Achieving the 20 minute city for Melbourne: Turning our city upside down.

Paper prepared for Bus Association Victoria
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1.   Context

Urban transport and land use planning have traditionally been 'top-down' activities, which start by identifying some loosely defined desired future state(s) for the greater urban area and work down to identify the key regional and corridor interventions that are needed to deliver this outcomes. The dominance of major transport infrastructure in city shaping is such that it is crucial for this planning process to start with a vision of desired future land use and then use transport to help deliver that outcome. All too frequently, however, the 'big transport projects' have a political life of their own and urban land use/transport integration becomes lost in the mire.

In more recent times, some limitations of the top-down approach have become increasingly apparent.[1] Most people live most of their daily lives locally, not city wide. Their wellbeing is therefore at least as much tied up in how well their local neighbourhood functions as it is in how the wider city functions. Both are important but one (the neighbourhood level) is rarely part of the urban land use/transport conversation or planning process. In fast growing cities like Melbourne, this emphasis on the local is particularly important, because infrastructure and services provision in outer growth suburbs lags well behind population growth, parodied somewhat by descriptions of new suburbs built with bus stops and shelters but no bus services!

A growing interest in the importance of neighbourhoods is also linked with a growing international trend for a shift from centralised systems to decentralised systems of service provision, in sectors such as energy, water, health and welfare services and, more recently transport (where it includes a growing interest in active transport and local initiatives such as the successful ConnectU social enterprise in Warrnambool, discussed later in this paper). This movement is partly underpinned by low levels of trust in senior levels of government and an increasing desire by people and communities to take more control over matters that affect their wellbeing (Selth 2014).

Localism, an expression of the shift in focus to the neighbourhood, has become an important political agenda in countries like the UK and Canada. Localism is viewed as a means of better meeting needs by viewing people holistically, rather than as a transaction, and resolving needs rather than offering a standardised service designed by people too far removed to hold the requisite knowledge to resolve the issue (Vanguard 2014). This means of service provision is effective as it resolves issues and achieves outcomes at the same time as building capacities rather than dependency. Local cooperation and integration of services between government, business, the third sector and the community also offers efficiencies, while at the same time developing leadership, local ownership and the opportunity to have greater flexibility and innovation in approach (Breeze et al. 2013; Blond 2010).

Melbourne has been a leader in drawing attention to the importance of neighbourhoods in urban land use/transport planning, particularly through the work of the Ministerial Advisory Committee appointed to advise the State Minister for Planning on the city's long term land use/transport strategy. A demonstration of the level of interest in neighbourhoods for urban and transport planning was provided by the 2012/13 consultation process for that plan. Of all the ideas discussed during the consultation process that was run by the Ministerial Advisory Committee, the idea that created most interest was that of the '20 minute city'. This was explained as a city in which most people would be able to undertake most activities needed for a good life within a 20 minute walk, cycle or public transport trip of where they lived. This idea had strong resonance with a wide range of stakeholders, many of whom

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[1] In addition to the problem of 'big transport projects' dominating the process.

queried exactly what it meant and how it might be delivered in their locality. The subsequent Plan Melbourne includes a chapter on liveable communities and neighbourhoods, which is unusual for long term city-wide strategies.

The reality is that much of inner and middle Melbourne would already meet the 20 minute city benchmark, because of widespread services availability and good public transport service offerings. The outer suburbs and parts of the middle suburbs are where achievement often falls short of the 20 minute benchmark. This paper looks at the idea of the 20 minute city in more detail than was presented in the Plan Melbourne work, to which both authors contributed. It focusses mainly on public transport requirements and urban densities that are likely to support achievement. With land use being slow to change in existing built-up areas, transport becomes a very important lever for taking action to accelerate achievement of a city that consists of a series of 20 minute cities, as well as a greater conurbation.

This paper offers some background thinking on what a 20 minute city encompasses. Section 2 explores the idea of neighbourhoods and explains why they are important. Section 3 discusses public transport service standards that are likely to support achievement of a 20 minute city and ways that patronage can be increased on local public transport services, which are essentially bus services. It also discusses active transport as important elements of neighbourhood accessibility. Section 4 considers built form and, in particular, the role that density plays in providing the foundations for an effective 20 minute city. The low densities that exist across much of Melbourne contributes to lower public transport boardings per service kilometre than in higher density locations and poses the question of the best way to provide 'public transport' in relatively low patronage settings. This is an important discussion that includes ideas for taking a more integrated approach to local 'public transport', the commas indicating that a broader conception of *public* transport is required. The section points out how very similar problems are currently being confronted in places such as Canada and the UK. Section 6 presents the paper's conclusions.

2.   The importance of neighbourhoods

Neighbourhoods are key building blocks to achieve a well-functioning city (Jacobs 1961). Meeting challenges necessitates the involvement of strong communities, capable of maintaining wellbeing while undergoing change. Strong communities arise from well-resourced and well-functioning neighbourhoods. Such neighbourhoods will be good for people, the environment and economic participation (Stanley et. al. 2014). All neighbourhoods need to offer the activities and social infrastructure to meet essential needs: personal wellbeing, mental health and social equity; a sense of place and belonging; participation and choice; and the ability to successfully adapt to external challenges. The ability to be mobile and be able to access friends, activities, government and business, is a requirement to achieve most such needs.

A 20 minute city requires a range of local activities and it requires local mobility choices, particularly safe walking/cycling opportunities and an adequate service level on local public transport (discussed in more detail in section 3). Good mobility opportunities and availabilities of local services and infrastructure can, in turn, most easily be provided where urban densities are planned for this purpose, thereby also reducing the need to travel (see section 4).

Once good local transport is established, household density at adequate threshold levels is in place and an adequate supply of the most common distributed services and recreational opportunities is locally available, the' 20 minute city' should be operational. The local community will gain benefits from improved accessibility, which will lead on to other benefits, such as facilitating a sense of place and a stronger local community, growth in social capital, and other health and wellbeing benefits from more active and included lifestyles. These outcomes can be further enhanced by attention to affordable housing, good urban design and architecture, attention to safe living, managing noise and pollution and provision of local opportunities to engage with nature, open space for children and recreational activities.

A major Victorian study supported by BusVic examined which factors are important in facilitating a person to achieve social inclusion and wellbeing (Stanley et al. 2011). Risk of social exclusion was measured using the following dimensions:

- household income
- employment status
- political activity in 12 months prior to interview
- social support available
- participation in community events in the month prior to the interview.

Modelling revealed (Figure 1) that 'adequate' levels of household income, trip making, social capital and attachment to community are all important for social inclusion; having an extrovert personality also helps. Social inclusion, in turn, is important for promoting personal wellbeing, as is environmental mastery (being able to manage personal space), good relationships with others and self-acceptance. A person is also more likely to achieve higher levels of wellbeing as they age.

Figure 1: The most critical factors to achieve social inclusion and wellbeing
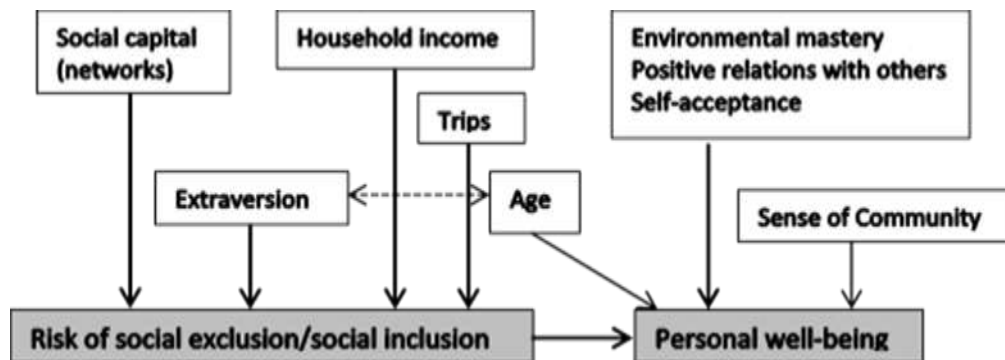

Source: Based on Stanley et al. 2011

The provision of a 20 minute city, which has high quality public transport and good active transport opportunities, will be particularly beneficial for people at risk of social exclusion and with low levels of wellbeing. Being included and having wellbeing then opens up other opportunities for people, such as increasing the likelihood of finding employment (if currently not employed). Trips both directly fulfil the need for wellbeing, as well as promoting need fulfilment achieved as a result of the access to resources that travel can foster (Vella-Brodrick and Stanley 2013).

