# The impacts of political changes on public transport accessibility in Melbourne, 2008-2014

Submitted for
7th State of Australian Cities Congress (SOAC), Gold Coast, 9-11 December 2015

*Dr Jan Scheurer, RMIT University, Centre for Urban Research*
*Prof Carey Curtis, Curtin University, School of Built Environment*

## Abstract

The Spatial Network Analysis for Multimodal Urban Transport Systems (SNAMUTS) tool has been employed to quantify and visualise public transport accessibility in metropolitan Melbourne on a regular basis since 2008. Across a four-stage time line (2008-2014 in biannual steps), it documents changes associated with network expansion and service upgrades as well as underlying trends in the geographical distribution of residents and jobs. During the same period, Victoria experienced two changes of state government as a result of elections where, in the eyes of most political commentators, the state of public transport and proposals for future improvements played a decisive role in determining voter behaviour.

This paper traces the evolution of public transport accessibility in Melbourne and link the documented changes to the political process. It shows that the Bracks/Brumby (1999-2010) government's SmartBus initiative had the greatest beneficial effect on accessibility according to most SNAMUTS indicators, but we argue that this impact arrived too late to save the government's electoral fortunes. The Baillieu/Napthine (2010-2014) government's focus on frequency improvements on selected rail and bus feeder lines measures more modestly in accessibility terms, and moreover failed to sufficiently address public transport's mounting congestion problem as Melbourne's population continues on a rapid growth trajectory. In the context of these documented shortfalls, we conclude with a range of recommendations for public transport improvements that would be required to minimise the risk of another election fought over legitimate discontent with public transport in 2018.

## Introduction: Public Transport and Electoral Politics

Until the 2000s, conventional political wisdom in Australia suggested that public transport was not a 'vote winner'. Regular public transport users were considered too marginal a population group to swing elections, and public transport modes had a long-standing reputation as a costly sink of government subsidies within a political discourse averse to welfare services considered inefficient. Against a background of continued path dependence supporting car-based transport for over fifty years in Australia, public transport solutions to mobility were rarely favoured or supported (Curtis and Low, 2012). Interestingly Victoria alone was prominent in the 1980s in promoting the idea that metropolitan Melbourne should invest in a world class public transport system, but this discourse was short-lived and fell victim to the neo-liberal philosophy of fiscal responsibility and government restructuring.

Towards the end of the decade, however, a combination of socio-demographic changes in cities, increasing petrol prices and a declining negative stigma of public transport in favour of a perception as a critical support system for the emerging knowledge economy as well as hip and green urban lifestyles called these certainties into question (Lagura et al, 2011; Newman and Kenworthy, 2011). Transport policy in Australia was also shifting. State governments were publishing transport policies lauding sustainable transport and requiring significant mode shift – especially to public transport and away from the car (see for example DoT et al, 1996).  Many metropolitan planning strategies were promoting urban development patterns capable of being served by public transport. Simultaneously, public transport in large Australian cities embarked on a trajectory of patronage growth whose magnitude had been unprecedented since World War II. While public bureaucrats were cognisant of the revived role for public transport,  mainstream political parties struggled to grasp the changing image and utility of public transport within the electorate and the impact of its users' everyday experience on their decisions at the ballot box, as evidenced by their political campaigns.

Victoria's Bracks/Brumby Labor government (1999-2010) released a multitude of public transport plans and strategies during its three terms in office, while presiding over increasing levels of overcrowding and unreliability particularly on Melbourne's rail network (Lazanas and Stone, 2010). In practice, however, network extensions or performance and capacity upgrades among trains and trams remained very limited during this period. In the bus sector, a more tangible transformation was achieved when a tangle of convoluted and irregular lines on multiple suburban corridors was consolidated into a branded network of eight SmartBus routes with service frequencies and operating spans comparable to (if not always synchronised with) the rail system (Parker, 2011; Mees and Dodson, 2011). These SmartBus routes operate along orbital corridors as well as making radial connections in the rail-free municipality of Manningham and the Caulfield to Rowville corridor – suburban areas that by and large had first developed during the era of mass motorisation, contain a significant number of marginal seats and had never enjoyed public transport services of such quality before. The rollout of this network occurred almost exclusively during the last term of the Bracks/Brumby government (2006-2010), with the majority of lines opened only months before the November 2010 election.

Labor, somewhat unexpectedly, lost government in 2010, partially because of widespread discontent with the state of Melbourne's public transport system. In the 'sandbelt' suburbs along the Frankston train line, no less than five seats changed hands from Labor to Liberal

and delivered a majority to the incoming Baillieu/Napthine Liberal/National government. The circumstances of the election win also delivered a strong public expectation that the new government would tackle Melbourne's backlog in public transport investment and performance with greater ambition than its predecessors (Stone and Scheurer, 2014). In practice, during the term of the Baillieu/Napthine government (2010-2014) some frequency improvements on train and bus routes were implemented and several additional train stations opened in outer suburban growth areas. But despite a flurry of studies in the early part of the term and the inception of a new agency to oversee public transport planning throughout the state (Public Transport Victoria or PTV) no major, transformative public transport infrastructure projects were initiated. Instead, the government made a highly controversial, large-scale inner-city tollway project the centrepiece of its transport infrastructure vision. The lack of popular support and of a credible business case for this tollway contributed to the defeat of the Baillieu/Napthine government at the 2014 state election and, after only a single term in opposition, returned a Labor government under the leadership of Daniel Andrews who promptly cancelled the tollway project (Bosler, 2014).

This paper will investigate how the changing policy environment accompanying the political changes in Victoria during the past seven years corresponded with public transport accessibility outcomes as documented by the Spatial Network Analysis for Multimodal Urban Transport Systems (SNAMUTS) tool. We will present a timeline of four snapshots in late 2008, 2010, 2012 and 2014, roughly coinciding with the two election dates and the halfway points of the terms preceding them. Among the rhetoric and public presentation of long-term plans for the conversion of Melbourne's aging suburban rail network into a modern metro-style system that dominated the agenda of both major parties in government, what impact did the short-term measures to improve services and infrastructure actually undertaken between 2008 and 2014 have on the user experience of Melbourne's public transport? Can the findings of this analysis help explain why community discontent with public transport appears undiminished among Melbourne's voters at the end of this period, and can they point to more viable policy approaches, achievable within the time frame of an electoral term, to ameliorate such discontent?

## SNAMUTS Indicators for Melbourne, 2008-2014

The Spatial Network Analysis for Multimodal Urban Transport Systems (SNAMUTS) tool assesses the performance of public transport networks in their settlement context, by way of a suite of eight indicators that illuminate different aspects of spatial accessibility. The core methodology of the tool has been inspired by the Space Syntax theory (Hillier and Hanson, 1984) and by the Multiple Centrality Analysis tool (Porta et al, 2006a, 2006b). It adopts measures and concepts commonly used in network analysis for the specific properties of public transport (Neal, 2013) and is particularly interested in the interplay of transport networks and the dynamics of land use changes (Bertolini, 1999; Bertolini, 2005).

