvantage on families and individuals with low income and no access to a private vehicle, living in areas with poor public transport provision. Hurni (2006) found transport is unevenly distributed across Sydney and impacts more heavily on low income households reducing access to jobs, education and recreational options.

Accessibility planning is supported by stakeholders such as Western Sydney Community Forum (2009) and the public transport alliance of the Australasian Railway Association, the Bus Industry Confederation and the International Association of Public Transport (Stanley and Barrett 2010). The development of accessibility indicators and linking these indicators to effective strategic planning is fundamental to the allocation of resources in providing greater equity in accessibility for communities.

### **3.1 NSW government**

The NSW Government has identified an accessibility target in its strategic planning documents including the *Metropolitan Strategy*, *State Plan* and *Metropolitan Transport Plan*.

### ***Metropolitan Strategy (2005)***

The NSW Government's *Metropolitan Strategy: A City of Cities*, released in December 2005, set five broad aims. One of the aims is "Ensure Fairness", which is defined as access to services, with a target to increase the percentage of the population living within 30 minutes by public transport of a City or Major Centre, with these centres defined in the *Metropolitan Strategy* as providing access to a wide range of goods, services and activities and connected by the public transport network.

The target to increase the proportion of the population with access to a City or Major Centre within 30 minutes by public transport has been included in the Draft Subregional Strategies for each of the ten subregions in Sydney released in 2007 and 2008. In order to implement the *Metropolitan Strategy* aim to focus residential development within centres and corridors with access to public transport and local services, each Draft Subregional Strategy includes an action that Councils ensure the location of new dwellings maintains (or improves) the subregion's performance against the access to centres target. Each Council's Local Environmental Plan which guides land use including residential and commercial zonings, must be consistent with the *Metropolitan Strategy* and Subregional Strategies. This measure and target formed the basis for Priority E5 Jobs Closer to Home in the *State Plan*, released 12 months after the *Metropolitan Strategy*.

### ***State Plan (2006, 2010)***

The NSW Government's *State Plan* released in November 2006 set 34 priorities, with associated targets, for government agencies. Priority E5 Jobs Closer to Home had a target to increase the proportion of the population with 30 minute public transport access to a City or Major Centre, measured for 10 subregions in Sydney. The *State Plan Update Report* released in 2007 clarified the target as access to a Strategic Centre, defined in the *Metropolitan Strategy* as Global Sydney, Regional Cities, Major Centres and Specialised Centres. Across Sydney, 75% of people live within 30 minute public transport access of a Strategic Centre, but the proportion within each subregion varies from 100% in the Sydney City Subregion and 96% in the Inner West Subregion to a low of 60% in South West Subregion and 51% in North West Subregion. The measure was calculated by the Transport Data Centre in NSW Transport and Infrastructure and verified by the NSW Auditor-General.

A revised *State Plan* was released in November 2009 and updated in March 2010 following the release of the *Metropolitan Transport Plan*. Whilst the original 34 priorities have been regrouped, there remains a priority in the Better Transport and Liveable Cities theme to 'Increase the number of jobs closer to home', defined as: 'Increase the percentage of the population living within 30 minutes by public transport of a City or Major Centre in metropolitan Sydney'.

The *State Plan* March 2010 also includes several transport-related targets such as increasing share of journey to work trips on a safe and reliable public transport system, meeting public transport reliability targets, improving the efficiency of the road network, maintaining road infrastructure, improving road safety, and increasing walking and cycling. Some of these targets may be in conflict with each other.

### ***Metropolitan Transport Plan (2010)***

The NSW Government's *Metropolitan Transport Plan: Connecting the City of Cities*, released in February 2010, supports the *State Plan* targets for public transport use and accessibility. However the impact of specific transport initiatives on the accessibility targets is not clear. The *Metropolitan Transport Plan* includes two maps comparing the proportion of total jobs in Sydney accessible by public transport and by private vehicle within 30 minutes. However the text does not refer to the maps, or set targets to improve or change the accessibility patterns represented on the maps.

