

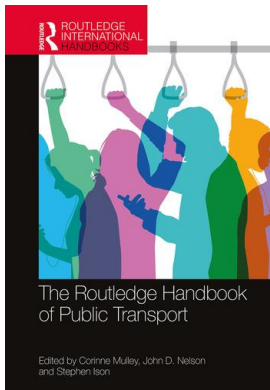
This article was downloaded by: 10.2.97.136

On: 22 Mar 2023

Access details: *subscription number*

Publisher: *Routledge*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: 5 Howick Place, London SW1P 1WG, UK



## The Routledge Handbook of Public Transport

Corinne Mulley, John D. Nelson, Stephen Ison

### Public transport and social inclusion

Publication details

<https://test.routledgehandbooks.com/doi/10.4324/9780367816698-30>

John Stanley, Janet Stanley

**Published online on: 13 May 2021**

**How to cite :-** John Stanley, Janet Stanley. 13 May 2021, *Public transport and social inclusion from: The Routledge Handbook of Public Transport* Routledge

Accessed on: 22 Mar 2023

<https://test.routledgehandbooks.com/doi/10.4324/9780367816698-30>

**PLEASE SCROLL DOWN FOR DOCUMENT**

Full terms and conditions of use: <https://test.routledgehandbooks.com/legal-notices/terms>

This Document PDF may be used for research, teaching and private study purposes. Any substantial or systematic reproductions, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The publisher shall not be liable for an loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

## 26

# PUBLIC TRANSPORT AND SOCIAL INCLUSION

*John Stanley and Janet Stanley*

### Introduction

Transport policy, like policy in most spheres of governmental endeavour, encompasses issues to do with both efficiency and equity. Trade-offs between the two are a frequent decision-making challenge. In public transport (PT), for example, should services aim to maximise patronage, an efficiency objective, or should they focus more on providing travel opportunities for people experiencing some form of transport disadvantage? This chapter seeks to provide an understanding of the equity perspective, an emerging field of research endeavour.

Public transport service provision is sometimes described as having the characteristics of a *merit good*, which Stopher and Stanley (2014, p. 24) describe as:

one which society, through its political processes, has decided should be provided on the basis of considerations of need rather than ability and willingness to pay. The good is provided in the private market place, but there is a social decision to ensure some base level is available, irrespective of individual preferences or circumstances.

There are two aspects of the merit good argument. First, recognition that if provision of this good is left solely to the private marketplace, some people will consume or use less of it than is in their best long-term interest, perhaps because they cannot afford more. Second, this lower level of consumption/use by a significant number of people is then recognised as leading to lower levels of personal and wider societal wellbeing. Education is perhaps the best-known example of a merit good, where higher levels of education than might result if this was left solely to the private marketplace are seen as being good for both the individual and for the society.

For societies that place a value on social inclusion, recognition that poor mobility opportunities may increase the risk that some people will be socially excluded often leads to subsidisation of public transport services as a form of social safety net. Targeted fare concessions are also often used to support mobility opportunities for particular groups, such as young or older persons, who may otherwise be at risk of mobility-related exclusion.

Over the past two decades, understanding of social exclusion and its relationship with mobility has increased considerably, particularly stimulated by the work of the UK Social Exclusion Unit (SEU, 2003) and by multidisciplinary research in Europe (e.g. Mollenkopf et al., 2005) and

Australia (e.g. Currie, 2011; Stanley et al., 2011). In the latter research, factors such as social capital and psychological wellbeing were added to the analysis of mobility. A good understanding of social inclusion/exclusion is fundamental to thinking about how the value of public transport services can be enhanced, including in a future world in which the nature of (some) public transport services may change significantly (e.g. associated with evolution of autonomous vehicles).

The next section of this chapter explores the concept of social inclusion and discusses its relationship to the ability to be mobile and to access opportunities. It identifies a number of other factors that also support inclusion, considers their connection to mobility/accessibility and illustrates how econometric analysis has been used to impute monetary values to (some of) the respective contributions.

The chapter then examines the roles that public transport systems play in cities and regions and identifies the expected benefits from service provision, with a focus on low-density cities in developed economies. *Mass transport (trunk) services* are distinguished from *social transport (local) services*, the chapter arguing that social inclusion benefits are most likely to arise from the latter. In a time of scarce governmental funding, it is the less-patronised social transport (local) services that are often at most risk of being cut ('rationalized'). Understanding the potential personal and societal consequences of such decisions is important to informed decision-making and to public transport policy and planning more broadly.

The chapter then identifies ways in which public transport might effectively support social inclusion, in terms of availability, accessibility and affordability. This is followed by discussion of how the development of autonomous vehicles (AVs) might impact public transport services and whether this might put the role of PT in supporting social inclusion at risk. Social inclusion is potentially a significant benefit from penetration of AVs into the vehicle fleet. However, social transport is probably the most at-risk PT market segment, in terms of future competition from AVs as a means of providing shared mobility. The chapter finishes with a summary of its main conclusions in terms of shaping policy to protect those at most risk of mobility-related exclusion.