Broadly, SNAMUTS assesses the degree to which a public transport network can offer an equivalent to the 'go anywhere, anytime' convenience usually associated with the private car, or at a smaller spatial range with non-motorised modes. This quality is based on several components, including the configuration of public transport as a multi-modal network that allows travel along geographical desire lines, at service frequencies high enough to not require timetable consultation, and with seamless transfers between vehicles both in terms

of physical co-location and in terms of integrated ticketing and timetable coordination. The interplay of these characteristics is what is known as the 'network effect' of public transport services, where the ability of the network as a whole to provide accessibility is superior to that of the sum of its individual components (Mees, 2010a; Nielsen et al, 2005; Walker, 2012).

It is beyond the scope of this paper to describe the rationale, evolution and methodology of each indicator in detail; interested readers are advised to consult Curtis and Scheurer (2010), Curtis and Scheurer (2016) and the project website (www.snamuts.com) for further reference.

The SNAMUTS analysis is based on network and service data derived from public domain timetables and route information, in Melbourne available through the Public Transport Victoria (PTV) website and printed material. Land use data relies on the ABS census undertaken in five-year intervals. Residential data is analysed at the level of mesh blocks and aggregated to determine the population size within walkable activity node catchments (see below). Job data was derived from journey-to-work destination zone figures from the 2006 census and extrapolated for 2011 by using the average change increment from 2006 to 2011 per SA2 within which the journey-to-work destination zone is located, the smallest statistical unit for which employment figures are available in the public domain. For the 2008 and 2010 study years, both residential and employment figures were calculated by adding 40% (2008) or 80% (2010) of the 2006-2011 change increment to the 2006 figures. For the 2012 and 2014 study years, unmodified 2011 census figures were used, since newer projections for residential and employment trends will not be available until the 2016 census. Given the substantial growth rate of metropolitan Melbourne, the activity node catchment sizes for 2012 and 2014 used in the SNAMUTS analysis thus contain a measure of understatement.

The SNAMUTS assessment refers to a matrix of activity centres, derived from strategic planning documents such as Plan Melbourne (DELWP, 2013), the structure of the public transport network and site observation, as the concentrations of origins and destinations most relevant to urban movement and accessibility. In 2008, 184 such nodes were identified in metropolitan Melbourne; by 2014, network expansion had increased their number to 198. SNAMUTS further investigates the public transport network composed of routes at or above a specific standard of service frequency, as it is interested in public transport as a facility that allows for both planned and spontaneous trip-making. This standard is defined as minimum 20-minute intervals during the weekday inter-peak period and minimum 30-minute intervals during the day on Saturdays and Sundays on buses and trams, and minimum 30-minute intervals during the weekday inter-peak period combined with service seven days a week on trains. The network analysis commonly refers to the weekday inter-peak period as the time of the day and week when the greatest range of travel purposes coincide, and the competitiveness of public transport to the car or non-motorised modes is most critically determined.

The eight core SNAMUTS indicators revolve around inquiries of:

- the operational input required to provide service on the network at the defined minimum standard (service intensity);

- the ease of movement provided by the structure of network and service levels (closeness centrality);
- the transfer intensity resulting from the structure of the network (degree centrality);
- the percentage of metropolitan residents and jobs with walking-distance access to public transport at the defined minimum standard (network coverage);
- the percentage of metropolitan residents and jobs that can be accessed by way of an average 30-minute kerb-to-kerb public transport journey (contour catchment);
- the distribution of travel opportunities generated by the interplay of public transport and settlement structure over network elements and places of activity (betweenness centrality);
- the suitability of network elements to service existing concentrations of travel opportunities and to absorb potential future growth (resilience);
- the position of activity nodes within a network that allows for flexible, autonomous user movement and attraction of land uses dependent on good public transport access (network connectivity).

In the following, we will present and briefly discuss the evolution of network results for Melbourne on each of these indicators in biannual intervals over the 2008-2014 period.

*Service intensity*

**Table 1:** Service intensity in Melbourne, 2008-2014, in vehicles/train sets in simultaneous revenue service on routes meeting the SNAMUTS minimum service standard

| Melbourne SNAMUTS *23R* | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|
| Service intensity (**total**/rail/tram/bus) | **412** 63/260/88 | **537** 71/269/197 | **538** 70/267/200 | **557** 75/266/216 |
| Service intensity (per 100,000 inhabitants) | 11.0 | 13.7 | 13.5 | 13.9 |

The service intensity index captures the number of public transport vehicles or train sets in simultaneous revenue service at SNAMUTS minimum service standard (see above). This measure of operational input experienced a quantum leap between 2008 and 2010 when the bulk of the SmartBus network was introduced. It stagnated (and slightly declined relative to population) between 2010 and 2012 before returning to a modest pace of growth between 2012 and 2014, linked to increased frequencies on some train lines and the reconfiguration of bus services in some areas that lifted more routes above the minimum service standard threshold.

*Closeness centrality*

**Table 2:** Closeness centrality in Melbourne, 2008-2014, with lower values indicating greater average ease of movement

| Melbourne SNAMUTS *23R* | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|
| Closeness centrality (average per node) | 63.6 | 62.3 | 63.5 | 64.8 |

The closeness indicator is based on a spatial separation or travel impediment measure composed of travel time and service frequency, as proxies for the ease with which passenger can move around a city on public transport. Ease of movement on Melbourne's network experienced some improvement between 2008 and 2010 when the new SmartBus routes allowed for the elimination of numerous time-consuming detours particularly for cross-suburban journeys. But since 2010, average ease of movement deteriorated. Between 2010 and 2012, this is likely linked to increases in scheduled travel times on several train lines in combination with a near-stagnation of service frequency levels across the network. Between 2012 and 2014, the addition of several new nodes at the perimeter of the network inflated the figures.

*Degree centrality*

**Table 3:** Degree centrality in Melbourne, 2008-2014, with lower values indicating lower average transfer intensity

| Melbourne SNAMUTS *23R* | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|
| Degree centrality (average per node) | 0.95 | 0.92 | 0.91 | 0.95 |

The degree centrality index measures the reliance of the network on transfers between public transport services on different routes to make journeys on the network. Average transfer intensity across Melbourne's public transport network was reduced between 2008 and 2010 when the new SmartBus routes introduced a broad range of direct connections between nodes that previously required transfer journeys. However, between 2012 and 2014 this trend was reversed, reflecting a growing preponderance of classic bus feeder services in suburban areas (such as Wyndham, Caroline Springs and Fountain Gate) that produce nodes with high transfer intensity values.

*Network coverage*

**Table 4:** Network coverage in Melbourne, 2008-2014, in residents and jobs and percentage of metropolitan total

| Melbourne SNAMUTS *23R* | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|
| Network coverage (**total**/percentage of activities) | 2,239,000 42.0% | 2,639,000 47.4% | 2,673,000 47.0% | 2,739,000 48.1% |

Network coverage measures the percentage of metropolitan residents and jobs within walking distance (roughly 800 metres around rail stations, and 400 metres along bus and tram corridors) of one of more public transport routes that meet the minimum service standard. On this measure, a substantial 400,000 additional residents and jobs obtained walking access to public transport as a result of the SmartBus network introduced between 2008 and 2010. This was a significant improvement from a well-targeted intervention. However, the percentage of metropolitan residents and jobs enjoying such privilege remained below 50% even after 2010: between 2010 and 2012, network coverage deteriorated slightly in relation to population and job growth. Between 2012 and 2014, it re-embarked on a modest growth trend as a result of service improvements in outer suburban areas.

