



NSW LONG TERM TRANSPORT MASTER PLAN

December 2012



A blurred high-speed train in motion, with a purple semi-transparent overlay on the left side of the page. The train is white with orange doors and is moving from left to right.

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Transport for NSW

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MINISTERS' MESSAGE

Over the past 12 months, we have embarked on the most extensive integrated transport planning process ever undertaken in NSW. In November 2011 the NSW Government announced we would spend the next year consulting and undertaking detailed analysis to develop a comprehensive transport plan for all of NSW.

We are proud to present the final NSW Long Term Transport Master Plan.

This Transport Master Plan is the first integrated transport strategy we have had in NSW. It brings together land use planning with transport planning, and it integrates planning for freight and passenger movements, as well as all modes of transport. It includes actions for road, rail, bus, ferries, light rail, cycling and walking.

The opportunities and challenges we face over the next 20 years are exciting but also demanding. For NSW to reach its potential, we need a transport system that focuses on the customer.

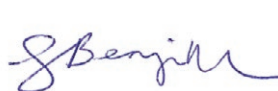
As our collective transport needs increase and become more complex, we need a transport system that responds to those needs by enabling us to move seamlessly across transport modes when and where we need to, and that also allows freight to move efficiently.

The NSW Long Term Transport Master Plan sets the path that will deliver the transport system we need, with a strong focus on customer needs, integration, modernisation and meeting projected growth. It sets the clear direction we need to take to make the most of our future potential in NSW.

With the Master Plan in place we can continue to focus on implementation, building on the many achievements we have already made over the past 18 months, knowing that each measure we put in place is another step towards the world-class transport system NSW deserves.

On behalf of the NSW Government, we thank the countless people in the community and transport industry who have taken the time to contribute to this planning process.

We look forward to working with you as we continue to improve and develop the NSW transport system.



Gladys Berejiklian
Minister for Transport



Duncan Gay
Minister for Roads
and Ports



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INTRODUCTION

A Long Term Transport Master Plan for NSW

The NSW Long Term Transport Master Plan sets the framework for the NSW Government to deliver an integrated, modern transport system that puts the customer first.



The Master Plan plays two fundamental roles.

First, it identifies the challenges that the transport system in NSW needs to address to support the State's economic and social performance over the next 20 years. It guides decision-makers to prioritise actions which address the most pressing challenges.

Second, it identifies a planned and coordinated set of actions (reforms, service improvements and investments) to address those challenges. It provides a map of future service and infrastructure developments which future decisions will be required to support, and against which proposed investments can be evaluated.

The NSW Long Term Transport Master Plan will guide the NSW Government's transport funding priorities over the next 20 years, providing the overall framework for how our transport system develops, whether it is the services that are delivered or the infrastructure that underpins them.

The Transport Master Plan is not intended to be a detailed step by step plan for all transport initiatives. Rather, it is an overarching framework that guides subsequent and more detailed transport plans, policy decisions, reforms and funding decisions. A series of funding decisions and timings are given for the near term. For the medium and longer term, decisions around timing and funding will be determined by changing levels of demand and the level of availability of funds. There will be a myriad of issues and changes arising in NSW over the next 20 years, given the complexity and scale of transport in the state, which will also inform decision making.

The Master Plan provides the evidence, the challenges and the right priorities to guide the many investment and service delivery decisions that will need to be made in the future. It sets the strategy and the direction required to deliver the customer-focused, integrated transport system that NSW needs.

The Master Plan will guide billions of dollars of investment in our transport system

In 2012-13 the NSW Government allocated a record \$13.2 billion in funding to transport, with a total of more than \$53 billion allocated for the first four years of the Master Plan. Over the 20 year life of the Master Plan this level of funding would equate to around \$260 billion delivering transport services and infrastructure across the State. This will fund operation and maintenance as well as expansion and modernisation with new capital infrastructure.

This investment is both a significant opportunity and a significant responsibility. An investment of this scale needs to be guided by a clear long term plan.

The Master Plan sets the framework and the overall priorities to guide where we invest these funds. Individual proposals and initiatives, whether they be new capital projects to construct new lines or stations, or proposals to expand transport services into new areas, will be tested against the strategic direction of the Master Plan, giving us confidence as a community that our funds are taking us towards the transport system we need.

The Master Planning process – our approach

The NSW Long Term Transport Master Plan is both strongly evidence-based and the result of a highly consultative process.

Within Transport for NSW, a significant level of evidence gathering and analysis has been undertaken. This underpins the identification of the challenges we face and the actions identified in the Master Plan.

Having first set the objectives, outlined on page 22, we analysed current and future demands and challenges on the NSW network, making sure that the challenges and their true causes were properly understood. We then identified the potential options to meet those challenges.

We considered all travel modes simultaneously and examined land use and transport together. We developed integrated packages of projects, regulations, pricing and other policy initiatives, then used rigorous modelling and assessment to prioritise actions against our objectives.



How you helped – the consultation process

In developing the NSW Long Term Transport Master Plan, we have implemented a fresh approach to planning that has involved unprecedented consultation with those who know the system intimately because they use it every day – our customers.

Our consultation approach was broad, inviting and encouraging a diverse and large number of voices to tell us what the transport system should be like. Anyone interested in improving transport in NSW was encouraged to participate, whether a commuter or a truck driver, an industry representative, a business person or local government representative.

We designed focused stakeholder forums to make sure transport experts in industry, community groups, academia and local government had their say.

This approach to consultation included submissions through email and our website; Advisory Groups covering the full range of customers; government; industry and other interests; 14 regional forums across the State between February and May 2012, involving over 1,000 participants; ongoing stakeholder meetings; over 1,700 submissions on the Discussion Paper and the Draft Plan; and over 65,000 hits on the dedicated website.

Our customers gave us rich and detailed insight into what is important in their city, region and across the State.

The result is a Master Plan that responds to the community’s needs. Using the analysis and evidence we have gathered and applying the customer view gained through this extensive consultation, we have developed a Transport Master Plan which will deliver the transport system we need for the future.



What's in the Master Plan?

The Master Plan is principally focused on the six key transport challenges that emerged from our analysis and our engagement with our customers. These six challenges have been identified by looking at the transport system from the perspective of the customer, the multi-modal journeys we make within and between places:

- Integrating modes to meet customer needs
- Getting Sydney moving again
- Sustaining growth in Greater Sydney
- Providing essential access to regional NSW
- Supporting efficient and productive freight
- Statewide actions.

The Master Plan responds to these challenges through four types of action:

- Integrate transport services
- Modernise our system
- Grow our networks to meet future demand (including the important tasks of corridor preservation)
- Maintain important road and public transport assets.

It also requires properly sequenced delivery to maximise the benefits from any investments made.

The Master Plan includes 220 short, medium and long term actions that are focused on our commitment to make NSW number one and transform our transport system over the next 20 years.

These actions will deliver very real benefits for customers of the NSW transport system.

- 1. A fully integrated transport system**, where customers move seamlessly across modes and between services, supported by the Opal ticketing system
- 2. A modern railway system – *Sydney's Rail Future*** – to reform, improve and grow services on our rail network, leading to an overall capacity increase of 60 percent
- 3. A modern light rail system – *Sydney's Light Rail Future*** – expanding the public transport network to address CBD congestion and provide reliable turn up and go services for city commuters
- 4. A modern bus system** that meets changing needs, particularly in growth areas, and complements the heavy and light rail networks
- 5. A connected motorway network in Sydney**, beginning with WestConnex, which will provide a step change in Sydney's connectivity, then the F3(M1)/M2 link, and then the F6(M1), alongside **significant investments in arterial roads** throughout regional NSW
- 6. Unclogging the Sydney CBD** to create a new level of amenity, by removing the monorail, building the Wynyard Walk, introducing more light rail, undertaking a major redesign of the bus network, increasing ferry use, providing more capacity on the rail system and better walking and cycling infrastructure
- 7. Supporting the growth of new economic centres** through investments in the North West Rail Link and the South West Rail Link, new roads in growth corridors, and new bus infrastructure
- 8. Connecting regional communities** through major highway upgrades, improved NSW Trains services including better connections with bus services, more community transport services, and protecting regional flights to Sydney Airport

- 9. **Improving freight efficiency and productivity** through major investments and efficiencies in the road and rail freight networks and at ports, airports and intermodal terminals, and through the Bridges for the Bush program to improve regional connectivity
- 10. **Improve access to international gateways,** addressing road access pinch points around Port Botany and Sydney Airport and improving public transport access to the airport, through better rail and bus services and WestConnex serving the whole Port Botany and Sydney Airport precinct
- 11. **Boost walking and cycling and support its integration with public transport,** including extensions and improvements to the State’s walking and cycling networks, better storage facilities and signs, and new interchanges that are attractive activity hubs for local communities
- 12. **Preserve future transport corridors** to ensure that as demand increases the transport networks can be expanded, covering 19 corridors in Greater Sydney and others across regional NSW, including a possible Outer Sydney Orbital route (the M9), the Bells Line of Road (B59) serving the Central West, the Maldon-Dombarton rail line, as well as a potential north-south high speed rail corridor.

The NSW Government is taking action now

The NSW Government has already allocated over \$53 million in recurrent and capital funding to deliver the first four years of the Master Plan. This means that over the next four years we will design, plan, invest and build many projects and initiatives that make a difference to customers across the State.

We have already identified and made significant progress on important major projects and initiatives across the State:

The **South West Rail Link** is under construction and the **North West Rail Link** is in the third major stage of the contract process. These projects will expand the heavy rail system in Sydney to serve the South West and North West Growth Centres and better connect people in these areas to jobs, education and other services. **Track duplication on the Richmond line** is also improving transport services in North West Sydney. **New Waratah trains** are progressively being delivered, enabling the retirement of non air-conditioned trains across the network.

The **Sydney Motorways Project Office** has been established, and planning has commenced on **WestConnex**, Sydney’s next motorway priority.



The **M5 West widening** will expand the motorway from two to three lanes in each direction between Camden Valley Way and King Georges Road. Construction has commenced and will take around two years to complete. This will reduce travel times for motorists using the motorway and surrounding roads and support planned residential and employment growth in South West Sydney. The **M2 motorway is currently being widened** and four new ramps are being built to improve access to and from the motorway. Construction work is expected to be complete in the first half of 2013.

The NSW Government is committed to **upgrading Camden Valley Way** to a four lane divided road between Narellan and Prestons by 2015. Tenders for the 4.4 kilometre stage between south of Denham Court Road and south of Raby Road at Catherine Field have been invited and a construction contract is expected to be awarded later this year. The **Erskine Park Link Road** is under construction and will unlock development potential in the Western Sydney Employment Area.



The **light rail system is being extended** in Sydney's Inner West from Lilyfield to Dulwich Hill. The existing light rail service has been incorporated into the MyZone ticket system.

A number of **additional ferry services** have been introduced to provide better harbour connections for people in Northern and Western Sydney, including an additional 25 weekly services along the Parramatta River. The **new Sydney Ferries operator commenced services** in July this year, five months early, providing better value for money for taxpayers and improved customer service for passengers.

A trial has begun of the **new electronic ticketing system, Opal**, which will make travelling on public transport easier, simpler and more convenient.



The **Southern Sydney Freight line** is under construction and will establish a dedicated rail link between Port Botany and Macarthur. This will allow the movement of freight at any time of day and provide greater efficiency for both commuter and freight services, supporting the development of Port Botany. The planned **Northern Sydney Freight Corridor** is jointly funded by the Australian and NSW Governments. This will improve the capacity and reliability of freight trains on the Main North Line between North Strathfield and Newcastle. Replacement and upgrade of an initial 17 key bridges in regional NSW has been committed through the **Bridges for the Bush** program.

The delivery of transport infrastructure in rural and regional NSW is focused on a number of major highway upgrades, including **upgrades of the Hume, Pacific, Princes, Great Western, and Newell Highways**. These will deliver improved safety and travel times for all road users, better freight efficiency and increased amenity for local communities. Construction is well underway on the \$1.7 billion, 40 kilometre Hunter Expressway due to be completed in 2013. The **Hunter Expressway** involves the construction of a four lane freeway link between the F3 Freeway (M1) near Seahampton, and the New England Highway, west of Branxton. The Expressway will provide a new east-west connection between Newcastle and the Lower Hunter.

The **Pacific Highway** is a high priority for the NSW Government. Upgrade works between Hexham and Port Macquarie are due to be completed in 2012. The Kempsey Bypass will be completed in 2013. The upgrades between Coffs Harbour and Woolgoolga and between Ballina and the Queensland border are due for completion in 2014. Construction of two further major sections between Port Macquarie and Coffs Harbour - Frederickton to Eungai and Nambucca Heads to Urunga - is expected to begin in 2013.

Work is also underway on the **Holbrook Bypass on the Hume Highway**. This is due to be completed in 2013. This is the final project required to complete the Hume Highway upgrade to a minimum four lane divided route between Sydney and Melbourne. The Great Western Highway is being upgraded to four lanes between Emu Plains and Katoomba, with completion expected by the end of 2014.

What happens next?

The Master Plan is as much about planning and investing for the long term as it is about short term action. Therefore we are taking action on our medium and longer term projects too - we have already commenced detailed planning and design on many of these projects, including those for which corridor preservation will be an important early step.

The Master Plan provides the framework for a series of more detailed plans and strategies (see Figure i), including individual Modal Strategies, Sydney Transport Plans, Regional Transport Plans and a *NSW Freight and Ports Strategy*. These more detailed plans will provide a greater level of detail for specific modes or for specific locations. They will directly address local and precinct level issues, and will contain a greater amount of operational detail than is appropriate in the Master Plan.

In doing so, they will also provide more detailed planning for individual projects and policies. For example, *Sydney's Rail Future* and *Sydney's Light Rail Future*, set out more detailed plans for the metropolitan rail and light rail systems, have already been published.

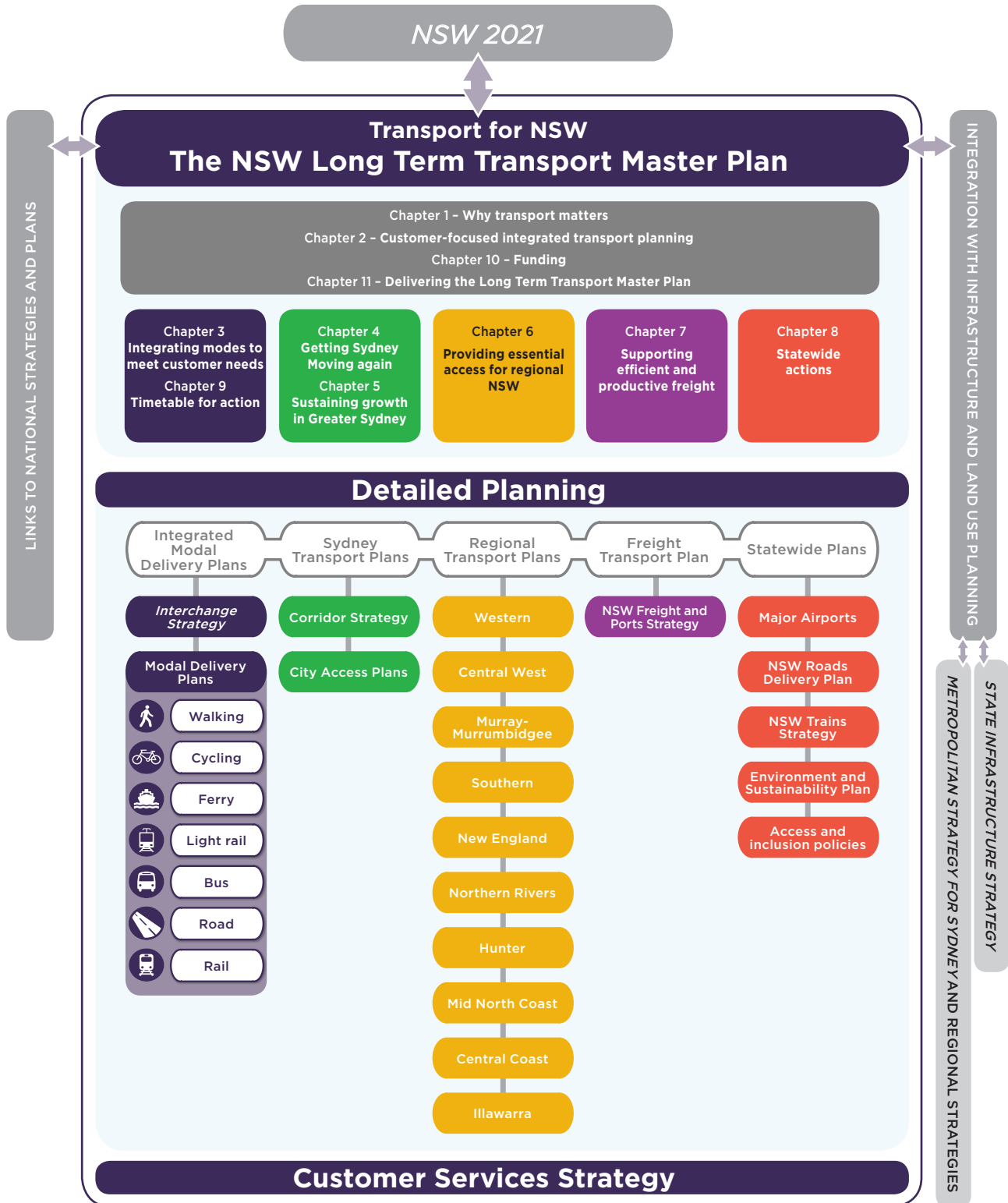
These plans will be closely aligned with the draft *Metropolitan Strategy for Sydney*, which sets the long term direction to 2031 for land use and planning in Sydney. This integration will ensure that transport planning is closely aligned with future growth, that appropriate transport services are provided to meet need, and that best use is made of infrastructure and investment.

Individual transport plans are being developed for the 10 regions across NSW. They will provide a more detailed analysis of local transport needs and priorities of each region and respond to the issues raised during regional consultation.

Regional Transport Plans will be linked to the Regional Strategies developed by the Department of Planning and Infrastructure to ensure that expected growth and changes to each region are considered.

Figure i also highlights the important links between the Master Plan and *NSW 2021*, the *Metropolitan Strategy for Sydney*, the *State Infrastructure Strategy*, and national plans such as *Infrastructure Australia's National Freight Strategy*.

Figure i The Long Term Transport Master Plan and its relationship to other State planning documents



The Long Term Transport Master Plan at a glance

The Long Term Transport Master Plan is organised into 12 chapters.

Chapter One provides a detailed analysis of why the transport system matters to customers and how it impacts the economic, social and environmental goals of the people of NSW. The chapter also sets out eight formal objectives for the NSW transport system, which cover customer service, economic, liveability, social, safety and environmental outcomes.

Chapter Two explains how we have taken a fully integrated and customer-focused approach to developing the Master Plan. It explains how we will continue to use these integrated transport planning principles to guide the more detailed modal and location specific plans that will follow this Master Plan.

Chapters Three to Eight correspond to the six key transport challenges that emerged from our analysis and our engagement with customers. Each chapter starts with comprehensive evidence and analysis which demonstrates the nature and scale of the challenge. The second half each chapter outlines the response to the challenge.

Chapter Three covers the important task of integrating modes to create seamless journeys that meet customers' needs.

Chapters Four, Five and Six consider the specific transport tasks in the different places across NSW where people live: the tasks of getting Sydney moving again; sustaining growth in Greater Sydney; and providing essential access to regional NSW.

Chapter Seven looks at the freight transport network and the need to support efficient and productive freight movement throughout the State.

Chapter Eight assesses a series of statewide actions, including reducing transport inequality, promoting safety and enhancing sustainability.

Chapter Nine provides a summary of actions at a modal level to provide clarity about the future of the different networks within the overall system.

Chapters Ten and Eleven look at the two issues which will influence the successful delivery of the Master Plan. Chapter Ten considers funding and financing issues. Chapter Eleven looks at governance for the successful ongoing delivery of the Master Plan.

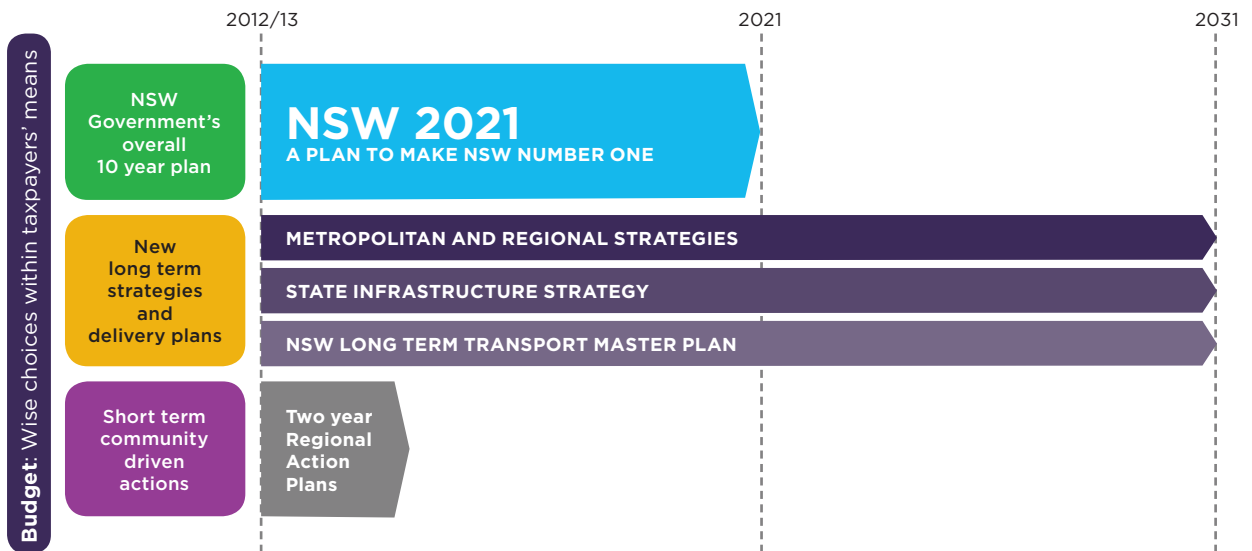
Chapter Twelve provides a detailed guide to the intensive consultation process which underpinned the development of the Master Plan. The chapter describes the process as well as a summary of the results of the consultations.

Integrated strategic planning for NSW

Infrastructure planning and delivery in NSW sits within a framework of NSW Government strategic planning that guides priority action and investment for the long-term benefit of the State.

The principal planning document is NSW 2021, the overarching plan to make NSW number one. Under this, separate sectoral plans guide land use and development, infrastructure, and transport. The Long Term Transport Master Plan is the overarching plan for transport. It will be supported by regional, modal and city access plans (shown in Figure i).

Figure ii Linkages in key NSW strategic plans





1



WHY TRANSPORT MATTERS

CHAPTER SUMMARY

Transport is one of the basic building blocks of modern life, and each time we make a journey or move goods, we become customers of the NSW transport system. Whether we live in the city or live in regional NSW, our mobility supports the lives we lead, how and where we live and work, and the goods and services we consume.

This chapter examines why transport matters to everyone in NSW and what matters most. It describes how transport improvements can benefit our economy, our environment and our community.

As our population grows, we must make sure that our transport system can keep up with growth and meet our changing travel needs. A fully integrated, modern transport system will secure the ongoing success of Sydney as a global city and sustain prosperity across regional NSW. It will help our businesses and industries lift their productivity and remain competitive.

The NSW Government has listened closely to what our transport customers want from the NSW transport system: customers want timely services, reliable connections, comfortable journeys, a genuine choice of travel options and services that respond to where and when they need to travel.

In Sydney, people want a modern transport system that is integrated, meets a range of needs, and supports Sydney's role as an exciting, dynamic and globally connected city.

In our regions, people want more flexible and convenient options, and public transport services that keep pace with growing and changing regional cities, towns, communities and industries.

We need to understand the role that each mode plays in meeting customer needs and how they can be integrated to provide a seamless travel experience. We need to recognise, for example, that buses, motorbikes and bicycles use our road networks as well as cars, and that people may arrive at their train station by car, bus, bike or by foot. True integration will allow people to choose the quickest, easiest and most convenient ways to make their journeys across modes.

Our objectives for the NSW transport system (Section 1.1) reflect the central role transport plays in our lives.

With transport playing such an important role, long term planning for the State's transport system is important for the future of NSW and Australia, and for shaping our cities and towns in the years ahead. We also have to build flexibility into our transport planning to ensure that we can adapt quickly to change and be ready for emerging trends and fresh challenges.

1.1 Our transport objectives

In developing the Long Term Transport Master Plan, we have considered how transport services and infrastructure can help us reach our economic, social and environmental goals over the next 20 years. We have thought carefully about what sort of place we want NSW to be and how transport can contribute to our quality of life and standard of living. We have listened to the views of our customers and the community about what our transport objectives should be. We've also matched our approach to the directions set by the NSW Government's 10 year strategic plan, *NSW 2021*.

This work has led to the identification of eight objectives for the NSW transport system:



Improve quality of service - by putting the customer at the centre of transport planning and service delivery, improving the quality of travel experiences, offering more travel choices and providing integrated services that directly meet our travel requirements



Improve liveability - by shaping our cities and major centres, improving connectivity, providing services that support jobs growth in centres close to where people live, and facilitating ease of movement in our major cities and activity centres



Support economic growth and productivity - by providing a transport system that responds directly to customer needs, is more efficient, increases freight efficiency and improves the connectivity and accessibility of people to other people, opportunities, goods and services



Support regional development - by improving accessibility to jobs, services and people, improving freight connections to markets and providing better links between clusters of business activity



Improve safety and security - by placing a high priority on addressing the causes and risks of transport accidents and security incidents



Reduce social disadvantage - by improving access to goods, services and employment and education opportunities for people across all parts of the State



Improve sustainability - by maintaining and optimising the use of the transport network, easing congestion, growing the proportion of travel by sustainable modes such as public transport, walking and cycling, and becoming more energy efficient



Strengthen transport planning processes - by improving integrated transport planning processes, including with land use planning; identifying areas where evidence should be collected for future decision making; and continually improving governance and administration of the transport system.

These objectives will guide the delivery of the Long Term Transport Master Plan. We will use these objectives as we plan for the future and as a guide to assessing the best available options for building a world-class transport system for NSW over the next two decades.

1.2 What transport means to us as customers

Transport impacts most of us every day. Whether travelling to work, attending school, picking up the week's supplies from the supermarket or visiting family and friends – and whether we are driving, travelling by train or bus, or walking or cycling – we rely on different transport services and infrastructure to get us to and from our destinations.

Our freedom to move around easily and safely, and our ability to travel at the times and in the ways we choose means we can participate in our communities, access services, pursue our recreational and social interests, receive an education, undertake productive employment and stay in touch with people.

When we make these journeys, we become customers of the NSW transport system. Through our extensive consultation and customer research, we have learnt about the things that matter most to customers when they use the transport system.

Well-targeted improvements that better meet our needs as customers will help us achieve our stated objectives of improving quality of service and liveability.

Customers have told us what they value most: shorter and more predictable travel times, reliability, efficiency, convenience, safety and comfort whether they are using public transport modes or driving their own cars.

In valuing journey time most, customers want fast transport services that save time and a system that makes buying tickets quick and easy.

They particularly value comfort for longer journeys and want safe, secure and clean services, as well as a transport system that is convenient to access, and reliable in all weather conditions. Customers also want an efficient transport system that is simple to use, easy to connect to other modes and which provides a pleasant travel experience.

Cyclists want routes that are safe, easy to access and link directly with the places they need to visit and public transport. Pedestrians want easy access, strong connections with other modes, and well signposted routes.

As more of us use the Internet, smartphones and other mobile technologies, we want real-time, relevant and personalised information about our transport options to help us make the best choices about how, when and where we travel. We also expect a transport system that is easy to navigate with clear signage, timetable and service information at train stations and bus stops, and current traffic updates on our roads.

Increasingly, our transport system is used to meet growing demand for access to services. In an economy more focused on services, highly mobile commercial service providers such as tradespeople, couriers and delivery services need to be able to move quickly around Sydney, between Sydney and growing cities such as Newcastle and Wollongong, and across the State.

Our transport system moves goods from ports and airports to our local shops and supermarkets, and from NSW businesses to interstate and overseas markets. The provision of these goods underpins our standard of living, giving us ready access to a choice of products. The efficient movement of goods through international and national gateways keeps local firms competitive and productive, and helps to create jobs.

Transport also helps shape our major cities. Where people choose to live is linked to their access to jobs, services and education. Achieving the settlement patterns and city form that we want, while retaining our mobility, requires careful planning.

To shape the future of Sydney and NSW, we need to make critical decisions now. We need to understand not only the travel choices and journeys we are making today, but also how these journeys might change over the next 20 to 30 years. We need to consider how Sydney will grow and change, where we will be living in the decades ahead and how we want our cities, towns and

communities to look. We need to think about the direction our economy might take, the global and local connections our businesses will need and how best to support the jobs of the future.

We need to anticipate environmental constraints and consider our limited natural resources wisely when making transport decisions.

We need to consider how new technologies might change our lives and our travel patterns, and how they might help us to use our transport infrastructure more efficiently and intelligently.

Perhaps most importantly, we need to make choices that do not severely constrain the options of future generations.

This will involve making informed, well-judged choices about how our transport services and infrastructure should look in the years ahead. Some of these choices will be difficult to make. But the rapid pace of economic, demographic and technological change means that we cannot postpone these decisions. We know that infrastructure can take many years to plan, design and build, and that the decisions we take today will determine how our transport system operates in 2031.

MAKING PUBLIC TRANSPORT AN ATTRACTIVE OPTION

Our research suggests there are four broad propositions that will encourage more people to use public transport. These propositions reflect the trade-offs customers consider in making their travel choices and evaluating where they get the best value for money. They also provide the basis of actions we can take to target, evaluate and measure strategies to improve public transport services.

What our customers say they value most

Time	<ul style="list-style-type: none"> • Travel time • Frequency • Reliability • Convenience
Systems and efficiency	<ul style="list-style-type: none"> • Information and technology • Ticketing • Interchange
Reassurance	<ul style="list-style-type: none"> • Safety • Accessibility • Friendly and helpful staff
Comfort	<ul style="list-style-type: none"> • Environment, including temperature, space and cleanliness • Other passengers

Transport now and into the future

Today	Looking ahead
Our growing population is increasing our demand for travel	
Today, the NSW population is just over 7.2 million.	By 2031, the population of NSW will be around 9.1 million.
In 2011, Sydney's population is 4.3 million.	By 2031, there will be a further 1.3 million people living in Sydney.
Each working day, Sydneysiders make around 16.2 million trips across the city.	By 2031, the number of daily trips being made by Sydneysiders will have increased by 31 percent.
<p>Bicycle trips account for about one percent of all daily Greater Metropolitan Area trips, and about 1.9 percent of all Greater Metropolitan Area trips under 10 kilometres.</p> <p>There are about 370,000 bicycle trips in Metropolitan Sydney every day. About 330,000 of these are 10 kilometres or shorter.</p>	By 2016, our target is for the number of bicycle trips in Metropolitan Sydney to double, with further growth in cycling for all trips in NSW, particularly in urban centres, by 2031.
Our transport network is coming under greater pressure	
While around 11 percent of all trips taken in Sydney each weekday are by public transport, 23.9 percent of Sydneysiders use public transport to get to work.	Based on current trends, the proportion of commuters using public transport to get to work in Sydney is expected to increase by three percent by 2031.
Commuter trips currently account for around 16 percent of all weekday trips.	Based on current trends, there would be a 34 percent increase in commuter trips by 2031.
<p>CityRail carried 303.5 million passengers in 2011-12, providing 2,781 daily services on weekdays and 1,943 daily services on weekends.</p> <p>CountryLink served 365 destinations and 1.9 million passengers in 2010.</p>	The number of trips made by rail is expected to increase by 26 percent by 2031, based on current trends.
<p>Approximately 850 bus routes operated in the Greater Metropolitan Area, servicing 223.4 million passengers in 2010-11.</p> <p>529 bus routes operated in rural and regional areas, carrying 5.7 million passengers in 2010-11.</p>	By 2031, based on current trends, the number of weekday trips made by bus is expected to increase by 29 percent.
Around 68 percent of all weekday trips by Sydneysiders are made by car.	Under a 'do nothing' scenario, most travel in Sydney would continue to be by motor vehicle, with roughly the same percentage of trips still made by car in 2031.

1.3 Transport and the economy

Virtually all economic activity in NSW involves or relies upon transport at some level, from getting people to and from work to shifting goods from suppliers to customers and bringing services directly to our homes and offices.

In Sydney and our major centres, transport plays a vital role in connecting people and businesses in a way that drives growth and innovation in a modern, knowledge-based services economy. In our regions, vital agricultural and resource industries rely on transport to connect goods with domestic and international markets, with the transport component often the single biggest cost facing these industries and the single biggest opportunity for improving their productivity and competitiveness.

Transport creates economic value. Goods are worth more in the hands of consumers than suppliers, and services acquire value when provided person-to-person or business-to-business. But transport and logistics also represent a significant cost of doing business in Australia, with up to 10 percent of the final cost of a product derived from its transportation. This means that improvements in transport can deliver a major productivity boost to the NSW economy by lowering the costs of distribution, increasing access to new markets and enhancing competition between businesses.

By making the right decisions to improve our transport system, we can achieve our stated objective of supporting economic growth and productivity. We can also increase the diversity and resilience of the economy as benefits are spread across a range of industry sectors.

1.3.1 The NSW economy

NSW enjoys a large and diverse economy. NSW contributed \$421 billion or almost one third of Australia's Gross Domestic Product (GDP) in 2010, with Sydney alone accounting for almost 15 percent of the nation's economic activity.

The NSW economy is primarily a services economy, with much of this activity located in the State's major centres, predominantly Greater Sydney. As shown in Figure 1.1, service industries comprise 75 percent of the State's economic value and 78 percent of all employment statewide. The services sector can be difficult to define, but the majority of NSW employees are engaged in service provision.

Sectors such as finance, insurance, retail, health, government, education, biotechnology, engineering, design and transport itself are all part of the services sector and are increasingly the way in which we earn our living. Health and education services are growing in most parts of NSW, while information and communications services are experiencing strong growth in Sydney and our major cities.

NSW has other significant industry sectors; in particular, our agriculture sector contributes a large share of Australia's total production in areas such as wool, beef, wheat, fruit, rice, oilseeds and vegetables.

Tourism contributes more than \$11 billion to our Gross State Product (GSP) each year and is particularly important to the economies of Sydney and regional destinations such as the Blue Mountains, the Hunter Valley and Byron Bay. In relation to other states, NSW is the largest contributor to the total value of tourism goods and services produced in Australia, contributing 34 percent. NSW provides and promotes transport and education-related tourism. For example, our State attracts the greatest share of day and overnight cycling tourists in Australia.

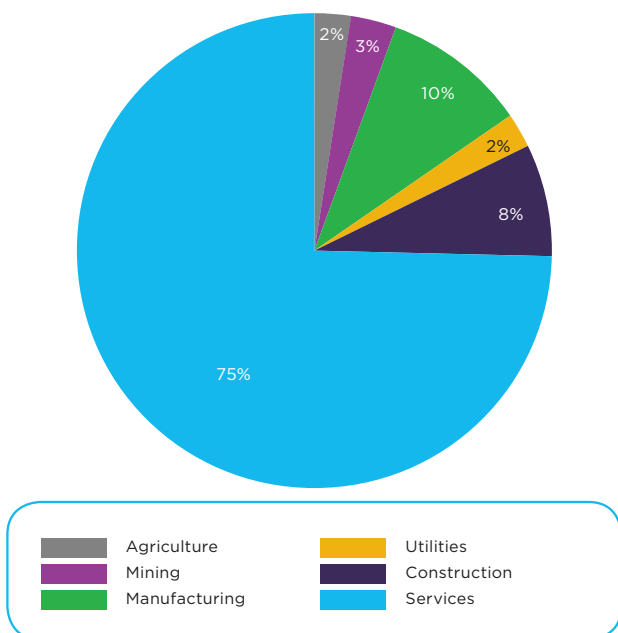
While the mining industry only accounts for three percent of NSW's GSP today, strong growth is expected in the resources sector (see Figure 1.2). This will require substantial investment in land-based transport and port capacity to connect mines with markets.

In 2011 freight and logistics contributed approximately \$58 billion (13.8 percent) of NSW GSP.

Manufacturing now makes up a smaller part of the NSW economy than in the past. However, it remains an important industry for Western Sydney, including in Bankstown, Campbelltown, Fairfield and Liverpool. As the industry moves into high-value products and advanced production processes, it will require more efficient land and air links to suppliers and customers.

Industries are spread across the State and have diverse transport needs depending on their location, the markets they need to reach and the volumes and types of goods they need to shift. These requirements need to be addressed to ensure that our most important industries remain competitive and continue to grow.

Figure 1.1 Share of key industry sectors in NSW, 2010

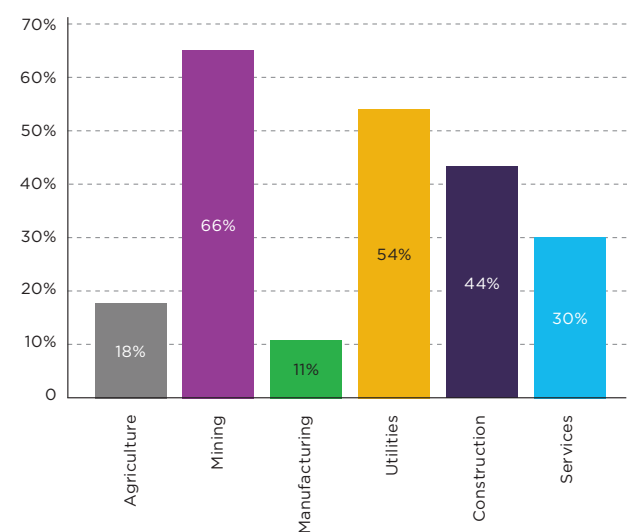


Congestion imposes costs to our economy. Transport for NSW will assess the cost of congestion for freight users to inform decision making.

A well-functioning transport system provides many productivity benefits to the NSW economy. At the macro-economic level, transport improvements can lift productivity levels by supporting greater labour mobility, increasing the productive capacity of the overall economy and facilitating effective competition. At the micro-economic level, transport can influence the efficiency and productivity of businesses by delivering time and cost savings, providing access to a larger pool of workers, enabling trade over wider areas and reducing the costs of being part of national and global supply chains.

In particular, more efficient and reliable supply chains across multiple transport modes (road, rail and sea) will be critical to productivity growth in our heavy industries and manufacturing sector. In our growing services sector, improvements to transport accessibility and connectivity will underpin productivity – linking different parts of our cities, connecting cities with other cities, connecting cities with our regions, and linking NSW with the world.

Figure 1.2 Expected growth in key industry sectors in NSW, 2010 to 2020



1.4 Transport and our cities and centres

We derive many economic benefits and advantages from living and working close to each other in a city or regional centre. From a business perspective, firms offering the same kind of goods or services often benefit from locating near each other. This clustering of activity supports collaboration and innovation by bringing businesses, workers, consumers and suppliers closer together. It gives industry access to a larger pool of specialised labour and generates the economies of scale that attract multiple competing suppliers, reducing the cost of supplies to businesses.

1.4.1 Business clusters in NSW

There is already a pattern of industries and businesses clustering near each other in Sydney and regional NSW:

- In Sydney, professional services tend to concentrate in the CBD, with manufacturing, wholesale trade and other services, such as health and education, clustered in suburbs outside the centre (shown in Figure 1.3).
- In recent years, new campus-style business parks have attracted businesses out of the traditional Sydney employment centres with growth in locations including Macquarie Park, Norwest and Marsden Park.
- In regional NSW, a large area is dominated by agriculture. Mining activity is centred around the Hunter Valley and the Western Region, with tourism and port-related activity along the coast (shown in Figure 1.4).

Better transport services can enhance the benefits of these clusters by reducing the costs associated with connectivity and access, supporting business diversity and employment opportunities, and by significantly improving the links within and between clusters of activity and their various markets.

Specialist precincts will attract top businesses and talent, and better connections with our regions will give people across NSW access to employment and business opportunities.

1.4.2 Supporting Sydney as Australia's only global city

Global cities are those that service and support the complex and specialised economic activities of global markets. Global cities are not constrained by international borders and are known for driving innovation, creativity, and positive economic, environmental and social outcomes.

Sydney holds the unique position of being Australia's only global city. A study by the Globalisation and World Centres Research Network indicated that Sydney was one of several Pacific Rim cities that had experienced a rapid rise to an 'alpha' city status, reflecting Sydney's position in the global economic network.

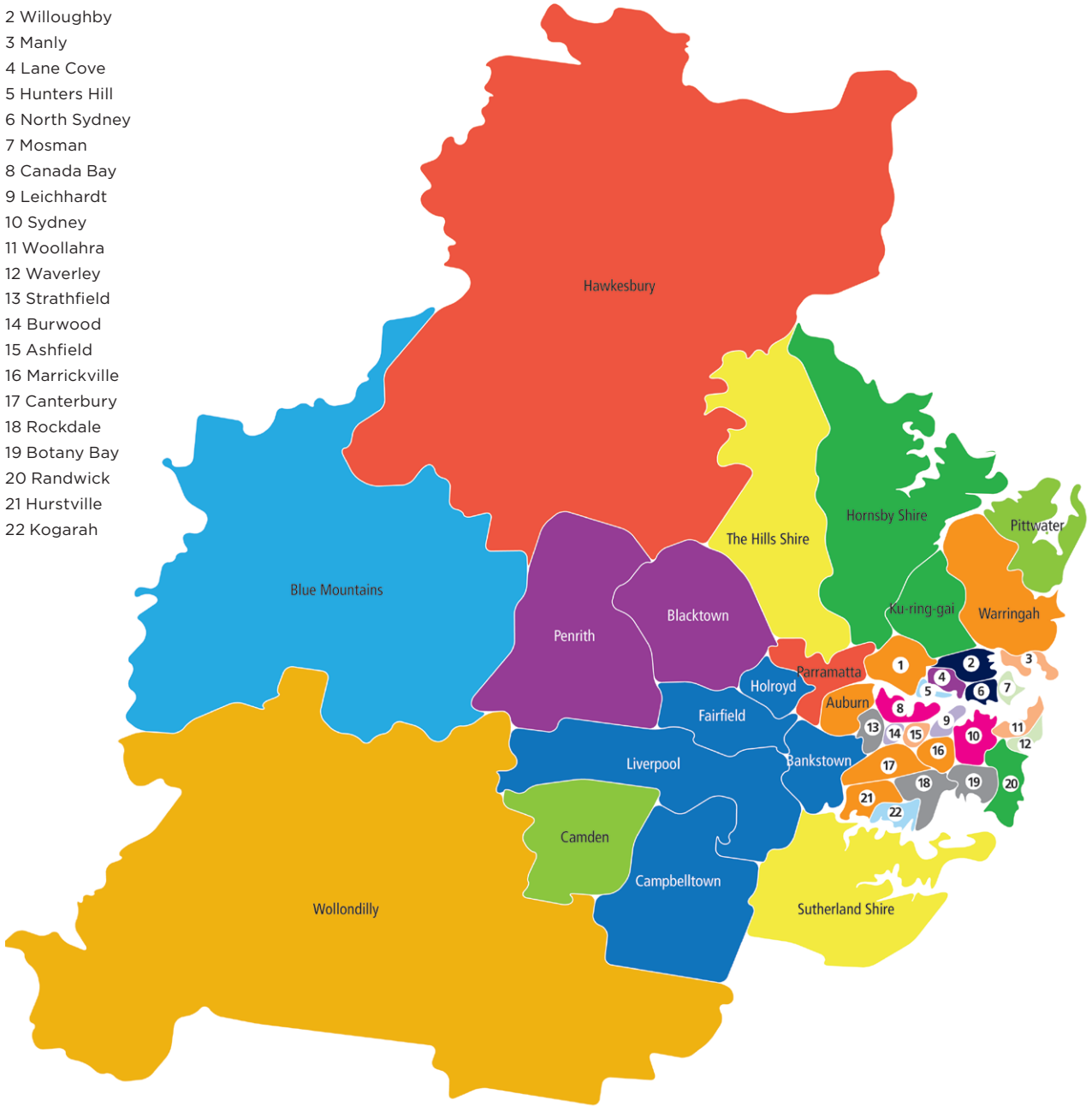
As global competition increases, governments around the world are investing in infrastructure to increase the attractiveness of their major centres and improve their rankings in a number of global city indicators. For Sydney to retain its position as one of the world's global cities, we must recognise the need for investment.

The *Metropolitan Strategy for Sydney* establishes a vision for Global Sydney as the dominant centre and the location for finance and other service sector industries active in the global economy. It recognises the importance of the Sydney City Centre as a key destination for visitors and Sydneysiders as the location for significant cultural, tourism and recreational facilities and venue for key international events.

Transport has an important role in supporting Sydney as a global city. Strong connectivity across the city, quality public transport networks and opportunities for walking and cycling can all contribute to maintaining Sydney's role as a centre of economic and social activity.

Figure 1.3 Primary employment sectors by Local Government Area, Sydney

- 1 Ryde
- 2 Willoughby
- 3 Manly
- 4 Lane Cove
- 5 Hunters Hill
- 6 North Sydney
- 7 Mosman
- 8 Canada Bay
- 9 Leichhardt
- 10 Sydney
- 11 Woollahra
- 12 Waverley
- 13 Strathfield
- 14 Burwood
- 15 Ashfield
- 16 Marrickville
- 17 Canterbury
- 18 Rockdale
- 19 Botany Bay
- 20 Randwick
- 21 Hurstville
- 22 Kogarah



 Accommodation and food services	 Manufacturing
 Arts and recreation services	 Mining
 Construction	 Professional, scientific and technical services
 Education and training	 Public administration and safety
 Electricity, gas, water and waste services	 Rental, hiring and real estate services
 Financial and insurance Services	 Retail trade
 Health care and social assistance	 Transport, postal and warehousing
 Information media and telecommunications	 Wholesale trade

Data source: Analysis of employment by NSW LGA, Deloitte Access Economics 2010

SYDNEY - A VISION OF THE FUTURE

In the next 20 years, Sydney will become a more compact, multi-centred, connected city, with a transport network that provides quick and convenient public transport connections across the city and frequent links to other cities.

To realise this vision, Sydney will maintain well connected urban centres. It will increasingly use state-of-the-art 'hardware' – the highly sophisticated transport, communications and energy infrastructure essential to give Sydney a competitive edge and improve its global city status.

Sydney will attract the brightest and best people and invest in its knowledge economy, improve business innovation and compete successfully for new business and investment opportunities. It will continue to strengthen its skill base and build capacity for a mobile, flexible and diverse labour force.

The city will become more liveable by improving the design of buildings and public areas, developing mixed-use spaces where people work and live, and creating more opportunities for people to walk and cycle to work and major service centres. Protecting our natural environment, improving access to green spaces and improving air quality will be critical. The *Metropolitan Strategy for Sydney* underpins this land use and planning vision for Metropolitan Sydney to 2031.

Central to these outcomes will be an integrated and efficient transport system that is closely aligned with land use planning. Sydney's transport infrastructure and services will cater to the customer, providing diverse transport options and reduced travel times, while being readily accessible across all parts of the city. Improved public transport networks will increase productivity and global competitiveness.

Better transport hubs and improved connections will support revitalisation of neighbourhoods and the success of centres

such as Liverpool, Penrith and Parramatta, our premier regional city with a growing role as Sydney's second CBD. They will also support employment growth in specialised precincts including Macquarie Park, Sydney Airport, the Norwest business park and the Penrith education and health precinct.

Freight customers will experience efficient and reliable journey times that meet growing demand, improve productivity and reduce the costs of doing business. Reliable, secure and capable transport networks will support the vessels, vehicles and rolling stock that move freight across Sydney and beyond. There will be initiatives to mitigate the impact of freight movements on the community.

The Sydney CBD and the Global Economic Corridor will have stronger transport connections to each other, to the regional cities of Parramatta, Liverpool and Penrith, and to the wider Sydney region and adjoining regions to support productivity and economic growth. Public transport services will link people to the jobs available in the Global Economic Corridor and other employment areas, including Western Sydney.

Development within the walking and cycling catchments of local centres will improve access to local services and public transport that links to major centres, with seamless interchange opportunities. Outer suburbs will be supported by enhanced road connections and interchange improvements that make it easier to use public transport.

With an integrated and more effective transport system, a future Sydney will be more sustainable, more liveable and will be a strong global city.

1.5 Regional NSW – improving connectivity and accessibility

Our regions rely on a well connected, efficient transport network to sustain community wellbeing and quality of life, support vital industries and link firms to markets.

Transport plays a vital social function in regional NSW, connecting communities with services, education opportunities, jobs and recreational activities. It provides people with good access to each other, their communities and key services – especially given the dispersed nature of townships across regional NSW and the development of peninsula communities along the coast. To achieve our objective of supporting regional development, we need good transport services within our regional towns and cities, between those towns and cities and between regional areas and Sydney.

In many regional areas, the provision of good public transport services requires careful planning to take account of long travel distances and dispersed demand. Levels of car ownership are very high and motor vehicles are the main way people choose to move around.

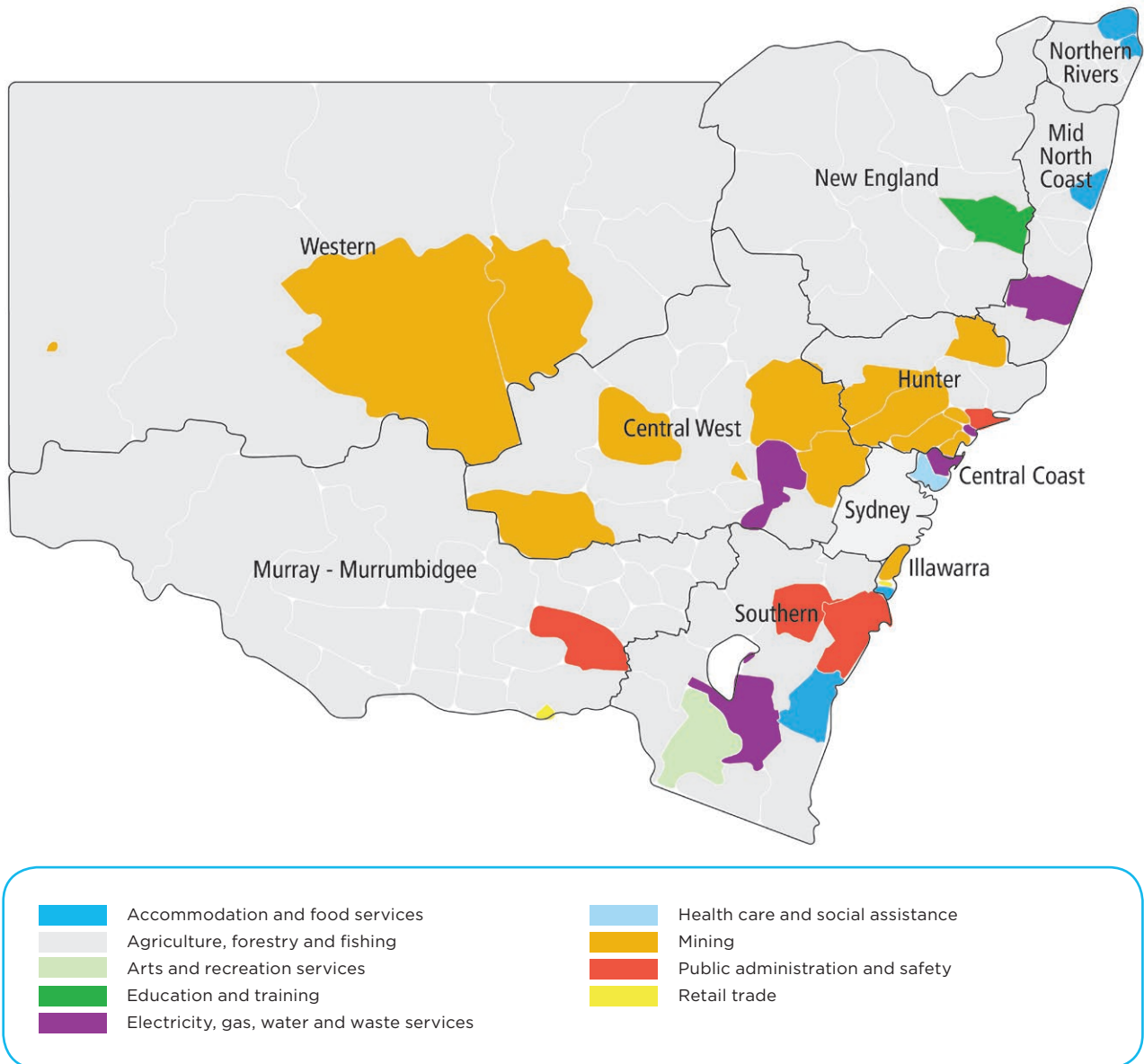
Providing park and ride facilities, or links from motorways to train stations and bus interchanges, will allow people in regional areas to link car trips to public transport services as part of their journey. Maintaining good connectivity and accessibility will require innovative solutions.

