

Is Residential Proximity to Public Transport Routes a Key Factor in Determining Public Transport Use in Melbourne?

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Abstract

In 2002, the Victorian Labor government adopted *Melbourne 2030*, a compact-city policy, designed to ensure that a high proportion of Melbourne's rapidly growing population to the year 2030 would be accommodated in established suburban areas. By the end of the Labor government's term of office, in 2010, it had passed, without parliamentary debate, legislative amendments to the Victorian State Planning Policy Framework which sanctioned higher-density residential development along public transport corridors within Melbourne. The current Victorian Liberal-Nationals Coalition government appears to have left the former government's policy virtually intact. A key justification of the new policy approached is the belief that high-density residential development along public transport corridors will result in a major shift in travel mode away from car use. Indeed, available data do show that a relatively high proportion of persons who live near public transport corridors in Melbourne do use public transport for home-work journeys. However, this study examines neighbourhood scale data from the 2006 Australian Census, which strongly suggests that this revised policy approach is not based on an adequate understanding of the social and life-cycle factors that help shape the relatively high public transport patronage by persons who currently live near public transport corridors. These persons are disproportionately young, transient, unmarried persons in rental accommodation. The Victorian government's policy assumption, that the close proximity of residential development to public transport will induce significantly higher rates of public transport use, appears simplistic and may not achieve its intended outcomes.

In September 2010, the then Victorian Planning Minister, Justin Madden, signed an amendment (VC71) to the State Planning Policy Framework. It was gazetted without parliamentary debate. Amongst other things, the amendment endorsed high-density residential development along tram, train and bus routes within Melbourne. Under Clause 18, the amended policy framework encouraged:

... higher land use densities and mixed use developments near railway stations, major bus terminals, transport interchanges, tramways and principal bus routes. (DPCD 2010)

Clause 16 of the policy framework, which dealt with housing provision, stipulated that strategic redevelopment sites were to be identified:

Along tram, train, light rail and bus routes that are part of the Principal Public Transport Network and close to employment corridors, Central Activities Districts, Principal or Major Centres and around train stations (DPCD 2010)

These amendments were enacted in the wake of the publication, in 2009, of a discussion paper prepared for the Victorian Department of Planning and Community Development (DPCD) by consultancy firm SGS Economics & Planning – *Residential Intensification in Tramway Corridors* (DPCD 2009). In affect, the discussion paper provided the rationale for the Victorian state government’s September 2010 Planning Scheme amendments.

The discussion paper promoted intensified residential and employment development along tramway corridors as a ‘sustainable’ option for the longer-term, compared with housing developments on the city edge, which, it argued, are ‘relatively isolated from jobs, services and other amenities’ (DPCD 2009, i).

The objectives of the Victorian Labor government’s *Melbourne 2030* compact-city policy (adopted in 2002) are cited in support of the proposal. Particular emphasis is therefore given to maximising an efficient use of existing infrastructure assets, improved housing choice, and reduced traffic congestion (DPCD 2009, i; DoI 2002). The objective of accommodating a rapidly growing population in the established inner and middle suburban areas of Melbourne, as projected in the Victorian government policy document *Melbourne@5 million*, is also cited in justification for the proposal (DPCD 2009, i).¹⁷

The *Tramway Corridors* proposal explicitly advocated something that had been left implicit in the *Melbourne 2030* policy. Whereas *Melbourne 2030* focussed upon the development of ‘activity centres’, or high-density, mixed-use ‘nodes’ for the accommodation of a significant proportion of the expected additional population, the *Tramway Corridors* proposal advocates ‘corridors’ of such development, potentially kilometres long. The potential for such an outcome was only implicit in *Melbourne 2030*, because of the possibility of designated Principal, Major and ubiquitous Neighbourhood activity centre boundaries overlapping.

The proposal argues that the ‘linearity’ of the existing tramway network is complementary to the activity-centre locations identified in *Melbourne 2030*. Two case study areas along

tram routes were analysed to demonstrate the potential for residential intensification along tram routes to facilitate the Victorian Labor government's compact-city objectives for Melbourne.

It is clear from the proposal that very significant legislative and regulatory amendments would be required to facilitate urban intensification along tramway corridors. It identified the fragmentation of available sites as a major difficulty and that compulsory site acquisition and consolidation would likely be required. To defray financial risk and to attract the scale of investment necessary for large-scale redevelopment, it is suggested that the public sector might assemble property packages to be subsequently offered to private developers (DPCD 2009, 98-103). Recommendations were also made calling for a consideration of "as of right" planning controls in tramway corridors, minimum dwelling density controls and reduced mandatory parking provision rates, or a no car parking provision for new developments (DPCD 2009, 102).

Election of the Liberal/Nationals²⁾ Coalition government

As part of its 2010 election campaign policy platform, the Victorian Liberal-Nationals Coalition released a policy document outlining its approach to urban-planning issues. The document included a range of in-principle positions dealing with infrastructure provision, planning, land use and urban development. It stressed that local governments would have to plan for the accommodation of additional population in all "Central, Principal or Major" activity centres, and that the boundaries of such centres would need to be fixed by local governments within 3 years. This, it was argued, would provide certainty on "exactly where large-scale urban change will occur". At the same time, the Coalition policy also indicated a more relaxed approach to metropolitan fringe development and the Melbourne Urban Growth Boundary (UGB). The establishment of a biennial review of the UGB, the goal of 20-25 years of land supply in Melbourne growth areas, and an immediate assessment of "logical inclusions in Melbourne's UGB..." were foreshadowed (VLNC 2010, 8). In addition, the document stated that, if elected, the Coalition would:

Remove from the State Planning Policy Framework the Labor Government's VC71, clause 16 amendments which allow for high rise, high density development along every tram, train, bus or light rail corridor. (VLNC 2010, 13)

The Coalition had sensed the unpopularity of Labor's VC71 planning scheme amendments and the political mileage it could gain from opposing it. Some media commentary argued

that the Baillieu government's opposition to higher-density suburban infill development had been a significant factor in the Coalition's ability to win back seats in Melbourne's southern and south-eastern suburbs (*The Australian*, 4 December 2010, 12). The Save Our Suburbs movement had been quick to condemn the amendment, stating:

...for most development projects, residents' appeal rights will be a thing of the past and councils will have no say in determining permits in activity centres where there will be no height limits. The minister won't have to justify decisions on projects he has "called in" nor even make public any panel reports on such cases. (SOS 2010, 2)