State of Australian Cities Conference 2015

*30-minute contour catchments*

**Table 5:** Average catchment of a 30-minute public transport travel time contour in Melbourne, 2008-2014, in residents and jobs and percentage of metropolitan total

| Melbourne SNAMUTS *23R* | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|
| Contour catchment (average per node) | 477,000 8.9% | 513,000 9.2% | 513,000 9.0% | 505,000 8.9% |

The contour catchment index captures the number of residents and jobs that can be reached within a public transport journey of 30 minutes or less from each activity node. The effect of the SmartBus network rollout is visible in the growth of the average result on this index, enabled both by connections in a larger number of directions and the expansion of walkable catchments around existing train stations through connecting bus routes. Since 2010 however, an opposite (though much weaker) trend can be detected: declining speed on some train and surface routes as well as the addition of peripheral nodes with inherently small 30-minute contour catchments bring down the average on this index.

*Betweenness centrality*

**Table 6:** Global betweenness and segmental betweenness by mode and within the CBD area in Melbourne, 2008-2014

| Melbourne SNAMUTS *23R* | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|
| Global betweenness (per million residents and jobs) | 164 | 176 | 174 | 176 |
| Segmental betweenness (rail/tram/bus) | 55.7%/36.8%/7.6% | 52.2%/30.0%/17.8% | 51.7%/30.4%/17.9% | 53.9%/28.2%/17.9% |
| Segmental betweenness (CBD segments) | 33.9% | 32.3% | 32.1% | 31.4% |
| Segmental betweenness (Zone 1/Zone 2) | 92.7%/10.6% | 91.4%/14.8% | 91.3%/14.7% | 90.5%/16.2% |

Note: Zone 1 and Zone 2 overlap, hence the total figure exceeds 100%.

This index visualises how potential preferred travel paths (those that offer the shortest travel times while also considering transfers and service frequencies) between any pair of nodes on the network are distributed across the network. In other words, which routes and nodes potentially attract the most through-put from travel opportunities generated by the land use-transport system as a whole? The results are analysed by transport mode and specific to geographical areas.

The global betweenness index assesses the concentration of public transport travel opportunities relative to the distribution of land use activities in the metropolitan area and can thus be read as a proxy for the overall presence of public transport for users. It grew between 2008 and 2010 in line with the SmartBus network, but stagnated between 2010 and 2014.

The distribution of travel opportunities over different transport modes saw the (previously very marginal) share of buses more than double between 2008 and 2010, more at the expense of the share of trams than that of trains (since the SmartBus routes integrate with

and thus support the train system more than the tram system). Between 2010 and 2012, the distribution barely changed, before nudging back towards trains at the further expense of trams between 2012 and 2014. This can be associated with the proliferation of 10-minute intervals on parts of the train system, making it more competitive to tram travel where similar frequencies have been common for some time.

The SmartBus system had a tangible impact on redistributing travel opportunities away from the CBD area, and on creating a greater presence for public transport in outer Melbourne (Zone 2). This is in the interest of counteracting potential congestion effects and of making public transport more attractive to users whose origins and destinations are elsewhere in the city. Between 2010 and 2014, this trend continued, albeit at a much slower pace.

*Resilience*

**Table 7:** Network, modal and CBD resilience of Melbourne's public transport, 2008-2014, with higher figures indicating greater resilience

| Melbourne SNAMUTS *23R* | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|
| Network resilience (**total**/rail/tram/bus) | **+10.6** +10.9/+11.3/+7.9 | **+7.7** +10.1/+10.5/+2.4 | **+7.0** +9.8/+9.6/+2.0 | **+7.9** +8.6/+10.8/+3.5 |
| Segmental resilience (CBD segments) | +9.5 | +7.2 | +6.2 | +7.4 |
| Segmental resilience (Zone 1/Zone 2) | +9.7/+13.8 | +6.7/+6.3 | +6.1/+6.1 | +7.0/+6.7 |

Note: Zone 1 and Zone 2 overlap, hence the total figure differs from the average of the two zones.

This index extracts a ratio between the betweenness index and the actual carrying capacity offered on each component of the network, determined by the service frequency and the mode used (vehicle size). It is designed to assist in differentiating network elements by their ability to absorb current usage pressures as well as future increases in patronage derived from further urban growth or improvements in public transport mode share. The index follows a scale from a positive value of 30 to open-ended negative values, with lower figures indicating greater potential stress or lower resilience.
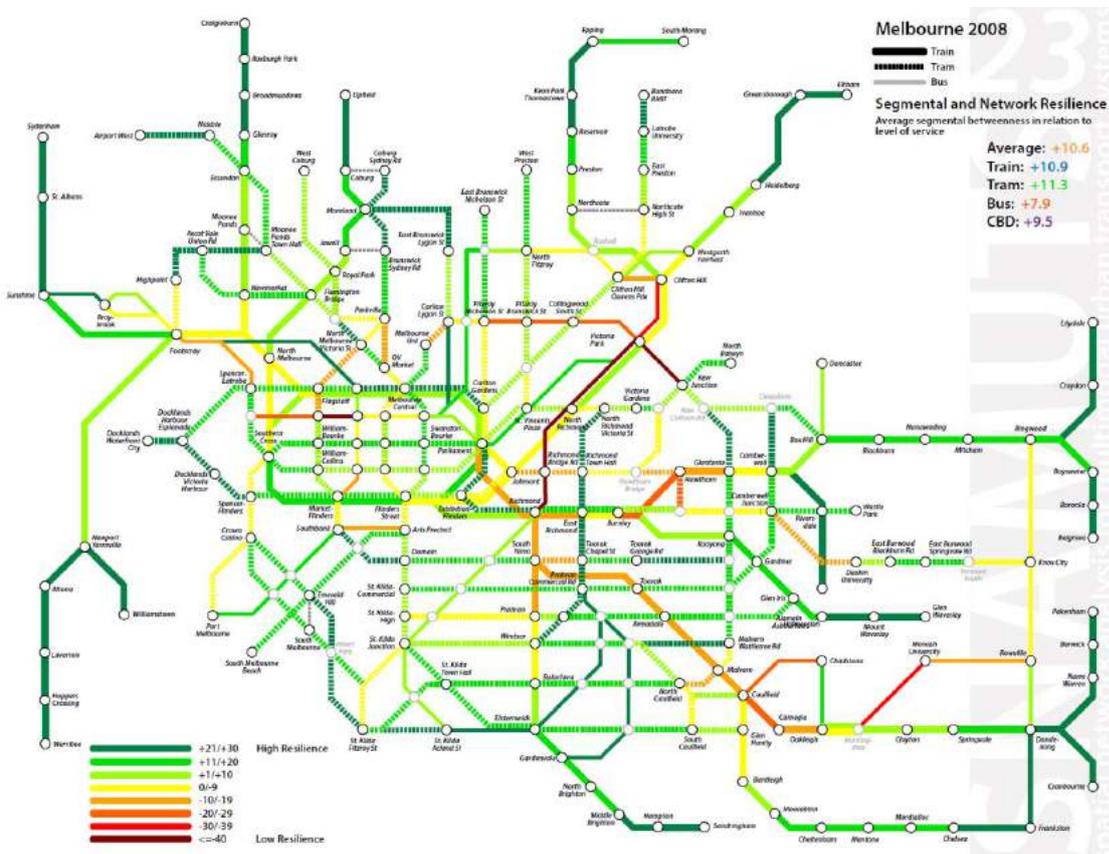
Resilience on Melbourne's public transport network declined markedly between 2008 and 2010. This effect is particularly conspicuous on the bus network, which due to small vehicle size and exposure to mixed traffic is the most vulnerable mode to pressures from travel opportunities generated by the land use-transport system. The trend is also particularly pronounced in outer Melbourne (Zone 2), where a previous resilience advantage over Zone 1 eroded. Clearly the SmartBus network, comprising both orbital and radial lines (with the latter also affecting CBD resilience), tapped into a rich pool of previously under-serviced potential for public transport across Melbourne. Simultaneously however, it becomes apparent that parts of the SmartBus network are characterised by exceptionally poor resilience measures and thus constitute but an initial, pioneering solution to the public transport accessibility challenges in middle and outer suburban Melbourne. To mobilise the full potential of public transport along the most critical SmartBus corridors, further significant performance and capacity upgrades will be required in the future.