Transport also facilitates the movement of goods produced in our regions to domestic and international markets, contributing to the NSW economy. The regional freight network supports agricultural, manufacturing and mining industries and the local businesses associated with these sectors. Regional ports and airports also support the movement of freight to export markets. With both freight movements and demand for goods increasing, efficient freight networks and improved movement across these networks is essential.

Ongoing and indexed NSW Government funding for the maintenance and upgrade of the Country Regional Network – around \$1.5 billion over 10 years – will improve connectivity and accessibility in regional NSW. This includes funding for replacement sleepers and upgrade of the Coonamble to Dubbo line.

Road safety is fundamentally important for regional NSW. While the rate of fatalities and serious injuries on regional roads has declined, we must continue to make every effort to tackle the issue.

Figure 1.4 Primary employment sectors by Local Government Area, regional NSW



Data source: Analysis of employment by NSW LGA, Deloitte Access Economics 2011

OUR REGIONS – A VISION OF THE FUTURE

NSW is home to thriving regional communities and successful businesses. Over the next 20 years, the NSW transport network will develop faster connections to regional, national and international markets. Improved transport and communications networks, supported by technological advances, will improve connectivity for regional NSW and support more reliable access to quality services, and to employment and educational opportunities.

To make this vision a reality, we must support and enhance the competitive advantages of each region. In some regions, this requires actions to support targeted growth industries; in other regions, such as the Central Coast, rail services with Sydney will be upgraded and tailored to meet customer needs.

To support existing industries, we will identify and embrace emerging opportunities in the region, including in the renewable energy sector and the creative, environmental and knowledge-based services sectors.

Our regions will continue to attract and retain skilled people. Communities will offer diverse employment and lifestyle choices and provide access to many services and amenities. Local workforces will enjoy good access to education and training, whether near where they live or through advanced distance-learning programs.

Countries around the world with strong regional identities have good access between their regions and their major cities, with frequent and reliable public transport connections.

The modern transport network will be seamlessly integrated across all modes, driving and sustaining regional development,

competitiveness and prosperity. Regional transport connections will shift freight and people safely and quickly between economic centres. More public transport options will be available.

Fast connections to and through Sydney will be increasingly important to firms in cities such as Newcastle and Wollongong, and in thriving centres such as Bathurst, Orange, Gosford, Port Macquarie, Dubbo and Albury, as they look to link growing populations to jobs and to forge global connections.

Regional freight networks will be less constrained, meet growing demand and support increased regional productivity while meeting customer needs.

In remote parts of the State, such as the far west, smooth and safe roads and strong freight connections will generate new opportunities and revitalise disadvantaged communities.

Transport improvements will ensure that our regions have the strength and capacity to meet new challenges and, in turn, offer more opportunities to people, businesses and communities living in regional NSW.

1.6 Transport and freight

One result of our burgeoning demand for goods and services is a rapidly increasing freight task across NSW.

Our road and rail networks, and our ports and airports, enable the movement of goods from supplier to consumer, shifting raw materials, intermediate goods and finished products between import and export markets, across the NSW domestic market and across State borders. An efficient and accessible freight network, along with the ability to maintain efficient freight operations and reduce freight costs, is vitally important to the competitiveness of firms in many industries and to our economy more broadly. The Australian Logistics Council has estimated that each one percent increase in freight efficiency will save our national economy around \$1.5 billion.

The timely and safe transportation of goods along the entire supply chain also underpins the economic growth and development of Greater

Sydney, our major regional centres and cities, towns and rural communities from one end of NSW to the other.

A well-planned freight and logistics network is particularly important to regional NSW, giving our farmers, regional producers and mining companies access to markets for their goods, whether those markets are in Sydney, interstate or overseas. This network also supports regional freight hubs, providing better connections to and between hubs and opening up opportunities for new businesses to emerge and grow. With the freight and logistics sector accounting for over 11 percent of the NSW economy, a successful sector can itself make a strong contribution to regional economies in a challenging global environment.

Australia's freight task is expected to double between now and 2030, and be triple its current size by 2050. With many key freight routes already congested, managing this growth presents some difficult challenges and choices.

Freight now and into the future

Today

Looking ahead

Our growing population is increasing our demand for travel

Around 67 billion tonne-kilometres of freight movements occur in NSW each year (2010).

More than 115 billion tonne-kilometres of freight will be moved annually in NSW by 2031.

Annual container trade through Port Botany is around two million twenty-foot equivalent units (TEUs) in 2010.

Container throughput at Port Botany is presently growing between six and seven percent annually.

More than 92 million tonnes of coal is exported from NSW each year. Around 121 million tonnes of coal are targeted for export through the Port of Newcastle this year and 14 million through Port Kembla (2010-2011).

The Port of Newcastle with Terminal 3 and Terminal 4 will have capacity for throughput of 200 million tonnes plus per annum (expected at the end of 2016) and capacity in Port Kembla Coal Terminal will reach over 20 million tonnes per annum by 2013-14.

Around 36 million passengers and 656,000 tonnes of cargo pass through Sydney Airport every year.

By 2035, Sydney Airport will be dealing with around 77 million passengers and more than 1.5 million tonnes of cargo each year.

Sydney's annual road freight movements are around 11.2 billion tonne-kilometres (2007).

By 2030, Sydney will be moving at least 18 billion tonne-kilometres of road freight each year – an increase of more than 67 percent. It is estimated that by 2031 the logistics task in NSW will have almost doubled to 794 million tonnes.

1.7 Transport and the environment

In particular, we face challenges in using infrastructure that is shared between freight and passenger journeys. Some roads are not suited to carrying heavy vehicles due to factors such as geometric or structural constraints (such as pavements and/or bridges) and there can be tension between adjacent residential land use and noise/vibration from heavy vehicles. Many rail lines are constrained in their capacity to carry passenger and freight services.

Airports face curfews and other problems in juggling high volumes of passenger travel with the carriage of freight that is often high-value, perishable or requiring rapid delivery.

Our freight task also has diverse requirements, including the sea transport of large shipping containers from international markets into Port Botany, bulk freight movements along the NSW and interstate rail networks, the movement of freight trucks across Sydney and the door-to-door delivery services provided by courier vans. We need to understand the way these components interact to ensure that the overall freight network functions effectively for the ultimate benefit of consumers.

While recognising the many benefits delivered by the freight network, we also have to acknowledge and address the negative impacts associated with moving ever-increasing volumes of freight around NSW: increased traffic congestion, displaced local economic activities and impacts on communities from higher numbers of trucks moving through urban areas. Allowing the efficient flow of goods to the market has inherent benefits for the environment and community. Lower costs, better management of impacts like noise, reduced emissions and increased use of green technology contribute to efficiency. Protecting communities and the environment from the outset also reduces longer term costs to government due to remediation and retrofitting.

The NSW freight network is also a critical part of the national freight network. Improvements or constraints within our network can increase or impede the efficiency of the national network, with flow-on impacts for national productivity. We will seek national solutions to many of our challenges.

The journeys we make each day on the transport network have a direct impact on the environment. To improve sustainability, we must consider how we can minimise this impact when planning our transport system.

Currently, around 14 percent of greenhouse gas (GHG) emissions produced in NSW come from the transport sector, making it the State's second highest source of emissions. In the context of population growth and increasing travel demand, mitigating GHG emissions is a major challenge for the future.

Providing people with opportunities to use public transport instead of private vehicles will help to reduce the environmental impact of transport in NSW. Increased walking and cycling, particularly for short, local trips, will also contribute to improved environmental outcomes.

The cost and availability of oil and the rising cost of electricity will also have a direct influence on the choices we make in procuring the most environmentally sustainable and energy efficient technologies to power our transport fleets.

The growing travel task is also a challenge for preserving the amenity of many of our communities. The movement of freight is rarely silent and the generation of noise on a shared network in proximity to residential areas is a recognised issue.

Large-scale transport developments can also disrupt long-established local communities and threaten our cultural and natural heritage. NSW is rich in European and Indigenous heritage with many items of cultural significance dispersed across the State. Managing our impact on these links to our past is important when planning future transport solutions.

1.8 Transport and strong communities

Social connections are important to our quality of life, giving us a sense of belonging and the ability to participate in work, education and community life. Accessible and affordable transport is essential to maintaining these connections and giving all of us the opportunity to gain work, obtain an education and become active and engaged members of our communities.

Good access to transport can help to address social exclusion amongst people with disability, those on low incomes and both younger and older people who are more likely to have some limits on their mobility. Across Australia, more than half of people with a reported disability do not use public transport, even though 75 percent have public transport available in their local areas, primarily because of difficulties in getting to bus stops or train stations and getting in and out of vehicles with steps.

In 2010, over one million people aged 65 years and older lived in NSW, with the highest proportion living in the Mid North Coast, Central Coast, and Northern Rivers regions. With the proportion of people aged over 65 years set to increase in the next 20 years, dependence on public transport and community transport services is likely to increase as people's independent mobility decreases. Public and community transport access in areas with ageing populations will support independence for those over 65.

Regular physical activity is important to our health and wellbeing. Recent research shows that many people get an additional eight to 10 minutes of exercise each day when they use public transport. Importantly, being active for part of our journey to work or school incorporates exercise into our daily routines. The NSW Centre for Population Health has observed that public transport use, walking and cycling are associated with a number of health benefits, including a reduced incidence of obesity, higher levels of exercise and improved mental health.

Building social and community goals into our transport planning will strengthen communities, reduce disadvantage and open up opportunities. To meet our objective of reducing social disadvantage, we will require new ways of thinking about how to distribute transport services more evenly across the State. We will need to give people healthier travel options, such as making it easier and safer to cycle to work or walk to the nearest train station. We will also need to integrate our transport system more closely with land use planning, creating well-designed cities and suburban centres that reduce our reliance on cars, encourage us to be more active and produce safe, attractive and well-used urban spaces.

A SAFE TRANSPORT SYSTEM

Improving safety and security is a key objective as we develop our transport system. Whether it is the risk of an accident while driving a car or feeling unsafe while waiting at a train station or bus stop, safety and security while moving around is an important community concern. While service factors such as timeliness and frequency are important to customers, surveys conducted by Transport for NSW identified safety when using public transport as the most important service factor after timeliness and frequency.

Road crashes cost the NSW economy nearly \$5 billion each year. While the rate of fatalities in road crashes has decreased, the rate of injury has remained relatively constant and has ongoing impacts on our society in people suffering permanent injury and trauma. The highest risks for these crashes continue to be borne by the most vulnerable road users such as pedestrians, cyclists and motorcyclists. Continued efforts are also required to ensure that the growth in freight is managed safely, particularly in relation to safer workplaces, road and rail safety and the transport of dangerous goods.

1.9 Transport and land use planning

An integrated approach to land use and transport planning can meet the community’s social, environmental and economic objectives.

Integrated planning recognises that land use generates demand for travel while the transport system influences how land is used for a particular purpose. Our ability to access employment, education and other services from where we live impacts on the quality of our lives. Likewise, the ability of a business to move its goods and people affects profitability.

Effectively integrated land use patterns and transport systems make it possible to move people and freight in ways that make the most of economic, environmental and human resources.

Integration needs to be considered at regional and local levels. At the regional level, development patterns, location and transport networks combine to make regional destinations easy to reach.

At the local level, the development pattern and transport system combine to support convenient, non-motorised travel and efficient vehicle trips. Together, these factors contribute to shorter trips, less car trips and more trips by walking, cycling and public transport.

A growing population and changing patterns to where we live and where our jobs are located will create new pressures that require far-sighted and flexible planning for our future transport system.

The Long Term Transport Master Plan takes into account future land use planning, particularly in areas where significant growth will occur both from greenfield developments and infill in existing residential areas.

Ensuring that land use and transport planning continue to be fully integrated will help us strengthen our transport planning processes.



2



CUSTOMER-FOCUSED INTEGRATED TRANSPORT PLANNING

CHAPTER SUMMARY

We have undertaken extensive consultation and research into what our customers want now and into the future. A key focus of this Long Term Transport Master Plan is how we meet these customer requirements as we develop our transport networks and deliver our services.

Transport for NSW's consultation has confirmed that to meet the travel needs of our customers, we need to move towards a fully integrated and seamless transport system that responds to where people need or want to go.

Building this system will take time; we need to modernise existing services, grow our networks to meet future capacity requirements and effectively manage our existing services and assets.

The Long Term Transport Master Plan is based on the following themes:

- **Putting our customers first.** Improving our customers' journey experience is our top priority. Our analysis has been informed by statewide consultation and extensive market research to better understand transport customers' needs.
- **Integrating, modernising, growing and managing** the transport system. To create a modern and customer-focused system, we need to integrate transport services, make better use of existing assets, expand various networks and manage our assets and the impacts on our communities and the environment.
- **Aligning transport and land use planning.** This Long Term Transport Master Plan integrates transport planning with land use planning across the transport network, and adopts a mode-neutral corridor approach to transport planning.

2.1 Introduction

The Long Term Transport Master Plan has been developed with a clear definition of our community's economic, social and environmental objectives. Using a strong evidence base to identify the key transport challenges facing NSW over the next 20 years, the Long Term Transport Master Plan identifies the best solutions and actions that are needed to modernise and grow the NSW transport system.

Our customers want us to move away from modal silos towards a fully integrated and seamless transport system that responds to where people need and want to go. We need to modernise our existing services, grow the network to meet changing customer needs and efficiently manage our transport services and assets.

Another important consideration in focusing on customers is developing a transport system that will contribute to the liveability of our cities and centres and support the entire population of NSW.

For example, to continue to develop Sydney as a liveable, world-class city we need to recognise the unique geographical constraints of a CBD that is confined by water on two sides and needs to provide good access to jobs for people living in Greater Sydney and inter-city locations.

This means we need to strike the right balance between investing in public transport and roads to support the movement of private vehicles, investing in passenger transport and freight across the city, and supporting walking and cycling for local trips.

The following elements underpin the Long Term Transport Master Plan:

- **Put our customers first.** Improving our customers' journey experience is our top priority. As a result, our analysis has been informed by statewide consultation and research to better understand transport customers' needs.
- **Respond to changing customer needs by integrating, modernising, growing and managing the system.** We need to modernise our existing services, make better use of existing assets, expand the various networks in response to a growing population and changing customer needs and manage the impacts on our communities and the environment.
- **Align transport and land use plans to meet customers' needs.** This Master Plan integrates transport planning with land use planning across the transport network. The first step in this approach involves the identification of transport corridors. We assess the current and future requirements of these corridors in terms of capacity, speed and frequencies to identify the most appropriate service and network response to meet customer needs on each corridor.

2.2 Putting our customers first

Our detailed analysis considered:

- Our annual Household Travel Survey
- Our annual customer survey
- Detailed market segmentation analysis across all public transport modes
- Around 1,280 written submissions on the Discussion Paper and over 460 submissions on the Draft Long Term Master Plan
- Comments and ideas from four Advisory Groups and 14 regional forums with more than 1,000 participants and
- Other customer centric market research.

Detailed analysis of customer needs has shown that time-related factors, such as speed, frequency and reliability are the central priority for transport customers (see Figure 2.1).

Other important aspects of the transport system identified by customers were efficiency (including convenience, ease of connecting and ease of buying tickets), and safety and comfort (including cleanliness, available seating and helpful staff).

Responding to customer needs and ensuring customer satisfaction across modes requires a planned approach to service delivery and a strong framework for determining priorities and making the best investment decisions.

Figure 2.1 Customer research areas of satisfaction by mode

Mode	What customers are most satisfied with	What customers are least satisfied with	What factors are most important	What will increase patronage
Rail	<ol style="list-style-type: none"> 1. Ease of buying a ticket 2. Ease of getting on/off 3. Ease of navigating around station 	<ol style="list-style-type: none"> 1. Car parking at station 2. Clean seats on train 3. Other passengers 	<ol style="list-style-type: none"> 1. Frequency 2. Being on time 3. Travel time 	<ol style="list-style-type: none"> 1. Services arriving and departing as scheduled 2. More frequent trains 3. Reduced trip time
Light rail	<ol style="list-style-type: none"> 1. Smooth journey 2. Safety 3. Ease of getting on/off 	<ol style="list-style-type: none"> 1. Convenient light rail stop 2. Rubbish bins 3. Safety at light rail stop 	<ol style="list-style-type: none"> 1. A convenient light rail stop 2. Frequency 3. Connecting to other modes 	<ol style="list-style-type: none"> 1. More frequent services 2. Extended network 3. Reliable arrival time 4. Electronic ticketing across modes
Bus	<ol style="list-style-type: none"> 1. Feeling safe 2. Convenient bus stop 3. Ease of getting on/off the bus 	<ol style="list-style-type: none"> 1. Being informed of service changes 2. Comfortable bus stop 3. Frequency 	<ol style="list-style-type: none"> 1. Frequency 2. Travel time 3. Being on time 	<ol style="list-style-type: none"> 1. Reduced waiting time 2. Reduced trip time 3. Air-conditioning and heating
Ferry	<ol style="list-style-type: none"> 1. Safety on the ferry 2. Safety at wharf 3. Safety boarding 	<ol style="list-style-type: none"> 1. Car parking 2. Convenient wharf 3. Feedback was addressed 	<ol style="list-style-type: none"> 1. Frequency 2. Convenient wharf 3. Connecting to other modes 	<ol style="list-style-type: none"> 1. More frequent services 2. Reliable arrival time 3. Consistent travel time
Roads/ Private Vehicle	<ol style="list-style-type: none"> 1. Convenience 2. Personal safety/security 3. Accessibility 	<ol style="list-style-type: none"> 1. Timeliness 2. Information 3. Cleanliness 	<ol style="list-style-type: none"> 1. Personal safety/security 2. Timeliness 3. Convenience 	

2.3 Integrate, modernise, grow and manage

The analysis undertaken in developing the Long Term Transport Master Plan has identified the critical elements of our decision making framework.

Integrate

Provide a seamless transport system for our customers

Our customers often rely on a combination of transport modes. They want simple and convenient end-to-end journeys, convenient electronic ticketing, aligned timetables, modern interchanges, better real-time information and functional freight intermodal terminals. To respond, we need to develop policy and plan the network in an integrated way and align land use and transport planning.

Modernise

Improve the efficiency, reliability and performance of the current network

To make the best use of our transport system and improve its efficiency, we need to modernise our network and fleet to increase flexibility and reliability. New technology will help us improve the performance of the current network and will help us to get the most from our past investment.

Grow

Expand the current network to meet changing customer needs, driven by land use changes and population growth

In some instances, responding to customer demand will require us to grow what we have, expand the network into new places and provide new services. This is likely to require new investment in transport projects and infrastructure.

Manage

Move people and freight efficiently, reduce the impact of transport on the environment, keep customers safe and communities strong and protect our transport assets

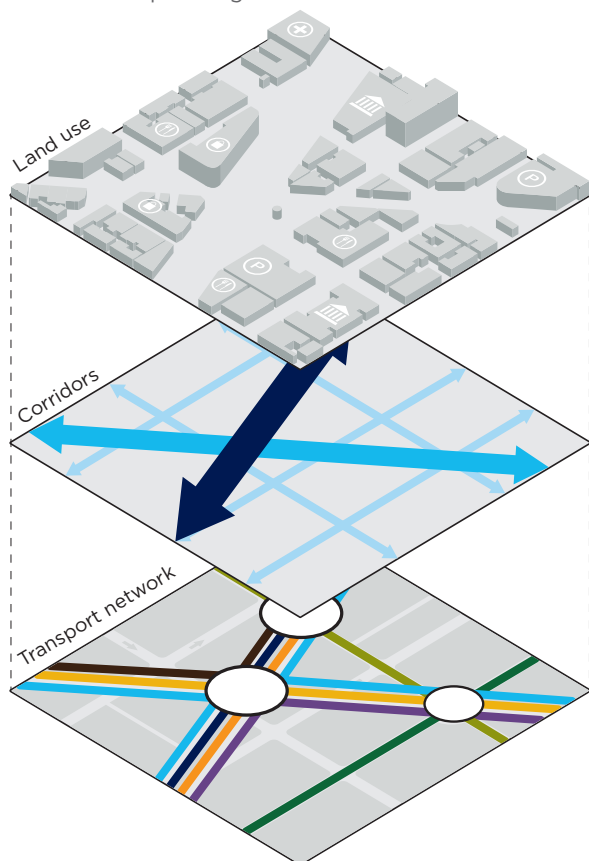
Not all initiatives in the Long Term Transport Master Plan are about providing new services or building more transport infrastructure – many focus on how transport impacts the community and the environment, ensuring the system is safe and secure for customers and maintaining our vital transport assets.

2.4 Our approach to transport planning

Many of the transport challenges NSW faces are the consequence of ad hoc planning in response to a particular project, modal or geographic issue. This has led to a system that is complex and not focused on meeting the specific transport needs of individuals, businesses and communities.

This Long Term Transport Master Plan has adopted an approach that takes an integrated planning perspective across all transport modes and the whole transport network. It brings together land use and transport planning, to identify transport corridors of demand which link the places between which people want to travel. It considers the level of demand along each corridor, the capacity of the corridor to meet current and future demand, and the type of transport service and network response required to meet customer needs on that corridor. This concept is illustrated in Figure 2.2.

Figure 2.2 Relationship between land use, corridors and network planning



2.4.1 Step one: Integrating transport with land use planning

Transport for NSW has worked closely with the Department of Planning and Infrastructure in developing this Long Term Transport Master Plan. This collaboration will continue as the Plan is implemented, and as the Department of Planning and Infrastructure finalises its *Metropolitan Strategy for Sydney* and regional land use plans.

The Department of Planning and Infrastructure develops land use plans to guide and facilitate sustainable growth in NSW. These plans aim to carefully manage the expansion of residential and commercial development across NSW to ensure that our cities, towns, suburbs and neighbourhoods retain their amenity and liveability.

Central to the Department of Planning and Infrastructure's approach is the centres hierarchy that classifies different types of urban centres according to their function. Through this approach, the Department of Planning and Infrastructure and Transport for NSW will support the development of strategic centres and precincts that are highly accessible through good transport links, making them attractive locations for economic development and employment growth.

The hierarchy enables us to identify which centres and precincts need better transport access and plan accordingly. As these centres develop and evolve, transport planning will need to evolve to match the changing needs of those centres.

Transport for NSW and the Department of Planning and Infrastructure are working to develop Regional Transport Plans alongside regional land use plans for the ten regions of NSW. These plans will be closely aligned to respond to the specific land use and transport challenges of each of our regions.

2.4.2 Step two: Identifying corridors of demand

The next step in our transport planning process takes land use plans, and forecasts the travel demand that will be created by the location and type of population and employment growth. By looking at transport needs in a mode-neutral way, broad patterns – or corridors – of movement emerge. These corridors connect activity centres such as CBDs, airports, ports or residential centres. They are held together by interchanges where people (and often goods) begin or end journeys, change modes or switch between services on the same mode.

While this approach will be applied across NSW, we have developed a corridor map specifically for Sydney (Figure 2.3). This map illustrates how key demand corridors can be identified from land use forecasts, with customers’ demands for mobility between activity centres evident in the form of 46 demand corridors connecting Sydney’s centres.

Figure 2.3 Sydney’s main demand corridors



- Global Sydney
- Regional city
- Major centre
- Specialised precinct
- Potential specialised precinct
- Planned major centre
- Potential major centre

2.4.3 Step three: Defining the performance required from the transport network

Once demand corridors are identified, the next step is to assess the nature of demand along each corridor to define the appropriate transport network service levels required to meet the demand. To do this, we use a series of transport planning tools, including:

- A new Strategic Transit Network that defines public transport service standards between activity centres through a hierarchy of service requirements and the public transport network's relationship with the road system along those corridors – for example, through bus priority requirements
- A series of road planning hierarchies that define road standards across NSW, including how the road system should provide for pedestrians and cyclists
- An interchange hierarchy that defines how the public transport network and the road network will interact through facilities such as park and ride schemes
- An urban road freight hierarchy to prioritise works across the State road network and identify the most economically important roads.

Each tier of these hierarchies – and the customer service standards that underpin them – will be the basis for future transport planning in NSW, providing the core planning framework for an integrated transport system.

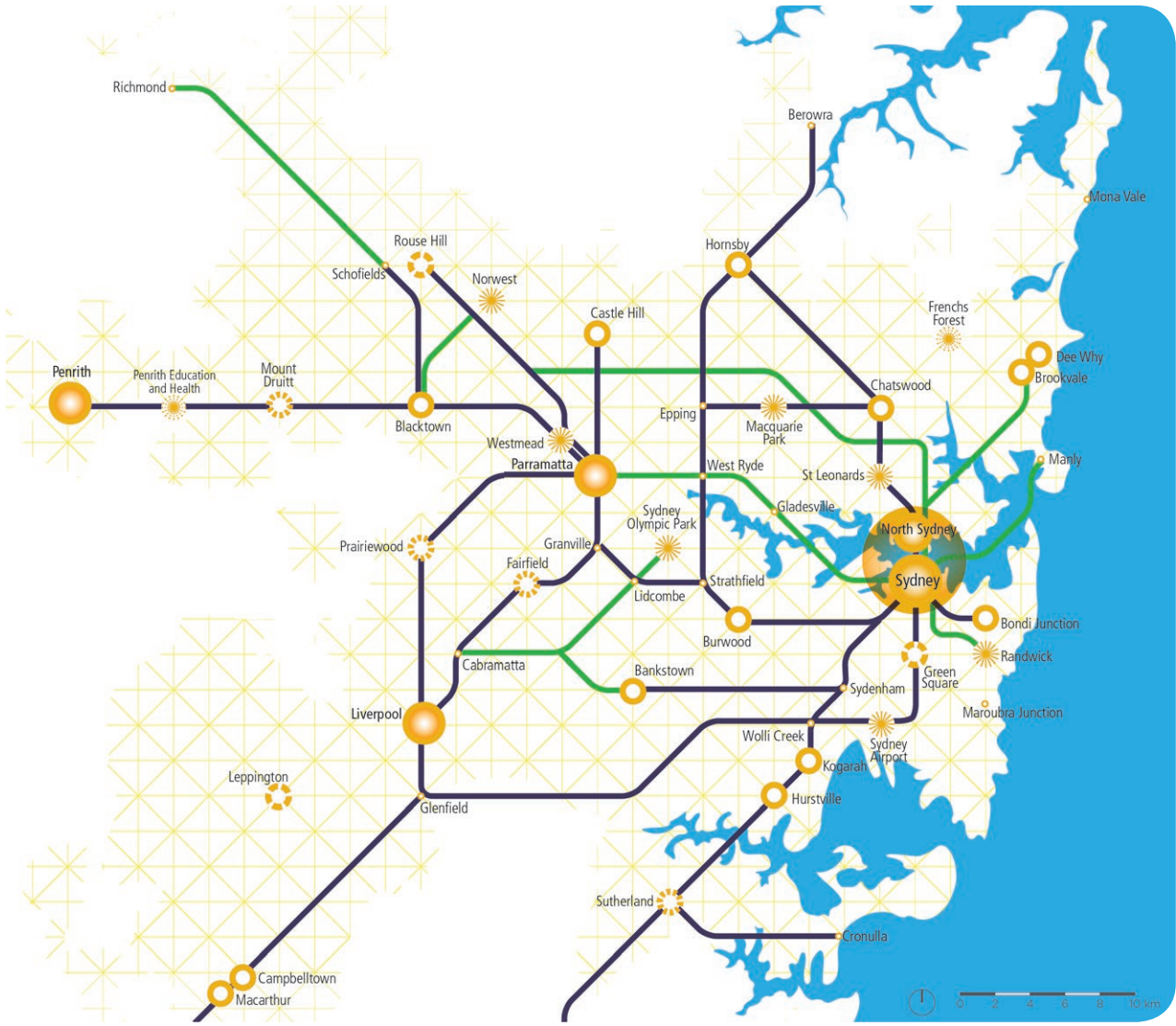
Specifically, the network hierarchies will be used to:

1. Define the function and role of each corridor or interchange on the basis of demand data (what type of customer journeys it serves) and therefore define the service standards required to fulfil that function (service capacity, speed and frequency)
2. Use data to identify when a particular corridor or interchange needs to be upgraded to meet new customer demand, based on a requirement for upgraded service standards (for example, a corridor may move up the hierarchy as population growth in a particular centre generates new travel needs)
3. Prioritise trade-offs on the network, with priority given to corridor users who are using the core function of the particular stretch of network (for example, supporting long-distance journeys ahead of local journeys)
4. Develop design standards for the provision of assets (such as engineering design standards for on-ramps along freeways)
5. Align governance and funding processes to different tiers, where relevant (for example, determining whether a local interchange is the responsibility of the local council or the NSW Government).

Figure 2.4 NSW transport planning hierarchies

Network	Land use classification	Public transport	Roads	Road Freight	Interchange
Level 1	Major centre	Mass Transit Network	Arterial network (includes motorways)	Primary	Regional cities and major centres
Level 2	Town centre	Intermediate Transit Network	Sub-arterial network	Secondary	Town centres
Level 3	Village	Local Transit Network	Local network	Tertiary	Local villages

Figure 2.5 2012 Sydney Strategic Transit Network



	Global Sydney		Specialised precinct	2012 Network
	Regional city		Potential specialised precinct	
	Major centre		Planned major centre	
			Potential major centre	
			Interchange/terminus	

The Strategic Transit Network

The Strategic Transit Network sets out the required public transport service levels based on an assessment of customer requirements along each corridor, taking into account capacity, speed and frequency. Importantly, it does not set out modal requirements – deciding which transport mode best delivers the required service levels is the next step in the planning process.

While each corridor has unique characteristics, to give clarity to the planning process the Strategic Transit Network defines three broad tiers of service requirements. This hierarchy responds to the hierarchy of centres identified by the Department of Planning and Infrastructure (as outlined in Section 2.4.1).

The Strategic Transit Network in Metropolitan Sydney in 2012 is provided at Figure 2.5.

The Strategic Transit Network hierarchy

The proposed public transport hierarchy within the Strategic Transit Network comprises three levels:

1. The **Mass Transit Network** is formed by the most important corridors and the corridors with the highest levels of demand in a region. The network is made up of the corridors that connect major centres and form the backbone of a city’s transport system. Heavy rail, T-ways and major interchanges serving multiple modes and large volumes of people (for example Wynyard, Central and Town Hall) are good examples of the Mass Transit Network.

- 2. The **Intermediate Transit Network** has lower levels of service and volumes than the Mass Transit Network. It is formed by corridors of regional importance that do not have the highest levels of demand or service level requirement. These secondary corridors link town centres and regions to major centres and connect people to the Mass Transit Network. Bus Rapid Transit, other buses, light rail and interchanges connecting one or more modes are the most common aspects of an Intermediate Transit Network.
- 3. The **Local Transit Network** is based on small local routes that serve local destinations or connect local customers to the Intermediate Transit Network and on to the Mass Transit Network. In a city or a region, customers typically use the Local Transit Network to travel short distances. From an interchange perspective, a bus stop or train station that serves small volumes of people and does not connect with other modes would be considered part of a Local Transit Network.

Figure 2.6 illustrates how these three transit types will interact to form the Strategic Transit Network.

Each tier of the public transport hierarchy delivers different levels of services. Figure 2.7 shows the core attributes of each tier.

Figure 2.6 Schematic of network formed by the three transit types

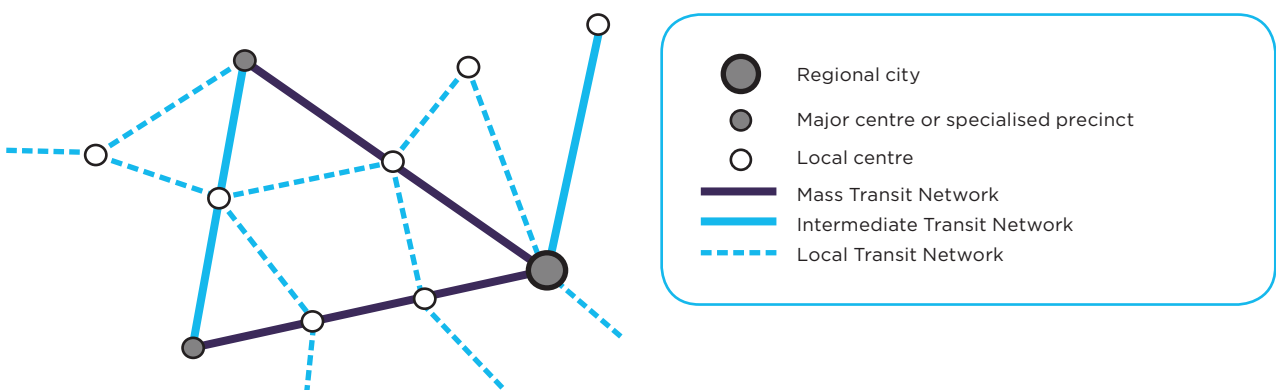


Figure 2.7 The Strategic Transit Network tiers - service levels and attributes

Service attribute	Mass Transit Network	Intermediate Transit Network	Local Transit Network
Service type	Rapid, express and all-stop services	Express services in peak periods and all-stop all day services	All-stop services only
Frequency	High frequency in peak periods. Good all day frequencies in off-peak periods	All day frequencies with higher frequency in peak periods	Relatively low frequency due to extensive coverage. Moderate frequencies in peak periods
Service span	Operates all day	Operates all day	May not operate during some periods
Priority	Operates mostly in separate right of way	Combination of separated right of way and on-street	Predominantly on-street
Speed (average, includes scheduled stops at bus stops, stations, and other stops such as traffic lights or signals)	All stop services with speeds in the range 25 to 60 km/h; express services with speeds up to 70 km/h	All stop services with speeds in the range 15 to 25 km/h	All stops services with speeds less than 20 km/h
Network coverage	Confined to a relatively small set of direct, high volume corridors	May have coverage over a wider area than Mass Transit Network. Still has a focus on direct connections	Extensive coverage over wide area. Mostly indirect and sometimes circuitous connections
Capacity	High	Medium	Lower
Station/stop spacing	Longer spacing to provide faster travel times. Typically at least 800 metres for bus and longer for rail	Generally long stop spacing (400 metres to 800 metres)	Short stop spacing to improve accessibility
Station access	Long access distances. Important role for park and ride in outer areas	Shorter access trips. Mostly walking access and some local bus	Predominantly walking access

Road network hierarchy

The NSW road network is administered under three administrative classifications – State Roads, Regional Roads and Local Roads. These define the governance and funding arrangements between the NSW Government and local government. Improvements are identified and service and design standards are set according to the separate functional classification of the road. The functional classification of urban roads is shown in Figure 2.8. The administrative classification of the regional NSW road network is shown in Figure 2.9.

Figure 2.8 Functional classification and standards used in NSW for the road hierarchy

Functional classification	Role and network management principles
Arterial road network	<p>Motorways:</p> <ul style="list-style-type: none"> • Highest form of arterial road, primarily dedicated to supporting traffic functions • Key portions of the motorway network as part of the National Land Transport Network • Commercial and freight access to strategically important ports, airports, employment areas, industrial areas, freight terminals and intermodal terminals • Major inter-regional traffic movement in a safe and operationally efficient manner • Strict access control, grade separated interchanges and carriageway separation • Traffic movement function and related aspects of capacity, congestion, speed and safety dominate network management. <p>Primary arterial roads:</p> <ul style="list-style-type: none"> • Major regional and inter-regional traffic movement in a safe and operationally efficient manner • Key routes for commercial, business and longer distance public transport travel • Freight links between ports, airports, industrial areas and motorways • Kerbside lanes allocated to bus lanes, transit lanes or clearways over significant lengths • Prioritised traffic movement, focusing on capacity, congestion management, speed and safety • Higher speed limits than transit arterial roads <p>Transit arterial roads:</p> <ul style="list-style-type: none"> • Key routes to support road-based public transport • Significant bus priority – bus lanes, bus bays, bus jump starts at traffic signals and electronic priority • Direct property access restricted (where possible)

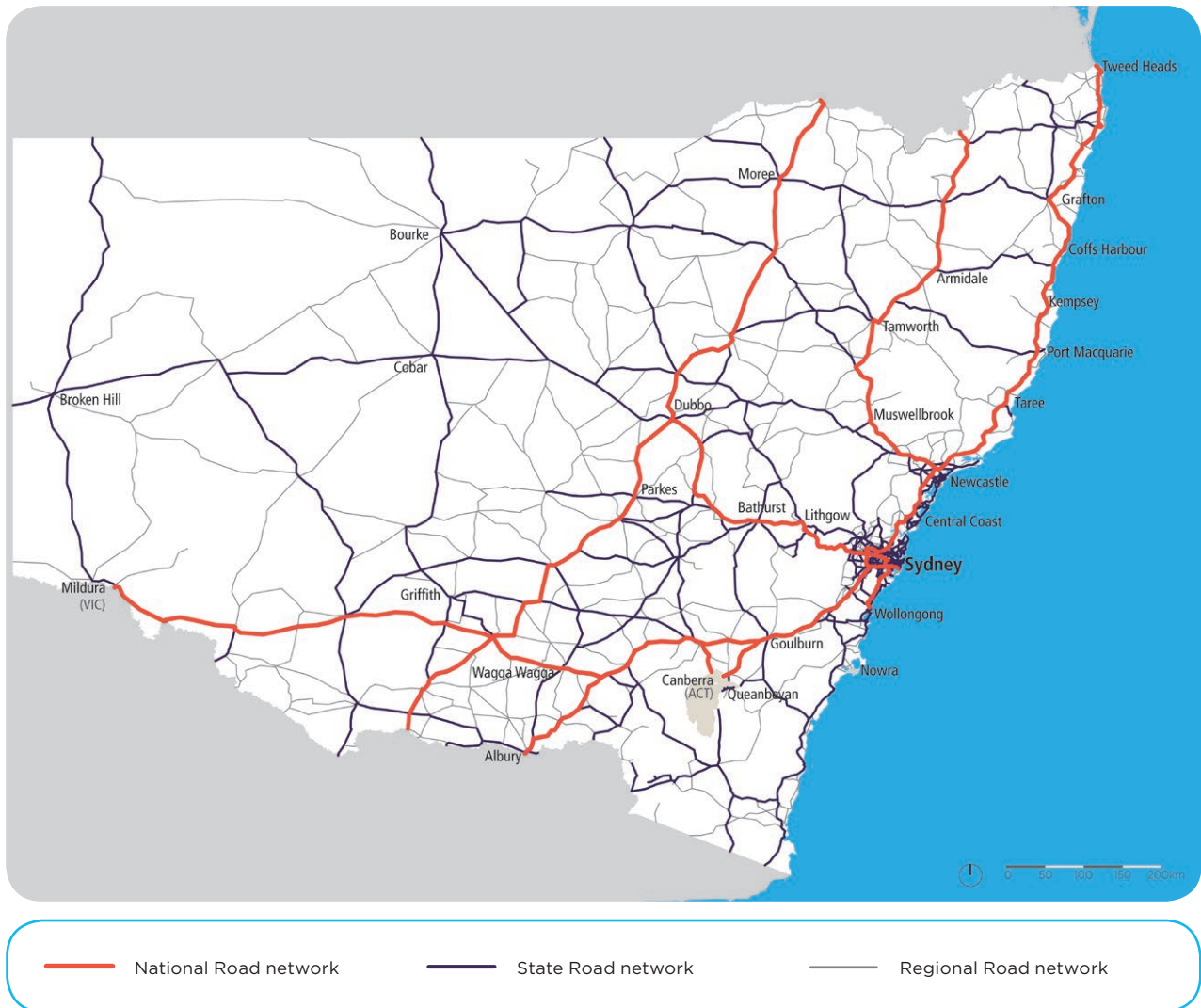
Functional classification	Role and network management principles
Sub-arterial road network	<ul style="list-style-type: none"> • Desirable community environment, balancing exposure to passing traffic and trade with lower vehicle speeds • A potential support role to urban arterial roads for the movement of traffic during peak periods • Connection between arterial roads and local roads • Distribution of traffic and bus services within residential, commercial and industrial built-up areas • Some local streets that have additional traffic functions, usually serving major traffic generators or non-local traffic movements • Strategies that reflect a balance between the traffic movement function and the need for access • Appearance that is appropriate to the surrounding living environment.
Local road network	<ul style="list-style-type: none"> • Vehicular access to abutting property and surrounding streets • Access for emergency and service vehicles • A network for the movement of pedestrians and cyclists • A means to enable social interaction within a neighbourhood, such as serving as community open space • Visual contribution to the living environment • Connection to sub-arterial roads where practicable • Strategies and design that convey to users that the local road is not solely for motor vehicles.

Roads in Regional NSW

Country roads in NSW also use the same three administrative classifications as the urban network – State Road network, Regional Road network and Local Road network. In addition, the Australian Government recognises key NSW interstate and freight routes as part of the National

Land Transport Network. The NSW Government sets design and service standards for the State Road network using a six point ranking system. The Regional Road network and local roads are maintained by local governments.

Figure 2.9 Regional NSW road hierarchy



Urban freight road hierarchy

To identify the most economically important freight roads and manage, plan and prioritise works across the State Road system, an urban freight hierarchy has been developed. This hierarchy comprises:

- Primary freight routes, which provide freight transport with access interstate or to strategically important ports, link major metropolitan areas to each other or to rural regions, incorporate the national network or carry high volumes of freight vehicles
- Secondary freight routes, which provide links for significant freight flows within regions
- Tertiary freight routes, which provide connections from the general local road system and the lower order elements of the state road system to the primary and secondary freight routes (these are often where last-mile issues occur).

Interchange network hierarchy – integrating the networks

As highlighted in Figure 2.10, the interchange hierarchy is part of the decision making process about how interchanges will be developed in the future.

If all bus stops are included, there are over 30,000 interchange locations across the Sydney Greater Metropolitan Area. Primarily the responsibility of local government, local interchanges are the entry point to the public transport network for many customers.

Across the Greater Metropolitan Area, more than 580 major interchanges have been identified. This number includes:

- All rail stations
- All major ferry wharves
- All bus T-way stops
- Major bus stops along ‘trunk’ bus corridors.

These interchanges are the principal focus of our work, which is being managed as part of the Transport Access Program. Decisions for this program are informed by a prioritisation process that considers the level of demand, the role of the interchange and the local demographics or users of the interchange (see Figure 2.10). These criteria will continue to influence investment decisions for the ongoing program of interchange upgrades.

As part of the roll-out of the Long Term Transport Master Plan, an *Interchange Strategy* will include service standards principles for each tier of interchange and support appropriate service frequencies.

Figure 2.10 Current classification and characteristics of interchanges in NSW

Service level	Major centres and regional cities	Town centres	Village/Local
Service characteristics	Large interchange places: multi-purpose trips	Transport hub linking rail, bus, bike, walk, drop-off facilities	Localised interchange infrastructure
	Good commercial potential	Medium sized interchange places	Entry to network rather than interchange between modes
	Integrated with town centres – vibrant and busy	Residential/small commercial potential	Shelter, lighting, network and timetable information
	Major interchange facilities – rail, bus, ferry, bike, walk, drop-off facilities	Integrated with town centres – vibrant and busy	Walk, drop-off facilities, bus to rail, bus to ferry
	Minimal commuter car parking	Some have commuter car parking	Some have commuter car parking

Planning cycle routes

We are investigating investments to support cycling, using a set of criteria that considers the type of cycling path required, the purpose for which it will be used, the required capacity and the connections that the investment will support. The development of a hierarchy for cycling investments will help to plan cycleways as part of the road system (in particular, planning that will occur for new roads).

2.4.4 Step four: Moving towards a connected and integrated system

In an ideal world, customers could always travel directly to their destination with no interchange between major transport modes. In the real world, there are trade-offs between the directness and speed of a journey, and between service frequency and the number of stops along a given route that need to be addressed through the use of interchanges on the transport network.

The overall viability of the transport network is important. Simple and consistent service patterns improve network legibility and support the development of connecting services. Systems that attempt to meet all markets through numerous and complex patterns ultimately provide a compromised transit option. Incorporating a degree

of interchange in the transport system means the needs of the majority of customers are met, while travel options for other trips are retained.

In conjunction with the network hierarchies, the planning of the State's future transport system must strike a balance between maximising direct journeys and using interchanges between services to improve overall journey speeds and the number of destinations. Determining this balance will rely on two important network planning principles:

1. Greater interchange can expand travel opportunities

A radial system requires all customers to travel to the city centre. However, a transport system that embraces interchange in its design (and that makes interchanging between services easy and quick) expands travel opportunities, including new opportunities for creating cross-regional connections between regional centres.

Imagine a bus system in a small town with only two routes: if the two lines are not connected, customers' travel options are limited to the stops on each line. However, if the lines are coordinated and cross at an interchange point, customers have double the transport opportunities – they can get to twice as many places in the same amount of time at no additional cost to the transport service provider.

2.5 How network planning underpins our decisions

2. A connected network better serves customers

Many modern cities and centres, such as Copenhagen and Singapore, rely on easy connection of different modes to increase choice for customers and to provide more diverse travel opportunities.

A transport network with a high level of interchange can be formed as a radial network or a connected network. A radial network is one in which corridors and transport services feed into a central point and back out again. A connected network is formed by corridors and transport services that both feed into a central point and operate cross-regionally. As a result, service coverage improves and service frequencies can increase. This concept is illustrated in Figure 2.11.

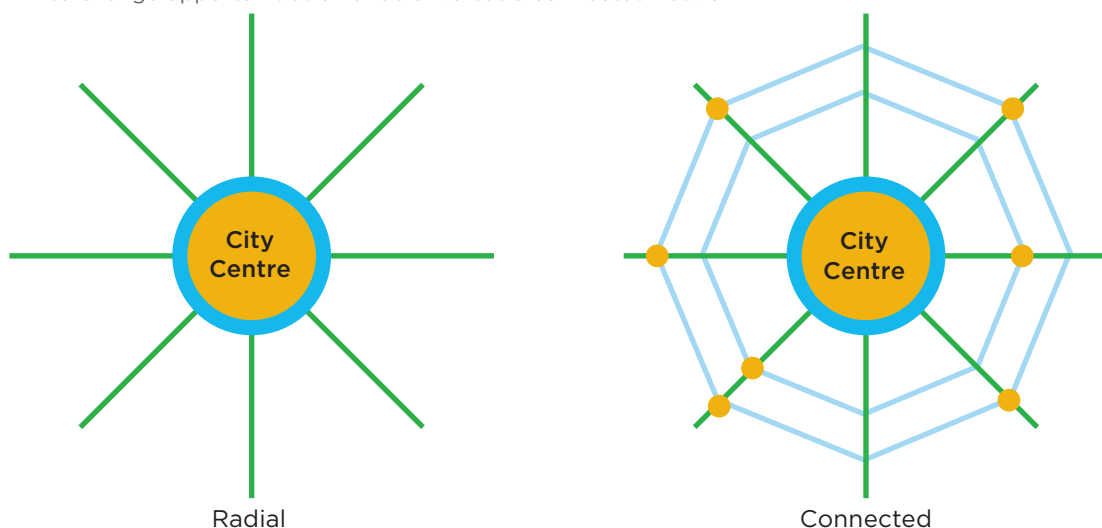
Sydney's network is much more of a radial system than a connected system. Our future transport planning will focus on moving the transport network closer to a connected transport system to give our customers new travel opportunities and choices through increased interchange. This will support more cross-city and cross-region journeys. The development of effective and easy to navigate interchanges will be an important part of this approach. These interchanges will be focused on frequency of service or aligned timetables to ensure that modes can work together and journeys are as seamless as possible.

The Strategic Transit Network and the series of public transport, road and interchange hierarchies proposed in this Master Plan provide the foundations of the transport planning process. These approaches help to define the transport service requirements for each corridor and interchange. Building on these approaches, the next step in the planning process is to assess where the existing network does not meet (or is forecast to not meet) those service requirements, and to take appropriate action.

The challenges and solutions set out in Chapters Three to Eight of this Long Term Transport Master Plan present the results of this assessment process, together with our detailed analysis, that highlights the need for an integrated and seamless transport system based on a connected approach to planning and investment.

In particular, Chapters Four and Five provide detail on Sydney's most constrained transport corridors, and explain our proposed actions to address those constraints.

Figure 2.11 Interchange opportunities on a radial versus a connected network





3



INTEGRATING MODES TO MEET CUSTOMER NEEDS

CHAPTER SUMMARY

Our transport challenges

This chapter sets out the challenges that must be addressed to build an integrated transport system that responds to customers' expectations:

- Delivering an integrated and customer- focused ticketing system that promotes public transport use and helps make customers' journeys simple and easy
- Ensuring that interchanges facilitate ease of travel, improve the customer experience and add value and amenity to their neighbourhoods
- Aligning timetables across all transport modes to make cross-modal journeys as fast and convenient as possible
- Giving customers access to real-time and reliable travel information so that they can plan their journeys while on the move
- Modernising our transport fleet to provide high levels of comfort and support greater interchange and high frequency services.

Taking action

A range of initiatives will address these integration challenges. These initiatives are underpinned by a strong customer-focus that aims to provide the mix and balance of services that match travel requirements. Highlights include:

- **The Opal card - a new integrated electronic ticketing system** for Sydney, the Hunter, the Illawarra and the Blue Mountains
- Actions to target future investment in interchanges through the *Transport Access Program*, including **an Interchange Strategy** to set the overall direction for improving the management of interchanges, the definition of **interchange design principles and guidelines**, and **planning interchange upgrades**
- **Increased park and ride** facilities, including as part of the North West Rail Link
- Aligning, improving and simplifying public transport timetables across modes
- Accurate and **modern real-time information and wayfinding** to support seamless use of public transport systems within Sydney and NSW
- Investment in a **modern public transport fleet**, including new trains and ferries, and new buses in growth areas and on strategic corridors.

These practical initiatives are complemented by the integrated planning approach outlined in Chapter Two.

Our transport challenges

As our population grows and we make more and more trips, our travel patterns are becoming more varied. To cope with this increasing demand and complexity, our transport system needs to become more connected and networked. We need to join up the different modes of transport so that interchange becomes a simple and easy process that genuinely opens up new options for travel and ensures that the transport system works for its customers.

Currently, about 15 percent of public transport journeys to work in Greater Sydney use more than one mode of public transport. If we can make the process of interchange as fast and simple as possible, this proportion would increase, allowing travellers to take better advantage of the full reach of our public transport system.

Integration is not just an issue for the public transport network. We need to balance modal solutions to recognise the individual strengths and roles of each mode in supporting wider network outcomes.

Well integrated transport systems combine private road-based transport with public transport, for instance, through the provision of park and ride facilities and secure bicycle parking at interchanges.

Historically, each transport mode in NSW has operated largely independently, with little consideration given to the best ways in which people can move quickly and easily across modes.

The Long Term Transport Master Plan will meet a number of challenges to building an integrated transport system for Sydney and NSW:

- **Integrated electronic ticketing:** As Australia's only global city, Sydney's public transport ticketing system should match the best systems used by other large, globally connected cities to make cross-modal journeys easier.
- **Modern interchanges:** Our transport interchanges need to facilitate efficient travel and help to manage travel demand during peak periods, while contributing to positive customer experiences. They also need to be the cornerstones of lively, safe and attractive precincts that add value and amenity to their neighbourhoods.
- **Aligned timetables:** Timetables across modes need to be better aligned to provide a strong operational basis for an integrated system, and to help customers navigate the system quickly and easily.
- **Real-time information:** Giving customers access to real-time, reliable travel information will be critical to encouraging people to change between modes as part of an integrated transport system. Legible wayfinding that guides customers within and through the system should align with real-time information.
- **Modernise the transport fleet:** Providing customers with modern and comfortable trains, buses and ferries will be essential to provide a reliable system aligned with customers' expectations.

3.1 Matching the world on electronic ticketing

Around the world, the best transport systems make it easy to cross between modes. Most of these systems, such as those in London, Hong Kong and Zürich, have electronic ticketing. In comparison, a number of ticketing problems in Sydney can make using public transport frustrating, confusing and unattractive:

- There are separate tickets for each mode of transport and multiple ticket types, with customers generally required to buy a separate ticket at each point where they change from one mode to another. In all, there are currently 176 ticket types across all modes in Sydney.
- Tickets are not readily available beyond the physical network. With a few exceptions, tickets for rail travel have to be purchased at stations, but bus tickets must be purchased at designated outlets prior to boarding a bus during peak periods.