### **Social inclusion and the role of mobility**

To understand the potential role of public transport in supporting social inclusion, it is important to understand the way some fundamental concepts are defined and relationships explored. Social inclusion is defined here as the ability to participate in mainstream society; social exclusion is its obverse. The majority of people in an industrialised society have the capabilities and access to resources to facilitate their inclusion. However, particular groups of people remain at risk of social exclusion, such as those with limited education and on a low income, those in poor health and with a disability, people who are geographically isolated and some disadvantaged youth and older people. Social exclusion tends to become self-reinforcing when the only affordable living locations are those with the poorest infrastructure, services and job opportunities. Thus, social exclusion is in large part an issue of public policy and planning for the availability of the means for people to be included through the provision of infrastructure and services. It is an issue of social justice and improving society as a whole for all people.

The most comprehensive study of relationships between mobility, social inclusion and wellbeing was a major research project undertaken around a decade ago in Victoria, Australia (Currie, 2011). The findings were based on linked travel surveys and in-depth interviews held in over 1,000 households in rural and urban locations. Mobility was viewed broadly. In terms of the statistical analysis discussed in this chapter, it was defined as number of trips undertaken, either by walking, cycling, public transport or motor vehicles.

Finding a measure of social exclusion, and of key variables thought likely to affect exclusion, is critical to progressing research on this subject. The Australian study drew on, but slightly modified, the mainstream work of Burchardt et al. (2002), who defined social inclusion as multidimensional. The Australian research measured social exclusion risk using the following five dimensions: income, employment status, political activity, social support and participation.

Survey respondents who failed any of the criteria, or thresholds, were thought relatively more likely to be at greater risk of social exclusion, with those who failed several criteria at greatest risk. Of the sample, 13.6% met three criteria, suggesting that they are at high risk of social exclusion. This proportion approximated the percentage of Australians defined as being in poverty between 1999 to 2015, which ranged from 11.5% to 14.1% (Davidson et al., 2018).

Participant *wellbeing* was measured using a personal assessment scale, the *Personal Wellbeing Index*, or PWI (International Wellbeing Group, 2013). It was also measured using an objective (not self-assessed) measure, the *Psychological Wellbeing Scale*, that measures eudaimonic wellbeing, which is the importance of life purpose and personal growth (Ryff, 1989).

The number out of the five possible social exclusion criteria that a person ‘failed’ (seen as a measure of the strength of the risk of social exclusion) was expected to be negatively related to that person’s household income, social capital, if they had an extraverted personality, and the person’s level of realised mobility (number of daily trips undertaken). These relationships were all found to be statistically significant and with the expected directions (Stanley et al., 2011), as illustrated in Figure 26.1.

The number of social exclusion criteria that a person met was then found to be significantly associated with self-assessed wellbeing (PWI). In other words, if you are at greater risk of social exclusion, you are also more likely to have lower wellbeing. A participant’s PWI rating was also found to be significantly associated with connection with community (stronger connection, lesser exclusion risk), three components of the objective (not self-assessed) wellbeing instrument (*Psychological Wellbeing Scale*) and, to a lesser extent, with other elements of that scale (Stanley et al., 2011; Vella-Brodrick & Stanley, 2013). In addition, those with lower PWI ratings were likely to have poorer levels of negative affect (stronger negative emotions, such as anger, fear, anxiety, sadness and depression) and lower levels of positive affect (joy, contentment, interest, engagement and pride). These relationships all confirmed and reinforced expectations about the likely impacts of social exclusion on at-risk people, which were key motivating factors in originally undertaking the research.

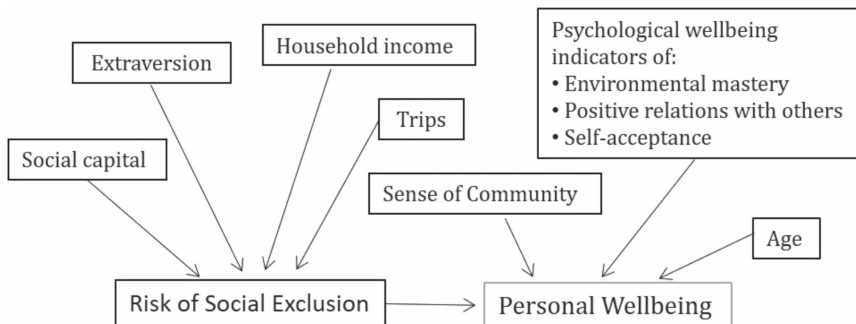


Figure 26.1 The drivers of social inclusion and wellbeing

Source: Based on key variables analyzed in Stanley et al. (2011)

The key point for this chapter is the strong associations found between the ability to be mobile, social inclusion and personal wellbeing. In summary, for a low level of social exclusion risk, a person needs to:

- have mobility (a means to access activities/people)
- have sufficient income (education and work available and accessible)
- have supportive personal relationships (be able to gain social capital) and be connected to the community
- feel good about themselves (self-esteem, confidence)
- feel in control over their personal environment (capabilities to make choices, problem-solve)

Many of these drivers of social inclusion and wellbeing are associated with the ability to participate in activities, underlining the importance of being able to access services and people through some form of mobility, linked to the idea of mobility as a merit good, along with (for example) health services and education.