### **Metropolitan Strategy Review (2010)**

A five year review of the *Metropolitan Strategy* is underway in 2010, informed by the discussion paper *Metropolitan Strategy Review: Sydney Towards 2036*, released in March 2010. The discussion paper confirms the government's commitment to the original measure to increase the proportion of people living within 30 minutes by public transport of a City or Major Centre. Following the review and consultation, the *Metropolitan Strategy* and *Metropolitan Transport Plan* will become an integrated land use and transport plan to be known as the Metropolitan Plan.

### **Other guidelines**

As well as strategic planning guidance, NSW has three sets of planning guidelines for bus services in metropolitan areas, outer metropolitan areas, and rural and regional areas, which focus on distance between homes and a bus service. The *Service Planning Guidelines* (NSW Ministry of Transport 2006) for metropolitan bus regions refer to a hierarchy of bus routes which are in turn related to the concept of a hierarchy of centres, as destinations. The *Guidelines* set a target for 90% of households to be within 400 metres of a rail line or a bus route during commuter peaks, inter-peak and weekend day time (straight line distance, not road or walking distance). However, the *Guidelines* do not explicitly consider or measure where the bus service goes, how long it takes to get there, or what goods and activities the bus service provides access to. The NSW Budget Papers (NSW Treasury 2010) report that in 2009/10, 83% of households in Sydney were within 400 metres of a rail line or a bus route during the daytime. For rail and ferries, there are no associated planning guidelines nor are there guidelines that consider all public transport modes more holistically.

## **3.2 Australian government**

The current Federal Government has expressed greater interest in cities, urban planning, public transport and social inclusion than the preceding Howard Government. The government has established the new federal agency Infrastructure Australia (IA), which advises on nation building funds for infrastructure and infrastructure policy. As part of the Nation Building program, the May 2009 budget included federal funds for public transport projects. IA's Major Cities Unit recently released *State of Australian Cities 2010* (IA 2010) which acknowledges accessibility as a measure of the liveability and social inclusion of major cities. The Council of Australian Governments (COAG), assisted by IA, is establishing national criteria for capital cities strategic planning which will be a pre-requisite for federal funding, and these criteria may include goals and targets for public transport use or accessibility targets.

The Rudd Labor Government established an Australian Social Inclusion Board in May 2008 ([www.socialinclusion.gov.au](http://www.socialinclusion.gov.au)). However, the six early priority areas for the Board do not directly include transport. The closest priority area with a spatial dimension is "Focusing on locations of greatest disadvantage". Under this priority, the focus has been on specific priority employment regions and remote locations, but the recent strategy *A Stronger, Fairer Australia* notes that "Locational disadvantage will also be tackled through better strategic planning of our cities. COAG's Cities Taskforce, along with the Major Cities Unit of Infrastructure Australia, will encourage future urban development that delivers social inclusion by promoting equitable access to education, employment, health, transport and other important services" (Social Inclusion Unit 2010 p. 17).

## **3.3 Local government in NSW**

At the local government level, individual councils have undertaken work on measuring and improving accessibility in their own local area, but there is no consistent approach which allows comparison across areas. For instance, Sutherland Council mapped accessibility at the individual block level, with an accessibility index for each parcel of land calculated using distance to a bus stop and railway station, topography/gradient, bus and rail service

frequency, distance to a major and lower order centres, centre hierarchy and presence of a paved footpath (Koernicke 2007). However, this approach is unusual within NSW, and as with other work on measuring accessibility, is not part of a framework of addressing inequality.

Local government does not control provision of public transport services, but it can support accessibility in several ways. It is responsible for local footpaths, cycleways and bus stop facilities such as seating, shelter and lighting. Local government may support community transport to provide equity in access including providing community transport as part of council activities or supporting a community transport operator through providing free or subsidised depots and support services. Local government also influences the location and density of land uses.

## **4. Research and policy issues for implementing accessibility planning**

Research and policy issues in implementing accessibility planning include setting and calculating indicators, community engagement, governance and institutional frameworks, and funding and implementation.

### **4.1 Developing accessibility indicators**

While there has been work on measuring and calculating accessibility in Sydney (such as Hurni 2006), there is no consistency or overarching framework in NSW in which to measure and compare accessibility across the whole state, and use that as a basis for allocating transport resources for improvement.