At the same time, interests within the construction industry were hostile to any reversal of a commitment to transport corridor redevelopment. The Master Builders Association described the Coalition's planning announcements as "bitter-sweet". While supporting many of the Coalition's foreshadowed planning changes, particularly those aimed at reducing or speeding up regulatory controls, the Association stated:

Masters Builders opposes the Coalition's plan to remove Clause 16 within VC71 (State Planning Policy Framework). Clause 16 is a necessary part of Melbourne's long term growth strategy and enjoys the strong support of Victoria's builders. (MBA 18 November 2010)

Nevertheless, on December 2010, having won office, the Coalition government announced with fanfare that:

The Baillieu Government has reversed Labor's disastrous Planning Scheme changes which would have allowed huge, out of character developments along every bus, train, tram or light rail corridor across the metropolitan area. (Lib/Nat. 2010)

The Baillieu government's declaration of a reversal of Clause 16 of the Victorian Planning Scheme also contradicted Federal Labor government support for urban transport corridor development, as outlined in the Federal government's national urban planning discussion document, *Our Cities – building a productive, sustainable and liveable future*, released on December 1, 2010.

This document emphasised a number of challenges facing urban development related to the economic efficiency of Australian cities and high population growth. The "low density

nature of our cities compared with many of our international competitors” is seen as a particular challenge (Department of Infrastructure and Transport 2010, 20). An underlying theme within the document is that future urban and metropolitan development will not be on a business-as-usual basis. Future sustainability requirements would require low-carbon urban forms, and a reduction in “... our dependence on private motor vehicles in urban areas” (Department of Infrastructure and Transport 2010, 13). A related emphasis is upon a more effective integration of land-use and infrastructure planning, which it is hoped will facilitate the management of travel demand. Optimising the use of existing transport networks is therefore seen as a high priority, together with a consideration of travel pricing mechanisms trialled elsewhere, such as road pricing and road congestion charging (Department of Infrastructure and Transport 2010, 22). This provided the policy context for federal support for higher-density development along public transport corridors:

Investment in urban rail and bus transport can also be used to leverage more sustainable urban development forms. For example, combining infrastructure investment with **new forms of housing and commercial development along transport routes** can create more accessible, less carbon dependent communities and businesses. (Department of Infrastructure and Transport 2010, 23) (My emphasis)

Conscious of the conflict between the Victorian Coalition government’s stated commitment to reverse Clause 16 of the Victorian State Planning Scheme and the Federal Labor government’s recently-released *Our Cities* agenda, the new Victorian Minister seized the political opportunity to reject federal Labor’s interference in Victorian planning affairs (*The Age* 2010 4).

It is, nevertheless, important to examine the underlying assumptions of the previous Labor government’s *Tramway Corridors* proposal. Firstly, political rhetoric aside, it is not yet clear to what extent the Coalition’s amendments to VC71 (through subsequent amendment VC75), particularly Clause 16, do reverse the potential for large-scale transport corridor redevelopment. The resident-based Save Our Suburbs organisation was quick to point this out (SOS, December 23, 2010). The rewording of the key statement within Clause 16, cited above, was relatively minor, with the amended wording referring to “on or abutting” tram, train lines etc, rather than “along” them. In addition, Labor’s policy document, *Melbourne 2030 A planning update Melbourne @ 5 Million*, has been removed by the Coalition government as a policy guideline reference. This document gave strong support to intensive redevelopment along inner-Melbourne transport corridors (DPCD 2008, 17).

Furthermore, the rationale for accommodating a significant share of additional population within high-density, tramway corridors was derived from the activity centre concept inherited from the *Melbourne 2030* policy. The activity centre aspiration is partly premised on the expectation that, if large concentrations of residents can be made to occur near public transport access, then car use will be significantly reduced. As noted above, the 'corridors' approach is essentially an extrapolation of the activity centre principal which, to date, remains central to the Coalition's approach to metropolitan development. Whatever conclusions may be drawn from a critical examination of the travel mode assumptions of the *Tramways Corridors* proposal may be similarly applied to assumptions underpinning the development of activity centres under the current Coalition government.

Further, it is crucial to ensure that the type of major intervention in urban development advocated in the *Tramway Corridors* proposal, which may involve curtailment of rights of appeal by residents and local governments and dramatically alter local urban character, be based on sound assumptions as to the claimed benefits of such change.

Underlying assumptions of the tramway-corridor proposal

A basic assumption of the tramway-corridor proposal, and underlying Labor's VC71 planning scheme amendment, is that an intensification of residential development along tramway, or other public transport, corridors would lead to a significant increase in public transport patronage amongst residents. If persons live in close proximity to a public transport route, it is assumed that they will use the public transport, rather than drive cars.³⁾ A related expectation (reflecting the aspirations of the *Melbourne 2030* compact-city policy) is that high-density, mixed-use development, close to public transit, will result in a significant increase in the proportion of persons who live and work locally – thereby reducing travel distances and the need for car use.

On this basis, tramway-corridor proposal recommends that the potential for intensified residential developments with street frontages on public tram routes be explored. It further recommends an assessment of the residential potential of the 'walk catchment' of 600 meters from tram corridors be subsequently assessed (that is, a corridor 1.2 kilometres wide along tram routes) (DPCD 2009, 3).

The idea of higher-density residential development along public transport routes (not only tram routes), as a means to achieve higher public transport patronage rates has received strong support amongst professional town-planning and academic circles. Although a comprehensive review of the Australian literature is not presented here, two notable examples are outlined to illustrate this support.