Figure 2 expands the model shown in Figure1, suggesting how the drivers of social inclusion and wellbeing might be achieved, building on related research.

Figure 2: The role of transport in achieving the drivers of social inclusion and wellbeing
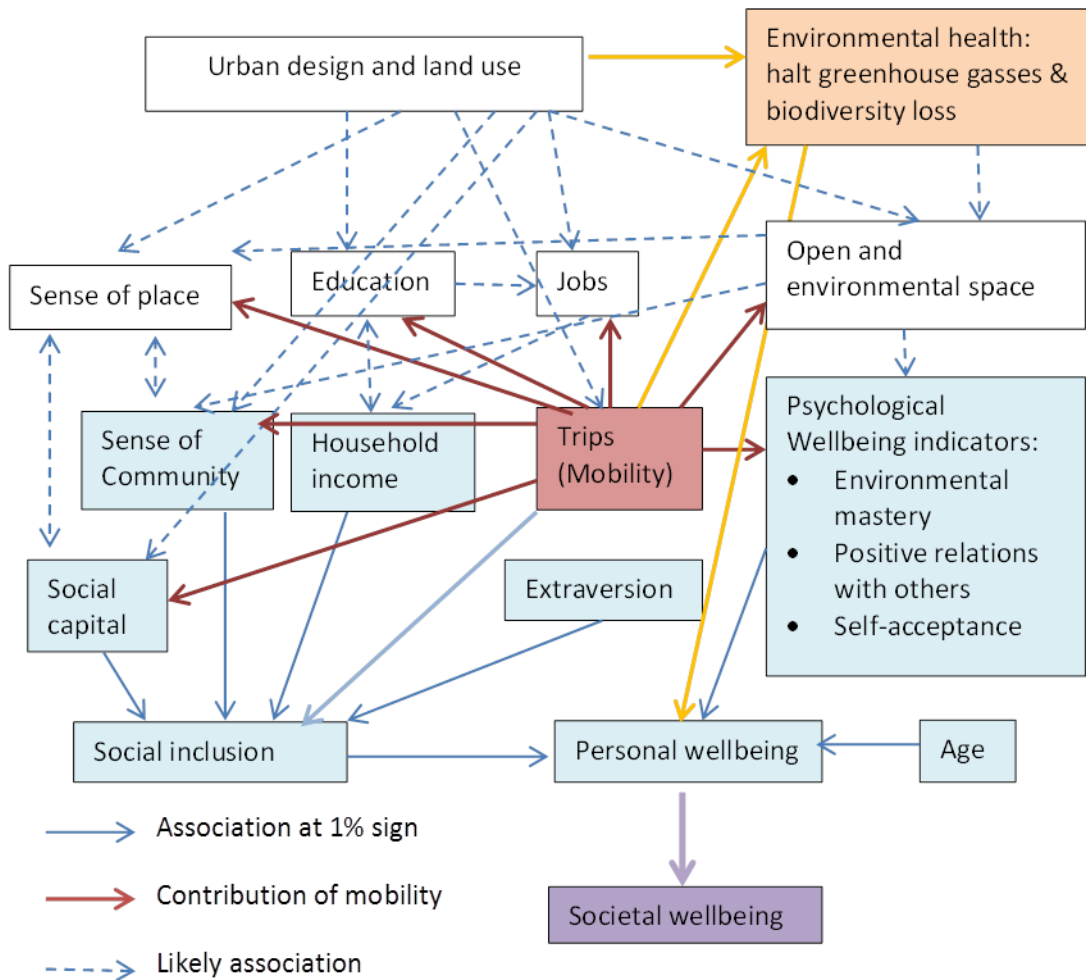
Transport is central to the role of achieving many of the identified outcomes which, in turn, leads to social inclusion and wellbeing. Thus, for example, without the ability to be mobile, it will be more difficult to obtain income, the education needed to obtain skills for a job, gain social capital and connection to community, build positive relations with other people and feel a sense of mastery of your environment (components which build these drivers, such as environmental amenity and sense of place, are also relevant). Modelling was undertaken to test the association between trips and the

psychological wellbeing indicators of environmental mastery, positive relations with others, and self-acceptance. It was found that transport mobility enhances wellbeing through the satisfaction of these inherent psychological needs (Vella-Brodrick and Stanley 2013). Neighbourhoods are where a major part of this fulfilment is achieved.

A person is thought less likely to be at risk of social exclusion when they are embedded in societal structures: family and friends, the community and society (Bronfenbrenner 1979), a theory shown to be supported by the model in Figure 1. In the literature, social capital is rarely linked with public transport and connections with community even less so, although Putnam notes an indirect association (reported in Urry 2000). He points out that two-thirds of car trips (in US) involve 'driving alone' and this is increasing, and that the time and distance of commuting is increasing, with the consequence that time is reduced for community engagement. He recommends we should aim for less travel time and better design of communities to encourage more casual socializing. Urry (2002 p.265) argues that co-presence is necessary, that mobility is '…central to glueing social networks together' and that the development of social capital depends on the range, extent and modes of mobility to prevent social exclusion. He talks about the need for co-presence for the development of trust, often defined as a component of social capital. The neighbourhood and idea of a '20 minute city' are at the heart of these conversations about wellbeing and social inclusion.

Mobility is particularly important for those at most risk of social exclusion. A substantial proportion of Melbourne people at high risk of exclusion reported they cannot do some activities because of transport problems. The most frequent activities nominated were enjoyment, getting out and about and sporting activities (Stanley et al. 2010). The value of these informal activities is greatly under-estimated by transport planners and by the community transport system, yet they appear to very important to people. When additional local bus services were provided in Pakenham, under the *Meeting our Transport Challenges* program, increased mobility was linked with feeling good about the community (Bell et al. 2006). Almost half the use of the new bus services was associated with leisure activities and socialising. 20% of passengers used the new services to reach community activities and sport, 16% to get to work, 8% for accessing health services and 8% for education. These activities build social capital and sense of community and, in so doing, promote inclusion and wellbeing.

While the definition of social capital varies, the most common version identifies social capital as comprising networks of people, trust and reciprocity. The network component of social capital can be disaggregated as:

- bonding capital - the extent of contact with close family, extended family, friends/intimates and neighbours, and
- bridging capital - the extent of contact with work colleagues and community groups (e.g. church, sporting, clubs, school, self-help or voluntary groups).

When this division was explored, it was found that trips are especially important for bridging social capital, but less important for bonding social capital (Stanley et al. 2010). When monetary values are applied, a unit increase in bonding social capital (as defined by Stanley et al. 2012) is worth about $37/day (or $13,500 p.a.) to that person, and a unit increase in bridging social capital (as defined) is worth about $43/day ($15,700 p.a.). These figures need to be treated with caution, due to assumptions made around this calculation, but they indicate the potential scale of benefit available from improving social capital. Greater confidence however can be given to the dollar value of connection to the

community, where a unit increase in a person's 'sense of community' (as defined) is worth about $60/day (or $22,000 a year) to that person.