As well as the personal impacts of social exclusion and low wellbeing, there is also a flow-on adverse impact on society, in terms of (for example) the impact of inequality and associated loss of productivity, additional health costs, a higher crime rate and so on. For example, the link between social exclusion and poor mental health found in this research is a general burden and financial cost to society. Pridmore et al. (2007) have shown a link between poor levels of social capital and poor physical and mental health and life expectancy after controlling for demographic and socioeconomic variables. Building social capital, especially bridging social capital that enables new important contacts with people, such as with employment opportunities, commonly requires mobility (Stanley et al., 2010).

### ***The value of improved mobility for social inclusion***

The Australian research included econometric analysis intended to impute a value to improved mobility as it relates to reducing risks of mobility-related exclusion. Stanley et al. (2011) estimated separate models of these relationships for the Melbourne sample and for a regional Victorian sample. Because the trip making and household income variables were each significant in both Victorian models, the ratios of the coefficients on trip making and household income can be used in each case to impute the marginal value of an additional trip in terms of reducing risk of social exclusion. The implicit marginal trip value was \$AUD24.40 in the Melbourne model and \$AUD17.20 in the regional Victorian model, both in 2008 prices. To put these values in context, median sample weekly household incomes at survey time were \$AUD237 and \$AUD219 respectively. These trip values are sufficiently close to give some comfort of their validity. Because the demand for travel is a derived demand, derived from the demand to undertake the activity for which travel is required, these values essentially measure the value of the activity that a person would undertake if they made an additional (or marginal) trip. These values varied inversely with income in both cases, such that higher unit values are applicable to people with lower household incomes (halving household incomes doubles the marginal value of an additional trip/activity).

Subsequent development of the regional model reduced the value of a marginal regional trip to \$AUD12.80 (from \$AUD17.20) but also suggested a high value for bridging social capital in reducing risk of social exclusion. If a person's bridging social capital could be increased from a medium range to a high range, as discussed in Stanley, Stanley et al. (2019),

this would be worth about \$AUD100 a day to the person in question. Building bridging social capital is, in turn, assisted by the capacity to be mobile (Vella-Brodrick & Stanley, 2013).

Unit values such as these, adjusted upwards from 2008 prices, can be used to estimate in money terms the contribution that public transport services, or improved services, might make to reducing risk of social exclusion by facilitating trip making or increased trip making (depending on context) by those at risk of mobility-related exclusion. Application of these values is most justifiable in an Australian setting. Repeating the research in other countries would be of great value for confirming the significance of social inclusion benefits. This research justifies a new benefit category for transport cost-benefit analysis, and applications beyond public transport are possible, because the values are not modally based: they apply to increased trip making, irrespective of mode.

The inverse relationship of the resulting values with household income levels means that it is important to identify the relevant expected beneficiaries and their household incomes. Also, the inclusion of bridging social capital values in the latest version of the modelling (Stanley, Stanley et al., 2019) indicates the importance of understanding the distribution of this variable among prospective beneficiaries and how improved public transport services can enhance bridging social capital. This is an important research opportunity.

## **Public transport and social inclusion**

### ***Public transport service markets and their benefits***

As noted in the Introduction, and recognising a risk of oversimplification, public transport services are primarily of two kinds: mass transport (or trunk) services, where the intent is largely to take people to or from their neighbourhood, and social transport (or local) services, which mainly take people around their neighbourhood (and may connect to services that will take them to/from their neighbourhood). Some services seek to perform both tasks, often to the detriment of both.

Public transport services sometimes operate on a fully commercial basis, where fares and other revenues fully recover costs of service provision, including a profit for the provider. However, the more usual financial context in a low-density developed country urban setting is one in which one or more levels of government provide some financial support to public transport to cover shortfalls in revenues. In Australia, the United States and Canada, for example, operating cost recovery rates for urban public transport services of between 20% and 60% are common (Stanley, 2014), whereas many PT services in the United Kingdom outside London, and informal transport services in developing countries, need to operate largely from the farebox.

Fare revenues that are captured by PT service providers reflect *benefits* that service users expect to receive from travel.<sup>1</sup> Governmental support for service provision should be predicated on wider benefits that government expects will flow from the service. These wider benefits are of two main types:

- benefits that are expected to accrue to the wider society, known as *external benefits* (or costs, if negative), and
- benefits expected to flow to some system users through the merit good principle. This category of benefit accrues to the user but would not exist in the absence of governmental support for service provision.

External benefits are largely associated with public transport trunk services, which are usually provided for mass travel to relatively dense destinations, the main external benefits being agglomeration economies, congestion cost savings and lower environmental costs. Heavy rail, light rail/tram and bus rapid transit are major ways of providing trunk or mass transport.

*Merit good benefits* are essentially about local (social) transport, because such services are primarily about enabling people to access the opportunities available in their community, which supports their social inclusion. The benefits that governments should expect from supporting local public transport services are thus essentially to do with merit good arguments about increased social inclusion. Relevant unit values, which are significant, were discussed in the preceding section of this chapter.