Woodcock et al. (2010), for example, argue that urban intensification is necessary to achieve a socially and environmentally sustainable future in context of an inherited low-density urban landscape in Melbourne (Woodcock et al. 2010, 102). They argue that Melbourne could readily accommodate the projected population growth foreshadowed by the Australian government over the coming decades through the construction of 4-5 storey residential complexes in designated activity centres and along transit corridors. The authors consider this approach to be a moderate one, capable of being achieved democratically while overcoming resident fear of high-rise development (Woodcock et al. 2010). It is further believed that 'as-of-right' development, together with enforceable height limits along transit corridors, would prove sufficiently acceptable to achieve the scale of redevelopment necessary (Woodcock et al. 2010, 102). While the primary purpose of Woodcock et al. is to demonstrate the feasibility of housing a significantly larger Melbourne population in established suburban areas through transit-corridor intensification, it is also clear that an implicit assumption of the authors is that residential proximity to public transport corridors will result in a significant increase in public transport patronage. The following statement illustrates this assumption:

Australian cities are at a renewal point in relation to the crisis of climate change. To be socially sustainable, this means addressing the imperative of a low-carbon future within the framework of a low-density suburban fabric – **developing lines and points of intensification that will make low-emission transport possible** while building new amenity throughout the city. (Woodcock et al. 2010, 102) (My emphasis)

At the Australian Davos Connection⁴⁾ Infrastructure 21 Summit, held in Brisbane in 2008, Professor Rob Adams, Director of City Design at the City of Melbourne⁵⁾, and Chris Loader of the Business Association of Victoria, asserted that Australian cities were becoming increasingly unsustainable, socially, environmentally and economically. They argue that urgent action is required to transform Australia's built environment:

The challenge is to transform those key elements of our cities that will provide the greatest benefit for the least change over the shortest possible time. (Adams and Loader 2008, 33)

The primary focus of Adams and Loader's criticism is the inherited low-density character of Australian cities. High-density, low-rise development along major transport corridors is

advocated as a means of transforming Australian cities, “to substantially improve their sustainability” (Adams and Loader 2008, 33). On the one hand, the authors’ advocacy of intensified redevelopment along urban transport corridors is motivated by an ideological contempt of the inherited urban form. Low-density development, based on the garden-city ideal is depicted as a vast historical mistake due to the spell of modernism during the course of the Twentieth century (Adams and Loader 2008, 34). This crusade to reverse perceived historic wrongs that have “diluted the experience or urbanity and forces us to travel vast distances” is a syncretic attempt to align this position with more recent concerns related to climate change and environmental sustainability. The “new paradigm” of intensified mix-use development along major transport corridors is therefore deemed to achieve two goals - the restoration of an enriched urban life and improved environmental sustainability through a shift to public transport. Again, a key assumption is that an urban design strategy that concentrates residential development in mixed-use settings along public transport corridors will lead to a mass shift away from car use.

However, as with the study by Woodcock et al., cited above, there is no analysis of the socio-economic factors which help shape choice of travel mode. These two examples, serve to illustrate the present gap in the Australian research literature in this respect.

Nevertheless, some research and expert opinion in Australia (See Holloway 2009, 9), and a much larger body of overseas research, argues that there may not be a direct relationship between increasing urban densities close to public transit and take up of public transport use.

The unpublished Masters of Urban Planning thesis, submitted by Christopher Hodgetts at the University of Melbourne in 2008 compared small-scale areas within Melbourne that had undergone significant population and dwelling growth with similarly-sized areas that had undergone little or no such growth. The purpose of the research was to ascertain whether urban consolidation had resulted in ‘more benign types of travel’ - reduced car dependence. While acknowledging the orthodox expectation amongst academics and urban planners that higher residential densities will induce greater public transport use, Hodgetts concluded that those study areas that:

...have been built at or near public transport locations, still show high levels of car ownership, high drive alone car use, and about the same public transport share as the unchanged areas nearby...there is a tenuous association between the urban form in these areas and travel. (Hodgetts 2008, 113)

Furthermore, a recent critique of the Melbourne *Tramway Corridor* proposal examined the rates of train or tram patronage (for journey-to-work purposes) in a range of locations within Melbourne amongst persons who resided at different distances from either a train station or a tram stop (McCloskey, Birrell and Yip 2009). The authors found that train or tram patronage dropped off rapidly with distance from the route.

In 2006, only 16.8 per cent of employed persons who lived within 500 metres of a train station used the train for work trips and only 11.8 per cent of those who lived within 500 metres of a tram stop used the tram. (McCloskey, Birrell and Yip, 2009: 52)

Similar observations have been made in the U.S. context (Martinson 2000, 115). McCloskey et al. further conclude that residential intensification around tram routes may exacerbate car congestion, rather than alleviate it (McCloskey, Birrell and Yip, 2009, 58).

Importantly, a U.K. study conducted in 2009 highlighted the potential for socio-economic characteristics to influence the travel behaviour of residents and how socio-economic characteristics made analysis of the relationship between land-use and travel patterns more complex (Stead, 1999).

One of the criticisms sometimes made about empirical studies concerned with the relationships between land use and travel patterns is that the socioeconomic dimension is excluded. Empirical research, for example, suggests that higher densities are associated with less travel, but this could be a consequence of the variation in income (or some other socioeconomic characteristic) with density, rather than the effect of land use per se. (Stead 2000, 499)

Although addressing the influence of individual and household characteristics upon travel distance and not travel mode, this study concludes that variation in travel pattern is often more influenced by socio-economic factors than by land-use characteristics (Stead 2000, 499).

As indicated above, in Australia, research concerning the inter-relationship between land use, residential densities, transport behaviour and the socio-economic character of local populations is limited. For example, research conducted in 2005 into the 'Social Outcomes of Urban Consolidation in Sydney' (Bunker, Holloway and Randolph 2005), observed that:

Up to now urban consolidation policies in Sydney have been dominated by considerations of accessibility and availability of public transport, so that areas for medium- and high-

density housing have been zoned around transport hubs and corridors. The market has then taken up those opportunities in varying degree and style. (Bunker, Holloway and Randolph, 2005a, p.44)

However, after a detailed investigation into the factors that characterise housing sub-markets in Sydney, one of the main conclusions of the study was that further research was needed into the question: “how should areas for attached housing be selected and zoned in terms of **social composition**, dwelling type, size and location...?” (Bunker, Holloway and Randolph 2005a, 44) (My emphasis). In another paper, the same authors state that, while simplistic views of urban consolidation as a solution to car dependence had diminished somewhat:

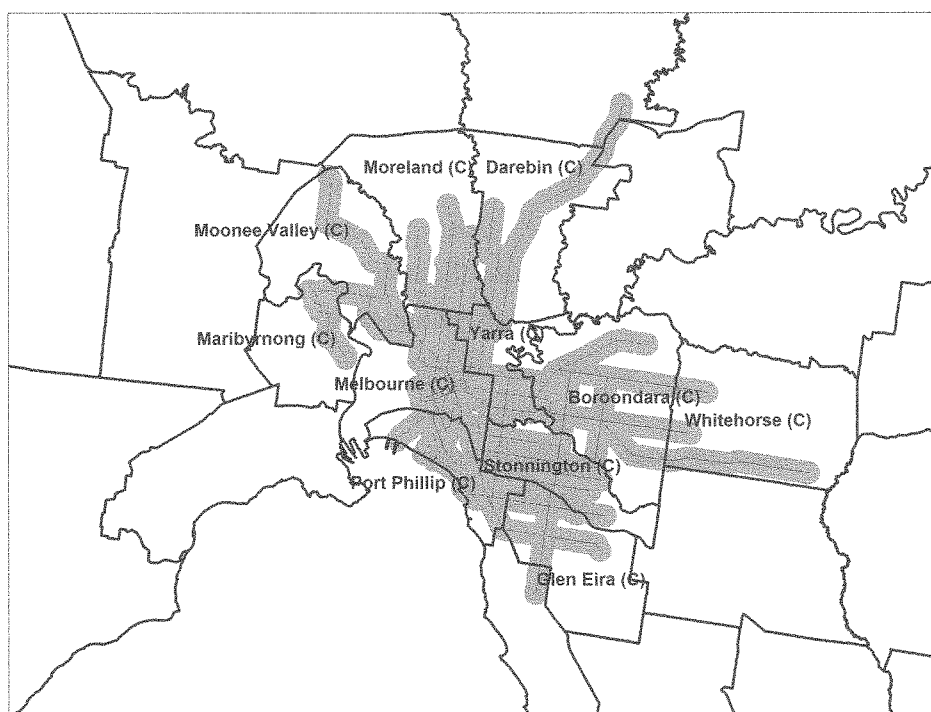


Figure 1 Land area within inner- and middle suburban Melbourne that would be potentially available for medium and higher-density redevelopment under the *Residential Intensification in Tramways Corridors* proposal

...there still remains a substantial body of opinion that the compact city and medium- and high-density living is the solution for car-dependence... accessibility to public

transport is still seen as the dominant influence in determining travel behaviour, and zoning and planning practices for urban consolidation follow this precept without considering other factors... (Bunker, Holloway and Randolph, 2005b)

Despite such uncertainty, the potential extent of the *Tramway Corridors* proposal in inner and middle-suburban Melbourne, if fully implemented to within 600 meters of tram lines, is indicated in Figure 1. If medium and higher-density residential development were to proceed to a distance of 600m meters on both sides of Melbourne's tramway/light-rail network, a number of local government areas would be very significantly affected. Approximately half of the municipality of Melbourne would be available for higher-density re-development, the majority of Stonnington, Yarra and Port Phillip, most of the southern part of Moreland, and significant proportions of Glen Eira, Moonee Valley and Boroondara.

Superficially, the objectives of the *Tramway Corridors* approach may appear plausible because rates of public transport use do tend to be higher amongst employed persons who reside close to rail and tramways corridors. This is shown in Figure 2, which is based on



Figure 2 Per cent of employed persons who use public transport for all or part of their home-work journey, Melbourne, 2006

travel-mode data for employed persons from the Australian 2006 Census.

Further, the *Tramways Corridor* proposal does correctly observe that dwelling densities are already higher in many areas adjacent to public transport routes.

Levels of public transport accessibility are already strongly reflected in the existing pattern of medium and high density housing in Melbourne. (DPCD 2009, 1)

Is proximity the determining factor in public transport use in Melbourne?

But, is residential proximity to public transport the key, or even a significant, factor in determining elevated levels of public transport use along tram routes? As suggested by the research cited above, other factors may be involved which, to date, have not been adequately explored. The relatively low levels of car use for journeys-to-work along train and tram corridors in Melbourne may reflect the socio-economic characteristics of the residents found there. Particular socio-economic characteristics may be concentrated near public transport routes, which in turn lead to the patronage of public transport at higher rates than amongst the general population. It may therefore be a mistake to overgeneralise about the role of proximity in accounting for higher rates of public transport usage amongst those living on tram routes.

The analysis

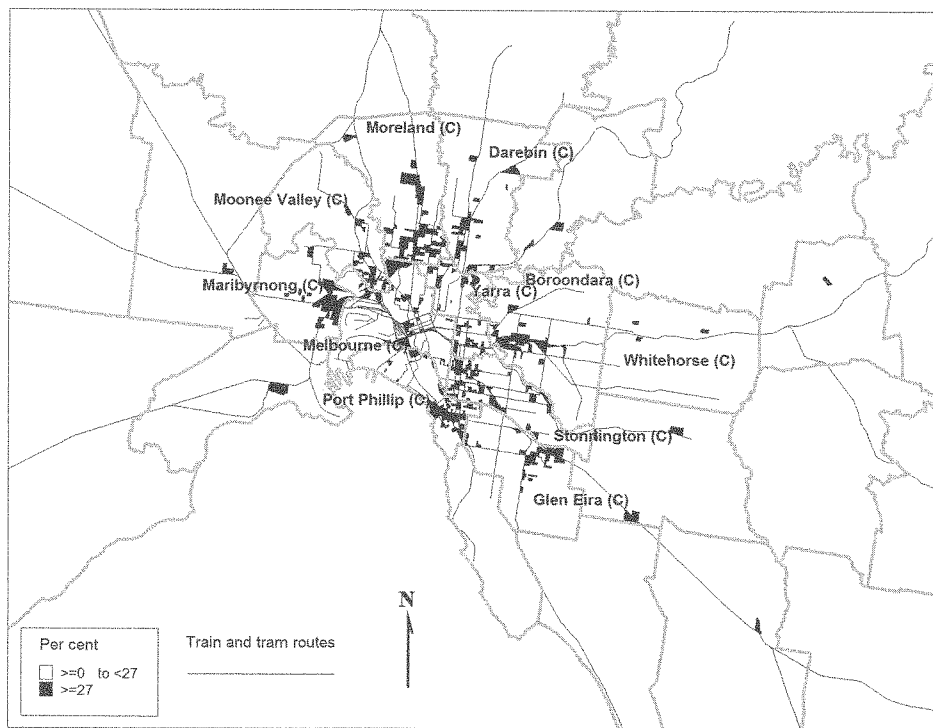
The analysis below examines selected socio-economic characteristics of resident populations who live along the tram/rail corridors identified in Figure 2 above. The data used is from the Australian Bureau of Statistics 2006 Census Basic Community Profile and is analysed at the collection district level (on average between 200 and 300 households per collection district). The analysis compares the characteristics of resident populations and housing characteristics in collection districts on or close to tram and rail routes, which have relatively high rates of public transport use for journeys-to-work, with the characteristics of the respective Local Government Areas (LGAs) of which these localised collection district populations are part. This comparison is conducted for collection districts within a number of LGAs that cover the greater part of the tram and rail network in metropolitan Melbourne.

