

# **Transport Disadvantage and Social Status: A review of literature and methods**

**Jago Dodson, Brendan Gleeson and Neil Sipe**



**Urban Policy Program**

**Research Monograph 5  
December 2004**

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# **Summary of the Research Monograph**

## **Background to the research**

This Research Monograph reports on the preliminary investigations of a pilot project that examines the relationship between social status and transport disadvantage. The project is being undertaken by the Urban Policy Program in partnership with the Gold Coast City Council and is funded through a Griffith University Industry Collaboration Scheme grant. The pilot project is the first stage in a broader research program that is intended to seek Australian Research Council funding for a more substantial investigation into the problems and issues surveyed herein.

## **Scope of the research**

This Research Monograph comprises the first part of the pilot project. The purpose is to review the literature relating to how social status is patterned and organized spatially within cities and to examine the links that have been identified between social status and transport disadvantage. While the primary focus is to review the literature, further concerns relate to assessing the methodological issues and problems relating to research on transport disadvantage, as well as identifying potential directions for future advancement of research into the issue.

## **Outcomes of the report**

The Research Monograph reviewed the literature pertaining to research into social status and transport disadvantage. Issues and findings include:

- Urban socio-spatial change in recent decades has been marked by increasing polarisation and differentiation of individuals and households.
- Transport systems play a role in mediating socio-spatial disadvantage through providing access to economic opportunities and social and community services.
- Urban structure can potentially play a role in determining access to employment and services and the availability of transport.
- Few empirical studies have investigated the connections between social status and transport disadvantage, however social exclusion has been linked to inadequate transport services.
- The cost burden of transportation on disadvantaged households has received little research attention.

- Methodologies for investigating transport disadvantage require further consideration to ensure they are appropriate to the research questions and the empirical material.
- Substantial research questions remain as yet unanswered by the literature on the relationship between social status and transport disadvantage.

# Table of Contents

<b>Summary of the Research Monograph .....</b>	<b>iii</b>
<i>Background to the research .....</i>	<i>iii</i>
<i>Scope of the research .....</i>	<i>iii</i>
<i>Outcomes of the report.....</i>	<i>iii</i>
<b>Table of Figures .....</b>	<b>vi</b>
<b>1 - Introduction .....</b>	<b>1</b>
<i>Context for the research.....</i>	<i>1</i>
<i>The structure of this Research Monograph.....</i>	<i>1</i>
<b>2 - Urban socio-spatial change .....</b>	<b>4</b>
<i>Global urban structural change .....</i>	<i>4</i>
<i>Divided cities .....</i>	<i>4</i>
<i>Socio-spatial polarisation .....</i>	<i>5</i>
<i>Dividing Australia's cities.....</i>	<i>6</i>
<i>Polarisation through housing markets.....</i>	<i>7</i>
<i>Social exclusion.....</i>	<i>7</i>
<b>3 - Transport and socio-spatial disadvantage.....</b>	<b>9</b>
<i>Transport and disadvantage internationally.....</i>	<i>9</i>
<i>Social exclusion and transport.....</i>	<i>9</i>
<i>Transport disadvantage and urban location.....</i>	<i>10</i>
<i>Splintered infrastructure .....</i>	<i>11</i>
<b>4 - Urban structure and urban transport.....</b>	<b>13</b>
<i>Spatial mismatch .....</i>	<i>13</i>
<i>Responses to exclusionary spatial structure.....</i>	<i>14</i>
<b>5 - Australian transport disadvantage.....</b>	<b>16</b>
<i>Transport equity .....</i>	<i>16</i>
<i>Social status, location and disadvantage and transport.....</i>	<i>17</i>
<i>Locational disadvantage and transport.....</i>	<i>18</i>
<i>Transit rich – transit poor .....</i>	<i>21</i>
<b>6 - Social categories and disadvantage .....</b>	<b>24</b>
<i>Gender and transport disadvantage.....</i>	<i>24</i>
<i>'Other' social groups and transport disadvantage.....</i>	<i>25</i>
<b>7 – Concepts related to transport and social status.....</b>	<b>27</b>
<b>8 – Methods for social status and transport research.....</b>	<b>29</b>
<i>Methods in transport research .....</i>	<i>29</i>
<i>Modelling .....</i>	<i>30</i>
<i>GIS analysis .....</i>	<i>32</i>
<i>Statistical analysis.....</i>	<i>34</i>
<i>Qualitative analysis .....</i>	<i>35</i>
<i>Methodological conclusions .....</i>	<i>37</i>
<b>9 – Re-conceptualising social status and transport.....</b>	<b>40</b>
<i>Underlying conceptualisation .....</i>	<i>41</i>
<i>Potential journeys.....</i>	<i>41</i>
<b>10 – Further research questions to be pursued.....</b>	<b>44</b>
<i>Drivers of socio-spatial differentiation .....</i>	<i>44</i>
<i>Assessing the transport system .....</i>	<i>44</i>
<i>Urban location of activities and services.....</i>	<i>45</i>

<i>Potentially disadvantaged groups .....</i>	<i>45</i>
<i>The financial burden of transport .....</i>	<i>46</i>
<i>Jurisdictional comparisons .....</i>	<i>46</i>
<i>Institutional constraints .....</i>	<i>46</i>
<b>11 - Moving forward on social status and transport disadvantage .....</b>	<b>48</b>
<i>The urban socio-spatial context .....</i>	<i>48</i>
<i>Transport can contribute to social exclusion .....</i>	<i>49</i>
<i>Urban structure can determine opportunity and transport disadvantage .....</i>	<i>49</i>
<i>Methods are a key issue .....</i>	<i>50</i>
<i>Numerous questions remain unanswered .....</i>	<i>50</i>
<b>References .....</b>	<b>51</b>

## Table of Figures

<b>Figure 1 – Murray et al's (1998) map of access to 'suitable' transport coverage in South East Queensland region using a 400m proximity measure. ....</b>	<b>33</b>
<b>Figure 2: Disciplinary divisions in transport disadvantage research. ....</b>	<b>40</b>



# **1 - Introduction**

## **Context for the research**

There is a substantial scholarly literature concerning patterns and dynamics of socio-economic disadvantage and advantage within cities. The processes of urban economic and social change that impact upon lower socio-economic status groups have been the focus of much research and analysis. A large proportion of this urban research has examined the role of housing markets, labour markets and government policy on the outcomes for lower social status groups. Typically such research considers dimensions of housing or labour market disadvantage and the spatial distribution of these phenomenon across urban space.

One aspect of the interaction of socio-economic status and opportunity with urban systems that has not been comprehensively addressed through research is that of transportation. The extent to which different social groups are able to negotiate urban space to access goods, services and socio-economic opportunities remains underdeveloped as a research consideration. The provision of transport services, and the capacity of different social groups to access such services, has so far received limited attention from scholars. The present review demonstrates however, that there is a growing, if uneven, field of research which links concerns with housing markets, labour markets, socio-economic opportunities and government policies to issues of transportation and urban accessibility.

This paper reviews the scholarly literature that examines how researchers, scholars and policy makers have conceptualised the links between urban socio-economic processes, social status, transport need and mobility. The paper frames the review in terms of the broader context of socio-spatial restructuring of cities. Having reviewed this literature, the paper has further aims of identifying existing ways of conceptualising and assessing social status in relation to transport and proposing potential methodological approaches that could enable further insights into the links between transport and social status to be developed.

## **The structure of this Research Monograph**

The paper is structured into ten chapters which are broadly organised into two parts. The first five chapters examine the relationship between urban social status and aspects of urban form and structure, while the latter six chapters concentrate on methodological issues relating to the investigation of transport and disadvantage.

Chapter Two identifies the main patterns of urban socio-spatial change both in Australian and in overseas cities during recent decades. The chapter notes the

growth in social polarisation and the spatial segregation of various socio-economic groups as key dimensions of recent urban change. Social exclusion is identified as a further important aspect of urban socio-economic disadvantage, that often has a strong transport dimension.

Chapter Three focuses more closely on the specific relationship between urban socio-spatial disadvantage and transport. The notion of transport disadvantage is surveyed, in relation to social exclusionary processes and urban location. The unbundling of urban infrastructure is also noted as a factor behind these problems.

Chapter Four focuses specifically on the effect of urban structure on patterns of socio-economic disadvantage and opportunity. In particular the notion of 'spatial mismatch' whereby housing affordability and employment opportunity are spatially distanced is reviewed as an important dimension of exclusionary urban form. Transport plays an important role in the mediation of exclusionary urban structure.

Chapter Five considers transport disadvantage in the Australian context. Issues of equity in access to transport services are reviewed. The chapter focuses on locational issues in terms of access to transport and services, while more recent research on the spatial availability of public transport is highlighted.

Chapter Six reviews the way social categories have been used in research on transport disadvantage as potential indicators of disadvantage.

Chapter Seven briefly identifies key concepts in the study of social status and transport disadvantage.

Chapter Eight reviews the main methodological approaches to investigations of transport disadvantage and access. The main approaches covered include mathematical modelling, GIS analysis, statistical comparisons and qualitative or phenomenological methods. The chapter identifies a need for the development of multi-dimensional methods in transport disadvantage research that combine elements of these methodological approaches.

Chapter Nine presents a basic critique of existing ways of conceptualising transport and urban travel. The chapter identifies a potential set of ways of further developing transport disadvantage research to better account for current problems.

Chapter Ten identifies a set of key research questions that deserve further attention from urban scholars. These range from comprehending the transport impacts and effects of ongoing socio-spatial change, to understanding the financial burden of alternative travel modes, and appreciating the institutional constraints which impact on attempts to overcome transport disadvantage.

Chapter Eleven concludes the paper, noting that there is substantial conceptual and empirical work yet to be done to further develop the understanding of the links between transport disadvantage and social status in the context of rapidly changing urban patterns. The chapter notes that social exclusion, urban structure and research methods all require further assessment as to their impacts on exclusionary transport systems.

## **2 - Urban socio-spatial change**

### **Global urban structural change**

To understand the relationship between social status and urban spatial structure, it is necessary to review the social scientific literature that has drawn attention to such relationships. Given the issue of urban socio-spatial disadvantage has been reported in substantial detail by other scholars, the focus in the present discussion will be on the general patterns that have been reported and the particular relevance of these patterns for the present study.

Since the late-1970s, urban regions, both within Australia and within other Western nations have experienced major changes to their socio-spatial structures. These changes have, in large part, been driven by the economic changes associated with the most recent broad phase in the restructuring of global capitalist production, which is generally referred to as 'globalisation' (Fagan and Webber 1999). Within many western cities, this restructuring process has resulted in greater spatial socio-economic differentiation.

The effects of ongoing globalisation have been particularly prominent in labour markets, both internationally (Sassen 1988; Reich 1991; Standing 1999), and in Australia (Freestone and Murphy 1998; Brain 1999; O'Connor and Healy 2002). Sassen (1991) in particular reported the spatial dimensions of this differentiation, in global cities, with high-value informational 'producer services' employment concentrated in the 'global core' of cities, while routine production work is located on the urban fringe. Noting these restructuring processes in Melbourne, and their interaction with housing markets, O'Connor and Healy (2002) observed that:

'In many respects, the Core is job and skill rich, housing-expensive and an increasingly exclusive region. Indeed, a major contradiction within contemporary metropolitan Melbourne is the existence of an economically significant region that is becoming increasingly inaccessible as a place of residence.'

Location within the metropolitan urban structure, it seems, has become a key determinant of households' and individuals' access to employment and other opportunities. Conversely, the impact of the effects of exclusion from such access on households and individuals remains a major concern of researchers and policy makers.

### **Divided cities**

The differentiation of social status, and accordingly, opportunity across urban space has become a major feature of recent urban inquiry. O'Connor and Healy's observation of the labour market and housing divisions that have opened

up in one of Australia's major globally integrated cities, reflects similar reports for other metropolitan areas. Such shifts have received much conceptual and empirical attention from urban researchers, and there has been a particular emphasis on the concept of the spatially 'divided city' (Fainstein *et al.* 1992; van Kempen and Marcuse 1997; O'Connor *et al.* 2001). Divided cities display high degrees of spatial differentiation between different socio-economic groups, with these distinctions readily observable in urban housing and labour market patterns.