The value of these connections to people and the community goes well beyond the dollar value for individuals. Improving an individual's social inclusion and wellbeing also benefits society as a whole. For example, gaining employment removes the cost to society of unemployment benefits. In addition, there are many other community costs forgone, such as in areas around health, mental health, substance abuse and family violence. There are also many benefits gained from a happy and healthy population, including increased volunteering and a population which is able to be innovative, responsive to emergencies, forward thinking and creative.

The way we are shaping our cities is also shaping life chances and is increasingly becoming a determinant of economic productivity. Both the quality and utilization of human capital will, in large part, depend upon how our cities facilitate citizens in being healthy and well educated, able to participate in the labour market and in social and civic life. Thus, a neighbourhood structure with good local and regional transport choices, is likely to promote many positive outcomes in terms of personal and societal wellbeing as well as cost effectiveness and increased economic productivity.

This analysis suggests that trip making is:

- a direct source of social inclusion and wellbeing
- an input in elements (such as income and connection to community) needed to achieve social inclusion and wellbeing
- important for maintaining and improving social inclusion and wellbeing
- a source of social capital in itself
- an important input in economic productivity.

Public transport is particularly important in this mix for people at risk of social exclusion and diminished wellbeing that results there-from.

Vancouver (British Columbia) and Portland (Oregon) have long recognised the importance of neighbourhood and a concept like the 20 minute city. That idea, we understand, had its genesis in Portland. Vancouver's land use/transport plans focus *inter alia* on achieving *complete communities,* with a more compact urban form a key element in delivery. That city has plans to lift the mode share for public and active transport from about 27% in 2011 to 50% by 2045 and to reduce average trip lengths for personal trips by 30% (Translink 2013). Increased densities, improved public transport service levels and better provision for active transport are all key elements in progressing towards these targets and achieving complete communities.

In short, neighbourhoods are fundamental building blocks for a strong and resilient community. If we get our neighbourhoods right, the city and its citizens and visitors will benefit and flourish. If we don't, then disadvantage will be further entrenched. How then, might Melbourne and other Australian cities go about delivering a city that consists of a series of connected 20 minute cities or neighbourhoods? We examine this primarily in terms of actions that can be taken in the transport sector and in the built environment, with additional and complementary suggestions about social infrastructure and environmental improvements.

3. Public transport service requirements

3.1 Minimum service levels

Following language introduced by Jim Betts when Director of Public Transport in Victoria, public transport services can be broadly classified as *mass transit*, where the emphasis is on longer distance trunk movements, and *social transit*, where the focus is on providing a social safety net local access service, with connection to trunk services. Mass transit is about getting *in and out* of your neighbourhood; social transit is about *getting around* your neighbourhood. Mass transit is primarily about bums on seats, whereas social transit is more focused on whose bums, with a particular concern about social inclusion, which Victorian research has demonstrated has very high value per trip (Stanley et al 2011, 2012).

The current Public Transport Victoria interest in concentrating services increasingly in the trunk movement category risks accentuating problems of social exclusion, a trade-off problem that is currently exercising the minds of transit providers in Toronto (at Metrolinx) and Vancouver (at Translink) and with whom the current authors have recently discussed this trade-off. Stanley and Hensher (2012) have shown that **boarding rates of about 8 passengers per service hour are sufficient for an economically warranted local bus service in Melbourne, recognising the substantial social inclusion value**. Metrolinx and Translink in Canada are currently both considering possible application of the Melbourne research to their cities. In section 4 we discuss development densities that should support consistent achievement of this boarding rate, or higher.

To provide a social safety net service for social inclusion purposes in middle and outer suburban Melbourne, where the greatest needs exist with respect to achieving a 20 minute city, local bus services must be the prime focus. No other mode has the service economics to do the job. The aim should be to provide a service level that enables most people to do most of the things they want to do, most of the time, without needing a car, subject to meeting the boarding rate benchmark (8/hour). This is likely to require a 30 minute minimum service frequency on local services for about 18 hours a day, with increased peak frequencies being justified if loadings suffice. Vancouver's community shuttle services (a brand name they have used for what are essentially local services) typically operate at frequencies of between 30 and 60 minutes, depending on demand. Translink is currently reviewing its service operating standards.

These local services would be complemented by trunk services operating at higher frequencies and over more direct routes, with a synchronised timetable. The Victorian Auditor-General (VAG) has recently drawn attention to the importance of, and shortcomings in, modal co-ordination (VAG 2014).

> *The efficiency, simplicity and quality of connections between public transport modes can make a major difference to people's willingness to use public transport* (VAG 2014, p. ix).

This mass transit/local transit combination will give people the certainty that they can achieve their trip purpose(s) without long waits, when they need or wish to travel. It will also reduce the need for car ownership. Given that many current public transport service levels in Melbourne's outer suburbs are typically well below this ideal, prioritisation of improvement will be required.

3.2   Supporting improvements to grow local public transport use

If public transport service is provided, solid patronage levels will encourage service continuity and, if volumes are sufficient, service improvement. A wide range of local initiatives can be used to promote use of local public transport. Ensuring a suitable service frequency and span of operating hours within 400 metres walking distance of residences is the starting point. This can be supported by, for example:

- linking public transport routes in new residential developments directly to routes serving existing urban development, without gaps or circuitous routing (and providing service early in the development stage of a new estate)
- providing bus priority treatments at intersections and along main trunk corridors
- ensuring good service marketing and customer experience, throughout the journey and in journey planning[2]. For example, as buses do not operate on fixed rails, route information is vital. Neighbourhood local buses need good information on bus routes, timing, good way-finding signage and trip-planning tools, as well as mode connections. The electronic signalling of time, as used with SmartBus, is a valuable information source
- a wider range of fare offerings. For example, Toronto offers a day pass which can be used any day for a month, which is very convenient for visitors and casual users. Fares which include bike and car sharing, parking payment and re-introduction of short distance fares, for example, could be offered
- public transport and active transport supportive land use initiatives, such as focussing growth around public transport nodes and along transit corridors, providing a full range of land uses in these locations (e.g. jobs, retail, recreational, personal business, cultural, institutional, etc)[3], providing good connectivity for walking and cycling access to public transport (including minimising unbroken block lengths and avoiding the need for back-tracking), avoiding impermeable street frontages
- link public transport to neighbourhood open space.

Where good public transport is available there is less need to purchase a car, so other options for occasional car use becomes important. Car sharing operates on many different models internationally, many schemes offering discount links between public transport and car sharing access (see for example, Glotz-Richter 2008; Röhrieef 2008). In Vancouver, more than one in five people who car share, give up their car and more than three in ten avoid buying a car (City of Vancouver 2012). The number of vehicles said to be replaced through sharing arrangements varies between six and 23 personally owned vehicles (Jones 2014, City of Vancouver 2012).

By supporting use of public transport and active transport, such initiatives will help to build strong, healthy communities.

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[2] Train stations have many features not included or not routinely included at bus stops: seating, shelter, lighting, information, often toilets and food outlets (Daniels and Mulley 2013). Indeed, most bus stops in Melbourne are very poor, designed for advertising rather than customer comfort with little shelter from the weather and sparse, uncomfortable seating. Better bus stops are offered in some international cities. In Portland, Oregon, bus shelters were fitted with solar lighting, better customer information, and safe street crossings to reach stops (Hansen 2010).

[3] Subject, of course, to market realities about financially viable land uses.