The trend towards poorer resilience continued at a much slower pace beyond 2010, before recovering slightly between 2012 and 2014 (though these figures may be misleading, as

population and job growth after 2011, which would put downward pressure on resilience, has not been factored in). Of concern is that resilience on the rail system declined while improving on both trams and buses. This is due to rail frequencies of 10 minutes or better, now prevalent on several inner urban lines, making train journeys more attractive compared to tram or bus journeys in some of inner Melbourne and thus shifting more travel opportunities onto the rail system. The same effect occurs as a result of additional feeder bus services in outer Melbourne, which add bus segments with relatively good resilience performance to the network while strengthening the role of the rail system providing connections to the rest of the city.

Maps 1 to 4 show the evolving network structure and resilience conditions on Melbourne's public transport network for each of the four study years.
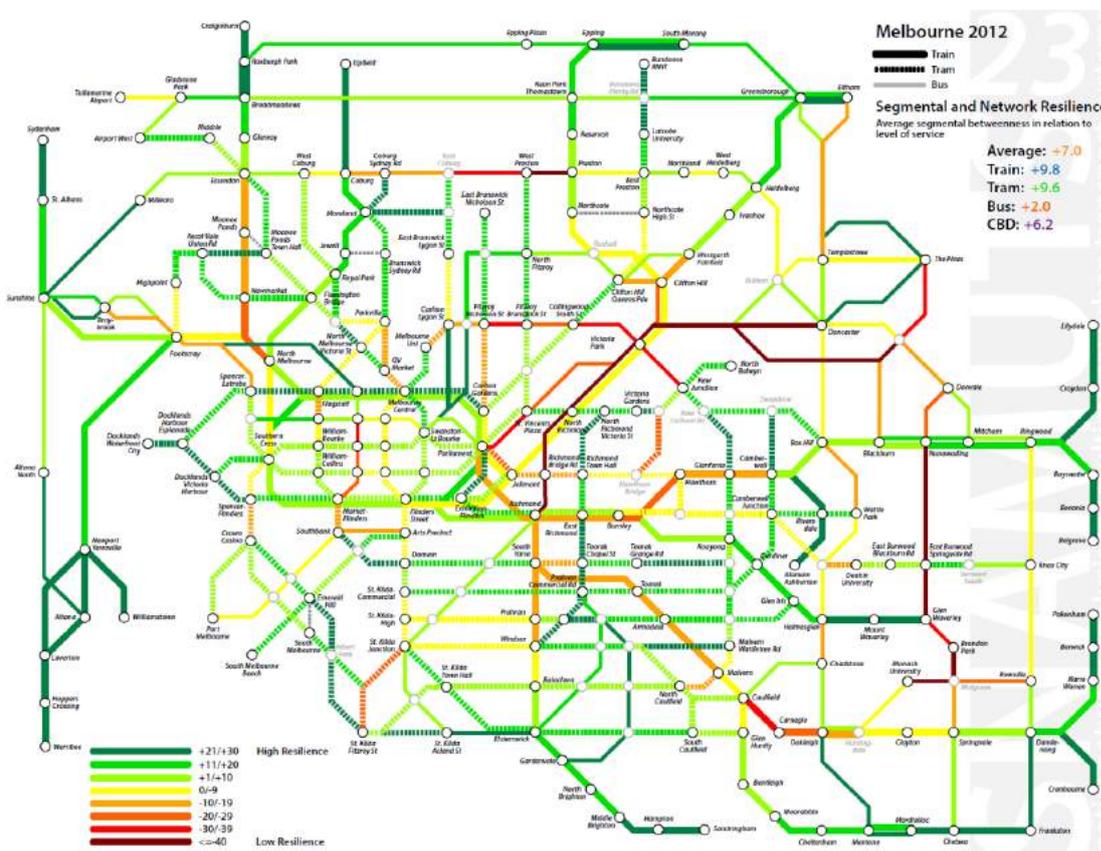
**Map 1:** Segmental and network resilience in Melbourne's public transport network in 2008
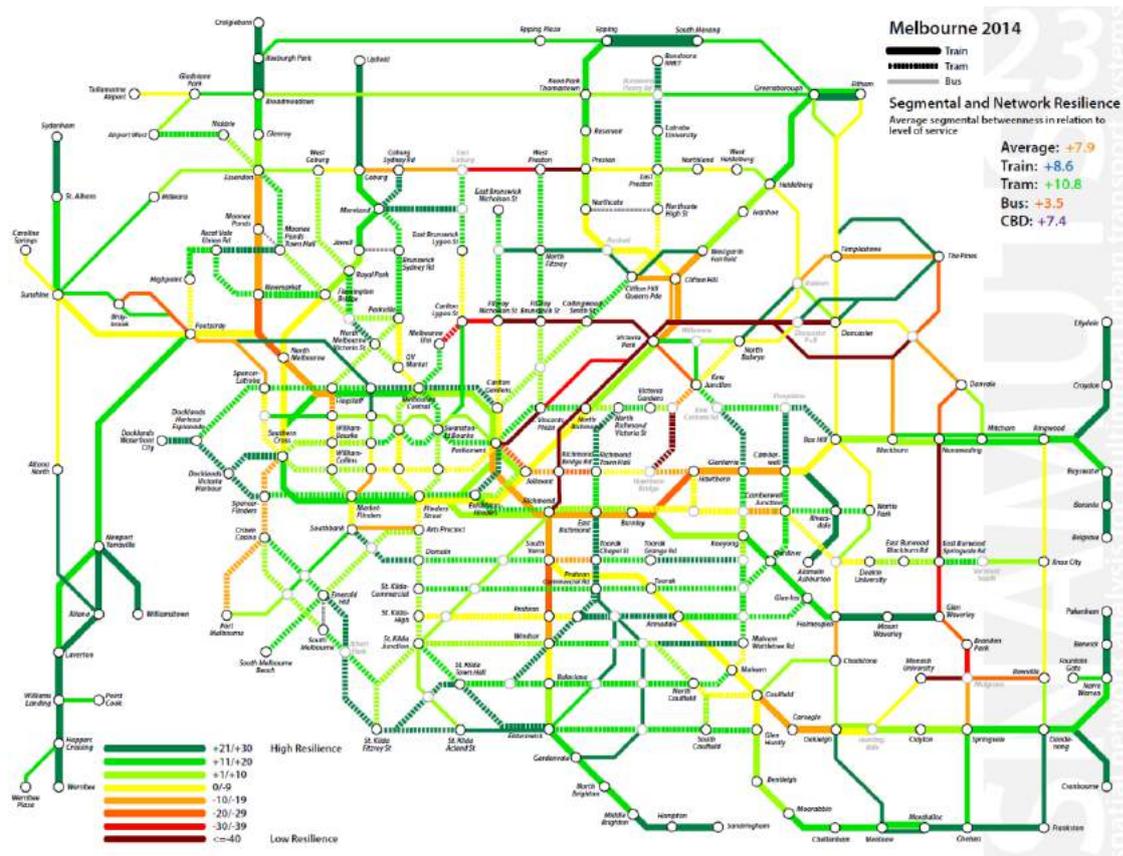
**Map 2:** Segmental and network resilience in Melbourne's public transport network in 2010
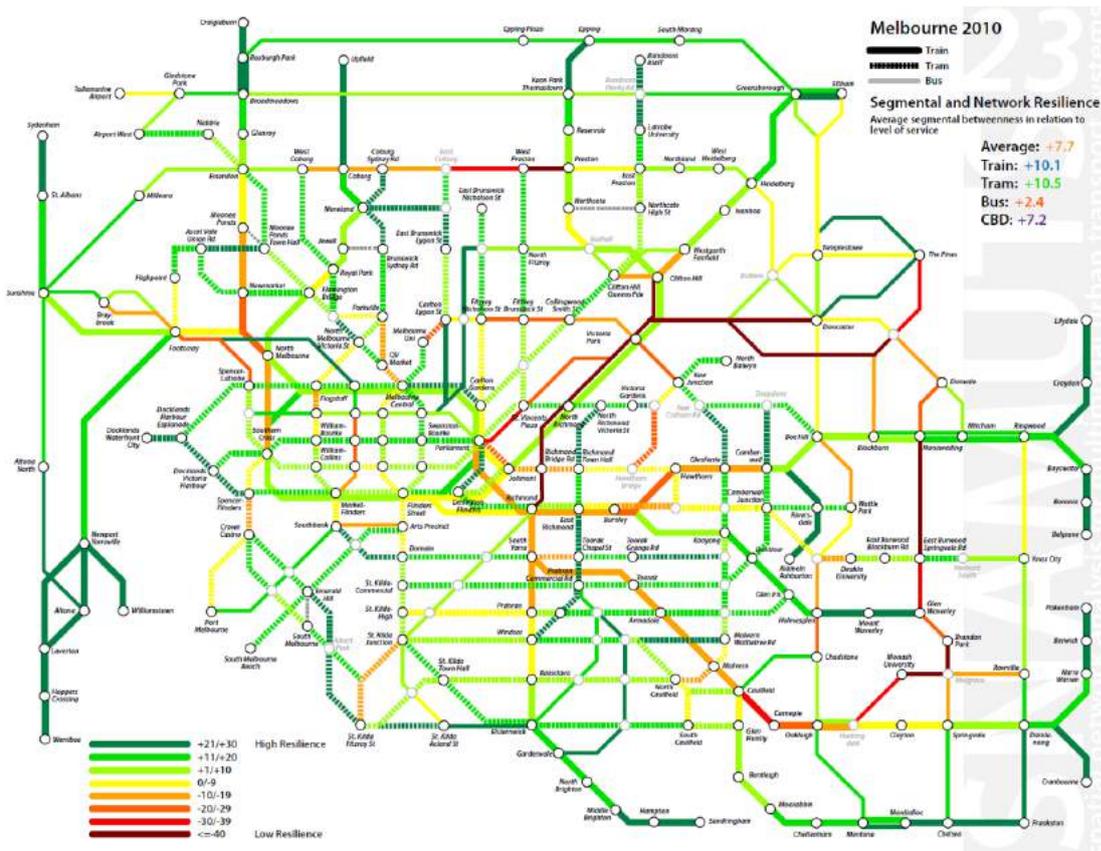