A threshold of 27 per cent of employed persons using public transport for all or part of their home-work journey was found to be an effective filter to identify collection districts on or near tram/rail routes.⁹⁾ From an examination of Figure 2, this is not surprising. In the analysis below, the comparison is between the collection districts identified in Figure 3 and the total LGAs of which the selected collection districts are part.

The LGAs used in the analysis are divided into two groups. One group is comprised of the innermost LGAs of the Melbourne Statistical Division (MSD): Melbourne, Boroondara, Stonnington, Port Phillip and Yarra. The second group is comprised of the mid-suburban LGAs: Darebin, Moreland, Moonee Valley, Maribyrnong, Glen Eira and Whitehorse.

The social and housing variables used in the comparison are: the proportion of occupied private dwellings rented, the proportion of residents in selected age groups, the proportion of residents 'never married', the proportion of dwellings occupied by non-family households⁷⁾, the proportion of dwellings that are flats, units or apartments, the proportion of residents living at the same address one year prior to the Census and the proportions of residents in selected individual income brackets.

The data used is for populations and is not unit-record level data. Therefore, it is not possible to show that all of the distinguishing characteristics observed for those who live in high-public-transport-use collection districts along tram/rail routes devolve upon the same persons. Nevertheless, the data is adequate for an preliminary examination of the issue being explored.



Source: Australian Bureau of Statistics, Census Basics, 2006

Figure 3 Collection districts with 27 or more per cent of employed persons who use Public transport for all or part of their home-work journey, Melbourne, 2006

Findings

Inner Melbourne

Table 1 shows the results for the inner Melbourne LGAs used in this study. The levels of public transport use for journey-to-work purposes in inner Melbourne LGAs is considerably higher than the figure for the Melbourne Statistical Division (MSD)⁸⁾ as a whole. The proportion of employed persons who used public transport for all or part of their journey to work in the MSD was 11.7 per cent. By contrast, the proportions of employed persons living in the inner LGAs who used public transport ranged between 16.7 and 23.3 per cent. Despite the already high levels of public transport use in these LGAs, the levels were higher still in the collection districts located along tram/rail routes shown in Figure 3, being between 29.3 and 31.4 per cent.

The data highlight a number of variables which distinguish the populations residing in collection districts located near to tram/rail routes relative to the total populations in their respective LGAs. The high levels of public transport use which characterise these collection districts are associated with high proportions of persons in the 20 to 29 years age group and, somewhat less consistently in the 30 to 39 years age group, relative to total LGA populations. Consistent with the greater youthfulness of the collection district populations along tram/rail routes, an above average proportion of these populations (15 years and over) were 'never married'. In two LGAs, Yarra and Melbourne, there was little difference in the proportion 'never married' between those living along tram/train routes and the respective total LGA populations. This, however, may be explained by the fact that the proportion of the populations of these LGAs which was 'never married' was already very high relative to the MSD average. Whereas 34.8 per cent of employed persons living in the MSD in 2006 indicated that they were 'never married', the respective proportions for Yarra and Melbourne were 56.2 and 66.2 per cent. It may not be surprising, therefore, that the contrast between those residing on tram/rail routes and those who are not within these LGAs is marginal.

Another characteristic that distinguishes inner Melbourne LGAs and the collection districts within them located along tram/rail routes is the proportion of non-family households. The proportion of occupied private dwellings that were occupied by non-family households within the MSD in 2006 was 28.2 per cent. By contrast, the proportions observed in the inner Melbourne LGAs ranged between 30.7 and 56.4 per cent. Notwithstanding the high levels of non-family households in these LGAs compared with the MSD, the proportion of non-family households found in collection districts along tram/rail routes within these LGAs is even higher, ranging between 48.2 per cent in Yarra to 59.7 per

cent in Melbourne.

A further distinguishing characteristic is dwelling tenure. With the exception of Boroondara, where the proportion of occupied private dwellings rented was close to the MSD average of 25.4 per cent, the remaining inner Melbourne LGAs were well above this figure, ranging from 41.1 to 65.1 per cent. The rates of rental tenure amongst dwellings located along tram/rail routes were still higher, ranging from 52.9 to 69.7 per cent. It is notable that, in Boroondara, where (as noted) the overall level of rental tenure was only marginally higher than for the MSD, the level was nevertheless more than double the MSD figure for dwellings located on tram/rail routes (52.9 per cent).

An associated observation relates to dwelling type in collection districts on tram/rail routes. Whereas flats, units and apartments comprised 15.1 per cent of occupied private dwellings within the MSD in 2006, this dwelling type comprised between 21.1 (in Boroondara) and 77 per cent of dwellings in the inner Melbourne LGAs. Yet, the proportion is significantly higher within the collection districts along tram/rail routes within these LGAs, ranging between 46.9 and 79.5 per cent. With 63 per cent of flats, units and apartments in the MSD rented in 2006 (ABS, 2006), it may be no surprise to observe an association between above average rental rates and a higher than average proportion of flats, units and apartments along tram/rail routes.

The data also indicate that transience of the residential population is a distinguishing characteristic. In Boroondara, 80.8 per cent of residents at the time of the 2006 Census resided at the same address as 1 year before. This was close to the MSD figure of 80.5 per cent. By comparison, the remaining inner Melbourne LGAs have considerably lower proportions, ranging from 52.3 per cent (Melbourne) to 72.2 per cent (Stonnington). The proportion of persons living at the same address was lower again in the collection districts located on tram/rail routes in the inner Melbourne LGAs. The difference is most marked in Boroondara, where the proportion who lived at the same address dropped from 80.8 to 66.7 per cent. Stonnington is also characterised by a marked difference, the respective figures being 72.2 to 63.1 per cent. The differences, however, for the LGAs of Yarra and Melbourne are marginal, there being only 1.5 percentage points difference between these LGAs respective total populations and those living in collection districts on tram/rail routes. Again, however, this may not be surprising given that these LGAs had relatively high levels of transience overall, with only 67.1 and 52.3 per cent of residents in these LGAs, respectively, living at the same address one year prior to the 2006 Census.