The related phenomenon of gentrification has been a key dimension in the re-shaping of urban areas under the processes described above. Gentrification involves the movement of high-income and high labour market status populations to previously declining inner urban locations, resulting in housing market price shifts displacing the existing less advantaged residents (Smith 1996). Such housing market shifts have been prominent features of socio-spatial change in cities in recent decades (Logan 1985; Zukin 1988), particularly in those cities where the middle class has demonstrated a willingness to return to the inner city, as has been the case in many European and Australian cities.

The corollary of the movement of gentrifying groups to the inner city has been the removal of the displaced lower socio-economic status and disadvantaged inner-city populations to outer urban locations (Freestone and Murphy 1998). This socio-spatial restructuring of Australian urban geographies has transport implications, particularly in terms of social equity, as it is the outer suburbs of Australian cities, most of which were developed during the post-WWII shift to automobile-based urban planning, which have the most inadequate public transport services (Burnley *et al.* 1997)

### **Socio-spatial polarisation**

The effects of divided cities and gentrification as urban spatial and structural processes has been of substantial interest to scholars both internationally and in Australia, with the least affluent end of the socio-economic spectrum receiving much attention. While urban poverty is not a new phenomenon, a number of authors have asserted that the forms of recent economic restructuring accompanying globalisation have produced new forms of spatially related economic and social disadvantage from those previously experienced in urban settings (Sassen 1991). Such divisions have been described variously as social polarisation (Hamnett 1994), social exclusion (Musterd and Ostendorf 1998), spatial segregation (Abramson *et al.* 1995; Andersen 1998; Cheshire *et al.* 2000) or social marginalisation (Jamieson and Jacobs 1996; Wacquant 1999).

Smith for example provides a stark depiction of the polarising social effects of gentrification-driven urban restructuring in New York (Smith 1996), while others, such as Madden (1996; 2003) have taken a more general view of the US

experience, as well as examining the ethnic dimension of such processes (Massey and Denton 1993).

Processes of socio-spatial polarisation have also been discussed in the UK (King 1991; MacLennan and Pryce 1996; Hamnett and Cross 1998; Lyons 2003) and European (Andersen 1998; Wessel 2000) contexts. European researchers have noted that in the European context, the presence of a strong welfare state has prevented many of the extreme forms of socio-spatial polarisation and social exclusion seen in the US, and to some extent the UK (Andersen 1998; Hamnett and Cross 1998; Wessel 2000).

### **Dividing Australia's cities**

The processes of socio-spatial polarisation and marginalisation described above have been well charted in the Australian context during the past decade. Murphy and Watson (1994; 1995) for example noted the development of the urban core-fringe socio-economic divide in Australia, with areas of least labour market opportunity located in outer urban areas. Of relevance to the present review, Murphy and Watson also observed that Australian outer suburban residents often faced long commutes to access employment, when compared with for example those living in the outer suburbs of US cities (Murphy and Watson 1994).

McDonald (1995) and McDonald and Matches (1995) noted that in Australian cities, the most socio-economically disadvantaged areas were concentrated around older industrial districts, with these localities also exhibiting, for example, higher rates of unemployment, housing and income disadvantage, and lower rates of labour force participation relative to broader metropolitan areas.

More recent research by Baum *et al* (1999) demonstrated the strong extent of socio-spatial segregation in Australian cities. Again, the core-fringe divide was found to be strong, but Baum *et al* were also able to identify 9 distinct categories of socio-economic spatial concentration within Australian cities. These categories captured a mix of socio-economic conditions, relating to the location of opportunity within Australian urban space, and the potential capacity of local communities to access that opportunity. Baum *et al*'s categories ranged from 'global economy/high opportunity' locations near the centre of cities such as Sydney and Melbourne, to the 'extremely vulnerable old manufacturing economy' localities, such as Sunshine in Melbourne, and Elizabeth in Adelaide. Stimson and Taylor (1999) noted increasing social polarisation in the Brisbane region, during the 1990s, such that households receiving government statutory income payments were becoming concentrated along growth corridors and outer suburban areas.

## **Polarisation through housing markets**

In Australia, as overseas, housing markets have been identified by researchers as contributing to social polarisation and social exclusion (Winter and Stone 1998; Wulff and Evans 1999; Cheshire *et al.* 2000; Wulff and Reynolds 2000; Yates 2002). Wulff and Evans' research on Melbourne showed that the housing market was entrenching the effects of socio-spatial segregation, with, for example, households receiving Commonwealth Rent Assistance concentrated either in inner-city suburbs replete with public housing, or in declining outer-suburban industrial areas, such as Sunshine or Dandenong. Similar spatially exclusionary patterns arising from housing market processes were also found for Melbourne by Burke and Hayward's (2000) report prepared as part of Melbourne's new metropolitan planning strategy. Burke and Hayward revealed that the limited housing affordability experienced by low-income households was excluding this group from inner areas, forcing them to cheaper outer-urban locations (2000).

Dodson and Berry's (2003) and Gwyther's (2002) recent research on new outer suburban housing estates in Melbourne and Sydney respectively, suggests that a new differentiating process is occurring in Australian urban spatial socio-economic patterns. Dodson and Berry (2003) examine new high-value residential developments on the urban fringe beyond older disadvantaged areas, and which are being occupied by relatively high labour market status households. As distinct spaces of prosperity such new estates are thus altering the simple core-fringe wealth divide, and are contributing to the more variegated socio-spatial patterns reported, for example, by Gleeson and Randolph (2001) in Sydney.

## **Social exclusion**

As changing socio-economic urban spatial patterns described above became increasingly prominent during the 1990s, policy makers in Australia and overseas began to dedicate greater attention to the broader social, economic and policy consequences of these sharpened distinctions. This attention has resulted in research focussing on policy programs being developed to address the 'social exclusion' of those at the lowest socio-economic level, and who are therefore most vulnerable to such spatial restructuring processes.

Social exclusion refers broadly to a condition in which socio-economic circumstances prevent individuals or households from accessing employment, adequate housing, and other social and community services. The concept of social exclusion differs therefore from social polarisation or differentiation, and identifies the effects of socio-spatial segregation on those at the lower end of the wealth spectrum, particularly relative to housing markets, labour markets and the provision of and access to public services.

The concept of social exclusion appeared in European social science discourse in the 1980s, and in the UK during the 1990s, as an alternative to the stigmatised notions of poverty and deprivation (Peace 2001). The causes of social exclusion identified by the UK government include those identified above in relation to urban structural and socio-spatial change, such as changing labour markets and the polarisation and fragmentation of communities (Social Exclusion Unit 2001). Addressing socio-spatial problems under the rubric of social exclusion has formed the basis for much of the urban renewal and housing programmes of the UK Blair Labour Government from 1997 onwards. Thus in the UK the concept underpins a range of government policies which have been put in place to address social exclusion, including, for example, the 'New Deal for Communities' which focuses on employment capabilities, crime levels, inadequate education, health, housing and neighbourhood environment, educational under-achievement, poor health; and problems with housing and the physical environment (Office of the Deputy Prime Minister 2003).

Social exclusion has not become as focal a term in Australasian policy discourse as it has in the UK and European context. The Australian Federal Government, for example, has no specific set of policies or programs for which social exclusion provides an underlying conceptual foundation. While social exclusion appears occasionally in the policy statements of the New Zealand Government, it does not form the basis for any significant policy directions there. This lack of an Australasian policy focus on social exclusion as a basis for social and welfare policy is, at least in part, due to the general lack of urban localities where deprivation and disadvantage is not as extreme as occurs in some areas of, for example, the UK.

Importantly, the concerns about social exclusion, and particularly the focus on the spatial dimensions of exclusion in relation to households and individuals access to services, generated interest in the importance of transport as a service that can enhance or impede the exclusionary processes and patterns of urban structures. The following section reviews literature which has addressed the links between transport and social exclusion.



### **3 - Transport and socio-spatial disadvantage**

#### **Transport and disadvantage internationally**

Transport has historically been unevenly accounted for in discussions of urban social disadvantage in the UK, European and Australasian context, particularly relative to other dimensions of disadvantage such as housing quality, location and affordability, and labour market status. This omission is not the case in the US (see below), although US research has typically focussed more on spatial structure than the phenomenological dimensions of social exclusionary processes.

The inadequate treatment of the transport dimension to social exclusion research in UK, European and Australasian context is unfortunate, given what is known about the ways in which housing and labour markets can often operate to concentrate those at the lower end of the socio-economic spectrum in locations and areas where access to employment and services are poor. Significant policy redress to the problem has been provided in recent years in the UK, although not yet in the Australian context.

#### **Social exclusion and transport**

During the late-1990s, following the election of the UK Labour Government, the links between social exclusion and transport have received much greater scrutiny than had previously been the case in the UK (Church *et al.* 2000; Power 2001). The UK Government's White Paper on Transport (1998), for example, stated that transport was a key component of policies for boosting economic growth, employment and combating social exclusion. A subsequent study conducted by the UK Department of Transport Local Government and the Regions (DTLR 2000) concluded that:

Households without a car, in a society in which household car ownership is the norm (peri-urban and rural areas), are 'socially excluded' within our definition of the term, since they cannot fully participate i.e. behave as the vast majority of society behaves. (p.76)

This study recommended that local authorities undertake a comprehensive survey and planning process to ensure that the needs of socially excluded people were being either met or ameliorated. They also made recommendations that addressed issues of improving service coordination, fares and ticketing, physical accessibility of public transport services.

Further indepth UK Government research, conducted this time through the Social Exclusion Unit (SEU) (2002; 2003) has continued to highlight the importance of transport in enabling individuals and households to access social and economic

opportunities. The SEU interim (2002) report on transport and social exclusion argued that inadequate transport was undermining government objectives in other policy areas, such as employment, education, welfare and health, thus incurring additional costs on the state. This report included substantial empirical evidence to support these contentions. For example the SEU (2002) quoted research which found that 38 per cent of jobseekers cited transport as a barrier to finding work (p.4), 65 per cent of lower quintile households did not own a car (p.18), such that 58 per cent of their trips are on foot compared to 30 per cent for low income households with cars, and 17 per cent for high-income households with cars (p.19).

The subsequent final version of the SEU report (SEU 2003) advocated for an 'accessibility planning' model whereby local governments would be required to identify areas poorly serviced by public transport, and to set in place measures to address these problems. The report also contained budget recommendations for upgrading public transport in disadvantaged areas as part of the government's 10 year plan for transport, but also noted wryly that the majority of passenger transport funding under this plan would go to modes used primarily by middle- and high-income earners (SEU 2003). It is too early to assess the outcomes from the transport plan for socially excluded individuals and households.

### **Transport disadvantage and urban location**

Similar attention has been directed towards social exclusion and transport in Scotland (Gaffron *et al.* 2001; Hine and Mitchell 2003). Hine and Mitchell's (2003) research is particularly pertinent to the present review. Hine and Mitchell examined the extent of transport disadvantage across three different types of urban form in Scotland – the central city, a peripheral housing estate, and a freestanding town – through a survey of 200 persons in each locality, and involving indepth interviews with selected residents. They also undertook semi-structured interviews with local planning and transport policy makers.

The Hine and Mitchell study produced a number of findings, in particular, for example, that women were more transport disadvantaged than men, rental households suffered greater disadvantage than owner-occupiers/purchasers, and that lower income groups paid more for their public transport, in terms of their income, and had longer travel times to access the same services (p.78). The authors argued that better targeted subsidies, greater coordination, and new services needed to be provided for public transport, and that improvements to cycling and pedestrian infrastructure were required to address transport-related social exclusion.

Interestingly, as well as highlighting the adverse social outcomes experienced by individuals and households this report noted the adverse environmental effects of road-based transport policies on communities and neighbourhoods (recalling Jacobs' (1961) and Goodman's (1972) classic texts), through increased

pedestrian death rates, high pollution levels, and isolation due to busy roads (SEU 2002). While these environmental health factors are not directly related to the purposes of the present study, it is worth noting that transport disadvantage may take forms other than simple service or access issues.