**Map 3:** Segmental and network resilience in Melbourne's public transport network in 2012

**Map 4:** Segmental and network resilience in Melbourne's public transport network in 2014



*Nodal connectivity*

**Table 8:** Nodal connectivity in Melbourne, 2008-2014

| Melbourne SNAMUTS *23R* | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|
| Nodal connectivity (**total**/average per node) | **13,262** 72 | **15,967** 82 | **16,027** 83 | **16,662** 84 |

The nodal connectivity index depicts the capacity of nodes to facilitate frequent movement in a multitude of directions, facilitating user flexibility in moving between places of activity on public transport as well as determining the attractiveness of network hubs for land uses that depend on public transport access. This feature received a boost in Melbourne with the introduction of the SmartBus network between 2008 and 2010, but remained nearly constant after 2010.
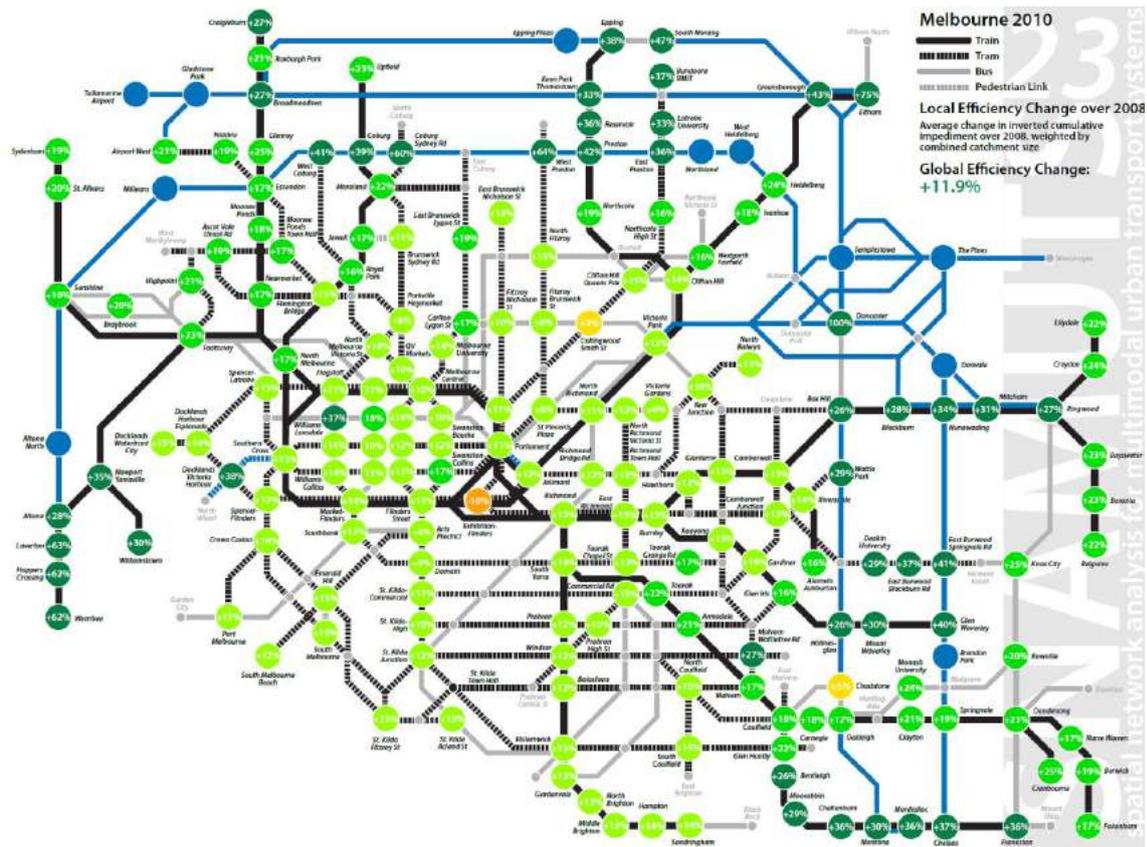
*Efficiency change*