Local or social transport services are unlikely to directly generate local agglomeration economies, congestion savings or environmental benefits of any significant magnitude, since local trips tend to be short and on uncongested roads at most times. However, to the extent that these services are used to access trunk mass transport services, there are likely to be some external benefits associated with use of the trunk services that are accessed.

Importantly, increased social inclusion may be associated with external (flow-on) benefits, such as lower health system costs and reduced costs of crime, as the personal circumstances of some hitherto excluded people are improved. We are not aware of any studies that have systematically measured such flow-on benefits in a way that would permit their application in cost benefit analysis. However, research undertaken for the UK's Urban Transport Group on the benefits of bus services recognises the probability of such flow-on benefits and elaborates on specific examples of public agencies (e.g., health, education) whose activities and budgets can be expected to benefit from well targeted bus services (see, for example, Fuller, 2019; Abrantes et al., 2013).

More broadly, *all PT services* that attract people out of cars may realise safety benefits and health benefits, the latter flowing (for example) from increased incidental exercise. As an illustration, the journey to work by a typical Melbourne car user involves less than 10 minutes incidental daily exercise associated with the work trip, whereas a PT user gets around 40 minutes, which meets normal daily requirements for healthy living (National Heart Foundation of Australia, 2014).

The societal contexts and associated expected benefits of trunk (mass) and local (social) transport services are thus different in many ways. The discussion about operating environments that follows, which explores the differences between these two types of service in more detail, is most applicable to conditions in low-density developed countries such as Australia, Canada and the United States, although much of the policy discussion has wider application.

### ***Ridership versus coverage***

The key public transport market distinction is often described as being a choice between pursuing *ridership* via mass transport service versus *coverage* via local transport. Figure 26.2 illustrates some of the key characteristics of urban structure that have been shown to affect PT patronage and car use (Ewing & Cervero, 2010) and explores how these are likely to relate to mass and social transport services.

In outer urban (and regional) areas, land use density and mix (diversity) are usually relatively low but distance from a city's central business district (CBD) is relatively high (shown in reciprocal form in Figure 26.2 as  $1/\text{Distance from CBD}$  being low). This is a relatively poor market for mass transport services, so PT connectivity will usually be relatively poor. PT service characteristics in this spatial setting are typically relatively low service frequency levels, short spans

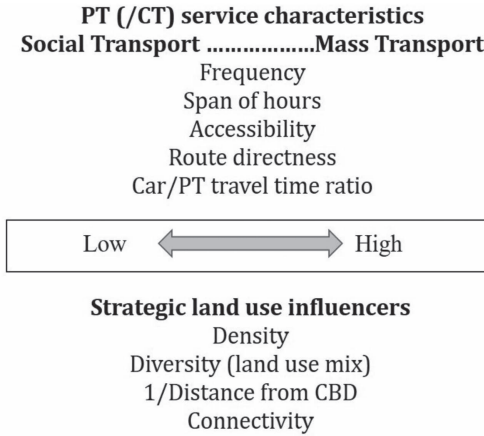


Figure 26.2 Aligning PT service with land use

Source: Based on Stanley, Hensher et al. (2019)

of operating hours, less direct routes and relatively poor travel time compared to car (including access/egress/wait/transfer stages). This is where social transport needs are likely to be, in relative terms, at their highest, given the tendency for land prices in such locations to be relatively low and attractive to lower-income households, often young families.

Accessibility is typically poorer in lower-density areas, in both the sense that PT stops may be less accessible than in better-served areas and in the broader sense that fewer access opportunities will be available by PT within any given travel time. As distance from the fringe reduces (i.e., the CBD becomes closer), densities increase, land use diversity (mix) typically increases and PT connectivity improves, because this is where mass transport services are most common, operating at higher frequency, over longer operating hours and with more direct routes. PT door-to-door travel time improves somewhat relative to that by car. Social transport needs in more inner locations will exist but are likely to be relatively less prevalent than in outer areas because of higher household incomes in more accessible locations and because many travel needs of those at risk of mobility-related social exclusion will be met by mass transport services in such locations.

PT operating cost per passenger and per passenger kilometre tend to be relatively lower for mass transport services, where scale economies are most likely, and higher for the social transport service, recognising that different PT modes may perform some or all these respective services. Thus, for example, Victorian 2016–17 Budget Paper No. 3 (DTE, 2016) suggests that 2015–16 Melbourne public transport costs, mainly operating, were \$AUD5.28 per passenger for bus (of which perhaps one fifth is capital cost), \$AUD3.35/passenger for train (operating payments for metropolitan train services) and \$AUD1.06/passenger for tram (operating payments for tram services). Buses mainly operate in outer areas with relatively more focus on service coverage, whereas train and tram are mass transport modes. Conversely, however, capital costs for mass transport, particularly rail and tram/light rail, are very high relative to social transport, for reasons such as the high cost of land acquisition and/or tunnelling (purchase/construction of dedicated right-of-way), fleet costs and signalling systems. For example, Melbourne’s Metro Rail Tunnel project alone has an estimated cost of \$AUD11 billion, and total current committed rail capital works are around \$AUD30 billion, none of which is reflected in the \$AUD3.35/passenger cost for rail cited previously.