3.3   Community transport

In Australia, a failure to meet the transport needs for many categories of people experiencing some forms of disadvantage, such as people with a disability and older people, has led to the development of a type of informal transport, known as community transport. While it involves a range of service types, it commonly involves organizations providing a transport service for their own clients or constituents. For example, an organization providing aged person accommodation may own a mini bus to take residents on a day's outing. Community transport commonly serves only particular people, rather than the wider public, and services are rarely coordinated with other community transport services or with other transport modes/services. 84% of 79 Victorian councils responded to a survey on community transport (Municipal Association of Victoria 2009). The survey results identified a consistent local government view that community transport services do not adequately meet the *amount* of community transport services needed in local communities (75% of councils) or the *type* of services needed (77% of councils). BusVic research identified relatively poor asset utilization by some community transport service providers, suggesting scope for more effective outcomes (Stanley and Stanley 2012).

Over the past few years in Victoria, community transport has grown, become more visible and gained greater legitimacy. The Victorian Department Planning and Community Development (DPCD) funded the Transport Connections Project from 2006 to 2013. The aim of the project was 'to develop innovative and efficient responses to the needs of people with limited transport options, and to improve access to services, resources, employment and community participation opportunities' (DPCD website 2013). Thirty-four projects were established across Victoria. However, tension between the DPCD and the Department of Transport (DOT) contributed to a requirement that the Transport Connections project not consider the interface between community transport and public transport, which was curious in a state where the ruling transport legislation is called the *Transport Integration Act*! The program also tended to offer information and familiarity with services, rather than any significant increase in travel opportunities as such, and was heavily administratively weighted (Victorian Auditor-General's Report 2011).

The Victorian government has provided funding for community transport vehicles and (together with the Federal Government) funds some community transport as a component of welfare and health services funding (HACC or Health and Community Care Funding). This funding is not transparent, the size is unclear and there is no public performance reporting on costs of the service.

There has been a recent (2013) amalgamation between DPCD and DOT. The current status of community transport is uncertain. The authors of this report could find no reference to community transport on the website of the new Department of Transport, Planning and Local Infrastructure, or on the Public Transport Victoria website.

Community transport services in Victoria meet some very important needs for some people, some of the time. While not all customers of community transport are able to use public transport, due (for example) to disability or age, many are. Where this is the case, it is often the unavailability or poor availability of public transport (policy failures) that leads to a substitute, highly restricted, often costly and uncoordinated system. If public transport is available, then duplicate systems may lower the economic viability of both. **An integrated approach, which sees community transport as one strand in a range of service offerings, is likely to result in better service levels to community transport customers and to the wider community**, a point to which we return in section 5. This role should be built up from the local level.

3.4   Walking and cycling

Active transport is commonly defined as walking and bicycle riding, although there are many variations of this, such as electric bikes, roller-blades and skate boards. There has been very strong growth in cycling in Melbourne since 2001. This growth is mainly in the inner northern suburbs, particularly Yarra and Moreland, where infrastructure investment has been significant (Bicycle Network 2013). There are also signs of growth in the inner east and the south, where infrastructure is less developed and less attractive but is improving. Cycling to work has had rapid growth in inner Melbourne between 2006 and 2011, particularly to workplaces in the inner north. Cycling rates within the CBD are relatively low, perhaps reflecting limited cycling infrastructure, ease of walking and the tram system. Two-thirds of cycling journeys to work in Melbourne were approximately 5 kilometres or less, with 80% less than 7 kilometres, and 30% were 2 kilometres or less. Bicycles are seldom combined with other modes. There is little information on the extent of cycling for reasons other than travel to work.

While active transport is much more frequent for short trips, the pattern of increasing car use as the distance from Melbourne city increases is also reflected for trips that are even less than one kilometre. Active transport is more common in the inner areas of Melbourne, despite the greater availability of public transport. Even for recreational trips of less than 1km in the outer suburbs, 30% of these trips are made by car (Loader 2014).

Detailed quantitative analyses of factors likely to influence walking and cycling are not nearly as common as those that explore drivers of public transport use. However, the local design metrics of **intersection density and street connectivity** were found by Ewing and Cervero (2010) to be important influences on car use, particularly through their impact on cycling and, more particularly, walking. Short blocks and many intersections seem to shorten travel distances, with higher intersection density seeming to be strongly linked to increases in walking. In contrast, cul-de-sac designs discourage walking and public transport use. Linking where people live and work (the jobs/work balance, or mixed use) allows more walking, particularly if intersection density is supportive. This is an important design insight for promotion of activity centres and urban villages or neighbourhoods. With an increasing focus on intersections, safety of cyclists and walkers becomes an important design consideration.

This focus on intersection density has been picked up by the Ontario Ministry of Transport, whose Transit Supportive Guidelines target minimum street intersection densities of 0.3 intersections per hectare, with densities of over 0.6 in mixed-use nodes and corridors (Ministry of Transport Ontario 2012).

Public transport accessibility is significantly related to walking (and to vehicle kilometres of car travel (vkt)), greater accessibility reducing vkt and increasing walking), while public transport use is (unsurprisingly) most closely correlated with **distance from a public transport stop** and the shape of the street network. For example, Ewing and Cervero (2010) find that halving the distance to the nearest public transport stop is associated with a 29% increase in trips, underlining the importance of dense land use and easy walkability around major public transport stops.

Some of the initiatives that can help to increase walking and bicycle use include:

- improving pedestrian infrastructure, such as suitably wide footpaths (wider where pedestrian numbers are larger, with opportunities for 'through walking'), non-slip surfaces, good lighting, design opportunities for 'eyes on the street', providing shade trees and seating places, weather

protection at stops, encouraging pedestrian-friendly street-related frontages, providing adequate time for crossing streets (intersections like Victoria Parade and Nicholson Street are bad in this regard) and engaging communities to prioritise such initiatives and identify others

- minimising conflicts with traffic by providing separated cycle lanes, clearly signing cycling routes, providing well lit routes, safe cycle storage facilities (including at transit stops), workplace showers, design bridges to accommodate all users (cyclists and pedestrians as well as vehicles)
- providing good connectivity to public transport for both pedestrians and cyclists

These examples are not exhaustive but are illustrative of how urban design can be used at neighbourhood level to encourage walking and cycling, supporting efforts to lift urban densities. These initiatives will also increase public transport use because of the necessity to walk to/from public transport and the opportunities for greater use of cycling to access public transport when access opportunities are improved.

4   The built form

The more activities that people are able to undertake in their neighbourhood, and the easier it is to move around that neighbourhood on foot, bicycle or on public transport, the greater the likelihood that the 20 minute city will be realised. This is partly a matter of urban location economics but is also influenced by policy opportunities, particularly in areas such as transport but also with respect to (for example) the education and health sectors, where careful location choices (e.g. co-location) can help promote neighbourhood development.

A growing body of research has demonstrated links between travel and the built environment. These links create opportunities to shape the urban environment in ways that are more likely to support achievement of a 20 minute city. The most comprehensive review of connections between travel and the built environment is the meta- analysis by Ewing and Cervero (2010). These authors emphasize the five 'Ds' of built form in terms of how they impact on car travel distances: **density**, **diversity** (of land uses), **design** (particularly street network characteristics), **destination accessibility** (ease of access to trip destinations) and **distance to transit**. Particularly interesting are their reported impact elasticities, which show the relative sensitivity of various response variables (particularly vkt) to changes in a range of potential causal influences.

Most elasticities are quite small, those with respect to neighbourhood land use variables (e.g. population density, land use mix, street network connectivity) being typically between -0.02 to -0.12 and those with respect to regional access to employment being larger, at between -0.05 and -0.2 (Boarnet 2011). However, the combined effect of a number of measures can be significantly large, implying that **policy packages** will usually be very important in the land use/transport space. These policy packages need to encompass both **regional and neighbourhood level** considerations, underlining the vital importance of taking integrated approaches across land use and transport. Higher development densities and a focus on mixed use will be supportive of greater public transport use, walking and cycling.

