

## Urban Mobility

### 4. ARA Submission to Senate Inquiry

#### 4.3 Role of rail in public transport and the benefits

##### Overview

Australia's mainland rail public passenger transport infrastructure and service providers are predominantly state-owned and operated entities (with the exception in Melbourne franchised services under contract to the Victorian government on state-owned infrastructure).

All organisations are ARA members working collaboratively to improve rail industry efficiency, productivity and safety. [Click here for a summary overview.](#)

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##### Link

[ARA Urban Mobility](#)

##### Passenger rail patronage

National rail passenger journeys have grown by 11.7% in the five years to 2006/07 as follows:

**Rail Passenger Journeys (million)**

Rail Mode	2002/03	2003/04	2004/05	2005/06	2006/07
Urban Rail	471.03	474.17	477.52	501.34	529.11
Light Rail (Tram)	124.95	124.95	129.63	132.67	136.76
<i>Sub- Total</i>	595.97	599.11	607.15	634.01	655.87
Non-Urban	10.42	9.72	9.08	9.35	11.22
<i>Total</i>	606.39	608.87	616.23	643.36	677.09

This growth in patronage exceeds population growth and is a significant increase compared to the previous two decades, when patronage only grew by 1.1% p.a. merely keeping pace with population growth, not increasing number of trips.

Over the last 30 years, Australia's public transport mode share declined significantly as total trip numbers and length of trip grew. Between 1973 and 2003, mode share fell from 12% to 7%. While major cities mode share has been broadly flat over the last 10 years this tends to understate the importance of public transport to functioning cities.

The proportion of people who use public transport to access city areas in the morning peak ranges from over 50% in Perth, to 60% in Melbourne and over 80% in Sydney.

The 200,000 plus people who commute into Sydney each working day by rail would need 65 freeway lanes and 782 hectares of car parking if they travelled by car.

##### Public transport issues and challenges

ARA's National Passenger Transport Agenda (2006) identified these as being:

- social and demographic trends;
- operational and funding issues;
- city design issues; and
- policy and governance challenges.

**Link**

[National Passenger Transport Agenda \(2006\)](#)

## **Urban and demographic trends**

### ***Urban form, population density and centres***

Australian cities have a large urban extent, with low population densities and are designed around cars with:

- high car dependency, particularly in outer-metropolitan areas;
- low public transport mode share;
- low cost recovery public transport systems; and
- high overall cost for passenger transport.

Over 13 million vehicles are registered in Australia, or two for every three people. Car ownership per person has grown steadily with Australia now having one of the highest car ownership rates in the world.

Greater urban consolidation and concentration of development around 'mixed use' centres widely referred to as 'Transit Oriented Development' (TOD) with transport nodes (stations, or bus/rail interchanges) is a strategic action of the highest priority.

Political leadership and long-term committed investment is required to modify the existing urban form to overcome the many economic and social problems it has caused.

Rail, tram and ferry networks largely serve central areas with radial networks. In the large outlying areas of our cities, much of the population has no access to these transport modes, and bus services are the only viable public transport option.

Large proportions of the population currently experience lower than expected service levels that significantly limits employment opportunities in these outlying areas and contributes to social exclusion.

Most States have developed strategic metropolitan planning policies with an explicit focus on increasing urban density to reduce urban extent.

From a public transport perspective, these plans represent a policy step in the right direction. A tighter urban form will improve both the mode share and economics of public transport. But there is significant pressure on Governments to continue to release cheap land at the urban fringes and the true costs of private transport to households (and the population) are not considered.

### ***Employment trends***

Over the last decade, employment patterns across the country have been changing;

- the traditional 9 am to 5 pm working day is no longer the 'norm';
- a higher proportion of employees have a varied work week schedule (i.e. flexible working hours such as 40 hours in 4 days), or working part-time;
- employees are working differently and for longer hours; and
- the location of work is also changing.

CBD employment has been growing in absolute terms, underlining the importance of having strong CBD-bound public transport systems to efficiently move large numbers of people in peak periods. However, the proportion of employment in CBD areas has declined to varying degrees in all of the five largest cities in the period 1981 to 2001.

### Employment within CBDs – Percentage of Jobs in CBD

City	1981	2001
Sydney	11.7	11.2
Melbourne	11.4	10.2
Brisbane	14.0	12.9
Adelaide	24.1	21.1
Perth	13.2	8.5

Transport systems need to deal with more dispersed employment (and schooling) and travel patterns including:

- varied workweek schedules;
- longer working hours;
- spread of the evening peak;
- shift from manufacturing to a service economy;
- multi-purpose trips (work, school, shopping and go home); and
- reducing household size.