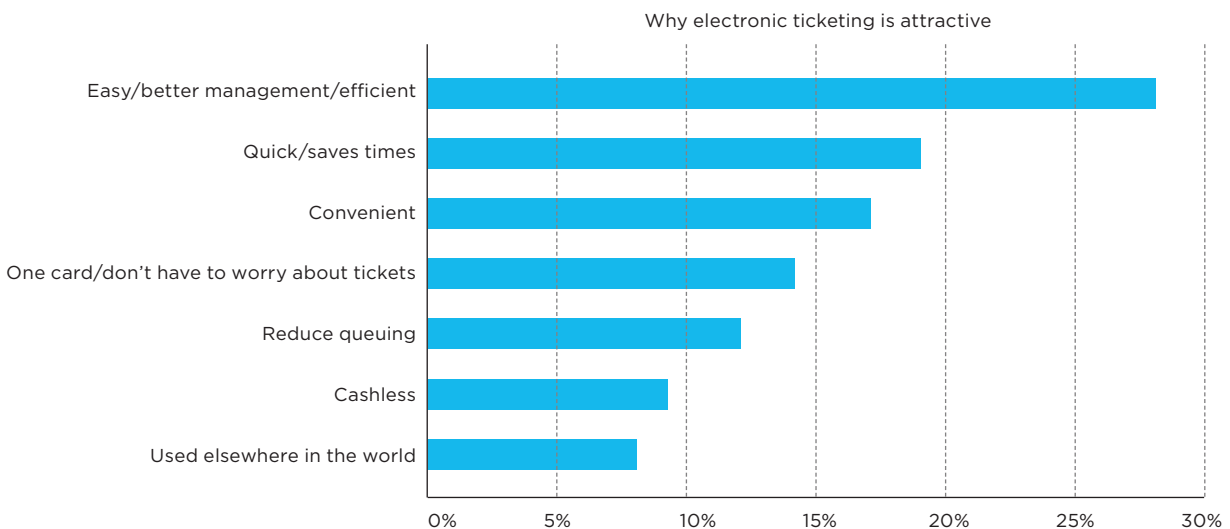
As a means to deliver integrated ticketing, the NSW Government is developing an electronic ticketing solution. Asked why they were attracted to electronic ticketing in a recent survey by Transport for NSW, customers indicated that they seek a solution that is easy to use, quick and convenient (see Figure 3.1).

3.2 Creating modern, integrated and user-friendly interchanges

Public transport interchanges are the gateway to the public transport network. They are where customers join or transfer between modes on the transport system, including combinations of rail, bus, car, taxi, ferry, light rail, bicycle and walking and are key focal points within town centres. Transport interchanges encompass infrastructure facilities that allow for safe, quick and informed customer access to the transport network such as pedestrian flow paths, cycle access, drop off/pick up, taxi ranks, bike racks, park and ride facilities, safety and security systems, customer and journey information systems and one-stop shop customer information centres.

In a well-integrated and coordinated system, interchanges facilitate efficient travel and make it easy to move between different transport services quickly and seamlessly. When customers have to wait, they should be able to do so in safe, comfortable surroundings. Interchanges can also offer shops, toilet and baby change facilities, information and first aid, among other conveniences.

Figure 3.1 Customers' perspective on electronic ticketing - Transport for NSW 2012



Improving the design, management and operation of interchanges across Sydney and our regions will provide public transport users with more comfortable and pleasant journeys, and will encourage more people to travel by public transport. Better integrated interchanges will help to manage the increasing demand for public transport services to the CBD during peak periods and the growing requirement for cross-town travel. Well-designed and configured interchanges have the potential to be places that add value and amenity to their surrounding communities, over and above their transport functions.

Each day, some 600,000 interchange movements are made across Sydney as people transfer between trains, buses, light rail and ferries. While our interchanges are effective in enabling this important basic function, many interchanges are old and lack the modern facilities and service standards rightly expected by customers.

At some busy interchanges, bus, ferry and train connections are not close to each other and the process of interchange can be unclear. For example, many people want to change between ferry and train at Circular Quay, but the concourse is congested with pedestrians, entrances are far apart and signs are obscure. At Wynyard Station, where 20 different bus stops are dispersed on the surrounding road network, access to the station is confusing for interchanging passengers.

Following recent investments, many interchanges incorporate facilities designed to encourage people to walk or cycle to connect with other modes of travel. These facilities include safe walking routes, storage and secure bike racks.

Addressing these practical issues presents a great opportunity to make moving around Sydney by public transport a far more attractive experience. Improving our interchanges to better meet the needs of customers will greatly enhance our public transport system.

Cost-benefit analysis of interchange upgrades indicates that there is a demonstrated case for this type of investment. The economic benefits of a recent program to upgrade 13 interchange locations across Sydney were measured as \$1.80 of benefit for every \$1.00 invested.

Until the establishment of Transport for NSW, there has been no clear lead agency or single body responsible for designing, developing and managing interchanges. Responsibilities have been shared between the NSW Government, its various agencies and local government, which is responsible for the majority of bus stops. This can mean services and facilities that do not fit easily within a particular transport mode can be overlooked. It also means that planning for interchanges responds to the requirements of each separate transport mode, rather than to meet customer needs.

3.3 Aligning timetables to better suit our customers

There is complexity in planning and aligning timetables across transport modes. When developing transport timetables, planners need to determine service frequency to match demand, minimise customer transfer times and cater for crew and vehicle usage.

Historically, timetables have focused on achieving the best outcomes for individual modes. This can misalign services, hampering multi-modal

integration. Examples include bus services arriving at rail stations just minutes after the rail service has left, increasing wait time and overall journey time.

Aligning timetables between different public transport modes will help to minimise transfer times between different services across the transport system. When combined with integrated ticketing and modern, integrated interchanges, fast overall journey times can be achieved and customers will enjoy a seamless journey.

3.4 Providing real-time information for customers

Customers want real-time information about the status of their journey. They want to know if their service is running late, where they need to get on or off a train or bus, whether they will make their connection with another service, whether their drive will take longer than usual and how they can link journeys together.

While many rail customers can access real-time information at busier stations, customers on other modes have limited information, and less if they

are still at home or the office. For example, drivers can access predicted journey times on some major routes and congestion data. Ferry customers can receive audio announcements when on wharves.

With more people using smartphones and other GPS-enabled portable devices, transport customers expect greater access to reliable real-time information about services at all stages of their journey.

3.5 Increasing the number of car parks and bicycle spaces at interchanges

A public transport customer survey of 20,000 people in 2011 showed that 32 percent of rail passengers are dissatisfied with parking at rail stations. Customer dissatisfaction with car and bicycle parking at rail stations, particularly in outer urban areas, was also raised through the consultation process for the Long Term Transport Master Plan.

Opportunities exist to increase park and ride, drop off points and secure bike lockers or racks, particularly at new stations. Commuter car parks for park and ride are most appropriate away from commercial centres to minimise conflict with local employment trips, shopping trips and urban amenity.

3.6 Modernising the public transport fleet

The public transport fleet of trains, buses, light rail and ferries is at the heart of our public transport system. An efficient, integrated and modern transport system needs vehicles that are reliable, efficient, comfortable and are designed to meet the specific needs of customers for particular journeys.

A state as large as NSW, and a capital city as extensive as Sydney, requires a large fleet of carriages, vehicles and vessels.

The challenge is to continually maintain and modernise and grow the fleet to meet increasing travel demand.

The L, R and S train carriage sets have been in service for up to 40 years and are being replaced to improve customer accessibility, comfort and security, and to increase rail capacity in Sydney.

On our CountryLink network, the XPT rolling stock has typically covered more kilometres than comparable trains in Europe, due to our small fleet size and high levels of use. The XPT rolling stock has exceeded its original design life with all trains needing either a significant upgrade or retirement.

The metropolitan and regional bus network has a mix of older and newer fleet. The bus fleet is progressively being replaced to improve customer accessibility, comfort, security and passenger capacity.

The expectations of customers are changing in respect to rolling stock and the transport system needs to change with them. Our customers tell us they expect clean and comfortable vehicles that feel safe (people value being able to clearly see from one end of a carriage to the other, and to feel connected to the driver on a train or a bus), and where internal temperature control works on days of extreme heat or cold. Fleet refurbishment will renew ageing assets to modern standards suitable for use on the Sydney or NSW transport network.

Likewise much of the Sydney Ferries fleet requires refurbishment and replacement to ensure reliability and meet customer expectations for a modern and comfortable service.

Different service patterns and demands in different customer segments will increasingly require different rolling stock design. For example, busy routes with high frequency services will require trains that place more emphasis on speedy boarding and alighting through large and numerous doors. Longer distance journeys to regional destinations will place greater emphasis on comfortable and spacious seating.

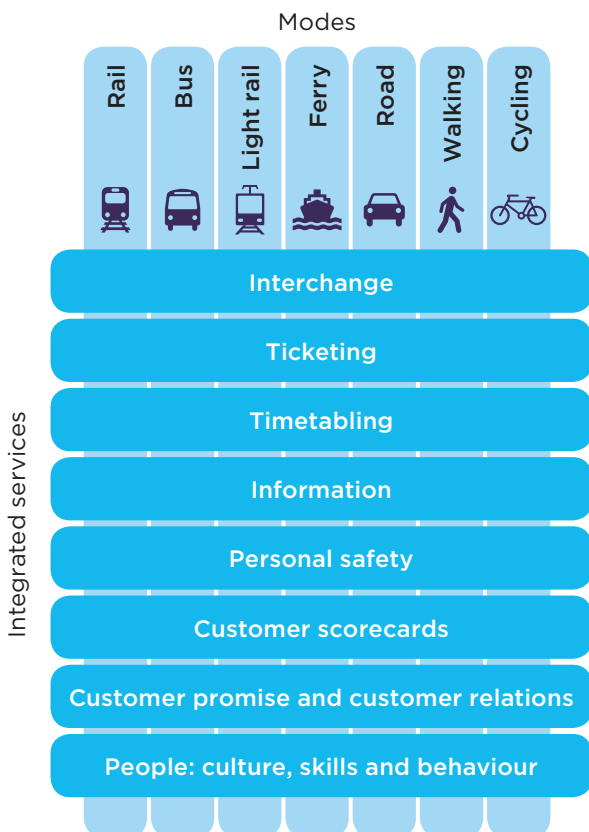
Finally, tougher emissions standards and a greater need for energy efficiency will also drive the need for fleet modernisation across all modes.

Taking action

Integrating transport modes will create opportunities for flexible, targeted and blended services. The Long Term Transport Master Plan proposes three interconnected sets of actions to help deliver an integrated journey experience for our customers:

- Improvements to information and ticketing, including the deployment of the electronic ticketing through the Opal card and better provision of real-time information for customers and improved signage at interchanges
- Improvements to interchanges and service alignment, including upgrades to make interchanges more user-friendly and better aligned timetables
- Investments in new public transport fleets to support greater interchange and higher frequency services.

Figure 3.2 Public transport integration



3.7 Information and ticketing

Action Deliver a new, integrated, electronic ticketing system – the Opal card

Network deployment of the card electronic ticketing system is scheduled over two years, which has commenced with a trial for Sydney Ferries.

There are three key incentives to encourage uptake of the Opal card and greater public transport use:

- A weekly reward providing free travel after eight paid journeys in a week;
- A \$2.50 daily cap on Sundays for Opal card customers; and
- A daily travel cap of \$15 from Monday to Saturday helping tourists and one-off users with travel affordability.

In addition to the benefits delivered to passengers, the Opal card will enable other opportunities, such as:

- Improving data collection and our understanding of origin-destination and loading data to inform planning and investment decisions
- Offering the possibility to expand the system beyond the Greater Sydney region
- Providing the potential for customers to use the Opal card to pay for other types of services.



OPAL - OUR NEW INTEGRATED TICKETING SYSTEM

The electronic ticketing system, accessed using an Opal card, will make customer journeys seamless. The Opal card will provide an easy, convenient and fast new way of travelling on public transport. It is a smartcard similar in size to a credit card and will work much like an e-tag. Customers using the Opal card will tap on at the start of their journey and tap off at the end.

The Opal card uses proven and secure technology based on London's Oyster card with new development for Sydney's unique transport requirements.

The card is being introduced on a limited basis on Sydney ferries from December 2012 and will become progressively available across further ferry routes throughout 2013. The first

customer trial starts on the Neutral Bay service on 7 December and will then move to the Manly ferry service and later other ferry services. From mid 2013 it will be introduced on Sydney's trains and on buses after that.

Come 2015, 42 ferry wharves, 307 train stations and more than 5,000 bus and light rail vehicles will have Opal card equipment operating in Sydney, the Hunter, Central Coast, the Illawarra, Southern Highlands and the Blue Mountains.

Customers won't have to queue for tickets or worry about having the right change for their fare, making entry onto public transport faster.

Customers can top up their Opal card accounts with an auto top-up system, cash, over the phone, online, or at Opal retail outlets.

Action Provide accurate, real-time and customised travel information

Providing accurate and timely information to transport customers is a critical element of operating and managing the transport system.

We will continue to refine and expand our approach to providing real-time information that is based on customer needs across all modes and delivered through a variety of channels. We will ensure that we have the right control systems and processes in place to provide this information.

A number of programs are already in place to enhance the capacity of Transport for NSW to engage with its customers and enhance their travel experiences.

The Public Transport Information and Priority System (PTIPS) has been deployed to over 3,300 buses, including all STA buses and buses from nine private bus companies, and will be deployed to the remainder of the NSW private bus fleet by June 2013. It gives bus operators a valuable real-time service monitoring tool and provides priority at more than 1,100 traffic lights for these buses when they are running late, to improve punctuality.

The TXTBUS SMS service provides bus passengers with real-time bus arrival prediction information. This is particularly beneficial for hearing-impaired customers as an alternative to the 131 500 telephone service. The service is currently receiving around 240,000 requests per week. Applications for iPhone and Android smartphones are being developed to provide more user-friendly and enhanced features to supplement the SMS service, together with a publicly accessible real-time bus status data feed for use by application developers. In addition, Passenger Information Displays have been installed at 11 bus stops on Sydney's Northern Beaches. These signs display real-time bus arrival prediction information provided by PTIPS.

The Live Traffic NSW website provides road users with real-time information about hazards, traffic cameras and traffic flow, travel time, major events, and other road information. Upcoming features include the ability for the public to register to receive personalised email alerts for hazards on defined personal journeys. A free Live Traffic NSW iPhone application and mobile website are up and running, and Android and iPad versions of the application are being developed and are scheduled

for release later this year. Real-time travel time information services are provided on variable message signs, and on the Live Traffic Website, to motorists on the Sydney-Newcastle Freeway south of Ourimbah (M1), the Westlink M7 and the Western Motorway (M4). Implementation of travel time information services for the F3 north of Ourimbah (M1) is scheduled for completion by December 2012. Planning has commenced to extend travel time information services to the rest of the Sydney Motorway Orbital network (M2) including the Lane Cove Tunnel, Gore Hill Freeway (M1), Eastern Distributor (M1), Southern Cross Drive (M1), M5 and Hume Highway from M7 to Narellan Road (M31).

Sydney Ferries' \$14 million investment in the Ferry Operations and Customer Information System (FOCIS), provides information through screens, audio announcements and facilities on wharves for hearing and vision impaired customers. It will provide real-time customer information on all wharfs serviced by Sydney Ferries, including information on destinations served, departure times and routes. An opt-in SMS service will also be available to provide an early warning if a ferry is unavoidably delayed.

We will also continue to install electronic real-time indicator boards at major railway stations where not already present.

Action Integrate and simplify wayfinding across the public transport system

Transport for NSW is developing a multi-modal approach to wayfinding for Sydney, the Greater Metropolitan Area and regional NSW.

An integrated wayfinding system will make it easier for customers to use the public transport network. Design of a multi-modal system of standard sign types, maps and other information elements is underway. This system will address the needs of customers using all modes of public transport, including customers interchanging between modes.

Elements of the built environment such as wayfinding signage and poster displays for maps, fare and local information will be provided at key decision points and will be coordinated with information delivered through other channels. This will include through websites, on mobile devices or through electronic displays and will give customers access to the information they need when they need it.

3.8 Seamless interchanging

Action Deliver modern, integrated and customer-focused interchanges

Improving the design, management and operation of interchanges will give regular public transport users more comfortable and pleasant journeys, and will encourage more people to travel by public transport.

Actions to target future investment in interchanges include:

- We will upgrade existing Sydney CBD interchanges, build new interchanges and improve the precincts adjacent to them. Upgrades will be considered for Wynyard, Town Hall, Redfern, Central and Circular Quay Stations. These projects will contribute to the creation of attractive, safe pedestrian friendly urban precincts throughout the CBD (see Chapter Four).
- Our *Interchange Strategy* will improve the management and delivery of interchanges. The Strategy will identify how interchanges are planned, where they are placed, how they are funded and how they are managed and maintained. The Strategy will also consider park and ride requirements.
- We will apply consistent design principles and guidelines for the urban design of interchanges to help create active, vibrant, multipurpose interchange environments that integrate with surrounding areas.
- We will continue to plan, prioritise and develop business cases for investment in interchanges to close any gap between current and proposed service standards.
- An integrated service delivery operating model will manage interchanges more effectively, including a model of ownership and maintenance that clearly articulates accountability for end to end management of interchanges. A draft model is illustrated in Figure 3.3.

Action Increase park and ride at interchanges

Better park and ride, and bike and ride, facilities at rail interchanges will increase the attractiveness and use of public transport. Through the Transport Access Program, we will commence construction of nine new park and ride facilities in the next two years, providing more than 1,200 additional parking spaces. In the medium to long term, we will make more investments to improve parking for public transport customers. In addition, 4,000 commuter car parking spaces are planned as part of the delivery of the North West Rail Link.

Action Design and build modern interchanges that add value to local communities

Public transport customers use a variety of modes including non-public transport modes as part of an overall trip. For many customers, interchanges are an entry point to the public transport system. Improving interchanges to facilitate easier entry into the public transport system is important to the transport experience of customers. Figure 3.4 outlines the many functions and characteristics of interchanges, including convenience, amenity, information and access to a range of modes.

TRANSPORT ACCESS PROGRAM

The Transport Access Program delivers accessible, modern, secure and integrated transport infrastructure where it is needed most. This includes station upgrades, better interchanges, ferry wharf upgrades and park and ride facilities. Over four years, more than \$770 million will be invested in the Transport Access Program.

The Transport Access Program integrates planning and delivery of targeted works aimed at providing:

- Stations that are accessible to people with a disability, older people and parents with prams
- Modern buildings and facilities for all modes that meet the needs of a growing population
- Modern interchanges that support an integrated network and allow seamless transfers between all modes for all customers
- Safety improvements including extra lighting, help points, fences and security measures for car parks and interchanges
- Signage improvements so customers can more easily use public transport and transfer between modes at interchanges
- Upgrades of wharves that provides access to people with disability, older people and parents with prams.
- Other improvements and maintenance such as painting, new fencing and roof replacements.

The first round of funding will see improvements at over 35 locations. The second round of funding will build nine new park and ride facilities, providing more than 1,200 additional car spaces at train stations across the Sydney and NSW Trains networks.

Further planning and design work will identify future projects through evidence-based criteria including current and future patronage, the needs and demographics of customers, whether important services such as hospitals or educational facilities are nearby, and the accessibility of other nearby transport interchanges and facilities.

In the five and 10 year periods beyond 2014-15 the Transport Access Program will continue to focus on a combination of major transport infrastructure upgrades and smaller tailored projects. The investments made under the Program will reflect the actions outlined in the Long Term Transport Master Plan. Decisions will reflect the service standards defined by the Strategic Transit Network and will align with major investment programs such as *Sydney's Rail Future*.

Figure 3.3 Draft Integrated Service Operating Model for interchanges

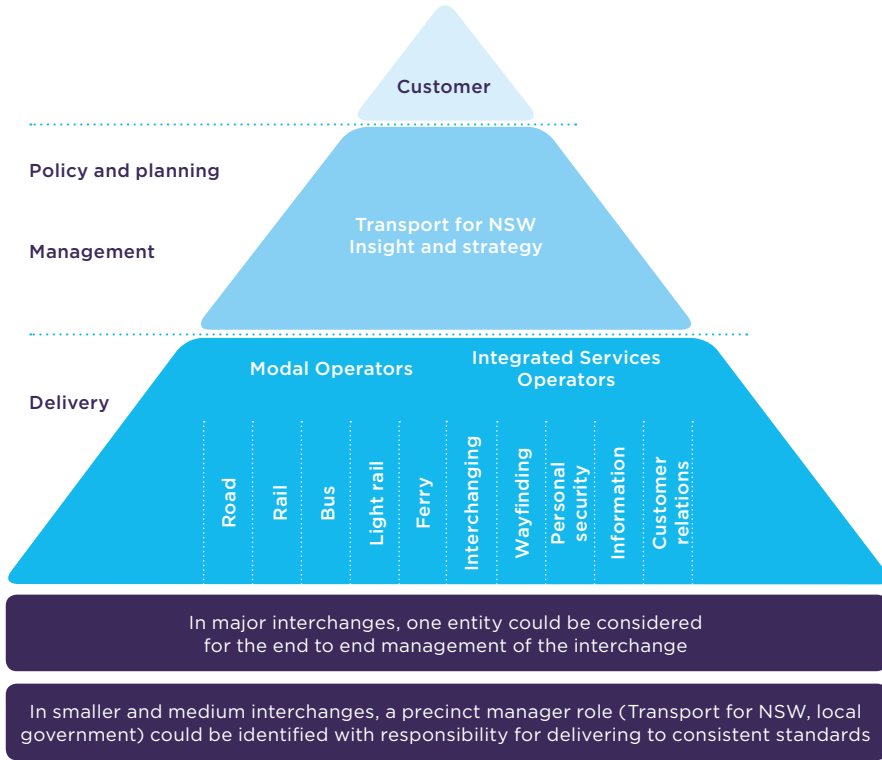
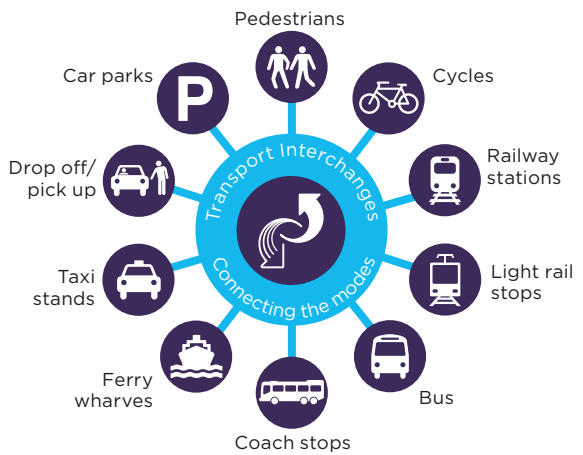


Figure 3.4 Functions of transport interchanges:

(i) range of services provided to customers



(ii) range of modes/access methods being connected



The *Transport Access Program* invests and delivers targeted works at interchanges, stations and wharves. These changes will facilitate easier entry to the public transport system for customers. In addition to the program, easier entry to the public transport system can be supported by strong urban design around interchanges and the strengthening of walking links and cycling links to interchanges.

Action Integrate and align timetables across the public transport system

We will integrate and align public transport timetables to create more seamless, timely journeys for customers.

We will identify priority services where integrated timetables can increase patronage and improve the customer experience, based on evidence of customer travel behaviours and community feedback.

Timetable integration will commence around the 2013 rail timetable which will provide consistency in the rail timetable and help to simplify and coordinate timetable across other modes. The 2013 timetable will take account of our ability to add additional peak services through the operational changes being delivered through *Sydney's Rail Future*. Benefits will include more frequent services during peak times, improved journey times and better reliability and punctuality.

The new 2013 rail timetable will be complemented by bus timetable changes to closely align bus and rail services. A review of the ferry network will provide an opportunity for greater integration with bus and rail services.

The timetabling process will be an ongoing activity, with changes being made to incorporate new services as initiatives in the Long Term Transport Master Plan area delivered. As service frequencies increase, timetabling on some of the network may become less important as passengers will be able to turn up and go, confident of short waiting times between public transport services.

Action Update and modernise passenger transport legislation

NSW passenger transport legislation focuses on specific modes of transport. This means that the way passenger transport services operate and are managed in NSW is not always consistent across modes. These inconsistencies can make it difficult for the NSW Government to purchase or allow new or innovative service types to operate. In September 2012, the NSW Government released a Discussion Paper reviewing passenger transport legislation in NSW to emphasise outcomes for customers rather than the types of vehicles which are used to provide a service. The proposed reforms would increase the NSW Government's ability to deliver flexible and innovative transport services in the future.

3.9 Investing in a modern public transport fleet

Our fleet program provides for the ongoing replacement of the existing fleet as the operational life of units is exceeded, and for the expansion of the fleet to increase capacity.

Specifications for new fleet will be based on service delivery needs and will take account of existing system requirements and opportunities to adopt improved or new technologies that can improve reliability, capacity, sustainability and customer comfort. For example, new train specifications allow for the introduction of Automatic Train Protection systems on the rail network. Specifications and procurement processes will also maximise the opportunities for best value responses from suppliers.

A description of the short to medium term plans to manage the fleet is provided below. These plans will be periodically reviewed and refreshed to take account of changing patterns of growth and service requirements.

Longer term fleet plans will be strongly influenced and aligned with other reform and program elements such as network extensions and initiatives to support and contribute to growth in public transport demand and better service delivery. The plans will also be influenced by funding considerations.

Action **Expand the Sydney Trains fleet to include modernised double-deck and new single-deck trains**

Over the next 10 years, approximately 52 percent of the existing electric fleet will be replaced and the total fleet size will grow by 28 percent. This means that in 2020 there will be approximately 460 more carriages on the network than there are today.

The logistical effort required to accept so many new trains onto a busy network and of managing the disposal of so many old ones, is a major undertaking. Supporting infrastructure such as

traction supply capacity will need to change and grow. The growth in trains will require more than seven kilometres of additional stabling, additional off-peak day stabling and a major increase in capacity of the existing maintenance facilities. The scale of the rolling stock program expansion and renewal implies that contracts need to be carefully monitored to ensure on time delivery.

Suburban fleet replacement and growth: Waratah A-sets

Sydney's next-generation suburban passenger trains – the Waratah fleet – will be the most technically advanced on the Sydney Trains network, improving reliability, safety and the travel experience of commuters with new air-conditioned carriages (78 sets and two spare carriages) being progressively rolled out across the network. These will replace life-expired non air-conditioned suburban cars and accommodate increased growth in rail services.

As part of the NSW Government's Rolling Stock public private partnership, Reliance Rail will ensure the Waratah trains are available until 2040 and beyond.

Tangara refurbishment

The Tangara fleet, now between 17 and 24 years old, has been maintained on the basis that it will require a substantial mid-life refurbishment including installing up-to-date technology. A substantial program of refurbishment is proposed to mitigate the risk of fleet unavailability for timetabled services and to reduce and remove obsolete technology that is no longer supported by industry. The refurbishment will extend the service life of the Tangara fleet, providing a significant financial benefit by deferring the replacement of the Tangara fleet with new cars in the short to medium term.

New high capacity single-deck rolling stock

In the longer term, as part of *Sydney's Rail Future*, new single-deck rolling stock will operate on specific parts of the network, including on the North West Rail Link. With single-deck rolling stock, the overall capacity of the line will be higher than can be achieved with the existing double-deck fleet. While there will still be plenty of seats on single-deck trains, increased standing room and flexible spaces will be introduced to cater for changing demand. Single-deck trains can load and unload quickly at stations, allowing more trains per hour on any given line.

Future rail rolling stock will be carefully planned through a rail fleet procurement strategy.

Action Modernise the NSW Trains fleet to meet multiple journey requirements

A fleet management strategy addressing future needs, including renewal of aged rolling stock, will be developed as part of the overall NSW Trains Passenger Rail Services Strategy, outlined in Chapter Six, in order to provide the right services for the right journey.

Action Modernise and expand Sydney's bus fleet

We are expanding the bus asset base to meet service needs including:

- Existing capacity constraints and forecasts of increasing demand anticipate that bus service kilometres travelled in the Greater Metropolitan Area will increase by over 16 percent from 2011 levels to 2031
- New services are required for growth areas, most notably the North West and South West Growth Centres in Sydney
- Higher frequency services are needed on strategic corridors
- Systemic service issues have been identified through customer feedback
- Dedicated school services are needed where route services are not viable.

In addition to expanding the bus fleet, funding programs will provide for the replacement of the fleet over time. New buses will meet modern standards, leading to a more fit-for-purpose, sustainable fleet with improved capacity, fuel efficiency, better comfort and improved accessibility. Fleet expansion and renewal will be carefully planned through a bus fleet procurement strategy.

Operating model options for bus asset management will focus on promoting consistent and reliable service standards.

Action Modernise and expand Sydney's ferry fleet to meet new service requirements

A fleet procurement strategy will be developed under the service contract with the new franchised ferry operator following completion of the ferry network review in the initial years of the contract. This will deliver modern ferries for Sydney, with fleet specification and procurement decisions guided by service delivery requirements, informed by technical advice from the private sector operator.



4



GETTING SYDNEY MOVING AGAIN

CHAPTER SUMMARY

Our Sydney transport challenges

The major transport challenges facing Sydney are:

- Keeping the city's most important transport corridors moving
- Providing travel options that support and enhance the strength and success of the CBD
- Improving connections across an expanded Sydney CBD
- Building a fully integrated city-wide transport system
- Sustaining growth in Greater Sydney—discussed in more detail in Chapter Five
- Providing better connections and services to Sydney's growth areas
- Adopting a customer focus and adapting to the changing needs of customers.

This chapter recognises the challenges posed by the unique geographical features of Sydney, with a CBD that is confined by water on two sides and which needs to provide efficient access to jobs and services for communities in Greater Sydney and inter-city areas.

Taking action

The Long Term Transport Master Plan proposes a coordinated and integrated approach to meeting these challenges. Highlights include:

- **Sydney's Rail Future** – a once in a generation modernisation of our metropolitan rail network, including investment in network capacity, new links to the city's South West and North West, more frequent services and faster journey times, and a second tunnel under Sydney Harbour as part of a new CBD rail link.

- **A redesign of the city's bus network** to create a connected system that gives customers a wider choice of services to reach more destinations more often, including the new Bus Head Start program to provide bus services for the North West and South West Growth Centres as those areas develop, and a redesigned bus network in Sydney's urban area that covers more areas and improves service reliability on inner Sydney's congested corridors, such as Parramatta Road, Oxford Street and Victoria Road
- **Build light rail in the CBD and South East, and the Inner West Light Rail extension**
- **Improvements to Wynyard precinct** to streamline bus operations and enhance customer interchange facilities in the northern CBD
- **Integrating roads, public transport and freight** to better meet customer needs across transport modes
- A long term plan to **complete critical links in Sydney's motorway network, with the 33 kilometre WestConnex being the immediate priority**
- A program of work to **expand capacity on Sydney's most congested corridors**, including road, rail and bus improvements
- **Improved pedestrian infrastructure**, including better wayfinding at interchanges and priority at signalised intersections
- **Major upgrades to our busiest CBD interchanges**
- A **Barangaroo Ferry Plan** that will improve ferry services to the CBD
- **An integrated electronic ticketing system** and other measures to integrate and align Sydney's transport networks (described in Chapter Three)
- A better **cycling network** around Sydney's urban centres and the CBD and a cycling investment program.

Sydney is growing strongly

Over the next 20 years, Sydney's population is forecast to increase from 4.3 million to 5.6 million. By 2031, the number of trips made around the city each day will increase by 31 percent from 16 to 21 million trips, placing great demands on our road, rail and bus networks.

Transport modelling shows that on a 'do nothing' scenario we cannot accommodate the increased demand for travel on our existing networks without generating more congestion, overcrowding along key corridors and longer travel times.

This chapter examines the major challenges facing Sydney over the next 20 years and potential solutions and actions to meet these challenges. It looks first at changes in land use and settlement patterns, identifies our busiest transport corridors,

and shows how our networks need to evolve. It then examines the impact of population growth and economic development on our most important transport corridors. As traffic volumes on these corridors grow, there will be increasing strain on our rail and road networks – the implications of which are examined in detail.

Many of these problems converge on Sydney CBD. This chapter also examines the specific transport challenges facing the Sydney City Centre as it grows, and possible actions to tackle these challenges.

We then map out actions to meet these challenges, covering road, rail, bus, light rail, ferry, walking and cycling.



More people

As Figure 4.1 shows, significant population growth will occur in the North West and South West Growth Centres, along rail corridors and around Parramatta. Strong growth is also forecast for Sydney’s inner suburbs through infill and urban renewal developments.

More jobs

Jobs in Sydney are expected to grow from 2.2 million in 2012 to 2.8 million by 2031. These new jobs will be spread across the city, with strong growth occurring in Parramatta, Liverpool and Penrith, the North West and South West Growth Centres, the CBD and other centres such as Macquarie Park, Olympic Park, Norwest and the Port Botany and Sydney Airport precinct.

Figure 4.1 Sydney’s population growth forecast, 2011 to 2031

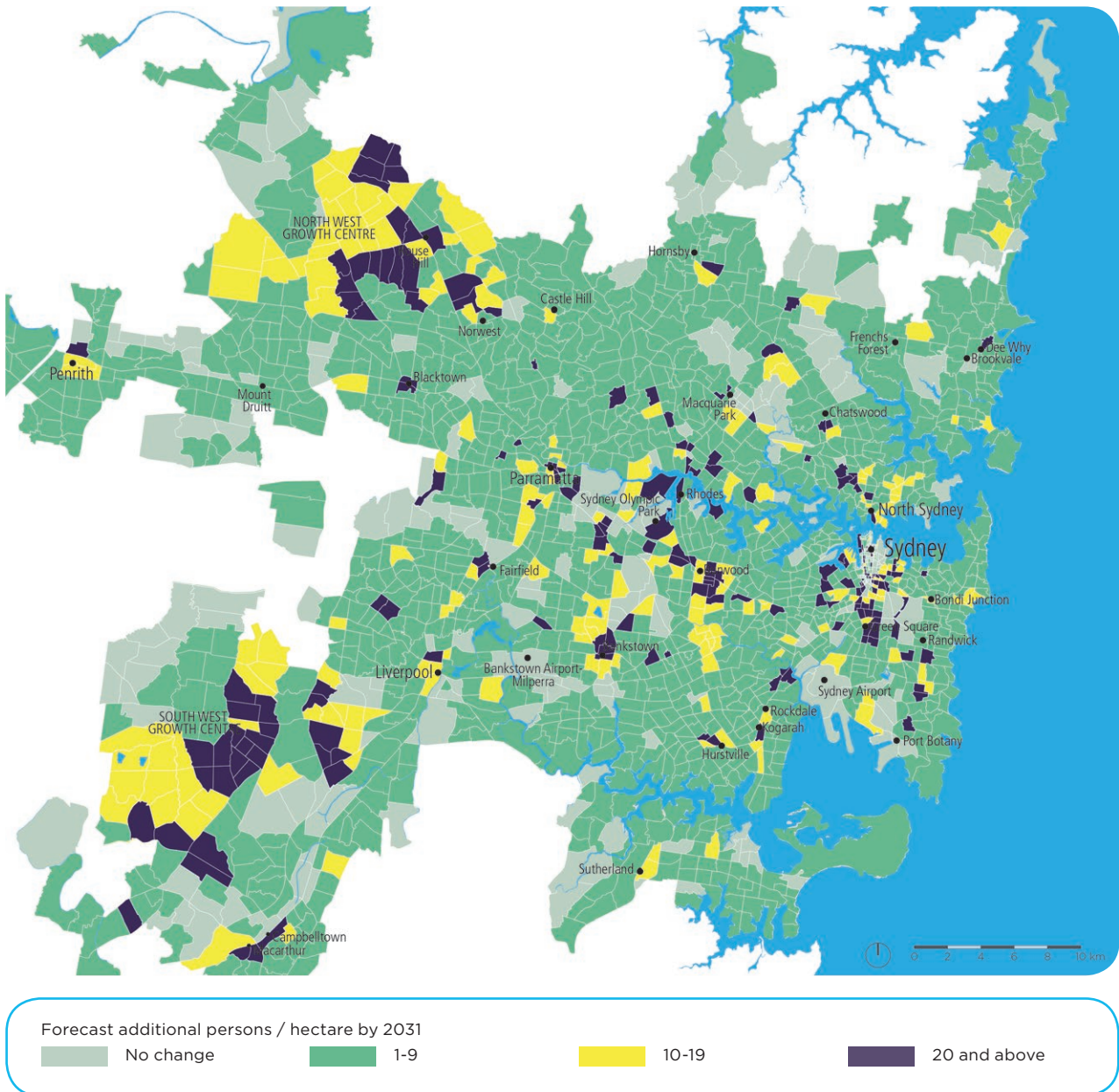
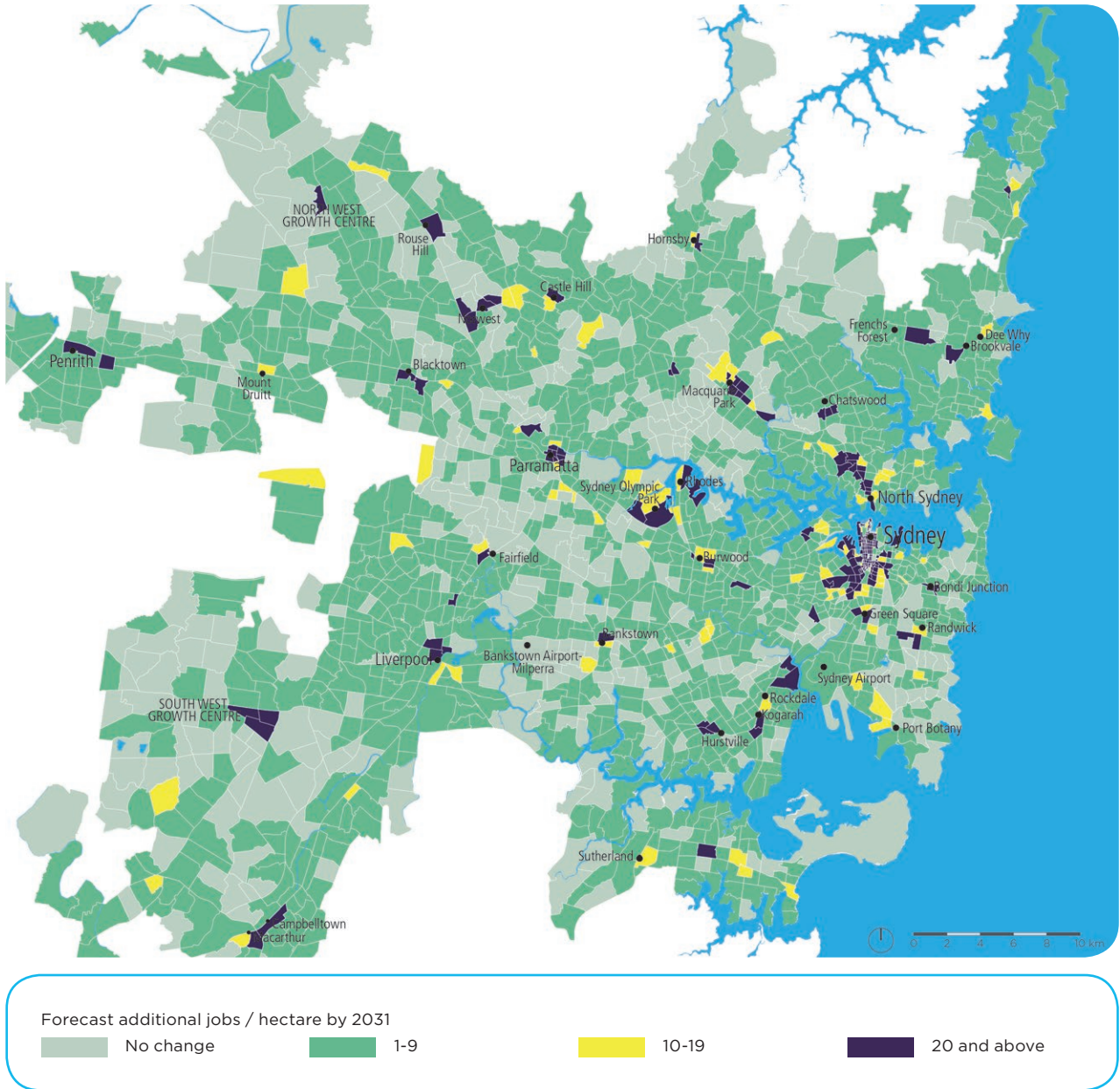


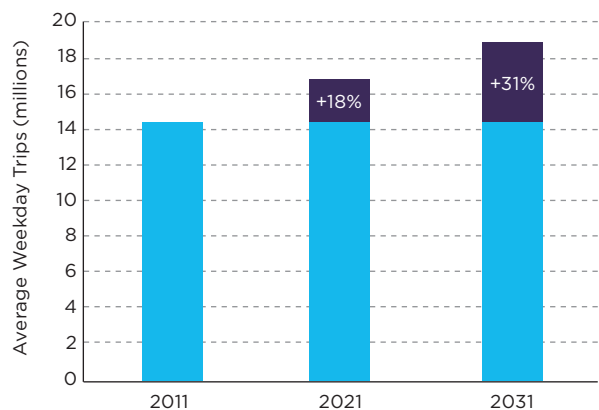
Figure 4.2 Sydney's jobs growth forecast, 2011 to 2031



More travel

As population and employment grows, Sydneysiders will need to make more and more trips. By 2031, approximately 21 million trips will be made in Sydney every day, with all transport modes experiencing growth in demand.

Figure 4.3 Daily trips in Sydney, 2011 and 2031



Our transport challenges

The major transport challenges for Sydney are:

- **Keeping the city's most important transport corridors moving:** As Sydney's population and economy grows and changes, minimising congestion and boosting capacity on our most important transport corridors will become increasingly important.
- **Providing travel options that support and enhance the strength and success of the CBD:** As the heart of Sydney and the centre of the NSW economy, Sydney's CBD must be easily accessed, with less traffic congestion, better use of street space to accommodate growth, and improved amenity.
- **Improving connections across an expanded Sydney CBD footprint:** The CBD will host more jobs across an expanded footprint, including in growth precincts in Barangaroo, Pyrmont, Ultimo and Darlinghurst. As the CBD's footprint grows over the next 20 years, there will be increased demand for transport connections and the transport network will need to grow to meet this emerging challenge.
- **Building a fully integrated city-wide transport system:** Sydney's transport system is not well integrated, restricting its reliability and capacity over time and limiting its ability to meet changing customer needs (see Chapter Three).
- **Sustaining growth in Greater Sydney:** Outside the CBD, Sydney's Regional Cities of Parramatta, Penrith and Liverpool need better transport connections locally and across Greater Sydney to grow, prosper and serve their communities. The challenges facing Greater Sydney are addressed in Chapter Five.
- **Providing better connections and services to Sydney's growth areas:** Without action, growth across Greater Sydney, particularly in the city's west, will put a massive strain on our transport networks. The challenges facing Sydney's growth areas are also addressed in Chapter Five.
- **Adopting a customer focus and adapting to the changing needs of customers:** Sydneysiders' travel requirements, patterns, choices and expectations are changing, and our transport system must keep pace with these changes.

4.1 Accommodating land use, growth and urban renewal

The challenges associated with getting Sydney moving again are closely linked to the decisions we make about land use, the position and density of housing developments, the extent of urban revitalisation and the locations of commercial, industrial and employment centres across the city. These decisions will influence the shape of Sydney and the transport infrastructure, networks and corridors needed to support these changes.

The *Metropolitan Strategy for Sydney* will outline the NSW Government's vision for the renewal and development of Sydney over the next 20 years. Transport planning that is closely aligned to land use plans can improve the liveability and amenity of urban areas. Generally, urban areas with good local accessibility have:

- Higher buildings and more intense use of land
- Mixed land uses
- Proximity to local destinations including parks, schools, shops and services
- Small, walkable blocks
- Convenient and safe access to a variety of destinations by walking and bicycle
- Good multi-modal transport connections.

These attributes are strongest in the Sydney City Centre and in compact inner city suburbs. Beyond the Sydney City Centre, the presence of these qualities varies. For example, South West Sydney lacks accessible, walkable local centres. In some places, such as Penrith, Rockdale, Strathfield, Seaforth, Epping and Ryde, local centres are severed from neighbourhoods by high volume arterial routes and rail lines, with negative impacts on local accessibility and amenity.

Sydney's larger centres provide concentrations of employment, shops and services and are hubs for the public transport network. Many smaller centres are dominated by low density developments, making it challenging to operate efficient public transport services.

If we're to achieve an efficient and liveable city while accommodating a larger population we need to make Sydney more multi-centred and connected. Urban renewal will improve the

amenity and function of Sydney's large and small centres, and support public transport, walking and cycling. Strategic centres and specialised precincts will be the focus of improved cross-city connections.

Unlocking the development potential of Sydney's suburbs and neighbourhoods can provide new homes close to jobs and services, and help to meet Sydney's growing housing demand. It also provides an opportunity to revitalise housing stock to match our changing household needs. In particular, supporting residents to age in place – with good access to public transport – will be an important requirement for Sydney in the coming decades.

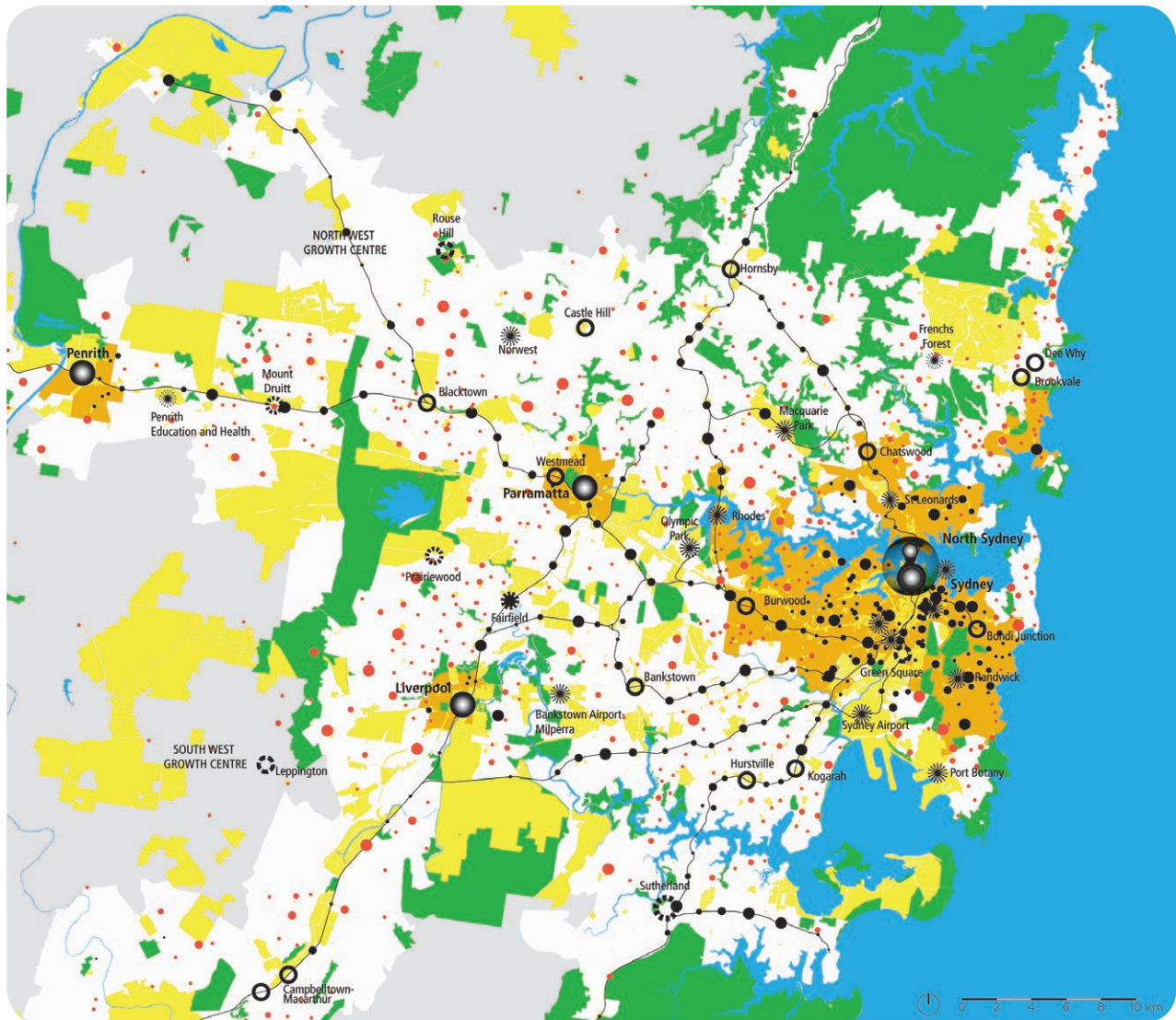
Medium and high density housing will be encouraged within the walking catchments of larger centres well serviced by public transport and infrastructure.

Figure 4.4 shows Sydney's land use profile and key urban centres, including Global Sydney, Parramatta, Liverpool and Penrith, and specialised precincts such as Sydney Airport and Macquarie Park.

The North West and South West Growth Centres will accommodate a significant part of Sydney's housing and employment growth in the coming two decades. These centres will be home to 200,000 and 300,000 people respectively. By staging infrastructure and service improvements, we can make sure these rapidly growing areas are connected to the rest of Sydney, while also encouraging a greater use of public transport and ensuring communities are not disadvantaged by poor access to transport.

Often in greenfield areas, local job creation lags behind residential growth and residents travel longer distances for work. By ensuring links will extend outside these areas – such as good connections to the Sydney CBD and other major activity centres – we can give residents access to the many employment opportunities, social networks and recreational activities that Sydney offers.

Figure 4.4 Sydney's urban centres and key land use profile



The integration of land use and transport is a critical feature of the planning for the North West Rail Link and South West Rail Link and the Richmond rail line. Encouraging higher density developments in appropriate centres and along major transport corridors will help deliver viable, efficient bus services, road networks and interchanges. Good urban design not only creates good places to live; it also contributes to reliable, safe and easily accessible travel options. The ways in which we will integrate land use and transport are outlined in Chapter Eight.

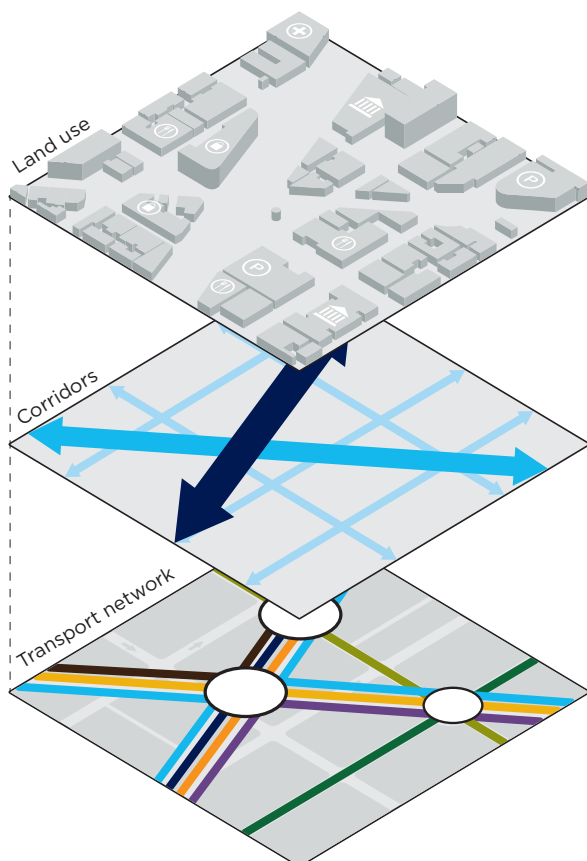
Many centres in Metropolitan Sydney are experiencing residential, commercial and employment growth. Some places – such as the Port Botany precinct and the Randwick Education and Health Specialised Precinct – are hubs of activity for strategic industries that are important to Sydney’s future. Some – such as Olympic Park and Macquarie Park – generate strong jobs growth, pulling in workers from across the metropolitan area. Others – such as Sydney Airport – are critical gateways to

Sydney that must be kept open and flowing. These centres also rely on access to transport networks and corridors that link them to each other, to the CBD and beyond.

Figure 4.5 illustrates the relationship between the way we use land and the way we develop our transport system. Land use is the built form of the city. Sydney is characterised by compact and suburban communities punctuated by dense urban centres. Corridors represent the main lines of travel demand and desire between centres. The transport network is how we service this demand for a variety of purposes and destinations.

We have aligned future areas of growth where the demand for travel is likely to be the highest, and the transport corridors that must be kept flowing to support this demand. These transport corridors are vital to sustaining population and jobs growth in Sydney’s centres and to support the transport needs of key industries and helping Sydneysiders get to work each day and move freely around the city.

Figure 4.5 Relationship between land use, corridors and network planning



4.1.1 Alternative land use scenarios

There are many different ways in which our growing population could be accommodated in the Sydney City Centre and other centres in Metropolitan Sydney over the next 20 years. Alternative scenarios have considered the extent of development in greenfield areas relative to infill areas.