Less conventional suggestions to addressing the transport dimensions of social exclusion have been put forwarded by Hodgson and Turner (2003) who argue for community management of the transport system. Meanwhile Kenyon *et al.* (Kenyon *et al.* 2002) have suggested that 'virtual mobility' could play a role in solving this problem. It remains difficult to imagine how low-income households might be able to afford the requisite information technology to enable such virtual mobility, nor is does it appear feasible that the deficits in local availability of essential services such as shops, hospitals and educational facilities could be satisfactorily overcome through an IT-based approach.

### **Splintered infrastructure**

A broader perspective on the exclusionary dimensions of urban transport planning has been provided by Graham and Marvin (2001) in their study of the relationship between fragmenting societies and 'splintering' urban infrastructures. This perspective is worth noting as providing a broader contexts for the conceptualisation of the relationship between social status and transport disadvantage. Graham and Marvin, echoing the concerns of advocacy planners in the 1960s (Goodman 1972), view transport infrastructure as a technology of social differentiation, which is able to divide populations, communities and cities, by both the physical spatial divisions created by, for example, freeways, while simultaneously entrenching social divisions by creating differential access to high quality transport infrastructure. Thus private tollways can potentially physically divide communities, who are often already disadvantaged. And pricing, regulations and restrictions upon who can access and use such infrastructure often in turn prevents the disadvantaged from using such infrastructure for their transport needs.

While the large magnitude of these problems of splintered infrastructure is a new phenomenon, the problems themselves are not. Badcock (1984) for example provides a compelling depiction of the way in which economically weaker households are subjected to processes of residential locational assignation which can reduce their access to various forms of infrastructure and public services. Access to infrastructure, Badcock (1984) argues, is a key dimension of inequality in urban land and housing markets.

The phenomenon noted by Graham and Marvin can be observed in the study undertaken by Johnson and Herath (2004) who note that residents of the disadvantaged suburb of Goodna in Brisbane are not only spatially divided from other communities and economic, social and community services by a major

regional freeway, while their access to that freeway and to the local rail station is also constrained by the physical environment.

## **4 - Urban structure and urban transport**

### **Spatial mismatch**

The UK and Australian research and policy responses cited in the previous sections of this review have only partly touched on the role of urban structure in the distribution of urban socio-economic opportunity. In the US however, there has been a long record of detailed urban scholarship in which urban structure is viewed as a determining factor in the distribution of urban advantage and opportunity, and in which transportation is viewed as primary element.

Among the earliest analyses of urban structure and disadvantageous transportation systems was the spatial mismatch research undertaken by Kain (1968), following the Watts Riots in Los Angeles in the mid-1960s. The inquiry arising from those riots had noted the links between urban structure and the transportation system as a major factor contributing to the concentration of socio-spatial (and racial) disadvantage in South Central Los Angeles (Black 1995). Kain's (1968) research demonstrated that inner-urban residents, particularly non-whites, were at a substantial socio-economic disadvantage in terms of local employment opportunities, relative to suburban residents, and in particular white suburbanites.

The spatial structure of most US cities gives rise to particular problems relating to particular labour market and housing interactions which have a strong transport dimension, and which are worth noting in this context. Unlike most European, Canadian and Australasian cities, US cities typically contain a disadvantaged core region – with low quality housing stock, and limited employment opportunity - surrounded by more affluent middle and outer suburbs. Combined with these housing and labour market pattern are ethno-spatial arrangements that reflecting the strong racial divisions in US society. Such divisions have resulted in concentrations of disadvantaged minority groups in the inner areas of many US cities.

As suburban development has decentralised (often re-centring around freeway nodes (Garreau 1991)) in US cities, so too has employment. The result of these patterns has been that inner city residents tend to face more complex job search processes and subsequent longer commutes once in employment, than do residents of the middle and outer suburbs. Spatial structure therefore, is viewed by many scholars as reinforcing ethno-social disadvantage for individuals and households located within inner city locations (Galster and Killen 1995). Such a phenomenon is has been referred to as 'spatial mismatch' and has been the subject of much research in recent years (Holzer 1991; Taylor and Ong 1995; Ihlanfeldt and Sjoquist 1998; Wachs and Taylor 1998; Sanchez 1999; Brueckner and Zenou 2003).

As with spatial mismatch, the classic US case of an automobile dependent city resulting from a dispersed urban form and investment in freeways over public transport means that those individuals or groups who are unable to drive or afford automobiles are at a major mobility disadvantage relative to those able to drive or afford automobile ownership (Black 1995). This mobility disadvantage in turn impinges on the employment opportunities of such groups, and can impinge upon government's social welfare objectives (Hughes 1995). Thus, for example, if welfare recipients are forced by housing market processes (pricing and discrimination) to locate in disadvantaged inner city areas, they can then face fewer employment opportunities than similar groups in the suburbs. And if they are unable to afford car ownership, or if public transport is inadequate, then government's objectives, such as encouraging higher employment rates among such households are likely to be confounded by both the socio-spatial urban structure and the geographic and temporal provision of public transport services (see also SEU 2003).

### **Responses to exclusionary spatial structure**

In the US, the prominence in popular and policy imagination of inner-city socio-economic disadvantage has prompted efforts to reduce the extent and prevalence of this problem. Hughes (1995) identifies three basic policy approaches available to address spatial mismatch: dispersal of inner city residents to suburban locations, the recentralisation of development, and efforts to improve intra-urban mobility for inner-city residents. Hughes (1995) argues for adoption of the third approach, as this affords more immediate policy responses, and is less dependent on political contestation over relocation or recentralisation.

The response of the US government to these welfare issues is often couched in rhetoric of emphasising 'welfare-to-work'. And the policy response to the patterns of urban spatial structure described above, has been to follow the third strategy through greater attention to public transport schemes, and via such policies as the 'Job Access and Reverse Commute Program' (Harbaugh and Smith 1998; Federal Transit Administration 2003; Department of Transportation (DOT) n.d.). This policy provides for the Federal Government to meet 50 per cent of the costs of providing a new transport service that will enable the 'reverse commuting' of inner-city labour to suburban locations<sup>1</sup>.

The welfare-to-work commuting policy is not without its critics, however. Wachs and Taylor (1998), for example, have argued that policy makers should focus on ensuring jobs locate in disadvantaged areas (c.f. Hughes (1995) above), rather than attempting to ferry workers to employment zones. Wachs and Taylor (1998)

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<sup>1</sup> These transport dimensions of welfare-to-work policies are the subject of substantial controversy. The 2003 Academy Award winning movie 'Bowling for Columbine' depicted the case of a young mother who was required by Welfare-to-work policies to endure a 128 km return bus journey to work each day, resulting in greatly diminished capacity to discharge her domestic and childcare responsibilities, with tragic consequences.

also lament the lack of schemes to assist low-income groups into automobile ownership, as well as the tendency for improvements to public transit to favour middle class residential areas and work trips to inner city white-collar employment zones, which does little to assist unskilled inner city residents seeking suburban service work. Such problems of 'middle class capture' of access to high quality public transport systems appears to be a common phenomenon across US, Australian and UK metropolitan areas.

The Federal Department of Transport in the US has claimed some success with welfare-to-work transport policies that focus on local neighbourhood transport planning processes (Laube *et al.* 1997). For example, in Hartford, Connecticut, an origin-destination and spatial analysis of low-income households and job opportunities was carried out as the basis of planning new transit routes. In St Louis, Missouri, an economic growth analysis was conducted followed by a review of transport services to ensure these areas were sufficiently accessible by transit (Laube *et al.* 1997). Laube *et al.* (1997, p.6) concluded that metropolitan planning can address job access problems and that bus and rail networks can be modified to meet the majority of job-access needs but that planning for employment access requires a collaborative approach among relevant agencies with transit agencies playing a critical role;.

The relevance of the US spatial mismatch phenomena to the Australian context has been recently tested in Melbourne by Dodson (2004). Dodson found that in contrast to the classic US case, the most socio-economically disadvantaged areas in Melbourne are located in outer suburban locations, with the result that as suburban expansion occurs, the number of available outer-urban job opportunities appears to be increasing, thus reducing any spatial mismatch. Dodson (2004) however noted that the transport service quality and employment skill dimensions of the phenomenon remain unexplored, such that transport may play a role in impeding employment accessibility for residents of disadvantaged areas while residents of these areas may not possess the skills or qualifications to enable them to gain employment in these employment growth areas.

The changing nature of employment also potentially impacts upon lower labour market status households through their greater reliance on casual, part time or after-hours shift employment. Journeys to such work are typically poorly catered for by public transport when compared to conventional '9 to 5' work, particularly that following a radial route relative to the urban structure. Such issues have not been addressed in Australian urban scholarship.

## 5 - Australian transport disadvantage

### Transport equity

As in other jurisdictions, the links between social status and transport disadvantage have received limited attention from scholars and policy makers. While the issue has been noted by urban scholars for some time, the extent of engagement with the problem has been uneven and often noted as an adjunct to wider research concerns. The discussion within this section notes studies that have considered the issue of social status and disadvantage in transport terms.

Morris and Wigan (1979) and Morris (1981) are among the earliest Australian authors to investigate social equity concerns through transport research. Morris examined the extent to which Australia's urban public transport systems provided socially equitable levels of service to groups likely to suffer both social (the poor; young people) and mobility (the disabled; the elderly) disadvantage due to inadequate transport provision. Morris (1981) mapped Melbourne's urban public transport system, demonstrating that in many areas of the city public transport was unavailable or of poor quality.

In their study of transport expenditure among Australia's capital city household, Morris and Wigan (1979) found that on average, 17.68 per cent of household income was spent on transport costs. Morris and Wigan also found that an income effect was present for transport expenditure: lower income households tended to spend a smaller proportion of their income on transport than middle or high income households. Thus for example, households with income under \$80 per week in 1974-5 spent 10.1 per cent of their income on transport costs, while those with incomes in the \$140-200 and \$260-340 ranges spent 15.1 per cent and 16.8 per cent respectively. Morris and Wigan noted that for low-income households food and housing receive initial expenditure, while transport was treated more akin to a 'luxury' good, with greater demand elasticity relative to income. This observation appears to be borne out by current data, whereby the higher income groups spend a greater proportion of their income on transport. Gilmour (1978, p. 38) also briefly considered the effects of Australia's car dependent urban systems, noting, for example, the 'severe' financial difficulty endured by the 40 per cent of Australian households whose incomes were less than \$4000 per year.

There is no recent research in Australia that has investigated the links between household social status, urban location, and access to employment or services, relative to the costs of transport. This void in the literature is perplexing, in light of the noted dispersed urban form of Australian cities, and the high levels of dependence on private motor vehicles for urban access and mobility (Newman and Kenworthy 1999; Mees 2000).



## **Social status, location and disadvantage and transport**

During the 1980s and 1990s in Australia, scholars began to recognise the importance of urban location as a determining factor in household status and opportunity. This concern was driven in part by the recognition of the continuing process of outward expansion of Australian urban areas, combined with a heightened interest in suburban access to services arising from the Whitlam Federal government agenda of the 1970s (see Troy (1981)).

In a comprehensive survey of urban inequality, Badcock (1984) gave some attention to the accessibility and urban movement problems faced by lower-income residents and public housing tenants in outer Sydney in the 1970s. Badcock (1984, pp 233-234) noted that:

[A]mongst those households relegated by a public housing assignment or coaxed there by cheaper land costs, only those with jobs nearby escape the imposition of poor access to work.

Badcock cited Federal Government data that demonstrated that households in outer areas such as Green Valley, Mount Druitt or Penrith incurred work-trip costs up to double the average rate for the metropolitan area, placing these households at a substantial financial disadvantage. It is worth noting that areas such as Mount Druitt have long been regarded as among the most socially disadvantaged urban localities in Australia, and to a large degree remain so (see Peel (2003)).

Badcock also attributed the spatial disadvantage experienced households' adverse residential location as not due to failures of planning and services provision in outer areas, but due to:

...their position in the labour market, which in turn limits where they will be located by the housing market. Poor households that find themselves badly located with respect to supportive community services and transportation are put in that position invariably because of their situation in the labour market.

