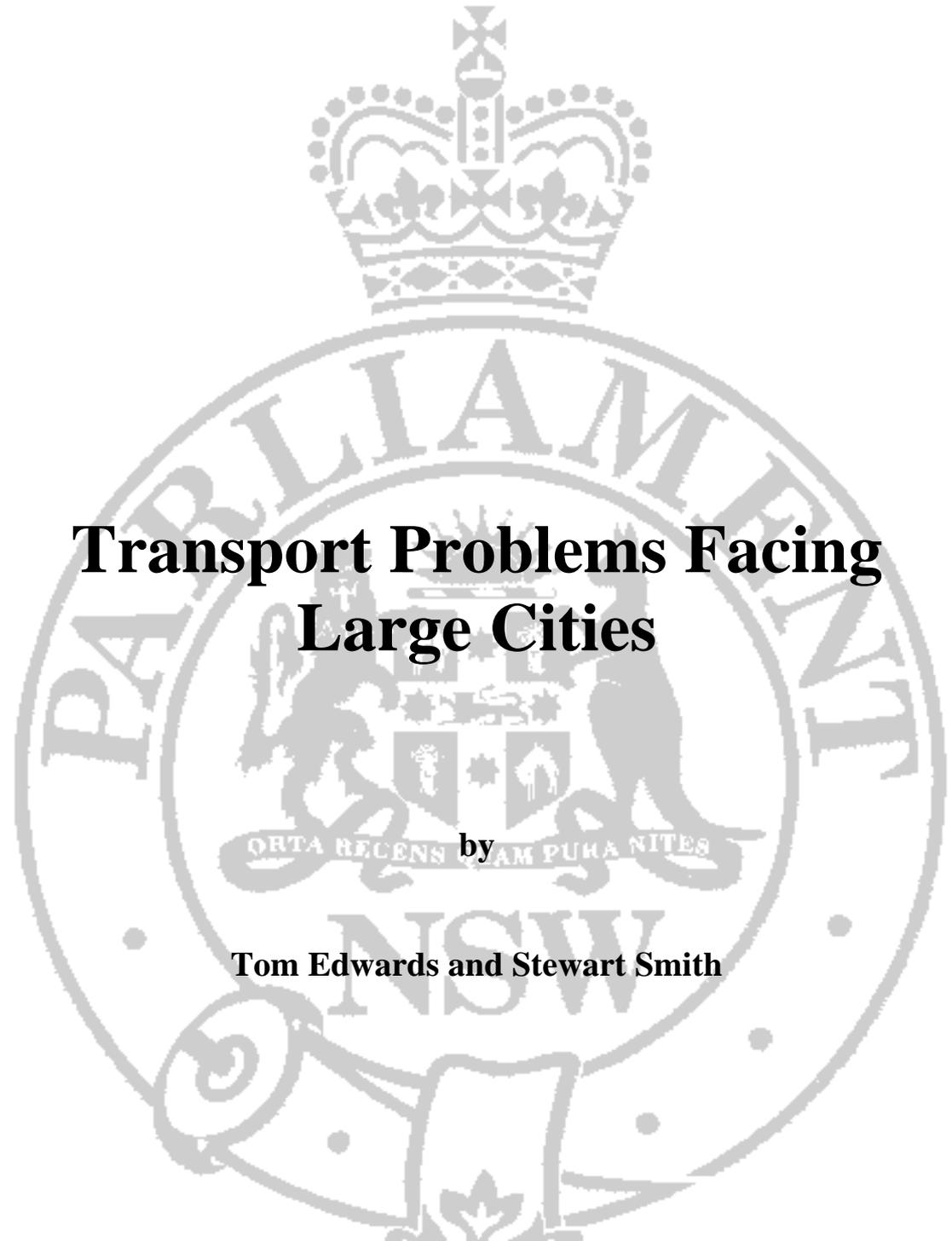


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**Transport Problems Facing  
Large Cities**

by  
**Tom Edwards and Stewart Smith**

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# **Transport Problems Facing Large Cities**

by

**Tom Edwards and Stewart Smith**



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Jason Ardit, (BA, LLB) Research Officer, Law.....(02) 9230 2768

Tom Edwards (BSc (Hons)), Research Officer, Environment ..... (02) 9230 3085

Stewart Smith (BSc (Hons), MELGL), Research Officer, Environment ... (02) 9230 2798

John Wilkinson (MA, PhD), Research Officer, Economics.....(02) 9230 2006

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## EXECUTIVE SUMMARY

This paper considers the problems facing transport policy in large cities. As the world's cities have become home to the vast majority of their national population, governments are faced with the challenge of providing transport infrastructure to accommodate the needs of their citizens. In many of the world's largest cities, the majority of travel is by private car, which poses two problems – road congestion and greenhouse gas emissions.

This paper begins with a discussion of transport problems facing large cities and their applicability to Sydney. The car is the dominant mode of transport in many large cities, including Sydney. This creates problems of congestion, atmospheric pollution and noise for residents (Section 2).

International best practice in urban transport policy from cities around the world is then identified, firstly from a public transport viewpoint (Section 3.0), and then reducing urban road congestion. International experience has shown that congestion is best tackled with a combination of incentives and disincentives. This approach has led to a shift from the private car to other transport modes in London, Barcelona and Singapore (Section 3.1). The cost of congestion in Sydney could rise to \$7.8 billion by 2020. If public transport is to help solve congestion problems in Australia, evidence suggests usage needs to be increased substantially above current levels.

Part 2 of the paper provides a comparative analysis of transport policies in Paris; Tokyo; London; New York; Vancouver and Sydney.

The public transport system in Paris and its surrounds is extensive, growing, and is largely in public hands. One agency coordinates all transport policy in the Paris region. While recent initiatives have not succeeded in reducing the use of the car in the Paris region, car use has declined significantly in central Paris, and in recent years growth in public transport usage has significantly outstripped the use of the car (Section 4.0).

The large but densely populated megalopolis of Tokyo grew up around its rail network, and suburban rail remains the dominant transport mode used by its citizens today. The sheer volume of passengers means that although trains are fast and punctual they are seriously overcrowded at peak times. Congestion is a serious problem for Tokyo's drivers, and a plan to create a high speed motorway network ringing the city which was first proposed in the 1960s has yet to be completed. Tokyo's candidacy for the 2016 Olympics has given fresh impetus to this roadbuilding in the city's 10 year plan (Section 5.0).

London's population continues to grow. Public transport provision has not kept pace with the city's growth, and infrastructure on the city's metro and rail networks is ageing. An electronic ticketing system has been successfully introduced, and a congestion charge and increased public investment in bus and metro have successfully stabilised traffic levels. A Crossrail system which would link the new developments in the east of the city to the city centre and the world's largest airport at Heathrow awaits Parliamentary approval (Section 6.0).

New York City is distinguished from other cities in the United States by the significant use

of public transport. Considerable investment continues to be needed to bring the city's transit system and roads into a state of good repair. With job and population growth, by 2030 it is estimated that 'rush hour' congestion on roads could extend to 12 hours every day. New York Mayor Michael Bloomberg released the PlaNYC initiative in April 2007, with transportation one of five key elements. Building the new transit identified in the initiative, and achieving a full state of good repair of existing infrastructure, will require spending of over \$50 billion. However, the lack of approval for a road congestion charge by the State legislature has created a considerable funding gap in planned investment in public transport (Section 7.0).

Although Vancouver's population is only half that of Sydney's, it is of a similar size and geography. In 1998 a public body called Translink was created and given responsibility for Vancouver's public transport system and its major roads. Public transport by rail, bus, Skytrain and ferry is largely in public ownership, with limited contracting of bus services to private operators. Car travel is the dominant mode in both the city and the metropolitan region. The culmination of a 10 year transport plan has resulted in a 10% decrease in the number of cars entering and leaving the city. (Section 8.0).

In 2005 Sydney residents made 15.7 million trips each weekday. The car accounted for 69.4% of all trips, either as driver or as passenger. Sydney's rail and ferry networks are publicly owned, while bus services are operated by the publicly owned State Transit Authority and private providers. The NSW State Plan committed government agencies to increase the proportion of total journeys to work by public transport in the Sydney metropolitan region to 25 per cent by 2016 (22 per cent in 2005). The Government announced in April 2008 that it would build the city's first metro rail system servicing the north west of Sydney. A contract for an e-ticketing system for Sydney's public transport was cancelled in 2007.

Congestion on some of Sydney's major arterial roads poses problems to bus operators, drivers and freight vehicles. New technology is being introduced to give buses priority at pinch points and improve information for passengers. With the city's population expected to continue to grow, the State Government has developed a number of policies and plans which provide the context for transport policy in Sydney. (Section 9.0).

## 1.0 INTRODUCTION

As the cost and inconvenience of road congestion grows, cities world wide have grappled with the problem of how to move an increasingly mobile population about. The escalating price of oil, the imperative to reduce greenhouse gas emissions, and governments facing increasing demands for investment from all sectors create a challenging transport policy environment.

Sydney is not immune to these forces, and faces similar transport problems as other leading cities. Furthermore, Sydney must compete both with other world cities, as well as domestically, to attract business and remain competitive. The efficient transport of both goods and people around a city is a significant factor in this regard.

This paper reviews four world cities: London; Tokyo; Paris and New York, to learn what transport problems they are experiencing and how they have gone about solving them. In addition, transport in Vancouver, Canada, is also reviewed as a city comparable in size to Sydney. An update on transport in Sydney is also presented.

This paper seeks to identify transport ‘world’s best practice’ in an endeavour to provide lessons for Sydney.

## 2.0 TRANSPORT PROBLEMS FACING LARGE CITIES

Across the world, cities face many common transport issues, including growing traffic congestion, pollution, greater car dependency, buses caught in city congestion, and ageing transport infrastructure. Transport problems that have been identified in large cities are presented in the table below. The applicability of these problems to Sydney is also shown, where this information is available.