The ideal development scenario depends on factors such as the infrastructure costs required to support development, the environmental and social impacts of development, commercial feasibility and current market features (including householder preferences for living in different areas, affordability and types of housing).

We are observing that while new areas will continue to grow, current trends indicate that people are increasingly choosing to live in established areas with ready access to transport.

4.2 Connecting Sydney's strategic centres – keeping our major corridors moving

Across Sydney's Greater Metropolitan Area, we have identified 46 strategic transport corridors, as shown in Figure 2.3, that represent travel demands between centres in Metropolitan Sydney and are where high concentrations of travel demand occur during peak periods on all travel modes. In the future, patterns of growth are expected to drive even higher demand along these corridors. We assessed the baseline performance of the transport network on each of the 46 corridors in Sydney, combined with a projection of future growth, to determine which corridors face the highest constraints. At present, six corridors are considered highly constrained in meeting travel demand, while 11 face medium constraints.

As shown in Figure 4.6, without extra capacity along these corridors, by 2031 the number of corridors rated as highly constrained will increase to six and those with medium constraints to 17. This slowing down of Sydney's major transport corridors will have follow-on effects right across the city's transport system, reducing our ability to keep high volumes of passenger and freight traffic flowing freely and efficiently.

A note about transport performance measures: Volume to Capacity Ratio (V/C) is a measure that compares demand (vehicle or passenger volumes) with transport service or roadway supply (the theoretical carrying capacity). The higher the number, the more congested the network. On roads where traffic demand exceeds theoretical capacity (a V/C ratio greater than 1.0), traffic flow breaks down resulting in bottlenecks and highly variable travel times. On public transport where demand exceeds seated capacity, this indicates a high level of crowding on some services across a peak period. For example where demand exceeds seated capacity by greater than 35 percent (a V/C ratio of 1.35) some passengers will not be able to board trains.

Figure 4.6 Sydney's constrained strategic corridors in 2031



	Global Sydney		Specialised precinct		Strategic transport corridor with high constraints
	Regional city		Potential specialised precinct		Strategic transport corridor with medium constraints
	Major centre		Planned major centre		
			Potential major centre		

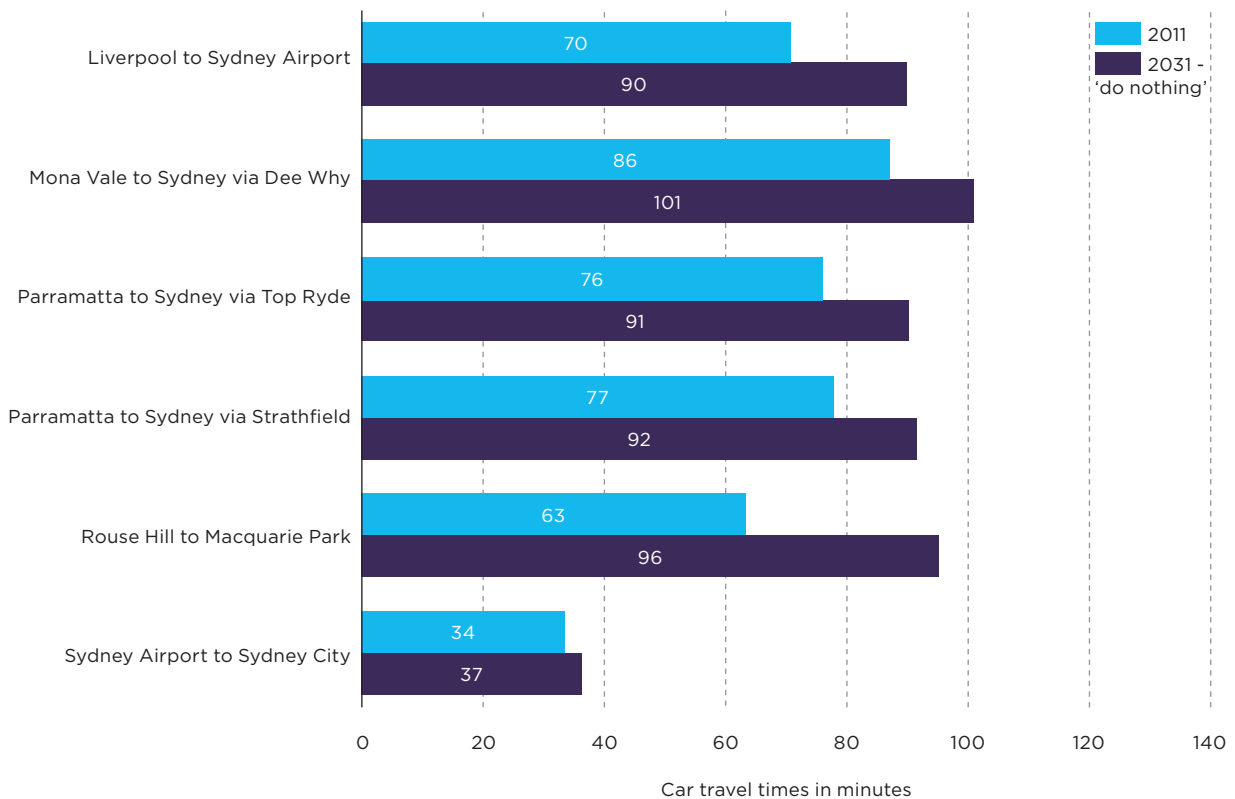
4.2.1 Our most constrained strategic corridors

Without action by 2031, the six most constrained corridors will be dealing with increased demand and much higher road congestion than at present, leading to increased peak travel times (Figure 4.7). For example, by 2031, peak travel times by road are forecast to increase by an average of 15 minutes between Parramatta and the CBD and by 33 minutes between Rouse Hill and Macquarie Park in the morning peak period. The increase in traffic congestion will lead to further delays and unreliability for bus users on some corridors.

Without action, many of the medium constrained corridors will also be performing very poorly by 2031. In particular, the forecast growth in the South West and North West will put increasing pressure on the existing road network. This is discussed in more detail in Chapter Five.

By 2031, these corridors will be even more congested. Without a package of actions (the “do nothing” scenario), they will not have sufficient capacity to accommodate the volumes of traffic moving along them.

Figure 4.7 Peak travel times along strategic corridors for cars (in minutes), 2011 and 2031 ‘do nothing’ scenario



The six corridors already experiencing high constraint are:

Sydney Airport to the CBD - The corridor linking Sydney Airport to the CBD is serviced by a Motorway link (Southern Cross Drive/Eastern Distributor); an arterial road network that provides access to Redfern, Central Station and the southern end of the CBD; and the East Hills Rail Line that connects the Airport to Central Station and the City Circle.

Southern Cross Drive currently operates at capacity during the morning peak period with a V/C ratio exceeding 1.0 and average speeds of 35 km/h. Due to congestion on the Eastern Distributor, traffic diverts onto the adjacent arterial road network including O’Riordan and Bourke Streets which are also congested. The Airport Rail Line is approaching seated capacity between Green Square and Central.

Increasing activity at Sydney Airport, population and employment growth in the South Sydney and Airport areas (including Green Square) and higher traffic along strategic connections to the South West Growth Centre, including the M5, will place increasing pressure on this corridor. Travel demand between the Airport and the CBD is forecast to

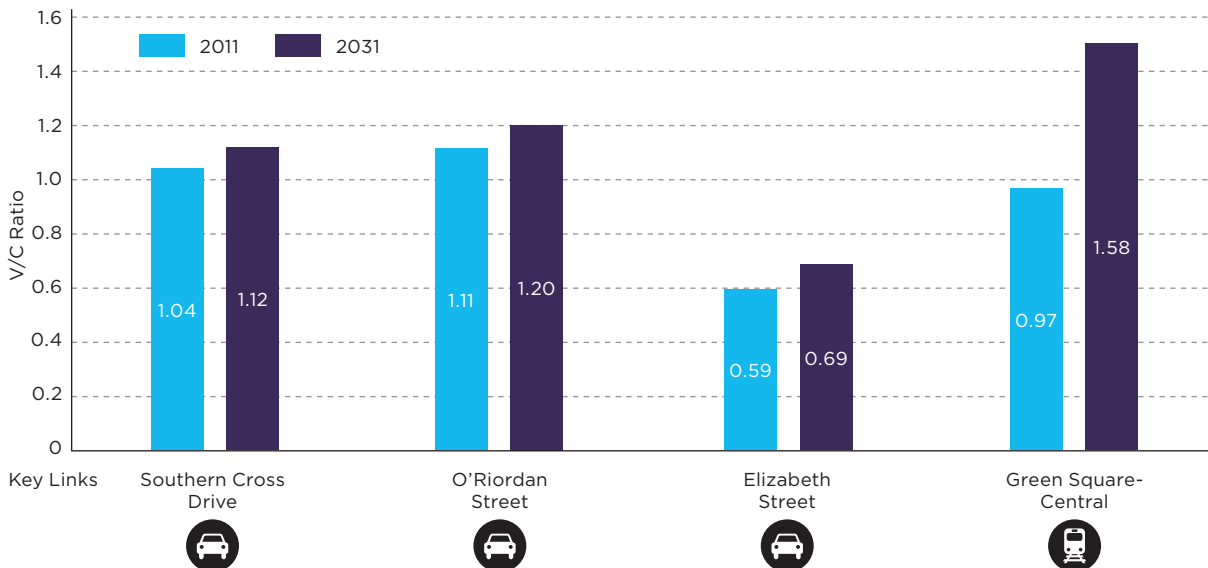
Figure 4.9 Sydney Airport to the CBD constrained corridor



grow to 24,000 by 2031 for the morning peak, an equivalent of six lanes of traffic or more than 25 train loads of seated passengers.

Traffic to and from the Airport mixes with through-traffic to and from the CBD. A solution for the corridor must address both types of traffic.

Figure 4.8 Sydney Airport to the CBD, volume to capacity, 2011 and 2031 ‘do nothing’ scenario



The public transport passenger crowding levels are based on seated capacity only.

Parramatta to the CBD via Ryde – This corridor services a range of demands for travel between the CBD and Parramatta, centres in Sydney’s north such as Ryde and Macquarie Park, and further to the city’s North West.

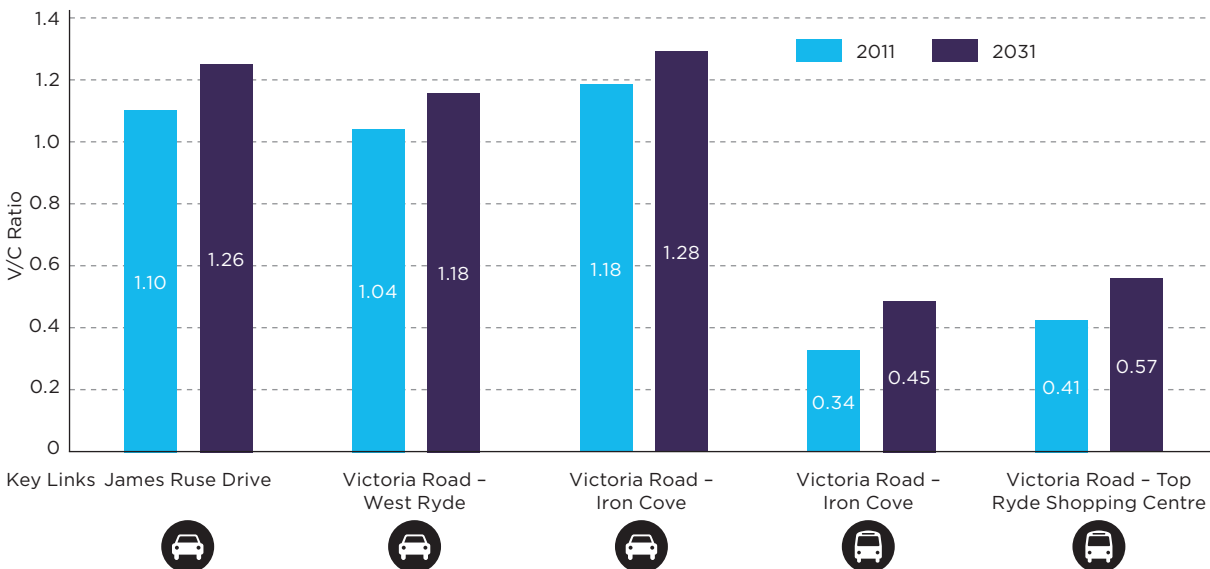
The corridor is centred on Victoria Road, an arterial road that connects Parramatta and the CBD. The section of Victoria Road between Drummoyne and the Anzac Bridge carries an average of around 75,000 vehicles each weekday across the Iron Cove Bridge. It is one of the most congested road corridors in Sydney with average speeds below 20 km/h between Hunters Hill and Rozelle. This section of road is also one of the busiest bus corridors in Sydney, with 19 bus routes carrying an average 40,000 passengers across the Anzac Bridge each weekday. With the recent opening of the new Iron Cove Bridge, transit lanes on Victoria Road have improved bus flow, providing city-bound bus commuters with travel time savings of up to 17 minutes in the morning peak period. Even so, there is still variability in bus travel times of between eight and 10 minutes due to the volume of buses.

Figure 4.11 Parramatta to the CBD via Ryde constrained corridor



Forecast growth in this corridor is also high due to growth at Ryde and Macquarie Park, inner Sydney and Parramatta. Forecasts suggest 37 percent growth on bus patronage to 2031. This corridor has a strong correlation with other corridors such as Parramatta to the CBD via Strathfield and Macquarie Park to the CBD via Chatswood.

Figure 4.10 Parramatta to the CBD via Ryde, volume to capacity, 2011 and 2031 'do nothing' scenario



The public transport passenger crowding levels are based on seated capacity only.

Parramatta to the CBD via Strathfield - This is the main corridor connecting residents of Western Sydney to the Global Economic Corridor and carries the highest number of transit passengers of any corridor in Sydney (with over 40,000 in the peak hour period towards the CBD).

The corridor includes the M4 and Parramatta Road, the main Western Rail Line and strategic bus route 10 to Burwood. The majority of rail services along the Western Line have load factors greater than 100 percent of seated capacity from Strathfield onwards in the morning peak period. For drivers travelling between Parramatta and the CBD, both the M4 and Parramatta Road are congested and at capacity during peak periods. Most bus services on Parramatta Road are full during peak periods and experience variable travel times, with an average variance of up to eight minutes in the morning and evening peak periods due to congestion at the CBD-end of the journey.

Growth in demand on this corridor is forecast to result in car travel times increasing by 16 minutes between the CBD and Parramatta. Rail demand is forecast to exceed existing capacity.

Figure 4.13 Parramatta to the CBD via Strathfield constrained corridor

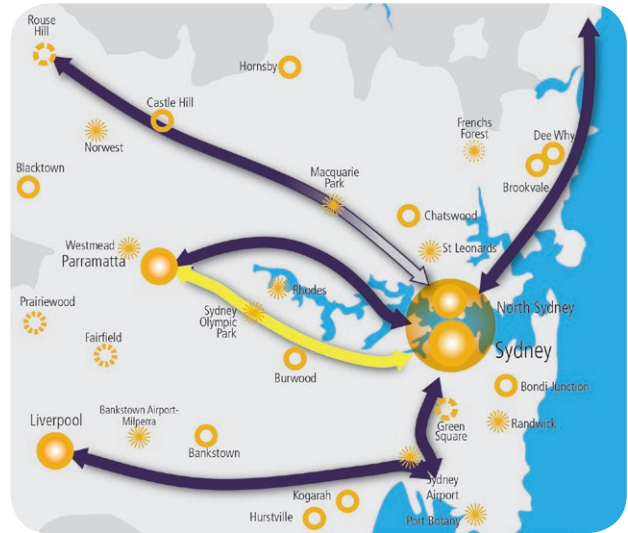
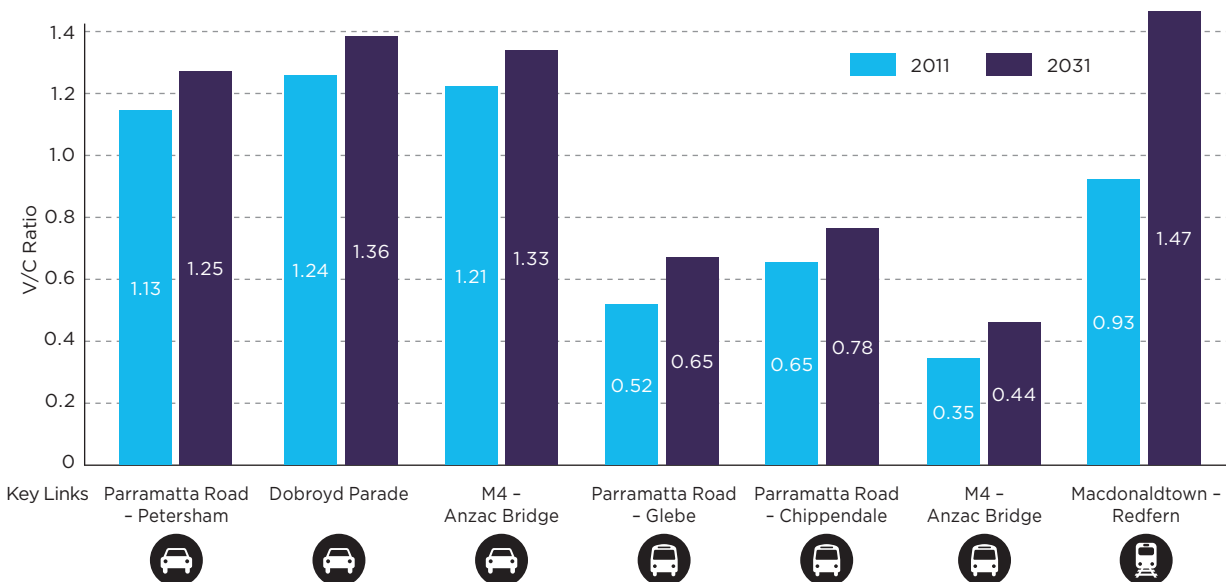


Figure 4.12 Parramatta to the CBD via Strathfield, volume to capacity, 2011 and 2031 'do nothing' scenario



The public transport passenger crowding levels are based on seated capacity only.

Rouse Hill to Macquarie Park - In addition to the substantial growth occurring in the North West, there is already high demand for travel from the Hills District across to the Global Economic Corridor, including to Macquarie Park, the lower North Shore and the Sydney CBD. Currently, there is a high level of car dependency for work trips into this corridor.

The M2, Epping Road and Windsor and Old Windsor Roads are the major traffic routes in this corridor. The North West is serviced by bus to the CBD and by rail between Macquarie Park and Epping. Bus services experience congestion as they approach the CBD. While the addition of the North West Rail Link will relieve pressure on this corridor, the demand for travel from the North West to Global Sydney is likely to continue to grow.

Figure 4.15 Rouse Hill to Macquarie Park constrained corridor

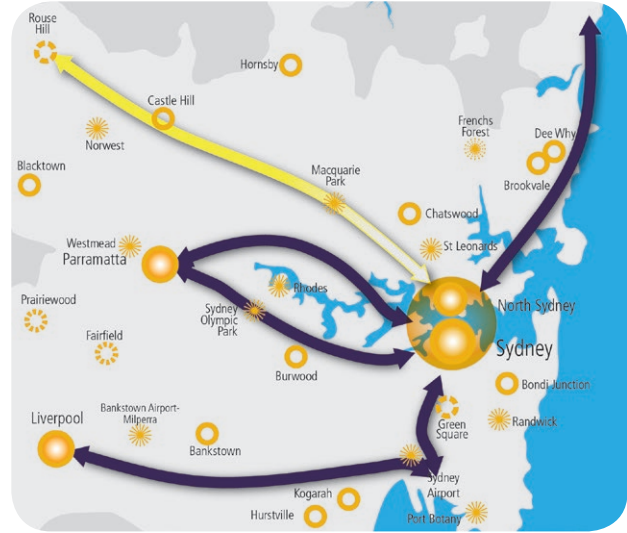
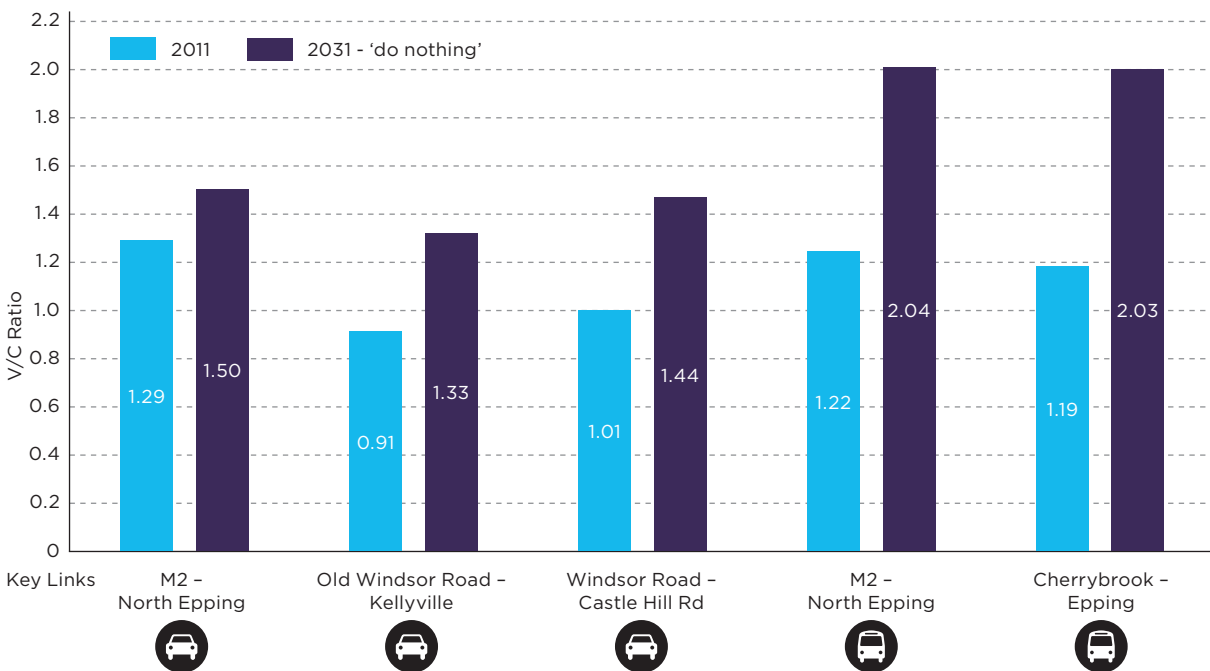


Figure 4.14 Rouse Hill to Macquarie Park, volume to capacity, 2011 and 2031 'do nothing' scenario



The public transport passenger crowding levels are based on seated capacity only.

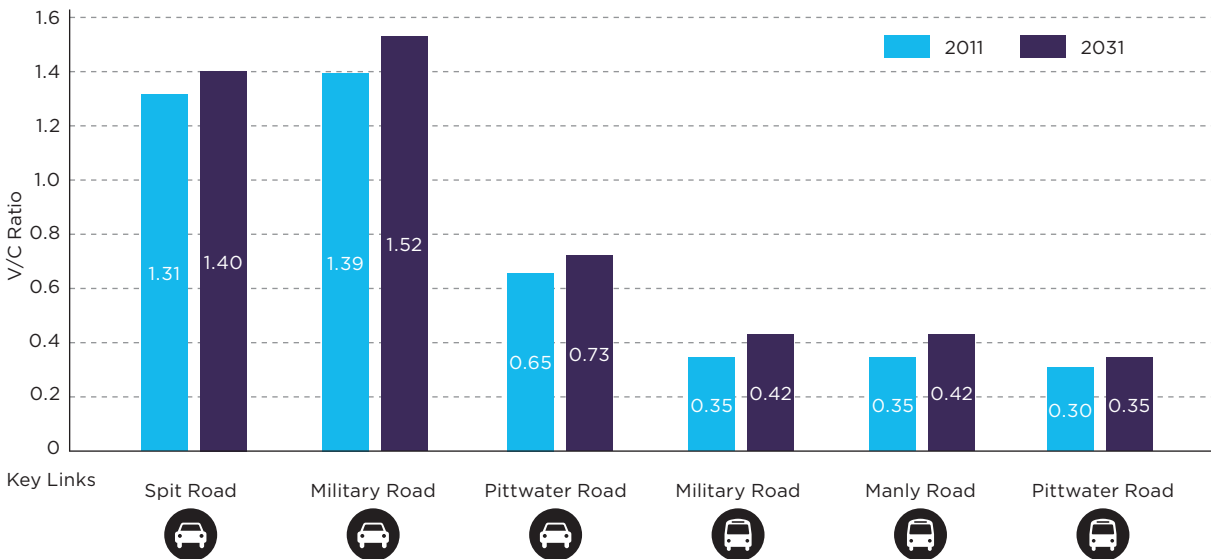
Mona Vale to the CBD – Most travel in this corridor is between private residences in the city’s north and the CBD. No rail services operate along this corridor; bus is the only public transport option. Very high bus volumes operate along the congested road network from Spit Junction to the CBD. The corridor experiences very slow bus speeds to the CBD due to interaction with other traffic on most of the route. In addition, there is a high variability in bus speeds, with bus travel times varying by more than 10 minutes from service to service. Traffic congestion occurs along this route particularly between the Spit Bridge and the Harbour Bridge, with the Spit Bridge having a V/C ratio over 1.0.

Population growth in this corridor is forecast to be less than 20 percent to 2031, lower than the Sydney average forecast growth.

Figure 4.17 Mona Vale to the CBD constrained corridor



Figure 4.16 Mona Vale to the CBD, volume to capacity, 2011 and 2031 ‘do nothing’ scenario



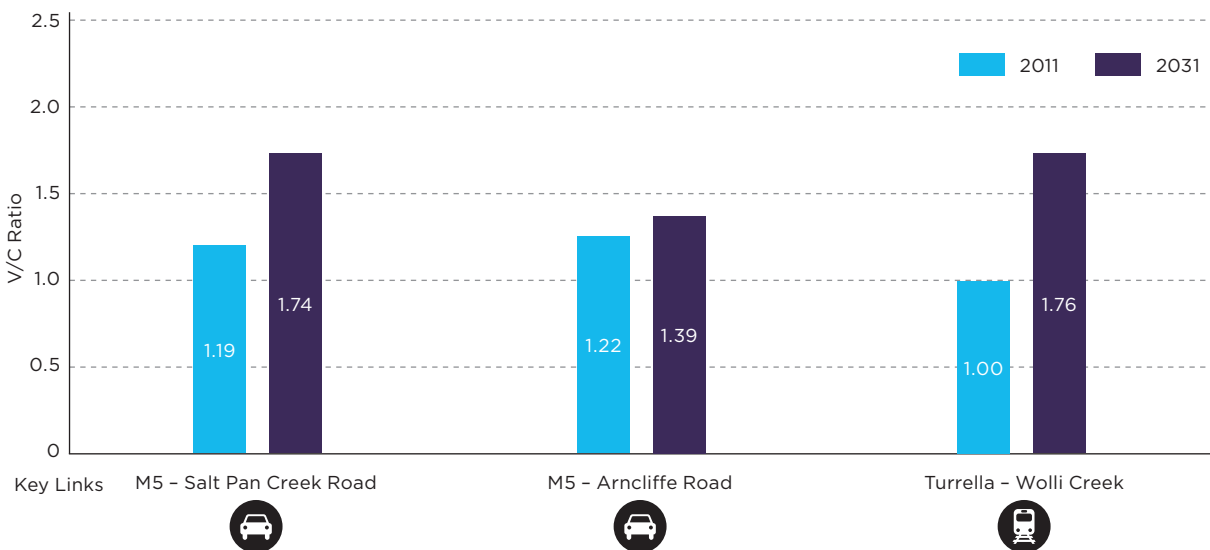
The public transport passenger crowding levels are based on seated capacity only.

The **Liverpool to Sydney Airport corridor** - This corridor links regional NSW, South West Sydney, the Airport and Sydney CBD. The M5 is very congested during peak periods with a V/C ratio over 1.0 and average speeds reducing to below 40 km/h. The high population growth forecast in South West Sydney will place increasing pressure on this corridor, further reducing speeds on the M5 by 2031. The East Hills Rail Line is approaching capacity at Wollie Creek and further growth has implications for the capacity of the rail system to accommodate demand at Sydney Airport.

Figure 4.19 Liverpool to Sydney Airport constrained corridor



Figure 4.18 Liverpool to Sydney Airport, volume to capacity, 2011 and 2031 'do nothing' scenario



The public transport passenger crowding levels are based on seated capacity only.

THE SYDNEY STRATEGIC TRANSIT NETWORK

The Strategic Transit Network is a high-level approach to assessing capacity and defining service standards across the entire network in a mode-neutral way. The Strategic Transit Network encompasses the public transport network and does not represent the road network, although public transport modes like buses rely on the road network, and the road network interfaces with the Strategic Transit Network.

The Strategic Transit Network defines the service standards that we expect our transport system to meet in terms of frequency and throughput for each corridor. It also allows us to prioritise future transport investments and policies to meet the needs of a growing population and growing economy and to ensure the development of an integrated and effective network.

The Mass Transit Network is the foundation of the transport system. We expect Mass Transit Network corridors to provide high service frequencies particularly during peak periods at average speeds greater than 30 km/h at peak times mostly in their own corridor.

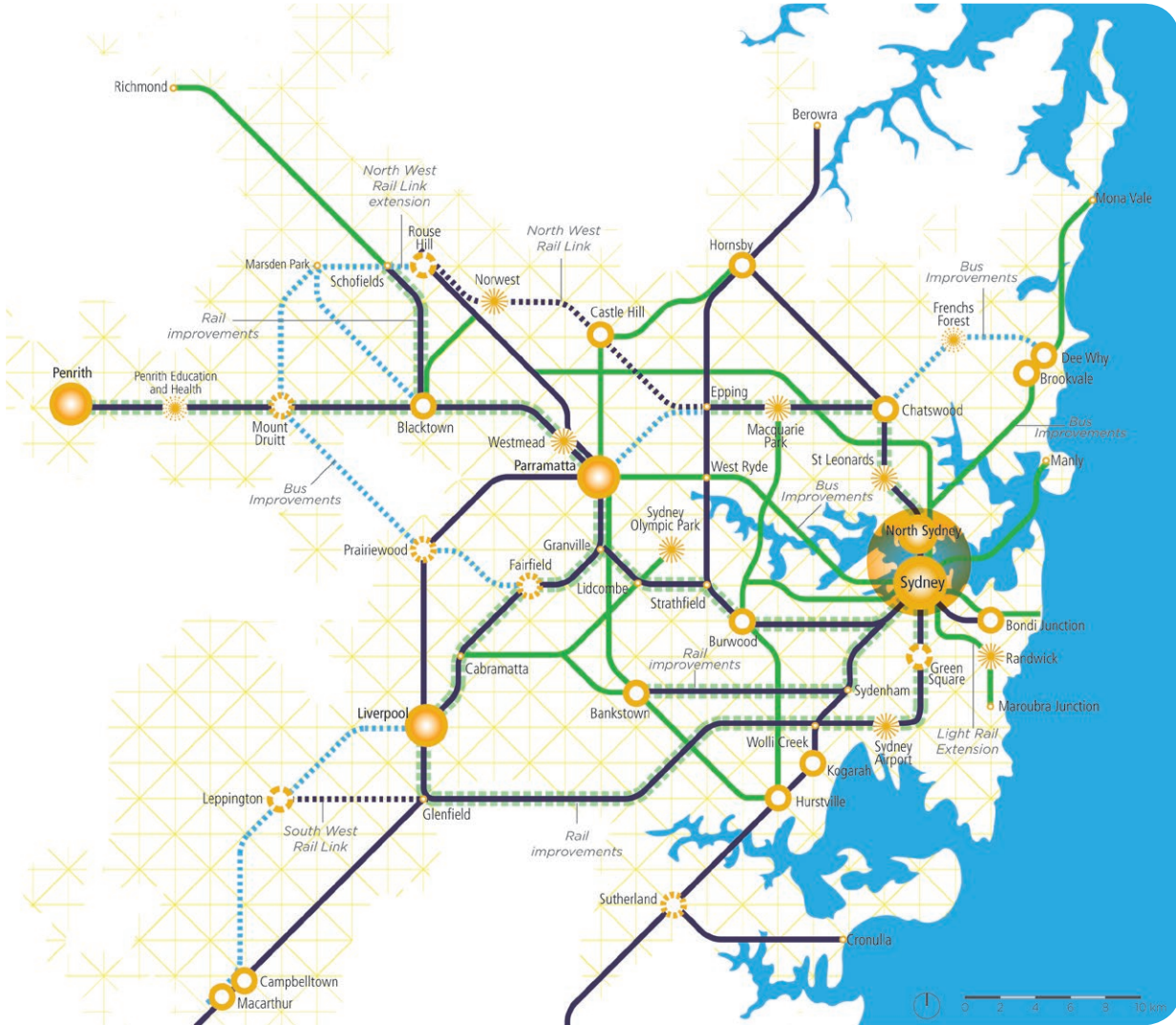
The Intermediate Transit Network supports the Mass Transit Network by providing good all-day frequencies at average speeds generally greater than 20 km/h.

The Sydney Strategic Transit Network reflects a hierarchy of links between Sydney's strategic centres. The hierarchy guides and prioritises which investments should be made along the corridors that make up the network.

The current configuration of the Strategic Transit Network is shown in Chapter Two. Figure 4.20 shows how we would like the future network to look in 2031, following the implementation of the Long Term Transport Master Plan, and illustrates the actions we will take to upgrade the physical network to the standards defined by the Strategic Transit Network.

Examples of specific investments in the Strategic Transit Network include *Sydney's Rail Future*, which will result in enhancements on a number of rail lines to the West and extensions to the North West and South West. A proposed Bus Rapid Transit scheme may enhance sections of the Strategic Transit Network extending to the Northern Beaches, and a potential new light rail line to Randwick may enhance access for the South East section of the Strategic Transit Network.

Figure 4.20 2031 Sydney Strategic Transit Network with planned and potential upgrades



Global Sydney	Potential specialised precinct	Mass transit
Regional city	Planned major centre	Intermediate transit
Major centre	Potential major centre	Committed extension
Specialised precinct	Interchange / terminus	Potential extension
		Committed enhancement

4.3 Congestion is clogging our transport network

In addition to constraints on the busiest corridors, congestion is experienced across the transport network on our rail network, on the city’s main roads and arteries and on the bus network across Sydney.

4.3.1 We are moving around more at different times of the day

The most critical period for our transport system is the morning peak when people are travelling to work, dropping their children at school, transporting freight and making deliveries to businesses. This demand puts a strain on the city’s entire transport network, not just its strategic corridors. Our transport network also struggles to service travel at other times of the day, including off-peak times during week days and on the weekends.

Figure 4.21 shows the various trip purposes that contribute to the distribution of travel across the day. The commuter peak period, drop offs and education trips create the congestion we experience in the morning peak. However, discretionary travel – such as shopping and recreational trips – contributes to the growth of off-peak travel.

Figure 4.22 shows the growth in weekend travel since 2001. On some parts of the network, motorists now experience similar levels of congestion on Saturdays to those occurring during the weekday peak periods – a common trend shared with cities of a similar size around the world.

Figure 4.21 Distribution of travel throughout an average weekday according to purpose

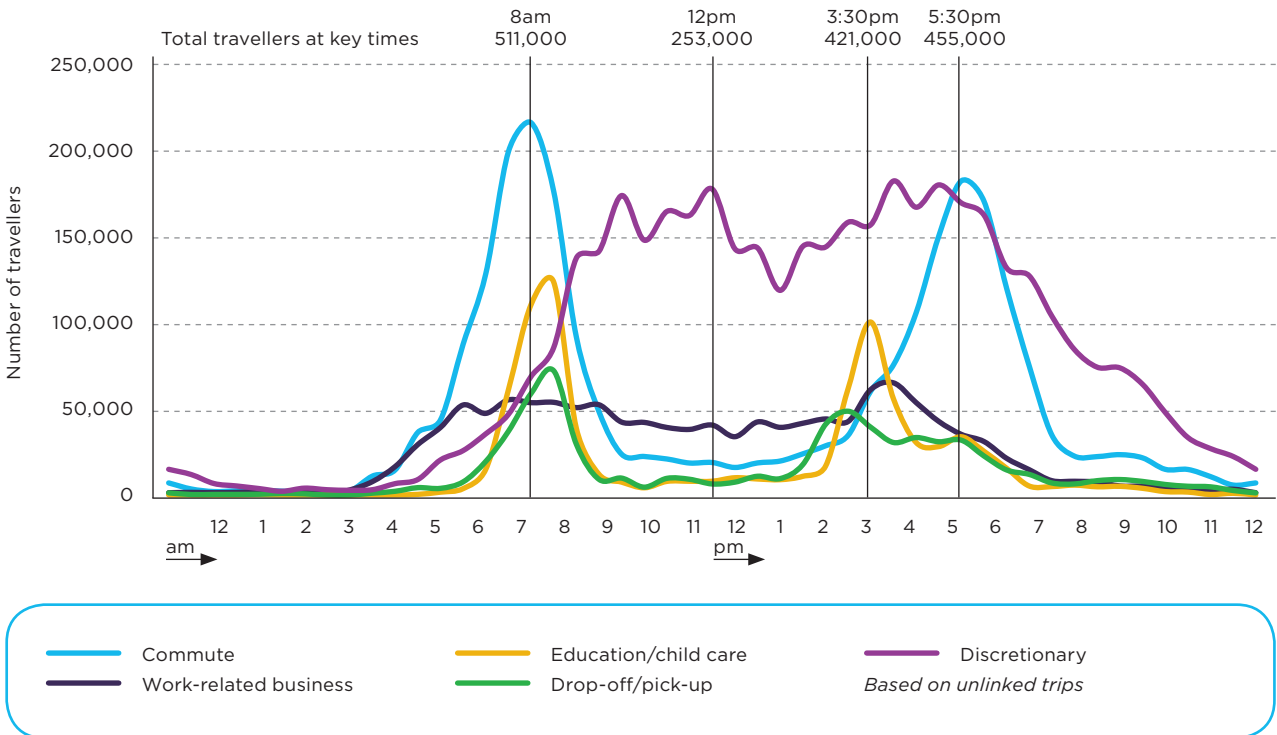
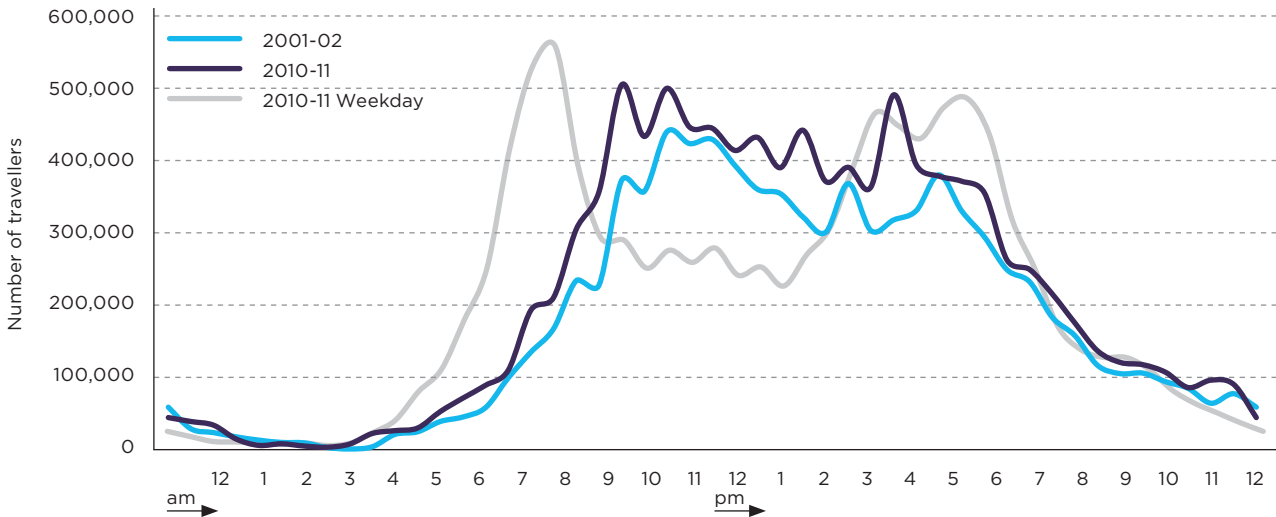


Figure 4.22 Growth in weekend travel, 2001-02 to 2010-11



4.3.2 Our rail network needs to grow

Sydney’s rail network is fundamental to how the city functions. Approximately one million journeys are undertaken by passengers on the CityRail network on a typical workday, one third of which occur between 6am and 9.30am. As Figure 4.23 illustrates, almost 50 percent of this morning peak passenger demand is headed for stations within the CBD – mostly to Wynyard, Town Hall and Central (see discussion on the Sydney CBD later in this chapter).

Most of Sydney’s rail network was built more than 100 years ago and is primarily centred on servicing the CBD. There has been little recent expansion of the network, with 39 kilometres of the total CityRail system of 1,050 kilometres built in the past 33 years. As Sydney has grown and evolved to a multi-centred city, its needs have changed and our rail system needs to evolve to keep up with these changes.

The strong demand for rail travel to Sydney CBD destinations contributes to congestion along the rail network, with a shortage of station capacity in the central city a significant bottleneck in the network. Congestion occurs on all rail lines

entering the CBD, apart from the Eastern Suburbs line. Figure 4.24 shows what this congestion is likely to be in 2031.

There is now significant crowding on most lines at the height of the morning and evening peak periods, with track capacity reached on the two busiest lines, the Western and Illawarra Lines, and on the East Hills and Airport Line, at these times. A complex operating configuration designed to provide through-services to Sydney on almost every line means rail-to-rail interchanges are concentrated at Central and Town Hall Stations, creating major bottlenecks.

Detailed demand forecasts undertaken for the Long Term Transport Master Plan show that crowding levels on the network will increase and many parts of the network will be near capacity in 2031, even with service improvements that are possible within the constraints of the current network configuration. With demand for rail travel expected to increase by more than the current 1.3 percent per year (if capacity allows), significant levels of crowding are predicted for the East Hills and Airport and Northern and Western Lines.

Figure 4.23 Number of people exiting rail stations in the morning peak on an average weekday (2010-11)

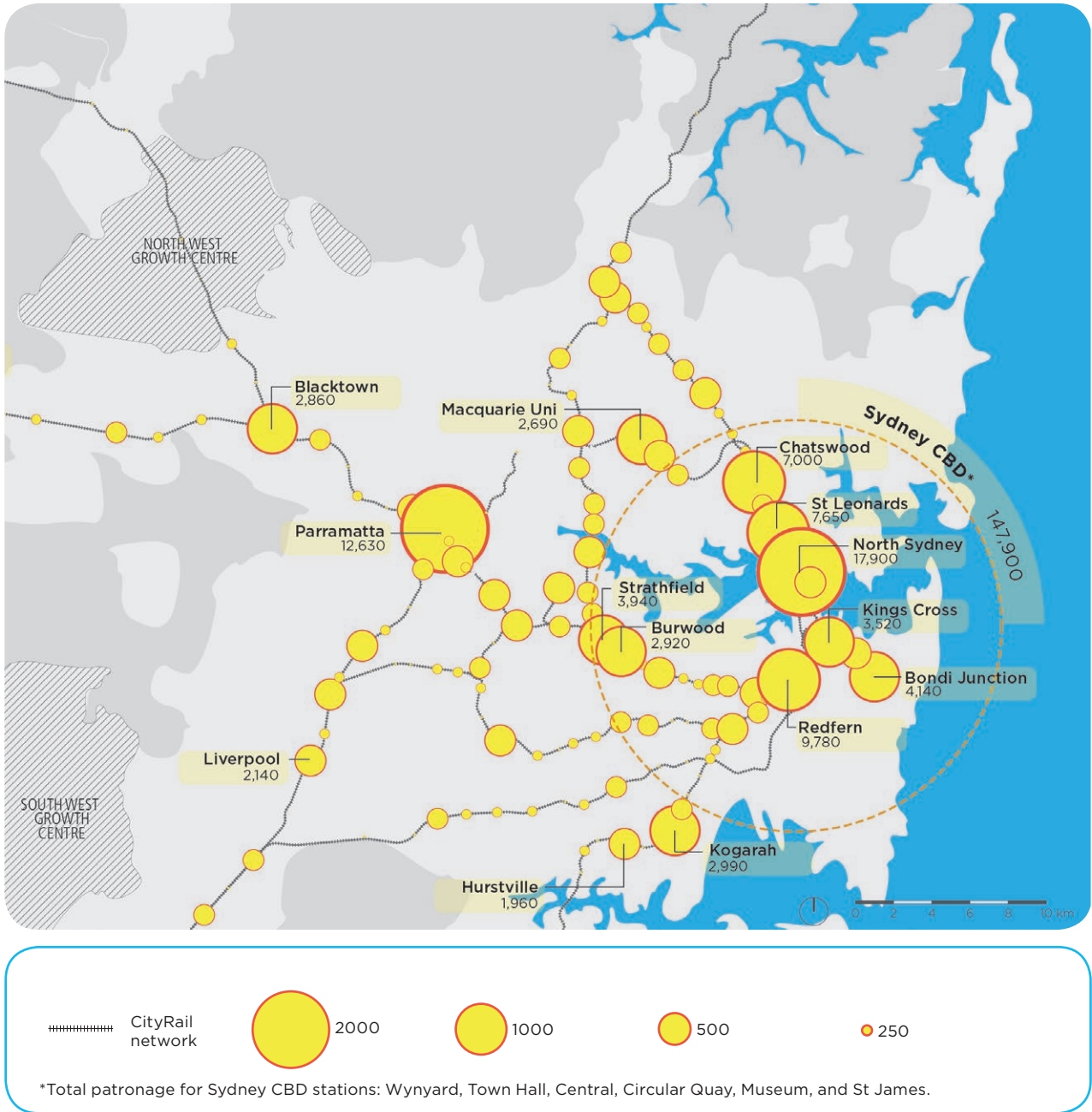
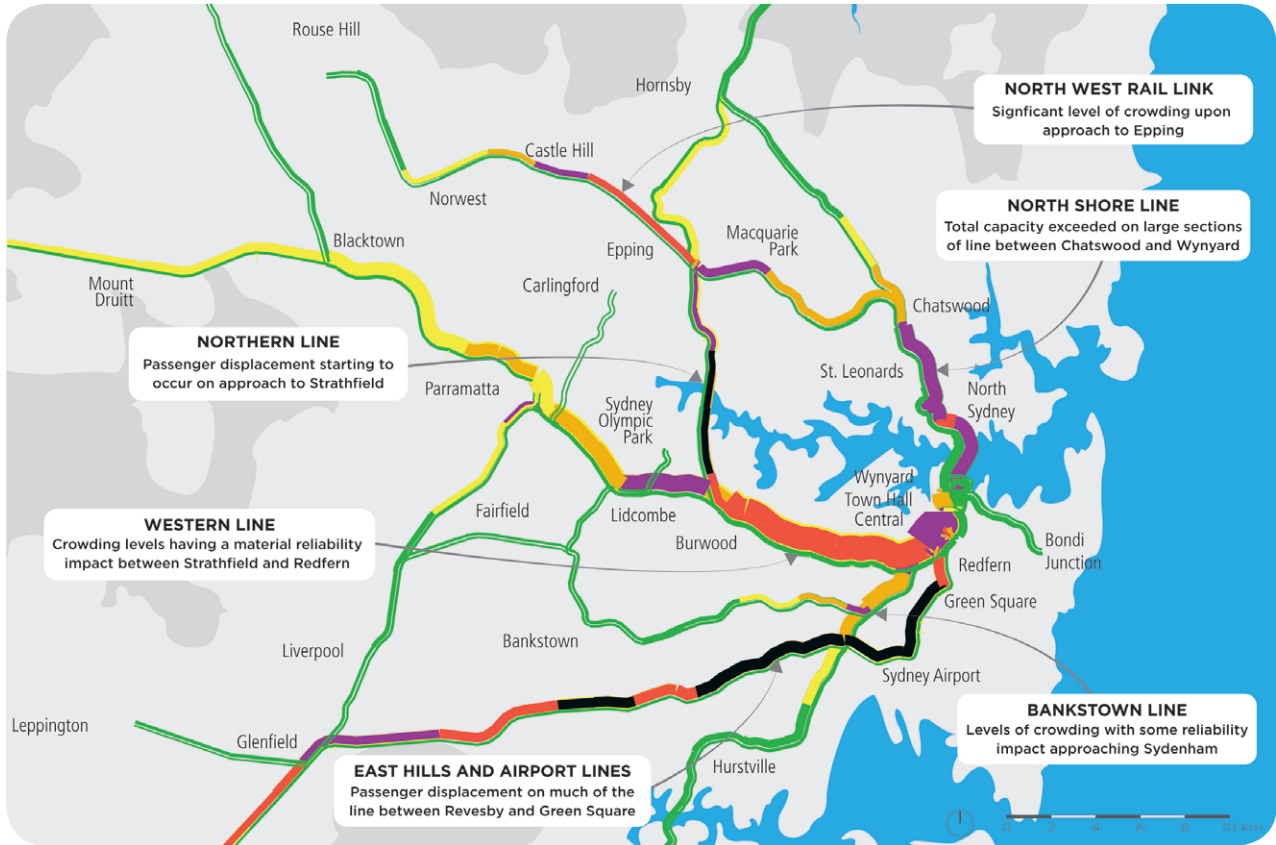


Figure 4.24 Rail network performance (represented by volume-capacity ratio), AM peak, 2031 'do nothing' scenario



Crowding Level	Description of crowding for double deck trains
Very Low	Passengers are mostly seated
Low	Seated capacity is reached and people start to stand
Moderate	Standing space approaching full capacity for reliable running
High	Crowding with some reliability impact
Very High	Crowding starting to have material reliability impact
Passenger displacement	Additional passengers are unable to board the train

Note: The above passenger crowding levels are based on total capacity (including both seated and standing passengers). This is a more generally accepted measure internationally rather than expressing capacity on the basis of seating alone.

Figure 4.25 models the future demand for rail travel on the Western Line depending on different annual growth rates, showing that even a modest increase in demand will cause the line to reach capacity within 20 years.

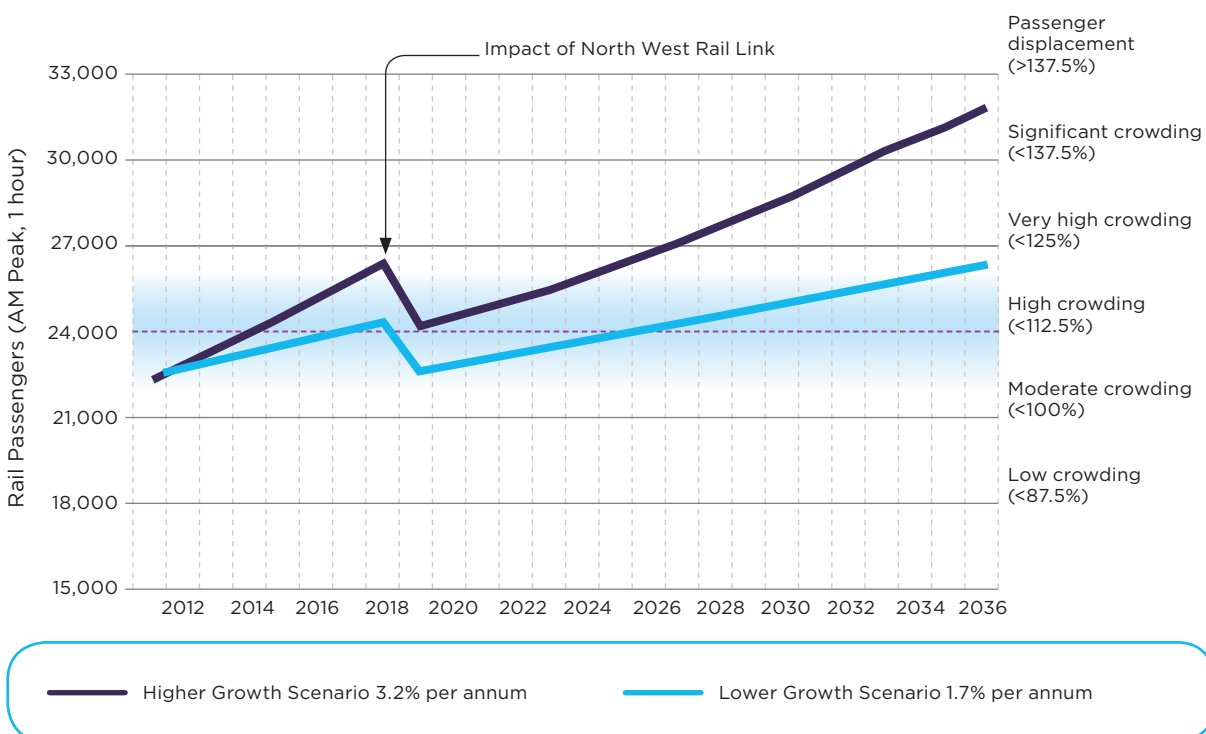
Growing congestion is reflected in increasing travel times along a number of rail routes to accommodate the extra time required at many stations to allow passengers to board and alight due to crowding. At the same time, the operational constraints on the rail network – and our desire to continue running through-trains to the CBD, which results in multiple services and lines using common track – have kept the number of trains per hour at the same level for many years.