Compact pedestrian and bicycle-friendly mixed use development, containing medium to high density residential, office and retail uses within walking distances of rail stations (or tram/bus rapid transit routes), is sometimes called Transit Oriented Development (TOD). A number of studies have shown how such developments can reduce car use by 20% or more. For example, a study in Seattle, Washington,

found that in mixed-use TODs car use was reduced by about one-third, with public transport, walking and cycling playing correspondingly larger roles (not controlling for self-selection). Residents of TOD-like neighbourhoods in the San Francisco Bay Area had almost half the vehicle miles travelled of new suburban developments (SYDEC 2007).

While linkages between land use, transport and affordable housing outcomes are recognized as very important in US research on TOD, US experience is that Smart Growth/TOD type initiatives have generally not been very successful at increasing the supply of affordable housing. TODs, for example, are frequently positioned at relatively high price points[4] (Ingram et al. 2009; Robert Cervero personal communication). Australian research by National Economics (2010) for the Australian Local Government Association has shown how lagged transport infrastructure investment in capital city growth areas has contributed to the backlog in outer urban housing supply, in response to population growth. Transport investment is clearly an important element in the achievement of affordable urban housing but is not sufficient.

Densities and public transport use

Newman and Kenworthy (2006) review relationships between energy used in private transport (which reflects vkt) and the intensity or density of residential and employment activity (persons plus jobs per hectare) across 58 international cities and within both Sydney and Melbourne. They conclude from this that car usage seems to grow quickly once the number of people plus jobs per hectare falls below about 35, or a range of 30-40, citing other authors who have reached similar conclusions about the kinds of densities required for a viable centre.

Newman and Kenworthy note that this accords with a residential density of about seven dwellings per acre, at a reasonable dwelling occupancy rate. They then link this density with the idea of travel time budgets, which was explored by Zahavi (1979) in the 1970s and taken further by Marchetti (1994)[5]. A ten minute straight line walking time at normal walking speed defines a pedestrian catchment (called a 'Ped Shed' by Newman and Kenworthy) of about 300 hectares (220-550 at a walking speed of 5-8 kph), which they suggest implies a population threshold of about 10,000 residents at 35 people/jobs per hectare. They see this as a minimum threshold size for a local centre catchment and cost-effective public transport service. This catchment can include a range of densities within the Ped Shed, provided that the average is about 35 people plus jobs per hectare (e.g. higher densities close to the centre and lower 200 metres away). The idea of the 20 minute city allows a longer walking time but walking is rarely straight-line from origin to central destination, so we work with the 10 minute straight line catchment here.

Newman and Kenworthy (2006) estimate that a 30 minute Ped Shed at an activity intensity of 35 people and jobs per hectare defines a catchment of 100,000 (70,000 to 175,000 range), which is large enough to provide many higher order functions. McPherson and Haddow (2011) suggest population thresholds

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[4] Partly for cost of production reasons but also because of planning/regulatory barriers and a lack of innovation in supply.

[5] This idea, based on extensive empirical research across time and cultures, suggests that people are prepared to spend a certain amount of time each day in travel. If travel speeds are increased, such as by a road improvement, they will travel further, which is a reason why freeways fill up quickly (generated travel).

for a range of activities, as indicated in Table 1. This provides an indication of the types of activities that might generally be expected to be available within catchments of different sizes. The 10 minute walking catchment, at densities averaging 35 people and jobs per hectare (~10,000 people), might include local shops and a corner store, a Small Neighbourhood Activity Centre and Primary School. Larger catchments are implied for the other activities shown in Table 1. These can be provided in a 30 minute walking catchment, or shorter trip time by cycle or public transport, consistent with the idea of a 20 minute city, if land use and access arrangements are well managed. High end knowledge-based activities, such as tertiary education, employment in top legal and finance businesses and complex medical services are likely to require travel beyond 20 minutes for most people.

Table 1: Facilities population thresholds

Community/commercial facilities in activity centre	Population threshold for viability
Local shops/corner store	800 - 1,000 dwellings
Small Neighbourhood Activity Centre (shops, community centre, primary school)	1,200 - 4,000 dwellings
Large Neighbourhood Centre	4,000 - 10,000 dwellings
Community health centre	8,000 - 12,000 dwellings
Primary School	1,200 - 5,000 dwellings
Secondary School	8,000 – 10,000 dwellings
Train Station	10,000 – 12,000 dwellings
Civic Centre	12,000 – 48,000 dwellings

Source: McPherson and Haddow (2011).

SGS Economics and Planning has kindly made available mapping of population plus jobs per hectare for Melbourne in 2011. Figure 3 shows the respective densities, the various shades of purple all meeting (or exceeding) the 35 threshold. Large parts of middle and outer Melbourne do not meet the threshold, indicating challenges to deliver strong neighbourhoods and cost-effective public transport services.

Densities of about 35-40 people (jobs and residents) per hectare, within a local one kilometre normal speed walking catchment of 10,000 people, are likely to support a PT trip mode share of at least 10%, or higher, especially in the peak. Sydney PT mode shares in middle suburban areas, for example, where these densities are achieved, are typically 11-14% of total trips, on an SSD basis. Lower mode shares would be expected in lower density areas.

As noted earlier, BIC research (Stanley and Hensher 2011) has demonstrated that local bus boarding rates of about 8 persons per service hour are needed for a service to be economically justified, in terms of the quantifiable economic benefits from reduced risks of social exclusion and road congestion cost savings. Boarding rates that should be expected at an activity intensity of 35-40 persons per hectare would easily exceed this hurdle and most fringe urban services should also meet this inclusion threshold.

The accessibility that is required to fulfil the higher order functions requires linking of smaller (neighbourhood) and larger centres by a network of integrated public transport services, which is very much the direction that Australian capital city land use/transport strategies are now heading, albeit at densities across parts of the various cities that fall short of the 35 threshold, as noted above.

Ontario sets a higher density target in its Toronto growth area urban planning, particularly because of the densities it assesses are needed for a viable transit service. Ministry of Transport (MOT) Ontario (p. 24) notes:

> *As residential and employment densities increase, the number of passengers per route-kilometre increases and a higher level of transit service can be cost-effective. Improved frequency and convenience of service has positive impacts on transit ridership, thereby further improving revenue/cost ratios and permitting even higher levels of service. Higher densities and a greater mix of uses in proximity to transit services helps to reduce travel distances between uses and minimize walking distances... Consideration of densities and mix of uses is required to determine the viability of a transit line or network.*

Figure 3: Population plus job density: Melbourne 2011
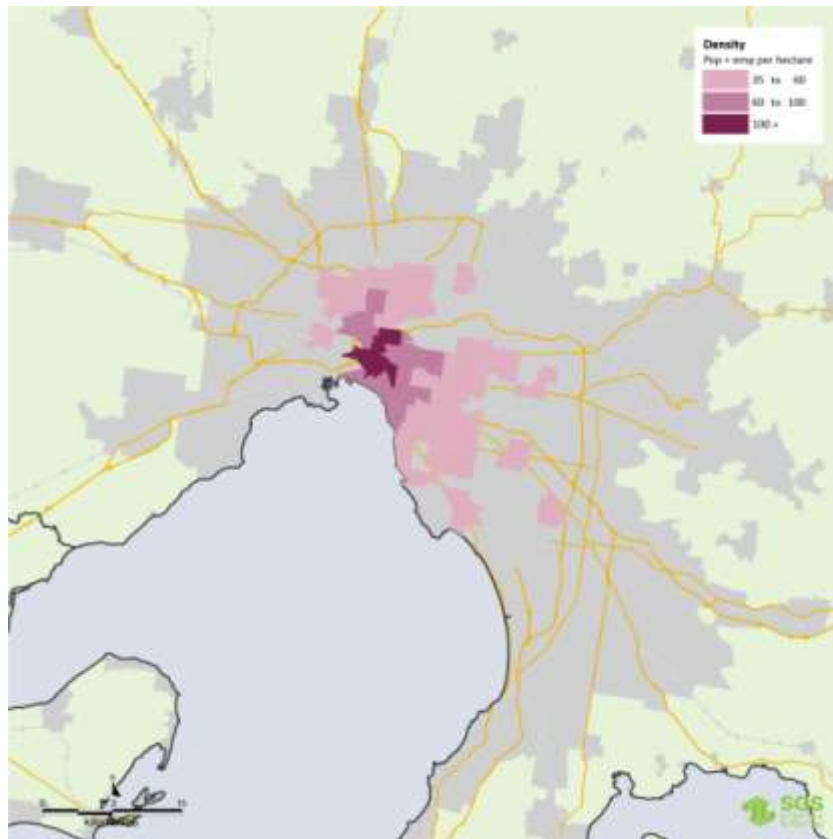
Source: Map kindly provided by SGS Economics and Planning

