Senate Rural and Regional Affairs and Transport References Committee: Inquiry into the role of public transport in delivering productivity outcomes

Submission by the
Department of Infrastructure and Regional Development
January 2014

1. Introduction

The Department of Infrastructure and Regional Development (the Department) appreciates the opportunity to comment on the issues identified in this inquiry. The Department is responsible for providing policy advice to Government across a wide range of areas including:

- infrastructure planning and coordination;
- land transport challenges associated with projected demographic change; and
- analysis which informs transport solutions and increases Australia's productivity.

We also play a key role in providing funding for transport infrastructure and promoting a transport system that is accessible, sustainable and environmentally responsible.

The matters dealt with in the terms of reference are important to the Department and affect both the overall national prosperity and liveability of our cities. This submission primarily addresses aspects of the terms of reference pertaining to the national significance of public transport (in terms of economic competitiveness, congestion and network integration) and presents some key understandings about the relationships between urban infrastructure, mobility and agglomeration.

The submission also highlights the substantial previous work carried out by the Department to develop an evidence based view of trends affecting traffic, urban growth, and patterns of commuting in cities. In particular, the Department has released annual State of the Australian Cities reporting and a series of specific reports by the Bureau of Transport, Infrastructure and Regional Economics (BITRE) investigating spatial patterns of population growth, employment and commuting for Sydney, Melbourne, Brisbane/South East Queensland (SEQ) and Perth. Some of the relevant findings (referred to in the submission) are instructive about possible future directions for managing networks and achieving a more cost effective and productive transport system.

2. Overview of National Significance of Public Transport

2.1 Importance of public transport in lifting national productivity, mitigating congestion and realising the gains of job creation, competitiveness and agglomeration

Strong growth in population and increasing demand for goods and services means that the efficient movement of people and goods around Australian cities is critical to productivity. In addition to housing the majority of Australia's population, Australian cities generated nearly 80 per cent of the nation's GDP and accounted nearly 75 per cent of its workforce (Australian Government, 2011). An effectively functioning public transport system can increase productivity for the economy as a whole by enhancing access to jobs, increasing business and freight movement efficiency, and through easing growing road congestion pressures.

Public transport is particularly effective at moving large numbers of people during the busy commuter periods. For example, within Perth, around 20 per cent of the distance travelled by commuters during the peak period is on public transport (DoT, 2011). This has the flow on benefit of making road networks operate more efficiently (through improved travel time reliability), and contributes to reduced commute times and improved accessibility to employment.

In an economic sense, cities exist because they agglomerate goods and services. Within each capital city, the Central Business District (CBD) acts as a particular concentration of this activity. Of all jobs offered in the metropolitan areas of Australia's five largest capital cities, 10 to 21 per cent are located within the CBD, resulting in very high employment density. This enhances productivity as many industries continue to agglomerate in central areas which in turn provide wider benefits that accrue at a state/territory and national level. By locating in CBDs, firms gain greater accessibility to customers, collaborating firms, suppliers and ideas (Tourism and Transport Forum, 2013).

However, Australian cities and their CBDs will only remain prosperous and competitive as long as the benefits of agglomeration outweigh the cost of congestion, and therefore strong economic growth will remain contingent on the ability to efficiently move hundreds of thousands of people every day on public transport during the peak commuter period.

2.2 The relationship between public transport and well-functioning cities

Australian cities are consistently ranked amongst the most liveable in the world and public transport plays an important part in how efficiently our cities connect people, knowledge, businesses and markets. In the Australian context, much of the trade is within our cities rather than between them, and therefore mass transit systems have had a correspondingly large impact on economic performance in facilitating these connections and interactions.

Historically mass transit infrastructure has been a strong force in shaping cities. Although Australian cities are among the most widely dispersed in the world, the quality of mass transit systems also influences achievable housing density. Investments in mass transit can be considered de facto land supply initiatives as they add scope to accommodate housing demand within the existing urban footprint and contribute strongly to reinforcing more compact settlement patterns (SGS, 2013).

Public transport also minimises the amount of land required for roads and car parking in central areas, enabling valuable, centrally located land to be used more productively. This has the added benefit of improving amenity and making cities more attractive locational options for business.

3. Key Challenges and Strong Forecast Demand Growth

3.1 The need for an integrated approach across road and rail in addressing congestion in cities, including Sydney, Melbourne, Brisbane, Adelaide and Perth

The inquiry's Terms of Reference specifically refer to the need for an integrated approach to urban congestion as it affects many transport planning decisions. In particular, the need for an integrated approach across road and rail is becoming more evident as congestion continues to increase; brought about by population increases and economic activity. Both urban road and rail systems are essential parts of both the urban passenger and freight networks and do not operate in isolation from each other.

Urbanisation and passenger growth challenges

By 2030, Australia's population is estimated to grow from 23 million to over 31 million (Australian Bureau of Statistics, 2013). Continued population and economic growth means that the Australian cities will face increasing challenges in mitigating congestion and maintaining accessibility. In what is already a highly urbanised society, the increasing trend of urbanisation of Australia's population will result in denser cities challenging how our transport networks are designed and operated, and risks a proportion of the population being 'locked out' of their city's prosperity by a steepening inner-city house price gradient and longer commutes.