Public transport service provision frequently confronts a trade-off choice between pursuing patronage and service coverage. Providing mass transport services, which tends to have relatively low operating costs per passenger kilometre, caters to large numbers of users and delivers external economic and environmental benefits, though the capital cost of new services is likely to be very high (see also Chapter 32). On the other hand, a focus on pursuing service coverage aims to support social inclusion and the benefits associated therewith, but boarding rates per service kilometre tend to be low and costs per kilometre, per passenger and per passenger kilometre tend to be high. Under funding pressures, governments often favour mass transport services, sometimes cutting local transport services, but high capital/borrowing costs might be involved in adding mass transport capacity (easier at times of low borrowing costs). Such choices need to be informed by analysis of the costs, or foregone benefits, associated with the changes that are contemplated and by opportunities that may be available to improve the performance of local transport services.

The *PT service characteristics* box in Figure 26.2 lists several levers that can be changed in the short term. The extent to which they might improve boarding rates on local transport is a matter for detailed local examination. For example, some Melbourne case studies have shown how extending bus operating hours into the evening can increase boarding rates on earlier bus services, as people have a greater chance of travelling in both directions by PT (Loader & Stanley, 2009).

### ***Target boarding rates for a regular local public transport (route bus) service***

Using the values of additional trip making as a factor supporting reduced risk of mobility-related social exclusion, as summarised earlier in this chapter, Stanley, Stanley et al. (2019) estimated that a local bus service boarding rate of 6–7 persons per hour in regional Victoria would be sufficient for that service to break even on the monetary value of the expected social inclusion benefits, given that the large majority of users of those services would be in the at-risk category (primarily older persons, students and people without a car available). Stanley and Hensher (2011) estimated a boarding rate of 10–11 per service hour for Melbourne route bus services for break-even on social inclusion grounds, also including associated congestion cost savings benefits. They argued that about one third of local route bus users in Melbourne would be at risk of mobility-related social inclusion.

It is interesting to look at patronage expectations that appear to be built into Vancouver, BC, bus services as a reflection on how policy makers in that jurisdiction may view low-patronage services. Examination of boarding rates across a large number of Vancouver bus services shows that the lowest average boarding rate per revenue hour is 3, with a number of other services averaging 10 or fewer boardings per revenue hour. Boarding rates of about 6–7 per revenue hour seem to be the lower bound that is commonly recognised as adequate for a service, with about half a dozen services averaging boarding rates around this level across Greater Vancouver (out of 217 services). It is notable that all the services with low average boarding rates use mini-buses for service provision, and all have average costs per boarding of around \$CAN10 or higher, with the highest rate being \$CAN22.35 (2018 prices) These numbers provide some insight into implicit minimum local transport boarding levels that are seen as needed to support social inclusion in Vancouver.

In short, the value of additional trip making by people at risk of social exclusion is high to those persons. These high values should be recognised in service policy making and planning, particularly when service rationalisation of low-patronage services is contemplated and when planning new greenfield services. Flow-on external benefits from reduced social exclusion will

add to the societal benefits of such services, suggesting that the break-even boarding rates cited previously might be lowered somewhat.

### ***Planning for mobility-related social inclusion***

The *Strategic land use influencers* box in Figure 26.2 suggests some of the planning levers that might be used to improve the economic and financial performance of local transport. These are all essentially longer-term levers but can make a difference to patronage levels on local transport services over time or more quickly in new urban developments.

While it is not possible to alter the distance of an existing neighbourhood from the CBD, development of a polycentric urban form may have a similar type of impact on improving service economics in larger cities. This is most likely to be associated with the other three elements in Figure 26.2. Population and job densities are usually both significantly associated with public transport boarding rates, though elasticity values are relatively low (Ewing & Cervero, 2010). However, most reported elasticities come from the United States. Higher values might be expected in settings with higher starting densities.

### **Some practicalities of effective public transport service delivery for inclusion**

The preceding sections have argued why public transport can play an important role in reducing risks of mobility-related social exclusion. The extent to which this opportunity might be realised depends substantially on how services are delivered, with matters of availability, accessibility and affordability being central.

#### ***Availability***

If public transport services are to support social inclusion, then some of the key service characteristics noted in Figure 26.2 need to be planned specifically to achieve this intent. Service availability, in terms of (for example) proximity to households, frequency of service and the span of service hours, is important. Walk distances to local public transport are usually regarded as being a maximum of 400–500 metres, with longer walk distances being acceptable for premium trunk services. Service frequencies and operating hours then need to be sufficiently attractive to reduce pressures on at-risk households that push their household budgets into a marginal car purchase, sometimes known as ‘forced car ownership’ (see Currie & Senbergs, 2007). Headways of 20–30 minutes, over 18 or so service hours a day, seem likely to be the minimum needed to provide a serious level of support for mobility-related social inclusion. In an Australian regional setting, the threshold boarding rate of 6–7/hour can be used as a guide to whether there is adequate patronage to support this service level by a regular PT service in a regional city, or 10–11/hour in a metropolitan setting. If this is not met for significant time segments, then alternative delivery methods to support inclusion may be necessary, which is likely to be less effective at supporting inclusion but have a lower total cost (but probably a higher cost per passenger).