Issues in developing accessibility indicators for accessibility planning include: defining opportunities, recognising differences in metropolitan and non-metropolitan locations, considering public transport vs other modes, and defining time periods. Recognising the difficulties of specifying measures, the *Technical Guidance on Accessibility Planning* (UK DfT 2005b p. 14) notes that “no accessibility measures are one hundred percent free of data or methodological limitations”.

#### ***Defining opportunities***

The UK core accessibility measures include access to work, education (primary, secondary and further), health care (doctor and hospital) and food shops. Apart from access to jobs, these are relatively simple measures of access to one opportunity, rather than measures of cumulative opportunities reflecting choice such as how many doctors are available within 30 minutes. Opportunities not considered in the UK process are access to social, cultural or recreational activities, which are also important for social inclusion and participation in society. For public use, often trade-offs must be made between simple easy-to-understand accessibility measures, and richer, more complex measures. There are definitional issues as to the size thresholds to be considered a suitable hospital (such as emergency facilities, out-patient clinics) or educational institution such as the range of programs offered.

However, the UK opportunities could form the base of accessibility indicators in NSW (Table 2). The current *Metropolitan Strategy* and *State Plan* measure of access to a City or Major Centre within 30 minutes by public transport represents access to a wide range of goods and services, and access to the public transport network. The use of community views on what are appropriate opportunities is discussed in section 4.2.

**Table 2: Possible indicators for NSW (based on UK indicators)**

Category	Indicator and target (increase %)
Access to a City or Major Centre	<ul style="list-style-type: none"> <li>• Increase the proportion of the population living within 30 minutes by public transport of a City or Major Centre (as defined in Metropolitan Strategy)</li> </ul>
Access to education - primary school	<ul style="list-style-type: none"> <li>• % of school-age population with access to a primary school within 15 minutes by walking/cycling or public transport</li> </ul>
Access to education - higher education eg TAFE, University	<ul style="list-style-type: none"> <li>• % of youth population with access to a tertiary education institution within 30 minutes by public transport</li> <li>• % of youth population with access to a University campus within 60 mins by public transport</li> </ul>
Access to health - GP	<ul style="list-style-type: none"> <li>• % of population with access to a GP within 15 minutes by public transport/walking</li> </ul>
Access to health - hospital	<ul style="list-style-type: none"> <li>• % of population with access to a hospital within 30 or 60 minutes by public transport</li> </ul>
Access to jobs	<ul style="list-style-type: none"> <li>• % of the working age population with access to at least 25% of Sydney's jobs (approx 500,000) within 30 mins by public transport</li> </ul>

### **Urban vs non-urban targets**

The current *State Plan* target focuses on the 10 subregions in metropolitan Sydney, with no targets for non-metropolitan areas. Even within Sydney, there are large differences in accessibility between higher density inner city areas and semi-rural fringe areas with low density development. The *State of Australian Cities 2010* report (IA 2010) indicates that 75% of Australia's population lives in capital cities.

A policy issue is identifying appropriate standards of accessibility for lower density, non-metropolitan regions. Stanley and Barrett (2010 p. 57) recognise that "access opportunities cannot reasonably be expected to be the same everywhere". For instance, Stanley and Barrett (2010 p. 20) report research that the typical rural and regional dweller in Australia has much lower accessibility to services than those living in metropolitan areas, with core services typically available within a distance of 1.4 km in metropolitan areas, compared to over 30 km in rural Australia and townships.

### **Public transport vs other modes**

In the UK, accessibility planning indicators focussed on public transport accessibility because accessibility planning is the evidence base for more effective social inclusion policies and a very high proportion of those excluded have low income and no access to a car (UK DfT 2005a). In 2009, changes to the way in which the indicators are calculated have meant that the private car is now included as a mode (UK DfT 2009). Nevertheless, a focus on accessibility by public transport (and walking and cycling) helps achieve other community objectives such as health and environment, as well as social inclusion. The NSW context of lower housing densities and a land use strategy based on supporting centres is different from that experienced in the UK. Thus a research issue is to identify how important public transport, walking and cycling accessibility is for different groups in the community, compared to access by private vehicle. This would be consistent with the approach of New Zealand where accessibility planning in the future may consider private vehicle accessibility, particularly for non-urban areas (Chapman and Weir 2008). Stanley and Barrett (2010 p. 20) note that "In regional areas, most people rely on the car for access opportunities. All-weather road access is a fundamental requirement for these people."