Key transport data compiled by BITRE (2013) for Australia's capital cities confirms that growth in population and economic activity continues to drive the urban transport task. Although motor vehicles still dominate urban passenger travel, it is estimated that by 2030 the aggregate metropolitan passenger transport task will rise from 195 billion pkm in 2012 to 290 billion pkm; about a 50 per cent increase in 18 years, and the metropolitan public transport task will grow by 44 per cent from 2012 levels, primarily through population growth rather than a significant shift in the proportion of people using public transport. Analysis of estimated increases in future passenger travel demand (including assumptions which account for recent ABS updated population forecasts) is provided in Attachment A.

Forecast traffic growth and congestion

Aligned to growth in passenger transport, future growth in traffic within Australia's capital cities presents one of the key challenges for continued mobility. Although actual vehicle kilometres travelled (VKT) per person in Australia have flattened off in recent years, BITRE modelling suggests that any recent trends of overall lower growth in traffic in our cities will give way to renewed growth in the years ahead. Similar to forecasts for urban passenger transport, current research shows the most likely long-term path for traffic is for it to grow at the same rate as population. In the short term there will be continued influences associated with fuel prices, unemployment, and recovery from the effects of the global financial crisis (BITRE, 2012).

This means that notwithstanding any moderation in growth of per person traffic, BITRE estimates traffic in Australia will rise by an aggregate from 55 billion VKT per quarter in 2011 to more than 68 billion VKT per quarter in 2020, (accounting for a recent ABS revision to the metropolitan population forecasts), representing an additional 4.5% growth each year. This represents approximately a 24% net increase in traffic with consequences for congestion and needed infrastructure investment (BITRE, 2013).

Based on current traffic generation trends, congestion will increase, imposing burdens on those accessing employment and seeking to move goods through Australian cities. BITRE has previously estimated that the avoidable cost of congestion for the Australian capitals will increase significantly from a total of approximately $15b in 2013 to $20b in 2020 (BTRE, 2007).

Left unchecked, urban congestion is a major obstacle to growth in the economy and its widespread incidence will delay peak period traffic and further extend travel times for motorists. This means that any significant contribution public transport can make to addressing modal share of anticipated traffic growth will also have a flattening effect on the escalation in road congestion costs.

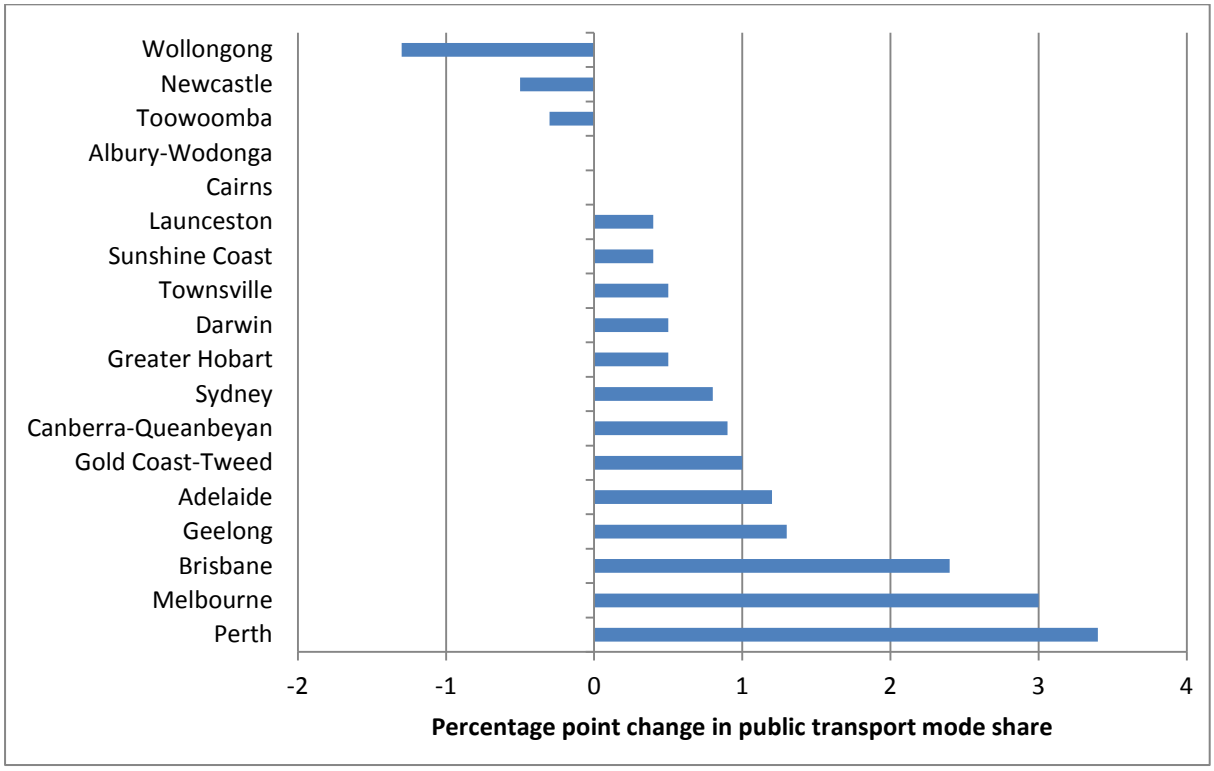
4. Population, Employment and Modal Trends

For public transport to deliver productivity enhancements, requires an understanding of where the opportunities for employment and population growth exist so that future investment can be targeted to deliver better outcomes for the national economy.