Outer urban transport disadvantage similar to that described by Badcock was reported in Adelaide by Kendig (1981), and Burnley (1980). In a study of home-ownership market decision making among Adelaide households, Kendig (1981) observed that new residents of outer suburban areas reported that:

The most frequently mentioned disadvantages were lack of access to public transport (19 per cent), long journey-to-work (15 per cent), poor access to shops (8 per cent) and poor access to the city centre (7 per cent)

Kendig's findings were supported by the transport equity conclusions presented in Burnley's (1980) survey of Australian urbanisation. Burnley also considered transport inequality, but primarily in terms of the effects of urban spatial location

on work access. Citing data from the 1971 Sydney Area Transportation Survey, Burnley (1980, p. 240) observed that:

While there was a slight tendency for workers in low income occupations to have shorter journeys to work than others, their costs were not very much less and so absorbed a higher proportion of their expenditure. As a result, work travel was a doubly severe burden in low income outer suburbs.

At the time of writing of this paper, the Australian Senate Community Affairs Committee report on poverty and financial hardship was released. While it was neither a central or systematic focus of the inquiry, the issue of transport was raised a number of times in relation to poverty (Senate Community Affairs Reference Committee 2004). For example the Committee observed:

Poor transport further hinders efforts by low income families to find employment and to engage in educational and social activities. (p.408)

Poor urban planning, public housing policy and transport infrastructure have created pockets of disadvantage in the major capital cities and in some regional areas. Once created, these poor neighbourhoods are a difficult problem to remedy, as they set up vicious circles of low aspirations, low education and low employment. (p. 466)

The fact that similar themes regarding transport disadvantage are still being enunciated in studies of social disadvantage, social exclusion and poverty as were being described over twenty years ago, suggests that problems of transport disadvantage remain in Australian cities. As yet however, a comprehensive study of the problem has not been undertaken.

The research described above demonstrates that there has long been an awareness of the relationship between social disadvantage, location and transport, but that this has typically been underdeveloped. A particular problem is that transport has often been folded into general studies of broader disadvantage (eg Maher *et al* (1992)), rather than being a primary focus of study. Nor has space been considered to a great extent in analyses of transport-related disadvantage. Thus, despite the detail of household income and outlays presented in their expenditure study, Morris and Wigan (1979), gave only passing consideration to residential location, noting the likelihood of outer suburban residents incurring higher transport costs due to relatively poorer accessibility. Such a cursory treatment of space and transport is commonplace in Australian urban literature, except, it seems, when density is the subject of consideration.

## **Locational disadvantage and transport**

Limited attention was given to transport issues in relation to social disadvantage in Australia during the late-1980s. However by the early 1990s, the concerns enunciated by academics and policy makers prompted a set of studies into the spatial problem of urban locational disadvantage in Australian cities. These studies occurred through the Federal Government's Social Justice Research Program into Locational Disadvantage (SJRPLD) - and a vigorous subsequent policy debate (Maher *et al.* 1992; Travers Morgan 1992; Badcock 1994; Beer 1994; Maher 1994).

The Maher *et al* study is highly pertinent to the present discussion. Maher *et al*'s (1992) purpose was to investigate the residential mobility, to determine the extent to which socio-spatial processes operated to disadvantage some groups in terms of the attributes of the locations to which households are attracted or allocated. In their study, however, which formed the basis for much of the recent Australian discussion of locational disadvantage, Maher *et al* (Maher *et al.* 1992) offered the following description of the concept of locational disadvantage:

Locational disadvantage is one element of a more general notion of social disadvantage. It results from an inability to access or to use effectively the whole range of facilities and resources which not only improve well-being but better position households to take advantage of resources available to improve their longer-term life chances.

Maher *et al* (1992) argued that locationally disadvantaged areas are deficient in terms of the facilities and resources necessary to enable a 'satisfactory life' or which require residents to undertake long journeys to access such resources. The transport network, and transport services are among the 'resources' available to households, and thus transport can be seen as a key element of locational disadvantage.

To operationalise the concept of locational disadvantage, Maher *et al* developed an index of local availability of services, and an index of accessibility to external services, using comparative longitudinal data from the 1981 and 1986 censuses. The availability of transport services was only one component in this indexing process, along with more primary variables such as income and employment status. Maher *et al* then mapped these indices for statistical local areas across Australia's capital cities.

Maher *et al* found three categories of locationally disadvantaged areas: inner city locations, older industrial suburbs, and outer urban locations. The latter two categories match those identified by Baum *et al* (1999) as 'vulnerable' to adverse socio-economic change, suggesting continuity of spatial transport disadvantage. Of relevance to the local context of the present review, Maher *et al*'s table of SLAs exhibiting some dimensions of disadvantage includes areas of South East Queensland suffering disadvantage in terms of low income - Albert, Ipswich and Redcliffe - and low proportions of owner-occupied tenure households - Albert,

Caboolture, the inner city, Ipswich, Logan and Redcliffe. Notably however, none of the identified areas registered on Maher *et al*'s transport indicator of having disproportionately low levels of car ownership, suggesting that automobiles are a necessary means of transport for outer-suburban households.

The link between housing and transport-related locational disadvantage also appeared in the Australian Government's National Housing Strategy (1992) which argued:

People without private transport, especially where public transport is not readily available are likely to be disadvantaged. In particular older people, young people and members of a car-owning household who cannot use the car, are more likely to have problems and/or longer travel times to services and jobs. (p.76)

Maher *et al*'s research stimulated considerable debate as to whether household's locational outcomes were the result of their attempts to maximise their residential within the structures of the housing market, relative to their means (Maher 1994). Badcock however questioned Maher's and others' (eg Wulff *et al* (1993)) interpretations of the data, suggesting that insufficiently detailed scaling of the analysis was masking forced residential moves by disadvantaged households to, for example, outer suburban areas with limited social and physical amenity. Unfortunately, a lack of further analysis at a closer and more detail scale has meant that this issue of choice in residential location, relative to transport disadvantage remains unresolved. The argument over the existence and causes of locational disadvantage in Australian cities therefore remains highly pertinent, as the work of Gleeson and Randolph (2001), Gwyther (2002) and Dodson (2004) attests, but the issue has largely disappeared from Federal Government policy concerns. The emergence of concentrations of medium- and high-social status households on the urban fringe in since the mid-1990s has complicated this discussion, given that these areas of new development are situated just beyond the older higher-disadvantage outer suburbs (Gwyther 2002; Dodson and Berry 2003)

Despite ambiguity regarding the existence and causes of Australian locational disadvantage in the early-1990s, solutions to the transport aspects of this socio-spatial inequality were quite clearly stated in the transport specific study conducted by Travers Morgan (1992) for the SJRPLD. Travers Morgan conducted a transport needs analysis for Adelaide's outer localities of Noarlunga and Willunga in Adelaide's south, via local discussions and consultations. Their findings were simple and clear, and their proposed changes included: more public transport services, greater spatial and temporal availability, and wider choice of destinations. Such proposals are identical to policy suggestions for improving metropolitan transport services that have been put forward by transport policy scholars in Australia. These policy suggestions however, despite the positive intentions of the Federal Government at the time, were not followed by any substantial program of public transport improvements in the study areas,

nor elsewhere in Australian cities. In fact the Federal Government retains no current interest in urban public transport infrastructure, policy or finance.

### **Transit rich – transit poor**

One of the best recent examples of empirical research on the spatial dimensions of transport exclusion in Australia is Cheal's (2003) consideration of 'transit-rich' and 'transit-poor' areas of Melbourne. Cheal mapped the areas of Melbourne where high quality public transport services are available, based on 'best-practice' international standards of public transport service. The criteria for an area to be 'transit rich' included minimum service frequencies of 30 minutes, the capacity to travel in more than one direction (i.e. north-south and east-west), 5 am to midnight services and weekend services. These standards are based on Mees' (2000) benchmarking of Melbourne's public transport system against the more efficient and more patronised Toronto system. Based on this standard, Cheal found that 82.5 per cent of Melbourne's population lived outside of 'transit rich' areas (2003. p.32). Cheal then compared the socio-economic characteristics of the populations in the transit-rich and transit-poor areas, and found that transit-poor households tended to be socio-economically worse off on average, when compared to those in the transit-rich areas.

Among Cheal's conclusions were the following observations:

Obviously, those living in transit poor Melbourne without cars are severely restricted in the times and destinations to which they can travel. This means that many people face a curtailment of their ability to participate in a range of activities that other people take for granted. Often they are reliant on the generosity of friends and family for simple and regular trips such as shopping. Where such generosity is not available they must either go without that trip or make the journey by taxi, both potentially costly options in their own ways. (p.54)

The implication of Cheal's research, that those residing outside 'transport rich' Melbourne are socio-economically worse off than those within this area, suggests that transport contributes a significant component to the existing levels of social disadvantage. Given housing is most affordable in the poorer, outer-suburban areas of Melbourne, (Wulff and Reynolds 2000; Dodson 2004), these less advantaged locations are likely to be far outside the 'transit rich' areas.

The direction of causality, if any, remains unclear from Cheal's analysis. Thus it is uncertain whether poorer households prefer automobile dependent suburbs, whether their employment opportunities are dispersed throughout suburban locations rather than centred on the CBD, or whether housing markets operate to exclude lower socio-economic status households from areas where public services are relatively good. Most likely it is a combination of all three processes (see below).

This issue of the inequitable distribution of public transport services, which can relieve the burden of automobile ownership on low income households is reflected in Battellino's (1997, study as reported by Mees (2002)) of mode share in Sydney, Morris *et al*'s (2002) analysis of mode share and car ownership in Melbourne, and Dodson's (2003) review of transport policy in Melbourne. Battellino (1997) demonstrated that in Sydney, the low-income outer urban area of Wyong had both higher household vehicle ownership rates, and public transport carried a lower share of non-work trips, than the wealthy areas of Mosman and Woolahra. Mees (2002) explains difference this as being due to the lower quality public transport service available in outer Sydney. Hence the poorer Wyong residents were effectively forced into higher rates of car ownership because of the uneven distribution of public transport investment across the metropolitan area, an issue which raises similar social equity concerns to those enunciated by Morris (1981).

A similar phenomenon to that described above for Sydney appears to be present in Melbourne. Morris *et al* (2002) demonstrate that vehicle ownership is much higher in outer urban municipalities than in inner urban locations, an outcome that appears to be the result of the inequitable distribution of public transport services across the metropolitan area. Dodson (2004) suggests that the mismatch between areas where housing is affordable and areas where public transport service is of good quality, in Melbourne, compounds the exclusionary processes operating in the housing market. As Mees (2002) notes in the case of Sydney, gentrification has exacerbated this inequity, as wealthier households displace poorer households from inner areas, thus also capturing a greater share of public transport subsidies, a phenomenon that is also present in other Australian cities (e.g Morris *et al* (2002). Black (1995) has also suggested that a similar process has been at work in the US context.

The problem of poor outer-suburban public transport services and subsequent reliance on automobiles for access to employment and services raises important questions about the financial stress placed upon individuals and households due to the costs of motor vehicle ownership. Housing scholars have long noted housing affordability as a key problem relating to the capacity of households to purchase housing in locations that are well situated in relation to employment and services. In Australia, this concern has been expressed through the notion of 'housing stress' (National Housing Strategy 1991; Randolph and Holloway 2002) which is a condition in which households are both within the lower two income quintiles, and paying more than 30 per cent of their income in housing expenses. It would be feasible to develop a similar measure of 'transport stress' which could assess the burden of transport costs on households similar to measures of household transport expenditure (Morris *et al*. 1979). However such an approach does not appear to have been undertaken either in Australia or elsewhere, whether for inner or outer suburban residents.

While no definitive work has been conducted on the issue of outer-urban transport disadvantage in Australia – Cheal's is probably the most specific so far - the financial and spatial problems described by Morris (1979; 1981) over two decades ago, are likely to remain, and have probably been exacerbated in recent years, given the effects of privatisation on urban transport systems. While public transport investment continues to greatly lag suburban expansion such problems will remain. An urban policy with a focus on equity would start providing better public transport in such areas, to redress the uneven metropolitan distribution of service levels, which currently operate to the detriment of outer areas. Unfortunately current policy responses seem oriented in a direction which will further entrench automobile dominance and provide little investment in public transport, as for example, Dodson's (2003) review of Melbourne's recent Metropolitan Strategy argues.