The data, therefore, strongly suggest that, notwithstanding broad differences between LGAs, employed persons living along tram/rail routes are more likely to be young, never

married, residentially mobile, renters who live in non-family households. These characteristics are closely associated with high levels of public transport use for all or part of employed persons' home-work journeys. The data suggest, therefore, that the high levels of public transport use observed amongst residents along these routes may be a reflection of the life stage of residents in these locations, rather than residential proximity to public transport *per se*.

Interestingly, the data show that individual income does not appear to have been a significant distinguishing factor between those residing along tram/rail routes and the total LGA populations of which they were part.

Mid-suburban LGAs

Table 2 presents a similar set of data for the mid-suburban LGAs of Darebin, Moreland, Moonee Valley, Maribyrnong, Glen Eira and Whitehorse. Of these, Whitehorse is the most distant from central Melbourne.

Notwithstanding differences between mid-suburban LGA populations, a similar pattern of differences is observed between the respective LGA populations and those living in collection districts along tram/rail routes within them.

The proportion of occupied private dwellings that were rented in tram/train corridor collection districts was considerably higher than for the respective LGAs. The percentage point difference ranged from 11.7 per cent in Maribyrnong to 40.1 per cent in Whitehorse.

By contrast with inner Melbourne, the proportion of persons aged 20 to 29 years in mid-suburban LGAs varied only marginally around the MSD figure of 14.4 per cent. Nevertheless, the proportion of persons aged 20 to 29 years was notably higher in the collection districts on tram/rail corridors, ranging between 20.5 and 27.7 per cent.

Similarly, while the proportion of persons never married in the mid-suburban LGAs varied marginally around the MSD average (34.8 per cent), significantly greater rates characterise the collection districts in tram/rail corridors in these LGAs. For the selected collection districts along these corridors, the proportion never-married ranged between 42.9 and 49.9 per cent.

The proportion of dwellings occupied by non-family households is significantly greater in tram/train corridors than in the mid-suburban LGAs overall. The proportions of dwellings with non-family households in tram/train corridors in mid-suburban corridors were between 7.3 and 17.6 percentage points higher than in their respective LGAs.

As with the inner Melbourne LGAs, those living on tram/train corridors in middle-suburbia are disproportionately transient compared with the LGA populations overall. The proportion of persons who lived at the same address one year prior to the 2006 Census were

Table 1 Proportion of total resident population and resident population in areas near to tram/rail routes with selected characteristics by selected inner-Melbourne local government areas, 2006

	All collection districts										CDs with =>27 per cent using public transport										Percentage point difference									
	Melb. SD	Boroond ara	Stonning ton	Port Phillip	Yarra Melbourne	Boroond ara	Stonning ton	Port Phillip	Yarra Melbourne	Boroond ara	Stonning ton	Port Phillip	Yarra Melbourne	Boroond ara	Stonning ton	Port Phillip	Yarra Melbourne	Boroond ara	Stonning ton	Port Phillip	Yarra Melbourne									
Rental	25.4	26.4	41.1	53.1	52	65.1	52	60.1	69.7	52.9	56.2	61	60.1	26.5	15.1	7.9	8.1	26.5	15.1	7.9	8.1	4.6								
20-29 yrs	14.4	14.5	20.2	21.9	24.9	41	41	29.7	45.2	31.7	29.7	29.7	29.7	17.2	9.5	7.8	0.8	17.2	9.5	7.8	0.8	4.2								
30-39 yrs	15.6	12.9	17.7	25.5	23.6	18	18	21.3	16.9	17.3	21.3	23.3	16.9	4.4	3.6	0.2	-0.3	4.4	3.6	0.2	-0.3	-1.1								
40-49 yrs	14.7	15.1	12.9	14.4	13.1	8.8	8.8	11.6	12.1	10.4	11.6	13	12.1	-4.7	-1.3	-1.4	-1	-4.7	-1.3	-1.4	-1	-0.9								
50-59 yrs	12.2	13.3	11.9	10.8	10.3	8.2	8.2	9.5	9.7	15.2	15.7	12.4	13.2	3.8	-3.3	-2.1	-0.1	3.8	-3.3	-2.1	-0.1	-0.6								
60 plus yrs	34.8	36.1	44.6	54.1	56.2	66.2	66.2	54.7	68.8	52.4	56.2	62.5	55.8	18.6	11.6	8.4	-0.4	18.6	11.6	8.4	-0.4	2.6								
Never married	28.2	30.7	43.9	52	47.4	56.4	56.4	54.9	59.2	52.4	54.9	59.2	48.2	21.7	11	7.2	0.8	21.7	11	7.2	0.8	3.3								
Non-family household	15.1	21.1	43.4	60.7	35.8	77	77	57.9	65.6	52.4	57.9	65.6	46.9	36.8	20.1	16.8	11.1	36.8	20.1	16.8	11.1	2.5								
Flat, unit appart.	80.5	80.8	72.2	64	67.1	52.3	52.3	66.7	79.5	66.7	63.1	59.1	65.6	-14.1	-9.1	-4.9	-1.5	-14.1	-9.1	-4.9	-1.5	-1.5								
Same address 1 yr ago	40.3	34.4	29.1	25.4	31.9	35.2	35.2	34.2	39.4	34.2	26.4	26.8	34.2	0.2	-2.7	1.4	2.3	0.2	-2.7	1.4	2.3	4.2								
<\$400	12.9	10	9	9	9	7.8	7.8	10.2	9.8	10.2	9.9	9.8	8.4	0.2	0.9	0.9	0.1	0.2	0.9	0.9	0.1	0.6								
\$400-\$599	10.6	8.7	9.1	9.4	9.2	8	8	9.7	8.4	9.7	10.3	10.5	8.7	1	1.2	1.1	-0.5	1	1.2	1.1	-0.5	0.4								
\$600-\$799	8.4	8.2	8.7	9.3	9.1	7.9	7.9	9.3	8.9	9.3	10.1	9.6	8.9	1.1	1.4	0.3	-0.2	1.1	1.4	0.3	-0.2	-0.4								
\$800-\$999	18.8	31.1	32.3	31.8	28.3	24.7	24.7	26.9	19.3	26.9	29.3	26.3	25.3	-4.2	-3	-5.5	-3	-4.2	-3	-5.5	-3	-5.4								
>=\$1,000	11.7	16.7	22	23.1	23.3	20.4	20.4	30.8	29.9	30.8	31.4	31.1	29.9	14.1	9.4	8	6.6	14.1	9.4	8	6.6	8.9								
Pub. Tran. all or part																														