4.1 Mode Share in Australian Cities

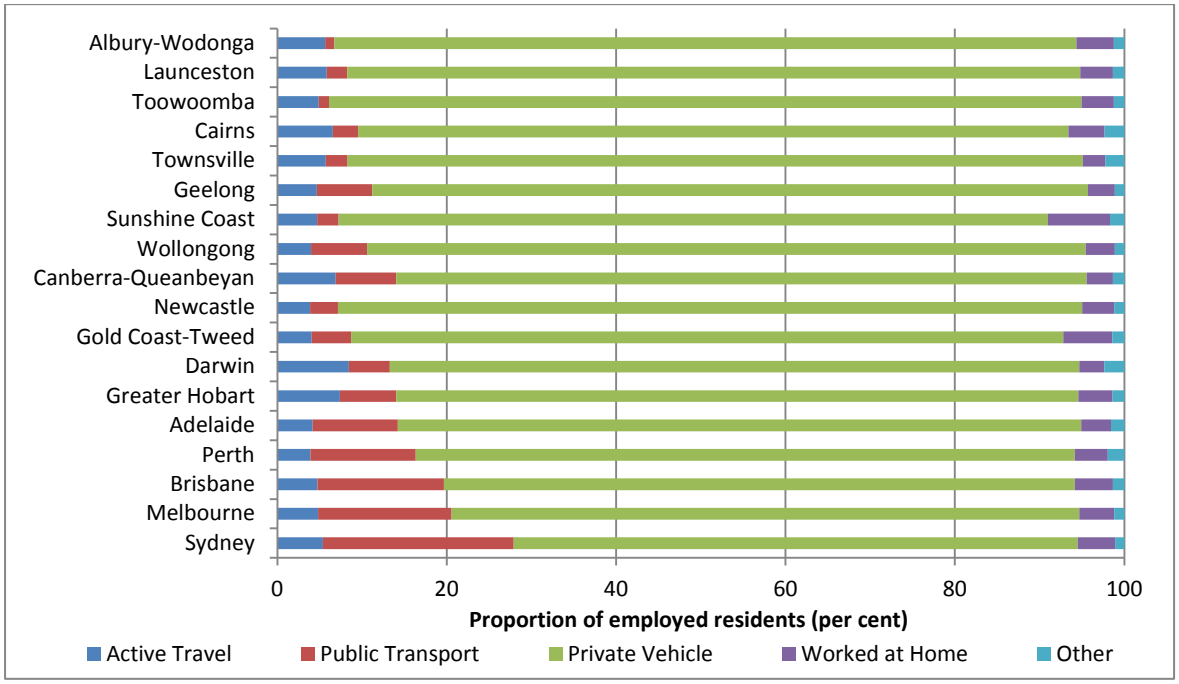
Overall public transport use and mode share has been increasing in all capital cities since 2001. Currently, one in six people in capital cities use mass transit for daily commuting (Mees and Groenhart, 2012). In addition to the predicted growth in the public transport task in Australia's capital cities, BITRE analysis over the period 2001-2011 suggests that other major cities such as Gold Coast, Canberra, Hobart, Geelong (refer Figure 4) are also experiencing added demand for future services.

Figure 4 Change in public transport mode shares for the journey to work in major cities, 2001 to 2011



However, despite strong growth in public transport demand, travel in Australian cities is still highly reliant on cars, as evidenced by the mode shares (refer Figure 5). In 2011, the overall public transport mode share for commuter travel in the 18 major cities was 15 per cent—it ranged from 1.1 per cent in Albury-Wodonga to 22.5 per cent in Sydney (Figure 5). The smaller and less densely populated the city, the smaller the public transport mode share tends to be.