## **6 - Social categories and disadvantage**

Research that is concerned with the way that different social groups are treated by social processes, including systems of transportation, necessarily requires some attention to the way in which these groups are identified as social categories. In transport disadvantage research, a number of social categories have been identified as particularly likely to be transport disadvantaged. This section briefly reviews which social groups are typically viewed this way. The intention is not to provide a comprehensive review, rather to identify some basic issues relating to different social groups' access to transport.

### **Gender and transport disadvantage**

Gender issues have also been cited in debates over transport equity. The exchange between Dowling and Gollner (1997; 1997) and Mees (2002) is instructive in this regard. Dowling and Gollner have argued that because women's contemporary travel needs are complex, due to multiple and often conflicting employment and domestic responsibilities, so too are the urban trips women make. Women's trips often include ferrying of children, and chaining of trips across urban space, as opposed to the travel patterns of men, which are typically for single origin and destination work travel. Public transport systems, Dowling and Gollner argue, are inadequate to the task of meeting women's mobility needs, due to poor service frequencies, inadequate operating hours, and limited service integration.

As a result, Dowling and Gollner argue, the automobile is a superior travel mode relative to public transport for meeting women's urban travel needs, and that automobiles provide a form of female empowerment and means of overcoming disadvantage. Mees (2002), by contrast, argues that promoting road-based transport policies in the name of feminism will merely reproduce the kinds of car-oriented approaches that created an automobile-dependent urban transport system in which women are likely to suffer transport disadvantage. Indeed, Mees (2002) argues, the burden of disadvantage is most likely to fall on women of poor socio-economic status in outer-suburban locations. Accordingly, Mees calls for improvements to public transport services over road improvements, to enable public transport to meet both women's travel needs, as well as the needs of social groups who are often dependent on women for urban chauffeuring, such as the young or the aged.

The tension created by this debate is clearly seen in the writings of Graham and Marvin (2001). These authors seem to accept the feminist critique of modernist transport planning as having failed to address the needs of many groups, yet they nonetheless express dismay at the collapse of the modernist ideal and the curtailment of its capacity to progressively improve the welfare of those groups who are yet to receive improved transport services.



The 'feminist car' debate also highlights the importance of gender equity issues in urban transport, and the role of modal policies in meeting the travel needs of women. In the UK context Hamilton and Jenkins (2000) have advocated for the use of a 'gender audit' by policy makers, planners and service providers in the transport sector to ensure that transport service provision meets women's transport needs. Hamilton and Jenkins (2002) highlight the fact that women constitute the majority of the public transport 'market' and that in conjunction with other factors, transport can play a significant causal role in women's disadvantage. This contention has been supported by Bostock's (2001) study of the adverse impact of lack of alternatives to walking as a means of transport on the wellbeing of women in poor urban communities in the UK.

A further important contribution to questions of gender and transport has been provided by Bostock (2001) who identifies the role of walking that walking plays in women's transport. Bostock notes that socially disadvantaged women often are unable to afford motor vehicles to meet their transport needs. For many, even using public transport is an unaffordable luxury, and hence walking is the default mode of urban transport. Reliance on walking however, while it can be seen to provide positive health benefits, in terms of exercise undertaken, can also impose negative health costs, particularly as a result of the wearying effects of traversing disadvantaged and often deteriorated neighbourhoods.

### **'Other' social groups and transport disadvantage**

Various authors have noted the effects of automobile-dominated transport policies on groups who are either unable to drive, or who cannot afford automobile ownership. An Schaeffer and Sclar (1975), for example detailed the various privations suffered by the poor, the elderly and the young in terms of their access to transportation. Black's (1995) text on public transport planning also noted what he termed 'special groups of users' or the 'transport-disadvantaged' including, the poor, elderly, disabled people, the 'mentally retarded' and women (p.306-318).

Young people, Schaeffer and Sclar (1975) noted were particularly disadvantaged in transport terms, reliant on chauffeuring for their urban mobility, with drastic negative implications for their personal independence and social development. Brownlee and McDonald's (1992) study of outer-urban young people suggests that transport disadvantage relating to the school journey, and to entertainment and leisure trips, is a significant problem in the Australian context. This conclusion is supported by Winter's (1994) study which suggests that inadequate transport constrains the educational and social opportunities for outer urban youth. The emergence of 'walking school buses' in response to the transport exclusion faced by young children, due to the lack of safe pedestrian routes between home and school, attests to the extent to which the transport needs of young children are often not met.

Australian research has also confirmed the categories described above (eg Mees (2000)), although an additional category might also include outer and peri-urban dwellers. The poor can also be divided into two categories – those on statutory incomes, and those in low-paid employment. Subtle differences exist between these groups in terms of transport need. The low-income employed or unemployed require transport for work access, while beneficiary groups have greater need for more general access to retail and social services.

Based on the foregoing literature review, the following groups are more likely to experience transport disadvantage or transport-related social exclusion than others. It is worthwhile restating who these groups are, as any methodology which is subsequently developed to investigate the presence of transport-related social exclusion in a specific empirical context would be sensitive to these different groups. Hence the transport disadvantaged potentially include:

- Low-income people
- The unemployed
- Beneficiaries
- Youth/Children
- Women
- Elderly
- Disabled
- Outer-urban dwellers
- Ethnic minorities

A research programme informed by post-modernist concerns with diversity, 'difference' and the unique experiences of the subject-positions of different social and cultural groups (Fincher and Jacobs 1998) might seek to address each group with a particular methodology and mode of analysis. Such sensitivity is beyond the scope of the present review. Further, there is an argument with transport planning literature that suggests concerns with 'difference' are misguided. Schaeffer and Sclar (1975) and Mees (2000; 2002) suggest that it is better to focus on the more 'modernist' objective of a universal high-quality urban transportation system in which all groups' needs are met through a universally adequate service. Mees (2000) cites Toronto and Zurich as cities whose public transport systems are approximating this universal level of service.

## 7 – Concepts related to transport and social status

A number of concepts can be used to identify different aspects of the relationship between transport and social status. Some are provided below, more for purposes of identification and recognition rather than with the intention of an extensive exposition. There is a need for further research and consideration to be undertaken to tease out the contours and potential alternative means of understanding these concepts and their implications for transport planning.

- Transport disadvantage – condition of disadvantage (social, economic, labour market, housing) in which transport plays a strong role.
- Transport-related social exclusion – condition in which individuals or households are unable to fully participate in society as a result of inadequate or unaffordable transport (Hine and Mitchell 2003).
- Transport-related poverty – condition of poverty (low-income) due at least in part to transport factor. Can include either private or public modes.
- Transport affordability – ability of a household to afford transport, or the proportion of household income required for expenditure to meet transport needs, relative to a benchmark value.
- Transport accessibility – spatial distance or ease of geographic access to transport services, such as public transport.
- Urban accessibility – degree of ease of spatial access to a range of essential activities and services. The magnitude or parameters for this concept can be dependent on mode of access.
- Connectivity– the extent to which the transport network provides options and opportunities for connecting to activities and services. Connectivity relates to the degree of inter-connection between modes and routes to provide timely and seamless urban transport. Primarily this relates to the public transport network and non-motorised modes, but some dimension of private motor vehicle use can also be considered.
- Network integration - refers to the infrastructure dimensions of connectivity, including the extent to which the public transport system operates as a genuine inter-connected network, or instead as a connection of loosely associated individual routes. Such considerations also note the efficiency of route structuring (circuitous or direct), timetabling (wait times for interconnection) and ticketing (stages, zones, times and transfers).

- Transport stress – level of household expenditure on transport at or beyond a level that results in financial stress. This concept is an adaptation of the notion of ‘housing stress’ used in housing research. Thus, for example, households earning 40 per cent of the median income and expending 30 per cent or more of their household income on housing are described as being in housing stress (National Housing Strategy 1991; Randolph and Holloway 2002).

The concepts that are selected for investigation in a given research study will strongly influence the methodology that is deployed in the study. The following section of this paper investigates potential research questions arising from the literature review, and the appropriate methods for responding to these research questions.

## **8 – Methods for social status and transport research**

### **Methods in transport research**

The previous sections have reviewed the research literature relating to social status and transport access and disadvantage. However, the review has not considered, to any great extent, the methodologies that researchers have deployed in conceptualising and investigating transport issues. The paper thus far has been primarily concerned with reviewing the underdeveloped research record on transport disadvantage in relation to social status, and identifying some of the insights provided by this literature. While some methodological concerns were noted, such as in the debate over locational disadvantage in Australia (Badcock 1994; Maher 1994) the foregoing analysis did not specifically address the complexity of methodological issues in researching the links between social status and transport.

This section of the paper identifies some of the main methodological approaches undertaken in the research literature on social status and transport disadvantage and considers opportunities for advances in the way in which this area of urban planning and policy is investigated. The section argues that some re-thinking is necessary to add to the capacity of both social research and transport research to address issues of social disadvantage in relation to transport systems. This Research Monograph is part of a broader pilot project examining the links between transport disadvantage and social status. In light of this purpose, the following discussion is not intended to provide new insights into or dramatic revelations about the methodological dimensions of the issue at hand. Rather the purpose of the discussion is to provide an initial foray into transport and social research methods, and which will be further developed during the subsequent investigation proper.

This methodological discussion also necessarily introduces some transport research methods that have not been covered in the previous sections. Such methods are discussed below in terms of their relevance to the social status focus of the present review. Further, the point of the analysis is not to undertake comprehensive critical review of all methodologies that have been used in socially concerned transport research. The point is to identify the main approaches, the way they have been deployed and their strengths and weaknesses. The main methods considered include:

- Modelling
- GIS analysis
- Statistical comparison
- Qualitative methods

The section also reviews the types of data that have been used in studies of transport-related social disadvantage and the usefulness of such data. There are however relatively few sources of transport data. For example, travel surveys, censuses and land-use surveys are the main three types of data collection in transport research. However the data these collection methods yield can be used in a variety of ways, depending on the broader methodological approach of the relevant study.

## **Modelling**

Modelling has been a central technique in transport planning since the development in the 1950s and 1960s of computer technology capable of handling complex mathematical equations. Typically such analysis has been used to apply mathematical algorithms and formulae to estimate traffic patterns and the effects of future planning scenarios on urban transport outcomes. Gravity models and their derivatives often form the basis of these models (eg Wadell (1997)) and are often used to measure such phenomena as the 'jobs-housing balance' of a region (Cervero 1989; Levinson 1998). For many researchers and policy makers, for example, Black (1981), modelling eclipsed other, less technical, methodologies to become identical to transport planning.

Because of its mathematical origins, modelling can appear as the application of objective 'scientific' methods to transport questions. This apparent scientific rigour in turn supported the political use of transport modelling as a means of stifling opposition to transport strategies or projects, typically those involving construction of major new roads (Newman and Kenworthy 1999; Mees 2000).

Modelling has also been criticised by transport scholars as distorting understanding of urban transport problems (Newman and Kenworthy 1999; Mees 2000). The institutional history of transport modelling as a method preferred by road engineers has led to the use of modelling being accused of substantial biases, which tend to favour road and automobile outcomes. For example, the multiple assumptions that inform the model calculations, such as the choice of a 'gravity' or other model of land-use and transport interactions, weighting given to different mode preferences by urban travellers, can predetermine the outcomes produced by the model. Accordingly, models are only as robust as the assumptions that they are based on. Graham and Marvin take this criticism even further, castigating the use of transport modelling as a form of 'essentialist determinism' based on demonstrably erroneous cause-and-effect models of social behaviour (2001, p.106).

Most urban transport modelling has been auto-dominated and focused on the needs and desires of auto-dependent transport users. However, there is potential for the development of models that address issues of transport disadvantage. However there are few readily available models used to assess the links between social status and transport disadvantage. Morris *et al's* (1979)

review for example incorporates a very basic model linking social disadvantage and transport accessibility. But transport models have been used to assess more general aspects of urban accessibility. Accessibility is a related concept to transport disadvantage, such that transport disadvantage is a form of poor accessibility. For the purposes of the present discussion therefore, accessibility is able to serve as a proxy for transport disadvantage.