**Table 1: Transport problems and their applicability to Sydney**

<b>Worldwide Transport Problems</b>	<b>Applicability to Sydney</b>
The population of cities is increasing, placing more demands on transport infrastructure	The population of Sydney is <a href="#">projected</a> to grow by around a million people from 4.1 million in 2001 to over 5 million by 2023
Cities are sprawling and becoming less dense. Rising house prices in central areas encourages people to move to the suburbs where property is cheaper. This makes journeys and travel times longer and favours the use of the car over public transport. Lower density communities are more difficult and more expensive to serve with public transport	With a density of 2100 people per km <sup>2</sup> Sydney ranks 608 out of 707 cities worldwide with a population of more than 500,000
Cities are dynamic and over time the use of different areas changes. Public transport infrastructure tends to be fixed and is inflexible	
Growth in single occupancy homes creates	The number of single person households in

demand for housing which causes sprawl and results in increasing car ownership levels	New South Wales is <a href="#">projected</a> to increase from 587,000 in 2001 to between 882,000 and 979,000 in 2026
Transport systems in cities tend to be radial in nature, they are efficient at moving people between the suburbs and the centre, but less good at moving people from suburb to suburb	Sydney's transport infrastructure is focussed on the CBD and surrounds, with the main transport hubs being located centrally. The Sydney Metropolitan Strategy envisages alternative CBDs at Paramatta, North Sydney, Liverpool and Penrith
Single occupancy cars are the prominent mode of passenger transport, and the majority of goods are carried by road and these are tending to increase over time. This growth in volume undermines progress e.g. in energy efficiency, emissions or noise of road vehicles	On an average weekday, 70% of all trips in Greater Sydney are made in private vehicles. The proportion of all trips made in private vehicles fell by 0.5% from 1999 to 2005. Travel by private vehicles made up 80% of the total distance travelled by Sydneysiders on an average weekday.
The time people spend caught up in traffic congestion results in economic cost e.g. lost working hours, higher transport costs	The economic cost of congestion in Sydney was estimated to be \$3.5 billion in 2005, rising to \$7.8 billion by 2020 by the COAG review of urban congestion
Cars and car parks consume valuable urban space. They are less space efficient than public transport	
Cars are less energy efficient than other forms of transport and produce more greenhouse gases per passenger km than other forms of transport. The NSW State of the Environment 2006 estimated that buses were 3 times, trams 6 times, and trains more than 40 times more energy efficient than cars	Emissions from transport made up 14% of total greenhouse gas emissions from NSW in 2005. Emissions from cars made up 60% of emissions from transport, light commercial vehicles 14%, buses and trucks 18%, ships 3%, railways 2% and motorcycles 0.3%.
Pollution from transport emissions – particulates, benzene and nitrous oxides affect health. In the EU transport emissions are thought to reduce average life expectancy by 9 months.	The NSW State of the Environment 2006 for reported that 12% of particulate emissions are from motor vehicles. The national goal for atmospheric particles is generally being met in Sydney, except in years with bush fires or dust storms. Motor vehicles are also the main sources of nitrous oxides and carbon monoxide. The State of the Environment 2006 said that even in the CBD carbon monoxide levels did not exceed the recommended standard, and from 2002-05 the highest nitrous oxide measurement recorded was within the recommended standard
Noise from traffic reduces quality of life. Urban traffic noise often exceeds guidelines	

set by the World Health Organization and causes sleep disturbance	
Traffic accidents are a major cause of death, especially among the younger age groups. Car travel is statistically much more dangerous than public transport	In NSW in 2006 there were 498 deaths in road accidents, 10 rail fatalities and 22 casualties from aviation accidents
Although car ownership is rising, many households do not have a car, and members of car-owning households may not have access to it at certain times of day.	203,000 households in Sydney did not own a car, 13% of all households.
Transport modes often develop independently and transferring between modes is often a problem	A report by the Auditor General's on interchange in Sydney published in June 2007 found that there was insufficient information available to allow the accessibility, capacity or utilisation of Sydney's interchanges to be assessed.
A number of different actors may be involved in developing transport policy and in providing transport services. Coordinating their work can be difficult	The Auditor General's report on interchange in Sydney said that there was "a need for a coordinating body to provide a strategic focus on interchanges."
While journey time between cities is reducing, journey times and average speeds within cities are falling	
Research has shown that decision makers can underestimate the importance the public places on improving public transport	

#### Sources of problems:

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NSW State of the Environment:

[http://www.environment.nsw.gov.au/soe/soe2006/chapter2/chp\\_2.4.htm#2.4.64](http://www.environment.nsw.gov.au/soe/soe2006/chapter2/chp_2.4.htm#2.4.64)

Household and Family Projections Australia:

[http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/DF2989BFFA7392E1CA256EB6007D63F4/\\$File/32360\\_2001%20to%202026.pdf](http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/DF2989BFFA7392E1CA256EB6007D63F4/$File/32360_2001%20to%202026.pdf)

Transport Data Centre: <http://www.transport.nsw.gov.au/tdc/documents/hts-report-2005.pdf>

NSW Population projections:

[http://www.planning.nsw.gov.au/population/pdfs/nsw\\_state\\_and\\_regional\\_population\\_projections\\_2005\\_release.pdf](http://www.planning.nsw.gov.au/population/pdfs/nsw_state_and_regional_population_projections_2005_release.pdf)

Transport accident statistics: [http://www.bitre.gov.au/publications/30/Files/BITRE\\_Yearbook.pdf](http://www.bitre.gov.au/publications/30/Files/BITRE_Yearbook.pdf)

Population densities: <http://demographia.com/db-worldua.pdf>

### 3.0 WHAT IS TRANSPORT 'BEST PRACTICE'?

Whilst transport problems in large cities are relatively easy to recognise, the identification of 'best practice' can be more difficult. Box 1 outlines the International Association of Public Transport's views on what constitutes best practice in relation to public transport. The following section is a discussion on best practice and road congestion.

#### Box 1: The International Association of Public Transport 16 points of best practice

<b>Best Practice 1</b>	<b>Public transport adds value to developing new areas.</b> High quality public transport increases the value of real estate. New transport infrastructure can be jointly financed with developers who benefit from these rising land values.
<b>Best Practice 2</b>	<b>Light rail regenerates city centres.</b> Many cities have successfully combined public transport projects with a policy of revival of its city centre. In the last 20 years, 14 cities in the USA and Canada have introduced new light rail systems: Baltimore, Buffalo, Calgary, Dallas, Denver, Edmonton, Los Angeles, New Jersey, Portland, Sacramento, Saint Louis, Salt Lake City, San Diego, San Jose.
<b>Best Practice 3</b>	<b>Pedestrians, cyclists, buses and trams make a good combination for inner city centres.</b> Even in narrow streets where cars are banned, pedestrians, cyclists, deliveries, buses and trams can co-exist.
<b>Best Practice 4</b>	<b>Attractive rail and bus services to out of town shopping and leisure centres.</b>
<b>Best Practice 5</b>	<b>Fast reliable links from city centres to airports.</b> In some cities public transport carries as much as 40% of all airport passengers.
<b>Best Practice 6</b>	<b>Co-ordination of all modes.</b> The market share of public transport rose by 10% in four years in Vienna, the capital of Austria. This is due to: a common ticket for all modes in the metropolitan area; well planned interchange stations making changes from one mode to another easy; expansion of metro and suburban rail; modern light rail system in city streets; new tramline to a new housing area; personalised marketing in new residential areas.
<b>Best Practice 7</b>	<b>Technology to better inform passengers</b> Good passenger information is a deciding factor to increase the competitiveness of public transport. Göteborg, Sweden, has a network wide real time passenger information system. The information centre monitors the position of over 450 buses and trams vehicles on their routes allowing real time information of the next service to be given at more than 140 stops. Information is accessible via the internet and mobile telephone.
<b>Best Practice 8</b>	<b>Easy access to all modes by 'e-ticket'.</b> Contactless smartcards have been introduced in many cities, including Hong

	Kong (Octopus Card) and London (Oyster card). In Hong Kong the smart card is used by 85% of passengers, and reduces access time to platforms and vehicles.
<b>Best Practice 9</b>	<b>Quality bus corridor transports 40% to 200% more passengers at peak times.</b> Dublin has invested in 12 Quality Bus Corridors. These include: priority right of way and dedicated road space for buses; a bus every one to three minutes during peak periods; real time information; shelters at every stop. Bus journey times have been reduced by 30% to 50%, and a survey in 2004 found that average bus journey times in the morning peak were less than the average car journey times in 9 of the 12 bus corridors. The number of cars entering Dublin's inner city was reduced by 21.4% from November 1997 to November 2004, and the number of bus passengers increased by 49% during the same period.
<b>Best Practice 10</b>	<b>High capacity bus networks can successfully transport large quantities of people.</b> Emerging and developing countries need to invest in urban transport systems that are sustainable and can respond to their growing needs for mobility.
<b>Best Practice 11</b>	<b>Light rail can also satisfy heavy demand.</b> Tramways on dedicated rights of way provide an economic and effective solution for emerging countries.
<b>Best Practice 12</b>	<b>The renaissance of trams.</b> 20 years ago, only 3 cities in France still had trams. Totally new systems have been successfully introduced in Nantes, Grenoble, Strasbourg, Paris, Rouen, Montpellier, Lyon and Orleans. These have been made possible by the implementation of a 'transport levy', a tax paid by employers and used for investment in and the operation of public transport.
<b>Best Practice 13</b>	<b>Tram-train, a new concept using both light and heavy rail lines.</b> Urban trams and regional railway trains can be run on the same railway lines, linking the city with outer regions.
<b>Best Practice 14</b>	<b>Metro can rapidly move a large number of passengers.</b> In large cities the metro is unrivalled in its capacity to rapidly move large numbers of people: 20,000 passengers an hour in each direction is the average, rising to over 80,000 on some networks. Madrid built 56km of metro in five years.
<b>Best Practice 15</b>	<b>Art brings light underground.</b> Citizens look to their metro as a reference of public transport quality, and including art improves its positive image. The Lisbon metro is considered to be a contemporary art gallery, and other cities are doing the same.
<b>Best Practice 16</b>	<b>Wealth and public transport go together.</b> Public transport becomes the preferred choice for everyone if it is quick and comfortable and if parking capacity is limited.

### 3.1 Best Practice and Road Congestion

The Council of Australian Governments has noted that the economic cost of congestion in Sydney was estimated to be \$3.5 billion in 2005, rising to \$7.8 billion by 2020. International experience suggests that successful schemes to tackle road congestion involve a combination of incentives and disincentives. This involves measures to restrict or limit cars, combined with measures to improve the alternatives of passenger transport, walking and cycling. Use of incentives alone has often been unsuccessful, since people are reluctant to give up the perceived benefits of driving their own car. Equally, measures to limit the car

are unpopular and impractical unless the alternatives are made much more attractive and convenient.<sup>1</sup>

A review of transport in world cities for the UK Commission for Integrated Transport came to similar conclusions. The Commission concluded that when a 'carrot and stick' are introduced in tandem, a modal shift from the car to more sustainable modes of transport can be achieved. London, Barcelona and Singapore are among the few cities in the world to successfully achieve this.

However, those cities focusing only on public transport improvements have not been able to secure significant change to travel behaviour. The benefits from public transport improvements in terms of fewer journeys by car and less congestion have not been sustained, as the vacated road space has simply filled up with new traffic. London has been able to achieve a 5% modal shift from the car to buses, with this change in travel behaviour starting before the introduction of the congestion charge but been strongly supported after it. The only other city which comes close to this figure is Barcelona, which has seen public transport use up by 1.7% and car use reduce by 3% between 1999 and 2002.

In contrast, the experience of Dublin shows the importance of long term solutions addressing both supply and demand. With the introduction of 'Quality Bus Corridors', bus use in the city increased by 40% between 1996 and 2003. However, with no car demand management measures in place, vehicle use rose by 28% in the same period.<sup>2</sup>

### **3.2 Urban Road Congestion in Australia**

Public transport services typically account for 5-8% of travel needs in Australia's major cities. The International Association of Public Transport considers that if mass passenger transport is to make a significant contribution to dealing with the issues of urban congestion and related issues, this usage rate needs to be increased to at least 12% in the medium term and 20% in longer term. In a submission to the House of Representatives Standing Committee on Environment and Heritage inquiry into Sustainable Cities in 2003, the Association argued that a major reason for the lack of action in the provision of mass passenger transport is the absence of a transport policy support at the Federal level. The Association said that the fringe benefit tax regime treated car use preferentially compared to public transport.<sup>3</sup>

In its final report, the Standing Committee inquiry into sustainable cities agreed with the need for a greater Commonwealth government role in relation to transport provision, and recommended:

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<sup>1</sup> Glazebrook, G. 'Many cities have decided to tame the car.' In International Association of Public Transport, Submission to House of Representatives Standing Committee on Environment and Heritage, *Inquiry into Sustainable Cities*, October 2003.

<sup>2</sup> Commission for Integrated Transport, *World Cities Research, Summary Report*, Prepared by MVA, March 2005.

<sup>3</sup> International Association of Public Transport, Submission to House of Representatives Standing Committee on Environment and Heritage, *Inquiry into Sustainable Cities*, October 2003.