**Table 9:** Global efficiency change in Melbourne, 2008-2014

| Melbourne SNAMUTS *23R* | 2010 | 2012 | 2014 |
|---|---|---|---|
| Global efficiency change (**total over 2008**/Zone 1/Zone 2) | **+11.9%** +13.8%/+27.8% | **+11.8%** +14.0%/+27.4% | **+14.5%** +17.2%/+31.1% |
| Global efficiency change (**total over 2010**/Zone 1/Zone 2) | | **- 0.1%** +0.2%/- 0.3% | **+2.3%** +3.0%/+2.6% |
| Global efficiency change (**total over 2012**/Zone 1/Zone 2) | | | **+2.4%** +2.8%/+2.9% |

Note: Zone 1 and Zone 2 overlap, hence the total figure differs from the average of the two zones.

The efficiency change index provides an overview over the impact of changes to the network configuration, service levels and/or settlement structure on ease of movement within the public transport network. It is corrected for changes in the numbers of population and jobs across the metropolitan area. The assessment shows that the measures between 2008 and 2010, including the bulk of the SmartBus network, the realignment and extension of tram route 48 through Collins Street to Victoria Harbour, and the introduction of 10-minute service frequencies on the Werribee to Frankston cross-town train route resulted in a cumulative efficiency improvement (ease of movement) of 11.9%. It also shows that these effects reverberated almost network-wide, with a measureable benefit on city-wide accessibility evident at almost every node (Map 5), though outer Melbourne (Zone 2) benefitted disproportionately. In contrast, between 2010 and 2012 some of the earlier frequency improvements on the Werribee line were withdrawn, while the Epping train line was extended to South Morang and bus services between Huntingdale and Monash University improved. Ten-minute rail frequencies were introduced at North Richmond and Victoria Park after semi-express services on the Hurstbridge line were discontinued in favour of all-stop services. Travel times were lengthened on several train lines as well as among some surface routes. As a result, overall network efficiency deteriorated marginally by 0.1% (Map 6). Between 2012 and 2014, rail frequencies were boosted to every 10 minutes on the Dandenong line (and to every 20 minutes on the Pakenham and Cranbourne branches). The Collins Street tram routes were reorganised, which resulted in a mix of frequency improvements from every 8 to every 5 minutes and declines to every 10 minutes on their suburban branches. A new rail station opened in Williams Landing and sparked improvements to feeder bus services to and from nearby activity centres away from the rail line. Better bus services were also introduced to link Caroline Springs and Fountain Gate to the rail system, and to improve local access in the East Kew-Balwyn area. The cumulative effect of these changes was a network-wide efficiency gain of 2.4% (Map 7).
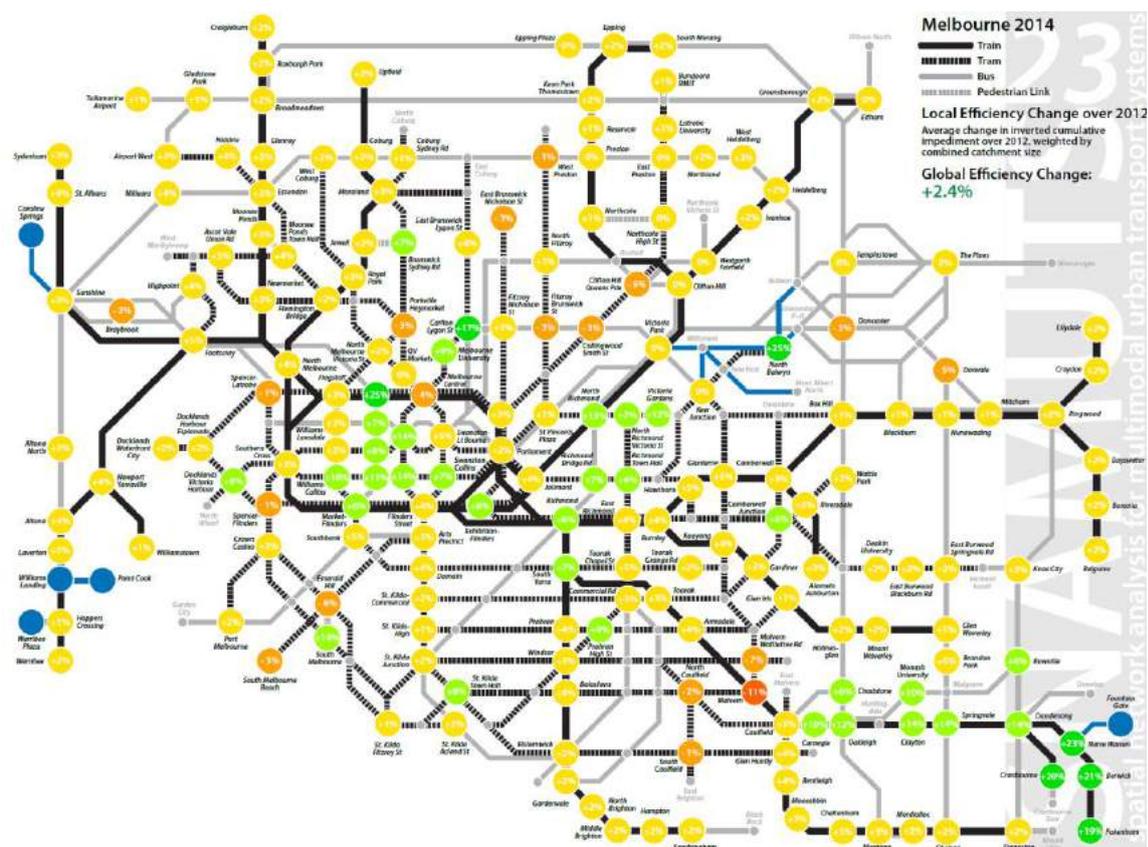
**Map 5:** Local efficiency change in Melbourne's public transport network in 2010 (over 2008). New routes and nodes in blue