Helling's (1998) study of intra-urban accessibility in Atlanta is a good example of this modelling approach. Helling used a gravity model based on road-based travel time and census data to measure accessibility to employment. Thus Helling was able to demonstrate a reduction in accessibility, in terms of travel time, during the 1980-1990 period. Wang (2003) undertook a similar model-based investigation using the US city of Cleveland as a case study. Of interest to the present review, Wang added the dimension of segmented labour markets based on wage levels as a proxy for labour market status and compared job proximity to job accessibility, where proximity is a simple distance measurement while accessibility takes into account further factors such as modal access. Wang (2003) found that although low-income workers enjoy better relatively good job proximity, many have very poor job accessibility, due to their limited transport mobility resulting from low levels of motor vehicle ownership. Such a finding has implications for the present review given that labor market status is a component of the degree of transport disadvantage potentially experienced by an individual or household.

Few studies have used modelling to examine accessibility to employment or services by public transport specifically, however some have assessed general transport accessibility via this mode (Talvitie and Dehghani 1980). Talvitie and Dehghani (1980) did not undertake empirical investigation, instead presenting a set of potential modelling approaches to analysing both the access and line-haul components of public transport travel times. Murray's (2003) study uses two models called the 'location set covering problem' and the 'hybrid set covering problem' to assess the spatial coverage of bus transit in Brisbane. Murray's models lead him to conclude that around 80 per cent of bus stops in the city could be eliminated without affecting spatial accessibility to the system and that this would in turn speed up travel times, and thus patronage.

Murray's approach is a good demonstration of the potential for internally coherent models to nonetheless produce incoherent outcomes, when only a limited set of variables is taken into account in the calculations. Network integration, the differential service quality provided by different bus routes and the psychological benefit to patrons from having a visible transit service are all ignored by the Murray approach. Further, the fact that many of bus stops along a route will not generate a boarding during a given service means that there the predicted travel time savings identified by Murray are likely to be much less than he claims. Further by removing bus stops the spatial coverage of the bus system would decline, making it much more like a rail service with widely spaced stops, but

without the dedicated right-of-way of a rail line. With bus services increasing speed of travel by reducing stops would likely reduce the patronage. It would also be of limited benefit to the transport disadvantaged, many of who already live in poorly serviced locations.

The foregoing discussion has highlighted some of the dangers of a modelling approach and the potential for rigorous analysis to produce flawed conclusions, or conclusions that merely reproduce 'business as usual' modes of transport planning. The failure of modelling in this regard however could potentially be rectified by the tuning of models to account for social disadvantage issues. However, there clearly remains scope for further development and deployment of models in investigations of transport disadvantage and accessibility via public transport.

## **GIS analysis**

A second methodological approach to understanding urban accessibility and transport disadvantage that has been developed and expanded in recent years is the use of computerised geographical information systems (GIS). GIS analysis allows the combination of spatial information with other types of information to enable both mapping of various characteristics of the transport system. Depending on the quality of the data that is provided to GIS systems, and the flexibility of the software controlling the databases that are generated by this data, the capacity of GIS can range from depicting such basic information such as the spatial coverage of the public transport network, or can be used to generate sophisticated multivariate analyses incorporating large numbers of complex calculations. GIS can for example, be used to quickly and accurately count the number of persons adjacent to a given item of transport infrastructure, or be used to

GIS differs from mathematical computer modelling in that it is less reliant on assumptions about the way urban systems work, rather being reliant on the availability of data sets and the combination of these to generate spatial analyses and representations that were unfeasible without high-capacity computing technology. The empirical meanings that are derived from manipulations of social data remain open to criticism as being inadequately sensitive to the nuances of actual social behaviour. However at least with GIS, as compared to, for example, transport modelling, the dynamic assumptions are less important to the analysis than are the relational assumptions. And GIS analysis operates more like a form of geographic set analysis rather than a dynamic process.

GIS is particularly useful for analyses of spatial disadvantage in relation to transport as it permits relatively easy calculation of spatial metrics. Thus for example the identification of locations where a given level of public transport service is unavailable becomes relatively easy with GIS once the necessary data is available.



**Figure 1 – Murray *et al*'s (1998) map of access to 'suitable' transport coverage in South East Queensland region using a 400m proximity measure.**

Perhaps the most common use of GIS is in coverage analysis, where the question of how many people have a given level of service and where are they located. Murray *et al*'s (1998) discussion of transport coverage in South East Queensland is a good example of this kind of basic GIS analysis. Murray *et al* sought to assess the policy implications of access to public transportation in terms of proximity to public transport services among residents of the region using a 400m standard of what they termed 'suitable' access to a public transport route. They combined this threshold of suitability with statistical Census residential location data, to produce a map of the areas of South East Queensland that had 'suitable' public transport, according to their definition of suitability, as shown in Figure 1. Further statistical analysis found that only 55 per cent of the South East Queensland residents had this level of access to public transport.

Murray *et al*'s analysis of public transport access, was however, particularly simplistic, operating at a very basic level of what constitutes a suitable service. Simple proximity to a public transport route does not guarantee that the level of service along that route will be of a quality that permits high levels of mobility, or access to services. Such a mapping process is useful in providing a gross indication of likely accessibility problems. But more sophisticated GIS analysis, which takes into account additional factors and dimensions of service quality is required to make any substantive assessments about the real suitability of public transport services.

Cheal's (2003) research on the 'transport rich' and 'transport poor' areas of Melbourne is a more sophisticated use of GIS analysis in assessing transport disadvantage. Cheal's analysis incorporated a measure of public transport service quality in terms of the frequencies of routes and the capacity for multi-directional travel across many time periods such as early morning, late evening and on weekends. Such spatio-temporal exclusion of inadequate transit services was then mapped over socio-economic Census data, which then permitted the identification of socio-economic differences between the high quality and low quality transit service areas. Cheal's analysis demonstrates the importance and the insights that GIS can provide in assessing links between social status and transport systems.

### **Statistical analysis**

A further methodology that is similar to modelling and GIS analysis is the use of statistical methods in transport research on accessibility. Such approaches typically involve the use of complex analytical techniques, such as regression analysis to identify particular variables that are more closely linked to particular travel phenomena than others. The use of statistical methods is closely linked to both modelling and GIS approaches and the critiques of each remain relevant to statistical methods, so this discussion will only cover statistical approaches briefly.

Statistical analyses such as regression have been used by Levinson (1998) to study accessibility in the journey to work, Modarres (2003) in an investigation of transit access to non-CBD urban locations and by Krygsman *et al* (2004) in their study of the accessibility and interconnectivity of public transport. All three studies relied on the use of regression analysis in the investigation of their specific topics. While this is an accepted practice in social and economic research, the use of regression, like modelling, requires high quality travel and spatial information to provide the necessary data to make the regression methods feasible.

More basic approaches to understanding transport and urban accessibility issues have used basic descriptive statistical comparisons rather than subjecting aggregated data to further manipulation. This is a fairly conventional social

scientific technique, in which two or more sets of data for a given number of variables are presented and explanations proffered for differences observed between them.

### **Qualitative analysis**

A major methodological stream in research into the links between social status, transport and accessibility is the use of qualitative methods. In this context qualitative methods are taken to include approaches which don't seek to quantify either the patterns of either traveller behaviour or the characteristics of the transport system. Often data is collected using either interviews or surveys which ask respondents about their travel behaviour or their experiences of travel and access to services.

A concise example of the use of qualitative methods in the investigation of the links between social status and transport disadvantage is the study undertaken by Hine and Mitchell (2003). Hine and Mitchell (2003) used a survey and focus group based method of assessing the extent of transport need, and associated transport-related social exclusion in urban Scotland. This research involved a comparison between three different categories of urban neighbourhood: an inner suburb, peripheral housing estate, and a free-standing township. The researchers conducted household surveys for each locality, including gathering of basic demographic and household data, socio-economic information, and data on vehicle ownership and travel behaviour. Interestingly, the researchers also conducted semi-structured interviews with local authority planners and transport operators, to develop understandings of transport and social exclusion from the policy and provider perspective. While some of the information they collected was quantified and presented in descriptive statistical form, much of the presentation of their findings involved conveying non-quantified statements made by respondents which revealed their personal experience as transport users.

Similar research into the relationship between social status, transport access and disadvantage was conducted by the UK Department of Local Government Transport and the Regions (DLTR 2000). The DLTR study used a qualitative approach to determine the level of transport adequacy for disadvantaged households across a variety of urban localities. The DLTR didn't specify a quantitative measure of 'adequacy' but identified adequate transport as meeting four criteria, namely affordability, availability, accessibility and acceptability. All four criteria were required for a given public transport service to be considered adequate.

Hamilton and Jenkins (2000) used a qualitative approach to assessing the adequacy of public transport services in meeting women's needs. Their qualitative methodology involved forming a theoretical and empirical understanding of women's travel needs and then deploying this understanding to develop a 'checklist' against which agencies responsible for provision of transport

services (local authorities in the case of the UK) could then assess the adequacy of those services. It is also worth noting that Hamilton and Jenkins' approach also differs notably from both conventional quantitative and qualitative approaches to understanding transport disadvantage which tend to focus on urban transport as a system, in which space, services and users interact with each other, to a focus on urban transport as an institution in which a service provider such as a local authority is assessed on its capacity and success thereof in providing an adequate level of service.

Maher *et al.*'s (1992) study of locational disadvantage experienced by residents on the fringe of Australian cities undertook a large survey to inform their analysis. This Household and Location Choice Survey (HALCS) involved face to face interviews with approximately 4300 households 'heads' in each of Melbourne and Sydney, across a range of intra-metropolitan zones. The survey was largely of a questionnaire format. The results of the survey were then quantified, tabulated, and used in a largely descriptive manner, with a set of conclusions provided about the locational preferences and experiences of the households in question. The survey is thus methodologically similar to that used in Hine and Mitchell's (2003) investigation of transport exclusion, except that the sample size of over 8500 households in total was much greater than Hine and Mitchell's approximately 500 households.

A further qualitative methodology that has been used to investigate transport disadvantage and exclusion is 'community mapping' approach used by Johnson and Herath (2004), based on similar approaches used elsewhere (Yearly *et al.* 2003). Johnson and Herath investigated the access to transport and services for residents of the socio-economically disadvantaged area of Goodna in the outer western suburbs of Brisbane. The researchers used focus-groups and community workshops, as well as ongoing face-to-face discussions with residents to identify the level of access residents perceived they had, relative to public transport, employment and social and community services. A particular benefit of the community mapping approach was that it enabled clear identification of access barriers to transport and services faced by residents. Such barriers included the physical layout of the transport infrastructure in the study area, which in many instances impeded access rather than enhancing access. For example, the freeway running through the locality prevented access to the local rail station. Such local empirical factors would only be discovered via a local-level mode of qualitative investigation as other methods, such as Census data mapping, or mathematical accessibility modelling would be unlikely to incorporate physical dimensions of local transport access.

Qualitative methods are an important research methodology in transport research. They are specifically useful in assisting with investigations that are concerned with that subset of the population that may be transport disadvantaged. Whereas quantitative approaches to transport access and adequacy questions tend to impute the experiential dimensions of transport

access qualitative questions are able to determine these in a much more direct manner. The 'voice' of the population in question, and the potential for their own observations about the transport conditions they face, is more likely to be expressed via qualitative methods.

However qualitative methods are typically more intensive in data collection terms than modelling approaches that often use existing data sets, such as spatial road network or public transport coverage data.

## **Methodological conclusions**

Methodological concerns and complications are an inherent and ever present element of transport research. There is a tendency when issues of access and mobility are investigated to choose methods which in themselves seem appropriate to the questions being posed, but which in fact contribute to the exclusion of potential other ways of responding to transport questions.

Modelling approaches, for example, by relying on imputed mathematical relationships can ignore the often highly locally specific dimensions of transport planning and service provision. These models are typically unable to account for behavioural or subjective factors, or processes in which the relationships between variables are dynamic and constantly undergoing adjustment.