The focus on mix of uses leads to density targets being expressed as residents plus jobs per hectare. The *Growth Plan for the Greater Golden Horseshoe 2006* (which includes Toronto) targets a **minimum density** of 50 residents plus jobs per hectare (or 22 units/ha) in designated *greenfield areas* (MEDEI 2013), which is higher than targets set for growth areas in Melbourne (minimum 15 dwellings/per net developable ha). This Toronto density target is then aligned with a guideline base (or minimum) bus service frequency of 20-30 minutes (MOT Ontario 2012). The range in the Toronto figures is broadly

consistent with the guideline of a 30 minute minimum frequency for densities of 35 to 40 jobs plus residents in an Australian capital city.

## 5.   Low patronage services

Figure 3 shows that substantial parts of Melbourne fall short of having 35 residents plus jobs/hectare, which suggests potentially low patronage levels on some services. However, densities within *400 metres of a bus route* (which is a finer grained density measure than is shown in Figure 3) might be close to, or exceed, this target level, even though a broader area density measure may be lower. It is densities within walking distance to services that are the key to patronage (Ewing and Cervero 2010). Mapping densities close to routes is beyond the scope of the present paper but should be undertaken as part of network planning.

Whatever the results of such mapping, there will remain substantial parts of the Melbourne route bus network that currently do not achieve densities of about 35-40 persons plus jobs per hectare. These areas will struggle to achieve the 20 minute city and one priority should be to increase resident numbers and jobs in these areas, towards reaching the density target. This is about urban infill and setting higher densities in new developments.

Census data suggests that, in outer areas, **jobs** are relatively scarce compared to **population numbers**. Figure 4 shows that there were almost 2000 jobs per 1000 residents in what we call inner Melbourne (Cities of Melbourne, Yarra, Port Phillip and Maribyrnong) in 2011, this ratio dropping to 424 in middle suburbs (including Greater Dandenong) and 312 in outer suburbs. The lowest ratio for any municipality was Melton, at less than 200. The vast majority of jobs in outer suburbs will be population serving jobs and, while the jobs/population ratio has increased in outer areas, manufacturing job losses[6] in recent years will put pressure on the ratio. Outer suburbs that sustain jobs/population ratios above 300 in the coming years will be holding up well.

Figure 4: Jobs per 1000 population across Melbourne, 2011.

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[6] Which are not usually local population-serving.
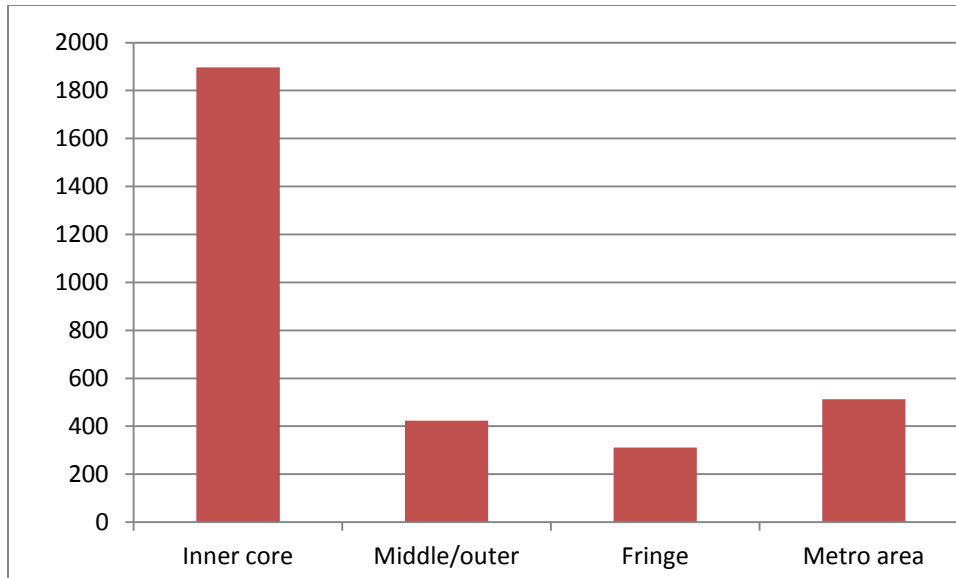
Source: Calculations by JK Stanley from NIEIR data base information)

One way to encourage job growth in outer areas is to focus on neighbourhood renewal, building social capital and sense of community. This is likely to encourage buying locally. Focussing employment opportunities (e.g. schools, health facilities) in neighbourhood centres can help to create a local economic cluster that might lead to extra employment opportunities in the business services area. Such initiatives will not have dramatic employment generating effects, with the major employment creation focus in non-population-serving (i.e. export oriented) employment being in the larger clusters, such as the inner city and National Economic Clusters designated in *Plan Melbourne*. Connecting middle and outer suburban neighbourhoods to such employment clusters by fast and frequent public transport is critical for sharing employment opportunities across the city.

The main implication from this brief discussion is that building up residential plus job densities in outer suburban Melbourne, in particular, will rely mainly on increasing densities of resident numbers. This means a focus on improving place and the opportunities for a good life that are available at neighbourhood level (including affordable housing), as well as providing opportunities to easily connect by trunk public transport to activities, including job opportunities, elsewhere.

Increasing densities will take time. In the meantime, what public transport service levels should be provided in lower density areas, recognising that *Plan Melbourne* is aiming to generally lift densities across existing built up areas as the city grows?

It has been argued above that a minimum boarding rate of about 8 passengers per hour is sufficient to economically justify a bus service, which can be considered in multiples. Thus, for example, if an hourly service attracts 8 or more boardings per hour, this meets the target. If two 30 minute frequency services each meet the target, then a 30 minute service would be justified. Individual services can be subjected to this test. If a service fails to meet the benchmark boarding rate, options include:

- replacing it with a lower cost service (see below)
- continuing it, particularly if deleting the service would lower boarding rates on other services along the route. For example, running additional later services under *Meeting our Transport*

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Challenges served to increase boardings on existing services, because of the greater flexibility that later services provided (Loader and Stanley 2011). Knock-on effects are to be expected if any service is removed and need to be considered in assessing the case for removal.

Implementation of minimum hourly service frequencies for about 15 hours a day on weekdays and Saturdays, with slightly shorter service spans on Sundays[7], demonstrated that this should be considered as a minimum acceptable service level; anything less is not sufficient to encourage a reasonable base level of use (Loader and Stanley 2011).

If boardings fall below a minimum of about 8 per service hour, what alternative service opportunities might exist? Three possibilities are worth consideration:

- use of smaller buses
- shifting to a demand responsive service, which might be provided by a taxi
- the social enterprise approach being trialled in Warrnambool
- offer a more frequent bus service

Combinations of these three options would also be possible.