**Map 6:** Local efficiency change in Melbourne's public transport network in 2012 (over 2010). New routes and nodes in blue
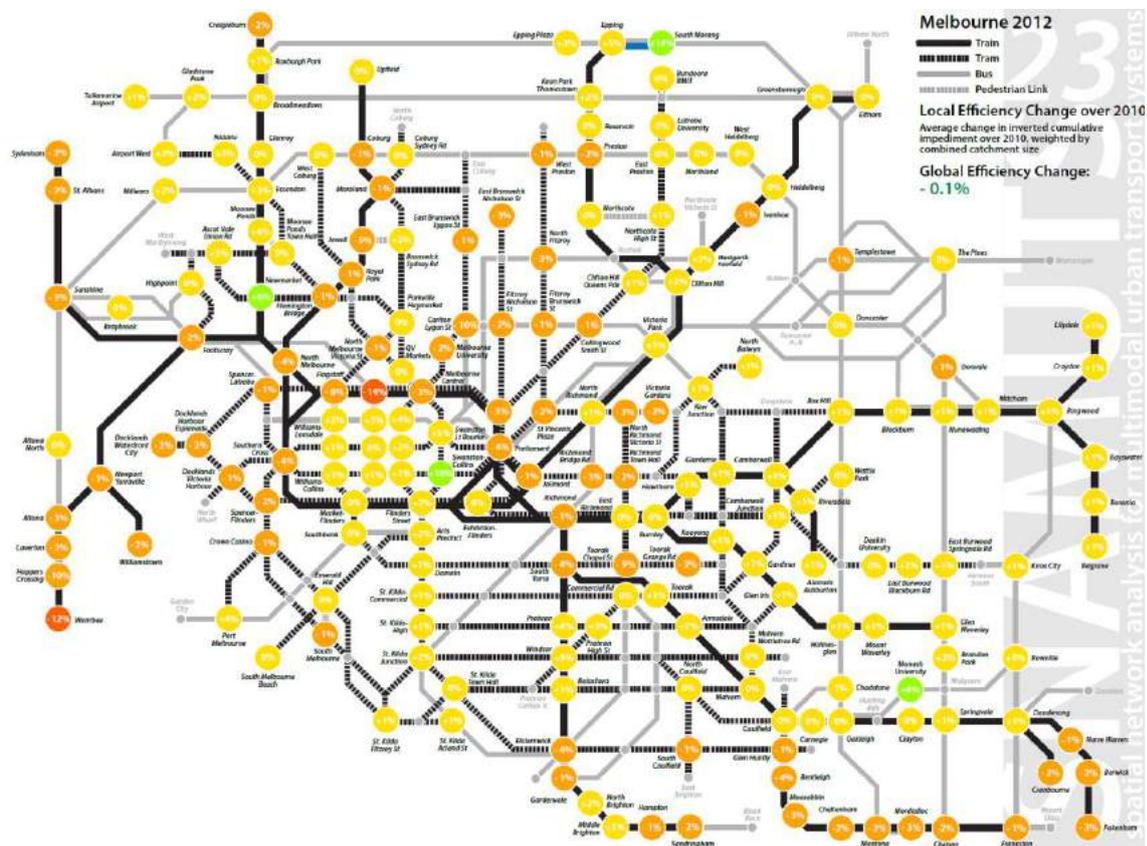
**Map 7:** Local efficiency change in Melbourne's public transport network in 2014 (over 2012). New routes and nodes in blue



## *Summary and discussion*

During the last two years of the Bracks/Brumby government (1999-2010), a long-planned initiative to create a network of full-service, high-frequency SmartBus services along key orbital corridors and along the radial Manningham corridor came to fruition and improved public transport accessibility across the entire metropolitan area markedly. The introduction of the SmartBus routes improved ease of movement, reduced transfer intensity, expanded the geographical coverage of the network and the presence of public transport travel opportunities, and enhanced network connectivity. However, average network resilience deteriorated in line with the proliferation of additional travel opportunities and the relative absence of major service and capacity improvements on the remainder of the network. Thus, it is likely that the SmartBus measures, still recent at the time of the state election in November 2010, failed to counteract the electorate's impression that the vulnerability of the public transport network to the impact of growing patronage remained insufficiently addressed by decision makers. This led to the consequential loss of several critical seats for the incumbent Labor government, ironically concentrated along the Frankston rail line which was one of the few that had actually experienced some frequency improvements prior to the election.

The election of the Baillieu/Napthine government, despite the campaign overtones about inadequate public transport, led to a period of stagnation in terms of network and service development during the first half of the term. During the second half of the term this changed in some selected areas, most notably the Dandenong and Pakenham/Cranbourne rail lines which received a significant frequency boost, albeit once again at a point in time perilously

close to the election date. Network improvements around better bus feeder services also focused on the Wyndham area in the city's outer west; however, these did not result in significant efficiency gains in the corridor as the low (20-minute) service frequency of the Werribee train line remained unchanged. On every SNAMUTS index except resilience, the accessibility improvements during the 2010-2014 term of government are far more modest than those achieved between 2008 and 2010 in the wake of the introduction of the SmartBus network. In terms of resilience, they did nothing to reverse the decline that was found to have occurred prior to 2010. On the demand side, they coincided with surging public transport patronage, an increase in the metropolitan population of more than 80,000 persons per year, and an urban growth trend that saw no average redistribution of population into public transport-serviced areas at the expense of urban fringe growth.

Thus in 2014, in an election campaign dominated by a partisan debate about a major inner-city toll road project (Stone and Scheurer, 2014), the accessibility analysis suggests once more that there were few tangible public transport improvements on the Liberal/National government's record that could have credibly weighed on voters' decisions in favour of the incumbent. Instead, unaddressed discontent about the state of public transport helped the Labor opposition over the line and relegated the Baillieu/Napthine administration to the status of the first Victorian state government to be voted out of office after a single term since the 1950s.

## Towards a Public Transport Policy beyond Electoral Cycles?

The growing potency of public transport performance to influence election outcomes has surprised the political class in Victoria (and elsewhere) and has led to a range of attempts for 'quick fixes', often with limited coordination in the context of long-term, strategic land use and transport planning. The acceleration in the rollout of the SmartBus network during the final months of the Bracks/Brumby government can clearly be seen as a pre-election response to growing unease within the electorate about Labor's deficient track record in improving public transport during a period of strong patronage growth. In accessibility terms, however, two contrasting experiences characterised the outcomes of these measures. On the one hand, access to public transport of a quality that allows users to orientate at least some of their everyday activities around it spread to a significantly higher share of Melbourne's population, creating many connections between nodes of activity and along corridors that previously provided no attractive public transport options. This enhanced the efficiency of moving around on the network as a whole. On the other hand, this very achievement resulted in an exacerbation of the mounting capacity crisis on the existing network, where service levels – with the exception of the Frankston and Werribee rail lines – remained largely unchanged between 2008 and 2010. This is because orbital bus routes not only relieve existing radial lines from pressure, though this effect can be significant. They also expand the catchment areas of rail stations by acting as local feeder services for journeys to and from the central city, and enable more convenient transfer trips that combine segments of orbital and radial lines on cross-suburban journeys. Both functions have the potential to funnel more passengers onto the radial rail lines and as a result, the resilience performance on almost two thirds of the existing network dropped between 2008 and 2010.