Figure 5 Transport mode share of employed residents, 18 major cities, 2011

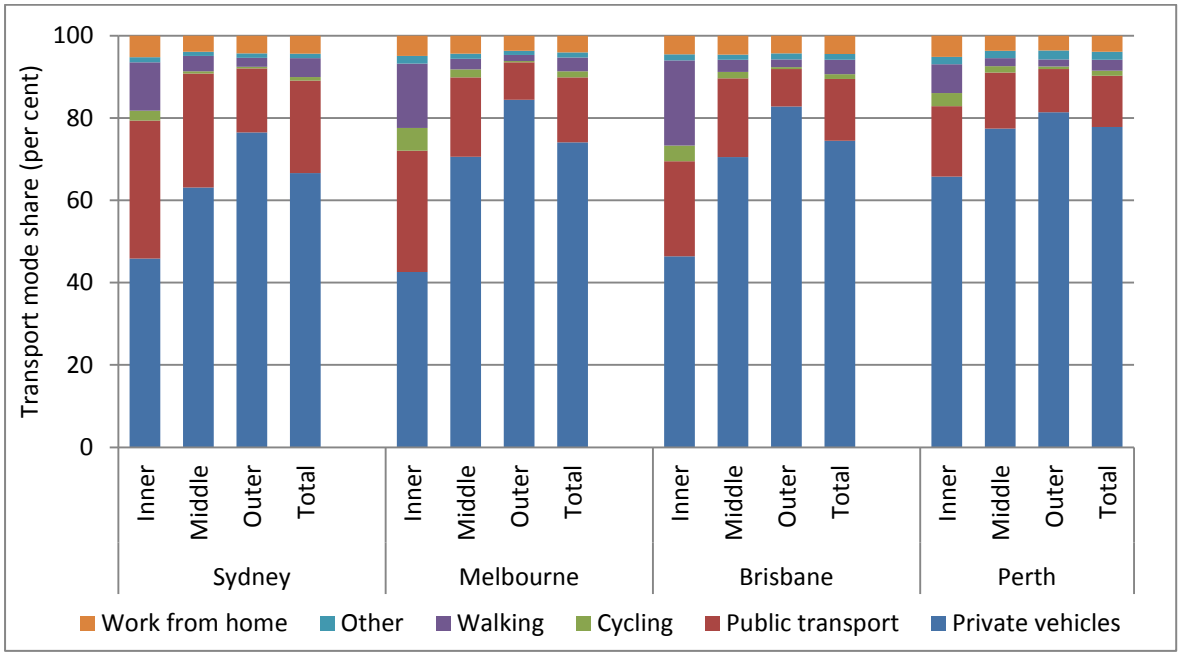


Notes: Private vehicle includes car, truck and motorbikes; Public transport includes train, bus, ferry, tram and taxi; Active transport includes walking and cycling; Did not go to work and mode unstated were excluded from mode share calculations. Data was concorded to 2006 ASGC (statistical division and statistical district) boundaries.Source: BITRE (2013b, p.25)—based on analysis of ABS census data.

4.2 Current patterns of commuting

Within each capital city, the historic concentration of business activity in CBDs has meant that transport infrastructure tends to emanate from CBDs in a radial pattern, designed to transport employees from across broader metropolitan areas to the city centre. In Sydney, Melbourne, Brisbane and Perth, the public transport mode share was higher for Inner sector residents than it was for Middle or Outer sector residents (see Figure 6). Public transport use was lowest in the Outer sector of each city.

Figure 6 Transport mode share for journey to work by sector of residence for Sydney, Melbourne, Brisbane and Perth, 2011



Source: BITRE (2013b, p.25)—based on analysis of ABS census data.

Commuters mainly use the public transport system to access inner city jobs, with Inner sector workers responsible for between 74 and 82 per cent of total public transport use by commuters in the four cities analysed (see Table 1). The public transport mode share is typically very low for outer suburban jobs, standing at 2–3 per cent for Perth, Brisbane and Melbourne, and 5 per cent in Sydney.

Table 1: Inner sector workers as a proportion of all workers using public transport to journey to work, Sydney, Melbourne, Brisbane and Perth, 2006

Statistical Division (SD)	Number of people using public transport to journey to work		Inner sector as a percentage of total
	Inner sector workers	Total SD workers	
Sydney	241 850	326 850	74.0
Melbourne	148 870	191 340	77.8
Brisbane	76 190	98 530	77.3
Perth	45 740	56 120	81.5

Note: Numbers are rounded to nearest 10. Based on those with a known and fixed work address.
Source: BITRE (2013b)—based on analysis of ABS census data on a place of work basis.

4.3 Population and employment distribution outlook

One of the main ways the public transport network supports productivity outcomes is by enabling people to commute efficiently between their home and work. BITRE (2013b) presents a summary of state government spatial projections of population and jobs through to 2031 and explores the implications of those projections for commuting patterns and transport use. These projections anticipate that the Outer sector of each city will contribute the largest share of population growth and will be the fastest growing in terms of employment.

4.4 Implications for future public transport operating paradigms

These spatial projections are expected to influence transport mode shares for commuter travel in several ways. BITRE's exploratory scenario modelling (2013b) has analysed commuting flows by sector. The results suggest that short commutes within the Outer sector will account for the largest proportion of increased commutes in Perth, Sydney, Brisbane and Melbourne (51, 47, 40 and 34 per cent shares, respectively). This reflects the large projected increases in the number of Outer sector residents and jobs in each city through to 2031. The analysis also points to an increase in the relative importance of same-subregion commutes and a decline in the relative importance of inward commuting flows (currently about three-quarters of commuter use of public transport is due to inward commuting).

These forecasts of rapid outer suburban job growth pose a challenge for increasing the future overall public transport mode share, as public transport is typically not as mature or well served in these outer metropolitan locations. However, these more complex trip demands (increased employment in outer suburbs and overall reduction in the dominance of commuting to and from CBDs) are not unique internationally. Overseas experience suggest that a reorientation of the dominant public transport operating paradigm —to better service those making trips within outer suburban subregions will be needed to avoid a mismatch between workers pursuing affordably priced homes and their desired places of employment.

Urban consolidation in outer suburban sub centres creates opportunities for suburban public transport interchange, although recent evidence in Australia shows that progress towards concentrating development around public transport nodes has been mixed. For example, in Sydney, the available evidence shows that residential development has become increasingly concentrated around transit nodes since 2001, but employment has become less concentrated around railway stations (BITRE 2013b, p.114).