The relativity of travel time by different modes is also important. Accessibility targets could measure access by public transport relative to car. For instance, that access to the nearest Regional City should be faster by public transport than by car for the majority of residents.

### ***Time periods***

It is often not clear what time of day is the base for accessibility time indicators. Often am peak travel times are used to calculate access time because many modelling networks are based on am peak networks. Indicators should reflect the time that the opportunity is usually accessed such as work and education in the am peak, and health and retail in the off-peak. It may be appropriate to set targets for different time periods such as peak and off-peak travel. Access by particular demographic groups to particular opportunities such as by young people to night-time education or social activities may be required.

### ***Data issues in calculating indicators***

Data required to calculate accessibility measures includes population and employment, location of land uses such as schools and hospitals, and the public transport network including train stations, bus stops, frequency of services and travel times. In NSW, the Bureau of Transport Statistics in Transport NSW (formerly the Transport Data Centre at NSW Transport and Infrastructure) has the data required to calculate accessibility measures. Transport NSW's Strategic Travel Model can be used to estimate accessibility in the current year with the current transport network, and in the future, given specified transport and land use changes such as new transport infrastructure and services or new centres. Transport NSW's Household Travel Survey provides information on current travel behaviour such as the travel time and distance for different trip purposes.

In areas outside the Greater Metropolitan Region of Sydney, Newcastle and Wollongong, appropriate data on current travel behaviour and network models may not be available. Simpler measures, such as distance to a certain-sized centre, may be required initially as a measure of relative accessibility, as data sources are developed.

Accessibility measures should be calculated at the smallest spatial unit possible, then aggregated for reporting purposes. It would be ideal to measure accessibility for every house or parcel of land. But it is more practical to use larger spatial units. In the Greater Metropolitan Region, a suitable unit would be the Travel Zone, which is already widely used for transport planning and transport data. The Bureau of Transport Statistics divides Sydney into 2,690 Travel Zones. The *State Plan* measure for the 10 subregions in Sydney is calculated at the Travel Zone level.

Another issue in calculating indicators is how to account for the impact of public transport frequency on travel time. Half the headway is often used to represent service frequency through wait time. However, actual wait time varies with people's knowledge of the frequency of the service. The average wait time for an hourly service is likely to be less than 30 minutes, as people plan their arrival a few minutes before the service is due. Overall, accessibility is reduced with lower frequency of service.

### ***Thresholds***

In the UK, the National Travel Survey was used to identify thresholds of travel time for trips for different purposes. In NSW, the Household Travel Survey (HTS), a continuous survey running every day since 1997/98, is available for this purpose. The face-to-face interview survey collects data on the travel of every member of the survey household for one day, as well as detailed socio-demographic data on the household. The 2008/2009 3 year pooled estimates are based on 24,806 people and 105,391 trip records. The HTS can provide detailed data on travel behaviour in Sydney, the Illawarra and the Hunter regions including minimum, maximum and median travel times and the distribution of travel time for various trip purposes such as commuting, education, childcare, medical, retail, and social/recreational. The TransFigures information paper *Statistics for the Subregional*

*Planning Process* based on the HTS data (TDC 2006) indicates how travel behaviour such as total travel time per person per day, total vehicle time and mode use varies across the ten Metropolitan Strategy subregions in Sydney. While averages are usually reported, complex data on travel time for different locations and different demographic groups is available. However, in developing the indicators, the choice of the time thresholds in terms of access within 15 minutes, 20 minutes, 30 minutes or 40 minutes is not so important, as long as the measures identify areas of relative disadvantage and advantage.

## **4.2 Community engagement**

Regardless of which level of government takes the lead in accessibility planning, community engagement will be required to develop accessibility indicators and identify appropriate community standards.

The findings of Titheridge et al. (2009) and Solomon and Titheridge (2009) highlight the need to understand the viewpoints of different groups in the community and to establish a way of combining these viewpoints in a transparent way to help government agencies strategically plan transport (and land use) to facilitate improvements in accessibility.