No network improvements of a magnitude comparable to the SmartBus system eventuated during the Baillieu/Napthine term of government. However, the limited measures to increase

frequencies on existing rail lines and to enhance service levels in some outer suburban areas did not lead to tangible resilience gains; in fact, if population and job growth between 2010 and 2014 was fully taken into account, it is likely that average public transport network resilience would show a further decline. Instead of more effectively addressing this shortfall in preparing for the 2014 election, however, the government unsuccessfully gambled its fate on the notion that the prospect of a major piece of new road infrastructure would ultimately prove more attractive to a greater number of voters than further short-term improvements to public transport.

Can this dilemma be resolved within the constraints of state government resources and the duration of electoral terms? Clearly, 'big-ticket' public transport infrastructure measures remain critical agenda items to overcome the backlog of investment that characterises the public transport systems of Melbourne and other Australian cities after decades of neglect. This is so clearly evidenced by the fact that, despite policy rhetoric asserting the importance of public transport and the need for development to be well-served by public transport, less than half of the population have access to quality public transport. 'Big-ticket' public transport infrastructure represents an investment into the future functionality of public transport (and urban movement as a whole), in a period when Australian cities are not only subject to continued population growth, but also face the task of decarbonising their transport systems and thus significantly augment the role of public transport in their mobility mix. However, it appears unviable for policy makers to rely on these large-scale projects as a singular panacea for solving transport problems. Simultaneously, it is crucial that governments meet community expectations of better public transport by engaging in programs that produce a constant stream of tangible (if mostly small-scale) improvements to public transport services, infrastructure and their integration with the urban fabric (Bosler, 2014). Such programs need to take a network perspective of public transport and thus recognise and work with the interdependence of different network elements, rather than implement mere isolated measures with limited consideration for their network impact (Mees, 2010b; Mees and Dodson, 2011).

In Melbourne, it is likely that a reversal of the trend of declining resilience of the public transport network will require a combination of service frequency increases on all modes of transport (including the infrastructural measures this may require, especially on the rail system), traffic prioritisation and associated travel time reductions on critical tram and bus routes, the establishment of a denser, multidirectional bus network with service frequencies and operating spans comparable to rail particularly in the middle and outer suburbs, and the strategic extension and adaptation of train and tram lines to provide better connectivity. The continuous pursuit of such improvements alongside transformational projects such as the Regional Rail Link (opened in 2015) or the Metro Rail Tunnel may present governments with a viable pathway to avoid the pitfall of entering further election campaigns fought over legitimate community frustration with the lack of progress in delivering public transport at par with other world cities. It also presents an opportunity to detach transport policy making from the electoral cycle and thus establish a more long-term and potentially more efficient pipeline of delivery (Gleeson, 2014).

# References

Bertolini L (1999) Spatial development patterns and public transport: the application of an analytical model in the Netherlands. *Planning Practice and Research*, Vol 14, No 2, pp 199–210.

Bertolini L (2005) Cities and Transport: Exploring the Need for New Planning Approaches. Chapter 5 in (eds) Albrechts L, Mandelbaum S J (2005) *The Network Society. A New Context for Planning*. Routledge, Oxford. UK

Bosler D (2014) Modern, Radical Community Campaigning for World Class Public Transport. Chapter 4.5 in Whitzman C, Gleeson B, Sheko A (2014, Eds) *Melbourne: What Next?* Research Monograph No 1, Melbourne Sustainable Society Institute, University of Melbourne, Melbourne (VIC)

Curtis C, Low N (2012) *Institutional Barriers for Sustainable Transport.* Ashgate, Aldershot, UK

Curtis C, Scheurer J (2010) Planning for Sustainable Accessibility. Developing Tools to Aid Discussion and Decision Making. *Progress in Planning,* Vol 74, pp 53-106

Curtis C, Scheurer J (2016) *Planning for Public Transport Accessibility: An International Sourcebook.* Ashgate, Farnham, UK

[DELWP] Department of Environment, Land, Water and Planning, VIC (2013) *Plan Melbourne.* Available online at http://www.planmelbourne.vic.gov.au/

[DoT] Department of Transport, Ministry for Planning, Main Roads Western Australia (1996) *Metrpolitan Transport Strategy.* Government of Western Australia, Perth (WA)

Gleeson B (2014) Integrative, Deliberative Planning: Beyond Sleepwalking towards Catastrophe. Chapter 5.4 in Whitzman C, Gleeson B, Sheko A (2014, Eds) *Melbourne: What Next?* Research Monograph No 1, Melbourne Sustainable Society Institute, University of Melbourne, Melbourne (VIC)

Lagura E, Norman P, Richmond M, Watling R (2011) The Public Transport Usage of Two Melbournes. *34th Australasian Transport Research Forum (ATRF)*, Adelaide (SA), 28-30 September

Lazanas K, Stone J (2010) An Investigation of Institutional Arrangements for Design and Delivery of Multimodal Public Transport Systems in Melbourne. *33rd Australasian Transport Research Forum (ATRF)*, Canberra (ACT), 29 September-1 October

Mees P (2010b) Planning for Major Rail Projects: The Melbourne Metro and Regional Rail Link. *33rd Australasian Transport Research Forum (ATRF)*, Canberra (ACT), 29 September-1 October

Mees P, Dodson J (2011) *Public Transport Network Planning in Australia: Assessing Current Practice in Australia's Five Largest Cities.* Research Paper 34, Urban Research Program, Griffith University, Brisbane (QLD)

Neal Z P (2013) *The Connected City. How Networks Are Shaping the Modern Metropolis.* Routledge, New York (NY), USA

Newman P, Kenworthy J (2011) Peak Car Use: Understanding the Demise of Automobile Dependence. *World Transport Policy and Practice,* Vol 17, No 2, pp 31-42

Nielsen G, Nelson J D, Mulley C, Tegnér G, Lind G, Lange T (2005) *Public Transport – Planning the Networks. HiTrans Best Practice Guide 2*, Civitas Consultants, Oslo, Norway

Parker P (2011) Bus Service Reform in Melbourne – The Last 5 Years. *34th Australasian Transport Research Forum (ATRF)*, Adelaide (SA), 28-30 September

Porta S, Crucitti P, Latora V (2006a) The Network Analysis of Urban Streets: A Dual Approach. *Physica A, Statistical Mechanics and its Applications*, Vol 369, No 2

Porta S, Crucitti P, Latora V (2006b) The Network Analysis of Urban Streets: A Primal Approach. *Environment and Planning B: Planning and Design*, Vol 33, pp 705–25

Stone J, Scheurer J (2014) Building Confidence in the Future of Melbourne's Transport Systems. Chapter 4.1 in Whitzman C, Gleeson B, Sheko A (2014, Eds) *Melbourne: What Next?* Research Monograph No 1, Melbourne Sustainable Society Institute, University of Melbourne, Melbourne (VIC)

Walker J (2012) *Human Transit. How Clearer Thinking about Public Transit Can Enrich Our Communities and Our Lives.* Island Press, Washington (DC), USA