#### ***Accessibility***

In the current context, accessibility means that the PT service that is provided to support social inclusion can be easily used by at-risk people, who may (for example) be persons with a disability or persons whose first language is not the local language. Thus, to illustrate for physical

accessibility, universal access measures such as safe wheelchair and child stroller spaces on board vehicles, access ramps, kneeling buses, stops with shelter, cues that assist waiting and boarding and the like should all be fundamental expectations. This extends to matters such as the quality of footpaths for accessing PT stops – where easy wheelchair accessibility should be available, recognising the challenges of terrain. The failure to meet universal access standards will exclude some people from the mobility support for inclusion that the service is intended to provide.

There is a growing body of research on valuation of a range of public transport service characteristics that impact the customer experience. De Gruyter et al. (2018), for example, present a meta-analysis of studies on customer amenity valuations, most depending on stated preference analysis or simpler customer ratings. While this research is only in its infancy, it should be of assistance in helping service providers tailor services more finely to their customers' expectations, including those at risk of mobility-related exclusion, and assisting governments in shaping their contractual expectations about service standards from contracted providers.

### ***Affordability***

Affordability here has two meanings: affordability to the person at risk of mobility-related exclusion and affordability to the government authority tasked with financially supporting the PT service. We deal with them in this order.

Low income is a common contributory factor towards social exclusion. If PT is to be used to reduce risks of mobility-related social exclusion, then fares need to be affordable. Fare discounts are commonly used to support some categories of user, such as older persons, students and persons with a disability, significant numbers of whom would be at increased risk of exclusion in the absence of this support.

The affordability of fares that are levied on users will, in turn, be assisted by PT service delivery costs being kept at efficient levels, such that governmental subsidy requirements are not unnecessarily inflated. There are many ways this can be assisted.

Operating costs for local PT services, which are usually local route bus services, are affected by many variables. Some of the key cost-influencing factors include:

- whether the service is provided by a government agency or a private provider, with private providers usually having lower operating costs, though the prospective cost difference may sometimes be only marginal (Wallis & Hensher, 2007), and
- if service provision is by the private sector with governmental financial support, the nature of the arrangement under which that support is provided will usually affect the costs of service provision (Merkert et al., 2018).

Service delivery contracts need to ensure performance pressure is applied to PT service providers to increase patronage and to operate an efficient and effective service. This usually means incentive and penalty clauses in the contract linked to both patronage and service quality. Hensher (2015a) sets out some useful service quality performance indicators in his Customer Service Quality Index. Competitive tendering for the rights to provide service is commonly used as a means of applying performance pressure on operators, but Hensher and Stanley (2010) and Hensher (2015b) have argued that negotiated performance-based contracts can be equally effective in terms of applying performance pressure to keep costs at an efficient level.

With labour being the single largest operating cost for providing local PT services, ways to substantially reduce labour costs are matters that operators need to keep under constant review. The introduction of autonomous vehicles is a major wildcard here.

## Risks to local public transport from autonomous vehicles<sup>2</sup>

Changing societal values and emerging new technologies are increasing the probability of large shifts in transport service offerings in coming decades, with potentially huge benefits and/or costs. Autonomous vehicles and, more particularly in a warming world, autonomous electric vehicles (AEVs) have been the primary focus of this discussion internationally, with their potential to provide service to socially excluded people often being claimed as a major prospective benefit. In terms of public transport service provision, where labour costs can constitute half or more of total operating costs, the opportunity to remove labour costs with autonomous operation poses big questions for the future of public transport as we know it today.

The high capital costs and associated high patronage of (radial) rail mass transport services to central cities and to other major activity clusters in the larger cities provides them with significant natural monopoly characteristics, which suggests that multiple sources of supply are unlikely.<sup>3</sup> The external benefits associated with rail services, for example, are often very large and speak to the importance of strong governmental control over service provision. These natural monopoly characteristics and external benefits are such that, in coming years, the mass (trunk) transport market in most developed country urban settings is likely to remain as some form of mass public transport as we currently understand it.

Local or social transport services can be provided by smaller units than mass transport services, which makes them more open to competition from a new shared mobility provider than is the case with mass transport. It is these local social transport services (mainly local fixed-schedule route bus services) that are most likely to face intense competition from expanded personal travel opportunities offered through emerging and future shared autonomous mobility services, probably packaged under Mobility as a Service (MaaS) offerings (see also Chapter 3). Significantly, the valuable social inclusion benefits from local or social transport are also likely to be available from an alternative form of local mobility provision, at least to some extent; they are not unique to local bus services. It thus comes down to who can provide an adequate level of social (local) transport-like service most effectively, efficiently and sustainably.

If social inclusion is seen as a societal priority, then, in a future that includes autonomous vehicles, provision of some base level of shared mobility service to support or underwrite social inclusion still seems warranted to ensure that minimum local mobility opportunities are available to 'at risk' people. Stanley, Hensher et al. (2019) suggest that *local shared mobility contracts* could be developed to support such service provision, which would be expected to vary by demographic/land use setting. For example, expectations should realistically be for a lesser service level in a rural area than in a town. Requisite minimum service levels need to be set out in service contracts and might be expressed, for example, in terms of:

- seat kilometres to be supplied per time period/spatial setting, where time periods and spatial settings are specified, and/or
- the maximum wait time for a demand-responsive service, within specific locations and time periods.