In studies which link transport disadvantage and social status, there is a danger that models may exclude a potentially important variable, which might play a strong determining role in the accessibility outcomes. There is also a tendency to impute potential behavioural responses to urban socio-spatial patterns and transport systems, rather than by investigating actual behaviour. Again, this often remains a problem of data availability. It is much easier to impute a relationship, for example, between social status and transport disadvantage using readily available spatial or service coverage data, than it is to undertake detailed empirical investigations to identify accessibility and availability at the local scale and in particular, the behavioural responses to these local factors.

This problem is partly one of spatial scale. Studies which seek an understanding of transport issues at the metropolitan scale are typically reliant on imputed transport processes and relationships based on systematic data, such as the road system, rail and bus routes and service frequencies. This is because there is usually limited data available that can provide behavioural information at the metropolitan scale at the level of disaggregation and variable differentiation sufficient for close and detailed analysis. Examples of this kind of research include that of Cheal (2003) and Murray *et al* (1998).

Conversely, local-scale analyses are often incapable of expanding to develop a macro-scale systematic view. This is in part because such studies often rely on methods that are not easily generalised by 'scaling up', due to socio-spatial and

transport system variation across the metropolitan area. They also typically cannot account for systematic dimensions of transport access problems, meaning that the overall metropolitan access provided by local services is not readily able to be determined. For example, the specific conditions experienced by a socio-economically disadvantaged community may be the result of a combination of local spatial, urban-structural and systematic conditions that cannot be used to ascribe potential comparable outcomes to localities with different conditions. Such methods are however much better suited to providing a rich portrait of the behavioural responses of residents to their social status and transport conditions.

Two potential means of resolving this contradiction may offer fruitful directions for transport research. The first is to recognise the importance of spatial scale in the kinds of research questions that are posed and the methods by which research responds to such questions. One of the solutions is to seek methods for deploying existing methods at multiple spatial scales. One particular scale that has typically been poorly developed in research into transport and social disadvantage is the meso scale between the metropolitan and local scales. In part this is often due to the lack of coherent statistical or administrative boundaries between the scales of the metropolitan region and the local suburb.

The second is to find methods that combine the advantages of both scales. Is it feasible to undertake studies that incorporate both macro-metropolitan modelling with local-scale qualitative assessments of local outcomes? The shift towards multi-disciplinarity in academic research suggests that such research is possible. However there are few examples of such studies in the transport planning literature. GIS approaches have the potential to provide this mid-scale level of analysis but again the density of data at the closer spatial scales can place limits on the extent of this.

Given these types of concerns, it is part of the purpose of the present project, of which this Research Monograph is a component, to attempt to tease out these opportunities and to shape new multi-scale methods of comprehending the myriad connections between social status, residential location, access to services, employment opportunity and transport disadvantage. The final section of this monograph makes some final remarks to this purpose.

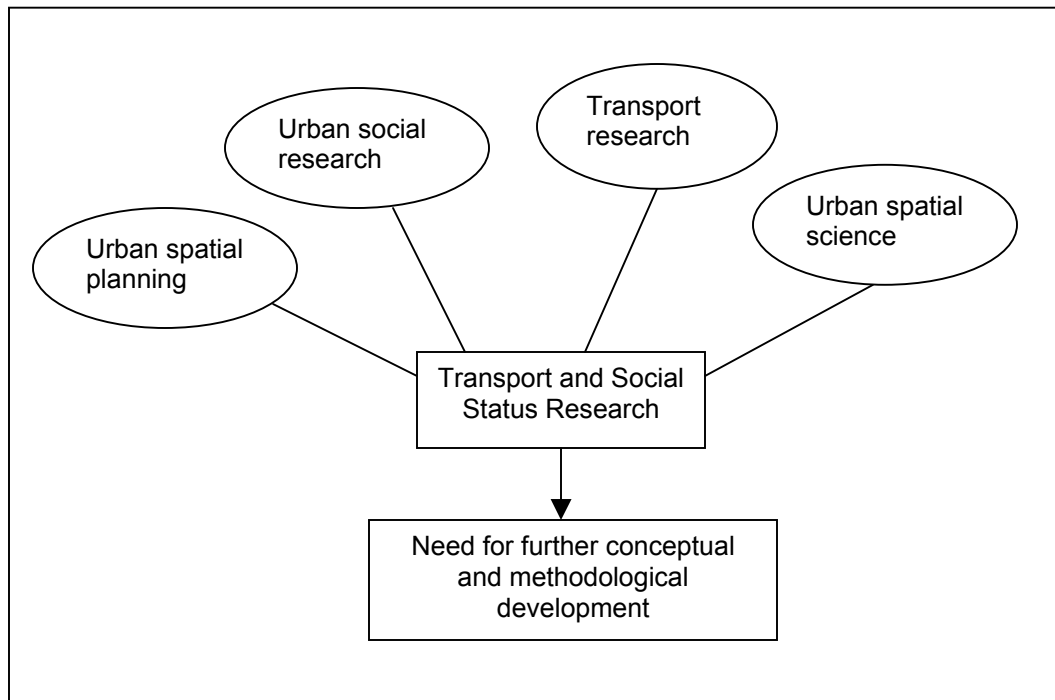
A final issue of concern regarding methodologies for comprehending the connections between social status and transport disadvantage relates to the extent to which social status and transport disadvantage are viewed as static categories, or whether these are dynamic and changing outcomes of broader social and economic forces which are themselves undergoing continuous transformation. The discussion which began this Research Monograph focused on metropolitan areas as macro-sites of dynamic socio-economic and spatial change. That preliminary discussion reminds us of the importance of comprehending the specific and local scale problems relating to social status and

transport access and disadvantage, not as isolated phenomena, but as outcomes and drivers of the broader macro-scale social and economic processes of urban change. Methodologies that are deployed in the investigation and analysis of such issues should while being multi-scaled, also be cognisant of the broader urban context.

## 9 – Re-conceptualising social status and transport

Chapters 2 to 7 of this research monograph have reviewed both the research literature concerning the connections between transport, accessibility and disadvantage. Chapters 2 to 6 focused on the substantive findings of the research, while Chapters 7 and 8 discussed the main methodological approaches to understanding the links between transport and disadvantage.

The preceding chapters have demonstrated a space in the research literature concerning the links between transport disadvantage and social status. The diagram in Figure 2 sets out the conceptual and research relationship between the research literature and transport disadvantage in terms of the various disciplinary divisions that underlie the discussions in Chapters 2 to 8. In particular, there is a lack of methodological capacity to link the systemic and often technical dimensions of transport research with contemporary concerns about access of urban residents to employment and other services.



**Figure 2: Disciplinary divisions in transport disadvantage research.**

This part of the research monograph undertakes a re-conceptualisation of the way that the connections between social disadvantage and transport are understood, with a view to examining at a closer scale and from multiple angles the various dimensions of this phenomenon. We consider that insufficient attention has been provided in the literature to either disadvantage or to transport provision and access, or to the connections between the two.



## Underlying conceptualisation

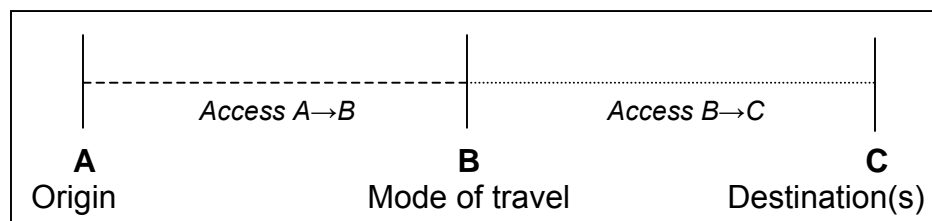
Before delving into the more detailed modes of investigating the links between social status and transport it is first necessary to identify a major point of division in the way in which the field of research into transport, social status, urban structure, disadvantage, accessibility and related questions has been conducted. In many ways the characterisation set out below is untested, but we consider that it will clarify many of the observations made by previous researchers, often in passing in their methodological statements.

Specifically we consider that there has to date been inadequate basic consideration of the notion of a journey or trip, and the ways in which the notion of a journey has been deployed as a basic component of transport research in the transport literature. We expect that through a simple reconsideration of the elements of a journey we will not only contribute to our own research objectives, but will assist other researchers in clarifying their own research aims.

The purpose here however, is not to entirely re-write the manual of how transport research is or should be conducted. Rather we seek to tune the understandings of transport researchers to the complexities of urban trip-making and to highlight the specific difficulties faced when the relationship between transport and social disadvantage is considered.

## Potential journeys

The first major methodological question revolves around the notion of a 'potential journey', and the elements which make up this journey. We have represented this journey schematically as a process of travelling between imaginary origin A and destination C, via means of travel B. This process is represented in figure 1.



**Figure 1: Transport access relative to mode and destination.**

The A→B component of the trip comprises access to the 'means of travel'. The means of travel includes such factors as ownership of a vehicle, financial capacity to afford travel, and geographic access to a public transport route, as well as social status. Such a notion is relatively easy to assess, although in studies focussing on the local scale are uncommon. For example, population

census data includes variables for vehicle ownership, while distance to transport routes can be assessed through basic mapping procedures.

The second component of the trip (B→C) comprises the extent to which the transport network or system permits or enables a range of trips to a range of desirable destinations. While motor vehicles are typically considered to provide the best access, in the case of public transport access quality depends on the availability of an integrated network, involving multiple potential destinations with direct routes and minimum transfer times, with supportive ticketing and route structures. Evaluating the B→C component of the potential journey opportunities is therefore more complex than the type of analyses that might be conducted for the A→B element of the journey. However the B→C analysis is likely to provide a more accurate portrait of the overall accessibility provided by a transport network. Thus a household may have ready spatial access to a public transport route, but if the service operates infrequently, the route is circuitous, fails to provide adequate access to useful services or provides limited opportunity for network inter-connection then transport disadvantage may still occur.

Transport literature to date has typically focussed on either one of these elements, with the A→B component being the most studied. Hence for example, Murray *et al*'s (1998) study of Brisbane measured the proportion of the population within 400 metre distance to assess transport accessibility, on the basis that this was a standard distance by which transport planning agencies measure the catchment of public transport routes. But like similar studies which focus on the spatial component of the A→B link, Murray *et al* were unable to proffer insights into the experience of transport users beyond the local bus stop, in terms of the inter-connectivity of the public transport network, although they did offer some commentary on how such broader linkages might be calculated. Their analysis was also unable to account for the potential costs imposed upon transport users, and thus entirely ignores issues of socio-economic status.

Cheal's (2003) study of 'transit rich' and 'transit poor' Melbourne introduced a B→C dimension to the basic geographic route-distance A→B measure. Cheal established a minimum standard of adequacy for the public transport network, and used a geographic measure of access to public transport adequacy to map the areas of Melbourne that were 'transport rich' and 'transport poor'. Thus transport rich areas had access to routes in multiple directions (such as north-south and east-west) with frequencies no less than 30 minutes, and which operated from 6 am until midnight each day. But the extent of B→C network analysis remained incomplete. Thus Cheal didn't account for whether services followed circuitous routes, provided inter-connection or accessed desirable activities such as shopping centres.

Other studies have measured the accessibility of the transport system more generally in terms of the relationship between the road network and urban spatial structure (eg Helling (1998)). While such studies are useful in providing

understanding for broader conceptualisations of urban accessibility, they are of limited use in providing insight into the transport disadvantage dimensions of the urban transport problem.

The broader research project of which the present study is a component acknowledges the significance of the B→C aspects of urban transport accessibility and seeks to explore means of assessing and evaluating these dimensions. It is acknowledged however that such measurements require a much more complex set of analytical procedures than is the case for measurement of A→B studies.

Given that the present study of which this Research Monograph is a component is a pilot for the broader research project, and that both the A→B and B→C dimensions are being investigated, the immediate intention is to concentrate on the A→B aspects as these provide a simple baseline means of assessing transport access. The differential conceptualisation between the two components of the idealised journey remains important however, and it is envisaged that insights gained from the early stages of the project will enlighten further investigation into the more complex relationship between social status and transport disadvantage which consideration of the B→C dimensions enables.