There is no NSW information on what different communities view as an acceptable standard of access. The literature has identified the current use of a single indicator or threshold as unsuitable for policy implementation purposes. The current accessibility indicators in NSW focus on Sydney only. Thus, as well as establishing the different community views, there is a need to identify whether these views vary spatially (both intra-area such as within the metropolitan area, and inter-area between urban vs non-urban areas) and the degree to which the views are affected by demographic characteristics as well as attitudes towards public transport and land use choices.

There is a risk that community expectations for accessibility may be very high, or unrealistic (such as access within 5 minutes to a hospital or university). However, a research approach of seeking community views would be similar to the basic-needs or hardship standards approach to poverty research which identifies items required for long-term physical well-being or to participate in society, or hardship or deprivation indicators (Saunders 2004). Standards are partly relative, reflecting the experience of the day that applies in the individual's community. The research would aim to identify what is in the "basket of accessibility" – what services and activities should people have access to, and access within what time frames by what modes is considered an appropriate community standard. Lee et al. (2010) confirm the importance of an activity-based approach to accessibility within a time-space prism, and the importance of accessibility to both work and non-work activities for households.

In a "basic-needs", "basket of goods" or hardship standards approach of poverty research to accessibility, community views would be sought on what is considered "appropriate" for participation in society based on current community behaviour, and as a basis for developing government policy. Both poverty and accessibility have similar challenges of being widely used concepts and important social objectives, which have multiple definitions and measurements. Research needs to explore the dimensions of community understanding of accessibility, while anchoring it in actual travel behaviour and current accessibility.

The "basket of accessibility" concept addresses the risk that a single indicator may not recognise that accessibility needs vary by different groups in the community, or that indicators based on current travel patterns may not be appropriate.

In seeking individual community views, the research needs to find a way of synthesising these views not only by group but also by spatial area if they are to be useful as the basis of strategic planning and in the allocation of resources. The Analytical Hierarchy Process (AHP) methodology could be used to elicit individual views that comprise the "basket of accessibility". The AHP methodology but extended to Multi-actor multi-criteria analysis could

synthesise the different community group responses with weightings to reflect views of different groups (Macharis et al. 2010, Zografos et al. 2008).

As well as community engagement about standards, community debate is required about funding of accessibility improvements to achieve standards.

### **4.3 Governance issues for accessibility planning**

An important policy issue for accessibility planning is identifying the governance and institutional framework for implementation. There are roles for all three levels of government in accessibility planning as part of the governance and institutional frameworks.

#### ***Role for federal government***

Ideally, accessibility planning should be initiated at the federal level through development of a national accessibility policy to provide a consistent approach which could be used to determine distribution of federal funds for public transport. The Australian Social Inclusion Board provides a basis for recognising accessibility as a national goal. There are also opportunities in the development of criteria for capital city strategic planning and funding to establish accessibility standards, benchmarks or targets. The then Bureau of Transport and Regional Economics measured congestion for capital cities (BTRE 2006), and BITRE could provide a national data resource on accessibility. In the *Moving People – Solutions for a Growing Australia* report (Stanley and Barrett 2010), the public transport alliance of the Australasian Railway Association, Bus Industry Confederation and UITP have called for a national land transport policy.

#### ***Role for state government***

The role of state government depends on the role of the federal government: whether state government is implementing federal policy which may be tied to funding, or going it alone. Without an overarching national approach, the NSW Government would be responsible for developing accessibility indicators and setting targets. This task should be done in conjunction with local government. The NSW Government could set and measure accessibility performance, and develop plans for improvement. Alternatively, the task of developing plans could be delegated to local government as part of the new requirement for councils to have a long-term Community Strategic Plan.

Developing and implementing plans to improve accessibility requires control over funding and the delivery of services, which the state government has. Local government clearly understands local needs, but does not currently have the funding to implement transport improvements, and does not have control over rail and bus services. In NSW, there are complex structures for public transport governance which influence the design and delivery of public transport services. Some local governments do fund and provide local transport such as Community Transport services for specific markets or open-access services such as Parramatta Council's free Loop Bus around Parramatta CBD or Willoughby Council's subsidised Council Cab, which may address a gap in state government-provided services. Many transport issues such as network planning must be addressed on a wider scale than a local government area.