Nonetheless, the strategic metropolitan plans for Sydney, Melbourne, Perth and SEQ all contain goals that aim to focus future residential development and job growth around public transport nodes. If realised, these goals will also create public transport interchange hubs, and the opportunities to connect at outer suburban nodes. These improved connections contribute to greater coverage, more direct and shorter journeys and a more efficient public transport system.

This will require both continuing investment in network infrastructure and service models that reflect the changing urban form and evolving trip generators, in sequence with development occurring.

4.5 Strengthening CBD accessibility and addressing inner city capacity constraints

Although the overall dominance of CBDs as a proportion of employment is forecast to diminish, the actual quantum of employment and activity in these locations will still necessitate that sufficient public transport capacity and priority be provided so as to safeguard the benefits agglomeration brings to each city.

5. Investment and Funding

5.1 Revenue shortfall and operating subsidies

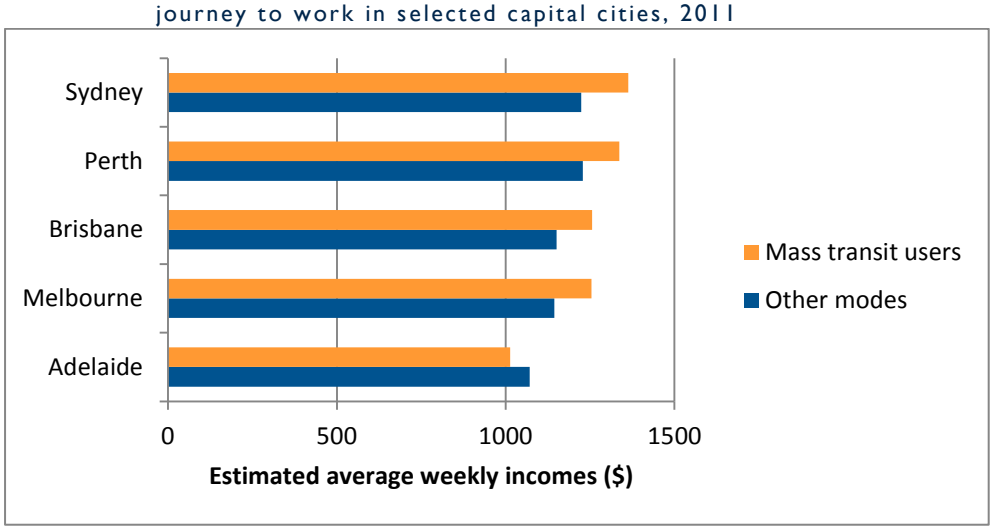
The operating and capital funding requirements of Australia's public transport networks will continue to increase as the networks expand to meet future demand.

In Australia's public transport systems, ticket revenue has always fallen short of the cost of providing the service; with the true cost of service delivery around 4 times the price the consumer currently pays in the form of fares. Typically, consumers pay none of the capital costs with the balance funded by state and Commonwealth tax payers.

SOAC (2012) observes that fare recovery in Australian urban mass transit systems is already well below international benchmarks and continues to decline. A preliminary analysis by BITRE estimates that Sydney's mass transit system recovers 24 per cent of its operating costs through the fare box while Melbourne recovers at 31 per cent, while Perth recovers 38 per cent. For Canberra's bus only system, users pay only 17 per cent of operating costs.

This raises questions about the sustainability of current financial structures and the scope for further investment in mass transport infrastructure and service (DIT, 2012). There may be further scope however for users of the systems to pay more. Figure 7 (extracted from SOAC, 2013) indicates that the average income of mass transit system users is significantly above that of users of other modes, suggesting that providing equity is considered, there may be some scope for users of the Australian systems to pay more for the service. However, the pricing of public transport needs to be carefully considered – if the cost is too high it is likely to reduce the mode share as it will be perceived as being more expensive than a private vehicle trip.

Figure 7: Estimated weekly average individual income for users of selected transport modes for the journey to work in selected capital cities, 2011



5.2 Provision of new infrastructure

Government's capacity to continue to fund capital infrastructure through traditional grants is increasingly challenging given the changing economic climate in Australia and the size of the infrastructure task. The Department, in consultation with the Treasury, is developing a range of infrastructure funding and financing options to improve the Government's ability to invest in infrastructure. In determining the most suitable funding or financing solution for each project, consideration needs to be given to the type of project, its cost, the relevant stakeholders, and the ability of the project to generate revenue, and the risk for Government.

The funding and financing options being examined include:

- Concessional Government loans - offered by Governments to project proponents at lower interest rates and/or longer terms than available in the market;

- Government Guarantees - agreement to make project repayments to a third party debtor in the event that a proponent is unable to service its debt obligations;

- Phased grants / availability payments to the private sector over a longer period (e.g. over 30 years) to provide certainty on revenue streams depending on the asset being available for its intended use;

- Infrastructure bonds - a debt instrument issued by the Private Sector or Government to fund infrastructure projects. The bond owner is entitled to coupon (interest) payments and repayment of the principal at maturity; and

- Targeted Payments - the Australian Government can provide state governments with some start-up capital, or targeted payments, to support large, nationally significant projects that could not be fully financed by the private sector alone.