- the Australian Government significantly boost its funding commitment for public transport systems, particularly light and heavy rail, in the major cities.<sup>4</sup>

This identified lack of Commonwealth support may change with the creation of the Commonwealth's infrastructure funds. In the 2008 budget the Commonwealth announced the establishment of three funds to invest in Australia's productive capacity, the Building Australia Fund, the Education Investment Fund and the Health and Hospitals Fund. The Government will provide an initial allocation in the order of \$40 billion, largely from the 2007-08 and 2008-09 surpluses, into these funds. Both the capital and earnings of the funds may be drawn down over time after specific infrastructure projects have been identified.<sup>5</sup>

To improve processes around the assessment of infrastructure investment decisions, the Australian Government established Infrastructure Australia in 2008<sup>6</sup> to advise governments on nationally significant infrastructure. This group will identify strategic investment priorities and policy and regulatory reforms to facilitate delivery of infrastructure investments of national importance between all levels of government and industry. Infrastructure Australia's immediate priority is to complete a National Infrastructure Audit by the end of 2008, and develop an Infrastructure Priority List for COAG consideration in March 2009. It is also to develop best practice guidelines for Public Private Partnerships for COAG consideration by October 2008.

The Commonwealth Government is also planning infrastructure feasibility studies with the States on high-priority projects, at a cost of \$75 million in 2007-08. These feasibility studies will feed into the National Infrastructure Audit to be completed by IA. For NSW, this includes feasibility studies for two urban transport projects:

- A proposed Western Metro railway line between Parramatta and the CBD, independent of the existing rail network. The feasibility study will identify preferred alignments, establish a business case and estimates of patronage, revenue and cost (Commonwealth contribution \$20 million, State contribution \$10 million);
- A study to examine potential improvements to the M5 transport corridor from Port Botany / Sydney Airport to south west Sydney (Commonwealth contribution \$5 million, State contribution \$10 million).<sup>7</sup>

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<sup>4</sup> House of Representatives Standing Committee on Environment and Heritage, *Sustainable Cities*, August 2005.

<sup>5</sup> Australian Government, *Budget 2008-09, Paper No 1, Statement 4 Boosting Australia's Productive Capacity: The Role of Infrastructure and Skills*.

<sup>6</sup> *Infrastructure Australia Act 2008* came into effect on 9 April 2008.

<sup>7</sup> Hon Anthony Albanese MP, *Tackling Urban Congestion and Planning*. Media Release, 13 May 2008. See:

[http://www.minister.infrastructure.gov.au/aa/releases/2008/May/budget-infra\\_14-2008.htm](http://www.minister.infrastructure.gov.au/aa/releases/2008/May/budget-infra_14-2008.htm)

## Road Charging

The ‘sticks’ or disincentives referred to in the previous section on road congestion have usually been applied via some form of road charging. In relation to urban congestion there are two main ways to implement this. An area charge scheme imposes a charge on all motorists that travel within a defined area. The charges may be levied either for crossing a cordon around the area or for circulating within the area. The second option is to charge for a selected route, such as a toll way. The Commonwealth government states that the broader adoption of efficient pricing signals in the transport sector would be expected to significantly reduce urban congestion.<sup>8</sup>

There are no examples of an area charge road system in Australia. In comparison, Australia is among the leading countries internationally in the introduction of single toll routes in urban areas. For instance, in NSW there are 161 kilometres of privately funded toll roads.<sup>9</sup> There are now some 12 toll route schemes in the metropolitan regions of the eastern capital cities (Sydney, Melbourne, Brisbane). However, these schemes are all on ‘new’ routes, or routes with major enhancements in capacity. The emphasis has been on route tolling as a means of funding new infrastructure rather than managing congestion on existing routes. Further, most Australian toll road schemes are privately owned and funded, with the toll revenues being applied to recoup the up-front private sector investment to construct the route.<sup>10</sup>

A review for the Council of Australian Governments concluded that Sydney and Melbourne appear to have sufficiently severe congestion problems to warrant these being addressed by charging policies, whether of the ‘single toll ring’ or other type. From a review of theoretical studies internationally on alternative toll road pricing policies, the report also found that:

- Network pricing of existing infrastructure is superior to select route charging, both in economic welfare terms and in revenue-raising terms. Network pricing would involve pricing of each link in a road network based on the marginal social cost of travel on that link, ie the charge could vary by link, type of vehicle and/or time of day.
- If any type of select route pricing policy is to be pursued, welfare-maximising (‘public’) pricing is superior to revenue-maximising (‘private’) pricing policies. Public pricing involves distinctly different price levels and structures than revenue-maximising pricing. Typically, public pricing will result in toll prices and revenue levels in the order of half those with revenue-maximising pricing.
- Revenue-maximising pricing typically results in lower net economic welfare than would an all-free network.<sup>11</sup>

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<sup>8</sup> Australian Government, *Budget 2008-09, Paper No 1, Statement 4 Boosting Australia's Productive Capacity: The Role of Infrastructure and Skills*.

<sup>9</sup> Roads and Traffic Authority, *Annual Report 2007*, at 25.

<sup>10</sup> Booz Allen Hamilton, Council of Australian Governments, *Review of Urban Congestion Trends, Impacts and Solutions*. November 2006.

<sup>11</sup> Booz Allen Hamilton, Council of Australian Governments, *Review of Urban Congestion Trends, Impacts and Solutions*. November 2006.

The NSW Independent Pricing and Regulatory Tribunal (IPART) notes that road pricing will be an area of increasing focus in the future, and recommended that in the medium term:

After relevant transport policy issues have been resolved, consideration should be given to rationalising existing vehicle usage charges, including the motor vehicle weight tax, with well designed road use and congestion charges.<sup>12</sup>

## **PART 2: WORLD CITY CASE STUDIES**

### **4.0 PARIS**

Paris is at the centre of the Ile de France region, which has a population of 11.5 million people and is made up of Paris plus seven other departments.

#### ***Governance***

Public transport is normally the responsibility of departmental general councils. However, transport in the Ile de France is the responsibility of a local transport authority called the Syndicat des Transports d'Ile de France (STIF)<sup>13</sup>. The STIF is responsible for:

- Deciding on transport routes, the make up of services, awarding contracts to transport operators, fares policy;
- Coordinating the work of the different public transport operators;
- Managing spending on public transport and deciding on the contributions to transport projects from the constituent departments, and ensuring a coherent programme of investment in public transport throughout the Ile de France region.

#### ***Public Transport Network and Operators***

Although the STIF has responsibility for transport policy in the Paris region, transport services are delivered by a number of public and private companies.

RATP (*Regie Autonome des Transports de Paris*) is the main public transport operator in Paris and the Ile de France. It is a state owned company, and is joint operator of two of the suburban metro (RER) lines, and operates the Paris metro, four tram lines, and is the largest bus operator in both Paris and the surrounding area. The Paris metro is the most used transport mode, with over 1.4 billion passenger journeys in 2006.

The SNCF (*Societe National des Chemins de Fer*) is France's publicly owned national railway company. It has a subsidiary, Transilien, which operates the 8 suburban railway

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<sup>12</sup> IPART, *Review of State Taxation, Report to the Treasurer, Other Industries – Draft Report*, June 2008.

<sup>13</sup> The organisation of public transport in the Ile de France. Ministry of Ecology, Energy, Sustainable Development and Development  
[http://www.transports.equipement.gouv.fr/article.php3?id\\_article=7339](http://www.transports.equipement.gouv.fr/article.php3?id_article=7339)

lines in the Ile de France, and is joint operator of the suburban metro (RER) with the RATP.

OPTILE is an association of private bus operators whose members operate suburban bus services in the Ile de France. TRA is a private bus company which serves one of the departments (Saint-Denis) within the Ile de France region.

Table 2 has some information about the public transport network in Paris.

**Table 2: Public transport operators in Paris**

Mode	Number of lines	Total length (km)	Stations/stops	Annual passenger journeys (million)	Operator(s)
Metro	16 (inc 2 branch lines)	202	297	1,410	RATP
RER (long distance suburban metro)	5	587	443	1,119	RATP/SNCF
Suburban Rail	8	709			SNCF
Trams	4	37	60	64	RATP
Paris Bus	59	568	1274	330	RATP
Suburban Bus	1312	22676	28794	800	RATP/TRA/OPTILE

Source: Mayor of Paris, *Public Transport*. <http://www.paris.fr/portail/viewmultimediacdocument?multimediacdocument-id=31277>

Note: Separate figures for stations and passengers for the RER and suburban rail are not available because of shared stations and lines, and are shown combined in the table.

### ***Private Transport and Paris' road network***

Paris has a lower rate of car ownership than the rest of the Ile de France. At 0.5 cars per household this is also lower than other European cities – 0.8 for London, 0.9 for Brussels and 1.1 for Madrid. The explanation for this is the quality of public transport in central Paris<sup>14</sup>. However, the high population density of central Paris means that many streets are filled with parked cars. The shortage of parking encourages residents to use public transport or walk for short trips, rather than risk losing a parking space, and cars are mainly used for less frequent trips to suburban shopping centres, or at weekends for leaving the city. The shortage of parking also discourages commuters from using their cars to travel to work, and most commuting into Paris from the Ile de France is by public transport. Unlike in London and New York, the Parisian authorities have not increased parking charges to discourage Parisians from driving, and have chosen to invest in improving public transport

<sup>14</sup>

Mayor of Paris. *Transport plan for Paris*, February 2007

instead<sup>15</sup>.

Paris has over 6,000 public roads, with a total length of over 1,700 km. It has 171 expressways<sup>16</sup>. Paris and the Ile de France are ringed by 3 concentric autoroutes. The outer ring is the “Francilienne” which partially encircles the Isle de France. Building began in the 1970s, and the ring is now 2/3 complete with three lanes in each direction. The ring is 50km in diameter, similar in size to the London Orbital (M25). The 70km long central ring is made up of the A86, which follows an irregular path around Paris, varying from 20-25km in diameter, and varies from 3 to 5 lanes. A tunnel is being built to complete the final 10km section of the ring and is scheduled to be completed by 2010. The innermost ring is the Boulevard Peripherique, which is popularly considered to mark the boundary of the city of Paris. It was built during the 1970s. The road has four lanes in each direction, and is approximately 10km in diameter. Fourteen autoroutes radiate outwards from the Boulevard Peripherique. Within it, a network of roads known as the boulevards extérieurs provide an inner ring road with flyovers and underpasses at intersections. Expressways were also built during the 1970s along the banks of the river Seine, and provide a bypass to the CBD.

Over the last 25 years, there has been a steady growth in the use of the car in Paris, and in 2001 there were 15.5 million daily car passengers in the Ile de France, of which 11.5 million were as the driver and 3.5 million as a passenger. Over the longer term, although car travel has continued to grow, the rate of growth has slowed, with an average annual growth in distance travelled by car of 0.8% since 1991, compared to annual growth of 3% from 1976-91. Between 1998 and 2002 traffic volumes stabilised in central Paris within the A86, but grew on the A86 itself, and on the autoroutes of the “Francilienne” and outside it.<sup>17</sup>

### ***Transport planning***

A hierarchy of plans governs the development of the transport system in the Ile de France. The overarching policy is set out in a regional masterplan, the Schema Directeur du Region de l’Ile de France (SDRIF). One of the five main objectives of the plan is to develop a transport policy which is less centred on the use of the car.