Smaller buses

Capital costs of route buses typically account for about one quarter of total costs. Smaller buses have lower capital costs and, *prima facie*, might be expected to reduce total service delivery costs. Translink in Vancouver has analysed this question in some detail, concluding that (Brian Mills, Translink, personal communication).

> ...*most of the benefits are from reduced operating cost and not from reduced capital cost. On capital, the vehicles are less expensive to buy, per vehicle, than standard transit buses but have a shorter life-cycle. As a result the annual debt service cost is comparable to that of a standard bus.*

Operating cost savings in Vancouver arise on the fuel side, in maintenance and on wages, where a separate industrial agreement has been negotiated for drivers of smaller vehicles. The latter option is not currently available in Australia but fuel savings and maintenance savings might be expected.

The major problem with smaller buses is that if passenger loads at any time exceed the capacity of a smaller bus, then another bus (or other vehicle) is needed.[8] If this is provided by the same operator, costs will clearly increase. If it was 'purchased' in on an as-required' basis, then the need for (and marginal cost of) an additional bus would be reduced.

More broadly, opportunities for downsizing buses are likely to be minimal. UK deregulation, for example, led to an influx of smaller vehicles, most of which have since disappeared, being replaced by larger vehicles on successful routes and removed completely on poorly patronised routes (Chris Nash, personal communication).

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[7] Under *Meeting our Transport Challenges.*
[8] Or people could simply be denied a trip, which our research on social exclusion shows has a high cost (~ $23/trip foregone, on average).

Demand responsive/flexible services

Demand responsive and flexible transit services are advocated by some analysts in low volume settings. Demand responsive services typically have no set routes, customers being picked up and dropped off at those locations and times they agree with the service provider (just like a taxi service). Flexible transit involves a variation from a main route and stopping pattern, such as a deviation to drop-off or pick up a passenger. Various evaluations of such schemes have been and they typically reflect the inherently costly nature of more closely aligning service provision with the requirements of individual clients.

Labour primarily drives the cost of various forms of public transport service, because it is the largest cost component, accounting for about half the cost of a route bus service, for example. The key to providing cost-effective public transport services in a low patronage setting is thus labour cost, not vehicle cost.

Vancouver has introduced an industrial agreement that allows drivers of Community Transit vehicles to be paid at a lower rate than drivers of others. This was introduced in a context of service expansion, such that existing drivers were not disadvantaged. Community transit drivers have a salary that peaks at $C24.31after 16 months, while regular bus drivers have a peak salary of $C30.38 after two years (Translink 2014). This possibility should be explored for Melbourne, in a context of increasing the provision of local bus services.

Social enterprise model: ConnectU

BusVic research in Warrnambool (Stanley and Stanley 2012, 2004) showed substantial unmet travel demand from people largely unable to use public transport and without other means of transport. At the same time, that there was a range of underutilised transport assets in the community, particularly community buses and cars. ConnectU, a local social enterprise, commenced providing transport service in October 2012 as a locally initiated in response to this research, supported by BusVic, the Bus Industry Confederation and Warrnambool Bus Lines. To deal with the labour cost problem, ConnectU uses volunteers to provide most of the transport service. The service is, in effect, a form of cost-effective community transport and provides a solution to transport for transport disadvantaged people who are unable to use route services. It could take on a larger tole, with suitable resourcing.

Over the first 8 months of operation to June 2013, patronage averaged 30 one-way trips a month. ConnectU then acquired more vehicle hours to assist passenger movement, to allow more time to organise vehicle sharing with partner agencies. As a result, patronage tripled to average 96 one-way trips per month over the July to December period, 2013. It tripled again over the January to June period 2014, averaging 269 one-way trips per month. In addition to this 84 trips carried multiple passengers.

Figure 5 shows the enormous growth in the number of clients carried since commencement. The chart shows the trend line of passenger growth, which is averaging 17.5% per month. This is huge and proves the need for the service. This growth has occurred **without the service being advertised**, because ConnectU is unwilling to turn away clients for whom it lacks the resources to provide service. If additional vehicles were available, a target of 1000 trips per month is in reach over the next year, if ConnectU is able to secure sustainable funding.
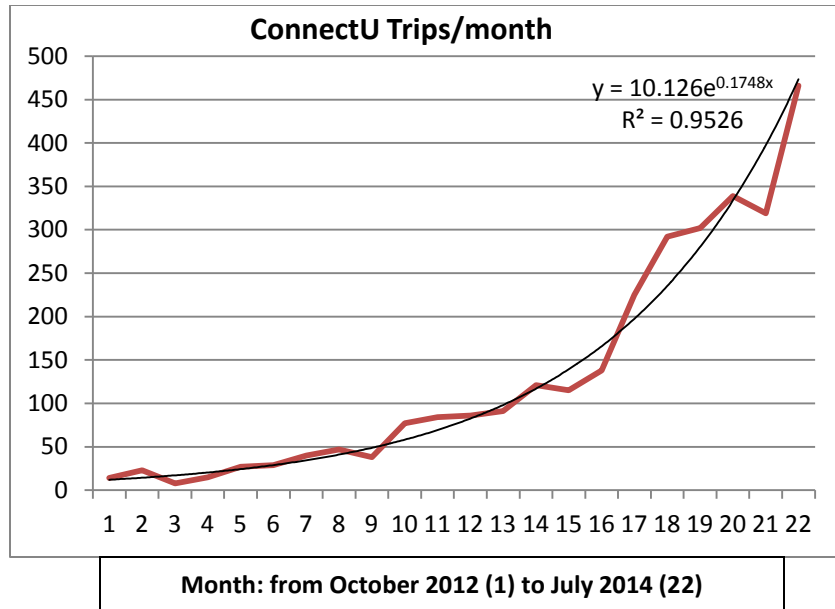
ConnectU Trips/month

$y = 10.126e^{0.1748x}$
$R^2 = 0.9526$

Month: from October 2012 (1) to July 2014 (22)

Figure 5: ConnectU patronage

The typical passenger on ConnectU services is female and elderly, although about one-third of passengers encompass a wide age range. While most trips involve a medically related appointment, there are also high requests for shopping and personal business, family related visiting, recreation, and child and TAFE related trips. The medically related appointments also frequently include business, shopping or recreation travel stops. Many referrals come from health services and Warrnambool and Moyne Councils. Referrals from other sources are assessed in relation to the availability of other transport arrangements (such as a bus or friend to drive them). Some people need assistance with movement and others are assisted from the car to their appointment.

It is one thing to be meeting a need; it is something else to be doing this efficiently. ConnectU's annual costs are running at about $118K, with passenger revenues of $17K, giving a net cost of ~$100K. At a current monthly passenger task of ~350/month, this is an implied net cost of $23.80/trip, or $28.10 gross cost/trip (one-way).

Given customer characteristics, the service provided by ConnectU has much in common with Canada's specialised transit services. In 2012, the average gross operating cost of those services was $26.18 and fares covered 8.5% of costs. Net cost of the Canadian specialised services was thus $24.17/trip, which is almost identical to the Connect U net cost of $23.80, given similar exchange rates between the two currencies. In short, ConnectU has reached the stage of operating in accordance with external cost benchmarks, despite not yet achieving economies of scale.

Now that ConnectU has reached a viable stage in terms of passengers carried, and given the growth in passengers, costs per trip could be lowered by further expanding the service. If more currently underused community transport vehicles were made available to ConnectU, service expansion could take place at very low marginal cost. Passenger numbers could probably be doubled with only a ~$20K increase in costs, which would lower gross costs per passenger carried to ~$16.10, and net costs to somewhere between $12-16. This would be a remarkable result. None of the existing community transport providers in the region could operate at anywhere near this result and are almost certainly considerably more expensive, per passenger carried, than the ConnectU today.