Data problems remain relevant, both in terms of acquiring datasets of a sufficient scale to enable network analyses, as well as acquiring information across a set of variables. Basic public transport network information is increasingly available in a format that is amenable to ready manipulation, particularly via GIS spatial and statistical analysis. For example, in South East Queensland, the government agency Queensland Transport holds spatial route and service quality information in a GIS format. Service quality information, such as the frequency of service per route can thus be used to assess service quality, at both the local, sub-metropolitan and metropolitan scale.

## **10 – Further research questions to be pursued**

The foregoing literature review identified a large array of issues relating to social status and transport disadvantage. Given the intention of this project to investigate the relationship between these two dimensions of urban patterns and processes of change, there are a number of research questions that are pertinent to the purposes of the study. This sections sets out a series issues identified via the review, and articulates a set of potential research questions which could form the basis for further inquiry via the pilot and subsequent studies.

### **Drivers of socio-spatial differentiation**

The brief review of research literature above identified urban restructuring as a key driver of contemporary socio-spatial differentiation. The labour market shifts that have accompanied this restructuring process have also had a major impact on socio-economic processes. It is also worth noting that while researchers have been attentive to these shifts in some capital cities, socio-economic change in other regional cities has not been studied to such an extent. The transport disadvantage implications of such changes have largely been ignored by scholars.

Comprehensive studies of disadvantage for local areas are major projects in themselves. However, in a research project such as this, which anticipates an area-focussed empirical investigation, and given what the forgoing review has already revealed about the links between socio-economic disadvantage and transport, some background is necessary to frame the subsequent investigation into the links between social status and transport in the current investigation. Studies of transport disadvantage need therefore to provide, at minimum, some socio-economic and spatial information regarding the distribution of advantage and disadvantage in their study areas, in terms of the residential location of the population, as well as some discussion of the underlying drivers of socio-economic change. Research questions such as the following can be seen as arising from this concern:

- i. Where are socially vulnerable groups located within the study area.
- ii. What economic and social processes appear to be driving the concentration of particular socially vulnerable groups in the study area?
- iii. How is social status related to urban structure?

### **Assessing the transport system**

As for the socio-spatial patterns described above, the status of the study area transport system also needs to be described, not only in terms of the basic physical infrastructure (roads, rail lines, transit terminals) but also in terms of the

urban development processes affecting transport. These include mode use patterns, mobility growth, vehicle use, and the current spatial and temporal distribution of public transport services. Research questions arising from such concerns therefore include:

- i. What is the existing condition of the study area transport system?
- ii. What is the existing spatio-temporal coverage of the public transport system?
- iii. What kind of service does the overall public transport system provide, when considered as a 'network for access'?
- iv. Which areas are relatively less well served by public transport?

### **Urban location of activities and services**

Transport is not generally an end to itself, but a means to overcome geographic barriers, such as inadequate local employment in the case of 'spatial mismatch' or the lack of locally available services. Hence some understanding of the geographic and temporal distribution of transport services across various categories (commercial, health, educational, social etc) is necessary to identify where services are located relative to residential locations.

- i. Where are the main concentrations of economic and service activity in the study area?
- ii. Which areas have least local availability of economic and social services?
- iii. What are the current drivers of economic and social service activity location in the study area?

### **Potentially disadvantaged groups**

The literature has demonstrated that disadvantage arising from socio-spatial processes can be significantly compounded by transport factors, such as inadequate access to public transport, or high costs of owning motor vehicles, or long commuting distances. The literature also identifies specific groups who are more likely to suffer transport-related disadvantage. It is therefore necessary to examine the spatial distribution (and any concentration) of various categories of transport-vulnerable group, relative to the quality of the transport system that is available to them. This would include specific focus on groups such as the elderly, the unemployed and youth. The analysis would also seek to identify the specific locations that are the most transport disadvantaged. Research questions thus arising include:

- i. Which social or demographic groups are concentrated in particular urban locations?
- ii. Do processes of socio-spatial concentration result in reduced transport access?

- iii. In what ways are particular socio-demographic groups vulnerable to transport disadvantage?
- iv. How does the urban structure distribute residential affordability and employment opportunity and are there transport implications of this?

### **The financial burden of transport**

The proportion of individual or household income that is spent on transport can contribute to social disadvantage through an excessive financial burden. The extent to which meeting transport needs places a financial burden on households is therefore relevant to the present concerns. The extent to which the financial burden of transport differs across different income-level groups is also of importance. And again, sensitivity to the spatial dimensions of transport cost is relevant. The transport-cost structure for households with ready access to comprehensive public transport services is likely to be different to those who are more reliant on private motor vehicles.

- i. How do mode usage patterns vary by social status?
- ii. How do mode usage patterns vary by spatial location?
- iii. What costs do different mode usage decisions impose on households and individuals?
- iv. To what proportion of household income is spent on meeting transport costs, and is this affordable?
- v. How does the transport system spatially distribute affordability as a function of service availability, relative to social status?
- vi. What policy settings contribute to diminished or increased transport affordability?

### **Jurisdictional comparisons**

A further issue for studies of transport disadvantage relates to the relative transport status of the study area population, relative to other areas. The relative performance of the study area in terms of the levels of transport disadvantage and the capacity of the existing transport systems to overcome this disadvantage can therefore be assessed. Research questions arising from this concern might therefore include:

- i. How does the level of public transport provision in the study area compare to that of other similar jurisdictions.
- ii. Does the level of provision of transport services in the study area disadvantage or advantage the city's residents relative to residents of comparable jurisdictions?

### **Institutional constraints**

A further dimension of the study area transport system concerns the underlying conceptualisation of the transport system, in terms of how policy makers frame the purpose of transport services provision. The question of whether there are tensions between the economic, environmental and social dimensions of the overall transport system and how these can be resolved is of relevance. This issue is particularly important, given that any attempts to improve the social dimensions of the study area transport system may be obstructed by a conceptualisation of the network, in which other concerns dominate. This analysis of underlying conceptualisation could be extended to consider the extent to which government's policies contribute to a perceived cultural attachment to motor vehicles. While these are more theoretical rather than descriptive concerns, they remain of relevance to the present study. Hence research questions might be:

- i. How do current government policies impose a particular mode dependency on households in the study area?
- ii. Do government policies support particular transport practices, which may then disadvantage some groups, but which then become the socio-cultural norm in terms of broader societal transport patterns and mode-share?
- iii. Does public policy implicitly promote the private motor vehicle as the dominant mode of transport, and if so, does this policy preference result in particular groups suffering transport disadvantage?

## **11 - Moving forward on social status and transport disadvantage**

This review has assessed the literature that examines the links between social status and transport disadvantage and identified some potential further avenues for investigation. The review is premised on the necessity of comprehending the links between individuals and households social status and their transport needs and opportunities within the broader context of urban socio-economic spatial and structural change. Social and spatial outcomes are strongly shaped by the combined interaction of housing and labour markets. Spatial labour markets to a great extent determine individuals' and households' capacity to generate income and in turn to operate within housing markets. But housing markets then transcribe the differential effects of the labour market onto urban residential space, and these spatial patterns produced then interact again with spatial labour markets. Entangled and mediating these processes is the transportation system.

### **The urban socio-spatial context**

Substantial evidence has built up in recent decades that the interaction of increasingly fluid housing and labour markets is extending and exacerbating the spatial differentiation, and concentration of particular social groups, within urban areas. Such understandings are often expressed in terms of increasingly 'divided cities'. Effects that are of particular concern include the concentration of socio-economically disadvantaged households in locations that result in their being spatially or socially excluded from participation in broader social, economic and political relationships. In US cities, this effect has been prominent in inner city locations, while in Australian cities such highly disadvantaged areas have tended to be on the urban fringe.

The locations where socially disadvantaged households are concentrated may subsequently place these households at a disadvantage relative to employment or services. Transportation systems have a role in mediating these dynamics. Access to motor vehicles, or adequate public transport can help socio-economically disadvantaged households to overcome their situation, but similarly, poor public transport, or an excessive financial burden of vehicle ownership can restrict opportunities.

As yet however, there have been few empirical studies that have sought to investigate these interactions between social status and disadvantage. This is particularly the case when social status is conceived of broadly. There is a tendency, to view the disadvantaged as those excluded from the labour market. However substantial proportions of the employed population potentially face problems of transport disadvantage, through the expenses incurred via motor vehicle ownership. Surprisingly, given the importance of motor vehicle



ownership for household's production and consumption needs, the financial burden of owning a motor vehicle has rarely been considered by researchers.

### **Transport can contribute to social exclusion**

Overseas research appears to have advanced further than Australia in investigating and addressing the implications that transportation systems have for individuals and households social status and access to employment and services. Researchers and policy makers in the UK have been particularly notable for their attempts to account for transport in processes of social exclusion and socio-spatial segregation and marginalisation. This in part reflects the particular condition of British cities, which combine a high level of socio-economic inequality within a rapidly transforming post-industrial urban-structural context, mediated by transportation systems that have been adversely affected by decades of under-investment and restructuring. By comparison, European cities have seen much weaker patterns of socio-spatial segregation than in the UK, while their transportation systems have typically been less affected by tendencies towards privatisation and chronic restructure. US cities are perhaps the most extreme example of both socio-economic polarisation and segregation, combined with an overwhelming dependence on automobiles for urban travel.

### **Urban structure can determine opportunity and transport disadvantage**

The conditions in US cities stimulated interest in the notion of a 'spatial mismatch' between the inner-city areas where poor households could afford to locate, and the suburban areas where employment growth predominates. There has been a strong degree of longitudinal support for this theory, but other scholars have suggested that the skills of residents of disadvantaged localities are more important determinants of their employment prospects than their spatial position within the urban structure. The 'spatial mismatch' argument is of limited relevance to Australian cities.

Despite a tendency by Australia's urban researchers to ignore issues of social status and transport disadvantage, there have been some positive engagements. Occasional research has assessed the financial burden imposed upon households by the transport system, while the spatial dimensions of transport disadvantage, in terms of access to employment and services have also been surveyed, albeit not with a focus on the most disadvantaged socio-economic groups. There appears to be a gradual shift in attention of researchers and policy makers towards accounting for issues of transport disadvantage in Australian urban research and policies, but this is highly irregular and uneven.

The present review noted that particular social categories are more likely to be associated with problems relating to social status and transport disadvantage. Women in particular were identified as having particular likelihood of

experiencing transport disadvantage. Other groups were also likely to experience such disadvantage, in particular, the unemployed, young people, the elderly, the disabled and those on low incomes.

### **Methods are a key issue**

The review discussed methodological issues for investigations of the connections between social status and transport disadvantage. The main methodological approaches of modelling, GIS and statistical manipulation were noted as being more appropriate to the macro-scale level of analysis. By comparison, qualitative methods, while providing a richer experiential and local scale perspective on issues of transport disadvantage are often resource intensive and difficult to generalise beyond their local context, depending on the specific conditions present.

The review identified a need to address issues of spatial scale in research on social status and transport disadvantage, and to both develop methodologies that can operate at multiple spatial scales, particularly the meso-scale, as well as undertaking research that combines methodological approaches to reveal different dimensions of the transport access and disadvantage problem. While the review itself did not specifically identify an exemplar means of advancing this objective, the broader research project of which it is a component has a specific intent of further developing such methodologies.

### **Numerous questions remain unanswered**

Finally the Research Monograph has identified a series of research questions which could potentially be deployed in research into social status and transport disadvantage. These research questions ranged from issues of clearly comprehending the dimensions of urban change that determine and affect social outcomes, to interrogating the capacity of the transportation system to deliver affordable and adequate transport to all urban residents. The review also identified a need to examine the institutional arrangements of transport provision to consider whether these are adequately constituted so as to take account of the relationship between social status and transport disadvantage.

There are substantial gaps and voids in the research record on issues of the spatial distribution of social status within metropolitan areas and the capacity of transport services to ameliorate or exacerbate socio-economic disadvantage. It is hoped that the project of which this Research Monograph is a component will contribute to furthering understanding and promoting policy awareness of the importance of these issues.

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