A more detailed transport policy for the region, the Plan des Deplacements Urbain de L’Ile de France<sup>18</sup> (PDUIF) was published in 2000, and covered the period up to 2005. The plan set out a number of measures to improve the transport system:

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<sup>15</sup> MVA. *World cities research*. March 2005  
<http://www.cfit.gov.uk/docs/2005/worldcities/worldcities/pdf/worldcitiesfinalreport.pdf>

<sup>16</sup> Mayor of Paris, *Roads in Paris*:  
[http://www.paris.fr/portail/deplacements/Portal.lut?page\\_id=19&document\\_type\\_id=5&document\\_id=4914&portlet\\_id=652](http://www.paris.fr/portail/deplacements/Portal.lut?page_id=19&document_type_id=5&document_id=4914&portlet_id=652)

<sup>17</sup> STIF *Diagnostic report by the Transport and Mobility Group*. 2005. <http://www.stif.info/les-developpements-avenir/etudes-planification/sdrif/diagnostic-rapport-realise-par-groupe-mobilite-transport-1345.html>

<sup>18</sup> Government of the Region of the Ile de France. *Ile de France Urban Transport Plan*. 2000.  
[http://www.stif.info/IMG/pdf/Le\\_PDUIF.pdf](http://www.stif.info/IMG/pdf/Le_PDUIF.pdf)

- Offering a real alternative to travelling by car, by improving the quality of service of public transport (safety, comfort, accessibility for disabled people, information, pricing and timetabling);
- Improving public safety and reducing crime on the public transport system e.g. by improved use of video surveillance;
- Better informing drivers about congestion to allow them to use alternative routes;
- Better integrating transport considerations into planning policy decisions and plans;
- Encouraging the use of vehicles which use alternative energy sources;
- Complementing the metro network with an improved system of rapid bus links, particularly for travel between suburbs;
- Improving public transport links to out-of town developments;
- Developing a cycle network, with links in particular to stations and major commercial centres;
- Improving road safety for pedestrians and cyclists, e.g. on routes to schools;
- Introducing a parking pricing policy which encourages motorists to make use of other transport modes, especially for shorter journeys.<sup>19</sup>

The plan also set targets of reducing car travel by 3% and increasing the use of public transport by 2% over 5 years. An evaluation of the plan published in 2007 found that the objective of reducing car travel had not been met – there had been an increase of 0.3% in traffic on the Ile de France road network. However, traffic volumes had fallen significantly within central Paris by around 20%, and by between 4 and 10% within the Boulevard Peripherique. Growth in usage of public transport had exceeded growth in car travel, with an average growth since 2000 of 1.9% in the number of journeys by public transport, reversing previous trends. A new transport plan for the Ile de France is now being drawn up by the STIF.<sup>20</sup>

The third and most detailed level of transport plans are the 34 local plans which have been drawn up for the Ile De France. The largest of these local plans covers the city of Paris in its entirety. The Paris transport plan sets out the objectives for the city of Paris up to 2020. The plan includes some specific targets:

- To increase the proportion of daily journeys by walking/cycling/public transport to 83% of all daily journeys within the city of Paris by 2020 (75% in 2001);
- To increase the number of daily journeys by public transport from a base of 9.6 million in 2001 to 11.5 million in 2013 (+20%) and 12.4 millions by 2020 (+30%);
- To reduce traffic within the city of Paris by 26% by 2013 and 40% by 2020 compared to 2001 levels.

The plan also sets targets in terms of environmental quality, including:

- To reduce carbon dioxide emissions from Paris' traffic by 25% by 2013 and 60% by 2020;

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<sup>19</sup> Regional Assembly of the Ile de France. *Masterplan for the Ile de France*. February 2007. [http://www.sdrif.com/IMG/pdf\\_sdrif\\_5\\_07\\_1-sommaire.pdf](http://www.sdrif.com/IMG/pdf_sdrif_5_07_1-sommaire.pdf)

<sup>20</sup> STIF *Synthesis of the evaluation of the Ile de France Urban Transport Plan*. November 2007. [http://www.stif.info/IMG/pdf/evaluation\\_du\\_PDUIF\\_-\\_synthese\\_-\\_novembre\\_2007.pdf](http://www.stif.info/IMG/pdf/evaluation_du_PDUIF_-_synthese_-_novembre_2007.pdf)

- Reduced noise levels on 65% of Paris' road network by 2013 and on 80% of the network by 2020.<sup>21</sup>

**Box 2: An example of best practice – Paris bike hire scheme**

Paris' bike hire scheme was one of the winners of the Institute of Transport and Development's 2008 Sustainable Transport Awards. The [Velib](#) scheme was introduced in June 2007. The scheme requires users to pick up and leave bikes at automated, self-service stations. Users pay a subscription to use the service, a one day subscription costs 1 euro, a weekly subscription 5 euros and an annual subscription 29 euros. The pricing policy is designed to encourage short trips, the first 30 minutes are free, the second 30 minutes cost 1 euros, but it costs 2 euros for the next half hour, and 4 euros per half hour after that. The key to the scheme's success is having enough bike stands so users can easily return their bikes once they have finished using them. By December 2007 there were 20,600 bikes and 1,451 stands, or one every 300m in central Paris. The scheme also has 20 trucks which move bikes from full stands to empty ones to ensure there are free spots at each stand. The stands are built on converted parking places, each one taking up 3 to 5 places, around 6,000 for the whole scheme.

The scheme is run by a joint venture between JC Decaux, an advertising and street furniture corporation and Publicis, an advertising company. The companies make their money from the advertising they display on the bikes and the bike stands. The rental revenue from the bikes, around €30 million per year, goes to the Paris council<sup>1</sup>.

<sup>21</sup>

Mayor of Paris. *Transport plan for Paris*, February 2007

## 5.0 TOKYO

Tokyo is the world's most populous metropolitan area. The UN estimated the population of the Greater Tokyo Area to be 35.7 million in 2007<sup>22</sup>. The Tokyo prefecture has a population of 12.8 million people. This resident population is swelled by over 2.5 million commuters per day from the surrounding prefectures within the Greater Tokyo Area<sup>23</sup>. At 7,835 km<sup>2</sup> the Greater Tokyo conurbation is also the second largest urban area in the world, after New York (Sydney is 1,697 km<sup>2</sup><sup>24</sup>).

### *Governance*

Japan is divided into 8 regions, which are in turn divided into 47 prefectures. Tokyo Prefecture is governed by the Tokyo Metropolitan Government. The government is headed by a directly elected Governor, who is accountable to the Tokyo Metropolitan Assembly. The Metropolitan Government is responsible for the Bureau of Transportation (known as the TOEI), which owns and operates some of the public transport services within the prefecture.

### *Public Transport Network and Operators*

It has been estimated that 57% of travel in Tokyo is by public transport, a higher level of usage than in other world cities<sup>25</sup>. Whilst many North American cities which experienced rapid growth during the 1930s were designed around the car, Tokyo only reached car ownership levels comparable to 1930s America in the 1980s. Tokyo's suburban rail network was built before the rapid growth post war, at a time when it had two thirds fewer people than today. The development of motorways in Tokyo has lagged behind other world cities. Congestion remains a problem, and despite new roadbuilding, average road speeds fell from 26 kph to 21 kph between 1996 and 2002. These factors together with the higher cost of motoring and the lack of parking<sup>26</sup> explain the high usage of public transport. Over capacity is nonetheless a problem on the train network, and trains are 50% over capacity in the morning rush hour. However, although the morning peak is very concentrated (lasting for around 20 minutes at 8.30 am), little has been done to introduce more flexible working hours and encourage peak spreading<sup>27</sup>.

Table 3 has some details about the public transport network in the Greater Tokyo Area.

<sup>22</sup> United Nations. *World Urbanization Prospects database*. <http://esa.un.org/unup/>

<sup>23</sup> Tokyo Metropolitan Government. *Overview of Tokyo – Geography, History and Population*. <http://www.metro.tokyo.jp/ENGLISH/PROFILE/overview03.htm>

<sup>24</sup> Demographia. *World Urban Areas*. March 2007 <http://demographia.com/db-worldua.pdf>

<sup>25</sup> Urban Transport Factbook. *Tokyo Yokohama Suburban Rail – Summary*. October 2003. <http://www.publicpurpose.com/ut-cr-tok.pdf>

<sup>26</sup> Drivers have to have an off-road parking space to park their car overnight. These are limited, and therefore expensive and this has deterred people from buying cars.

<sup>27</sup> MVA. *World cities research*. March 2005 <http://www.cf.it.gov.uk/docs/2005/worldcities/worldcities/pdf/worldcitiesfinalreport.pdf>

**Table 3: Public transport operators in Tokyo**

Mode	Number of lines	Total length (km)	Stations/stops	Annual passenger journeys (million)	Operator(s)
Suburban Rail	121	2865	1243	10600	East Japan Railway is the major operator, over twenty other companies operate services in the Greater Tokyo area
Metro	13 (one line under construction)	292	202	2117	Tokyo Metro (9 lines) and TOEI (4 lines)
Trams	1	12	30	206	TOEI
Bus	138	1121	3874	11	TOEI

The main public transport operators in the Tokyo region are the Eastern Japanese Railway, the Tokyo Metro and the Metropolitan Government's bureau of transportation (TOEI). There are a number of other private companies who operate lines on Tokyo's suburban railway network.

The most commonly used form of transport in Tokyo is the train, with an average of 28 million passenger journeys daily, and an annual use of over 10 billion trips. The largest operator is the [Eastern Japanese Railway Company](#), which carries more passengers than all the other rail operators put together. The company was privatised in 1987 as part of the privatisation of Japanese Railways, which was divided into 6 passenger companies and a freight business.

[Tokyo Metro](#) is jointly owned by the national government and the Tokyo Metropolitan Government. It operates 8 subway lines in central Tokyo, and has a daily ridership of 5.9 million passengers.

The [TOEI](#) operates four metro routes, one tram line, and Tokyo's bus service. It carries 2.7 million passengers daily on its services, the majority of which, over 2 million, travel on the metro.

Although it is not a metro, the Yamanote line is a metro-like train line which rings central Tokyo. It is the most important line in the city, and its 29 stops connect all the main metro and overland stations. The line carries between 3 and 5 million passengers per day (comparable to the ridership of the whole New York Metro) and is operated by the Eastern Japanese Railway Company<sup>28</sup>.

An interesting feature of Japan's public transport operators, including the publicly owned

<sup>28</sup> Japan Times, 25 June 2006: <http://search.japantimes.co.jp/cgi-bin/f120060625x1.html>

Tokyo Metro and TOEI is that they are also involved in property development and retailing. Tokyo Metro<sup>29</sup> and the TOEI<sup>30</sup> have developed office buildings, hotels, shopping complexes and housing on sites they own around Tokyo. They also lease optical fibres installed in their tunnel networks and lease advertising space in trains and stations.

Table 4 has data on the evolution of modal shares of public and private transport expressed as a proportion of all annual trips within a 50km radius of the centre of Tokyo.

**Table 4: Annual passenger share of selected transport modes in Tokyo 1985-2004**

	1985 (%)	1995 (%)	2004
Eastern Japanese Railway Companies	23	22	23
Other suburban rail companies	23	21	21
<i>Total suburban rail</i>	<i>46</i>	<i>44</i>	<i>44</i>
Metro	13	12	13
Buses	11	8	7
Taxis	5	3	3
Private cars	25	33	34

Source: Ministry of Internal Affairs and Communications. *Japan Statistical Yearbook – Passengers carried within 3 largest cities by type of transportation*. 2008 <http://www.stat.go.jp/data/nenkan/zuhyou/y1213000.xls>

The importance of public transport in Tokyo can be clearly seen from these data, making up 64% of all passenger trips in 2004 (not including taxis). While car use increased from 1985-95, it has stabilised since then.