6. Measures to address demand, improve infrastructure utilisation and maximise value for money

6.1 Effective long term transport planning

Infrastructure planning spans all levels of Government and the Department continues to collaborate with Infrastructure Australia and jurisdictions to provide greater scrutiny of transport infrastructure projects under consideration at the state level to ensure that those with the most important long-term benefits are progressed first.

Several measures can aid long term planning including multi modal corridor preservation, the separation of urban passenger and freight movements, and public transport operations (as outlined below).

Multi-purpose corridors

The opportunity to reserve and utilise major transport corridors that serve both road and rail (or other forms of dedicated public transport) enables these links to provide for long-term capacity needs, whilst lowering land take and construction costs from the agglomeration of utilities and services, particularly where large-scale urban greenfield development is occurring.

An example of where an integrated approach to road and rail corridor preservation has worked effectively is the Kwinana Freeway and the Mandurah railway line - which connects Perth with Western Australia's second largest city, Mandurah. A substantial section of the 70km railway line is located along the median of the Kwinana Freeway (Public Transport Authority, 2014).

The Victorian Government is adopting a similar approach with the proposed Doncaster rail line – much of the proposed line would be located in the median of the existing Eastern Freeway (Office of the Premier of Victoria, 2014). In the past, opportunities for integrated rail and road corridor preservation have been lost. The M7 in Sydney being a case in point where a rail line following the M7 Orbital alignment could have serviced movement across Sydney's western suburbs, and would have negated passengers having to commute into Sydney to catch an outbound service to travel north/south.

The benefits of using the same corridors for road and rail projects also presents greater potential for minimising community impact and developing affordable housing along the corridor.

Separation of passenger and freight

The separation of urban passenger rail and freight is another one way of getting existing transport systems to run more efficiently through minimising operational conflict between urban passenger rail and freight operations.

An example of this is the Northern Sydney rail corridor - which until recently serviced both urban passenger rail and freight, leading to bottlenecks in the absence of passing loops along the route. To address this conflict, the Australian Government is providing $840 million for Stage 1 of the Northern Sydney Freight Corridor freight rail upgrade programme. The Stage 1 programme of works will cost $1.1 billion to deliver with the balance of funds required being provided by NSW. While the programme of works is focussed on delivering immediate capacity increases for freight rail traffic, the works also provide significant benefits for passenger rail operations by freeing up capacity and reducing congestion for passenger trains within the corridor. While Stage 1 of the Northern Sydney Freight Corridor will deliver a significant capacity improvement that is expected to meet forecast passenger and freight capacity

requirements until approximately 2028, further enhancements under future stages will be required to maintain sufficient capacity for both passenger and freight rail operations for the period beyond 2028.

Other opportunities exist in South Australia and Western Australia, such as the Torrens Junction and Fremantle Bridge respectively, where freight services are impacted from shared access or conflict with urban passenger rail, leading to delays in freight movement.

Network operations

Considering the large scale of investment required in both new and existing public transport infrastructure, it is also important that public transport sector continue to progress efforts to enhance utilisation, achieve trunk priority, and improve network optimisation. At present there are major differences between networks on a cost per kilometre basis and there are clearly efficiency gains still to be realised in some systems (SOAC, 2012).

Key initiatives include:

- Improving rail signalling system technology (including level crossings). Digital train control technology (including the interoperability of communication systems) enables the position of trains in the network to be monitored, and provides train speed guidance to drivers. This adds capacity to the network, improves reliability and headways, enables tighter scheduling, and improves compatibility of current signalling systems across state borders.

- Intelligent Transport Systems that make better use of existing road infrastructure (more efficient operation of traffic lanes and traffic signals) to improve travel times and service reliability.

- Greater efficiency in network planning and service design strategies such as reducing service duplication and increasing service integration.

- Encouraging passengers to avoid peak periods (through use of variable fares) to better utilise existing fleet and infrastructure, including better utilisation of off peak services and providing incentives for using these services at these times.

6.2 Monitoring

Existing national performance indicators related to congestion are targeted primarily at general traffic movement and highway infrastructure rather than the movement of people. The Department has been working collaboratively with Austroads, under the direction of the former Standing Council on Infrastructure and Transport (SCOTI) to develop a suite of national performance indicators specifically for public transport in Australia's major cities.

This reporting would assist national productivity gains from public transport by providing a benchmark of efficiency and a basis planning to address congestion through improved planning and service provision.

7. Conclusion

The level of urbanisation and concentration of activity in Australian cities means that the efficient movement of people and goods around cities and urban areas is critical to productivity growth.

Over the coming decades, as Australia's population and economy grow, and new opportunities and challenges emerge, the growth in demand for infrastructure and access to transport systems across all modes, in both our urban and major centres will intensify.

As transport infrastructure underpins the competitiveness and liveability in our major cities, then ensuring that our nation's public transport systems and infrastructure work as efficiently as possible will be key to combatting congestion, supporting clusters of economic activity and realising of the gains of future job creation.

Tackling these complex policy and investment challenges will require a collaborative approach by all levels of Government.