Source: Derived from ABS 2006 Census Basic Community Profile data

Table 2 Proportion of total resident population and resident population in areas near to tram/rail routes with selected characteristics by selected mid-suburban Melbourne local government areas, 2006

	All collection districts										CDs with =>27 per cent using public transport										Percentage point difference									
	Dare bin	More land	Moonee Valley	Maribyr rning	Glen Eira	Whithorse	Dare bin	More land	Moonee Valley	Maribyr rning	Glen Eira	Whithorse	Dare bin	More land	Moonee Valley	Maribyr rning	Glen Eira	Whithorse	Dare bin	More land	Moonee Valley	Maribyr rning	Glen Eira							
Rental	33.1	30.6	29.2	37.3	29	21.7	46.1	47.4	60.5	49	50.6	61.8	13.0	16.8	31.3	11.7	21.6	13.0	16.8	31.3	11.7	21.6	40.1							
20-29 yrs	16.1	16.9	14.3	18.6	13.9	13	20.5	27.7	20.8	27	26.8	24.9	4.4	10.8	6.5	8.4	12.9	4.4	10.8	6.5	8.4	12.9	11.9							
30-39 yrs	18.2	17.9	15.8	19.8	16	15	20	21.6	19.3	20.8	18.7	17.4	1.8	3.7	3.5	1.0	2.7	1.8	3.7	3.5	1.0	2.7	2.4							
40-49 yrs	14.2	13.6	14.5	14.7	14.8	14.1	12.5	11.8	12.5	13.1	12.4	12.4	-1.7	-1.8	-2.0	-1.6	-2.4	-1.7	-1.8	-2.0	-1.6	-2.4	-1.7							
50-59 yrs	10.2	9.7	12.2	9.8	12.4	12	9	8.5	10.1	9	9.6	9.9	-1.2	-1.2	-2.1	-0.8	-2.8	-1.2	-1.2	-2.1	-0.8	-2.8	-2.1							
60 plus yrs	19.8	20.3	20.2	15.7	19.8	22.2	22.7	15.7	16.3	13.8	17.1	12.6	2.9	-4.6	-3.9	-1.9	-2.7	-4.6	-3.9	-1.9	-2.7	-2.7	-9.6							
Never married	39.8	39	35.7	42.7	34.5	31.4	45.7	53.7	47.5	49.9	46.9	42.9	5.9	14.7	11.8	7.2	12.4	5.9	14.7	11.8	7.2	12.4	11.5							
Non-family household	35.3	35.1	32.1	37.1	34.7	29.1	52.9	46.7	49.2	44.4	51.4	45.1	17.6	11.6	11.6	7.3	16.7	17.6	11.6	11.6	7.3	16.7	52.8							
Flat, unit appart.	19.5	17.7	19.5	19.6	26.2	9.6	47.1	34.3	50.8	34.8	60.8	62.4	27.6	16.6	31.3	15.2	34.6	27.6	16.6	31.3	15.2	34.6	52.8							
Same address 1 yr ago	78.6	79.3	80.9	75.5	80.1	83.7	72.8	70	69.7	68.1	71.2	69.6	-5.8	-9.3	-11.2	-7.4	-8.9	-5.8	-9.3	-11.2	-7.4	-8.9	-14.1							
<\$400	45	44.3	40.2	43.4	36.5	41.5	41.7	39.3	43.1	41.8	38.4	52.9	-3.3	-5.0	2.9	-1.6	1.9	-3.3	-5.0	2.9	-1.6	1.9	11.4							
\$400-\$599	12.6	12.5	11.7	11.8	11.5	12.6	12.5	11.8	9.7	12.9	11.9	15.3	0.2	-0.7	-2.0	0.1	0.4	0.2	-0.7	-2.0	0.1	0.4	2.7							
Non-family household	9.8	9.8	9.7	9.9	10	9.9	10	10	7.4	9.9	11.3	9	0.2	0.2	-2.3	0.0	1.3	0.2	0.2	-2.3	0.0	1.3	-0.9							
Flat, unit appart.	7.5	7.9	8.3	8	8.4	8.1	7.7	9.2	7.2	7.4	9	6.2	0.2	1.3	-1.1	-0.6	0.6	0.2	1.3	-1.1	-0.6	0.6	-0.9							
\$800-\$999	14.8	15.6	20.7	16.2	23.7	21.1	15.9	18.2	17.1	14.4	18.6	10.1	1.1	2.6	-3.6	-1.8	-5.1	1.1	2.6	-3.6	-1.8	-5.1	-11.0							
>=\$1,000	18.2	19.2	15.2	20.2	17.3	14.5	31.2	30.4	30.9	32.8	32.6	28.2	13.0	11.2	15.7	12.6	15.3	13.0	11.2	15.7	12.6	15.3	13.7							
Pub. Tran. all or part																														

Source: Derived from ABS 2006 Census Basic Community Profile data

between 5.8 and 14.1 percentage points less in tram/train corridors than for total LGA populations.

Discussion

As with the inner Melbourne LGAs, the data for mid-suburban LGAs suggests that the populations living in collection districts with high rates (27 per cent or higher) of public transport use (for journey-to-work) and which are situated along tram/rail routes are disproportionately younger, unmarried renters who are more likely to live in non-family households in medium-density housing.

The high threshold of public transport patronage, of 27 per cent, used to select these collection districts excludes many collection districts from the analysis that would have also confirmed these conclusions, but to a lesser degree. Nevertheless, in most LGAs, the 27 per cent threshold selected a sufficient number of collection districts for comparison with the respective LGA populations of which they were part. In the case of Whitehorse, however, this high threshold resulted in only three collection districts being selected for comparison. Nevertheless, if a lower threshold had been used for Whitehorse, for example of 22 per cent, the number of collection districts selected would have been considerably greater (20) and the same basic observations made, but less marked than with the higher threshold.

The socio-economic profile of persons living in collection districts along tram/rail routes within the LGA of Melbourne is consistent with the findings of recent research into the residential mobility patterns within Melbourne. Wulff and Reynolds (2010) found that the Inner Melbourne Statistical Subdivision (SSD), which is comprised of the LGAs of Melbourne, Port Phillip, Stonnington and Yarra, had the highest household turnover rate within the MSD between 2001 and 2006. Over 60 per cent of households in the Inner Melbourne Statistical sub-division (SSD)⁹ had changed residence since 2001, compared with 41 per cent for the Melbourne SD as a whole (Wulff and Reynolds 2010, 37). These observations are consistent with the relatively high level of residential transience indicated in the above analysis, for the LGAs of Melbourne, Port Phillip, Stonnington and Yarra, and for the populations in these LGAs living along tram/rail routes.