Sydney’s double-decker fleet is slow to board and causes delays at many stations. Limited platform space and stair capacity at stations such as Central, Town Hall and Wynyard also increase dwell times. These delays reduce the network’s capacity to run more trains per hour and also have impacts across the entire rail network.

It is often more difficult to travel by rail at peak times. Crowding in trains at peak times is consistently the most common reason given by rail travellers for their dissatisfaction with CityRail services. Because trains are crowded at peak hours, commuters on some lines are often unable to board trains and have to wait for a later service.

Major improvements to the existing rail network are required to meet current customer needs and to prepare for expected capacity demands. With the network approaching its capacity limits, we face the choice on some lines of either building a new line now or changing to a simpler, more effective operating model – an approach adopted by many other cities around the world. The benefits would include savings in travel time, more frequent services and greater reliability.

Figure 4.25 Forecast rail demand loads, Western Line



4.3.3 A bus network that works for customers

Sydney’s geography means that we rely heavily on our bus network to connect with the rail network and to service areas that are not accessible by rail. The network operates about 850 routes that together traverse 87 million kilometres, and provide approximately 220 million passenger journeys each year – around the same number as our rail network. The flexibility offered by bus travel means buses service a larger catchment area and a wider range of trip types than rail, while also servicing shorter trips.

Because buses compete for road space with cars, the bus network is affected by the growing congestion on Sydney’s roads, especially along arterial connections and routes to the Sydney City Centre.

Congestion is slowing down many bus services, with longer and more volatile travel times recorded across the network during peak periods. This unreliability has effects across the bus network, with delays moving along the service

chain and holding up the next services, particularly along congested routes such as Parramatta Road and across the Harbour Bridge. Figure 4.26 illustrates the travel time variability that occurs on bus routes in and around the CBD on a typical weekday.

Congestion in the Sydney City Centre causes a bottleneck for a number of bus services, with critical pinch points at Wynyard Station and York Street. Bus operators report low passenger numbers on many Sydney City Centre services, indicating that services that do not need to go to or through the Sydney City Centre may unnecessarily contribute to congestion. As shown in Figure 4.27, the highest volumes of buses enter the Sydney City Centre across the Harbour Bridge, from the east on Oxford Street and Anzac Parade, from the South West on Broadway and from the West over Anzac Bridge.

Approximately 48,530 trips are made by people on buses into the Sydney City Centre in the morning weekday peak. A limited number of gateways provide entry points into the Sydney City Centre from regional and inner area corridors,

Figure 4.26 Travel time variability on buses travelling on corridors approaching the Sydney CBD.

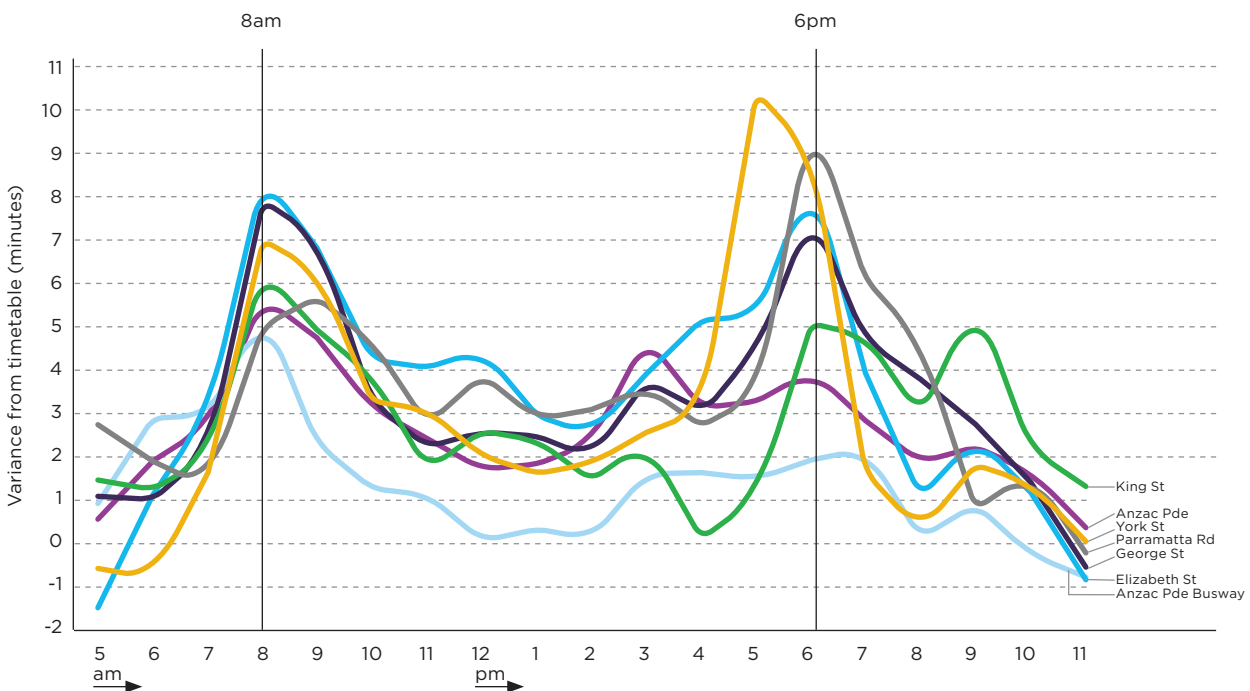
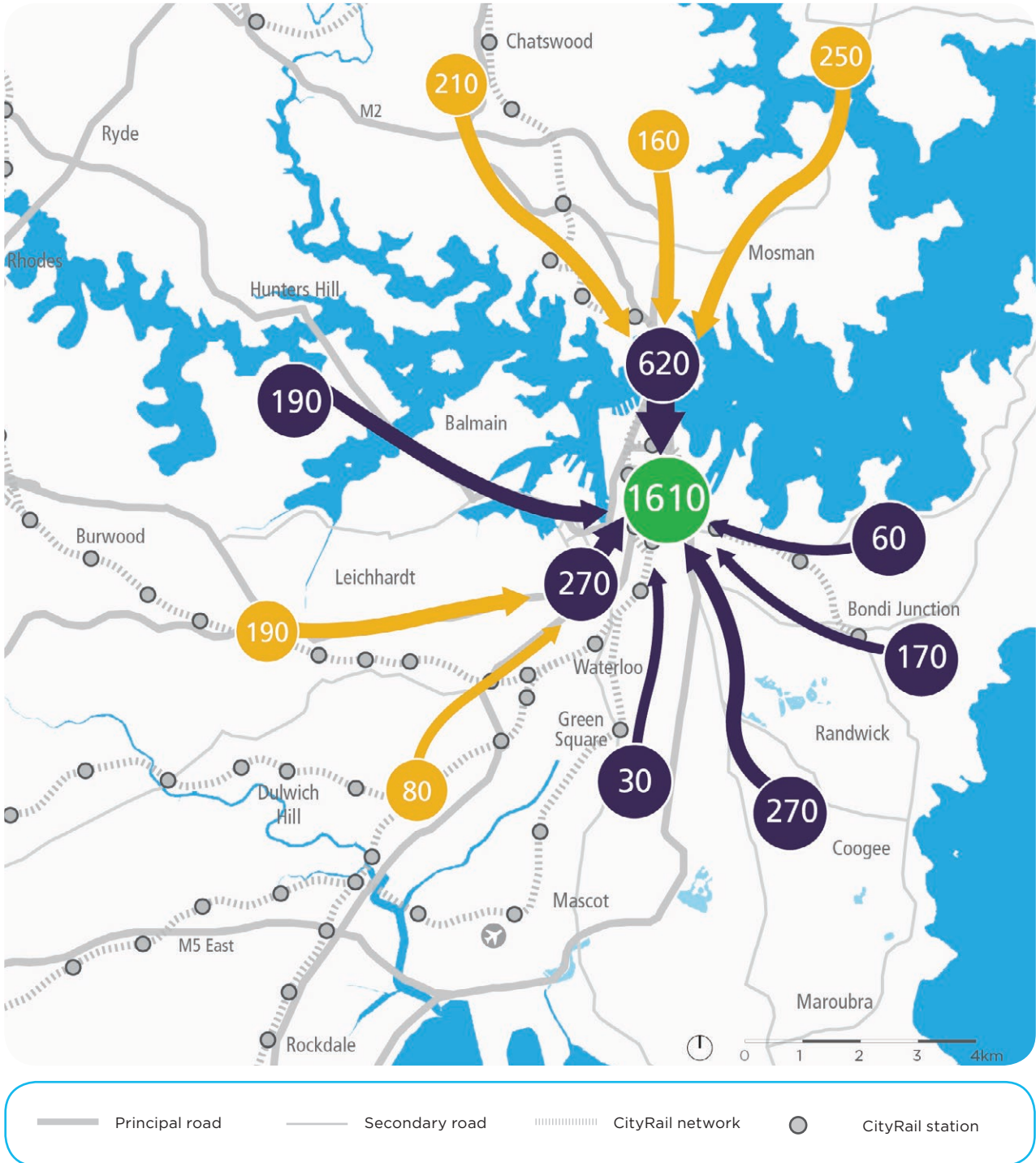


Figure 4.27 Bus volumes entering the Sydney City Centre during the two hour morning peak 2012



particularly to/from the North and West, resulting in a concentration of transport moving through these gateways. This has impacted on the amenity of Sydney City Centre locations, such as Railway Square, Town Hall and Wynyard, which struggle under high levels of passenger demand during peak periods.

The Harbour Bridge acts as a gateway for an average 620 inbound buses during the two hour morning peak. Parramatta Road accommodates an average of 270 inbound buses, Anzac Parade brings about 270 buses into the city, and Oxford Street carries an average of 170 buses. The average number of buses entering the Sydney City Centre in the morning peak is 1,610, as can be seen in Figure 4.27.

Extending out from the CBD, services are slowed down and delayed by route congestion along Parramatta Road and Anzac Parade.

Demand for bus travel is forecast to grow by 30 percent to 2031. Increased bus services will be required, as this growth will increase congestion along key routes and as a number of these routes link growth centres beyond the CBD. This increased congestion may adversely affect business expansion and employment growth in these centres.

Bus service congestion in the CBD, variable travel times and access to growing centres and areas not serviced by rail are all issues that need to be addressed to ensure that we manage the growing demand for bus travel while maintaining an efficient service that is an attractive alternative to using our cars.



DEVELOPING AN INTEGRATED AND COORDINATED BUS NETWORK

A multi-modal integrated transport network across Sydney needs bus services that are better connected with the rail network and more closely focused on meeting the travel demands and needs of customers.

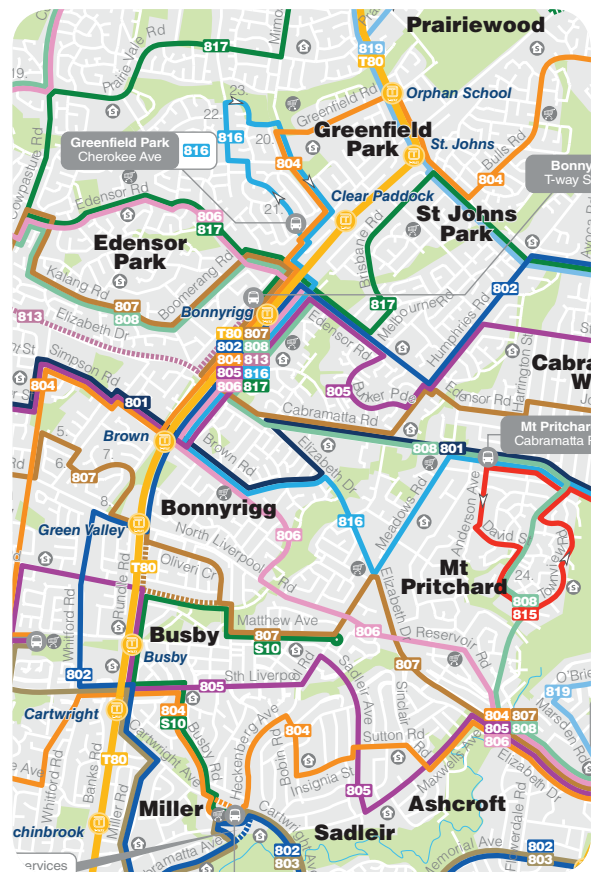
Better bus operations can be achieved by improving the contract zones system under which contracts with bus operators are defined by geographic area.

For example, Parramatta is surrounded by five contract zones. Bus service providers in the area would be required to work in partnership to deliver a coordinated response to their customers.

The Metrobus network operates high capacity, fast, frequent and direct services between employment and growth centres across Sydney. Metrobuses run along 13 routes, seven days a week at intervals of 10 minutes in peak periods, 15 minutes during weekday off-peak periods and 20 minutes at nights and on weekends. The Metrobus network gets people quickly to where they are needed, addresses congestion along key routes and helps to rationalise bus services entering the Sydney City Centre.

Across the network, a number of bus services need to be re-examined to improve operating patterns that are consistent with the function required by customers. In particular, some important cross-town services require consideration: for example, there is no bus service on the Cleveland Street corridor connecting Broadway to Bondi Junction. Opportunities for simplification of interconnecting bus routes would make bus travel a more attractive option.

Figure 4.28 Example of the current complex maze of bus routes around the Parramatta to Liverpool T-way



4.3.4 Growth is putting our road network under pressure

Figure 4.29 shows the high degree of travel speed variability that occurs on the network during the peak congested conditions. The speed variability on the M5 ranges from below 40 km/h to above 80 km/h.

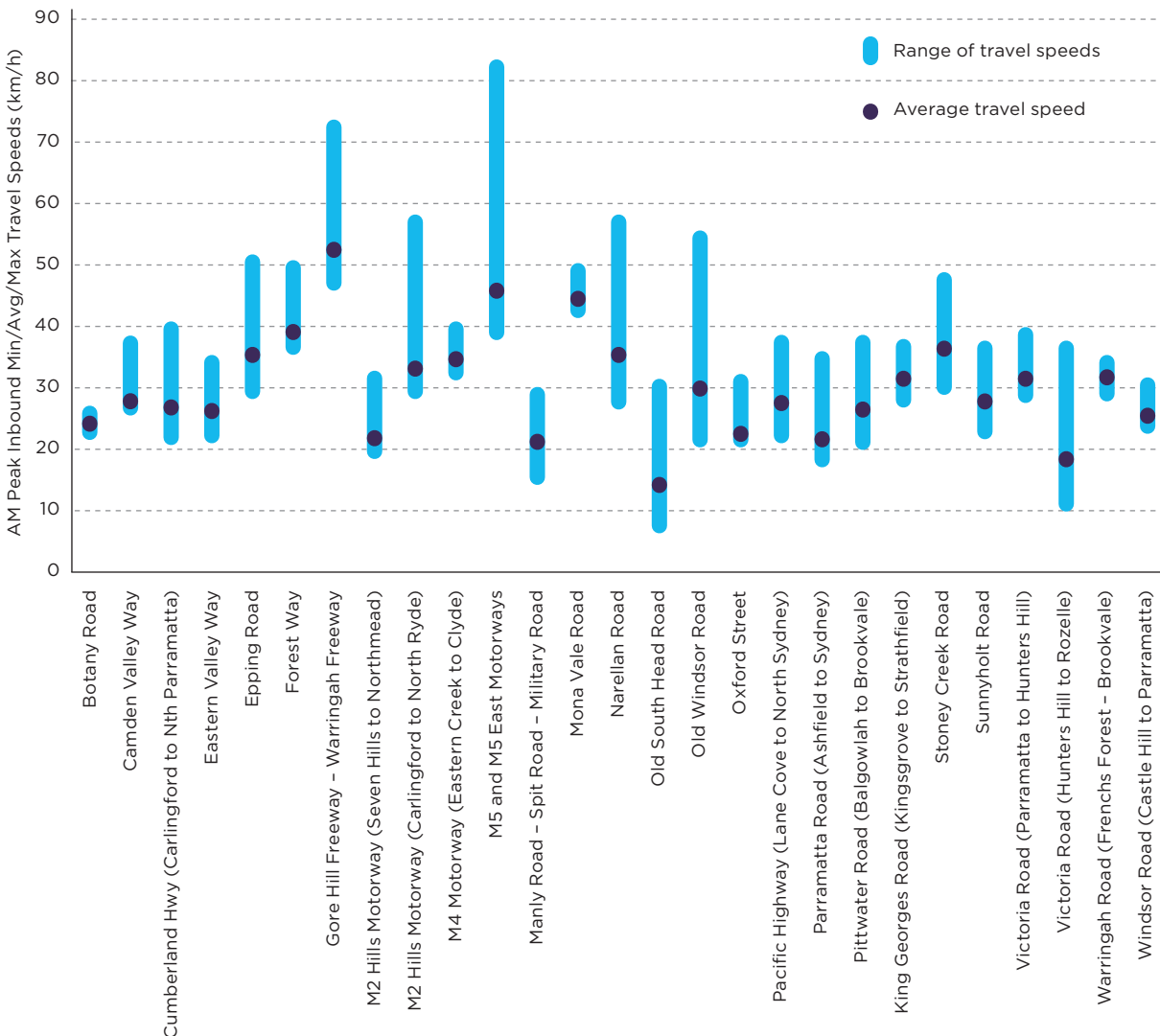
Congestion occurs mainly during the morning and evening peak hours when many people are commuting to and from work. This congestion is concentrated on the main arteries leading to employment centres.

As shown in Figure 4.30, weekday morning major congestion occurs on the motorway network that provides access to Sydney’s CBD. The M2, M4 and

M5 are all operating at capacity during the morning peak. Other key bottlenecks – such as Victoria Road, Spit Bridge and the Harbour Bridge – are at capacity. Congestion occurs on approaches to the CBD, Sydney Airport and Port Botany and to centres such as Parramatta. Some major cross-city routes such as Dee Why to Chatswood and Hurstville to North Ryde are also congested.

Many arterial roads have average travel speeds of less than 30 km/h in the morning peak as shown in Figure 4.29. Speeds on the motorway network are also low in places, with the M4 and M5 Motorways experiencing travel speeds below 40 km/h and 50 km/h in some locations in the morning peak. Motorists using the M2 experience travel speeds

Figure 4.29 Minimum, average and maximum AM peak travel speeds on key roads in Sydney



as low as 20 km/h in some sections. The high variability in travel speeds and times along major motorways and arterial roads decreases road freight efficiency and productivity and adds time to commuters' journeys each day. An unreliable network makes travel difficult to plan.

Forecast strong growth in car traffic over the next 20 years means that road congestion will get worse unless action is taken. Over the next 20 years, congestion will increase on the motorway network and on the arterial road network, which has less capacity to accommodate through trips.

City-wide road congestion and travel delays are impacted by gaps in Sydney's motorway network. Our motorways – and the arterial road network that feeds into them – are the major routes used for direct access to Sydney's major centres from other parts of the city and from our regions. They are also critical to the efficient operation of the road freight network. An efficient motorway network must support major growth areas in the North West and South West and support the productivity of the freight and logistics industry and its connections to the ports and Sydney Airport, intermodal hubs and freight activity centres.

CONGESTION: AN INTEGRATED PROBLEM THAT REQUIRES INTEGRATED SOLUTIONS

Congestion on the road network has many causes and manifests itself in different ways across the transport network. It requires of solutions that address problems simultaneously.

Congestion can either be characterised as non-recurrent (caused by one-off events such as crashes) or recurrent. Recurrent congestion happens when a road regularly reaches its maximum capacity. It is caused by factors that affect demand for road space such as the behaviour of transport users, land use patterns, employment patterns, income levels, infrastructure levels or poor traffic engineering.

Congestion on one mode of transport affects other modes. For example, road traffic congestion affects those who drive, catch the bus and cycle and has subsequent effects for those who catch the train.

The Long Term Transport Master Plan provides measures that go beyond addressing the visible incidence of congestion and extend to the management of the State's transport systems as a whole*, by:

- Accommodating land use, growth and urban renewal and ensuring land use policies make a positive impact on congestion
- Managing demand through priority measures, demand-responsive technology, better customer information and pricing
- Managing congestion on roads by encouraging the use of public transport by:
 - Developing an integrated, fast, and reliable bus network
 - Improving public transport interchanges
- Employing a coherent, whole-of-network planning strategy through the Strategic Transit Network.

* P20, Managing Urban Traffic Congestion, Transport Research Centre, European conference of Ministers of Transport.

Figure 4.30 Road network performance (represented by volume-capacity ratio), AM peak, 2011 and 2031 under a 'do minimum' scenario

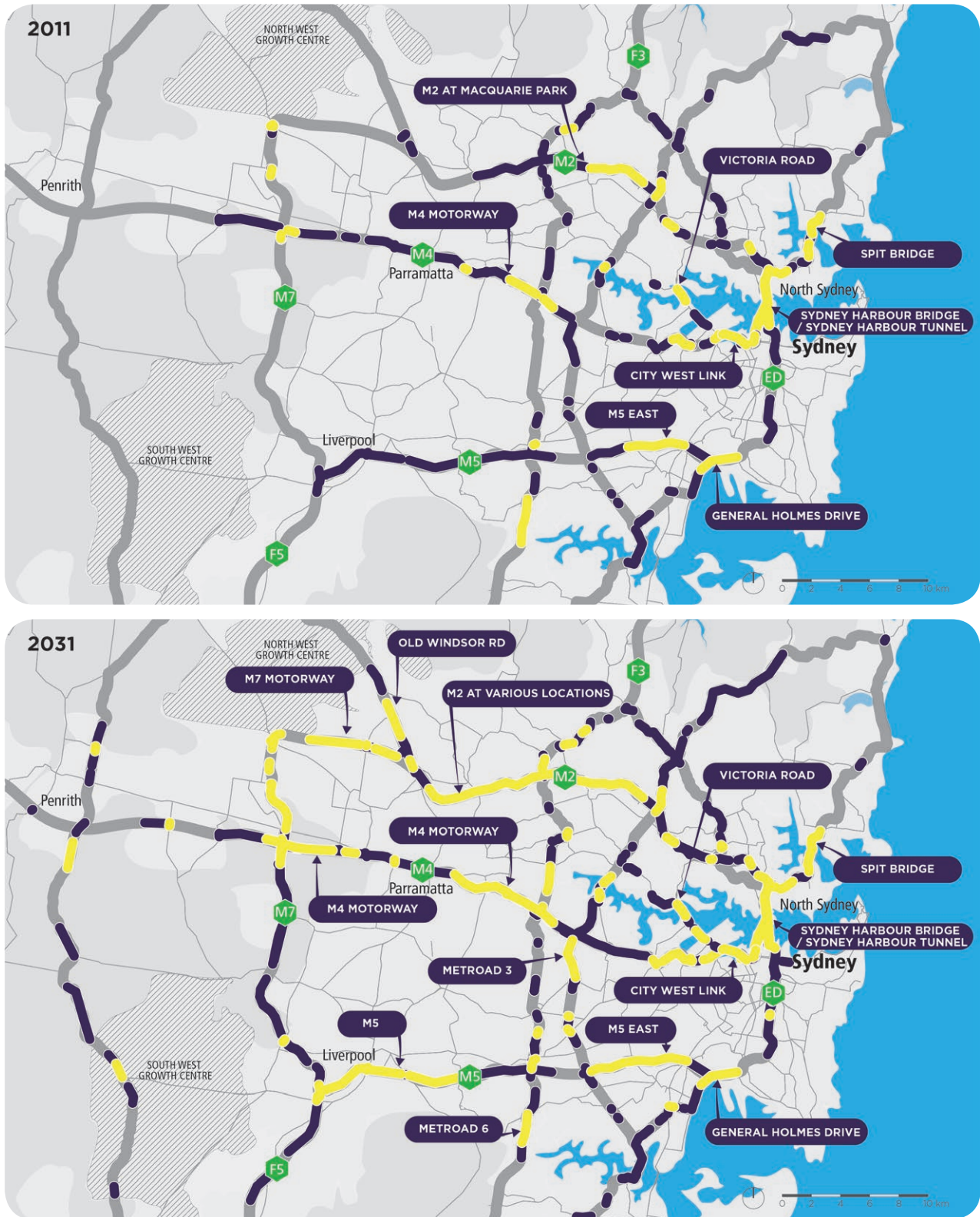
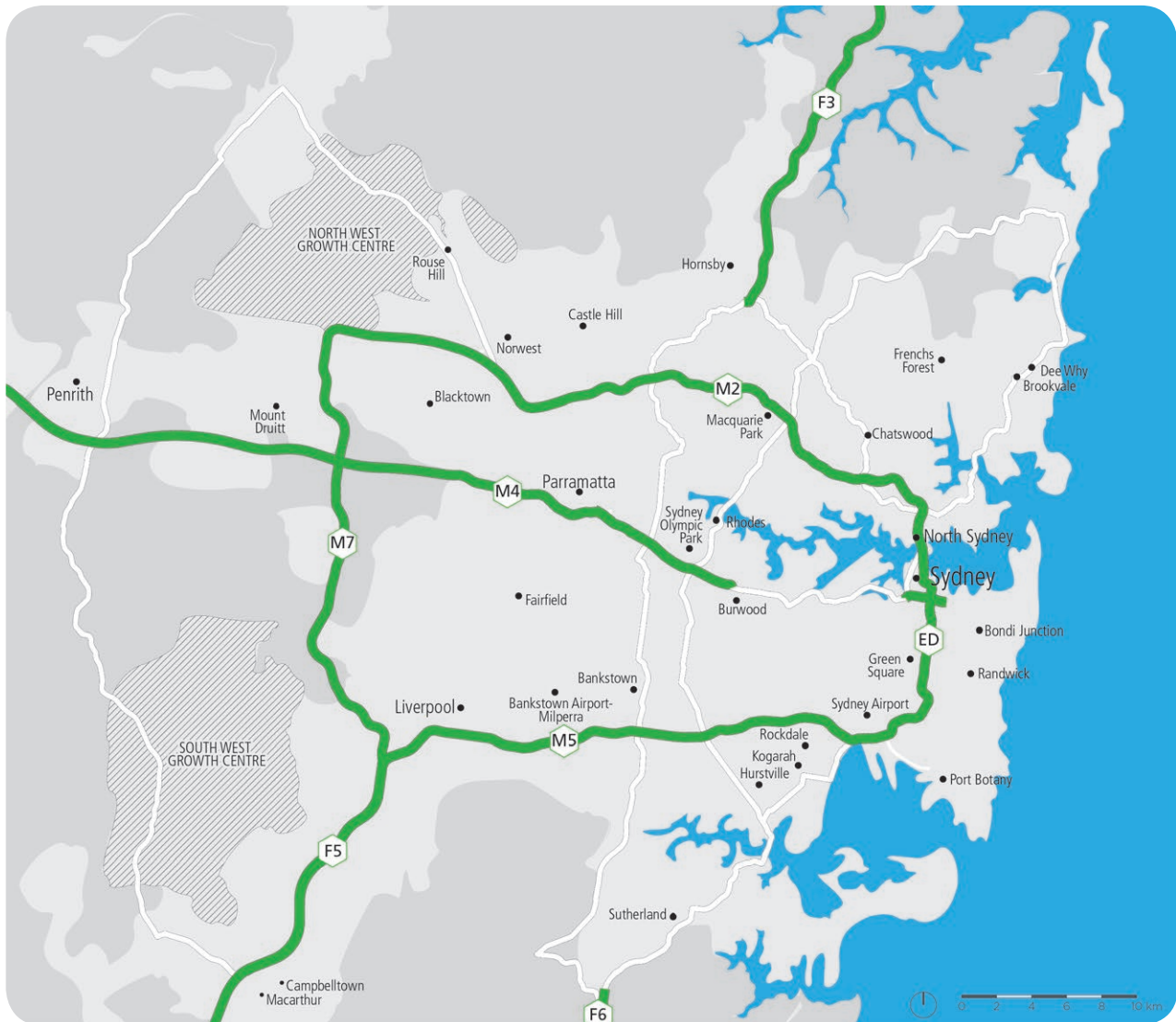


Figure 4.31 Motorways and major metropolitan roads in Sydney



Motorways and freeways
 Major metropolitan roads

Growth centre
 Major centres

Missing sections in the motorway network cause traffic congestion. These gaps include the M4 not connecting to the Port and Airport; the F6 (M1) not providing access to the motorway network from the South; and the F3 (M1) and M2 not connecting with each other. The gaps mean arterial routes are at capacity during the morning peak period. Figure 4.31 depicts the main gaps in the Sydney motorway network. Work is underway to widen the M2 and M5. These works will help to ease congestion.

motorways are the arteries of the city, particularly for the growing freight task. Tackling road congestion challenges will require ongoing investment in Sydney's road network, to fill the missing links that cause congestion, delays and access problems on the motorway network and to make sure the city's growth areas and centres have good arterial road connections with each other and to the Sydney City Centre.

THE COST OF CONGESTION

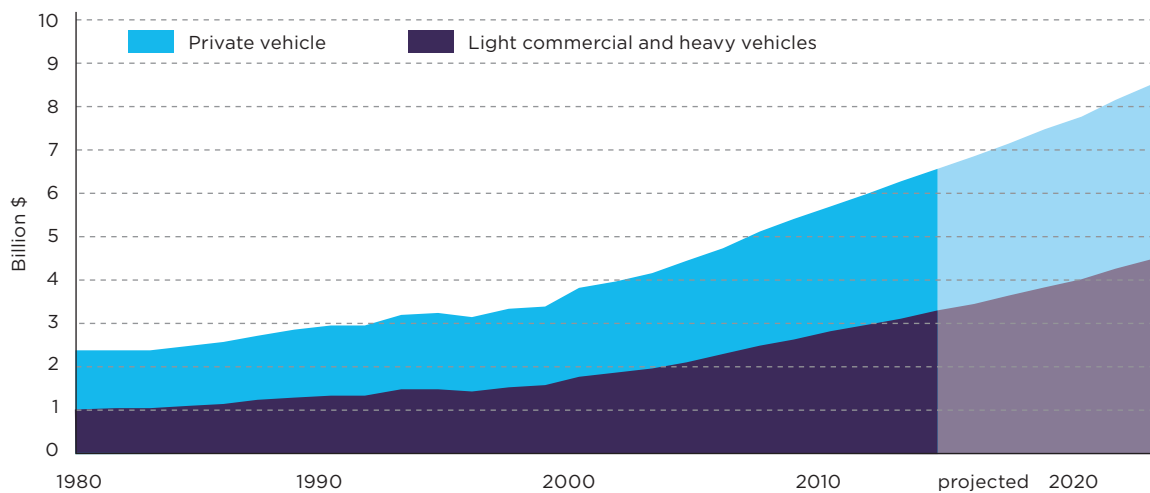
While road congestion can reflect a growing economy, it also has a cost to our economy of around \$5.1 billion each year – or nearly \$1,100 for every person living in Sydney.

The cost of this is longer travel times, which make working days longer and means less time for family and recreational activities. Congestion also leads to higher transport costs, which can drive up the price we pay for goods and services and erode the competitiveness of our businesses.

By 2020, the costs of congestion are expected to rise to \$8.8 billion a year (see Figure 4.32) as Sydney’s population grows and as travel, particularly car travel, increases. Unless we act, the costs of congestion will grow at 6.8 percent per year over the next decade – double the growth rate of congestion costs in the previous decade and nearly triple the expected rate of economic growth. Once congestion costs start growing faster than economic growth, they consume a larger and larger share of household budgets and business expenses.

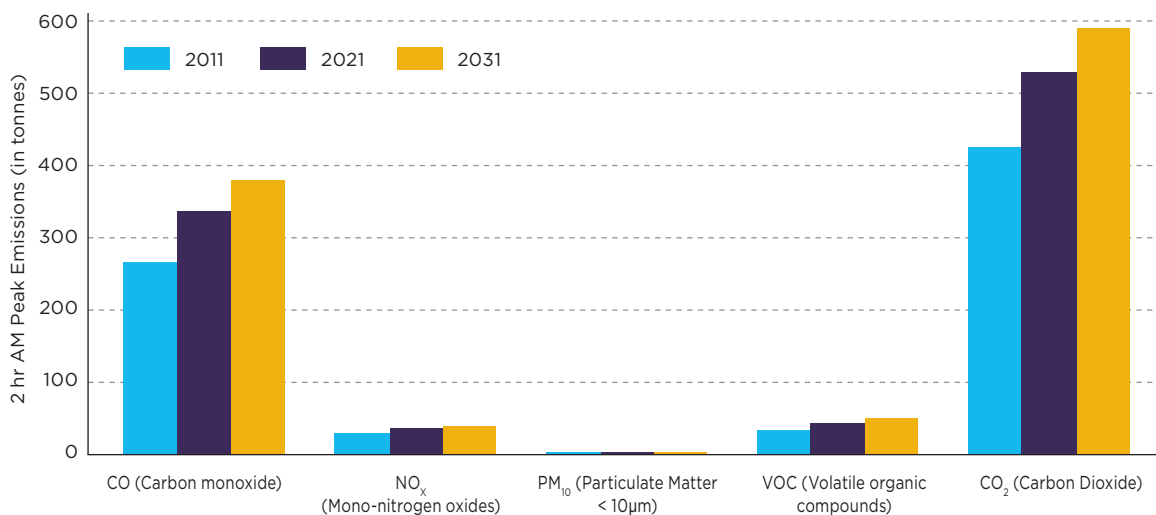
The State of Australian Cities 2010 report noted that a failure to contain congestion costs in Sydney and Australia’s other capital cities will impact adversely on national productivity and national, state and local economies.

Figure 4.32 The economic cost of congestion in Sydney 1980-2020



Road congestion also has an impact on Sydney’s air quality. Figure 4.33 shows that if we adopt a ‘do nothing’ approach to managing congestion, emissions from motor vehicles will increase, reducing air quality and having negative consequences for community amenity and Sydneysiders’ health and wellbeing.

Figure 4.33 Forecast emissions from motor vehicles 2011, 2021 and 2031 under a ‘do nothing’ scenario



4.4 Supporting the Sydney City Centre

Sydney CBD is the nation's major financial centre and is the Asia Pacific headquarters for many of the world's leading firms and national and international businesses. Firms located in the central city have access to a highly skilled workforce that is increasingly concentrated in knowledge-intensive industries and the services sector. The CBD is our gateway through which Sydney competes internationally, on behalf of NSW and Australia, for people and investment.

As the home of some of Australia's most popular tourist attractions, the Sydney City Centre is also a premier tourist destination. Most international visitors arrive in Australia via Sydney and spend time in the central city.

Over the years, Sydney's growth – in conjunction with the prime employment role of the CBD – has created pressures on all transport modes. With the employment and population of the central city expected to grow by about 100,000 and 20,000 respectively between 2011 and 2031, these pressures will only increase.

The CBD needs to protect its core economic role by managing these pressures in an efficient and sustainable way. At the same time, with more people wanting a central city lifestyle, we need to improve the amenity and liveability of the Sydney City Centre by reducing vehicle traffic and allocating more space for walking and cycling.

4.4.1 Securing the CBD's success

Sydney CBD's ongoing strength and success is based upon its capacity to perform several critical functions, each of which generates specific transport challenges.

The CBD has to support efficient connections in moving people and goods between key hubs of economic activity and the city centre, the Airport and Port Botany. It also needs strong links with other major cities in NSW and interstate.

The CBD has to maintain a high level of amenity, liveability and vitality to attract international firms and workers. These qualities are also important to the growing number of residents moving into inner Sydney.

The productivity of businesses located in the central city relies upon ready access to a supply of skilled workers. With the largest single concentration of jobs in Sydney, the CBD must remain highly accessible for commuters from all parts of the city.

The CBD is the base of growing financial, professional and specialised services sectors, all of which are generating more short trips in and around the central city and its adjacent precincts. The requirement for well integrated connections to the rest of Global Sydney is also likely to increase over time.

Easy access to tourist attractions, major events and sporting and entertainment venues is vital to the CBD's success.

4.4.2 The CBD is a focal point of demand

Sydney CBD's various functions and roles generate travel patterns and demands that are markedly different from the rest of the city and that create their own constraints and challenges.

On a typical weekday the number of people in the centre of Sydney grows from around 50,000 residents overnight to half a million during work hours – the highest concentration of people and jobs in the country. A total of 509,000 trips are made into the city centre each weekday, including 205,000 in the morning peak. This is expected to grow to around 242,000 trips by 2031 (an 18 percent increase in the CBD in the morning peak).

Nearly 150,000 people (or 72 percent of all commuters) who come to the CBD in the morning peak period use public transport, with volumes forecast to increase by 31 percent (about 45,000 additional people) over the next 20 years. As shown in Figure 4.35, around 90,600 come to the city centre by train; 48,530 travel by bus and 8,900 come by ferry.

Around 50 percent (250,000) of all weekday trips to the CBD come from adjacent suburban areas. People travel from these areas for work, shopping, education, entertainment, events and tourism.

SYDNEY CBD - AN ECONOMIC POWERHOUSE

Economic activity

Sydney CBD generates \$70 billion of economic activity each year – equal to around 20 percent of the NSW economy and six percent of Australia’s Gross National Product.

Employment

Around 330,000 jobs (14 percent of all Sydney jobs) are located in the CBD. This is forecast to increase to 417,000 in 2031, a 27 percent increase. About 50 percent of this growth will occur in the northern part of the CBD.

Services sector

The services sector now makes up 75 percent of all jobs in NSW, many of which are concentrated in the CBD. Within the CBD, there is a high concentration of jobs in the finance sector (around 20 percent of all employment within those sectors in Australia), information technology and the creative industries.

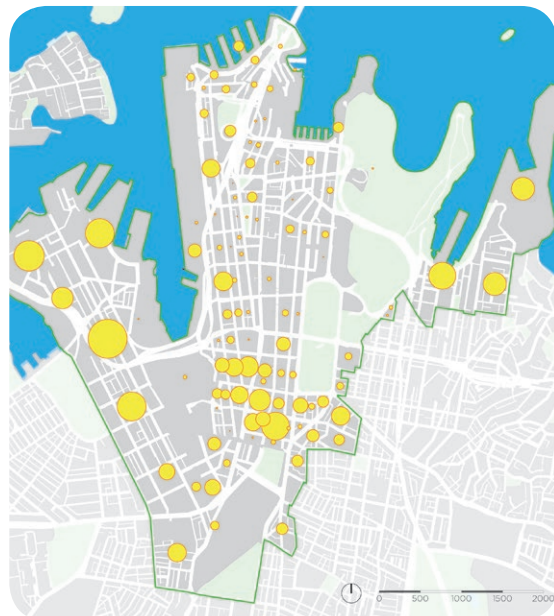
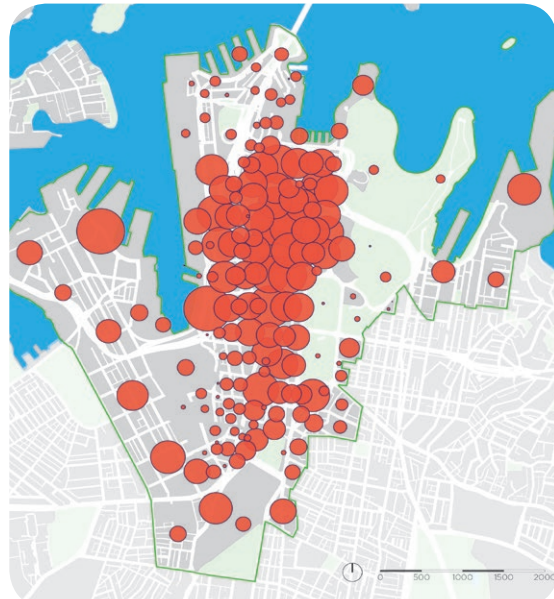
Residents

The CBD is home to around 55,000 residents, with particularly strong growth over the last 15 years. This population will grow to 72,000 by 2031, outstripping the rate of employment growth and reflecting the increasing popularity of living in the central city.

Visitors

In 2009-10 more than 2.6 million international visitors arrived in Sydney and 6.8 million domestic visitors came to the city. Tourism in Sydney contributes over \$5 billion annually to Australia’s economy, with most activity focused in and around the CBD.

Figure 4.34 Sydney city centre, population and employment distribution



4.4.3 Better access is needed to and within the CBD

Access to the CBD will become more difficult unless action is taken.

Sydney's road network

Travel times from outer areas will increase as traffic congestion increases. The road network into the Sydney CBD is not only important for car users, but is also a vital part of the public transport network and is critical to CBD commerce. Figure 4.36 maps the expected travel time increases for people travelling by public transport to the CBD from the wider metropolitan area by 2031, showing an increase in travel time for people who commute to the CBD from within 10 kilometres – those who rely most heavily on buses for public transport to work.

For extended periods during weekdays and weekends, the road network within and surrounding the CBD is at capacity as cars, buses and trucks compete for space. Important

gateways, such as the Harbour Bridge, Anzac Bridge and the Eastern Distributor, are heavily congested, primarily because traffic not destined for the CBD is forced to use these arteries to reach areas north and south of the Harbour and to the east and west.

Within the CBD, major city streets such as George, York and Clarence Streets, and intersections along Market and Bathurst Streets, are often congested with cars, buses, taxis and pedestrians.

With limited road space in the CBD, cars, buses, commercial vans (light vehicles used for delivery and specialised trades) and other service vehicles all compete for parking and driving space. These conflicting demands for space clog up city thoroughfares, slow down bus services and reduce pedestrian safety and amenity.

Figure 4.35 Weekday trips into the city centre by mode, AM peak

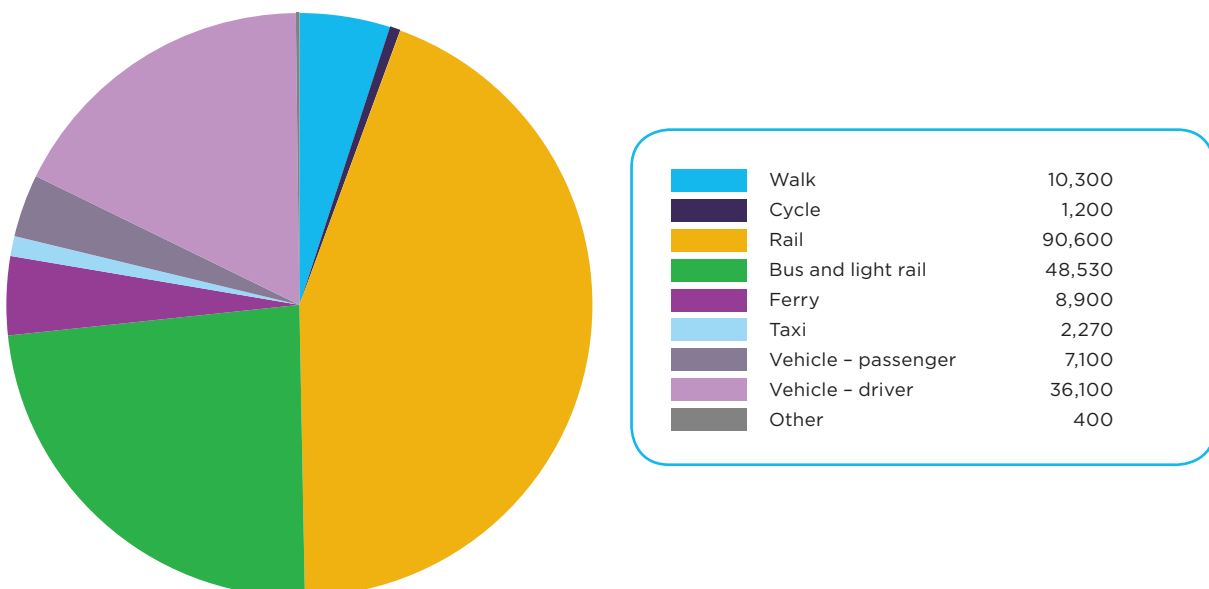
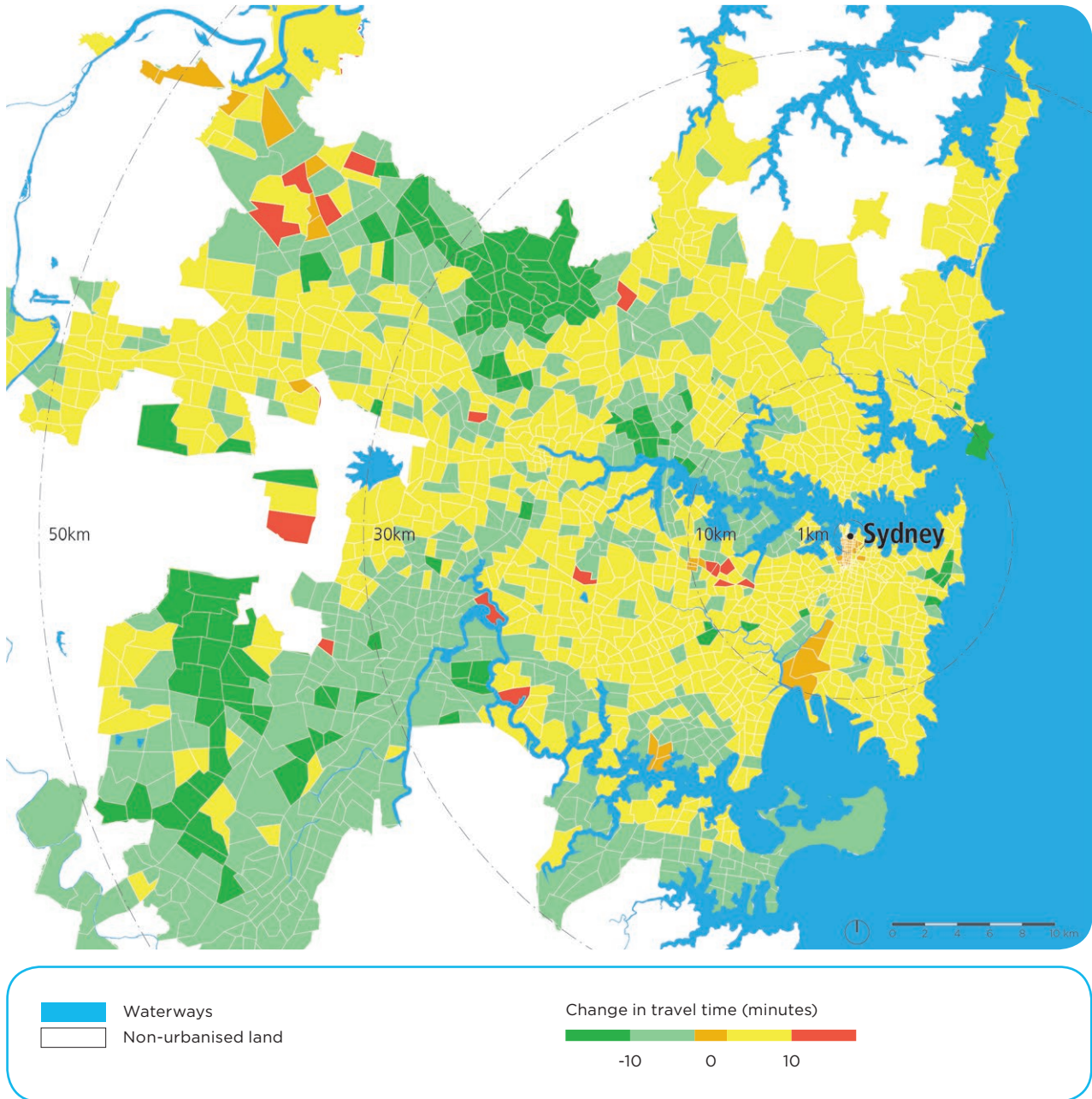


Figure 4.36 Forecast change in AM peak travel time by public transport to Sydney CBD (2011 - 2031 'do nothing')



Public transport interchanges

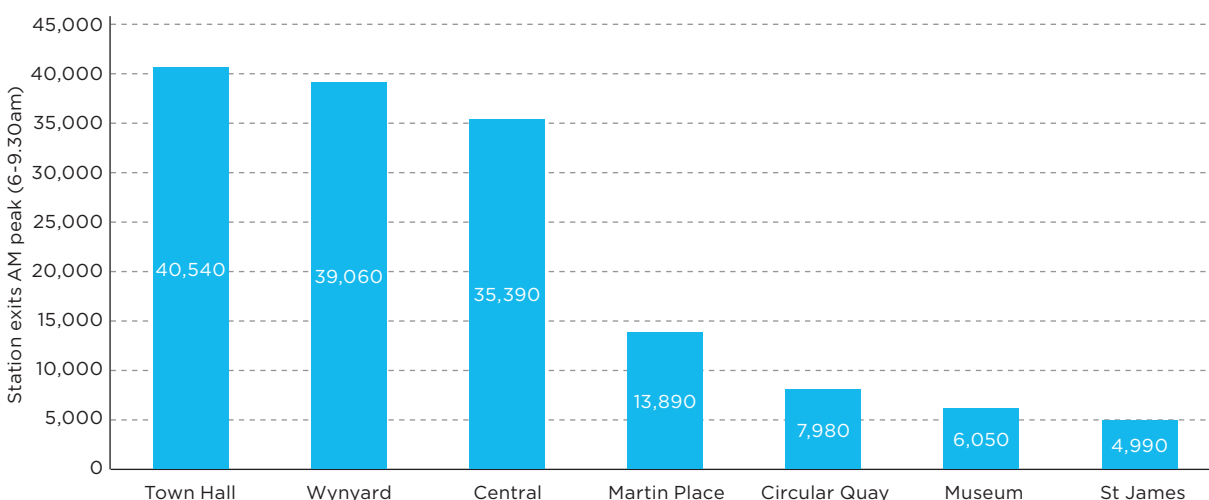
With public transport used by three-quarters of people travelling to the CBD, key stations and interchanges are crowded and at, or close to, capacity.

- Around 28 million passengers pass through the Circular Quay interchange each year, of whom just over half (14.2 million) are ferry passengers. Many visitors to Sydney will pass through the interchange at least once. The Circular Quay precinct experiences pedestrian congestion and links with other transport services need to be enhanced.
- Town Hall Station, which facilitates more than 150,000 passenger movements each week day, is crowded during the peaks. Traffic congestion around the station contributes to bus delays for those people seeking to change between modes.
- Platform capacity has been reached during the evening peak period at Wynyard Station, which has 110,000 passenger movements every

weekday, and 39,060 in the three and a half hour morning peak period. Around the station, 58 bus services terminate at 15 different stops. More than 800 buses and 35,000 passengers arrive in the precinct via York Street, and a further 400 buses and 18,000 passengers access the precinct via George Street in the same three and a half hour morning peak period. Wynyard has a high volume of services converging on a small space leading to congestion.

- Central Station, which has more than 170,000 passenger movements each week day, is the largest railway station in Australia, serving almost all lines on the CityRail network and serving as the terminus of intercity and interstate rail services. Some platforms are also crowded at peak periods, and the station is poorly signposted and unconnected to other modes such as buses.
- Stations at Martin Place, Museum and St James are relatively underused.

Figure 4.37 Passengers exiting at CBD stations for AM peak based on 2011 barrier counts



Walking in the CBD

As shown in Figure 4.38, around 93 percent of the 1,400,000 localised trips within the CBD each day are made on foot. Volumes are forecast to increase by 21 percent (260,000 additional people) over the next 20 years.

Right across the CBD, pedestrian amenity is reduced at peak times by congestion. Recent works have improved provision for pedestrians in the CBD. New developments are being approved with an increase in share of public transport and walking. The Wynyard Walk, for example, will provide safe and well managed walkways between Wynyard and Barangaroo. This will be vital for this precinct and the CBD as it continues to grow.