#### *Private Transport and Tokyo's road network*

Table 5 shows information about the road network in the Tokyo prefecture<sup>31</sup>.

**Table 5: Tokyo's road network**

Type of road	Length (km)
Local roads	21448
General metropolitan roads	1387
<i>Of which expressways</i>	178
Main regional roads	968
National highways	363
<i>Of which expressways</i>	68
<b>Total</b>	<b>24166</b>

<sup>29</sup> Tokyo Metro. *Affiliated businesses* <http://www.tokyo-metro.jp/global/en/about/affiliated.html>

<sup>30</sup> TOEI. *Related businesses*, see: [http://www.kotsu.metro.tokyo.jp/english/images/pdf/related\\_businesses.pdf](http://www.kotsu.metro.tokyo.jp/english/images/pdf/related_businesses.pdf)

<sup>31</sup> Tokyo Metropolitan Government. *Tokyo Statistical Yearbook 2006 – Transport and Communication* <http://www.toukei.metro.tokyo.jp/tnenkan/2006/tn06qyte0510u.htm>

Post war, car ownership in Japan grew exponentially, but the country's roads were in a poor state. A report for the Japanese Government found that no other industrial nation had so neglected its highway system<sup>32</sup>. The Japanese Government accepted this advice, and began an intensive programme of road building. To fund this programme, many of the new roads were tolled expressways. Toll revenues were pooled, and tolls from completed roads were used to fund the construction of new expressways. This became unpopular, as cross-subsidisation meant many of the expressways in urban areas have paid for themselves several times over. A national public corporation, the Japan Public Highway Corporation built and operated intercity expressways, and a separate corporation, the Metropolitan Expressway Public Corporation built and operated expressways in the Greater Tokyo Area. Following a review, both corporations were privatised in October 2005<sup>33</sup>. On privatisation the Japan Public Highway Corporation was split into three limited companies covering the Eastern, Western and Central areas. The national expressways in the Tokyo area are operated by the Eastern Japan Expressway Company, and the regional expressways by the Metropolitan Expressway Company Limited. A one way trip on a regional expressway in Tokyo costs around \$7 for a car or \$14 for a large vehicle<sup>34</sup>.

In Tokyo, a longstanding plan for the development of the road network was adopted in 1967. Work to complete the "3 rings and 9 radials plan" continues today as shown in Figure 1.<sup>35</sup>

In August 2006, Tokyo was chosen as Japan's candidate city for the 2016 Olympic Games. In December 2006 the Metropolitan Government of Tokyo published a document entitled "Tokyo's Big Change: the 10 year plan" which presents a vision of the city in 2016. The plan identifies the failure to complete the three loop roads and the resultant congestion as the "largest weakness of Tokyo". One of the 8 goals set by the 10 year plan is to complete 90% of the loop roads by 2016. Among the benefits expected to flow from the completion of the loop roads are reduced greenhouse gas emissions, congestion and journey times, and an increase in traffic speeds.<sup>36</sup>

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<sup>32</sup> Ministry of Land, Infrastructure, Transport and Tourism. *History of Japanese Roads*. [http://www.mlit.go.jp/road/road\\_e/hist/hist2.html](http://www.mlit.go.jp/road/road_e/hist/hist2.html)

<sup>33</sup> Mizutani, F & Uranishi, S. *Privatization of the Japan Public Highway Corporation*. August 2006 <http://www.ersa.org/ersaconfs/ersa06/papers/226.pdf>

<sup>34</sup> Metropolitan Expressway Company Limited. *Expressway Fees as of November 2006* <http://www.shutoko.jp/english/fees.html>

<sup>35</sup> Ministry of Land, Infrastructure, Transport and Tourism. *Roads in Japan*. [http://www.mlit.go.jp/road/road\\_e/contents.html](http://www.mlit.go.jp/road/road_e/contents.html)

<sup>36</sup> Tokyo Metropolitan Government *Principal Policies of the Tokyo Metropolitan Government – Tokyo's Big Change: the 10 year plan*. <http://www.metro.tokyo.jp/ENGLISH/PROFILE/policy03.htm>

Figure 1: Road Network of Tokyo



## 6.0 LONDON

With a population of over 7.5 million, London has significant transport challenges. Demand for travel has been growing and has become more complex. London's population and employment are projected to grow by around 900,000 by 2025. However, London's recent growth has been accommodated largely on pre-existing, mostly Victorian infrastructure.

Bus, tram and metro services in London are the responsibility of the Greater London Assembly, which is headed by the Mayor of London. Transport for London, an organisation headed by the Mayor, assumes overall responsibility for all public transport in London.

### Public Transport

#### Rail / Underground

Overall, growth in public transport capacity has fallen well below growth in population and employment in London. Between 1997/98 and 2003/04 rail passenger demand rose by 22 percent, whereas capacity rose by only 13 percent. Crowding on the Underground and national rail networks is widespread, and most severe during the morning peaks. In the future, public transport demand is predicted to grow faster than the current rate of capacity enhancements.

The Government's response to the urgent need to upgrade and modernise the Underground was to introduce the Private-Public Partnership (PPP). This is a 30 year £17 billion contract for infrastructure improvements, safety modernization and station refurbishment. The contract was awarded to two parties, Metronet and Tube Lines. The companies are required to deliver a certain level of daily asset performance, and to upgrade the network to deliver improved capability in the longer term. They are subject to financial incentives or penalties based on their delivery against performance levels set out in the contracts. After wide ranging criticism of its performance, Metronet went into liquidation in July 2007, four years after commencing its contract. A steering group has been formed to consider the options for the Metronet contracts, but at least in the short term they are likely to be transferred to Transport for London.<sup>37</sup>

#### Buses

Apart from the rail and Underground radial based networks leading into central London, buses are the principal means of transport in the suburbs. The quality and quantity of services will need to be increased to support London's growth and the viability of town centres. Bus occupancy levels have risen in London by 18% since 1999/00. There have been many bus priority measures implemented, but their net effect in the context of increasing congestion is to stave off the worst effects of congestion. More recently, bus transit ways, with dedicated bus laneways separated from other road traffic, have been developed or due to open within the next 18 months.

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<sup>37</sup> House of Commons Transport Committee, *The London Underground and the Public Private Partnerships Agreements: Government Response to the Committee's Second Report of Session 2007-2008*. 31 March 2008.

The Oyster Card is a form of electronic ticketing used on Transport for London and National Rail services within the Greater London Area. The card was introduced in 2003, and now more than 80% of all tube and bus journeys use the Oyster Card.

### **Managing Traffic Congestion**

The car remains the dominant mode in London, accounting for 40 percent of all journeys. Forty one percent of workers living in London use the car as their main mode of travel to work, while in outer London 50 percent of all journeys are by car. For short journeys of less than 2 kilometres, the car captures a third of the travel market. Even though the recent trend for the level of car ownership is remaining relatively constant, with population increase there would be an additional 400,000 cars in London by 2025.

Traffic levels overall in the strategic network of London have been stable over the last five years, partly as a result of:

- low bus fares;
- a major expansion of bus services;
- implementation of the Congestion Charge zone in central London;
- introduction of new road safety and pedestrian facilities;
- constraints on parking.

Congestion charging was introduced into central London in February 2003. Cars are charged an £8 fee entering the zone between 7:00am to 6:00pm Monday to Friday. In February 2007 the congestion charging area was extended westwards. Traffic entering the congestion zone in 2006 was 21 percent lower compared to 2002. The Scheme generated net revenues of £123 million in 2006/07. Revenue is spent on transport improvements, particularly on improved bus services. A cost benefit analysis of the Scheme suggests that the benefits exceed the costs of operating the scheme by a ratio of about 1.5 with a £5 charge, and 1.7 with the current £8 charge.

From 28 October 2008, the Scheme will include new carbon dioxide charges. Cars that emit high levels of carbon dioxide (defined as 225g/km of CO<sub>2</sub>) will have to pay a congestion charge of £25. No congestion charge will apply for low emission cars (120g/km of CO<sub>2</sub>). Typically, high emission cars include large 4 wheel drive cars, whilst low emission cars include hybrid powered vehicles.

However, the newly elected London Mayor, Boris Johnson, has indicated that he will reform the congestion charge scheme, and it appears unlikely that the carbon dioxide charges will be implemented.

### **Walking and Cycling**

Over 50 per cent of tube journeys in central London are quicker on foot. In recognition of this, in February 2008 the then Mayor of London Ken Livingston made substantial commitments to facilitate walking and cycling in London. Some £500 million over the next decade was promised to be spent on cycling. There are currently an estimated 480,000 cycle journeys each day in the capital. This is an 83 per cent increase compared with 2000. Five new programmes were announced by the Mayor:

- A Central London bike hire scheme, similar to that in Paris, with up to 6,000 bikes

located across docking stations every 300m so residents and visitors have quick and easy access to a bike. This will be supported by a series of easily navigable routes

- Around a dozen radial Cycling Corridors for commuters to provide high-profile, easy to follow cycling streams into central London;
- The creation of a series of Bike Zones for shoppers and the school run in Inner and Outer London, with cycle priority streets, 20mph speed limits and quick, clear and simple routes that link key local destinations and open parks and waterways for cyclists;
- The expansion of the Legible London signage system to help people make short trips around the capital on foot, rather than driving, or taking the bus and tube;
- Working with the London Boroughs on the establishment of 200 Streets of Gold – urban makeovers which link key local destinations like stations, schools and shops in inner and outer London with high quality walking facilities, delivering improved pavements, seating and crossings alongside regeneration measures.<sup>38</sup>

### **New Capacity**

Crossrail is a major new rail infrastructure project which will provide a direct link between London's main economic centres of the West End, the City and Canary Wharf, linking these directly with Heathrow Airport (west of the city) and the Thames Gateway (east of the city). The route travels underground through the city centre between Paddington and east London. Crossrail will operate with main line size trains, carrying more than 1500 passengers in each train. According to projections the new rail link will generate transport and economic benefits that are more than double its cost, and create up to 30,000 high value jobs.

Crossrail services will call at all stations with a peak frequency between Whitechapel and Paddington of 24 trains per hour in the morning and afternoon peak. The trains used for Crossrail will be 200 m long formed from 10 cars, with a top speed of 160 km/h. The layout of each carriage will be designed to assist rapid boarding and alighting in the central area in order to minimise dwell times. Each carriage will have at least two sets of double doorways per side.<sup>39</sup>

The expected cost of Crossrail, up to £16 billion, has represented a considerable challenge for successive governments. It is not being funded via the public private partnership structure – as per the Underground. Funding has been agreed on the basis of one third cost each for government (which has allocated £5 billion), passengers (through rail fares) and businesses. London businesses will contribute through a variety of mechanisms. Direct contributions have been agreed with some of the projects key beneficiaries along the route. The Government has recently published a White Paper setting out proposals to introduce a power for local authorities to raise supplementary business rates to fund economic development. The previous Mayor of London, Ken Livingston, indicated that he would use

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<sup>38</sup> Greater London Authority, Media Release, Ken Livingston, "Mayor unveils programme to transform cycling and walking in London." 11 February 2008. see: [http://www.london.gov.uk/view\\_press\\_release.jsp?releaseid=15612](http://www.london.gov.uk/view_press_release.jsp?releaseid=15612)

<sup>39</sup> Cross Rail, *Environmental Statement*, Volume 1, Chapter 2.

these powers to levy a supplement of two pence per pound of rateable value across London from April 2010, which will be used to service £3.5 billion of debt raised by the Mayor during construction. As Mayor, he also envisaged securing contributions from property developers, particularly those who develop in the vicinity of Crossrail stations.