Any such clauses would require mechanisms to be in place (e.g., bonuses, penalties) to help ensure compliance.

In the interests of more efficient, integrated service delivery at minimum call on the public purse, shared mobility service contracts should strive to be as broad as possible, generally seeking to encompass route-type PT services, school services and community transport service offerings, together with taxis, other ride-sharing modes and bike-sourcing. This implies a need for

restructuring flows of public funds that currently support such varied services to ensure integrated service planning and provision on a spatial basis.

### **Risks to public transport from a pandemic**

The uncertainty of a pandemic, such as COVID-19, in terms of occurrence, impact and society's ability to control the spread of the disease leads to uncertainty about the longer-term impact on public transport. There is likely to be an elevated risk for people experiencing mobility-related social exclusion, due to an increased probability of reduction in local bus services, associated with the relatively higher cost of this service per traveller. This risk is amplified to the extent that there is a policy failure to recognise the wider societal benefits of local transit, such as lower health costs, reduced need for welfare payments and improved personal wellbeing. Other shared mobility modes may also be at risk, being less appealing during a pandemic for those who do not wish to travel in close proximity to another. Exclusion risks will again arise.

### **Conclusions**

This chapter has emphasised the distinction in public transport service provision between mass (trunk) transport and social (local) transport and explained how the public policy basis for governmental funding support for each of these service types is different. Mass transport is essentially about direct user benefits plus external benefits, such as agglomeration economies, congestion cost savings and environmental benefits. In contrast, social transport is about supporting inclusion of those at risk of mobility-related exclusion, which the chapter has argued should be treated a merit good. Australian research has shown high values to the at-risk person. Similar research should be encouraged in other settings and would add much value to understanding of the social inclusion benefits of transport and public transport.

Social transport services are also expected to generate external benefits from flow-on impacts of increased social inclusion, such as a lower crime rate/crime costs, reduced health care costs and lower unemployment benefits. Quantification of such social transport externalities has made little progress compared to valuation of external benefits of mass transport. This unequal state of understanding of service societal benefits is likely to bias resource allocation towards support for mass transport services and away from social transport. Research on the nature and magnitude of the external benefits of social transport should be a high priority.

Social transport is likely to experience considerable pressure in coming years from the introduction of autonomous vehicles. While the timing and scale of impact are uncertain, the chapter suggests that policy measures should be put in place to prepare the ground for this evolution, with a focus on protecting those at risk of mobility-related exclusion. Shared mobility contracts are suggested as one way forward here, implying (among other things) a shake-up in existing fragmented funding flows that are often in place to support different forms of local public/community/school transport.

### **Notes**

- 1 Fares are usually a low estimate of expected benefit due to the existence of consumer's surplus, which is equal to the difference between the expected monetary value or benefit from the trip to the traveller and the fare paid.
- 2 This section draws heavily on Stanley, Hensher et al. (2019).
- 3 Although vertical separation of track and services can be used to reduce the degree of natural monopoly.