These changing patterns have favoured car use over public transport, particularly with high levels of car ownership per household, although levels of car ownership are highly variable within and between localities within a metropolitan region.

The existing predominantly radial, city-focussed public transport networks, make it difficult for public transport to serve multi-purpose trips at least for most adults who do have the choice to drive.

#### ***Ageing population***

Australia's population is ageing with around 18% being 60 years or older. By 2021, this proportion will increase to around 25%. This has several implications for public transport:

- a higher proportion of people will be eligible for concession tickets lowering cost recoveries. Currently, Melbourne and Sydney already forgo annual fare box revenues of around \$100 million and \$200 million p.a. respectively due to concessions. This will increase with the ageing population if concession policies are left unchanged;
- public transport systems must accommodate a greater proportion of the customer base who are over 60 in the future by modifying the design of stations, stops and rolling stock to allow for their reduced mobility but these changes are costly; and
- Local government asset management planning/State funding is not yet geared to footpath repairs (or cycling facilities) in the railway station catchment areas, even for new infrastructure projects to provide 'seamless' travel for people.

#### ***Transport's contribution to living costs***

Transport costs rose markedly over the 2007-2008 financial year. Transport is generally the third largest item in living costs, after food and housing and also has the second highest rate of growth in all categories.

The effect of rising transport costs on categories of people by income status is reported by the ABS.

#### ***Comparative performance of public transport and private transport; Quality of journey and household expenditure***

The strong growth in vehicle ownership has been driven by two factors:

- the price of cars since 1995 has decreased by 3.8% p.a. in real terms making cars 25% cheaper; and
- average weekly earnings have grown steadily at the same time.

Modern cars have more features that make them much more comfortable and safe to drive. This has raised the bar for customer expectations of public transport. For example, air conditioning is now considered essential by passengers, on trains, trams and buses yet these conflict with governments which needs to contain infrastructure (rolling stock) costs.

Once households buy their cars, the variable cost of a journey is not paid at the time of use, but there is a reluctance to pay upfront for a trip by public transport.

### ***Fuel Prices***

The uncertainty of fuel supplies and strong growth in fuel prices since 2005 has caused a surge in public transport usage, putting further pressure on Australia's public transport capacity in peak periods.

For example, the 4.2% growth in rail patronage, over the 12 months from April 2005 to April 2006, occurred when petrol rose by 16-17% higher in the major cities – a similar experience to that in the USA.

### ***Environment and health effects***

Rail transport, for passengers and freight, is the most environmentally-friendly and health-promoting of all modes of motorised transport.

Rail passenger transport operators take responsibility for environmental management of their system and are improving its environmental performance.

Rail passenger public transport:

- consumes significantly less land and energy reducing its ecological footprint;
- generally runs on separated corridors, on or off-road or underground;
- has considerable beneficial consequences over other motorised modes; and
- combines well with walking and cycling.

### ***Rail performance: operational and funding issues***

Australia's metropolitan public transport networks face a number of operational and funding issues including:

- peak period capacity constraints;
- poor off-peak utilisation;
- freight congestion (rail);
- road congestion (impacting tram and bus); and
- low cost recoveries.

Further details on these topics are explained in ARA's National Passenger Transport Agenda (2006).

#### **Further Reading:**

[National Passenger Transport Agenda](#)

### ***Passenger Satisfaction with Urban Rail Services***

Passenger satisfaction with rail and light rail public transport is declining in four of Australia's five major cities. The exception being Perth which has benefited from successful major expansion of its rail network with good connections to other modes.

The passenger service is struggling and passenger dissatisfaction is highest in Sydney and Melbourne due to over-crowded (some not air-conditioned), unreliable and sometimes cancelled services and some overcrowded and poorly ventilated inner city stations. Services in Brisbane are also under closer public scrutiny.

### **Benefits of Public Transport for Moving people – people moving**

#### ***Contribution of Rail Passenger Transport***

Rail is most suited to mass trip-making in urban areas due to:

- dedicated track in a protected corridor or on-road priority takes less urban space and less risk of collision – allowing more compact and safer cities;
- speed and reliability owing to dedicated corridor;
- lowest emission mode of motorised transport – minimal urban air and noise pollution and greenhouse gas emissions;

- most readily accommodates human-powered, wheeled vehicles, e.g. push chairs, wheelchairs, bicycles;
- highly efficient at peak demands for transporting – journey-to-work and special events – particularly between centres and where major trip generators are located with the station/interchange catchment; and
- enables people to be active travellers – walking or cycling to the railway station/interchange or taking their bicycle on the train to continue their journey.