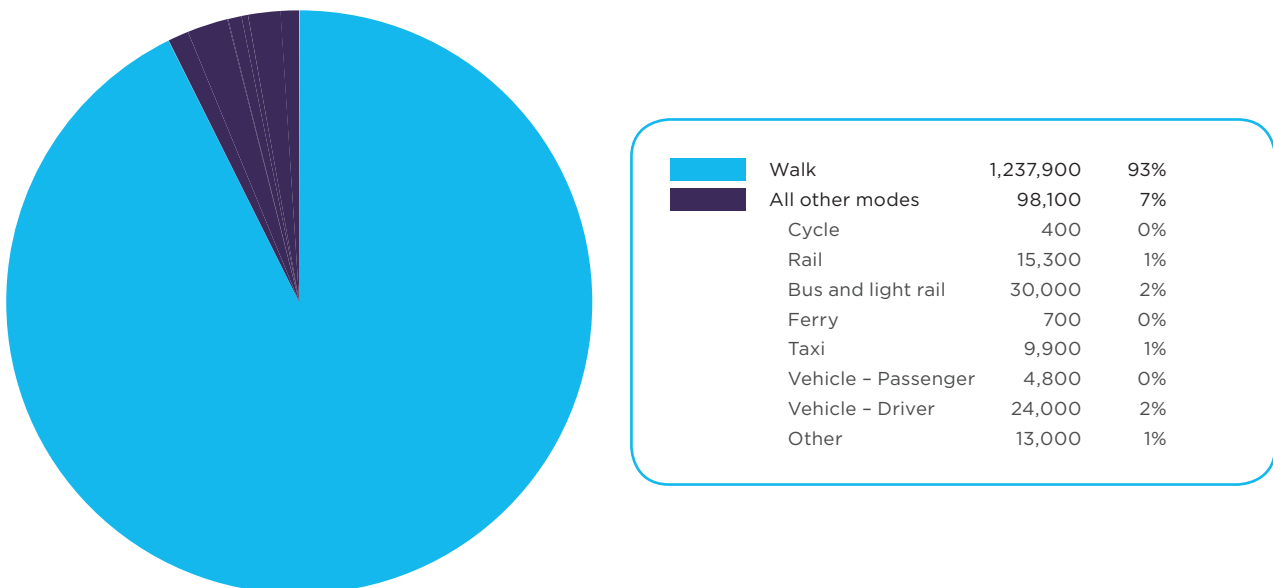
Encouraging more people to walk in Sydney has its own set of challenges. In many places around the city, pedestrians are not given priority – even in places where many people walk. For example, traffic signals are timed for optimal flow of vehicles, not pedestrians – meaning that pedestrians spend longer waiting to cross streets than they should.

Pedestrian delays at traffic signals can increase walking times by 60 percent – reducing travel speeds from around 6.5 km/h to just 4 km/h. When we are pressed for time – even for a short journey – walking may simply take too long.

Many footpaths are not designed for easy access, with narrow paths and poor surfaces impeding journeys. Often, major thoroughfares and key routes are not well signposted for pedestrians. Walking is also poorly integrated with the public transport network, with inadequate facilities for pedestrians at many interchanges. Traffic design guidelines for pedestrian paths do not always create a quality environment. People are much less likely to use unattractive paths.

Perceived and actual safety issues are a major impediment to promoting walking. Safety issues include poorly-lit footpaths and thoroughfares, busy roads that lack median areas or islands, poorly located pedestrian crossings and crossings with walk times that are too short. Outside inner suburban areas of Sydney, as settlement patterns become more dispersed, many places are simply not conducive to walking.

Figure 4.38 Weekday trips within the city centre



Cycling in the CBD

Compared to other global cities, Sydney's cycling links are not extensive. Routes mixed with high volumes of vehicle traffic discourage some people who would otherwise cycle into the CBD.

However, cycling is growing in the Sydney CBD. This growth has been fuelled by new bi-directional bike paths to the CBD (such as along the Harbour Bridge and Anzac Bridge) that are separated from cars and that offer faster travel times to the central city. For example, cycling on the Anzac Bridge has risen from about 500 per day in 2002 to more than 1,500 per day in 2012. On Anzac Parade, cycling over the same period has risen from about 250 per day to about 1,250 per day. And on the Harbour Bridge cycling has risen from just over 750 per day to almost 2,500 per day over the last 10 years. This growth demonstrates that when safe and convenient facilities are provided, cyclists will use them.

The constraints in the CBD mean it is difficult and expensive to solve all of these problems with large scale projects. Rather, in creating a world-class transport system, we need to look to innovative solutions and clever improvements to make the most efficient use of our existing services, infrastructure and surface space.

We need to look at opportunities to improve cycling connections including with other transport modes. Interchanges and public transport that support cyclists will encourage the use of this mode. How cyclists are accommodated on the road network will also continue to be an important issue.

Sydney's ferries – an Australian icon

Sydney's ferries provide services across Sydney Harbour and along the Parramatta River via eight routes that serve 39 wharves. Sydney's ferries are often referred to as an Australian icon, are popular with visitors and perform an important function as part of the transport network. However ferries are expensive to operate compared to other transport modes and are often underused.

Just two percent of Sydneysiders commuting to the CBD use ferries. In the morning peak period, ferries are on average about half full travelling to the CBD. Customers are divided between commuters and visitors, and 50 percent travel to or from Manly. While annual ferry patronage has stayed static at around 14 million per year over the last decade, since the NSW Government increased services 12 months ago, patronage has grown.

A number of issues constrain a substantial boost in ferry services:

- There is limited wharf capacity for vessels at Circular Quay in peak periods, and pedestrian access and interchange facilities need improvement.
- Connecting bus services are typically designed to serve the greater number of bus passengers or those who need to connect to rail, rather than those connecting to ferry services. This makes it more difficult for ferry customers to rely on a quick interchange.
- There are limited locations where berthing, mooring and repairing ferries can occur.
- Ferries are capital and labour intensive to operate, and highly seasonal in terms of revenue, with a surge in travel occurring over the summer months and on Sundays when Family Funday Sunday fares are in place.
- Ferry services pose particular accessibility challenges and infrastructure needs to be upgraded to comply with national disability access standards.
- While some locations and developments, such as Barangaroo, may be suitable for ferry services, providing the necessary capacity requires significant capital investment.

4.5 Providing transport to a growing CBD

While Sydney's CBD is growing, so too is high volume activity and high density living across Sydney City and the Global Economic Corridor. New growth in areas to the immediate west, north, south and south east of the CBD are creating opportunities to expand cultural, leisure, tourism and economic activity.

The growth in these places is predominantly situated within reach of existing transport and other supporting infrastructure. But the expansion of the inner Sydney footprint will also create challenges alongside opportunities. Travel demand will grow and travel patterns will change as more people choose to live and work in these areas.

Figure 4.39 shows the precincts in inner Sydney with significant forecasted population and jobs growth between 2011 and 2031. This development includes the intensification of jobs in Randwick and the increase of employment in the urban renewal areas of Barangaroo, Green Square and Redfern-Waterloo.

Barangaroo

When the first office tower in Barangaroo opens in 2015, it will be another significant step in the gradual shift of CBD business activity towards the west. It will also reinforce the Sydney CBD as a major high-grade office location, with the northern CBD as its financial hub.

Until Barangaroo is developed, there are only a limited number of areas where the CBD interacts directly with the Harbour. As this disused port and storage facility is transformed, it will attract commercial and residential development on a scale not yet seen in this area, as well as being a significant visitor attraction.

Forecasts indicate that some 23,000 people will live or work in Barangaroo and another 33,000 people will visit the precinct every day.

The financial and professional services sectors are expected to feature largely in business activity in Barangaroo, requiring links back to the centre of the CBD. There will be significant pedestrian traffic between the two locations.

The commercial core of Barangaroo will be located at Barangaroo South and will be the primary generator of travel demand. Barangaroo Central

and Headland Park will attract people visiting for tourism, recreational and cultural purposes.

The rapid development of Barangaroo poses a significant transport challenge. While close to the core CBD, topographic and network barriers must be overcome to deliver the high levels of public transport envisaged for the area.

Such a central and high density location demands an almost total focus on public transport, walking and cycling. While the nearest rail station is Wynyard, pedestrian links are not straightforward and easily accessible.

In August 2011, the NSW Government set up a Barangaroo Transport Taskforce which has overseen the development of an Integrated Transport Plan for Barangaroo. The taskforce was chaired by the Director General of Transport for NSW and included other stakeholders such as the Barangaroo Delivery Authority, Lend Lease (the developer of Barangaroo South), the City of Sydney and other State agencies.

The Barangaroo Integrated Transport Plan sets the framework for delivering transport services and infrastructure to support the Barangaroo development. Work has started on the Wynyard Walk – a grade-separated pedestrian link that will directly connect Barangaroo South to Wynyard Station via a short walk. Wynyard Walk will open in 2015 and will provide connectivity and capacity sufficient to meet a demand of up to 20,000 pedestrians in the one hour business day morning peak in both directions.

Planning is also underway to ensure that all modes service Barangaroo including a new midtown ferry hub at Barangaroo South and new bus services along Hickson Road.

Green Square

Green Square is Australia's largest urban renewal site and one of the inner city's fastest growing areas. Since 2000, some 11,000 new residents have settled in the area; by 2030 there will be capacity to accommodate about 40,000 residents and 22,000 workers. The site is part of the Global Economic Corridor and located 4.5 kilometres to the south east of the CBD en route to Sydney Airport.

Figure 4.39 Precincts with forecast significant population and employment growth between 2011 and 2031 in inner Sydney



Green Square is a good example of inner Sydney's increasing diversity, with residents, shops, parks, offices and commercial facilities coming together to bring the area to life. It is also an example of our willingness and desire to opt for higher density living in inner city suburbs – a shift that provides an opportunity to meet our growing transport demand through public transport services.

However, the growth of Green Square does present transport challenges. While Green Square Station is on the Airport Rail Line and only a few minutes to the CBD, much of the forecast growth in the area will be beyond walking distance of the station. Other mass transit solutions may be needed to meet future travel demand and to secure direct connections with the CBD and other activity nodes such as the University of NSW.

Randwick

To the south east of the CBD, Randwick is expected to experience 50 percent growth in industry output between 2011 and 2031, reflecting the substantial increase in jobs forecast for the area. The main driver for this growth is the Randwick Education and Health Specialised Precinct, made up of the University of NSW and the Randwick Hospitals precinct. Randwick is an example of the influence being exerted in many cities around the world by strong growth in health and education services, with leading hospitals, research institutions, universities and private firms increasingly joining forces to commercialise scientific research – creating new jobs and opportunities along the way.

The absence of a rail link from the CBD places pressure on the bus network to meet the Specialised Precinct's increasing need for a high capacity, reliable and fast transport service to the CBD and beyond. While bus priority measures have been implemented on this corridor, services still experience delays due to interaction with other traffic.

Moore Park

Moore Park is home to the Sydney Cricket Ground and the Sydney Football Stadium. These venues, combined with a range of sporting activities in the park itself, exhibition facilities at the Hordern Pavilion and Royal Hall of Industries, and shopping and dining in the Entertainment Quarter, put Moore Park on a sound footing to remain an important sports and events precinct in the central city's south east.

Events in the precinct attract high numbers of people. A demand estimate for major events in Sydney shows that more than 488,000 people attend the SCG each year for AFL and cricket matches; more than 668,000 attend football matches at the Sydney Football Stadium; and a further 280,000 attend events and concerts at Hordern Pavilion. These high numbers of people coming to the precinct generate congestion along the Randwick corridor during major events.

While public transport services to Moore Park have increased, the easy availability of parking means many people drive to events, adding to congestion in and around the precinct and placing pedestrians at risk. In 2010, only five to 20 percent of people attending events at the SCG and the Sydney Football Stadium used buses to get to Moore Park (compared with an average public transport mode share for major events at Sydney Olympic Park of 55 percent).

An integrated ticketing system for the precinct will include a train or bus ticket with entry to events at the SCG, Sydney Football Stadium and Centennial Parklands. As the Sydney Olympics showed, these systems can encourage event-goers to use public transport – reducing congestion in the vicinity of an event and quickly moving large numbers of people. This system is an important step in improving access to Moore Park and supporting its development and growth.

North Sydney

Global Sydney comprises the Sydney and North Sydney CBDs. Due to the predominance of the Sydney CBD and its proximity, North Sydney can be overlooked as a centre in its own right. North Sydney is an important business location with employment density second only to the Sydney CBD.

There were 44,000 jobs in North Sydney in 2011 and this is expected to increase to 56,000 by 2031. Employment is predominantly located in high-rise office development in the core of the CBD with lower density commercial and residential around the fringes. North Sydney is home to the telecommunications, and the finance and insurance sectors, both engines of growth in the modern services economy.

The rapid development of Macquarie Park as a business centre further to the north-west places North Sydney in a central location within the Global Economic Corridor. Maintaining connections along this line creates both transport challenges and opportunities.

North Sydney enjoys good public transport access and 54 percent of commuters travel to work by bus and train while 39 percent drive to work. Over 56,000 people use the rail station every day, making it the fifth busiest station on the CityRail network. North Sydney was upgraded in 2010, providing capacity to support the growth of North Sydney CBD.

North Sydney CBD is bound to the east by the Warringah Expressway which separates its CBD from residential areas to the east. The Expressway provides convenient road access to the Sydney CBD and locations to the North including Chatswood and Macquarie Park. The Pacific Highway runs through the centre of North Sydney, creating a barrier to local pedestrian movement which is addressed through grade crossings, a footbridge and subsurface connections through the Greenwood shopping centre.

North Sydney's location on the lower North Shore and its proximity to the Sydney CBD creates particular transport challenges. Many people pass through North Sydney as they travel to and from the Sydney CBD. This places pressure on the rail, bus and road networks.

The transport challenges facing North Sydney over the next 20 years include:

- Rail and bus service capacity must meet the needs of the Sydney CBD and North Sydney in the peak periods. This can mean that the maximum load on southbound services occurs immediately prior to North Sydney in the morning peak period.
- North Sydney interchange will help maintain the attractiveness of public transport as a travel option. Ensuring the interchange has sufficient capacity to meet future transport needs will include pedestrian paths, bus stop capacity and facilities.
- Roads passing through North Sydney can be heavily trafficked. Congestion impacts bus services passing through the centre and impacts on pedestrian amenity. Balancing the needs of local development, car parking and through-traffic will support the growth of North Sydney.
- High quality, frequent transport connections throughout the day are required to support business-to-business travel, recognising North Sydney's role within the Global Economic Corridor.

Port Botany precinct

The South Sydney Industrial Area, between the CBD and Port Botany, is the second largest employment area in Sydney after the CBD, with employment in 2011 of about 65,000 and an additional 16,300 people employed at the Airport. Significant jobs growth is forecast for the precinct, including a 31 percent increase at the Port and a 21 percent increase at Sydney Airport. The precinct is also a catalyst for much of the surrounding economic activity and employment growth.

The growing volumes of freight moving through the Port make the maintenance of efficient links between the precinct, the CBD and the Global Economic Corridor one of our most important transport challenges – not just for Sydney, but for NSW and the national economy.

The area is serviced by the M5 and Eastern Distributor and a dense, but low capacity arterial road network between the Airport and the CBD. This network is particularly congested during peak periods.

While the Illawarra and Airport Rail Lines provide north-south connectivity, a number of areas are not accessible by passenger rail and rely on buses for public transport. The precinct is discussed in greater detail in Chapters Five and Seven.

4.6 Customers' travel needs are changing

TRIPS TO THE AIRPORT

Travel demands associated with Sydney Airport continue to grow. At present, around 100,000 trips are made every weekday to and from the Airport. Roughly one third (36 percent) of these trips start in the CBD and inner Sydney, with the next greatest proportion of travellers (13 percent) coming from the North Shore/Northern Beaches. The majority of these travellers must pass along the Airport to CBD corridor to reach the airport.

Activity at Sydney Airport is forecast to double over the next 25 years: from 36 million trips each year to 79 million trips. This means that airport traffic by itself will have a major impact on the corridor, before any other growing demands are taken into account – such as travel from South West Sydney to the CBD or an increase in freight bound for Port Botany.

Bays Precinct

Glebe Island and White Bay have been used as a commercial port facility for 100 years. The site occupies 39.7 ha and currently has eight berths, the last remaining deep-water berths with backup land for commercial port use in Sydney Harbour. The berths and land area are used for various purposes including commercial vessel lay-up, unloading of bulk cement, general maritime use, and cruise passengers.

White Bay will continue to be a port facility. We will progress decisions on related landside transport requirements. At the eastern end of White Bay, a new world-class cruise ship terminal will be operational in 2013. As part of this development, a new road link will connect the terminal to the City.

We have established the Bays Precinct Taskforce to advise on renewal opportunities and land use and transport planning for the wider site. A priority for the Taskforce is ensuring the precinct's continued operation as a freight port, balanced with other mixed-use maritime, commercial, and recreational requirements.

While Sydney's transport system serves many communities well, it needs to adapt to the changing requirements of some places and people. The Long Term Transport Master Plan has identified six travel requirements where our transport system needs to provide better support.

4.6.1 Our growing demand for off-peak and weekend travel

Sydneysiders' travel patterns are changing, with a trend emerging of more off-peak and weekend travel. Frequency of services is listed by public transport customers as one of the most important factors in how satisfied they are with the services they use. But at some times of the week, services are much less frequent despite demand being relatively high. In part, this is due to historic reasons. Our transport system was developed largely to cater to a nine to five, five-day working week. As working patterns and lifestyles change, many more of us now want – and need – to travel outside peak times. The rise of the services sector has contributed to this change in demand, with more people now working on the weekends and many more commercial and other vehicles operating outside traditional business hours.

But while our travel habits are changing, our public transport services generally continue to provide less frequent services on weekends than during the week. Cities must respond to these changes: in Melbourne, for example, train service frequencies have increased on two rail lines to 10 minutes on weekends to meet increased demand.

Across the city, our access to high frequency transport services varies throughout the day depending on provision and coverage of services. In particular, bus service coverage and frequency is highly variable. While rail service frequency reduces in off-peak times, some bus services stop altogether outside these while others operate at low frequency or along different routes.

Public transport services will need to become more demand-responsive, which requires a better understanding of customers' travel needs and also better planning around demand generators, such as universities and new developments.

Figure 4.40 shows how bus services become less frequent over the course of a day. The maps show roads that have a frequency of more than four buses per hour during: the morning peak, middle of the day and in the evening. It shows that frequent bus coverage drops considerably in the middle of the day, and drops further in the evening, particularly in the western and northern areas of the city.

4.6.2 Cross-city trips are increasing

The growing demand for cross-town travel indicates that a CBD-focused transport network is no longer adequate to service the travel needs of Sydneysiders. There is a growing need for trips across the greater metropolitan area. Almost half of travel into Sydney is not destined for the CBD. Including the viaducts and tunnels, about 48 percent of traffic in the morning peak period within the Sydney CBD is travelling through the CBD. While the majority of through trips are accommodated on the perimeter of the CBD, through-traffic takes up road space on the approaches that would otherwise be used for access to the CBD. Over the next 20 years, as employment centres beyond the CBD continue to grow in size and importance, cross-town traffic volumes will increase.

Figure 4.41 shows the combined journeys to work for Parramatta, Liverpool, Penrith and Macquarie Park. Many of these journeys are not to the CBD – and these types of trip will increase as more jobs are generated in these centres.

As cross-town travel increases, congestion is likely to spread further from the CBD, with areas between 20 kilometres and 50 kilometres from the CBD forecast to experience higher reductions in average travel speeds than areas less than 20 kilometres from the CBD. There is also likely to be a substantial increase in travel times for cross-town routes on some corridors. For example, people travelling from Penrith to Campbelltown or from Badgerys Creek to Blacktown can expect increases in their travel times of about 20 minutes.

These predicted travel time increases highlight the growing influence of Sydney's emerging employment centres on travel demand and the need to find ways to meet this demand in the years ahead.

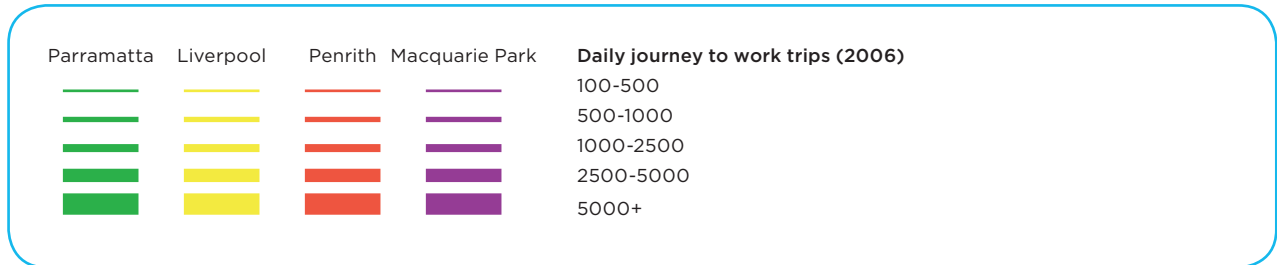
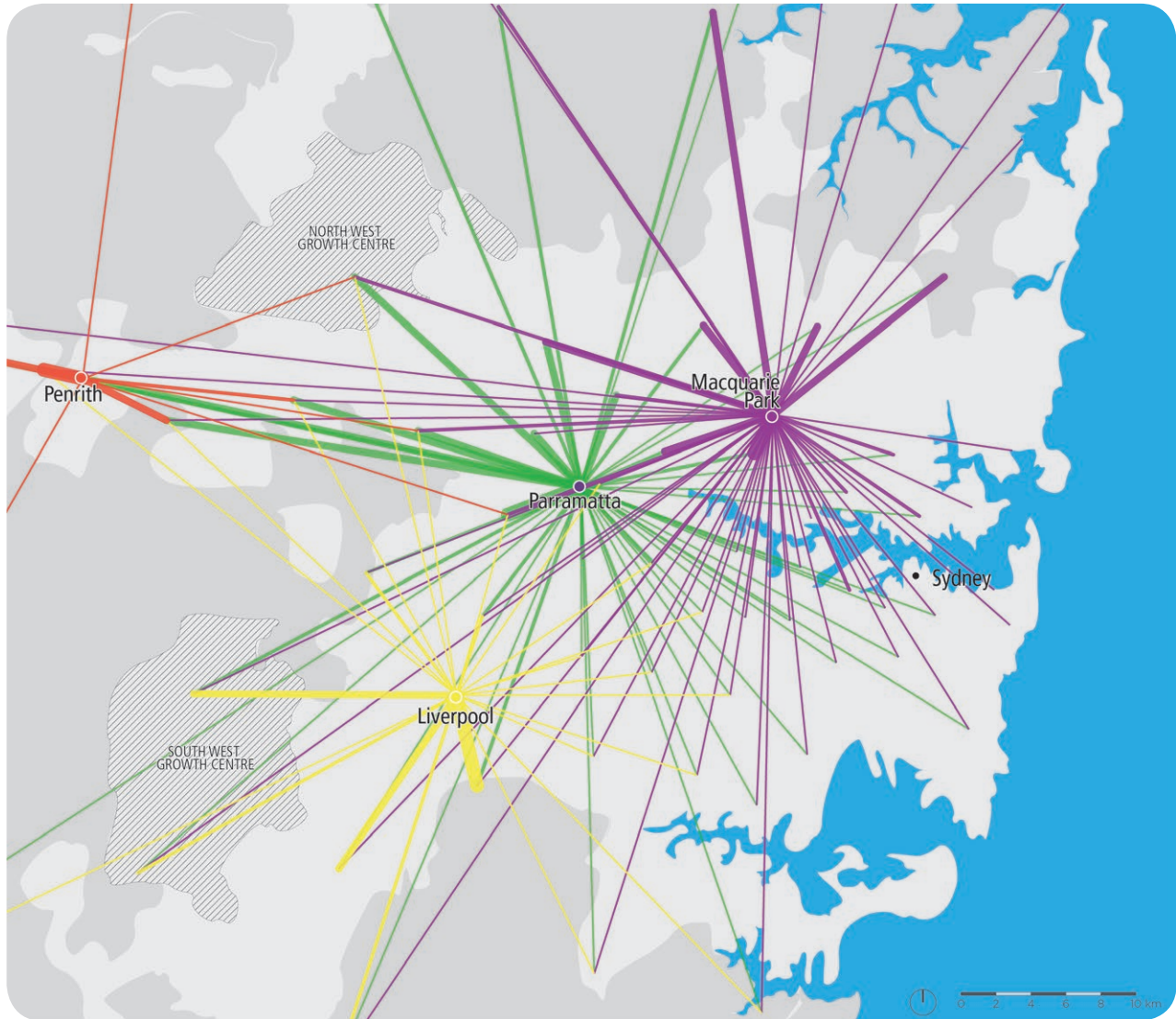
Figure 4.40 Roads with buses approximately every 15 minutes or more frequently



Average hourly bus frequencies

— Roads with buses operating every 15 minutes or more frequently

Figure 4.41 Origins of workers travelling to Parramatta, Penrith, Liverpool and Macquarie Park



4.6.3 Jobs and services need to be more accessible

A key measure of how well an area is served by transport is the accessibility residents have to jobs, education and essential services, and how much time and money it takes to get where they need to go. Figure 4.42 shows the percentage of Sydney’s jobs that can be accessed within 30 minutes from a location by public transport and by car. The figures illustrate that accessibility of jobs varies across different parts of the city and that, beyond the CBD, accessibility by public transport is largely determined by rail corridors.

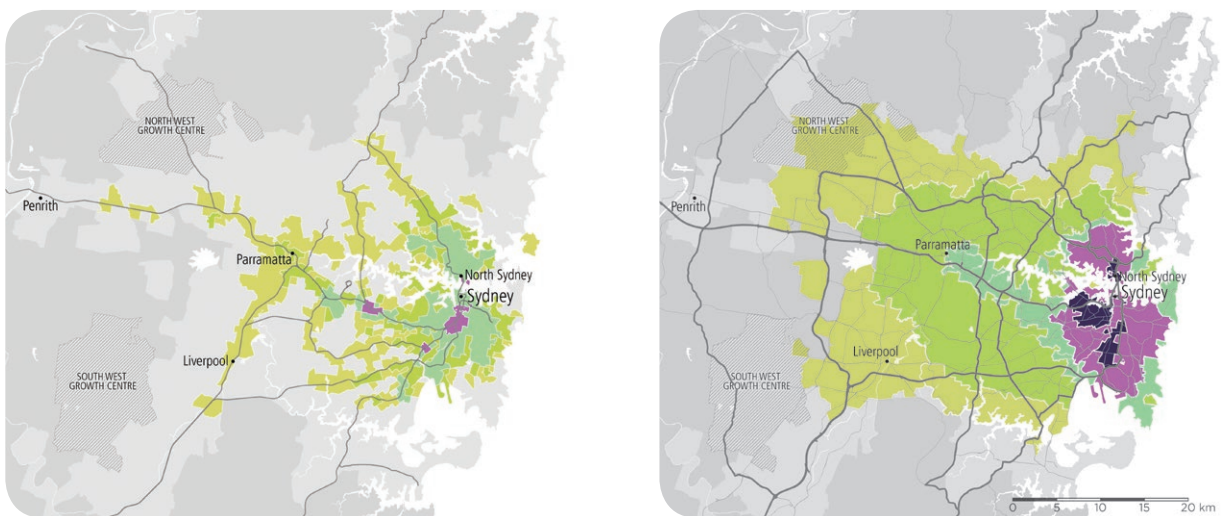
People living close to a rail line or a public transport connection have easier access to jobs; those living some distance from public transport usually have to rely on travel by car. Access to jobs by public transport is poor in the North West and South West, and in the Northern Beaches. The area serviced by public transport can be widened by providing more commuter car parking for park and ride and bicycle parking at public transport interchanges. Current programs to increase commuter car parking at rail stations are being expanded to provide even more parking spaces in the future.

While car travel provides broader access to opportunities across Sydney, accessibility to employment in the outer areas is much more limited than in areas close to the city centre.

In the outer suburbs, roads designed years ago to meet rural transport now need to have their capacity increased to meet growing demand. Improved network connections need to keep up with population, employment and housing growth. Dispersed patterns of residential development make it difficult to provide a viable public transport service and in these areas roads need to be expanded to meet the needs of local residents and businesses, particularly in the city’s outermost areas.

The peripheral areas of Sydney’s Greater Metropolitan Area that are now experiencing accessibility problems are the same areas that will experience the greatest population growth, making improvements to transport services to these areas even more important.

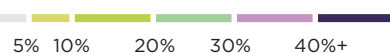
Figure 4.42 Proportion of metropolitan jobs accessible within 30 minutes by public transport and private vehicle



Public transport
 CityRail network

Private vehicle
 National and state roads and highways

% of metropolitan jobs accessible within 30 minutes in AM peak



4.6.4 Walking is an important transport mode

Walking is not just good for us it is also good for our transport system. Many transport journeys start and end with a walk and journeys that only involve walking reduce congestion. When homes and jobs are within walking distance of each other and within easy walking distance of public transport, accessibility to jobs and services increases and our commute is easier. Pedestrian-friendly interchanges with more street-level activity are safer and more secure. More people walking to catch the train, bus or ferry also means less pressure on town centre streets, busy bus services and commuter car parking. A consideration when planning new developments and supporting transport infrastructure is to provide a network of pedestrian connections, which requires consideration of:

- Personal safety and security, including adequate lighting and activated public spaces
- Adequate footpath widths
- Safe and convenient pedestrian crossings of roads at intersections and mid-block crossings
- Convenient and legible access to public transport stations or bus/light rail stops or ferry wharves
- Good signage and wayfinding to support efficient pedestrian movement.

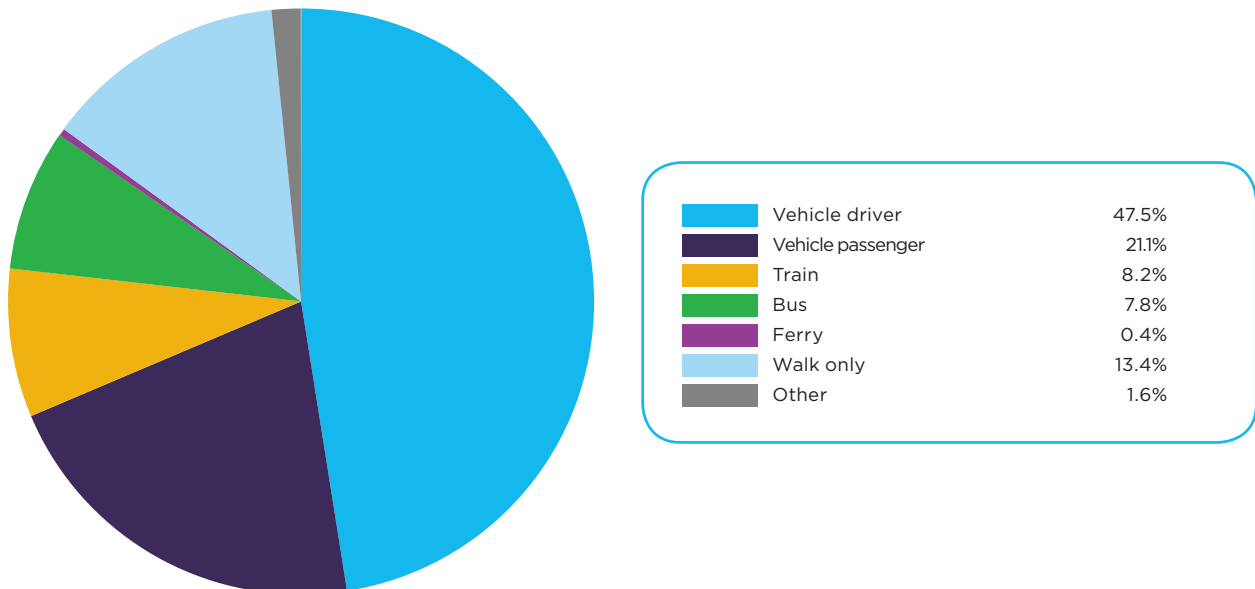
Figure 4.43 shows that walking accounts for 18.3 percent of all daily trips in the greater Sydney area. Across the city, mode share for walking is highest in inner Sydney (39 percent) and lowest in outer Sydney (10 percent in outer South West Sydney, 12 percent in the outer Western Sydney and 13 percent in Liverpool/Fairfield).

As Figure 4.44 shows, more than two million of the car trips we make every weekday are less than two kilometres – generally considered a comfortable walking distance for most people. Walking, instead of driving, would benefit our health and improve neighbourhood amenity.

Figure 4.45 shows that walking mode share is highest in the over 60 age group. This suggests that walking activity may increase as a result of our ageing population – placing even greater importance on providing safe and convenient facilities for pedestrians.

At the other end of the age spectrum, there has been a dramatic decline in school children walking and cycling compared to 20 years ago.

Figure 4.43 Mode share across the Greater Sydney area (all trips)



4.6.5 Cycling is growing in popularity

As with walking, cycling for short trips can reduce congestion on roads and public transport. Cycling habits are changing. While overall mode share for cycling accounts for just one percent of all daily trips and 1.9 percent of trips under 10 kilometres, the number of cycling trips is growing, particularly in inner Sydney. Recent surveys conducted in the CBD show that cycling is a key part of Sydney's transport system: every day in Sydney, there are now 370,000 bicycle trips. About 20 percent of these trips are for work purposes, and 20 percent

are to the shops, school or uni, or for personal business. The rest of Sydney's daily bicycle trips are for recreational and social purposes.

Forty-two percent of households in Sydney own a bike. Around 90 percent of the bicycle trips made each day in Sydney are less than 10 kilometres long, with the average distance being 3.2 kilometres. In other words, bicycles are increasingly a mode of choice for shorter journeys that are a little too far to walk, but do not justify the use of our cars.

Figure 4.44 Opportunity to replace short car trips with walking (average weekday trips by distance and mode, 2010-11)

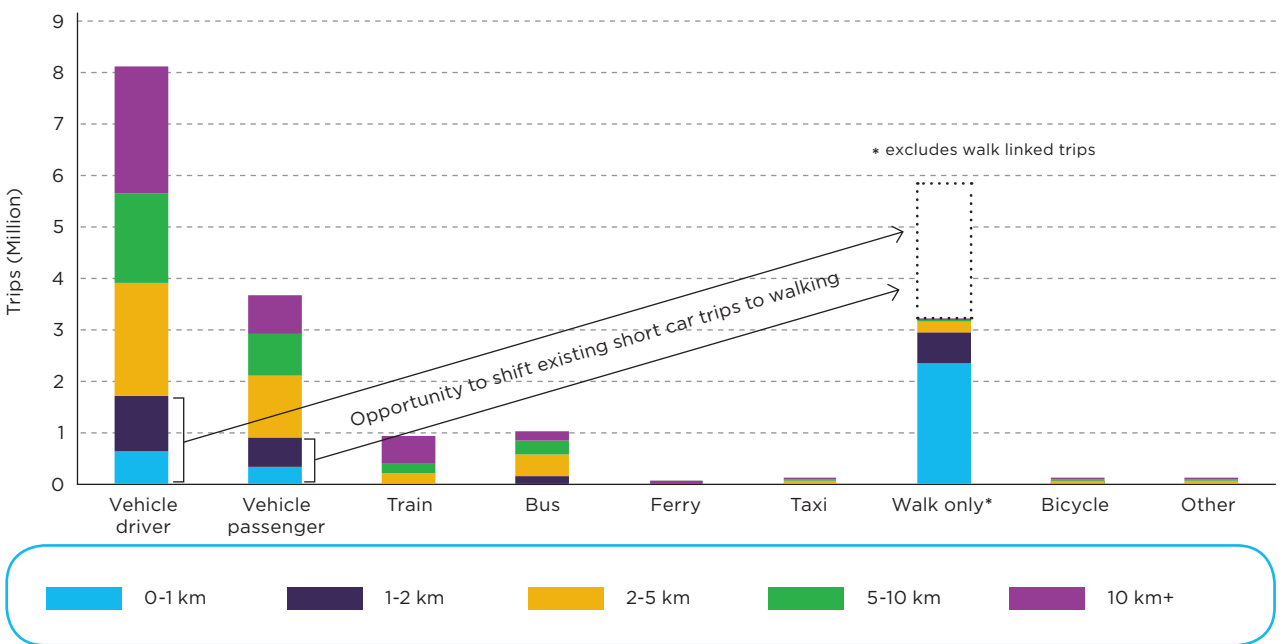
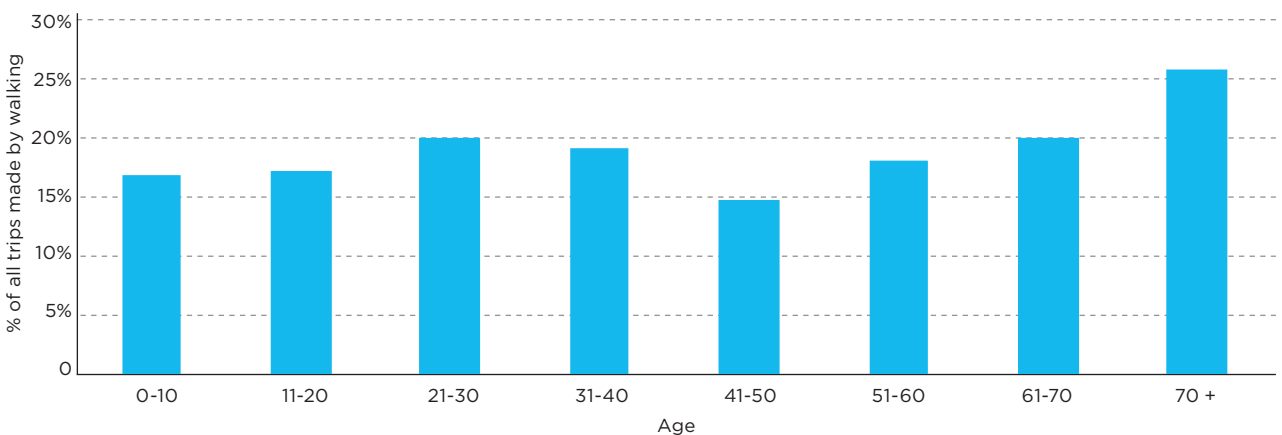


Figure 4.45 Walking mode share by age group, 2010-11



While rates of walking in Sydney are on par with other capital cities, the comparison is much less favourable when it comes to cycling (Figure 4.46). Surveys show that cycling is lower in NSW and Sydney both in general participation and also for transport purposes, than in any other State in Australia.

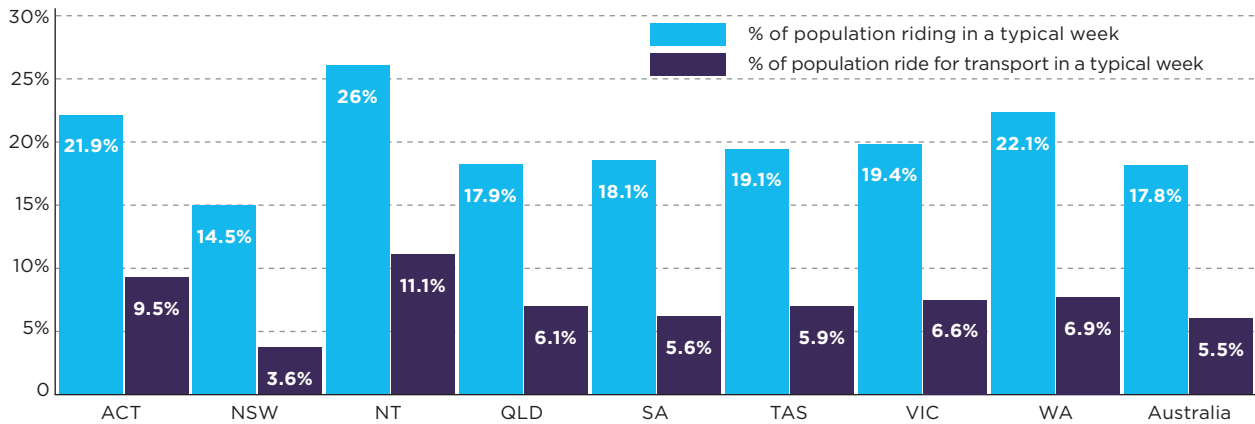
An emerging exception is the Sydney CBD and inner Sydney, where cycling is starting to grow at a higher rate than the Greater Metropolitan Area. The number of cyclists crossing the Harbour Bridge and Anzac Bridge during a typical weekday has nearly doubled between 2005 and 2010.

While the signs of greater cycling take-up are encouraging, some important issues need to be addressed for cycling to be a mainstream travel option.

Safety concerns are often cited by people in our consultations and surveys as a reason for not cycling in Sydney. This suggests that further programs to provide measures to separate bikes from cars would increase cycling.

Further work is required to create a connected network of cycleways. Despite ongoing investment in cycle paths and routes in Sydney there are still many gaps in the network that can create unpleasant travel experiences and deter people from cycling.

Figure 4.46 Benchmarking cycling mode share: cycling participation in a typical week by State and Territory



4.6.6 Motorcyclists are important road users

Motorcycles provide a flexible, low cost, space and fuel efficient travel option, particularly suited to dense metropolitan areas. Motorcycle and scooter use and registrations have also been growing strongly in recent years. Both motorcyclists and the NSW Government are keen to continue to address safety concerns. Further opportunities to improve motorcycling conditions, including improvements to parking, will be investigated. For example, a lane filtering trial for motorcycles will begin in February 2013.

We will examine opportunities to support motorcycling as part of our roads and parking strategies, and continue to work with motorcycling stakeholders in developing and implementing actions. A *NSW Motorcycle Safety Strategy (2012-2021)* is being finalised to address motorcycle safety and support the *Road Safety Strategy for NSW*.

Figure 4.47 City of Sydney cycling counts, March 2012



Daily peak hour cyclists

- 1,000-2,500 cyclists
- 500-1,000 cyclists
- 250-500 cyclists
- 125-250 cyclists
- 58-125 cyclists

- City of Sydney high priority cycle routes
- Waterways
- Urban areas (City of Sydney)
- Parks

Taking action – Getting Sydney moving again

20 YEAR VISION

To respond to Sydney's challenges, we have identified actions to modernise and grow the transport network. A modernised rail network, a fully completed motorway network and a fully integrated and customer-focused transport system will ensure that Sydney's transport system has the capacity to handle our rapidly growing transport demand, enabling people and goods to move around Sydney quickly, conveniently and efficiently. Sydneysiders will be proud of the city's state-of-the-art rail and bus networks, and the city will be acknowledged as having one of the best metropolitan transport systems in the world.

Tackling the transport challenges that will face Sydney in the future requires a whole-of-transport system response. Our heavy rail, road and bus networks will carry most of the task into the future but they must work together to achieve the best outcomes possible.

Congestion and the travel demands of a growing population can be tackled by many measures, but each city or place requires its own solutions. We must invest in new road and rail links so we can tackle congestion and provide more services, and it is also vital we take steps to make best use of the network we already have. That means taking steps to free up our network to make it more efficient, as well as taking steps to manage demand through measures such as pricing so that our investments are not eroded as travel demand grows.

Heavy rail is the backbone of the public transport network. The Long Term Master Plan reaffirms this role through *Sydney's Rail Future*. We will also take steps to preserve those corridors where heavy rail will be needed in the years ahead.

Our action plan for buses links with heavy rail by servicing the corridors where heavy rail does not go, with buses being given priority, including Bus Rapid Transit, where demand dictates.

Buses also provide local coverage to customers. We will ensure the bus system is increasingly flexible and responsive to customer needs by

reducing travel times and responding to growth and land use changes with new services and a large bus fleet.

Our road network will still meet the demand for the journeys Sydneysiders make each day in private motor vehicles and for the growing freight task. The motorway network, arterial roads and local roads, will each remain important.

The completion of the motorway network is a high priority in the Long Term Transport Master Plan. Motorway enhancements in the future include the 33 kilometre WestConnex scheme in the M4 and M5 corridors, linking the F3 (M1) and M2. Importantly, we have also identified the major corridors we need to preserve and protect to allow timely and planned development of the motorway and arterial road networks. We will also examine the benefits from reforming tolls on the motorway network to match network improvements with demand management and fairer pricing.

At the heart of the Sydney transport network is the CBD, a major destination point for Sydneysiders and the place where many of our transport challenges combine. While roads in the CBD must continue to play a supporting role, our *Sydney's Rail Future* establishes public transport at the centre of the Long Term Transport Master Plan through a major boost to rail capacity by way of a second Harbour Crossing, potential new stations and planning for the efficient movement

4.7 Meeting the increasing demand for Sydney's growing travel needs

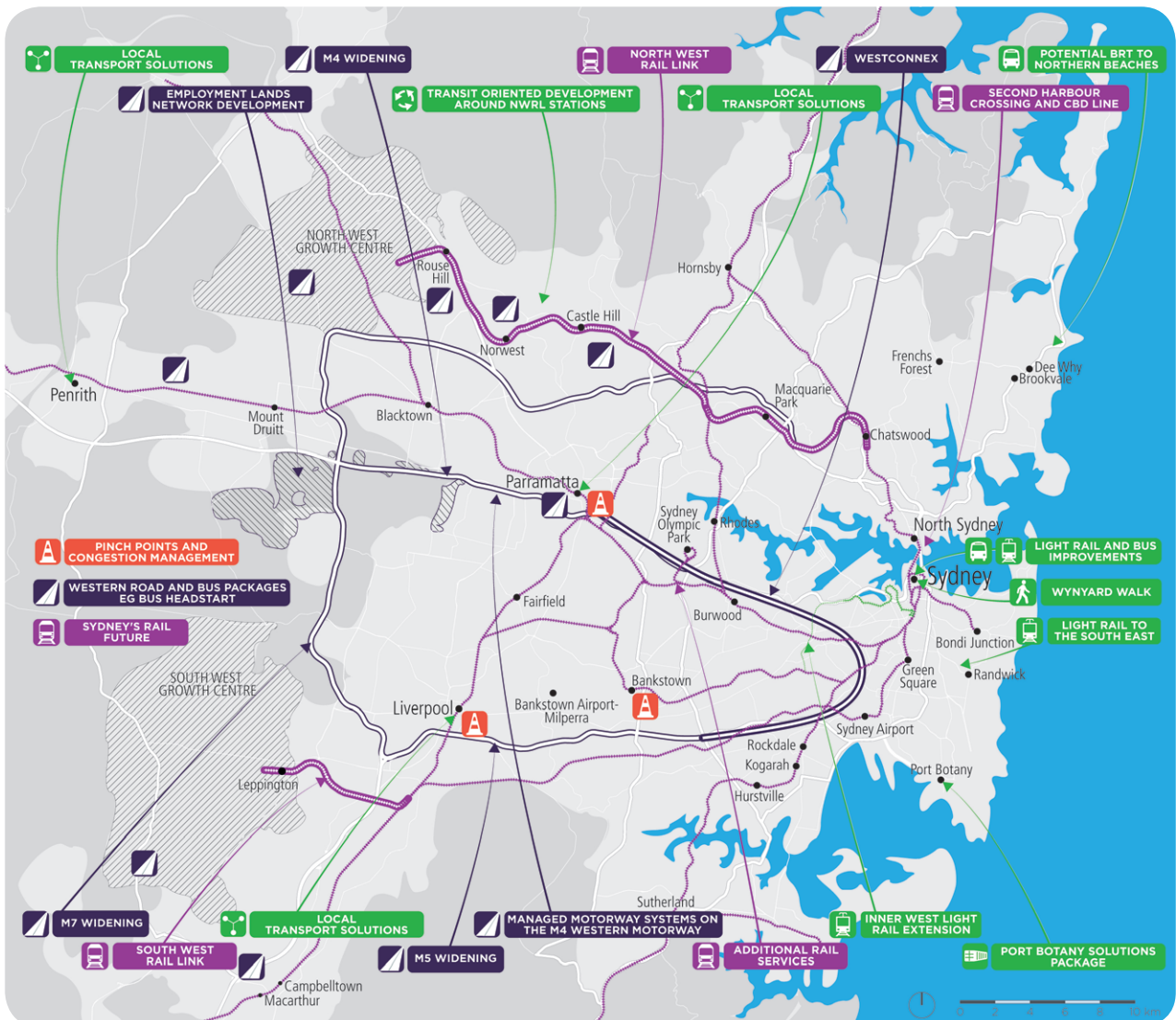
of people within the CBD. We will combine these heavy rail changes with a review of bus routes and network structure within the CBD to improve flow and service capacity, as well as examining the potential for a new light rail line through the CBD. A new ferry terminal to the west of the CBD at Barangaroo along with an upgraded Circular Quay will further increase the destination options for customers, with their service experience enhanced through a new iconic fleet and service innovation.

Some of our priority actions for Sydney are shown in Figure 4.48 below.

The centrepiece of our approach will be a transformational change to, and modernisation of, the metropolitan rail network as part of a five point approach (*Sydney's Rail Future*) to expanding the capacity of Sydney's transport system.

This approach also includes Modal Plans covering road, bus, light rail, ferries, cycling and walking.

Figure 4.48 Priority actions for Sydney



4.7.1 *Sydney's Rail Future* – modernising our metropolitan rail network

Over the next 20 years, we will build a modern rail system for Sydney that will rank with the best in the world, providing an efficient, reliable and comfortable service that is recognised as one of the great benefits of living in Sydney.

In planning *Sydney's Rail Future*, we have looked to the best international examples to see what a world-class city railway looks like. The best city rail systems share several attributes: high capacity trains and platforms, simple stopping patterns, segregated tracks without complex junctions, separation from freight and high speed rail operations and advanced signalling.

We will take action to build a rail system that has these attributes.

We will follow the lead of other global cities and move to a 'differentiated service' approach. In this hierarchical approach, there will be three tiers of service with the implementation of high capacity rapid transit being added to the current two-tier arrangement of suburban and intercity services. This new tier will provide high frequency services, where the timetable is less significant and customers can simply turn up and go. On these lines, new single-deck trains will be introduced that can run faster, more frequently and carry more people. The development of the three tier network will untangle the current system and ensure fast, efficient and reliable services throughout the network.

The three tier network will be complemented by a modern fleet, upgraded Sydney stations and improved customer information.

Modernising our rail system cannot happen overnight, we can make an immediate start on getting the basics in place to enable us to build, over time, a system that not only meets our travel needs into the future but that is recognised as one of Sydney's greatest assets.

More details are provided in *Sydney's Rail Future*, our long term strategy for the city's rail network.

Short term

Action Implement efficiencies across the rail network

We will introduce a series of essential rail operational efficiencies that will provide the foundation for further modernisation of the rail system:

- Timetable changes to introduce standardised and regular stopping patterns
- Significantly improved management of dwell times at stations
- Platform redesign, including de-cluttering to allow clear passenger entrance and exit
- Better incident recovery management through improvement of operational processes and the rollout of digital train radio systems
- Track infrastructure enhancement
- Transition to dedicated fleet types for some lines
- Introduction of simpler timetables across the network
- The rollout of automatic train protection on critical sections of the network.

Action Complete the South West Rail Link

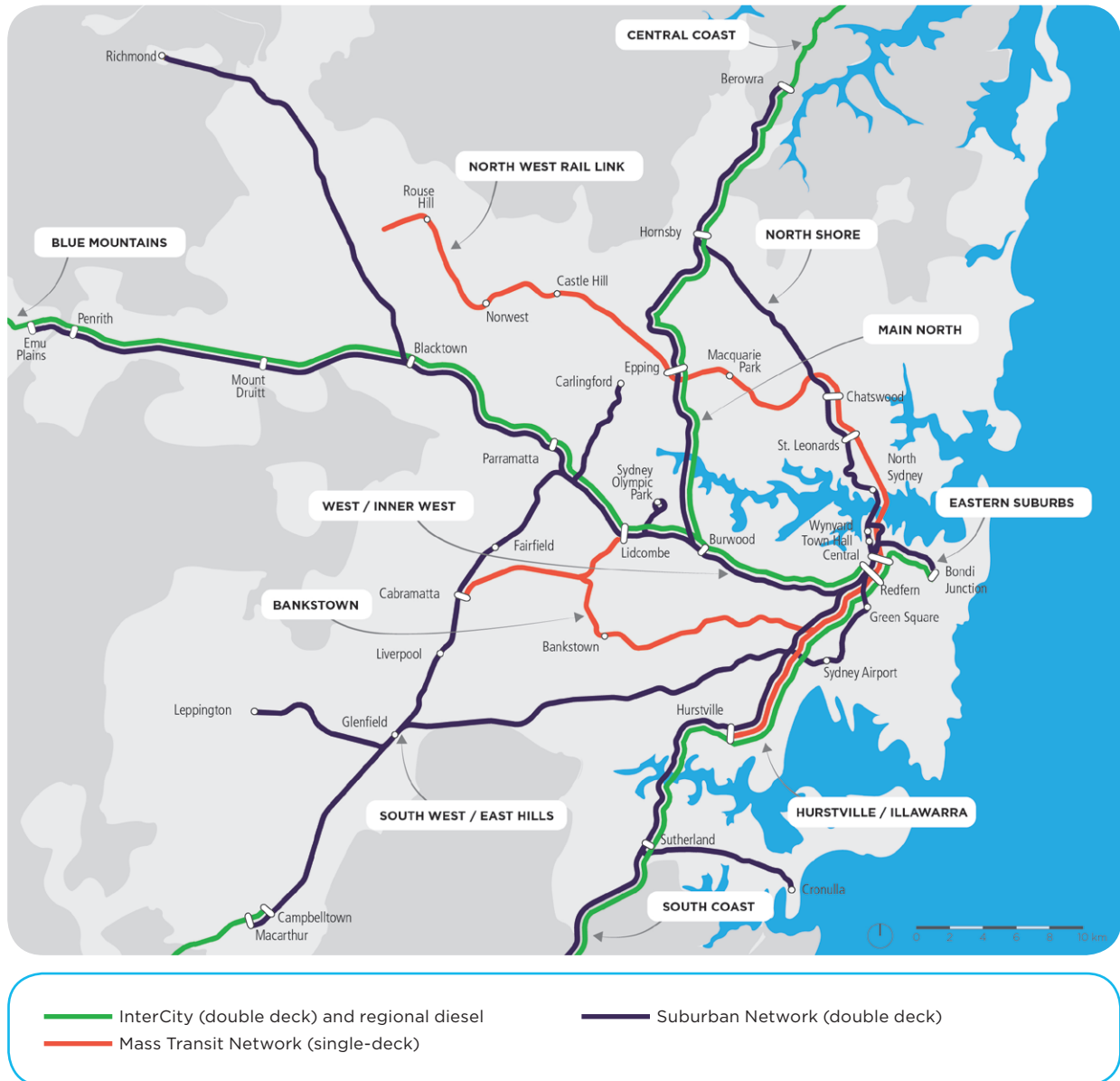
We will complete the South West Rail Link, as well as station upgrades and rail clearways projects.