## References

- Abrantes, P., Fuller, S., & Bray, J. (2013). *The case for the urban bus: The economic and social value of bus services in the metropolitan areas*. Public Transport Executive Group (PTEG). Retrieved January 29, 2020, from [www.urbantransportgroup.org/resources/types/reports/case-urban-bus-economic-and-social-benefits-investing-urban-bus](http://www.urbantransportgroup.org/resources/types/reports/case-urban-bus-economic-and-social-benefits-investing-urban-bus)
- Burchardt, T., Le Grand, J., & Piachaud, D. (2002). Degrees of exclusion: Developing a dynamic, multidimensional measure. In J. Hills, J. Le Grand, & D. Piachaud (Eds.), *Understanding social exclusion* (pp. 30–43). Oxford University Press.
- Currie, G. (Ed.). (2011). *New perspectives and methods in transport and social exclusion research*. Emerald Publishing Limited.
- Currie, G., & Senbergs, Z. (2007). *Exploring forced car ownership in metropolitan Melbourne*. 30th Australasian Transport Research Forum.
- Davidson, P., Saunders, P., Bradbury, B., & Wong, M. (2018). *Poverty in Australia, 2018, ACOSS/UNSW. Poverty and Inequality Partnership Report No. 2*. ACOSS.
- De Gruyter, C., Currie, G., Truong, L., & Naznin, F. (2018). A meta-analysis and synthesis of public transport customer amenity valuation research. *Transport Reviews*, 39, 261–283.
- Department of Treasury and Finance (DTF). (2016). *Getting it done: Victorian budget 16/17, service delivery*. Budget Paper No. 3. Retrieved August 25, 2020, from <http://budgetfiles201617.budget.vic.gov.au/2016-17+State+Budget+-+BP3+Service+Delivery.pdf>
- Ewing, R., & Cervero, R. (2010). Travel and the built environment. *Journal of the American Planning Association*, 76(3), 265–294.
- Fuller, R. (2019). *The cross-sector benefits of backing the bus*. Urban Transport Group. Retrieved January 29, 2020, from [www.urbantransportgroup.org/resources/types/reports/cross-sector-benefits-backing-bus](http://www.urbantransportgroup.org/resources/types/reports/cross-sector-benefits-backing-bus)
- Hensher, D. (2015a). Customer service quality and benchmarking in public transport contracts. *International Journal of Quality Innovation*, 1(4). doi:10.1186/s40887-015-0003-9
- Hensher, D. (2015b). Cost efficiency under negotiated performance based contracts and benchmarking. *Journal of Transport Economics and Policy*, 49(1), 133–148.
- Hensher, D. A., & Stanley, J. (2010). Contracting regimes for bus services. What have we learnt after 20 years? *Research in Transportation Economics*, 29(1), 140–144.
- International Wellbeing Group. (2013). *Personal wellbeing index* (5th ed.). Australian Centre on Quality of Life, Deakin University. Retrieved January 31, 2020, from [www.acqol.com.au/instruments#measures](http://www.acqol.com.au/instruments#measures)
- Loader, C., & Stanley, J. (2009). Growing bus patronage and addressing transport disadvantage – The Melbourne experience. *Transport Policy*, 16, 106–114.
- Merkert, R., Preston, J., Melkersson, M., & Linke, H. (2018). Workshop 2 report. Competitive tendering and other forms of contracting out; Institutional design and performance measurement. *Research in Transportation Economics*, 69, 86–96.
- Mollenkopf, H., Marcellini, F., Ruoppila, I., Szeman, Z., & Tacken, M. (Eds.). (2005). *Enhancing mobility in later life: Personal coping, environmental resources, and technical support. The out-of-home mobility of older adults in urban and rural regions of five European countries*. IOS Press.
- National Heart Foundation of Australia. (2014). *Blueprint for an active Australia*. National Heart Foundation of Australia.
- Pridmore, P., Thomas, L., Havemann, K., Sapag, J., & Wood, L. (2007). Social capital and healthy urbanization in a globalized world. *Journal of Urban Health: Bulletin of the N.Y. Academy of Medicine*, 84(1), 1130–1143.
- Ryff, C. (1989). Happiness is everything, or is it? Exploration on the meaning of psychological wellbeing. *Journal of Personality and Social Psychology*, 57, 1069–1081.
- Social Exclusion Unit. (2003). *Making the connections: Final report on transport and social exclusion*. Retrieved August 25, 2020, from [https://webarchive.nationalarchives.gov.uk/+/www.cabinetoffice.gov.uk/media/cabinetoffice/social\\_exclusion\\_task\\_force/assets/publications\\_1997\\_to\\_2006/making\\_transport\\_2003.pdf](https://webarchive.nationalarchives.gov.uk/+/www.cabinetoffice.gov.uk/media/cabinetoffice/social_exclusion_task_force/assets/publications_1997_to_2006/making_transport_2003.pdf)
- Stanley, J. K., Hensher, D. A., Stanley, J. R., & Vella-Brodrick, D. (2011). Mobility, social exclusion and well-being: Exploring the links. *Transportation Research A*, 45, 789–801.
- Stanley, J., & Hensher, D. (2011). Economic modelling. In G. Currie (Ed.), *New perspectives and methods in transport and social exclusion research* (pp. 201–222). Emerald Publishing Limited.
- Stanley, J. (2014). *Public transport: Funding growth in urban route services* (Bus and Coach Industry Policy Paper 3). Bus Industry Confederation. Retrieved April 13, 2020, from [www.movingpeople.com.au/solutions-for-moving-people/bic-policies](http://www.movingpeople.com.au/solutions-for-moving-people/bic-policies)

- Stanley, J., Hensher, D., & Wong, Y. (2019). *Moving people in the future: Land passenger transport and 'new' mobility technology* (Bus and Coach Industry Policy Paper 11). Bus Industry Confederation. Retrieved April 13, 2020, from [www.movingpeople.com.au/solutions-for-moving-people/bic-policies](http://www.movingpeople.com.au/solutions-for-moving-people/bic-policies)
- Stanley, J., Stanley, J., Balbontin, C., & Hensher, D. (2019). Social exclusion: The roles of mobility and bridging social capital in regional Australia. *Transportation Research Part A*, 125, 223–233.
- Stanley, J., Stanley, J., Vella-Brodrick, D., & Currie, G. (2010). The place of transport in facilitating social inclusion via the mediating influence of social capital. *Research in Transportation Economics*, 29, 280–286.
- Stopher, P., & Stanley, J. (2014). *Introduction to transport policy: A public policy view*. Edward Elgar Publishing.
- Vella-Brodrick, D., & Stanley, J. (2013). The significance of transport mobility in predicting wellbeing. *Transport Policy*, 29, 236–242.
- Wallis, I., & Hensher, D. A. (2007). Competitive tendering for urban bus services – Cost impacts: International experience and issues. In R. Macario, J. M. Viegas, & D. A. Hensher (Eds.), *Competition and ownership in land passenger transport* (pp. 453–488). Elsevier.