That this high level of residential transience is linked to the movement of younger persons is supported by internal migration data derived from the 2006 Census. Table 3 shows the net gain/loss of residents in the Inner Melbourne SSD by age for the period 2001 to 2006. The data show a very significant net gain of residents aged 15 to 29 years. This stands in contrast to net losses of residents aged 30 to 44 years.

Table 4 shows the net gain/loss of household reference persons¹⁰ in the Inner Melbourne

Table 3 Net gain/loss of residents by age, 2001-2006, Melbourne Statistical Subdivision

Age	Net domestic movement 2001-2006 as % 2001
15 to 29 years	65.2
30 to 44 years	-17.1
45 to 64 years	0.3
65 years and over	-1.9

Source: ABS 2006 Census, Internal migration data set held by CPUR

Table 4 Net residential movement of household reference persons by household type, Inner Melbourne Statistical Subdivision, 2001-2006

Age	Net domestic movement 2001-2006 as % 2001
Lone parent >=45 years	3.9
Lone parent <45 years	-15.9
Couple with children	-29.4
Couple without children >=45	1.2
Couple without children <45	6.8
Lone persons >=45	0.1
Lone persons < 45	34.1
Group household	73.7
Other or multi-family household	24.9

Source: ABS, 2006 Census customised internal migration data set held by CPUR

SSD for the period 2001 to 2006. The number of reference persons can be taken as a proxy for the count of households. The family/household type of the reference person is also indicated and, for some household types, the broad age of reference person. The data show significant net gains of reference persons who in 2006 were living in group households, and living as lone persons less than 45 years of age. At the same time, there were significant net losses of reference persons who were either lone persons older than 45 years, or reference persons in couple-with-children households. The significant net loss of reference persons who were in couple-without-children households in 2006 supports the conclusion that the concentration of younger persons in Inner Melbourne is associated with a pre-family life stage and that, as young persons enter into the family formation life stage, there is a propensity for them to move out of Inner Melbourne.

Table 5 shows the net gain/loss of persons by age and dwelling tenure for the period 2001-2006 for the Inner-Melbourne SSD. The largest net gain by far is younger renters. As observed with the data in Table 3, the net gain of younger persons is accompanied by a significant net

loss of older persons, aged 30–44 years. The data, however, show that this net loss consists of persons who, by 2006, either owned or were purchasing their dwelling.

The data in Tables 3, 4 and 5 corroborate the conclusions drawn from Tables 1 and 2 – that the populations of these LGAs, including those who reside on tram/train routes, are disproportionately young, unmarried, residentially transient, and living in rented accommodation.

This conclusion means that one of the primary assumptions of the *Tramway Corridors* and similar proposals appears to be, at best, simplistic. The assumption that significant concentrations of residential development along tramway corridors will result in a major modal shift to public transport may fail to take into account the life stage characterising many residents within the populations currently living along public transport corridors.

The travel mode behaviour of persons who are disproportionately represented in the selected collection districts located along public transport corridors may not continue if the larger future population that is expected to be accommodated along tramway corridors does not share the life-stage characteristics of the current incumbents in these locations.

The above analysis points to significant uncertainty about the key assumptions of the *Tramways Corridor* policy approach to urban densification in Melbourne and, more broadly, the assumptions that continue to underpin the Victorian Planning Policy Framework. In particular, the coercive measures (e.g. compulsory acquisition of land titles, and weakened car parking provisions) that have been foreshadowed as necessary to the implementation of the policy, do not appear defensible as means for increasing public transport use in these areas. As noted, the *Tramway Corridors* proposal is quite open about the level of government intervention and restrictive legislative/regulatory change that would be needed to accompany its implementation. The adoption of the VC71 amendment in the dying days of the Brumby Labor government, without parliamentary debate, is notable in this context.

The above analysis suggests that a more complete understanding of the social and demographic factors that help shape travel-mode decisions of residents who live near public

Table 5 Net gain/loss of persons by age and dwelling tenure, 2001–2006, Inner Melbourne Statistical Subdivision

Age	Net domestic movement 2001–2006 as % 2001	
	Owner/purchaser	Private rental
15 to 29 years	4.4	122.9
30 to 44 years	-32.4	3.7
45 to 64 years	-3.0	9.1
65 years and over	-3.1	-1.0

Source: ABS 2006 Census, Internal migration data set held by CPUR

transport corridors is necessary before any concerted, large scale attempt is made to implement residential intensification strategies along public transport corridors in Melbourne. Residential proximity to public transport alone may not be sufficient to bring about a major shift in travel mode preferences.

Notes

- 1) It is not acknowledged, however, that the Melbourne@5 million document assumes that a significantly higher proportion of additional housing will be provided on the suburban fringe than did the original *Melbourne 2030* policy document.
- 2) The Victorian Liberal/Nationals Coalition government is a political coalition between two political parties: the Liberal Party – focussed on small-government and pro-business, and the Nationals – a party dependent upon non-metropolitan small business and farm community support – formerly named the Country Party.
- 3) It is curious that the proposal advocates reduced car parking provisions, or even no provision for car parking, measures that are essentially coercive. This suggests that the authors of the proposal are not entirely convinced that land-use policies (based on higher densities along tram corridors) alone would be sufficient to bring about a significant travel mode shift in favour of trams.
- 4) In its own words the “ADC is a wholly Australian, non-political, not-for-profit leadership organisation which brings together leaders from business, government, the public sector, academia and the broader community to improve their understanding of key issues affecting Australia.” <http://adcforum.org/about-adc-forum/>
- 5) Here, the ‘City of Melbourne’ refers to the municipality of Melbourne.
- 6) Not all collection districts along tram/rail routes within the selected LGAs are therefore included in the comparison – only those collection districts that meet the high 27 per cent public-transport-use criterion.
- 7) Non-family households principally consist of group households of unrelated persons and lone-person households.
- 8) The Melbourne Statistical Division is roughly equivalent to metropolitan Melbourne.
- 9) The Statistical Division of Melbourne is comprised of 16 SSDs.
- 10) The ‘reference person’ is the household member used in Census coding as the starting point for identifying the relationships between usual residents of a household. Familial relationships are defined in terms of the relationship between the family reference person and all other family members.

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