The Crossrail Hybrid Bill is proceeding through Parliament and the Government expects it to receive Royal Assent in the UK summer 2008. Full construction is expected to be underway during 2010, with services commencing in 2017.<sup>40</sup>

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<sup>40</sup> UK Government, *2007 Pre-Budget Report and Comprehensive Spending Review*, 2007 at 58.

## 7.0 NEW YORK

New York city has a population of 8.1 million people, with over 118 million in the greater metropolitan area. Bus, metro and suburban rail networks are operated by various subsidiaries of the Metropolitan Transport Authority. The Authority is referred to as a public-benefit corporation, created by statute by the New York State Legislature in 1965. The Authority is governed by a 17-member Board. Members are nominated by the Governor, with four recommended by New York City's mayor and one each by the surrounding county executives. The board also has six rotating non-voting seats, three held by representatives of the Permanent Citizens Advisory Committee (PCAC), which serves as a voice for users of MTA transit and commuter facilities, and three held by representatives of organized labor.

For the last 25 years, the focus on transport in New York city has been on rebuilding transport infrastructure, not expanding it. In 1981 the Metropolitan Transport Authority halted all new transit expansion until the existing system could be restored. The improvements have been significant. For instance, in 1981 trains broke down every 6,600 miles, now it is every 140,000 miles. However, more than half of the transit rail stations are awaiting repairs, and 40% of the networks signalling equipment systems are obsolete, preventing new services such as displays showing the arrival time of the next train. More than US\$15 billion is needed to achieve a state of good repair on the transit system and roads.

New York City is distinguished from other cities in the United States by its significant use of public transportation. Of all people who commute to work in New York City, 32% use the subway, 25% drive alone, 14% take the bus, 8% travel by commuter rail, 8% walk to work, 6% carpool, 1% use a taxi, 0.4% ride their bicycle to work, and 0.4% travel by ferry. 54% of households in New York City do not own a car, and rely on public transportation.

The New York City Subway is the largest rapid transit system in the world when measured by track mileage (1,056 km of mainline track), and the fourth-largest when measured by annual ridership (1.4 billion passenger trips in 2005). Around 6 million passengers use the subway each weekday. Subway riders pay with the MetroCard, which is also valid on all other rapid transit systems and buses in the city, as well as the Roosevelt Island tramway. Fares are loaded electronically on the card. New York City's bus network is extensive, with approximately 5,800 buses carrying about 2.01 million passengers every day on more than 200 local routes and 30 express routes.<sup>41</sup>

The Metropolitan Transport Authority reported in August 2006 that ridership on its buses, subways and commuter trains in recent years has grown faster than population growth, indicating that more New Yorkers are choosing to use mass transit. The MTA attributed the ridership gains to the introduction of the MetroCard in 1995, and the replacement of more than 2,800 subway and train cars since 2000. The Metropolitan Transport Authority had an operating budget in 2007 of \$10.36 billion.

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<sup>41</sup> *Mass Transit in New York City*, see:  
[http://en.wikipedia.org/wiki/Mass\\_transit\\_in\\_New\\_York\\_City](http://en.wikipedia.org/wiki/Mass_transit_in_New_York_City)

## PLaNYC

Every travel mode in New York city is considered congested, and New Yorkers experience the longest commutes in the nation. Studies have estimated that traffic congestion costs the city \$13 billion every year. By 2030 nearly a million more residents, 750,000 new jobs and millions more tourists are expected in New York, and it is estimated that 'rush hour' congestion on roads could extend to 12 hours every day. With this bleak outlook, the New York Mayor Michael Bloomberg released the PlaNYC initiative in April 2007, with transportation one of five key elements.

Building the new transit identified in the initiative, and achieving a full state of good repair of existing infrastructure, will require spending of over \$50 billion. Some \$13 billion has already been committed, and over \$6 billion is expected from Federal sources, so the region must raise \$31 billion between now and 2030. In partnership with the State, New York city is working to create the Sustainable Mobility and Regional Transportation (SMART) Financing Authority. The Authority's mandate will be to provide the funding necessary to complete the transportation projects.

PLaNYC proposed piloting a congestion pricing system for three years as a means of reducing traffic and raising funds for the SMART Financing Authority. In July 2007 the State Legislature passed legislation creating the Traffic Congestion Mitigation Commission, which ultimately recommended that congestion pricing be implemented. Whilst New York City approved the plan, the State Legislature refused to vote on legislation approving congestion pricing, and it will not proceed. It was estimated that congestion pricing would raise \$491 million a year for transit investment, and its lack of implementation has created significant funding difficulties for the development of the rest of the PlaNYC transport projects.<sup>42</sup>

PLaNYC identified 11 major capital projects, including new commuter rail access to Manhattan, and expanded transit access to underserved areas. However, the funding gap for these projects alone is nearly \$21 billion. Five new Bus Rapid Transit routes are planned to be opened by 2011, and congestion management plans are being developed for the outer city growth corridors. In 2007 the City designed and installed 60 miles of bicycle lanes, with another 80 miles planned for 2008. 800 bicycle racks were installed in 2007, with another 400 due this year. Proposed Development Control Plans will require new buildings to provide bike parking.<sup>43</sup>

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<sup>42</sup> New York City, *PlanNYC Progress Report 2008*. 22 April 2008.

<sup>43</sup> New York City, *PLAN NYC, A Greener, Greater New York*. 2007

## 8.0 VANCOUVER

Vancouver is the largest city in the province of British Columbia, on the SW coast of Canada. Although Vancouver's population is only around half that of Sydney, it is similar in area and its location on the Strait of Georgia gives it a similar geography to Sydney's harbour.

### *Governance*

Similar to Australia, Canada has federal, provincial and local governments. Unlike in Australia, in Canada, the Federal Government provides some of the funding for public transport. Canada is divided into 10 provinces and 3 territories. Each province is divided into municipalities. In British Columbia, partnerships of municipalities have been formed from whom municipalities contract certain services. Metropolitan Vancouver is one of these partnerships, and is governed by a 35 member board made up of councillors from its constituent municipalities<sup>44</sup>. The City of Vancouver is one of the municipalities which makes up Metropolitan Vancouver. The City of Vancouver has a population of almost 600,000 out of a total metropolitan population of 2.1 million<sup>45</sup>.

In 1998 the British Columbia Assembly passed an Act to create a new public body to take over responsibility for public transport provision and the network of major roads from the regional partnerships. This body was the Greater Vancouver Transportation Authority, called [Translink](#). Since 2007, the remit of Translink has been extended beyond the boundaries of Metropolitan Vancouver. The nine member board of Translink is appointed by Metropolitan Vancouver. There is also a Regional Transportation Commissioner whose role is to approve fare increases which are above inflation, and Translink's plans for annual customer satisfaction surveys, its customer complaint process and any proposed sale of major assets. The Commissioner is also appointed by Metropolitan Vancouver.

### *Public Transport Provision*

Public Transport in Metropolitan Vancouver is operated by a combination of Translink's subsidiaries, and other contracted operators. The Coast Mountain Bus Company, Skytrain and the West Coast express are all subsidiaries of Translink.

The [Coast Mountain Bus Company](#) is the main bus operator in Metropolitan Vancouver, operating 96% of the region's bus service. It operates conventional buses, trolley buses, and community shuttle (mini buses). It operates a total of 195 bus routes and carries 600,000 passengers each day.

The British Columbia Rapid Transit Company operates Vancouver's [Skytrain](#). The Skytrain was built for the World Expo in 1986 and is a rapid transit system which operates on elevated lines, hence its name. It currently has two lines with 50km of track and 33 stations,

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<sup>44</sup> Metropolitan Vancouver. *Taking care of our region, every day*. 2003. <http://www.gvrd.bc.ca/about/pdfs/TakingCareofRegion.pdf>

<sup>45</sup> Metropolitan Vancouver. *2006 Census – Population and Dwelling Counts*. March 2007. [http://www.gvrd.bc.ca/growth/pdfs/Census2006\\_PopandDwel\\_Bulletin\\_1.pdf](http://www.gvrd.bc.ca/growth/pdfs/Census2006_PopandDwel_Bulletin_1.pdf)

which link the City of Vancouver with suburbs to the South East.

A third line which will be similar to the Skytrain is due to be completed in November 2009 and will run South from the CBD to Vancouver International Airport. When complete it will add an additional 19km of track to the system. A private company, InTransit BC was awarded the contract to design, build, construct, operate and partially fund the Canada Line. The Federal and Provincial Governments, TransLink, the Vancouver International Airport Authority and the City of Vancouver are providing the remainder of the funding for the new line. Plans for an additional fourth line have also been approved by the Provincial Government and Translink.

The [West Coast Express](#) operates Vancouver's commuter rail service. There is one line which runs East from Waterfront Station in the CBD for 65 km with 7 stops to terminate in Mission. The line runs at peak commuter times, with five trains westbound towards the city in the mornings, and five trains eastbound in the evenings. At weekends a coach service operates along the same route.

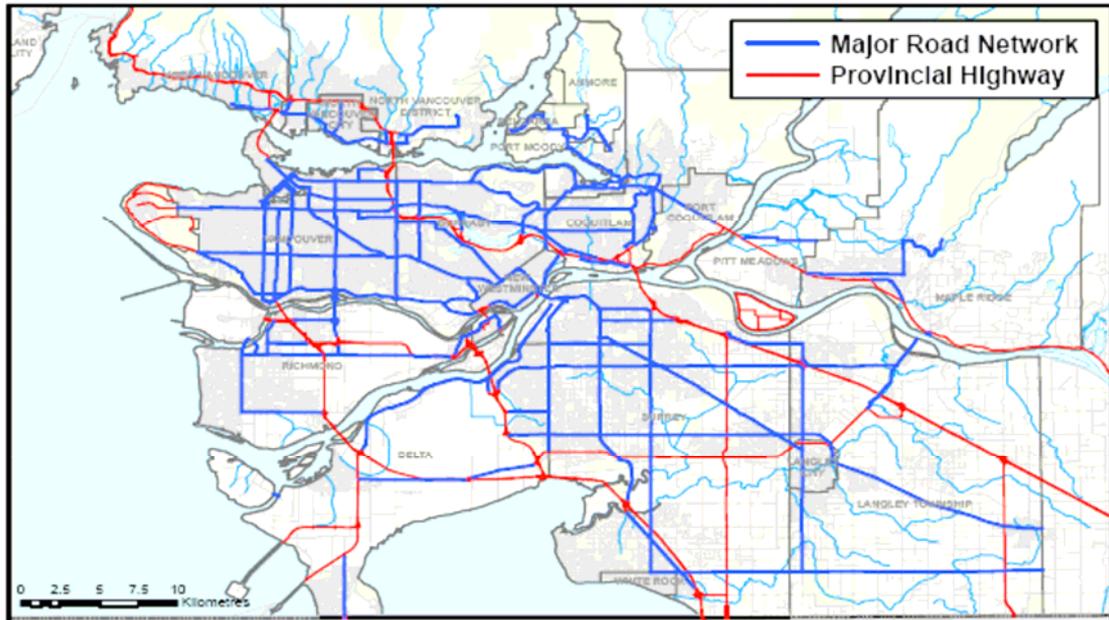
The Coast Mountain Bus Company also operates the SeaBus passenger ferry service, which runs two catamaran ferries, seating up to 400 passengers at a time. Seabus carries 17,000 passengers on an average weekday. In 2006, SeaBus had 5.2 million passengers.