#### ***Role for local government***

The current NSW Government accessibility targets are not fully integrated within local government processes, although local government can influence accessibility through transport decisions and through land use in statutory planning documents such as Local Environmental Plans. There is a need to show how a state (or federal) government identifying an appropriate accessibility target can be embedded into state and local government planning and policy processes to encourage action to improve those areas of relative disadvantage.

Current local government strategic planning reforms provide a basis for this. A new planning and reporting framework for NSW local government has been introduced through the *Local Government Act 1993* (NSW Department of Local Government 2009). The 2009 reforms replace the former Management Plan and Social Plan with an integrated framework and include a new requirement to prepare a long-term Community Strategic Plan and Resourcing Strategy. The NSW Government could require each council's Community Strategic Plan to address accessibility, similar to the UK model. Figure 1 highlights the strategic planning framework for local government.

**Figure 1: Integrated planning and reporting for local government in NSW**



Source: NSW Department of Local Government (2009)

Stanley and Barrett (2010 p. 62) call for a regional approach: “Regional Accessibility Planning Councils across Australia, comprised of key regional stakeholders with an interest or involvement in personal transport/accessibility, should be formed to (inter alia) identify the most pressing regional needs to improve social inclusion as it is affected by transport and to also identify ways for getting better use from existing transport resources to meet these needs”. “This area of investigation should produce proposals for minimum access levels for urban and regional Australia” (Stanley and Barrett 2010 p. 41).

#### **4.4 Implementation and funding**

There are existing objectives for improved accessibility in strategic plans, but this has not been translated into a clear process for action, partly due to implementation and partly due to funding. Local government is required to meet the state government accessibility targets in developing their land use plans, but does not currently have the funding to implement transport changes which might be required to support their land use plans or overcome known transport disadvantages.

Funding is a critical issue and is related to the governance and institutional framework. The institutional framework must identify how actions identified in accessibility plans required to improve accessibility will be funded and prioritised.

Accessibility indicators and performance should be monitored and reviewed over time. An institutional framework needs to be established to define responsibilities, reporting and review.

Stanley and Barrett (2010 p. 60) identify two approaches to the structuring of Federal financial support for land transport: a formula-based approach to distribution of funding allocations (similar to current Federal allocations of land transport financial assistance) or a bid process, where bids are submitted in accordance with pre-specified criteria and allocations are made to those proposals which best meet the criteria (similar to the Infrastructure Australia allocation in the May 2009 federal budget).

#### **4.5 Other issues**

Other issues need to be recognised in the development and use of accessibility indicators to improve accessibility.

Accessibility can be improved through transport and/or land use measures. For instance, to improve access to a hospital, transport services could be improved, or the location of a hospital could be changed. The NSW Government recognises that solutions to accessibility will include both transport and land use elements. The need for an integrated approach to transport and land use planning is recognised in the consultations currently on-going for the *Metropolitan Transport Plan* (2010) and the 5 year review of the *Metropolitan Strategy* by the NSW Department of Planning, with the aim of releasing an integrated land use and transport strategic plan, the Metropolitan Plan, by the end of 2010.

Accessibility indicators measure *potential* access to opportunities, and *potential* to use public transport, not actual behaviour. Accessibility indicators need to be supplemented by other indicators such as data on travel behaviour and use of public transport to determine whether transport improvements have improved actual accessibility.

This recognises that there are many factors influencing use of public transport, apart from spatial coverage of services. These factors include physical access, information and signage, ticketing and fares, interchanges, access to train stations and bus stops, and waiting facilities (shelter and lighting), and perceptions of security and safety. Some factors are unique to an individual's circumstances, while responsibility for other factors varies between state and local government.

### **5. Conclusions**

The links between transport, accessibility and social inclusion are well-recognised, but there is a gap in how to set and translate accessibility indicators into government policy and planning to improve accessibility and social inclusion. The UK accessibility planning framework has led the way, but does not fully recognise that different groups within the community may have different needs in the development of indicators and the use of thresholds based on current behaviour. In Australia, with an increasing federal policy and funding interest in cities, public transport and social inclusion, an accessibility planning framework would help to provide transparency in transport decision-making and prioritisation for transport investment in services and infrastructure.