The ConnectU model should be tested for extension to service provision in low volume outer urban settings, as a complement to the route bus service. Operating it in that way would save some back-office costs and lower costs per passenger carried. It would widen the range of vehicles available to the bus operator to provide service and thus open up the possibility of better matching vehicles with demand levels, from increased fleet diversity (i.e. cars, people movers and small buses could be available). This should lower operating costs. If this model could be linked to wage arrangements like in Vancouver, cost savings might be possible.

This approach to service provision in low volume settings is consistent with conclusions reached by the UK House of Commons Transport Committee in its very recent report on *Passenger transport in isolated communities*. That Committee concluded (UK House of Commons Transport Committee p. 3):

> *'Total transport' involves pooling transport resources to deliver a range of services. For example, it might involve combining hospital transport with local bus services. That new approach could revolutionise transport provision in isolated communities by making more efficient use of existing resources. We recommend that the DfT initiates a large-scale pilot to test the concept in practice.*

A similar approach has been proposed by the Ontario Ministry of Transport (MOT Ontario 2012, p. 105):

> *All public transportation services within a community should be coordinated to expand or provide more efficient transit service. This can include coordination between conventional or specialised agencies; long term care agencies; social service agencies; hospitals, ambulance and patient transfer operators; school boards and school bus companies; intercity bus companies; taxi operators; and volunteer groups.*
>
> *The level of coordination between agencies should be tailored to local conditions, and can include shared information or referral, joint acquisition and sharing of supplies and services, use of excess capacity, joint use of resources, and centralised services for intake and dispatch.*

The 'total transport' and coordinated provision concepts are in line with the recommendations of BusVic's Warrnambool research in 2004. It includes ConnectU but broadening the approach is encountering similar problems of 'silo thinking' as have been identified in the UK report, from existing small service providers, including those whose transport role is ancillary to their main business (usually in the welfare of health areas). An integrated or 'total transport' approach holds out the prospect of making better use of existing resources. As the UK House of Commons Transport Committee concluded, large scale pilots of this approach should be tried.

The local coordination function should be performed by the entity best placed to do this in any local context. In many cases it will be the local route bus operator, who will most likely be the largest service provider and should be well placed to provide a cost-effective coordinating service. A larger service provision role by the coordinator is likely to be efficient, given scale economies. Thus, for example, in Warrnambool the ConnectU model should be incorporated in to the route bus service, and transport tasks undertaken by other non-specialist transport providers should also be coordinated with these more integrated services. The 'bus operator' could then provide a client transport service for those agencies, on a fee-for-service basis. To cut through the silos, this would require some re-directing of existing governmental funding flows that are used to provide transport services. It would deliver more cost-effective outcomes.

Offer a more frequent bus service

The achievement of a 20 minute city will encompass moving people from private vehicles to public and active transport. To achieve this move, it is likely that the waiting time for buses will need to be reduced, such that people won't need a timetable but feel confident that a bus will come along 'soon'. This will be especially important for the trip to work and to trunk connections. The idea of putting in more buses, rather than the usual response of removing services due to low patronage, needs further examination.

6. Environmental values of the 20 minute city

A major cost of the use of private vehicles is the generation of pollution. This encompasses the production of greenhouse gases, air pollution such as particulates from diesel fuels, and waste disposal of the by-products of mobility, such as oils and tyres, as well as pollution generated in vehicle production.

In 2012, transport represented 16.6% of total Australian domestic greenhouse gas emissions (excluding land use and forestry emissions), the second highest source of emission after stationary electricity. Road transport contributes about 85% of transport emissions, with cars contributing about 50% of this. Motor vehicles contribute to more than 50% of all air pollution in urban areas (Center for Disease Control and Prevention 2014). In terms of energy use, private cars and taxis have the lowest energy efficiencies of energy expended per passenger per kilometre travelled (Bannister undated).

The association between environmental health, transport, social inclusion and wellbeing, is complex. Read is one of the few researchers to empirically measure this association (Read et al. 2013). On a national basis, the over-production of greenhouse gases reduces wellbeing, demonstrated in poor health such as cancer and obesity, as well as behavioural problems such as family violence. Exposure to traffic emissions has been linked to many adverse health effects including, exacerbation of asthma symptoms, diminished lung function, adverse birth outcomes, and childhood cancer (Center for Disease Control and Prevention 2014).

Transport policy initiatives that seek to reduce the external costs of car use, such as greenhouse gas emissions, should focus on trip lengths and mode of travel rather than the number of trips, as trips or activities are important for inclusion and wellbeing (Stanley and Hensher 2011).

7.   Conclusions

Neighbourhoods are key building blocks to achieve a well-functioning city, and strong communities arise from well-resourced and well-functioning neighbourhoods. Such neighbourhoods are good for people, the environment, and economic participation. They help meet essential needs: personal wellbeing, mental health and social equity; a sense of place and belonging; participation and choice; and the ability to successfully adapt to external challenges. The ability to be mobile and to access friends, activities, government and business, is a requirement to achieve most such needs.

The *Plan Melbourne* concept of a '20 minute city' is a useful way to think about how to build neighbourhood, in the context of land use/transport planning. A 20 minute city requires a range of local

activities and it requires local mobility choices, particularly safe walking/cycling opportunities and an adequate service level on local public transport.

To enhance opportunities for a range of local activities and to improve mobility options, minimum density benchmarks should be set, the paper suggesting this minimum should probably be something like 35-40 residents plus jobs per hectare. Development densities lower than these are not conducive to effective public transport service provision and will make local job generation more difficult. They are a barrier to implementing a 20 minute city. Melbourne's planning provisions should consider lifting minimum densities to meet this benchmark.

Given the time it takes to influence land use, improved local public transport, walking and cycling opportunities should be a high and immediate priority for delivering a Melbourne that is comprised of a series of 20 minute cities. The generally low densities in middle and outer suburbs, where the availability of public transport is relatively poor, means that this is where most attention needs to be focused.

Local public transport service frequencies, which will be bus services, should initially achieve a 30 minute or better headway, for about 18 hours a day. Longer term, the aim should be to align with trunk service frequencies that the local services meet. Once minimum service levels are achieved, if boarding rates on particular local services regularly fall below 8 per hour, then alternative service delivery methods should be explored for the trips in question.

Linked to this matter, there is growing international focus on the idea of 'total transport' in low public transport patronage markets, where all available service delivery opportunities (e.g. route bus, school bus, community transport, taxis, etc) are used on an integrated way, to further travel choices, particularly for people at risk of social exclusion. Silo thinking is a fundamental barrier to the achievement of such an approach. It is time to knock these silos down. They are costing the taxpayer money and denying vulnerable people travel opportunities, which compounds social exclusion and diminishes wellbeing. It undermines community. A successful social enterprise approach in Warrnambool is showing some promise as a way forward. It is time to conduct more extensive trials of the Warrnambool approach in low patronage markets, challenging the siloed thinking and associated funding models that stand as major barriers.

This concept of total transport should also include taxis. The Government's taxi reforms which endeavour to have taxis play a greater role in outer urban and regional areas and offer demand responsive and scheduled quasi bus services, are part of a series of reforms. Others include the ongoing school bus reforms and changing categorisation of route buses (premium, connector, neighbourhood) and intended route bus area reviews. These reforms are occurring in a context which lacks a cohesive and holistic social transit policy which should be founded on mainstream public transport. Community transport and taxis playing demand responsive type roles, should complement a comprehensive mainstream service, not substitute for it.

Achieving a Melbourne of 20 minute cities should lead to a number of desirable outcomes: reduced air pollution and greenhouse gas emissions, reduced congestion, better health, improvements to wellbeing and social inclusion, stronger social capital, improvements in the quality of local community and associated economic and social opportunities for people, and improved local and regional economies, now and in the future.

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