Translink contracts West Vancouver Municipal Council to operate the Blue Bus system, which provides bus services to most areas of West Vancouver and parts of North Vancouver. In 2006, 7.8 million passengers used West Vancouver Transit services. In addition, private companies operate Community Shuttle buses which provided services to 1 million passengers in 2006. Translink also contracts out the HandyDART public transit service, which is designed for passengers who are unable to use public transit without assistance. In 2006, 1.2 million passengers used HandyDart services.

### ***Road Network and Private Transport***

Translink was the first transport authority in Canada to have responsibility for both roads and public transport. The road network in Metropolitan Vancouver is based around 2,300 km of major arterial roads, which carry most of the regions traffic, and three major bridges. Unlike in many other cities, the road network in Vancouver is not based on roads radiating out from the centre, but on a grid pattern, as shown in Figure 2.

**Figure 2: Major Road Network of Vancouver**



Source: Translink, *The Greater Vancouver Transportation Plan*, 2006. [http://www.translink.bc.ca/files/pdf/plan\\_proj/07\\_Trans\\_Plan.pdf](http://www.translink.bc.ca/files/pdf/plan_proj/07_Trans_Plan.pdf)

Table 6 shows some statistics about travel in Vancouver and the Metropolitan region based on data from 2004.

**Table 6: Share of selected transport modes in Vancouver 2004**

	City of Vancouver (% of trips in a 24 hr period)	Metropolitan Region of Vancouver (including City) (% trips in 24hr period)
Car (driver and passenger)	64	78
Public transport	17	9
Bike	3	2
Walk	17	11

Source: City of Vancouver, *Vancouver Transportation Plan, Progress Report*. 2006. <http://vancouver.ca/ctyclerk/cclerk/20060530/documents/rr1a.pdf>

**Transport planning**

At the regional level, Metropolitan Vancouver’s long-term transport plans are currently being revised. Translink is consulting on a longer term strategy to replace this plan entitled [Transport 2040](#). A public consultation on the plan has been held, and Translink intends to produce its proposals for further consultation during the course of 2008.

Legislation<sup>46</sup> passed in 2007 required Translink to produce 10-year transport plans from

<sup>46</sup> Greater Vancouver Transportation Authority Amendment Act 2007

January 2009, replacing the previous statutory requirement for 3 year transport plans. Translink is preparing a 10 year plan for the 2009-18 period.

Beneath the long-term transport planning for Metropolitan Vancouver are 5 sub-regional transport plans. The City of Vancouver Transport Plan was published in 1997. The plan set out 76 separate transport initiatives. These initiatives included:

- Incorporating a travel pass for students with their college fees;
- Introducing priority measures for buses and bikes;
- Improving facilities for cyclists: bike lanes, bike facilities on Skytrain;
- A partnership with JC Decaux to replace street furniture (bus shelters, benches, litter bins, bike racks) in return for advertising space;
- Improvements to the downtown road network in conjunction with Translink e.g. left turn bays, improved pedestrian crossings.

A progress report published in 2006 found that while there had been a 23% increase in trips to the City of Vancouver from 1997-2006, the number of vehicles entering and leaving the city had decreased by 10% over the same period.<sup>47</sup> The progress report found that the plan had been largely implemented. Fifty initiatives had been completed, and work had begun on the remaining twenty six. Of the uncompleted initiatives, 24 were due to complete by 2008, and the remaining two by 2012. The city now plans to develop a new plan to tie in with the longer term plans being prepared by Translink at the regional level.

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<sup>47</sup> City of Vancouver. *Vancouver Transportation Plan – Progress Report*. 2006. <http://vancouver.ca/ctyclerk/cclerk/20060530/documents/rr1a.pdf>

## 9.0 SYDNEY

The Ministry of Transport was established in 2003 and is the lead public transport agency of the NSW Government. The Ministry is responsible for providing policy advice and managing a budget allocation of \$3 billion to support rail, bus, ferry and taxi services in NSW. The Ministry of Transport also has a key regulatory role in the bus, taxi, hire car and tourist vehicle industries, along with the management of bus and ferry contracts.

In 2005 Sydney residents made 15.7 million trips each weekday, and 13.7 million trips each weekend. Sydney residents travelled a total of 147 million km. Trips for social and recreational purposes comprised the highest proportion of total trips on weekdays (22.9%), whilst in terms of distance, commute trips to and from work were the most significant accounting for a quarter of total kilometres travelled. The car accounted for 69.4% of all trips, either as driver or as passenger. Buses accounted for 5.6% of trips, trains 4.8% and other modes 2.3%.

Since 1999, Sydney vehicle kilometres travelled (VKT) has, apart from a small period between 2000 – 2001, increased faster than population growth. However, this has reversed, with VKT declining between 2004-05 and below population growth rates. This is consistent with Gross State Product, which grew strongly in 2002 followed by a slower growth rate.<sup>48</sup>

### Public Transport

RailCorp, a statutory State Owned Corporation, provides metropolitan passenger rail services via CityRail and long distance services via CountryLink. Key facts about CityRail include:

- 281 million passenger journeys in 2006-07;
- 900,000 passenger journeys on a typical weekday;
- 53% market share of journey to work trips in the CBD;
- 3,236 km of track, 300 stations and 1531 electric cars with 746 new cars on order;
- Cost per passenger journey \$8.45, with customer revenue per passenger journey \$2.01.

### State Transit

Since October 2005, metropolitan bus operators have been operating under service contracts with the Ministry which provide consistent fares, concessions and service standards for passengers on both public and privately run bus services. There are 15 regions across metropolitan Sydney. The State Owned Corporation State Transit has four contracts for the Sydney region covering Regions 6, 7, 8 and 9. These contracts commenced on 1 July 2005 for a term of seven years.

Under the contracts, each Region stands alone with State Transit paying fare revenue, a proportion of advertising (25%) and charter revenue (5.5%) for each region to the Ministry of Transport. The Ministry of Transport makes monthly payments to State Transit

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<sup>48</sup> Ministry of Transport, Transport Data Centre, *2005 Household Travel Survey. Summary Report, 2007 Release*. August 2007.

representing fixed costs, depreciation change payment, fuel cost payment, service payment, patronage benchmark, patronage change and new fleet periodic payments.

The State Transit Authority operates Sydney Buses, including over 300 bus routes in the Sydney metropolitan area extending to Parramatta in the west. It also operates the bus transit ways in Western Sydney. Key statistics about Sydney Buses include:

- 187 million passenger journeys in 2006-07, up by more than 1 million trips on the previous year;
- each weekday over 15,000 services transport over 600,000 people;
- fleet of 1,978 buses.

State Transit observes that traffic conditions in Sydney are a major challenge to the reliability of bus services, and that traffic congestion in Sydney CBD and on major arterial roads such as Victoria Road, Epping Road and Military Road affect the on-time running performance of Sydney Buses' services.

Net payment received from the NSW Government, including those under the Metropolitan and Outer Metropolitan Bus System Contracts in 2006/07 was \$264.8M, State Transit's operating result for the financial year ending 30 June 2007 was a profit of \$32.7M.

The NSW Government has committed \$335 million to improving bus priority on Strategic Bus Corridors. Both infrastructure and technological solutions will be used to improve the average bus speed on strategic corridors. Technology options include the Sydney-wide implementation of the Road and Traffic Authority's Public Transport Information and Priority System (PTIPS). PTIPS uses satellite technology to identify late running buses and communicates with the RTA's traffic management system to direct traffic signal priority to late running buses.

### **The Roads and Traffic Authority**

The Roads and Traffic Authority (RTA) is a NSW statutory authority responsible for managing the road network. The RTA manages 17,912 km of State roads.

On the seven major routes to and from the Sydney CBD, the average speed in 2006-07 was 30 km/h for the AM peak and 41 km/h for the PM peak. Traffic volumes on the major routes have increased by around 44.6% during the past 16 years, whilst the RTA reports that the trend in average speeds has remained relatively consistent.<sup>49</sup> However, a Sydney newspaper reports that out of Sydney's seven major commuting routes evaluated last year by RTA engineers, travel times had deteriorated on six over the past decade. Drivers using Victoria Rd to get to the city, measured from Parramatta to King St, took 64 minutes in the morning peak during 2006-07. In the evening the journey took 45 minutes. When the study was done in 1997-98 the morning journey took 58 minutes and the evening 33. Even drivers paying \$86 a week in tolls on the M2/Lane Cove Tunnel route spent 13 minutes longer each day (four minutes in the morning and nine in the evening driving last year compared with 1997-98.<sup>50</sup>

<sup>49</sup> Roads and Traffic Authority, *Annual Report 2007*, at 40.

<sup>50</sup> 'Crawling, not commuting' in *The Daily Telegraph*, 5 May 2008.

The Government has identified 43 strategic bus corridors across the Sydney metropolitan area, and work has begun to improve average bus travel times and reliability through the introduction of bus priority measures. These measures include bus lanes, transit lanes, priority traffic signals and bus bays along major bus corridors. In 2006-07 there were 98 kilometres of bus lanes. A Public Transport Information and Priority System has been developed, which improves bus reliability by giving late running buses traffic signal priority. When fully deployed, more than 4000 metropolitan buses will be fitted with satellite tracking devices. More than 6500 bus routes, 100,000 timing points and 3,500 traffic signals will be monitored. Approximately 1,800 State Transport Authority buses are to be fitted with the technology by July 2009, and the intention is to bring the private bus fleet into the system between 2009 and 2011.<sup>51</sup>

### **The Public Transport Ticketing Corporation**

A transport 'smartcard' was first announced by the NSW Government in 1996. The Tcard, to provide integrated ticketing systems for Sydney's public transport, was first intended to be in place for the Sydney 2000 Olympics. In February 2003 the NSW Government entered into a contract with Integrated Transit Solutions Limited, a wholly-owned subsidiary of the ERG Group, for the development and operation of Tcard. The management of this contract has been assigned to the Public Transport Ticketing Corporation (PTTC). The PTTC was formed through enabling legislation which took effect from 1 July 2006. Prior to the PTTC's establishment, the Tcard project was the responsibility of the Transport Administration Corporation (TAC), an arm of the NSW Ministry of Transport.

However, after lengthy delays on delivering the Tcard, the Public Transport Ticketing Corporation issued a notice of intention to terminate the Tcard project agreement on 5 November 2007. The issue is now being contested in the Supreme Court of NSW.

### **Transport Planning in Sydney**

There have been many government and independent reviews of transport planning in Sydney over the last ten years or so. For example, the Office of the Coordinator General of Rail released the Long Term Strategic Plan for Rail in 2001. The Plan noted that inner city lines will all reach saturation within the next ten years (or so). There will be a need for a new, alternative route through the CBD from Eveleigh / Redfern to St Leonards in the medium term, most likely by between 2011 and 2015. The Strategic Plan noted:

This project is regarded as being of the highest priority. Without it, the metropolitan rail system will face strangulation and progressive operational collapse – and solutions if this occurs will all have very long lead times, of up to ten years or more....

If rail patronage grows as expected, and even if it grows much more slowly than expected, there is now no time to spare. Because of the complexity of almost all aspects of the project, it is essential to start serious planning for this new line immediately.<sup>52</sup>

<sup>51</sup> NSWPD. Public Transport and Information and Priority System. Hon John Watkins MP. Page 3253, 24 October 2007.

<sup>52</sup> Office of the Coordinator General of Rail, *Long-term Strategic Plan for Rail. Greater Sydney metropolitan region. Overview Report*. June 2001 at 51.