In NSW, the strategic planning documents of the *Metropolitan Strategy*, *State Plan* and *Metropolitan Transport Plan* include a broad accessibility target of increasing the proportion of the population in Sydney with access to a City or Major Centre within 30 minutes by public transport. In extending this target into an accessibility planning framework, there are a number of research and policy issues to be resolved. In identifying accessibility measures and targets, issues include defining access to which opportunities, recognising urban and non-urban differences, considering modal issues, setting thresholds, and recognising time-of-day. An important overarching issue is the need for community engagement in setting appropriate standards and thresholds for accessibility and recognising the needs of different

groups within the community. Other issues include governance and institutional frameworks and funding and implementation. The relationship between transport and land use must be recognised, as accessibility improvements may be transport or land-use based. In this context, accessibility is about spatial access, but a range of other factors also influence people's access and participation in life such as physical access, cost, information and awareness, and perceptions of safety and security. However an accessibility planning approach has the potential to provide a structured approach to improve access to important life opportunities for people in areas of relative disadvantage.

## References

- Bureau of Transport and Regional Economics (BTRE) (2007) *Estimating Urban Traffic and Congestion Cost Trends for Australian Cities*. Working paper 71. BTRE, Canberra, ACT.
- Chapman, S. and Weir, D. (2008) *Accessibility Planning Methods*, New Zealand Transport Agency Research Report 363. [www.nzta.govt.nz](http://www.nzta.govt.nz)
- Currie, G., Stanley, J. and Stanley, J. (eds) (2007) *No Way to Go: Transport and Social Disadvantage in Australian Communities*, Monash University ePress, Melbourne.
- Curtis, C. and Scheurer, J. (2009) *Network City Activity Centres*, Final Report. <http://www.abp.unimelb.edu.au/gamut/pdf/perth-snamuts-future-scenarios-19june09.pdf>
- Daniels, R. (2007) Jobs closer to home: what does it mean and how to achieve it, Proceedings of the *30th Australasian Transport Research Forum*, Melbourne, Australia, 2007.
- Dodson, J., Gleeson, B., Evans, R. and Sipe, N. (2007) Investigating the Social Dimensions of Transport Disadvantage II: From Concepts to Methods through an Empirical Case Study, *Urban Policy and Research*, 25(1), 63-89.
- Halden, D. (2009) 10 years of accessibility planning in UK – What has been achieved?, Paper presented to the *Association for European Transport Conference*, 5-7 October 2009, Leeuwenhorst, The Netherlands.
- Hurni, A. (2006) *Transport and Social Exclusion in Western Sydney*, University of Western Sydney and Western Sydney Community Forum. [www.wscf.org.au/uploads/File/Transport\\_disadvantage\\_report\\_web.pdf](http://www.wscf.org.au/uploads/File/Transport_disadvantage_report_web.pdf)
- Infrastructure Australia (2010) *State of Australian Cities 2010*, Major Cities Unit, Infrastructure Australia, Canberra.
- Koernicke, I. (2007) Accessibility constraints mapping for walking and public transport in the Sutherland Shire, *Papers of the 30th Australasian Transport Research Forum*, Melbourne.
- Lee, B., Waddell, P., Wang, L. and Pendyala, R. (2010) Reexamining the influence of work and nonwork accessibility on residential location choices with a microanalytic framework, *Environment and Planning A* 42, 913-930.
- Lucas, K. (2005) Providing transport for social inclusion within a framework for environmental justice in the UK, *Papers of 28th Australasian Transport Research Forum*, Sydney. [http://www.patrec.org/web\\_docs/atrf/papers/2005/Lucas%20\(2005\).pdf](http://www.patrec.org/web_docs/atrf/papers/2005/Lucas%20(2005).pdf)
- Lucas, K. (2010) Transport and Social Exclusion: Where are we now? Paper presented to the *12th World Conference on Transport Research*, 11-15 July, Lisbon, Portugal.
- Macharis, C., De Witte, A. and Turcksin, L. (2010) The Multi-Actor Multi-Criteria Analysis (MAMCA) application in the Flemish long-term decision making process on mobility and logistics, *Transport Policy* (doi:10.1016/j.tranpol.2010.02.004).
- NSW Department of Local Government (2009) *Planning a Sustainable Future: Planning and Reporting Guidelines for local government in NSW*. [www.dlg.nsw.gov.au](http://www.dlg.nsw.gov.au)