Action Undertake detailed planning for a second Harbour Crossing and CBD rail line with new stations

We will commence planning for the alignment of the second Harbour Crossing and new rapid transit line through the CBD.

SYDNEY'S RAIL FUTURE

Figure 4.49 Sydney's Rail Future – How our rail network will look



The Long Term Transport Master Plan is accompanied by *Sydney's Rail Future* which details how we will deliver the four core elements needed to give Sydney a world-class rail network that can support the city's growth:

- High capacity rapid transit services** – where customers can simply turn up at the station and expect to get on a train within a short time. These mass transit services will be separated from the current suburban and intercity services.
- New rolling stock** – higher capacity single-deck trains that can carry more customers and move around the network more quickly. Compared with double-deck trains, single-deck trains are able to load and unload passengers more quickly, enabling shorter dwell times, and increasing train capacity at busy rail stations.

- **More trains** – operational changes to enable us to operate more trains an hour during peak times, alleviating capacity constraints.
- **New capacity through the heart of the network** – a new Harbour crossing and CBD line will address growing demand in Sydney's north-south travel corridor and provide greater flexibility to respond to future requirements.

This additional capacity will enable Sydney Trains to carry another 90,000 to 100,000 people per hour in the peak, delivering sufficient capacity to serve Sydney well into the future.

The strategy will be delivered over five stages:

Stage one will improve the operational performance of the rail network through better dwell management, standardised stopping patterns and improved incident recovery management.

Stage two will consist of initiatives to improve network efficiency. This will include Automatic Train Operations, a transition to dedicated fleet types for certain lines, track infrastructure enhancements and some platform redesign.

Stage three will introduce a new rapid transit system.

The completion of the North West Rail Link and the introduction of rapid transit trains will provide comfortable, frequent and fast high capacity services from Rouse Hill to Chatswood (and later through to the CBD and south via the Bankstown and Hurstville sectors). The Epping to Chatswood Rail Link will be upgraded to facilitate the high capacity rapid transit system.

Stage four will consist of the largest increase in capacity to the Sydney rail network in 80 years with the completion of a second Harbour Crossing allowing services from the North West Rail Link to extend directly to Sydney CBD.

Stage five will consist of a southern extension of the rapid transit system through the conversion of the Bankstown and Hurstville sectors and major timetable changes to existing suburban services to increase capacity across the network.

Medium term

Action Build the North West Rail Link

We will complete the North West Rail Link, our first high capacity rapid transit service railway, designed to operate single-deck, high frequency trains.

Action Epping to Chatswood conversion

We will convert the Epping to Chatswood line to operate single-deck, high frequency trains to enable North West Rail Link services to run from Rouse Hill to Chatswood as rapid transit services. In the initial stage after the North West Rail Link is opened, passengers will take a service to Chatswood where they will change trains to travel to the Sydney. We will develop a high-quality interchange to accommodate these passengers.

Action Improve rail safety through technology upgrades

We will make a major investment in rail safety programs, including Automatic Train Protection and digital train radio systems.

Long term

Action Build a Second Sydney Harbour rail crossing, new CBD line and new CBD stations

The centrepiece of the modernised rail system will be a new Sydney Harbour crossing and CBD line that will connect Redfern to Chatswood via the CBD. We have commenced detailed planning for the second Harbour Crossing. The new CBD line and Harbour crossing will improve access and connectivity for the North Shore Line, Epping to Chatswood Rail Line and North West Rail Link, and will improve travel times and capacity through the city from the north and south. It will provide the largest increase in capacity to the Sydney rail network for 80 years. New stations will relieve pressure on Central, Wynyard and Town Hall Stations.

4.7.2 Sydney's bus future

Buses have an important role to play as part of an integrated transport system. Buses are important for mass transit and connecting centres and local regions. They provide core services on corridors with intermediate demand, as well as on the local network servicing greenfield and other low density areas (delivering attractive service frequencies before rail is built, and filling gaps in or relieving pressure on the rail network).

As described in Chapter Two, we know that customers most value a fast and reliable bus journey. Therefore, reduced waiting and on-board journey time, extended service hours and improved service reliability are the leading factors that will encourage customers to use the bus.

For public transport patronage to grow on non-rail corridors, bus transport needs to be competitive with car travel in terms of network reach or coverage, door-to-door journey time, and reliability. This means average speeds of 25-30 km/h for selected highest priority corridors, with implications for how bus network layout and design can improve service speed, frequency, reliability and network legibility, and generally make for a more pleasant customer experience.

Some initiatives are already in progress to manage congestion including:

- Double decker bus trials
- Introduction of bus marshalls
- Traffic signaling and parking changes
- Rerouting of bus services to avoid congestion areas, including the diversion of services to operators via the Cahill Expressway in early 2013 to improve overall reliability
- Formation of a dedicated police motorcycle team for the Sydney CBD to target and avoid traffic stopping in intersections.

Our vision for the bus network

The bus system must be part of a seamlessly integrated public transport network. Integration means that the bus network is part of the overarching Strategic Transit Network that includes all other public and transport modes. The Strategic Transit Network will guide future decision making on what type of public transport service should be provided. Corridors and interchanges will form a connected system that offers a greater range of bus travel opportunities than the current radial system. The busiest, development-rich bus corridors within this network will be candidates for conversion to high capacity modes such as Bus Rapid Transit (BRT).

This all translates into the following actions:

- **Improve bus networks** - improve the quality of service offered to customers in terms of frequency, reliability, travel speed and legibility, improve the efficiency of operating the system and reduce the impacts of bus congestion in centres and structure bus networks to meet all day demand and to support better connections
- **Fleet upgrades** - upgrade the bus fleet and move toward a cleaner, quieter, fit-for-purpose fleet
- **Infrastructure upgrades** - implement bus priority works to improve reliability and, where possible, travel speeds, ranging from improvements in bus lanes and intersection treatments to the construction of dedicated BRT infrastructure
- **Customer experience improvements** - improve amenity on buses and at bus stops, T-way stations and multi-modal interchanges, by working toward making stops compliant with the *Disability Discrimination Act 1992*, and by improving walking and cycling transport facilities
- **Integration across modes** - introduce electronic ticketing and reformed fare structures, improved and integrated service planning, and a redesigned bus network to ensure that the bus system can be easily navigated as part of multi-modal public transport travel.

The table below shows our actions to improve the bus network over the short, medium, and long term.

Fleet	Infrastructure	Customer experience	Integration
Short term (0-5 years)			
Expand and upgrade existing fleet and deliver more services	Commence Bus Head Start priority works on key roads in Western Sydney growth areas Deliver bus service reliability improvements on other strategic corridors	Enhance service frequencies on Western Sydney Bus Head Start routes and other strategic corridors Upgrade vehicles, stops and interchanges, and information Progressively achieve <i>Disability Discrimination Act</i> compliance	Complete whole-of-public transport system timetable integration Deliver integrated ticketing reforms Commence bus network realignment including low-frequency route consolidation Contract bus services based on outcomes for customers Realign Sydney CBD bus network
Medium term (5-10 years)			
Continue fit-for-purpose fleet expansion	Northern Beaches Bus Rapid Transit, subject to feasibility	Operate more frequent and reliable services	Complement North West Rail Link, other heavy rail upgrades and light rail
Introduce high-capacity buses on other key corridors	Study the development of a major CBD bus interchange Support emergence of high frequency strategic bus network for Sydney with bus priority packages	Add bus frequency to meet demand	Adopt the three level service hierarchy for Sydney's bus system
Long term (10-20 years)			
Continue investment in quieter, cleaner, fit-for-purpose fleet Meet world's best practice for noise and emissions standards	Introduce Bus Rapid Transit on key established corridors including Victoria Road Stage Bus Rapid Transit development on key city-shaping corridors to service growth areas and support sustainable land use change	Enable seamless interchange to, from and between bus services across entire network	Complete transition to fully connected bus system based on coherent spatial strategy Develop bus route networks for growth centre expansion

The sections that follow describe the initiatives that comprise our bus strategy for the next 20 years.

Phase one (short term, 0-5 years): Improve the customer experience

Our most urgent suite of short term actions will be focused on improving the customer experience, and reducing frustration caused by poor service reliability.

Action Improve bus services and frequency as the population changes and grows

We will extend operating hours and increase frequencies to meet demand and improve customer satisfaction. We will improve night and weekend services, and enhance services to growth areas, regional cities and employment areas such as Sydney Airport. We will also develop targeted bus transport service offerings where required. For example, new late night bus services are being offered from Kings Cross to city interchanges to better meet customer needs.

Bus timetables will be revised to align with the timetables for rail and other modes where the frequencies do not already allow for quick interchange between services.

Action Provide bus priority and better bus services on growth centre road networks under the Bus Head Start Program

An early priority for the development of greenfield areas will be the construction of bus priority measures that have the potential to improve bus

speed and reliability for access to new suburbs. We will provide service frequencies and priority infrastructure as areas are developed, so that service is not lagging behind. This will include fleet acquisition, and service frequency to meet identified minimum standards.

By investing in growth centres, we can provide a high-standard public transport product at an efficient cost, provide a reliable public transport choice from the day people move in and shape sustainable travel patterns.

Action Enhance bus priority on Strategic Bus Corridors

We will implement urgent priority measures on existing Strategic Bus Corridors, as a means of making travel time competitive in established areas. For example, upgrades to enhance bus priority on clearways and at intersections is currently being investigated for the six highest priority Strategic Bus Corridors across Metropolitan Sydney.

Phase two (short and medium term, 0-10 years): Create a more efficient, integrated bus network

Short and medium term actions will focus on a more efficient bus network that is faster, more reliable, more cost effective and better integrated with the rest of the public transport system.

Action Adopt simplified service types for buses, to make the system easier to understand and use

Along with the construction of a Bus Rapid Transit line to the Northern Beaches, we will adopt a new three-tier service hierarchy for this and other major corridors in Sydney's strategic bus network. For the Northern Beaches corridor this will comprise higher capacity services, frequent buses, larger fleet for intermediate capacity services, and standard route buses for all other services.

Action Redesign city-wide bus network to meet customer needs, use buses more efficiently, and better complement rail and light rail

We will redesign the bus network based on the Strategic Transit Network hierarchy (see Chapter Two). The focus initially will be on the development of a strategic bus network that complements the rail network outlined in *Sydney's Rail Future*. The strategic bus network will consist of links with elevated service frequencies and on-road bus priority features that provide cross-regional connections between existing and emerging centres, including in Western Sydney.

A redesign of the bus network will focus on Sydney CBD. The reconfigured bus network will be planned around the principles of through-routing and some 'near-side' termination, rather than 'far-side' termination. In the short to medium term, the

CBD bus routes and network will be restructured to avoid the impacts caused by significant levels of termination within the congested city centre. Improved levels of bus capacity, speed, reliability and legibility would be achieved by running buses on a smaller number of dedicated routes and through-routing a higher number of bus services.

Instead of the current arrangement under which many bus routes enter the CBD, travel through and terminate at the opposite side of the CBD, creating congestion and layover challenges, the future network will see additional cross-city Metrobus-style routes that traverse the CBD, terminating at destinations beyond. Local routes will through-route, or, where necessary, terminate just inside the CBD (the 'near side'), allowing passengers to connect to other high-capacity modes such as rail or light rail, or to walk a short distance to their final destination. This more efficient use of Sydney's bus fleet will result in more frequent, more reliable journeys for bus customers and relieve congestion for pedestrians, cyclists and other road users.

The centrepiece of a redesigned bus network in the CBD will be a high capacity north-south light rail line as part of a pedestrian zone on George Street. This light rail line will offer very frequent, high capacity transit from the Eastern Suburbs to the Harbour. It will enable convenient north-south travel for passengers transferring from near-side terminating local buses (see page 160).

A NEW STRUCTURE FOR SYDNEY'S BUS SYSTEM

Sydney's highest demand, centre-to-centre core bus network will be serviced by frequent, fast, all-day routes, using T-ways, full Bus Rapid Transit, or arterial roads with a high level of priority. The core network will carry regular all-day, all-week services at a reliable and predictable minimum frequency.

Sydney's highest demand, centre-to-centre Strategic Bus Corridors will be serviced by the most frequent, fastest, all-day routes, using T-ways, full Bus Rapid Transit, or arterial roads with a high level of bus priority. The city's core network of standard bus routes will carry regular all-day, all-week services at a reliable and predictable minimum frequency. These standard routes will enable people to get around locally or connect to the wider transit network. Where needed to meet additional patronage demand, the standard network will be augmented by extra services, such as peak express services, school buses and NightRide services.

Bus priority infrastructure such as bus lanes, queue jumps and bus signals will be targeted at the highest demand corridors or on sections of the road network where multiple routes converge. This will improve the reliability and speed of all bus services, and particularly high demand bus routes. All bus services will be equipped to operate under PTIPS (Public Transport Information and Priority System), the traffic light operating module developed by RMS to help keep buses running to timetable.

The Long Term Transport Master Plan has defined tiers for all types of public transport as part of the Strategic Transit Network:

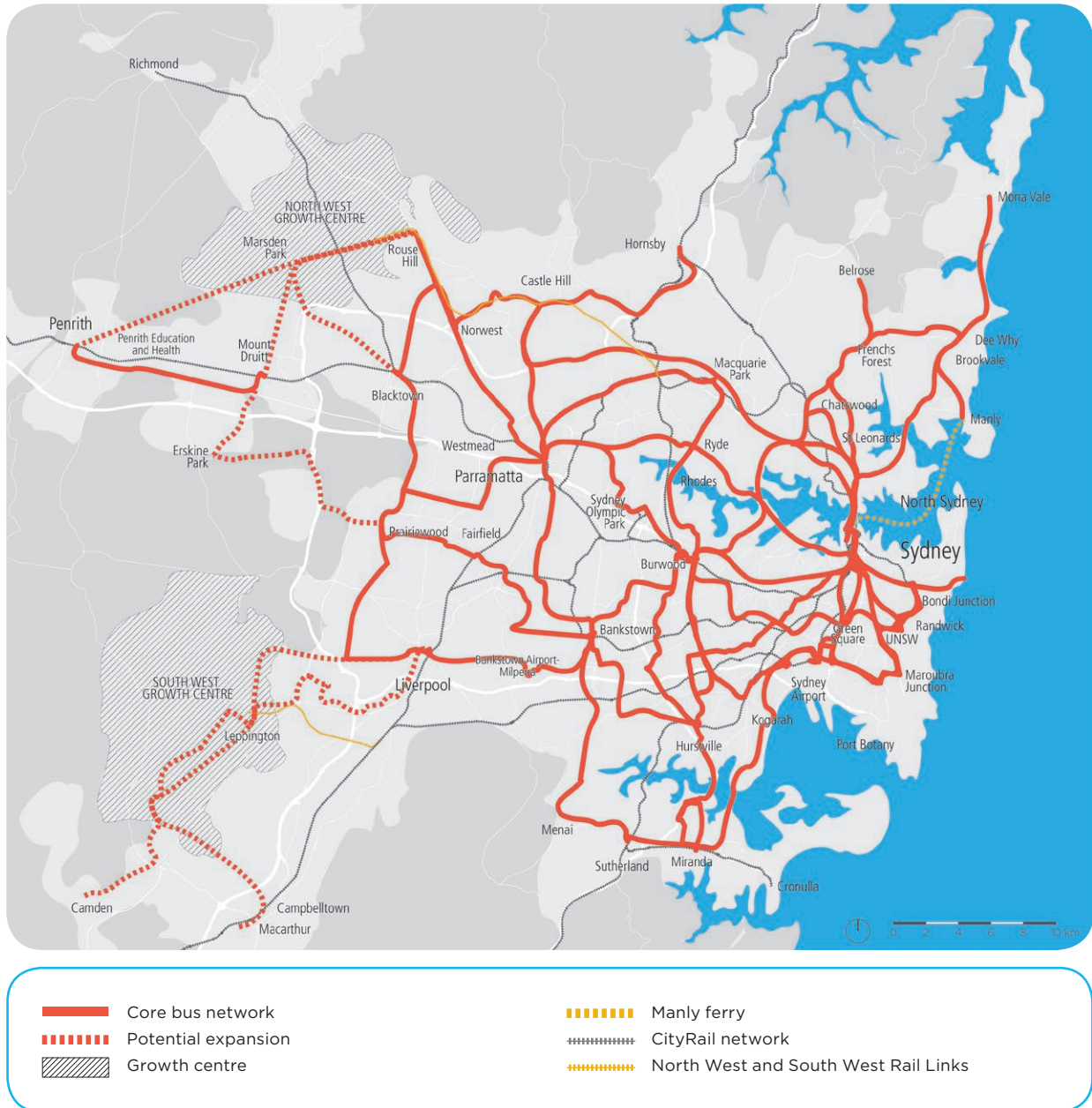
- **Mass Transit** – high frequency, high capacity services that provide access to major destinations, such as heavy rail
- **Intermediate Transit** – high frequency but moderate capacity
- **Local Transit** – getting around locally or providing access to the Mass or Intermediate Transit levels

Each service level in Sydney's restructured bus system will be associated with specified operating standards for bus frequency, target speed and customer walking catchment. The highest demand Strategic Bus Corridors will therefore align with the Mass and Intermediate tiers of the Strategic Transit Network. Standard and demand-driven bus routes will align with the Intermediate and Local tiers.

Figure 4.50 shows the strategic routes of a restructured bus system for Sydney in 2031, representing the Mass Transit and Intermediate Transit levels for buses. The network will operate to a high frequency to service cross-metropolitan travel needs.

We will develop Sydney's bus system through the introduction of new services, rationalisation of existing services and progressive delivery of packages of bus priority infrastructure over the short, medium and long term towards 2031.

Figure 4.50 Sydney's core bus network in 2031



Phase three (medium term, 5-10 years): Build new bus infrastructure to support and extend improved services.

This phase will see the construction of major new bus infrastructure – primarily a new Bus Rapid Transit (BRT) line connecting to the Northern Beaches, and a major bus interchange in the CBD.

Action Bus Rapid Transit for the Northern Beaches

The Northern Beaches BRT system (see page 154) will improve travel time to the CBD for more than 200,000 residents of the Northern Beaches. The options identified in the recent pre-feasibility study will now be subject to detailed analysis, allowing the Government to make a long term decision based on sound evidence and cost information.

Action Investigate a new CBD bus interchange

As a result of the Northern Beaches BRT and further demand growth from North Western Sydney, new bus interchanges will be needed. We will study the feasibility of a new major bus passenger facility, possibly at the northern end of the CBD, that would link Northern Beaches BRT passengers, and other Lower North Shore and North Western Sydney bus customers, with the CityRail and wider bus networks, and offer good walking connections to Barangaroo and other CBD destinations.

Action New service hierarchy

We will adopt a new three-tier service hierarchy for this and other major corridors in Sydney's strategic bus network. For the Northern Beaches corridor this will comprise a BRT spine for high capacity services, frequent articulated bendy buses or other larger fleet for intermediate capacity services, and standard route buses for all other services. The service hierarchy will align with the Mass Transit, Intermediate Transit and Local Transit framework outlined in the Strategic Transit Network.

Action Contract bus operators to continually improve service for customers

In the long term, we will move from input-based contracting of bus services to a customer outcomes orientation that will make bus providers more responsive to changes in demand and other customer needs, while still meeting all minimum service requirements.

Phase four (long term, 10+ years): A networked bus system

In the long term, we will make more investments in the bus network as a fully connected system.

Action Move from a radial to a networked bus system

The current radial one-seat bus service network, which attempts to provide single-service bus transport from many origins to many destinations without interchange, has little capacity for growth and is not adequate to the task of meeting complex, modern travel patterns. Over time we will transform Sydney's bus system from a radial system of routes oriented towards a few major centres to a connected system, scaling up bus capacity on cross-city routes in response to changes in demand. This will be enabled in part by consolidating some existing low frequency bus routes onto major corridors, and by reallocating resources to provide a higher frequency on trunk corridors and their rearranged intersecting feeder routes. With a connected network, the need for interchange may be increased, but the inconvenience of interchange is reduced due to higher service frequencies. The net effect is to extend the bus travel possibilities available to the public transport customer.

Action Investigate BRT or light rail on high demand corridors

Bus system capacity will need to continue to grow along with Sydney's population and travel demand. The arrival of BRT on the Northern Beaches will be accompanied by an investigation of the use of high frequency and high capacity buses, BRT infrastructure or light rail on other corridors in Sydney that face high demand and heavy traffic congestion. For example, the corridor from Parramatta to the CBD via Victoria Road will be investigated for potential BRT or light rail development.

4.7.3 Sydney's road future

Sydney's motorway network is a vital transport asset for the city that provides access to the Sydney CBD and other main centres, as well as supporting the city's major growth areas in the North West and South West. With Sydney growing, we need to fill the missing gaps, add capacity and improve technology to address the shortfalls that slow the network down and contribute to congestion and delays.

A fully connected motorway network will be the cornerstone of a free flowing road network and a significant transport asset for Sydney. The benefits of the network will extend to improving travel on arterial roads connecting urban growth centres with each other and the CBD, Sydney Airport, Port Botany, as well as improving access to the North West and South West Growth Centres.

The following are considered priority projects as part of a long term program to complete the motorway network. Other projects, such as the F6 (M1), and F3 (M1) to M2, are described in the box on page 140.

Action Establish the Sydney Motorway Project Office to lead the planning and delivery of WestConnex

We will progressively deliver WestConnex in a series of stages over the next decade, with key project components to include:

- The Northern Sector, comprising the M4 extension, upgrades to the existing M4 between Parramatta and North Strathfield, and a new motorway between North Strathfield and the St Peters area

- The Southern Sector, comprising the M5 East expansion and the new connections proposed around Sydney Airport to the St. Peters area
- Delivering an appropriate setting for the progressive urban renewal of Parramatta Road, including enabling public transport improvements in and across the corridor
- Working closely with industry to drive the best solution for WestConnex, including urban renewal solutions for the Parramatta Road corridor and strategies to optimise benefits from new investment.

Action Develop integrated land use and transport outcomes to renew the Parramatta Road corridor in conjunction with the delivery of WestConnex

Progressively contribute to the urban renewal of Parramatta Road in response to the significant urban amenity and public transport benefits enabled by the WestConnex scheme.

Action Implement a multi-modal package of improvements for delivery with WestConnex

Deliver an integrated package of transport improvements with WestConnex, including complementary enhancements to the existing road network (including associated surface street changes, bus priority measures, heavy vehicle access improvements) redesign of bus services and facilities, improved access to rail stations and upgrades to cyclist and pedestrian facilities.

NETWORK CHANGES TO SYDNEY'S MOTORWAY TOLLS

The cost of the construction and operation of the road network is typically borne by taxpayers: national, state or local governments meet the costs from general tax revenues, and the road is then free at the point of use – there is no charge to road users when they choose to use the road system.

However, a number of different road charging mechanisms around the world make a more direct link between the use of a road and the payment of a charge for the road user. The earliest example of a tolling system in Sydney was for financing the bridge over South Creek, Windsor in 1802. Governor Macquarie was the first to establish a tolling system to maintain NSW roads on the colony's first main road from Sydney to the Hawkesbury. Currently, about two thirds of Sydney's motorway network is tolled. Each of the nine toll roads has different pricing arrangements: M2, M5, M7, Eastern Distributor, Sydney Harbour Bridge and Tunnel, Cross City Tunnel, Lane Cove Tunnel and Falcon Street Gateway.

Importantly, pricing mechanisms around the world have different primary policy objectives: to help pay construction costs, such as the intercity motorway network in France and several of Sydney's motorways; or to manage congestion and pay for public transport investment, such as in London and Singapore. In many cases, environmental objectives are also a consideration.

A number of these mechanisms are briefly described in the following table. Charging reforms introduced in other parts of the world show that transport alternatives, in particular additional public transport services, need to be in place before any significant changes are made to current road charges. Evidence suggests that using the funds raised to pay for existing and new infrastructure plays an important role in securing public support for road user charging reforms.

In NSW, the primary objective behind the introduction of further road pricing would be to provide a revenue stream for much needed investment in extending and enhancing the current motorway network. It is important that the funds raised from any new road user charge for using the road network are spent on the transport network. In addition, there is opportunity to introduce consistent charging across the network, so that users pay a similar charge across the network.

An analysis of the options (including the mechanisms in the table) for delivering these two objectives suggests that the introduction of distance-base tolling on the Sydney motorway network offers the most benefits to NSW. It will encourage greater network efficiency by sending a consistent price signal to road users and has been used successfully around the world, including here on the M7.

This measure would recalibrate the existing tolls on the Sydney motorway network to make them consistent. For example, the use of a standard rate per kilometre for general motorway network travel would align the price to the travel time benefit achieved by commuters rather than to the cost of construction. The general per kilometre rate would also be capped, at a rate that does not lead to excessive charging for longer journeys.

Development and implementation of such a regime would require discussion with the private sector tollway operators currently managing significant parts of the network (see Chapter Ten).

DIFFERENT TYPES OF ROAD PRICING MECHANISMS USED AROUND THE WORLD

Option	Description	Objectives	Sub-Options	Example(s)
1. Area-based charging	Charges for access to a specific area	<ul style="list-style-type: none"> • Raise revenue • Reduce congestion • Fund public transport alternatives 	<ul style="list-style-type: none"> • Area-based licenses • Cordon charging or Toll ring 	<ul style="list-style-type: none"> • UK • Singapore • Norway
2. Point charges	Charges at fixed points on the network	<ul style="list-style-type: none"> • Reduce congestion • Fund infrastructure 	<ul style="list-style-type: none"> • Tolls • High Occupancy/Toll (HOT) lanes 	<ul style="list-style-type: none"> • Sydney • US
3. Distance based charges	Charges based on the distance travelled by the vehicle Includes mass, distance, location variations	<ul style="list-style-type: none"> • Fund infrastructure • Improve efficiency through price signals 	<ul style="list-style-type: none"> • Vehicle Class options (eg; heavy vehicle only) • Periodic distance charge • Mass distance location • Road corridor • Fuel excise • Whole of network charging 	<ul style="list-style-type: none"> • France • Germany • US
4. Parking charges	Charges for parking in an area	<ul style="list-style-type: none"> • Reduce congestion 	<ul style="list-style-type: none"> • Parking levies • On-street parking fees • Off-street parking fees • Performance parking • Parking meters • Parking station 	<ul style="list-style-type: none"> • Worldwide
5. Heavy vehicle priority routes	Heavy vehicle route. Light vehicles charged to use/banned	<ul style="list-style-type: none"> • Assist freight task • Raise revenue 		<ul style="list-style-type: none"> • Ireland
6. Fixed access charges (Standing charges)	One-off periodic charges for access to the network	<ul style="list-style-type: none"> • Fund infrastructure • Fund regulation 	<ul style="list-style-type: none"> • Driver licensing • Vehicle inspection fees • Purchase charges Stamp Duty, GST, etc • Vignette 	<ul style="list-style-type: none"> • Worldwide
7. Non-price initiatives	Rationing and other non-price measures for reducing congestion	<ul style="list-style-type: none"> • Reduce congestion 	<ul style="list-style-type: none"> • Registration • Restricted registration • Car park space rationing • Fuel rationing • Road access rationing 	<ul style="list-style-type: none"> • Worldwide • Singapore (weekend use)

THE FUTURE OF SYDNEY'S MOTORWAY NETWORK

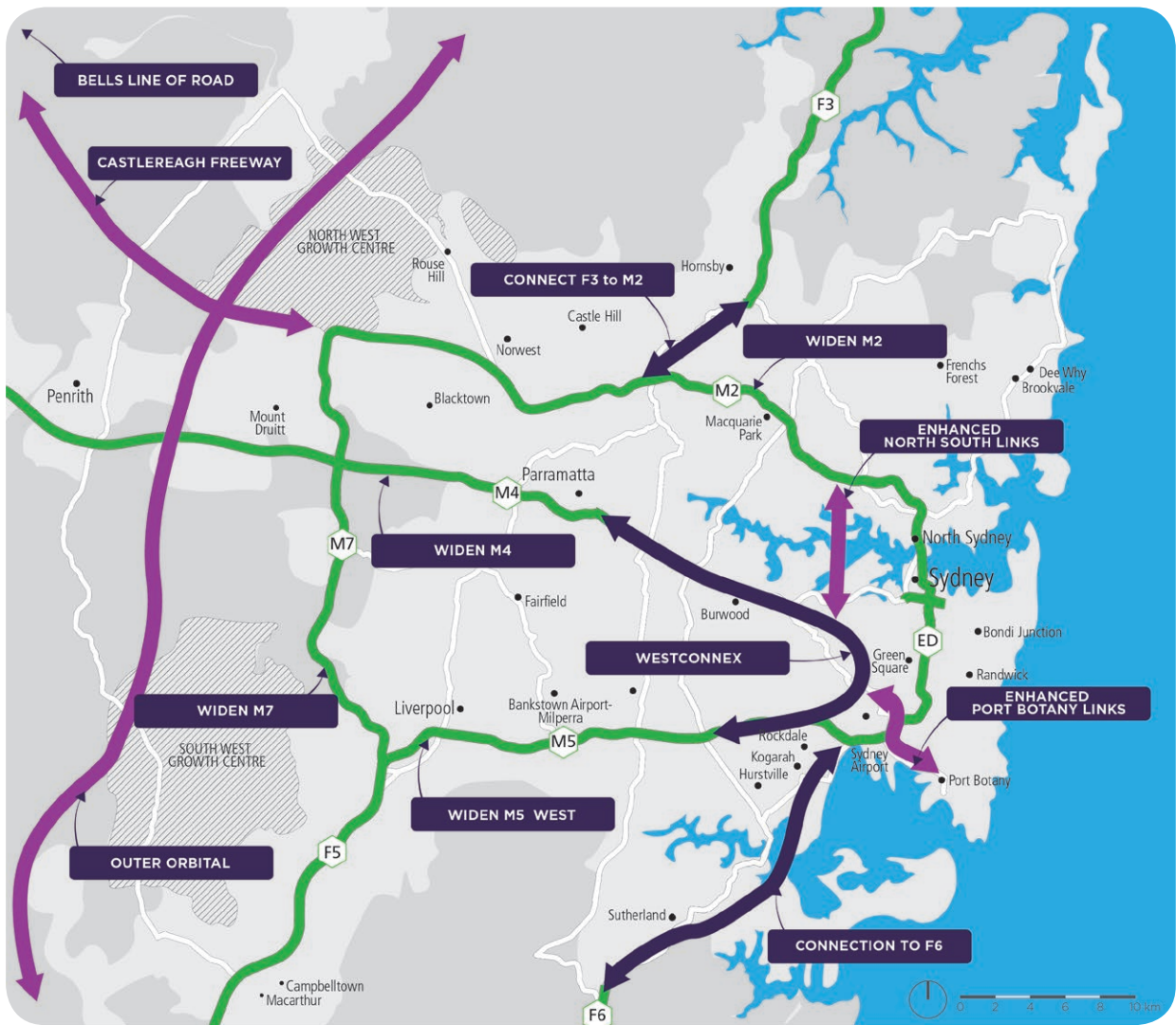
The rationale for building major new road infrastructure should be to generate substantial productivity benefits by increasing the volume of traffic the infrastructure can accommodate. Reducing congestion does have productivity benefits, but congestion itself is a symptom of a market failure which is not necessarily solved by increasing supply. The motorway network's ability to fulfil its critical task of moving people and goods is currently hindered by congestion – congestion which is expected to get worse over the next 20 years.

Congestion on Sydney's motorway network requires an integrated package of solutions. One reason for

congestion on the motorway network is that the network itself is not complete – many pieces of the motorway network are not linked to each other. This could be described as a supply problem. Another set of problems are better characterised as demand problems: smart road management technology, better parking policy, and better public transport are the types of solutions that could positively impact the demand profile for Sydney's road network.

Investment in Sydney's motorway network will have a negligible impact on congestion unless we simultaneously address wider problems underlying congestion. As the motorway network develops, an

Figure 4.51 Potential connections to bridge gaps in the Sydney motorway network by 2031



integrated policy response will be required to manage growing demand and to preserve the productivity benefits from new investment. This will require a suite of measures that reduce reliance on car travel, enhance public transport, manage congestion and traffic flows efficiently, and reform road pricing and access. Measures to improve the performance of the motorway network over the next 20 years, include:

- **Integrated planning: Sydney's roads hierarchy** – Our approach to planning road investments will create a cohesive road network that features integration with land use planning, integration across all modes and integration with Sydney's wider public transport network.
- **Reducing reliance on car travel** – We will build more park and ride and bike and ride facilities to encourage commuters to use public transport and ease congestion on the road. We will make walking and cycling more viable and attractive in Sydney to reduce reliance on cars.
- **Supporting public transport and unblocking Sydney's constrained corridors** – We will improve and extend public transit on Sydney's strategic transport corridors, prioritising the most constrained corridors to make public transport a more attractive option and mitigate demand on the motorway network.
- **Arterial roads for a growing city** – We will improve the flow and capacity of arterial roads by providing intelligent traffic systems to reduce congestion and introducing complementary measures including clearway and on-street parking measures, transit lane systems, long turn bays, additional traffic lights, and bus bypass lanes and B phasing at intersections.
- **Congestion action plan** – We will deploy targeted investment at congestion pinch points. We will also invest in managed motorway technology to make the motorway network more demand-responsive. Enhanced traveller information will help drivers make informed decisions and avoid congested roads. Our approach to road pricing can improve the flow of Sydney's motorways.

Our new motorway investments

We must complete the missing gaps that are slowing the network down and contributing to congestion and delays across the city. Combined with the above initiatives, these motorway investments will provide a fully connected, smoothly flowing motorway network:

Under construction

- **M5 West widening** – Widening of the M5 West from two lanes to three lanes in each direction from Prestons to Beverly Hills.
- **M2 widening** – Widening of the M2 West from two to three lanes in both directions – eastbound between Windsor Road and Lane Cove Road and westbound from Lane Cove Road to Pennant Hills Road.

Missing links

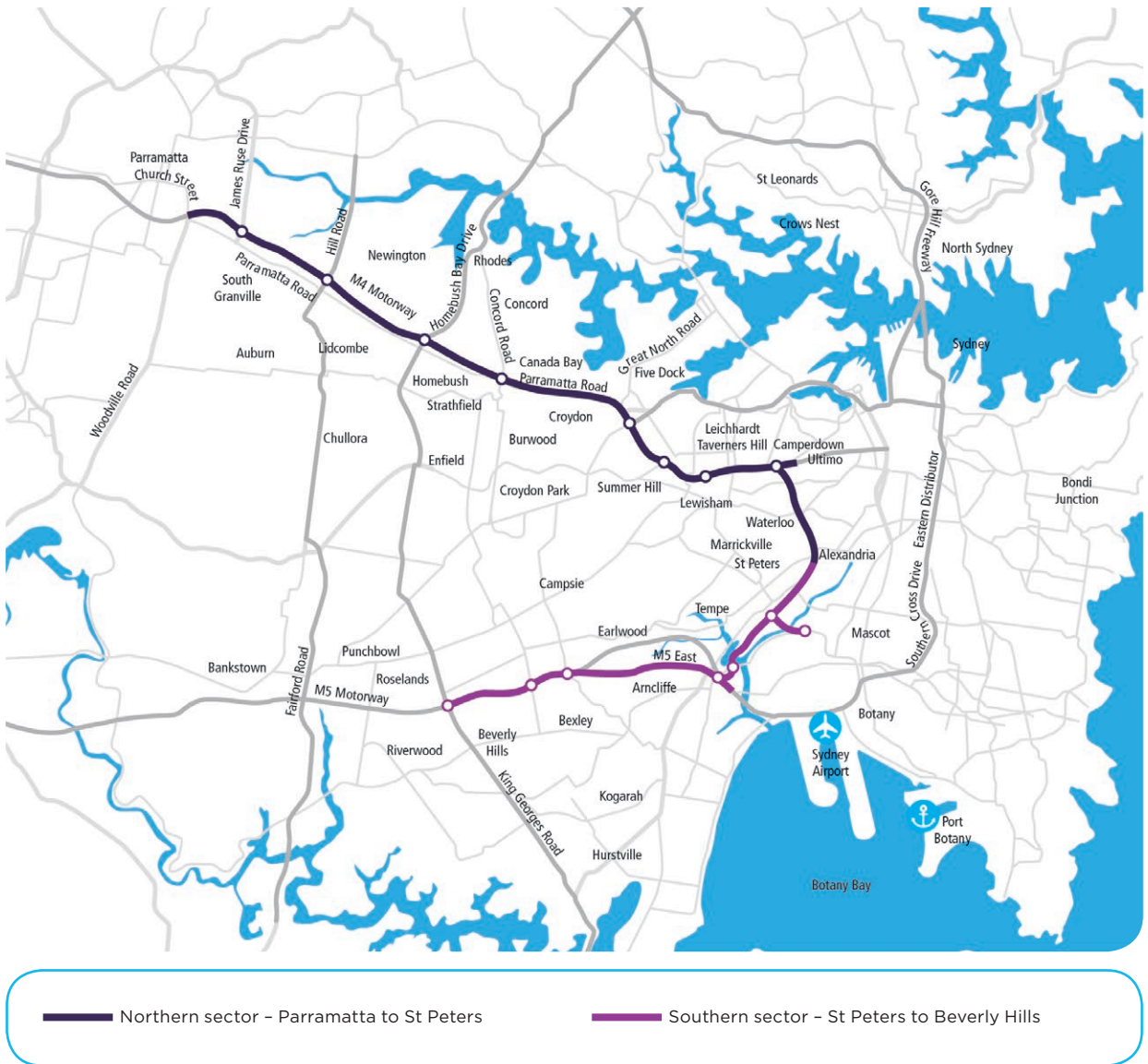
- **WestConnex** will be the first new motorway project undertaken to complete the missing links in Sydney
 - **WestConnex Northern Sector** – The Northern Sector comprises the M4 extension, upgrades to the existing M4 between Strathfield and Parramatta, and a tunnel between the Taverners Hill area in Petersham and the St Peters area.
 - **WestConnex Southern Sector** – The Southern Sector, comprises the M5 East Expansion and the new connections proposed around Sydney Airport.
- **F3 (M1) to M2 link** – Connecting the existing M2 at Seven Hills to the F3 (M1) at Wahroonga with a tunnel under Pennant Hills Road.
- **F6 (M1) corridor** – Connecting the F6 (M1) to Sydney's motorway network is a major long term priority. We will progress a motorway project between St Peters near Sydney Airport and Loftus in Sydney's south.
- **Widening the M7** – Widen various parts of the M7 Motorway between Seven Hills and Prestons.
- **Enhanced north-south links** – We will identify and preserve corridor for new sub-surface motorway links west of the CBD.

Corridor preservation

- **Outer Sydney Orbital (M9)** – Preservation of an outer north-south corridor potentially connecting the existing road and rail networks, including the F3 north of Sydney with the Hume Highway south of Campbelltown.
- **Bells Line of Road and Castlereagh Freeway** – These are potential long term projects to strengthen connections of Sydney's motorway network to regional NSW.

WESTCONNEX SYDNEY'S NEXT MOTORWAY PRIORITY

Figure 4.52 Proposed WestConnex alignment



The 33 kilometre WestConnex project is Sydney's next motorway priority. It includes capacity improvements on the existing roads and new sections of motorway in the M4 and M5 corridors all combining to better link Western Sydney with its international gateways and key places of business.

Together, the combined Western Motorway (M4) and South Western Motorway (M5) corridors contain around 30 percent of Sydney's population and employment and service the diverse transport demands generated in the corridor. Sydney's international gateways - Sydney Airport and Port Botany and major freight activity areas are concentrated around the M4 and M5 corridors.

The WestConnex project will:

- Support Sydney's long term economic growth through improved motorway access and connections linking Sydney's international gateways and Western Sydney and places of business across the city
- Relieve road congestion so as to improve the speed, reliability and safety of travel in the M4 and M5 corridors, including parallel arterial roads
- Cater for the diverse travel demands along these corridors that are best met by road infrastructure
- Create opportunities for urban renewal, improved liveability, public and active transport improvements along and around Parramatta Road
- Enhance the productivity of commercial and freight generating land uses strategically located near transport infrastructure
- Optimise user pays contributions to support funding in a way that is affordable and equitable.

WestConnex will improve economic productivity through reduced freight operating costs and increased freight productivity. Increased capacity and connectivity to end markets, freight activity centres and Sydney's international gateways along the M4/M5 corridors will increase travel speeds and reliability and reduce travel distances for freight vehicles, with flow on effects to NSW freight and economic productivity.

Preliminary strategic modelling of WestConnex forecasts that it has the potential to deliver travel time savings in the order of 15 minutes to 35 minutes by 2021 on the M4/M5 corridors.

Urban amenity will be improved as more freight vehicles will use the Sydney motorway network rather than Parramatta Road and other lower order roads. Increased capacity and connectivity on the M4/M5 corridors will make Sydney's motorways more attractive for heavy vehicle use and divert heavy vehicle traffic away from Parramatta Road. This will improve local travel speeds and reliability, and improve urban amenity along the corridor as a result of reduced congestion, improved green spaces, mixed land uses (commercial and residential) and improved public transport services.

4.7.4 Reducing congestion and better managing traffic

Transport for NSW will continue to manage the urban road network in real-time through the Transport Management Centre: detecting and responding to incidents, traffic signal timing, planning for major events and providing real-time traveller information to motorists.

In addition, the Sydney Road Congestion Management Program (CMP) will set the direction for minimising congestion within the metropolitan area. Initiatives taken through the CMP will include bus priority measures, kerbside management, addressing pinch points at rail level crossings, incident management and actions to address congestion hot spots. The CMP will focus not only on motorways but also on alleviating pinch points on Sydney's arterial roads.

Travel demand along the motorway network currently exceeds capacity during peak periods. This results in flow breakdown and associated negative consequences. A Managed Motorway System will make better use of the existing motorway network by implementing new traffic management systems and infrastructure to manage traffic flows along the motorway network and integrate the network with surrounding arterial roads. It will minimise the incidence of flow breakdown on the main motorway carriageway, improve travel efficiency and reliability, reduce emissions and improve safety.

The Managed Motorway System includes the implementation of traffic management systems and infrastructure including intelligent vehicle monitoring, adaptive traffic control, incident management and traveller information systems to both the motorway and the surrounding arterial road system to ensure integrated operations. The infrastructure deployed includes roadway vehicle sensors, variable message signs, closed circuit television cameras, variable speed limits, on-ramp metering signals including priority user (truck) ramp access to the motorway at selected locations, lane management systems off-ramp queue detectors and pits and conduits for the connecting power and communications.

Distance-based tolling, a standardised cents-per-kilometre charge across the Sydney motorway network, will mean that regardless of where people drive or where they live, they will all pay the same amount to use the network. Payment can also be linked directly to the amount of use motorists make of the network. It will help to improve traffic flows and provide a revenue stream for much needed investment in extending and enhancing the current motorway network and other transport infrastructure.

Further details of distance-based tolling and the principles that could be applied in adopting such an approach are included in Chapter Ten.

Short term

Action Apply distance-based tolling on new and upgraded motorways

We will investigate, develop and test a distance-based tolling model for Sydney's motorways. The work program will involve extensive discussions with private sector tollway operators, as well as cross-disciplinary experts on planning, economics, finance and engineering. Based on the results of this investigation, we will consider options for tolling new and upgraded roads on the Sydney motorway network on a consistent cents per kilometre basis. WestConnex will be the first trial of a new distance-based tolling scheme for Sydney's motorway network.

Action Implement Managed Motorway Systems and new technologies to better address congestion

A Managed Motorway System will introduce new traffic management systems and technologies to better manage traffic flows along the motorway network. It will allow an appropriate allocation of road space to provide priority for buses, light rail, trucks, taxis, cars, bicycles and pedestrians according to the demand for road space and the most efficient use that can be made of this space. We will also enhance the efficiency of road use overall in Sydney by improving priority access according to the efficient use of space by various types of road users.

We will plan and begin to implement the Sydney Road Congestion Management Program, by deploying a new approach and technologies to managing congestion in urban centres. We will establish a program of road improvements to expand capacity along Sydney's most congested corridors. This will include bus priority, incident management, clearways and kerbside management, intersection improvements and addressing congestion at urban hot spots. We will invest in growth centres road networks to serve new greenfield residential and employment areas in Sydney's West (see Chapter Five). Upgrades to the road network around Sydney Airport to relieve pinch points will commence.

Medium to longer term

Action Deliver targeted investment and efficiency improvements on the arterial road network

The completion of the motorway network will provide further opportunity to provide for provision and priority for public transport users, pedestrians and cyclists on arterial roads. On intermediate or secondary city shaping corridors (particularly those that form vital cross-city links), we will target investments and efficiency improvements that make better use of our infrastructure, such as optimising intersection operations and the use of on-street parking.

Subject to the result of our investigation into distance-based tolling, we will introduce pricing reforms to enable the road network to be used more efficiently.

We will continue the Sydney Road Congestion Management Program and continue the growth centres roads networks program.

4.7.5 Promoting walking

We recognise that walking is a critical mode in a successful integrated transport system. A package of actions will be targeted at making walking a more convenient and attractive transport choice. We aim to make our neighbourhoods and suburbs pedestrian friendly places and to get more people walking, especially for short trips, as this will increase the capacity of our transport system. We will put pedestrians' needs at the heart of CBD access and interchange planning.

Short term

Over the next five years, we will deliver a package of actions to support and encourage walking, as a transport mode in its own right and to improve access to public transport services for longer journeys.

Action Design new links in off-road pathway networks to provide walkers and cyclists with separated space where feasible

We recognise that off-road cycleway projects may also offer new incidental walking opportunities for short local trips, exercise and recreation. We will ensure that new paths used by both of these active and sustainable transport modes are designed appropriately for walkers and cyclists and that conflicts are minimised. We will develop and require the use of guidelines on providing and managing separated space for the use of cyclists where feasible.

Action Improve pedestrian facilities in partnership with local councils

We will improve pedestrian access, safety and amenity around the city and work with local government and communities to make city neighbourhoods and local centres more walkable. Investment will focus on the walking catchments around public transport interchanges and local centres.

Action Improve pedestrian priority and upgrade amenity in the CBD

We will investigate opportunities for new and improved pedestrian links along George Street and deliver new sub-surface pedestrian connections in the CBD to serve areas with high pedestrian demand, including the Wynyard Walk pedestrian link between Wynyard and Barangaroo.

We will enhance pedestrian priority on the inner Sydney road network through initiatives such as improved safety, lighting and the prioritisation of pedestrian desire lines. We will identify opportunities to improve pedestrian priority at signalised intersections on major urban centre pedestrian desire lines.

Medium and longer term

Over the medium and longer term, we will ensure that pedestrian access, safety and amenity are at the core of planning for public transport interchanges and CBD access strategies.

Action Directly invest in pedestrian links in local centres and to public transport interchanges.

We will prioritise pedestrian access and mobility in and around public transport interchanges through improved safety and lighting, prioritisation of pedestrian desire lines and enhanced walkability of connecting streets and pathways. We will expand the Roads and Maritime Services program to connect walking desire lines safely in local centres and across busy arterial roads with new infrastructure, such as the pedestrian bridge over Anzac Parade to the Moore Park sporting and entertainment precinct.

New pedestrian infrastructure will include better wayfinding at public transport interchanges. Enhanced online customer walking information and promotion tools will also be developed.

4.7.6 Encouraging more Sydneysiders to cycle

We will invest in short and long term initiatives to support and grow cycling across Sydney.

Short term

Action Build a connected cycling network within a five km catchment of local centres

We will commence delivery of a clearly defined and legible, safe network of cycleways on streets that feed into Sydney's urban centres. Links will include the Penrith to Emu Plains connection (Nepean River Green Bridge).

In the short term, our cycling program will focus on community partnerships and clearly defined bike path networks based on a five kilometre catchment from Sydney urban centres, in line with *NSW 2027* targets for healthier, safer connected communities.

Action Provide bike parking at transport interchanges

We will provide improved bike parking at transport interchanges will make cycling a more integral part of the transit system.

Action Continue to invest in the cycling network with a focus on dedicated cycling paths and pinch point improvements

A new NSW Cycling Investment Strategy will improve the management and delivery of cycleway capital programs. The program will deliver value for money investments that meet the needs of different cycling customer market segments in cost effective ways. The Strategy will identify how and when cycleway projects are planned and prioritised, where they are located, what their design standards should be, and how they are funded, managed and maintained.

The Strategy will establish a single set of project prioritisation and funding allocation guidelines for state and local government agencies targeting areas of greatest need. It will include a flexible safe cycleway hierarchy of design solutions to match customer needs with cost effective solutions, improved cycling experience, cycleway management, monitoring and integrated approaches to cycleway investment and land use planning.

The Strategy will consider funding for the North Shore Cycleway for pre-construction detailed design.

Medium and longer term

Action Continue to extend the catchment of connected cycling networks around local centres in the long term

In the longer term, we will extend cycling networks to focus on the wider catchments for Sydney's urban centres, based on demand and our internal hierarchy of strategic cycling links. We will make cycling part of the integrated transport network by incorporating cycling facilities within train stations and key interchanges.

Our medium to long term goal is to provide a connected network of cycle routes that give access to each urban centre from a 10 kilometre catchment, with the busiest commuter routes designed to provide bicycle-only space separated from pedestrians.

4.7.7 Sydney's Ferry Future

Our plans for action for Sydney's ferries are designed to not only retain ferries as an important part of Sydney, but to expand, modernise and integrate ferries alongside the rest of our transport system.

We will ensure ferry services are an efficient and important component of a seamless multi-modal network. We will develop services around customer needs and demand, not around historic operational and infrastructure constraints, and we will take action to modernise vessels and wharf facilities to reflect modern customer expectations.

Deregulating the Manly to Circular Quay high speed services has led to patronage growth and improvements in customer service. We will remove regulatory barriers to private ferry operations to improve services, including opening up new routes and providing better service.

We will replace the ageing and diverse fleet with efficient new vessels. We will continue to streamline the contracting and franchising arrangements to leverage the best service delivery improvements for NSW customers and to keep pace with new growth areas and emerging trends. To grow the network, we will undertake an ambitious wharf upgrade program prioritised according to the new routes and timetables and to local needs.

Short term

Action Optimise the current ferry network with improved routes and services

The new franchised ferry operations will be complemented by a redesign of the ferry network. This is at the top of our short term priorities for ferries heralding the start of a new era of service quality and delivery. We will work with our ferry contractors to analyse and restructure routes and timetables to better reflect travel patterns and demand.

We will commence planning to introduce new routes and destinations such as cross-harbour trips, loops and services to King Street Wharf and Barangaroo. Ferries will become part of the integrated transport system, with fares, tickets and timetables integrated with other modes. As part of this, ferries will be at the forefront of the delivery of our new integrated electronic ticketing system Opal. We will continue to strengthen the contracting and policy framework to better meet customer needs and enable supplementary ferry services on routes of high and growing demand (such as high speed services to Manly).

Action Plan for long term ferry service, fleet and infrastructure improvements to match population and travel growth

We will develop a long term ferry strategy to entrench a customer-focused vision for ferries and guide the development of service, infrastructure and policy initiatives.

Action Work with tourism stakeholders to develop the ferry leisure market

We will collaborate with tourism stakeholders such as Destination NSW and the Tourism and Transport Forum to improve services, information and marketing for the ferry leisure market.

4.8 Expanding capacity on our most constrained corridors

Action Integrate ferries with the wider public transport network

We will further integrate ferries as part of the city's transport network by aligning ferry timetables with other transport modes, and by providing real-time passenger information.