### Government Transport Planning

The State Government has in recent years developed a number of plans and strategies that collectively form the State's Transport Planning Framework. Of significance are the following:

- **State Plan, A New Direction for New South Wales** (November 2006) - Defines future strategies and priorities for the public sector. The State Plan includes priorities that the transport agencies will need to address;
- **The New South Wales State Infrastructure Strategy** (2006) – Links the four year capital budget contained in the Infrastructure Statement (NSW Government Budget Paper Number 4) with longer term planning strategies. Infrastructure investment is a key driver to achieving transport outcomes within the State Plan;
- **Premier's Urban Transport Statement** (November 2006) - The Statement outlines the Government's response to Sydney's transport challenge, and includes initiatives to increase the availability and reliability of public transport across the Sydney region. The Urban Transport Statement facilitates the implementation of key transport priorities identified in the State Plan;
- **Metropolitan Strategy, City of Cities – A Plan for Sydney's Future** (December 2005) – Transport is a critical element of this strategy which aims to provide a broad framework for the sustainable growth and development of Sydney over the next 25 years.

The State Plan defined future strategies and priorities that transport agencies will need to address. These included:

- Increasing the share of trips made by public transport to and from the Sydney CBD during peak hours to 75 per cent (72.8 per cent in 2005) by 2016;
- Increasing the proportion of total journeys to work by public transport in the Sydney metropolitan region to 25 per cent by 2016 (22 per cent in 2005);
- Consistently meeting public transport reliability targets including 92 per cent on-time running for CityRail, 95 per cent for Sydney buses and 99.5 per cent for Sydney ferries;
- Reducing road fatalities to 0.7 per 100 million vehicle kilometres travelled by 2016.

Also in November 2006 the Government released the Urban Transport Statement. The Statement defined 18 major transport corridors which account for more than two thirds of daily trips made in Sydney. The Statement rejected the idea of light rail within the main routes of the CBD, whilst promoting the use of buses. In particular, the Statement accelerated parts of the Metropolitan Rail Expansion Program.

The Metropolitan Rail Expansion Program was a 50km expansion of Sydney's rail network into the growing areas of the north west and south west. In the south west it would extend services from Glenfield to Leppington. The extension in the north west would build on the new Chatswood to Epping rail line to Castle Hill and Rouse Hill. The Urban Transport Statement brought forward the staging of the North West Rail Link to deliver rail services to the Hills Centre by 2015 instead of 2017 as scheduled.

The strategic objectives of the north west rail link were:

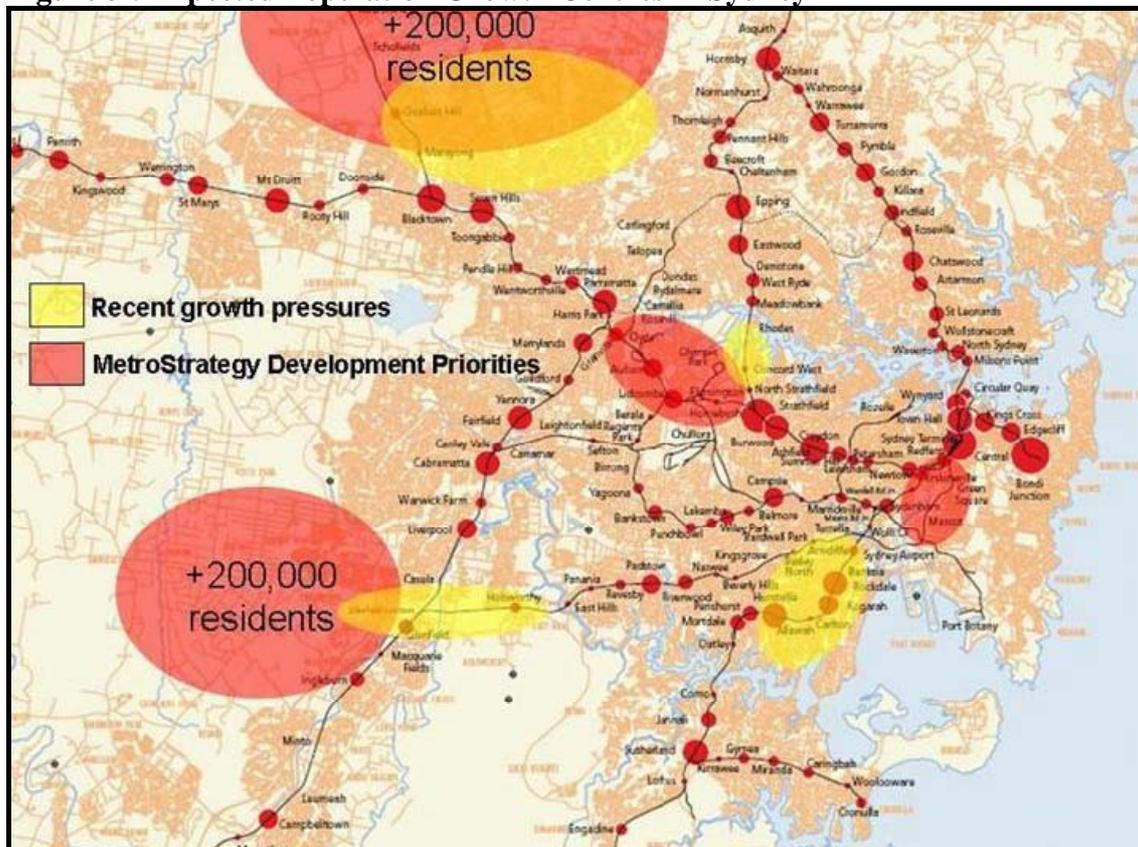
Enhancing public transport along an established and growing corridor of travel demand by:

- Directly linking the North West region and ‘Global arc’ centres of Sydney, including the Sydney CBD;
- Increasing access to the rail network across Sydney; and
- Provide rail network congestion relief on the Richmond Line and the Western Line including relieving overcrowding on trains.

### Population and employment growth in North West Sydney

North West Sydney is experiencing significant population and employment growth. The Metropolitan Strategy indicated that by 2031, the population of North West Sydney will be 475,000, three times the 1981 population of 150,000. Eighteen percent of Sydney’s anticipated residential growth is expected to occur in North West Sydney. Employment is expected to increase by 350% to 129,000. Figure 3 shows the recent and expected population growth pressures in both the North West and South West Growth Centres.

**Figure 3 : Expected Population Growth Centres in Sydney**



A significant reason for the north west rail link was the direct linking of population centres with employment centres. Major employment destinations for residents from north west Sydney include Macquarie Park (North Ryde), Chatswood, St. Leonards, North Sydney, the Sydney CBD and the commercial area around Sydney Airport. Employment in the ‘global arc’ (based on the statistical local areas from Ryde to Sydney CBD) is forecast to grow by 21%, from 486,000 jobs in 2001 to 590,000 jobs in 2031.<sup>53</sup>

The Urban Transport Statement discussed the possibility of introducing a metro style rail system to Sydney. Noting that the Rail Expansion Program would fast track services to the North West, the Statement identified that new Metro services would be best suited either to high demand inner areas, such as eastern and inner west suburbs, or major western centres (Penrith, Blacktown and Parramatta), and linking these with each other and the CBD.

However, some 16 months after deciding to fast track the north west rail link, the Government announced that it would not proceed with it. Instead, services to the north west are to be served by a new \$12 billion metro style train system. Announced as part of the launch of SydneyLink, the North West Metro will run from Rouse Hill to Norwest, Castle Hill, Epping, Top Ryde, Gladesville, Drummoyne, Pyrmont, Wynyard, Martin Place and St James in the CBD. The service from Epping to the Hills Centre will be operational by 2015, and the entire line by 2017. Proposed travel time to the city is 42 minutes from Rouse Hill and 20 minutes from Epping. The Government stated that the next priority is a Parramatta to CBD Metro. Other components of SydneyLink were the previously announced South West Rail Link and an extension of the M4 motorway.

The North West Metro will provide benefits for rail users by reducing crowding on the existing Western, Richmond, Main North and North Shore rail lines. The new Metro will provide an additional corridor into the CBD for residents of the North West, and because of this the Government stated that it defers the need for a second rail harbour crossing – the construction of which was announced in the Rail Expansion Program.

The announcement of the north west metro attracted considerable attention. The NSW Chapter of the Planning Institute of Australia was supportive of some elements but considered the Epping to Rouse Hill leg should be retained as heavy rail. The Institute stated:

- The alignment and metro rail technology on the higher density leg between the Sydney CBD and Epping or West Ryde via Victoria Road is supported. This segment of the alignment as a bus replacement railway will be a strong mass transit link to the CBD;
- The Epping to Rouse Hill leg should be retained as a heavy rail corridor that is part of the CityRail network connecting to the soon to be opened Epping Chatswood Rail Link. This will provide a strong direct rail link between the North Western parts of Sydney and major employment locations on the northern side of Sydney Harbour, such as Macquarie Park Corridor, Chatswood, St Leonards and North Sydney;
- Both components should be built within the next 10 years to support population growth, changes in land use activity and provide a viable rail based transport alternative;
- PIA believes that a heavy rail North West Rail Link should be supported by the South West Rail Link and a CBD through line identified in the Metropolitan Rail Expansion Program (MREP). The MREP rail proposals strongly support the Metropolitan Strategy of the Department of Planning where a strategic integration program was established between landuse and transport planning;

- PIA notes that the announcement of the North West Metro and its connectivity with Victoria Road overturns years of careful planning by the State Government to integrate landuse and transport planning for Sydney's global city corridor from Epping to the Airport via Chatswood, North Sydney, the Sydney CBD and the growing areas served by the Airport Line;
- PIA encourages the NSW Government to provide a comprehensive plan to industry and the community of the long-term aspirations of a metro network for Sydney and its integration with other transport modes. Potential catchments include the Parramatta Road corridor, Victoria Road corridor, Military Road corridor, Anzac Parade corridor and potentially a Northern Beaches corridor between Chatswood and Dee Why.<sup>54</sup>

In response to some of these concerns the Minister for Transport John Watkins MP stated that commuters on the North West Metro can access the 'global employment arc' by changing at Epping or the CBD onto the CityRail system.<sup>55</sup> However, there are serious concerns that the interchange and CityRail services at Epping may not be able to cope with the expected number of people wishing to change from the metro to City Rail services.

The investment and expansion of transit services in Sydney is occurring at the same time as public transport is experiencing large increases in passengers numbers, reportedly due to the escalating price of petrol. Sales of unleaded petrol fell by 4.4% in the first three months of 2008, whilst morning peak hour numbers on CityRail and bus services have increased dramatically.<sup>56</sup>

## 10.0 CONCLUSION

Cities world wide are facing similar transport problems. Congested roads, overcrowding on public transport and lack of capital to fund major infrastructure projects are commonplace. There are only a few major cities that have managed to reduce car use. Transport planners have demonstrated that in order to make a city's transport more sustainable, a 'carrot and stick' approach is needed to encourage people to use public transport and reduce their use of the car. It is also evident that successful public transit systems have seamless integrated ticketing, usually with some form of a 'smartcard'. In these systems, fare levels are simplified, and passengers have easy access to public transport information. Finally, many world class cities have an over-arching board or organisation, often with independent experts, that is responsible for the coordination of all transport – both road planning and public transit. For instance, the Metropolitan Transport Authority in New York is governed by a 17 member Board, with appointments made by a variety of government levels and participation with community representatives. Vancouver has a nine member board, which has responsibility for public transport provision and the road network.

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<sup>54</sup> Planning Institute of Australia, NSW Division, *PIA Position Statement On Sydneylink Proposal* April 2008.

<sup>55</sup> "Metro throws Sydney' big plan on its head' in *The Sydney Morning Herald*, 7 May 2008.

<sup>56</sup> "Petrol crisis fuels bus, train crush." In *The Sydney Morning Herald*, 30 May 2008.

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