- NSW Government (2005) *Metropolitan Strategy City of Cities: A Plan for Sydney's Future*, December 2005 [www.metrostrategy.nsw.gov.au](http://www.metrostrategy.nsw.gov.au)
- NSW Government (2006) *State Plan: A New Direction for NSW*, NSW Government, November 2006. <http://more.nsw.gov.au/StatePlan2006%20>
- NSW Government (2010) *NSW State Plan 2010*.  
[http://more.nsw.gov.au/sites/default/files/pdfs/stateplan/09NSW\\_State\\_Plan\\_Final.pdf](http://more.nsw.gov.au/sites/default/files/pdfs/stateplan/09NSW_State_Plan_Final.pdf)
- NSW Government (2010) *Metropolitan Strategy Review: Sydney Towards 2036*, March 2010.
- NSW Government (2010) *Metropolitan Transport Plan: Connecting the City of Cities*, February 2010.
- NSW Ministry of Transport (2006) *Service Planning Guidelines for Sydney Contract Regions*, June 2006. [www.transport.nsw.gov.au](http://www.transport.nsw.gov.au)
- NSW Treasury (2010) *Budget Paper No. 3 – 2010-11 Budget Estimates*.  
[www.treasury.nsw.gov.au](http://www.treasury.nsw.gov.au)
- Saunders, P. (2004) *Towards a Credible Poverty Framework: From Income Poverty to Deprivation*, Social Policy Research Centre Discussion Paper No. 131, UNSW.
- Social Inclusion Unit (2010) *A Stronger, Fairer Australia* (National Statement on Social Inclusion) – Summary brochure, January 2010, Social Inclusion Unit, Department of Premier and Cabinet, Canberra. [www.socialinclusion.gov.au](http://www.socialinclusion.gov.au)
- Solomon, J. and Titheridge, H. (2009) Setting accessibility standards for social inclusion: some obstacles. In *41<sup>st</sup> Annual UTSG (Universities' Transport Study Group) Conference 2009*, 5-7 January 2009, UCL Centre for Transport Studies, London UK.
- Stanley, J. and Barrett, S. (2010) *Moving People – Solutions for a Growing Australia*. Report for Australasian Railway Association, Bus Industry Confederation and UITP.
- Titheridge, H., Achuthan, A., Mackett, R. and Solomon, J. (2009) Assessing the extent of transport social exclusion among the elderly, *Journal of Transport and Land Use* 2 (2), 31-48.
- Transport Data Centre (2006) *TransFigures: Statistics for Subregional Planning Process*, June 2006, Transport Data Centre, Sydney.
- Transportation Research Board (2004) *Effective Methods for Environmental Justice Assessment*, NCHRP Report 532.
- UK Department for Transport (2005a) *Accessibility Planning Guidelines: Full Guidance*, DfT, London. [www.dft.gov.au](http://www.dft.gov.au)
- UK Department for Transport (2005b) *Technical Guidance on Accessibility Planning in Local Transport Plans*, DfT, London.  
<http://www.dft.gov.uk/pgr/regional/ltp/accessibility/guidance/gap/nicalguidanceonaccessibi3641.pdf>
- UK Department for Transport (2009) *Core Accessibility Indicators Guidance*, DfT, London.  
<http://www.dft.gov.uk/adobe/pdf/162469/221412/221692/474257/guidance.pdf>
- Western Sydney Community Forum (2009) *Connecting with Buses: Reducing transport disadvantage by supporting bus services in Western Sydney*, WSCF Position Paper, August 2009. [www.wscf.org.au](http://www.wscf.org.au)
- Zografos, K.G., Androutsopoulos, K.N. and Sihvola, T. (2008) A methodological approach for developing and assessing business models for flexible transport systems, *Transportation* 35, 777-795.