### ***Accessible Centres or 'Transit-Oriented Development (TOD)'***

Requires accessible, co-located activities for people to reduce time and costs of travel; such development can avoid increasing road capacity to accommodate growth in demand for motorised travel. These planning principles have been known for a long time and are well articulated as policy principles, but the challenge remains for implementation. By comparison, many other countries have implemented TOD practices.

### ***Efficient use of resources: Oil and Land***

Well-designed cities are more compact. Cities well-served by public transport take less land for transport and reduce the area of surfaces to be sealed. Sealed surfaces interfere with the water cycle and contribute the rise of ambient night temperatures.

These principles illustrate the interdependency of the physical relations between geographic urban areas, transport infrastructure and effects on the environment.

Urban rail facilities provide the following benefits:

- significant land use savings by using rail for moving the same number of people by road – a double track railway requires only one quarter of the land of a dual carriageway road and has about one third of the construction and maintenance costs;
- rail services can move 50,000 people per hour; a freeway lane only carries 2,500 people per hour;
- a peak hour train taking 600 people to work replaces 500 motor cars or 11 buses, significantly reducing congestion and pollution and the amount of land needed for roads and car parks; and
- the estimated 200,000 plus people that commute into Sydney each working day by rail would need 65 freeway lanes and 782 hectares of car parking if they travelled by car.

Energy use per passenger by the land based public transport operators in 2005/06 are shown in the table below.

**Table – Energy Use per Passenger-km 2005-06**

<b>Passenger Mode</b>	<b>Per Passenger MJ-FFC/Passenger-km</b>
Buses	1.50
Heavy Urban Rail	1.61
Motor Cycle	2.07
Light Rail (Trams)	2.35
Motor Cars	2.94

### ***Relationship between transport, planning, environment and health***

This was originally recognised and promoted in the late 1990's through collaboration of European Ministers in the portfolios of transport, planning and environment and health.

Public transport, particularly rail, exerts a positive influence on three of Australia's key health determinants – physical environment, personal health practices, and income and social status. The factors tied most closely to transport are air quality, climate change, safety, physical activity and equity. Car-dependent urban areas are also less walkable or cyclable owing to spatial dispersion of activities.

The concept of 'active travel' is now widely in use in Australia – its benefit for health arises from the need for healthy people to take a daily 'dose' of 30 minutes physical activity (walking, cycling etc). This can be done by walking to or from the public transport stop/railway station to travel to and from work or education facility or other activity.

### ***Air quality management***

Rail passenger transport and in combination with walking and cycling has the greatest benefit for protecting urban 'air sheds' from motor-vehicle air pollution. Active travel for health is a co-benefit of environmentally responsible transport.

Air quality management programs, including greenhouse gas reduction strategies of all levels of government, have been at the forefront of seeking to stem the growth in vehicle-kilometres-travelled (vkt) by car. Growth in vkt adversely affects any interventions to limit air pollution.

Total vehicle km travelled in 2000 was 113 billion with private motor cars having the greatest vehicle km. Total vehicle km are expected to increase to 166 billion by 2020 an overall increase of 46% or 1.9% annually. The projected increased total vehicle km travelled by 2020 is shown in the table below.

**Table – Projected Increase in Vehicles Travelled by 2020**

<b>Vehicle Type</b>	<b>Increase %</b>	<b>Vehicle Type</b>	<b>Increase %</b>
Private Cars	36	Light CV	107
Motor Cycles	16	Rigid Trucks	26
Buses	31	Articulated Trucks	120

By 2020 private cars' relative share of metro-motor vehicle PM<sup>10</sup> emissions increases from 49% to 58%.

Motor-vehicle air pollution is a major health problem causing chronic disease, impairment and premature death through cardio-vascular problems, bronchitis and other respiratory disease.

In Australia in 2000, such pollution was the cause of an estimated 2,700 cases of morbidity and an estimated 1,400 cases of premature death. The main causative factors were cardio-vascular problems, bronchitis and other respiratory diseases. The cost of death and disease that can be attributed to motor vehicle pollution in 2000 was of the order of \$2.9 to \$3.9 billion.

### ***Access and Social Inclusion***

Australian cities have, for many decades, been designed around private vehicles and cheap fuel.