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Attachment A

Increasing future passenger travel demand

Previous work by BITRE demonstrates that total passenger travel has grown steadily over the past decades, and although travel per person, it is estimated that overall passenger travel demand will increase in line with population growth (BITRE, 2012).

To forecast aggregate metropolitan passenger travel it is necessary to multiply by forecast metropolitan population. The ABS has just updated its population forecasts, including an assumption of higher levels of immigration and fertility. The effect is to raise forecast metropolitan population substantially, as shown in Figure 1 below.

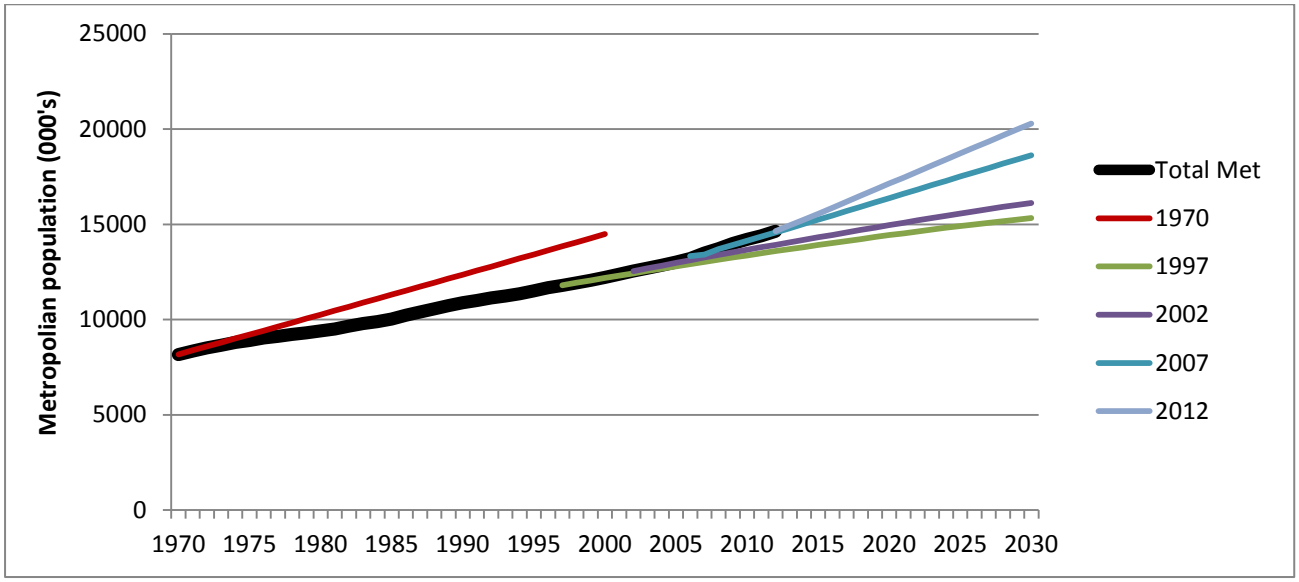

Figure 1: ABS metropolitan population forecasts.

Using this new forecast population leads to an updated forecast aggregate metropolitan passenger transport task rising from 195 billion pkm in 2012 to 290 billion pkm in 2030 – about a 50 per cent increase in 18 years (refer Figure 2).