The absence of urban transport planning and investment condemns areas and people to be dependent on private car travel. This has occurred in the outer rings of metropolitan areas and large regional towns over the last 40 years; we have an opportunity to invest to start healing the transport-related 'divide'.

In the large outlying areas of our cities, much of the population has no access to rail, tram or ferry networks and bus services are the only viable public transport option.

There is a growing 'forced car ownership' in fringe Australia where over 20% of households with income <\$500 per week are running two or more cars due to zero/very low public transport. This lack of transport access significantly limits employment opportunities in these outlying areas and contributes to social exclusion.

Public transport services enable economic activity but also social inclusion, plus connectivity through the walking and cycling catchments. So public transport services can be regarded as essential as health services. Like health services, transport services have 'socio-technical' content and both are identified as sectors ripe for greater Commonwealth investment and accountability for sustainability.

### ***Climate change and greenhouse gas emissions***

Transport comprises about 14% of total Australian carbon emissions and is the second fastest growing source. Cars contributed 8% of national emissions. The fuel used by cars increased by 19% from 1990 to 2003 and their related emissions increased by 25% in the same period.

Between 1990-1999, total emissions from fuel consumption in transport increased as follows:

Road	+18.3%
Air	+56.6 %
Rail	+ 2.4 %

If transport continues as at present, it will comprise over 66% of the total Australian carbon emissions by 2050, which is unsustainable. A sharp reduction in transport emissions will be required if Australia is to pursue a modest emissions target. Reducing transport emissions will in turn require a substantial modal shift from road to rail, as well as lower emissions intensity in motorised transport modes.

The proposed Carbon Pollution Reduction Scheme (CPRS) is a market scheme intended to reduce carbon emissions but the CPRS will disadvantage rail use in Australia, despite rail's environmental advantages and higher carbon efficiency.

The Government proposes to offset the carbon cost imposed by the CPRS for passenger vehicles, so there will be no change in the cost to car users. As a result there will be no incentive for car users to reduce their car use.

At the same time passenger railways will incur the carbon emission permit cost. If passenger railways rightly pass on the cost of the emissions charge as a market based scheme requires, it will increase the relative cost of rail travel, thereby encouraging users to transfer from rail to car travel.

The CRC for Rail Innovation describes that an emission trading scheme is valuable, but not sufficient to meet Australia's emissions objectives. Both the transport system and the CPRS are riddled with market failures, so neither can be economically efficient. Consequently additional complementary policies are essential to meet climate change and transport objectives. Furthermore, a variety of improvements to the rail system have substantial environmental, social and economic benefits, representing excellent value for the investment.

### ***Including walking and cycling***

The benefits of walking and cycling in combination with public transport for the environment, health and affordability are widely documented. Walking and cycling infrastructure includes:

- strategic planning and construction of the physical routes, networks;
- retrofitting major intersections; and
- wayfinding and end-of-trip facilities.

More than 90,000 people used pedal-power as their sole form of transport to work in 2006 up from 78,000 in 2001. But the biggest deterrent to increasing the levels of cycling in the community is the lack of safe cycling routes.

Improving the cycling network and its connectivity to railway stations/interchanges is expected to continue growth in cycling.

### **Overcoming barriers to the use of public transport**

Australia's transport needs differ from City to City and Region to Region. However, there is a common requirement for the involvement of the Commonwealth, State and Territory and Local governments, public and private transport operators and the community to develop strategies and plans for people movement by integrating all modes (private and public road and rail, cycling and pedestrian).

The relationships between all parties are very complex but there are many opportunities to overcome the barriers to using public transport by improving the way we plan and fund public transport infrastructure and

services in Australia.

Current barriers to the use of public transport include:

- a lack of Commonwealth involvement in planning and funding for integrated public transport with walking and cycling - a change would provide opportunities for services with shared objectives to reduce reliance on car travel;
- deficiencies in public transport infrastructure and services for existing and potential customers - upgrade rail infrastructure and strategically plan for an appropriate mix and functions of passenger transport modes;
- differing public transport ticketing policy on concessions, ticket structures and pricing – the level of State government subsidy is a social policy and depends upon a wide range of factors;
- adverse conditions for walking and cycling in railway station and interchange catchments - give priority to asset management within catchments which could be assisted by legislation on local government asset management and 'community'/corporate planning;
- inconsistent metropolitan car parking policy - needs review and the adoption of a parking standard for small cars;
- unfavourable guidelines for car sharing – these have previously been recommended to the former Australian Greenhouse Office; and
- there is no tangible support for households that are already car-free and those wanting to become car-free – value and support households that function with no car.