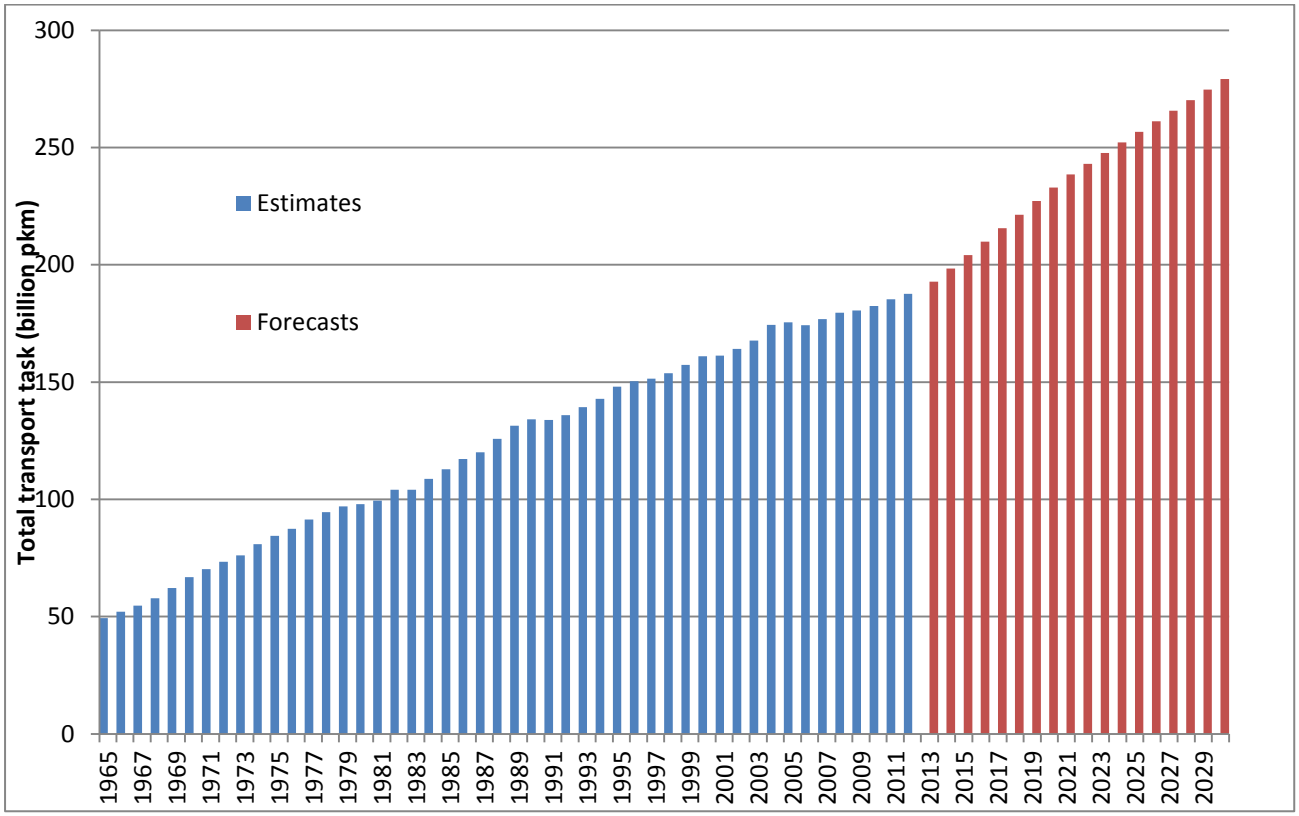

Figure 2: Estimates (1965-2010) and forecasts (2011-2031) for total passenger transport task, sum of all capital cities.

Previous work by BITRE also showed that the total urban public transport (UPT) task has grown steadily over the past decades. Between 1977 and 2010, the total estimated metropolitan UPT task increased from 10.1 billion passenger-kilometres (pkm) to 19.1 billion pkm, an average annual growth of 1.96 per cent, a near doubling over the three decades (BITRE, 2012).

The UPT share was also projected in BITRE Report 129, where it was forecast to fall from about 11 per cent to about 10.5 per cent. Applying this forecast share to the forecast aggregate metropolitan passenger task gives the forecast of urban public transport passenger kilometres shown in Figure 3. This estimates the metropolitan public transport task growing from 19.5 billion passenger kilometres in 2012 to 27.6 billion in 2030 – a 44 per cent increase in 18 years.

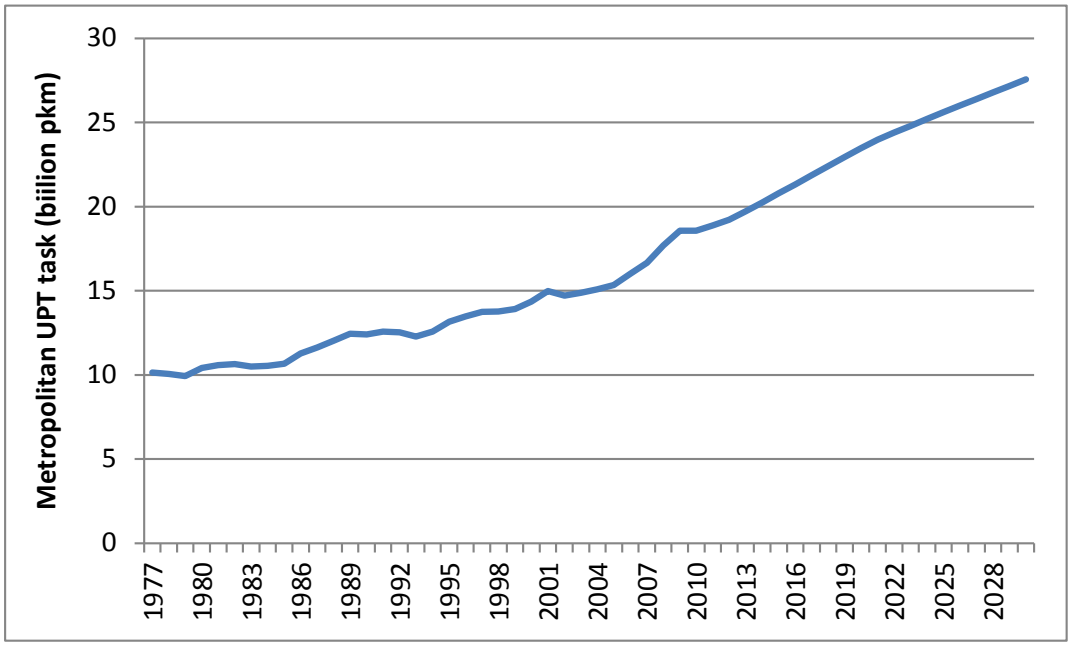

Figure 3: Actual and projected metropolitan UPT task (billion pkm), total for (all) capital cities

Allowing for the updated population forecasts, this means the growth experienced in the three decades to 2010 is predicted by BITRE to continue to 2030. Of course, both the total passenger travel forecast and the UPT passenger travel forecast are demand projections, dependent on the supply of urban passneger transport for their realisation.