Medium and longer term

Action Build a new ferry hub at Barangaroo

New wharves will include a Barangaroo ferry hub to support Barangaroo commercial development, with new services from the Lower North Shore, Manly, Parramatta and inner harbour. This will also take pressure off Circular Quay.

Action Upgrade ferry facilities at Circular Quay

We will upgrade Circular Quay to improve modal integration and wayfinding, in order to enhance its functionality as an interchange.

In addition to modal plans, we will commence a program of work designed to expand capacity on Sydney's most constrained corridors.

As discussed in Section 4.2, journeys between different parts of Sydney largely take place along 46 strategic corridors that define the peak demand for travel to centres in Sydney. Figure 4.6 shows these strategic corridors as they are today, highlighting the six corridors that are highly constrained at present and in most need of action.

We have examined what will be needed over the next 20 years to keep these arteries flowing and to keep Sydney moving. Our plan to free up these corridors includes a mix of public transport and road initiatives, delivered in a staged approach across the life of the Long Term Transport Master Plan.

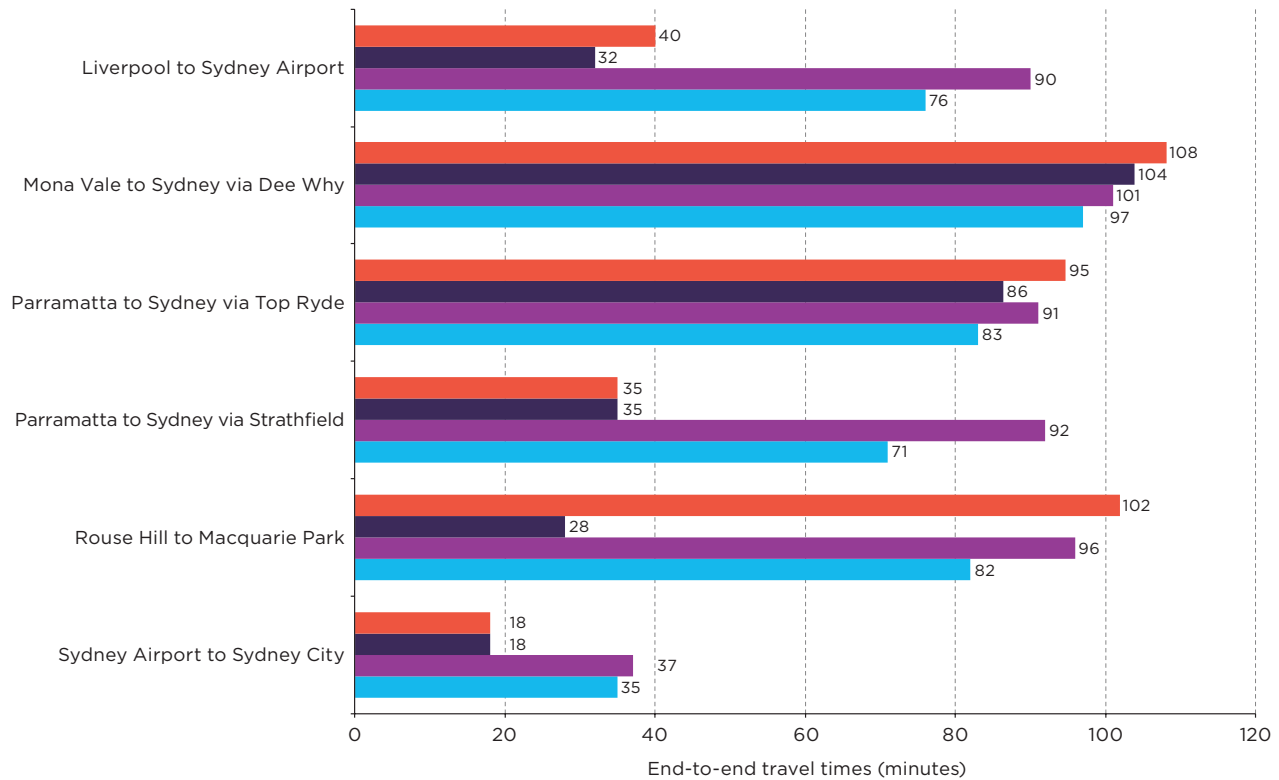


4.8.1 Taking action to unblock Sydney’s most constrained corridors

Six corridors will be most constrained in the future unless we take action. Figure 4.53 shows benefits for forecast travel times along these corridors for both public transport and cars with the implementation of Long Term Transport Master Plan initiatives. In addition to reductions in travel times in all but two comparisons – where the current train service already provides a

quick service – the Long Term Transport Master Plan initiatives will include higher frequencies for public transport. These will provide greater capacity and shorter waiting times, helping customers arrive at their destinations more quickly. Figure 4.54 provides an overview of these corridors and potential major initiatives to tackle capacity constraints.

Figure 4.53 Car and public transport travel times in 2031 on Sydney’s constrained corridors under ‘do nothing’ and Long Term Transport Master Plan scenarios



<p>Public transport travel times in the AM peak</p> <ul style="list-style-type: none"> ■ Do nothing scenario (2031) ■ Long Term Transport Master Plan (2031) 	<p>Car travel times in the AM peak</p> <ul style="list-style-type: none"> ■ Do nothing scenario (2031) ■ Long Term Transport Master Plan (2031)
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Figure 4.54 Potential capacity solutions for Sydney's six most constrained transport corridors



	Global Sydney		Specialised precinct		Constrained strategic transport corridor
	Regional city		Potential specialised precinct		Corridor linking constrained corridors to CBD
	Major centre		Planned major centre		Growth centres
			Potential major centre		
			Subject to INSW prioritisation		

Sydney Airport to the CBD

Key actions on the corridor

- Add train capacity
- Shift more freight to rail
- Improve Botany Road

Movements between the Port Botany and Sydney Airport precinct and the Sydney CBD are critical to the economic success of Sydney and NSW.

Improving the flow of traffic along this corridor will involve a mixture of rail and road improvements to relieve pressure on the corridor's main road and rail arteries, which are already at capacity.

Broader improvements to Sydney's road and rail networks will also expand capacity along the corridor. *Sydney's Rail Future* will lift the capacity of the Airport Line from eight trains per hour to 20 trains per hour.

Much of the congestion on roads serving this corridor, especially at its south, is the result of taxi and private vehicle traffic serving the Airport. Transport for NSW is identifying upgrades to Botany Road to improve the flow of traffic, especially bus traffic. These improvements may include adding bus priority at critical pinch points, optimising signals and crossings, and removing some on-street parking to expand road capacity.

In the medium term, delivery of the WestConnex scheme will improve links between Sydney Airport and Port Botany and Western Sydney, relieving pressure on the Eastern Distributor to the CBD. New intermodal freight terminals in South West and Western Sydney will enable a greater share of freight to be moved out of Port Botany by rail, also relieving pressure on roads.

Rouse Hill to Macquarie Park

Key actions on the corridor

- Build the North West Rail Link
- Implement a Western Sydney bus and road upgrade package

North West Sydney is one of the fastest growing parts of our State and requires transport services and infrastructure to support this growth.

The North West Rail Link will provide an additional rail service to up to 300,000 residents in the North West and provide convenient access to destinations across the Global Economic Corridor area. The 23 kilometre link will include eight new stations and provide services from Epping to Rouse Hill that will complement the existing rail network. The Rail Link will eventually be part of an enhanced high capacity rail network featuring a second Sydney Harbour crossing and new CBD line. Precinct plans will complement the transit-oriented development proposals for North West Rail Link stations.

Bus services will integrate with the North West Rail Link, while still servicing areas outside the rail catchment, and will remain an important mode of transport on this corridor. A bus and road upgrade package will improve bus connections to the link and increase the capacity of access roads.

The widening of the M2 will provide additional capacity.

Mona Vale to the CBD

Key actions on the corridor

- Introduce Bus Rapid Transit to the CBD

The Mona Vale to CBD corridor is a highly constrained corridor leading from the Northern Beaches to the CBD via the Spit Bridge. As the corridor is an important bus corridor, we will focus our short to medium term efforts on improving the bus network.

The level of bus demand and current operating conditions supports the implementation of a Bus Rapid Transit (BRT) system to relieve congestion and provide better services for customers. BRT usually involves very frequent services, exclusive bus roadways and high quality stations and vehicles. BRT works well in delivering fast travel times where demand is high, but not high enough to make investing in heavy rail systems a viable alternative.

The options identified in the recent pre-feasibility study will now be subject to detailed analysis, allowing the Government to make a long term decision based on sound evidence and cost information.

The first stage of developing the BRT will be to provide dedicated lanes and address the key bottlenecks along the corridor, such as Spit Bridge, to provide improved bus travel times and reliability.

The redesign of the bus network will enable the public transport network to better service growing east-west demand, such as between Dee Why and Chatswood.

Parramatta to the CBD via Strathfield

Key actions on the corridor

- Increase rail frequency
- Connect the M4 to the Port/Airport as part of WestConnex

This is one of the most important rail and road corridors in Sydney, carrying the highest number of public transport passengers. It is also one of the city's most constrained corridors, with a high level of road congestion and crowding on trains.

The Northern Sector of WestConnex, comprising the M4 Extension, upgrades to the existing M4 between Strathfield and Parramatta, and a tunnel between the Taverners Hill area in Petersham and the St Peters area, will alleviate congestion on Parramatta Road and improve conditions for bus services.

One of the aims of the WestConnex program is to support the regeneration of the Parramatta Road corridor. A slotted road concept has been proposed to enable this regeneration. The slotted concept sinks the motorway below surface level while constructing a new local road at surface level.

Improvements to rail infrastructure will improve the capacity of the corridor by increasing the frequency and speed of trains to and from the CBD. In the short term, timetable and operational changes and the new 2013 timetable will deliver services at a reliable 20 trains per hour.

The construction of a new Harbour crossing and CBD line will provide additional capacity on the Western Line to the CBD, increasing the number of trains per hour on the line by a further 14 trains per hour.

Parramatta to the CBD via Ryde

Key actions on the corridor

- Investigate the potential for BRT
- Connect the M4 to the Port and Airport as part of WestConnex

Expanding the capacity of this corridor will rely on improving bus priority and efficiency in the short term, and deploying higher capacity road-based transit in the longer term.

While many marginal improvements to bus routes have been made recently, the corridor lacks a pipeline of long term investments.

Between 2011 and 2031:

- Bus demand is forecast to increase by up to 30 percent in the morning peak period, with around 2,000 to 3,000 passengers per hour moving through the corridor
- Traffic growth of approximately 10 percent will be constrained by capacity on the corridor

The forecast strong growth in bus patronage suggests further priority will need to be given to buses. Transit design guidance such as the Transportation Research Board's *Transit Capacity and Quality of Service Manual* suggest that these volumes warrant consideration of transit options with their own right of way, segregated from other traffic. We will investigate whether future investment in BRT or light rail could be prudent within the Long Term Transport Master Plan timeframe.

Motorway initiatives such as the Northern Sector of WestConnex could reduce traffic demand on Victoria Road, providing the opportunity to create more dedicated bus lanes.

Beyond the timeframe of the Long Term Transport Master Plan, we will investigate opportunities to further expand the motorway network including potential linkages between the M2 and M4 via Gladesville.

Liverpool to Sydney Airport

Key actions on the corridor

- Increase capacity on East Hills Line
- Duplicate and widen the M5 East as part of WestConnex

This corridor supports growth in South West Sydney and is also a well established route serving suburbs and growth centres in South West Sydney.

Improvements to the rail network will provide more capacity on the East Hills Line with capacity to accommodate another 9,600 passengers in the peak hour. In addition, the widening of the M5 and the Southern Sector of WestConnex will provide more capacity and improve travel times and reliability from South West Sydney to Sydney Airport, Port Botany and beyond to the CBD.

Even with these improvements, the M5 is forecast to experience congestion due to growth, particularly at the Liverpool end. Further investigation is required to develop long term solutions to manage traffic demand on the M5 and encourage mode shift to public transport as part of an integrated study into growth in South West Sydney.

The most significant travel time savings through the actions taken under the Long Term Transport Master Plan are forecast to be on the Liverpool to Sydney Airport and Parramatta to Sydney via Strathfield corridors in response to the additional capacity provided by the upgrades of the M5 and M4 respectively, with the 33 kilometre WestConnex scheme. The Sydney Airport to CBD corridor is expected to experience some congestion relief due to the M4 connection, providing additional capacity on that corridor. The other highly constrained corridors will experience some congestion relief due to people transferring from car to public transport given the much improved public transport service delivered by *Sydney's Rail Future* and the revamp of the bus network.

NORTHERN BEACHES BUSES

The Northern Beaches region of Sydney is predominately served by two highly constrained corridors: a north-south corridor (Pittwater, Spit and Military Roads) and an east-west corridor (Warringah Road). The north-south corridor has been identified as the second-slowest commuter route in Sydney.

The Northern Beaches region is served by buses which experience a high level of unreliability and travel time variability. For example, the travel time of a limited stops bus between Spit Junction and Wynyard can vary from the timetable by 15 to 20 minutes on some mornings depending on congestion.

Demand on the Northern Beaches transport system will place pressure on existing services. The population of 279,600 is forecast to increase by 33,600 over the next 20 years and employment of 105,500 is expected to grow by 22,000 over the same period. Already 128,000 commuter trips and 900,000 non-commute trips are made in the region each weekday. To meet this growing demand, a Bus Rapid Transit (BRT) solution will be progressed as part of program of upgrades to existing services.

The level of public transport demand and current operating conditions within the Northern Beaches may support the implementation of a BRT system. A BRT would provide congestion relief through the provision of better public transport services for customers.

BRT usually involves very frequent services, exclusive bus roadways and high quality stations and vehicles. BRT can deliver fast travel times where demand is high, but not high enough to make investing in a mass transit system such as heavy rail a viable alternative.

The bus priority works undertaken over recent years on the north-south corridor provide a base from which to develop a future BRT system. The clearway, bus lane and transit lane provisions which apply to the kerbside lanes of the roads along the north-south corridor are familiar to motorists and other road users.

Transport for NSW has been identifying and testing potential options for both corridors. The north-south and east-west corridors are shown in Figure 4.55. These options range from short term investments such as better bus priority on the corridors, to long term options such as separated lanes and a bus tunnel under Sydney Harbour.

Options include various combinations of dedicated bus lanes (in the kerb lane or on the median lane), peak tidal flow arrangements and supporting infrastructure investments including options that replace existing bridges (at the Spit and Narrabeen) with wider bridges (including possible 'clip-on' options) and a tunnel to bypass Military Road.

All options focus on the existing road corridors complemented by a redesign of the bus network aimed at making the network easier to understand and use. We will consult with stakeholders and the community as we progress analysis of shortlisted options.

Findings

An initial set of 15 options has been reduced to six using a multi-criteria analysis. The six shortlisted options are currently subject to more detailed assessment of the feasibility of constructing and delivering a package of measures on the identified corridors in the Northern Beaches. Options include infrastructure delivery as well as operational changes to the network that could be progressed with or without infrastructure changes.

Implementation of any option would need to take into account:

- The potential impacts of the project on general traffic, given that subject roads suffer congestion at peak times and removing general traffic lanes would make congestion worse
- The potential impact of exclusive running lanes for BRT on on-street parking and access for both residents and businesses
- The cost applicable to each option
- The options identified in the recent pre-feasibility study will now be subject to detailed analysis, allowing the Government to make a long term decision based on sound evidence and cost information.

- Potential BRT route
- Potential improved bus facilities

Figure 4.55 Potential route for Northern Beaches BRT



Option	Description
Option 1: North-south priority works	Upgrade existing kerbside bus lanes to 24 hour
Option 2: North-south median BRT	Segregate median BRT lanes and local buses on the kerbside
Option 3: North-south kerbside BRT	Segregate kerbside BRT lanes and passing bays at all bus stops
Option 4: North-south northern interchange BRT	Segregate kerbside BRT lanes with rail interchange at North Sydney
Option 5: North-south tunnel BRT	Kerbside BRT on Pittwater Road and bus tunnel under Military Road
Option 6: East-west kerbside BRT	Upgrade existing kerbside bus lanes to 24 hour

SYDNEY LIGHT RAIL STRATEGIC PLAN

Sydney's Light Rail Future is focused on expanding light rail services for the CBD and inner Sydney. It represents a step change for transport in the city, significantly boosting capacity and reliability.

The actions outlined in *Sydney's Light Rail Future* will also grow public transport capacity, enhance commuter experiences and reduce congestion, leaving more space for vital commercial traffic as well as pedestrians.

We are expanding Sydney's light rail and streamlining the CBD bus network at the same time to achieve an integrated transport solution for our global city. This integration, together with *Sydney's Rail Future* and actions we are taking now, will reduce congestion in the CBD.

The light rail solution is about the right transport mode for the right task. One light rail vehicle has capacity to move up to 300 people – compared to a bendy bus which can move up to 100 people. Sydney's Light Rail Future will reduce buses in the CBD by 180 in the morning's busiest hour and when combined with bus network changes this will increase up to 220, helping to lower congestion caused by buses entering and travelling along CBD streets. Light rail is reliable – with a forecasted 97 percent of all services running within two to three minutes of the timetable. Currently, only 19 to 34 percent of buses achieve this in the Anzac Parade and CBD corridor. There will also be more room for walking, which currently accounts for 93 percent of trips made in the CBD.

Putting the customer first

The NSW Government has put the customer at the centre of *Sydney's Light Rail Future*. Light rail in the CBD will benefit a wide range of customers, including:

- **Commuters making short trips within the CBD** for business, shopping, tourism and recreation
- **Commuters travelling from the South East suburbs to the CBD** for work, shopping and entertainment
- **Students travelling to education** at the University of NSW, NIDA and schools along the route
- **Patrons travelling to major event precincts** at Moore Park and Royal Randwick Racecourse
- **Commuters making connections between public transport services** at key interchanges in the CBD at Central, Town Hall, Wynyard and Circular Quay
- **Staff, patients and visitors** travelling to the Randwick health precinct
- **Commuters on other bus services** from the north, west and south whose trips are delayed by congestion in the CBD.

Turn up and go

Light rail services in the CBD will run every two to three minutes in peak times, and slightly less frequently in off-peak. This will offer commuters a 'turn up and go' service – meaning spontaneous trips can be taken without needing to consult a timetable. Light rail will run throughout the day and into the night, giving commuters confidence it will be easy to get home late into the evening. Bus and light rail services will have integrated timetables providing easier and convenient interchanges.

A simpler system for all

The existing bus network serving inner Sydney is complex, especially in the CBD. Introducing light rail in the CBD will provide a comfortable, easy to use and reliable service. For people travelling to the Moore Park precinct it will offer an easy journey to major events.

On George Street, pedestrians will experience a quieter and less chaotic environment with more space to move around. Light rail vehicles can travel through the area at low speeds, allowing pedestrians to comfortably share the space with light rail. And because light rail produces little noise and no local emissions, it can be in Sydney without negative impacts to local amenity.

The four stages of Sydney's light rail future

1

Service integration and improvements

- Integration of light rail into the existing MyZone ticketing system and 131 500 information line and website - completed June 2012
- Introduction of the Opal card, the integrated electronic ticketing system, on light rail to make travelling easier between modes.

2

Modernise and extend the existing network

- Construction of the 5.6 kilometre Inner West Light Rail Extension to connect Dulwich Hill to the CBD - to be completed in 2014
- Modern light rail fleet introduced to improve commuter experience
- Real time information and timetable updates.

3

Deliver a new CBD and south east service

- Overhaul of CBD bus network to integrate with light rail and better connect commuters
- Completion of light rail connecting Circular Quay, the CBD and the south east including Moore Park and the University of NSW
- Pedestrianisation of 40 percent of George Street.

4

Longer term investigations

- Feasibility investigations of light rail or other high capacity public transport, like Bus Rapid Transit, for additional corridors including Victoria Road, Parramatta Road, Anzac Parade to Maroubra and potentially Western Sydney
- Continued support to councils investigating potential light rail schemes
- Growing the light rail network in line with demand and integrated with new urban development
- Investigating potential extensions to the line such as to Malabar, Walsh Bay and Barangaroo North.

4

GETTING SYDNEY MOVING AGAIN

Inner West Light Rail extension

The 5.6 kilometre Inner West Light Rail extension, currently under construction and on track for completion in 2014, is the first, vital stage of extending light rail in Sydney.

The \$176 million project will extend light rail services from Lilyfield to Dulwich Hill, for the first time connecting neighbourhoods including Dulwich Hill, Leichhardt and Haberfield

to shopping and entertainment districts such as the Sydney Fish Markets, Paddy's Markets, Capitol Square and Leichhardt Marketplace.

It will provide better public transport integration – allowing passengers to transfer between light rail, bus, bike as well as heavy rail at Lewisham and Dulwich Hill.

Key benefits – *Sydney's Light Rail Future*

Increased capacity

- Space for 300 commuters on each 45 metre long light rail service – equivalent to five standard length buses
- Reduced crowding and congestion
- Buses freed up to service other destinations.

Faster, simpler, more reliable services

- 'Turn up and go' services every two to three minutes in peak times
- 97 percent reliability
- Services that are on time and fast
- Real-time information at all stops and on vehicles, showing route and stop locations
- Simple to navigate
- Effective wayfinding at stops and interchanges, to help you transfer to bus, ferry or heavy rail.

Urban renewal opportunities

- Pedestrian friendly streets, open spaces and revitalised public areas
- Reduced congestion at the heart of the CBD
- A more attractive, accessible environment for visitors, businesses and workers
- Improved connections where people live, work and visit.

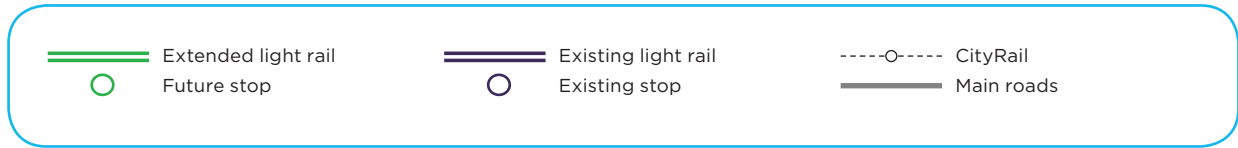
Improved amenities

- Integrated, electronic ticketing available at outlets or on-board
- Light rail stops maximise accessibility, with multiple doors available to alight at your stop
- Smooth, comfortable and quiet services, with air-conditioned vehicles
- Safe, clean, accessible and comfortable environment.

Inner West Light Rail extension – key facts

- Uses old **Rozelle Goods Line**, originally opened in 1916
- Includes **nine new stops** – Leichhardt North, Hawthorne, Marion, Taverners Hill, Lewisham West, Waratah Mills, Arlington, Dulwich Grove, Dulwich Hill Interchange
- **Upgrades to existing stops east of Lilyfield** including longer platforms, real time information and cycle parking
- **More frequent services** by introducing new light rail vehicles in addition to existing vehicles.

Figure 4.56 Inner West Light Rail extension route



CBD and South East Light Rail

The project

Following extensive feasibility investigations and consultation, the NSW Government is proceeding with a new light rail line extending from Circular Quay through George Street to Central Station and to the University of NSW via Anzac Parade and Alison Road.

The benefits

The new CBD and South East Light Rail will offer a simple, user-friendly way to travel between key attractions – from the Rocks and Circular Quay to the city’s retail heart and on to Chinatown, linking visitors staying in our world-class hotels to the in-progress Sydney International Convention and Exhibition Centre.

CBD and South East Light Rail – Key facts

Opal card – the electronic ticketing system – will be implemented on all light rail services.

Circular Quay to Central Station

- Three kilometre route along a dedicated corridor with a 15 minute journey time
- Service reliability of 97 percent
- Nine stops in the CBD between Circular Quay and Central
- Interchange with heavy rail, bus and ferry services at Circular Quay, Wynyard, Town Hall and Central Stations
- ‘Turn up and go’ services, with services every two to three minutes during peak periods and continued high frequency across the day, evenings, weekends and nights
- Pedestrianised zone between Hunter and Bathurst Streets.

Central Station to Nine Ways at Kingsford

- Six kilometre route along a dedicated corridor with a 24 minute journey time
- Seven stops between Central and Kingsford, including the University of NSW at Anzac Parade and Moore Park
- Bus interchange at Kingsford
- ‘Turn up and go’ services across the day, evenings, weekends and nights.

Central Station to Randwick

- Six kilometre route along a dedicated corridor with a 20 minute journey time
- Seven stops between Central and Randwick, serving the Prince of Wales Hospital, University of NSW at Wansey Road, Randwick Racecourse and Moore Park
- Potential to join two vehicles together for special events at Moore Park – doubling capacity to move up to 18,000 commuters each hour in each direction
- Bus interchange at Randwick
- ‘Turn up and go’ services across the day, evenings and weekends.

Light Rail Vehicles

- Air-conditioned, accessible low-floor design, electric powered
- Capacity for approximately 100 seated and 200 standing passengers
- Can carry up to 9,000 passengers per hour in each direction on a highly reliable service that is not impacted by traffic congestion.

George Street - how it will work

The CBD and South East Light Rail will change the face of George Street. A one kilometre pedestrianised zone shared with light rail along George Street will be created between Bathurst and Hunter Streets - covering around 40 percent of the 2.4 km street between Circular Quay and Railway Square.

Cars will still be able to access 60 percent of George Street. In addition emergency vehicles, property owners and small delivery trucks will retain access to the pedestrianised zone 24 hours a day. We will examine the best way for taxis and hire cars to have access during the night. This will help to support the night time economy, keeping George Street activated at night.

Beyond the pedestrianised zone, there will be a general traffic lane on either side of the light rail on George Street. Motorists will still be able to travel east-west along all cross streets in the pedestrianised zone, as well as other north-south streets within the CBD.

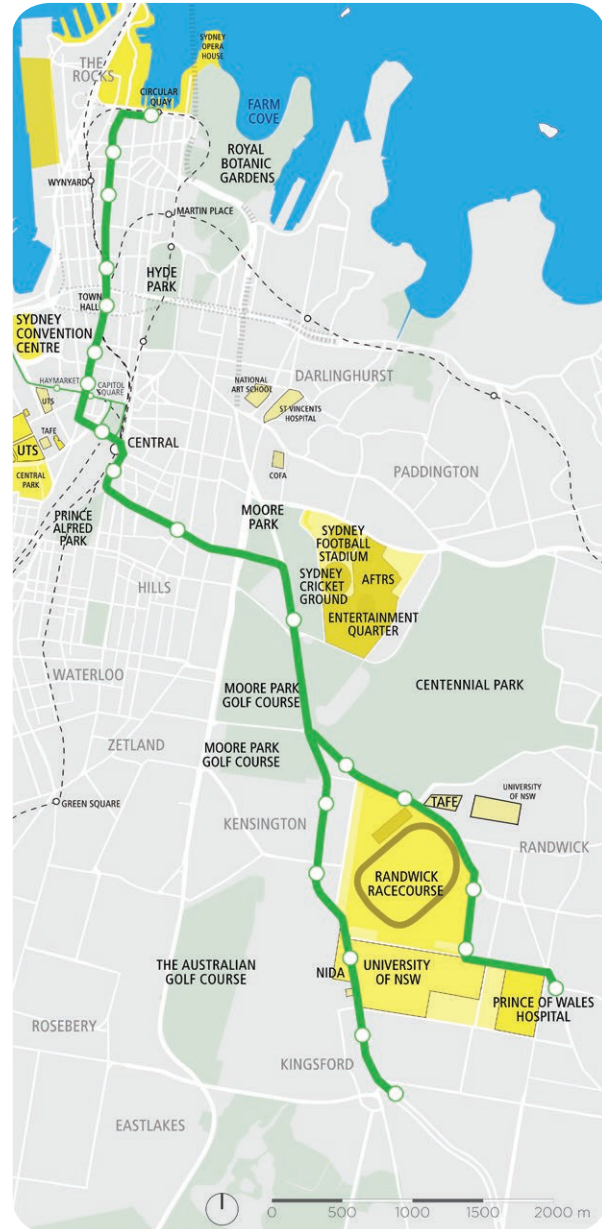
These changes will reduce bus and traffic congestion, and improve travel time reliability for commuters travelling through the CBD.

Construction and cost

The CBD and South East Light Rail will cost approximately \$1.6 billion to complete, funded from the transport budget and a PPP arrangement, subject to testing the business case, and value for money being met. We are also working with the City of Sydney and our other stakeholders who have committed additional funding contributions.

Construction on the project will take place in stages, with city streets closed in sections to minimise disruption to residents, businesses and commuters. We are consulting with the City of Sydney, Sydney Business Chamber, NSW Property Council and other stakeholders to understand how we can support businesses during construction. Once completed, light rail will significantly benefit businesses along the route. Construction is likely to take five to six years to complete.

Figure 4.57 CBD and South East Light Rail extension route



- Recommended light rail route
- Potential stop location
- CityRail network
- Existing light rail network
- Major trip generator

4.9 Creating a vibrant, attractive CBD – the heart of Global Sydney

The CBD is economically and culturally the heart of global Sydney and is nationally important. A highly efficient transport network will maintain and improve Sydney's global status and amenity.

In the short term, we will take actions to ensure that current infrastructure is used as efficiently as possible. Beyond this, further actions will contribute to a modern, state-of-the-art transit system.

4.9.1 A transit-friendly CBD

We will grow and improve Sydney's CBD transport networks to improve accessibility.

Over the next 20 years, new public transport initiatives in the CBD will transform mobility and accessibility. The centrepiece of the future CBD transport network will be a light rail line running from Kingsford and Randwick to Circular Quay via the University of NSW, Moore Park, Central Station and George Street.

The new CBD and South East Light Rail will offer a simple, user-friendly way to travel. Light rail will run along George Street from Circular Quay to Central Station in 15 minutes with a highly reliable service in dedicated lanes and a shared pedestrianised zone between Hunter and Bathurst Streets. Light rail in the CBD will be the step-change needed to transform Sydney.

Implementation of light rail will allow the restructure of bus routes to avoid congestion caused by the number of buses turning and terminating in the CBD. Improved levels of bus capacity, speed, reliability and legibility would be achieved by running buses on a limited number of dedicated routes and through-routing a higher number of bus services.

Traffic signals in the CBD will give priority to pedestrians, public transport and cyclists at designated intersections.

Sydney's Rail Future will create a high capacity, high frequency rail network that can operate more than 30 trains per hour and deliver high capacity mass transit services across the city.

A CBD expansion program will deliver the upgrades required to establish this network. A new tunnel under the Harbour and through the CBD will provide direct rail access from Hurstville and the Bankstown Line to Chatswood and the North West Rail Link. This will improve connectivity with the wider metropolitan rail network (including the North Shore Line, the North West Rail Link, and the Epping to Chatswood Line) as well as improving travel times and capacity through the CBD from the north and south.

The establishment of the Central Sydney Traffic and Transport Committee is one of the first steps that has been taken to streamline traffic planning in the CBD. We will adopt an improved road hierarchy to guide the allocation of road space in the CBD, recognising the importance of different user groups, demand and capacity, and how these factors change throughout the day and across the week. The hierarchy will take into account all road users – and the costs and benefits associated with travel modes – to manage the demand for services throughout the day for different users and modes. The objectives of the road hierarchy will be to reduce private vehicle demand for access to the CBD and to manage remaining demand in line with available capacity. Public transport will be prioritised and pedestrians, cyclists, taxis and motorcyclists will be allocated space.

We will rationalise bus routes and timetables to improve travel experiences. Bus journey times in the CBD can be highly variable in peak periods. There are relatively low numbers of passengers per bus as services progress through the city to far-side termination points – in other words, we are using these assets poorly but they are making a significant contribution to road congestion.

We will improve intersection management across the CBD through a better allocation of time and priorities.

UPGRADING BUSY CBD INTERCHANGES

Potential upgrades to existing interchanges and new interchanges will improve customer experience and create attractive centres and precincts for pedestrians.

Town Hall/Mid Town – The redevelopment of Town Hall Station to accommodate more rail passengers is an early-stage concept that would include a bus interchange which may form part of the development of a light rail line on George Street. This work could integrate with the City of Sydney’s proposal to create Town Hall Square.

Circular Quay Station – Circular Quay Station will be upgraded to improve wayfinding and layout to enable easier interchanging between ferry, bus, rail and taxi. The upgrade will involve better integration with private water transport providers and an interface with the George Street light rail line.

Wynyard Station – In the long term, Wynyard Station will need a comprehensive and multi-modal upgrade to better accommodate rail and bus passengers interchanging at the station and Barangaroo. The upgrade will link with Wynyard precinct bus improvements that will improve efficiency, bus interchange and layover options.

Central Station – A comprehensive and multi-modal upgrade would encompass and integrate trains, coaches, taxis, buses and light rail. The rail network efficiency program provides opportunity to streamline rail services to Central. The implementation of *Sydney’s Rail Future* and construction of light rail will enhance the role of the Station and possibly require an upgrade to better integrate with surrounding transport infrastructure. The upgrade will alleviate overcrowding on some

platforms and pedestrian congestion in the passenger terminal at peak times. Wayfinding will be improved within and outside the station.

Wynyard precinct bus improvements – Actions to improve bus system operations and reduce delays in the Wynyard precinct in the short term (up to two years), with capacity to meet medium term needs (10 years). The upgrades will also include changes in the way York, Drutt and Clarence Streets are managed; changes to bus routing; increased kerbside bus stops; and investigating utilisation of the Sydney Harbour Bridge toll plaza area to provide bus priority, bus layover and possible bus stops.

Redfern Station – A comprehensive and multi-modal upgrade would address station access and connectivity issues, including access within and to the station, safe and convenient interchange with bus, pedestrian and cycle routes, and accommodating a corridor for expansion of the CBD rail network.

Barangaroo ferry hub – A new ferry hub will be designed and constructed for Barangaroo. Initial modelling and analysis of requirements indicates that two ferry wharves (four berths) will satisfy forecast patronage at 2021 and beyond. The hub will provide convenient access to the western edge of the CBD for ferry passengers, help to reduce congestion on other modes and relieve pressure on transport infrastructure at Circular Quay.

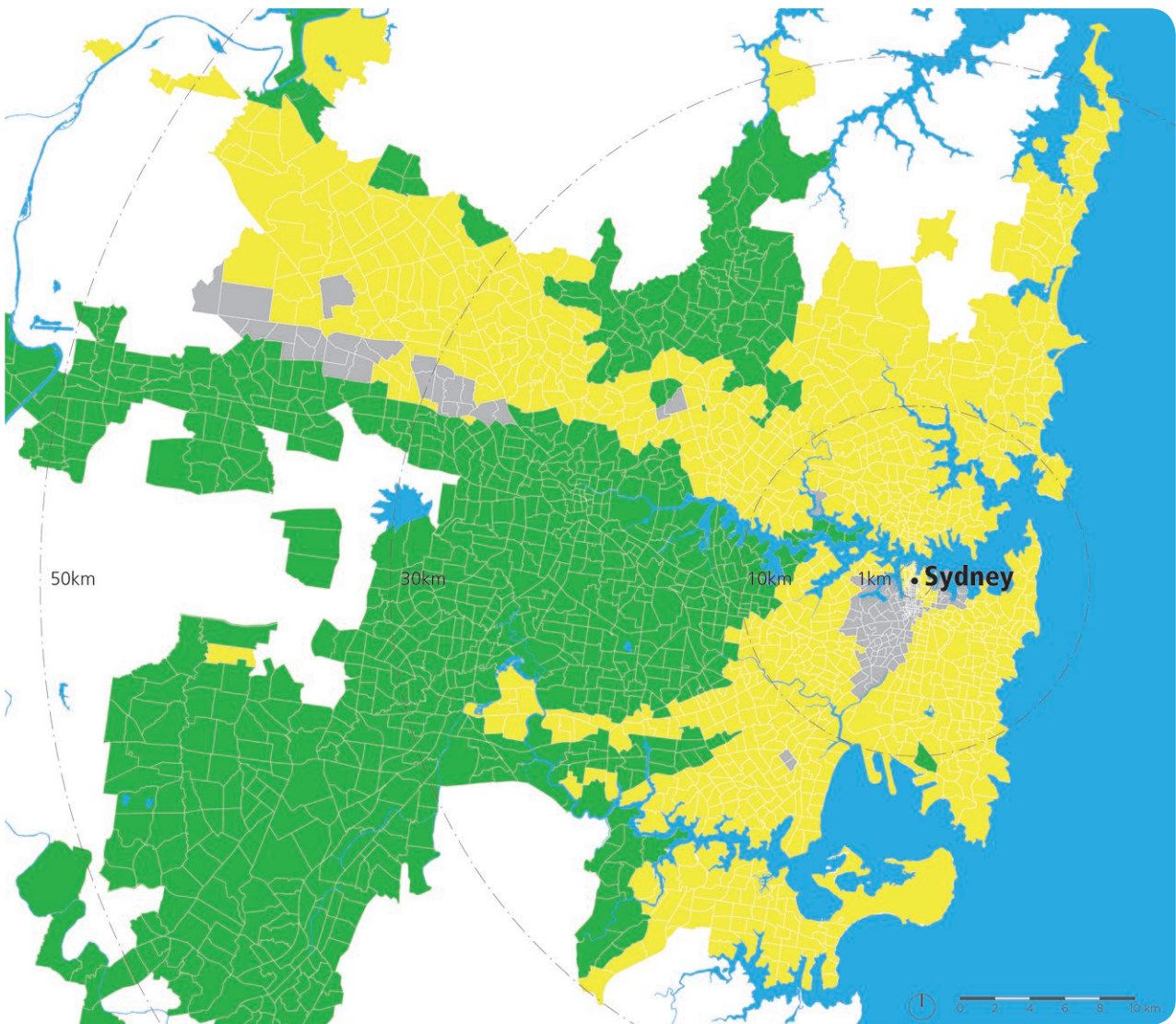
We will review the operation of the bus network to reduce far-side termination. We will also rationalise bus stop arrangements to improve network and service efficiency and ease of travel.

The public transport initiatives proposed in the Long Term Transport Master Plan are forecast to contribute to a significantly higher public transport mode share and the mode share of pedestrians and cyclists for commuter trips to the CBD by

2031. This equates to a 44 percent increase in commuter public transport trips over the 20 year period to 2031.

Figures 4.58 and 4.59 show the improvement in travel time that is forecast to be experienced by people travelling to the CBD during the morning peak period by car and public transport respectively due to the key Long Term Transport Master Plan initiatives.

Figure 4.58 Change in 2031 morning peak car travel time to the CBD due to Long Term Transport Master Plan initiatives



Modelled change from 2031 'business as usual' scenario as a result of the Long Term Transport Master Plan solutions packages

- Waterways
- Non-urbanised land

Change in travel time (minutes)

-5 0 5

4.9.2 Growing and improving CBD transport networks

We will grow and improve CBD transport networks to improve accessibility, including a planned high capacity light rail line along George Street. We will also improve interchange amenity in the CBD by upgrading interchanges and building new interchanges to achieve high quality and seamless transfers, as well as improving the precincts adjacent to these interchanges.

Short term

In the short term, we will take a number of actions designed to deliver meaningful results from getting the most out of the existing system. These improvements include:

Action Adopt simplified service types for buses, to make the system easier to understand and use

We will redesign Sydney's inner urban bus network based on the Strategic Transit Network hierarchy (see Chapter Two) to improve services and make the system easier to understand for customers. The focus initially will be on the development of a strategic bus network that complements the rail network outlined in *Sydney's Rail Future* strategy. The strategic bus network will consist of links with elevated service frequencies, and on-road bus priority features, that provide cross-regional connections between existing and emerging centres, including in Western Sydney. Bus systems redesigned around strategic bus network links will also comprise intermediate capacity all-day district services, and connecting routes that meet local demand.

Action Northern Beaches bus network redesign

To complement the construction of Bus Rapid Transit to the Northern Beaches, we will redesign the area's bus network in line with clear differentiated service types and new principles aligned with the Strategic Transit Network hierarchy (see Chapter Two). For the Northern Beaches corridor this will mean a BRT spine for high-capacity services, frequent articulated bendy buses or other larger fleet for intermediate capacity services, and standard route buses for all other local services.

Action Implement Wynyard Precinct Bus Improvements Plan

We will make operational efficiency changes to the bus network, supported by improved passenger facilities, traffic control and road space allocation for buses.

Action Develop and implement a plan to manage CBD road space more efficiently

We will take steps to manage demand, with respect to time of day usage, including the implementation of demand management measures for road space to manage private vehicle use. We will implement a revised CBD street hierarchy to favour public transport, pedestrians and cyclists where appropriate.

Medium term

Action Upgrade city interchanges at Town Hall, Central, Redfern, Wynyard and Circular Quay

We will plan for upgrades to develop key city interchanges including Town Hall, Central, Redfern, Wynyard and Circular Quay (see box on page 163).

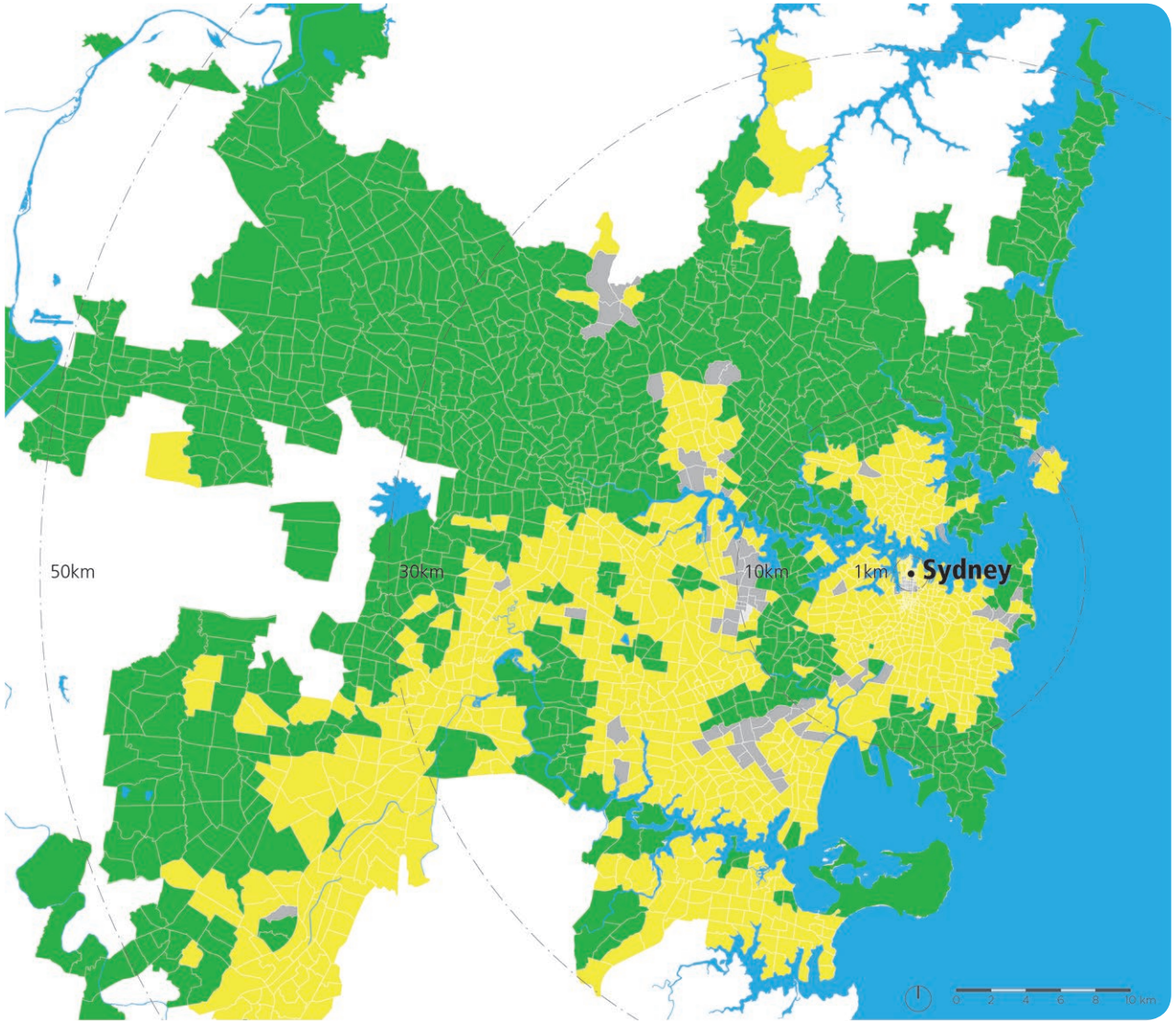
Action Develop CBD transit network

Deliver the George Street light rail project, which will include a redesign of bus services to accommodate and complement the new light rail lines. To coincide with the development of Barangaroo, we will build a new ferry wharf at Barangaroo and use this new facility to improve ferry services.

Action Expansion of light rail from Circular Quay to Kingsford and Randwick

Sydney's Light Rail Future identified the extension of light rail from the University of New South Wales and Randwick to Circular Quay via Central Station and George Street as the preferred route for light rail. (This project is outlined on pages 160 and 161).

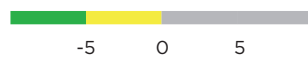
Figure 4.59 Change in 2031 public transport travel time to the CBD due to Long Term Transport Master Plan initiatives



Modelled change from 2031 'business as usual' scenario as a result of the Long Term Transport Master Plan solutions packages

- Waterways
- Non-urbanised land

Change in travel time (minutes)



Longer term

Action Build second Sydney Harbour rail crossing, new CBD line and new CBD stations

In the longer term, *Sydney's Rail Future* plans for a second Harbour Crossing and CBD rail line, serving trains from the North West Rail Link through to the converted line to Bankstown and Western Sydney. This initiative is described in the section on *Sydney's Rail Future* (4.7.1).

4.9.3 A pedestrian friendly CBD

With 93 percent of all trips in the CBD made on foot, we need to make much stronger efforts to make the central city pedestrian friendly.

We will invest in new pedestrian infrastructure to serve areas with high pedestrian demand.

Action Create a pedestrian boulevard along George Street

40 percent of George Street will be pedestrianised as part of Sydney's Light Rail Future, to transform the street into an attractive pedestrian and transit boulevard with general traffic excluded between Bathurst Street and Hunter Street.

Action Create new dedicated pedestrian links in the CBD

We will alleviate pedestrian congestion at peak periods through additional sub-surface (grade separated) pedestrian links at busy CBD interchanges, which could include:

- A continuation of Wynyard Walk from Wynyard Station to Martin Place

- A link from St James Station to Town Hall (under Elizabeth Street connecting to existing sub-surface routes) to improve access from St James to the area around Town Hall
- A Central Station east-west link (parallel and to the north of Devonshire Street tunnel and providing a link across Pitt and George Streets to the west).

We will prioritise pedestrian access and mobility in and around busy CBD public transport interchanges, contributing to the creation of attractive, safe pedestrian friendly urban precincts.

4.9.4 Cycling as a viable commuter choice

Further work is needed to understand the potential for continuing the steep growth in Sydney CBD cycling and how best to support it. Much of this work will be incorporated into our longer term Cycling Strategy.

Action Measure and respond to cycling demand in the CBD

As part of developing a street hierarchy that takes into account the needs of cyclists, we will introduce temporary measures to establish and assess user demand before making more permanent changes.

Action Extend cycling connections to suburbs surrounding the CBD

We will create a clearly defined and legible, safe network of bike paths and quiet local streets that feed into the CBD.

EASING CBD CONGESTION

Transport investments taking place in the CBD over the next 20 years aim to address the constraints of CBD congestion and reconfigure the way the CBD transport network functions.

Based on analysis of current travel patterns and future growth, the City Centre Access Strategy will put forward an integrated, multi-modal response to the city's major transport challenges.

Sydney city centre – a growing CBD

The scale of the transport task for the city centre and its supporting networks is challenging, and growing:

- 329,000 jobs (14 percent of the metropolitan total) are located in the CBD. This is forecast to increase to 417,000 over the next 20 years, almost three times as many jobs than North Sydney CBD (48,000), Parramatta CBD (49,000) and Macquarie Park (45,000) combined.
- The number of people in the city centre grows from around 50,000 to 500,000 every day.
- Around 148,000 people coming to the city centre in the morning peak use public transport. This number is forecast to increase by 45,000 over the next 20 years.
- In the busiest one hour, 1,010 buses bring 41,000 people into the city, while 19,500 other vehicles bring in a further 24,000 people.
- Almost 50 percent (250,000) of people travelling to the CBD come from nearby areas.
- Lead by the development of Barangaroo, about 50 percent of projected growth will occur in the western CBD.
- Over 90 percent (1.3 million) of weekday trips within the city centre are walking trips. These 1.3 million trips are forecast to increase by 21 percent (an additional 260,000) over the next 20 years.

Issues facing the city centre

Congestion and capacity constraints –

Congestion is a pressing challenge and growing employment and activity means more peak hour travel through the CBD. Public transport services will need sustained improvement and the capacity of the city's stretched transport networks will need to be increased.

An integrated approach to managing the different modes in the city is needed to support more people moving through the CBD's constrained network. Individual projects need to be part of a managed and coordinated approach to achieve the best use of space as demands change throughout the day.

Customer service – Research has indicated the following proportion of people would be more likely to use buses if services were: faster (34 percent), more efficient (28 percent), safer (21 percent) and more comfortable (21 percent). As the hub of the transport network, the city centre is a critical focus for efforts to improve bus reliability, comfort, interchange and information.

Loss of urban amenity – Sydney is famed for its quality of life, but increasing congestion, looming transport capacity constraints and perceptions of inconvenient or inefficient transport services are jeopardising the city's amenity. Sometimes, as is the case with bus services in George Street, the solution to one problem may inadvertently create another.

Transport must nurture a liveable, modern and productive CBD.

Our 20 year plan for CBD congestion

A number of initiatives to improve the city centre's transport future are proposed or underway. These actions combine getting the most out of our existing system with expansion to accommodate growth and new connections. They will tackle congestion and the related amenity challenges head on.

We are underway with:

- **Coordinated and efficient decision-making** through the new Transport for NSW and collaboration with the City of Sydney via the recently established Central Sydney Traffic and Transport Committee
- More **coordinated multi-modal incident management** in the CBD.

In the short term we will:

- Build a **light rail line for George Street**. *Sydney's Light Rail Future* will be the catalyst for changing how the CBD works and revitalise the CBD. With 'turn up and go' services across the day, it will take cars off George Street, reduce bus congestion around the north-south spine, provide 50 percent more capacity than buses and achieve 97 percent on-time running. Introducing light rail together with proposed bus improvements will mean at least 220 fewer buses will enter the city centre in the morning peak hour. We will also implement public domain improvements such as revitalised public spaces together with partial pedestrianisation along George Street between Town Hall and Wynyard Stations. Light rail will provide a step change in travel experience and will be simple, comfortable, and easy to use.

- Implement a **bus plan for all bus routes to and through the CBD**. Current bus timetables are designed to transport passengers into the central city with a minimum number of transfers between buses. This results in some 200 different bus routes delivering an enormous number of buses into the CBD along a limited number of congested roads and is the cause of many delays to customers.

A redesigned bus network will create simpler, faster and better bus services for customers:

- More buses on fewer streets with higher bus priority levels
- A redesigned inner urban bus network to reduce bus numbers entering the CBD by ensuring buses are full when they enter the CBD
- More cross-city Metro-style bus routes, avoiding termination in the city centre
- Seamless transfers between buses, light rail and heavy rail from higher frequency and more reliable services
- Easier to understand bus services for customers.
- Build **Wynyard Walk** to add capacity and provide safe and well managed walkways between Wynyard and Barangaroo.
- Invest in the **CBD cycle network**.
- **Investigate using road space gained from the removal of the Sydney Harbour Bridge toll plaza** to improve transport operations in the northern city centre.

In the medium term we will build:

- The **North West Rail Link**, which will remove a further 160 buses from the Harbour Bridge during the two hour morning peak period and deliver high capacity, single deck trains every five minutes from the North West into the CBD.
- A **ferry terminal at Barangaroo**, providing extra capacity for ferries and alleviating congestion at Circular Quay wharves.

In the long term we will construct:

- A **new heavy rail line through the city** with new CBD stations, linking with the rest of the rail network as announced in *Sydney's Rail Future*. It will enable the CBD rail network to carry up to 100,000 more people an hour, provide new access to growing parts of the CBD and create a significant incentive for commuters to shift from cars to public transport.

We will also undertake **progressive improvements to Circular Quay, Wynyard, Town Hall, Central and Redfern Stations and interchanges**. Investment in interchanges outside of the CBD will facilitate more public transport use and relieve congestion in the CBD.

Our integrated approach to CBD congestion and amenity will deliver significant outcomes for our customers. We will work with stakeholders including the City of Sydney, residents and business to implement these transport initiatives.

Proposed projects to enhance interchange amenity in the Sydney City Centre are shown in Figure 4.60.

Figure 4.60 Projects to enhance interchange amenity in the Sydney City Centre

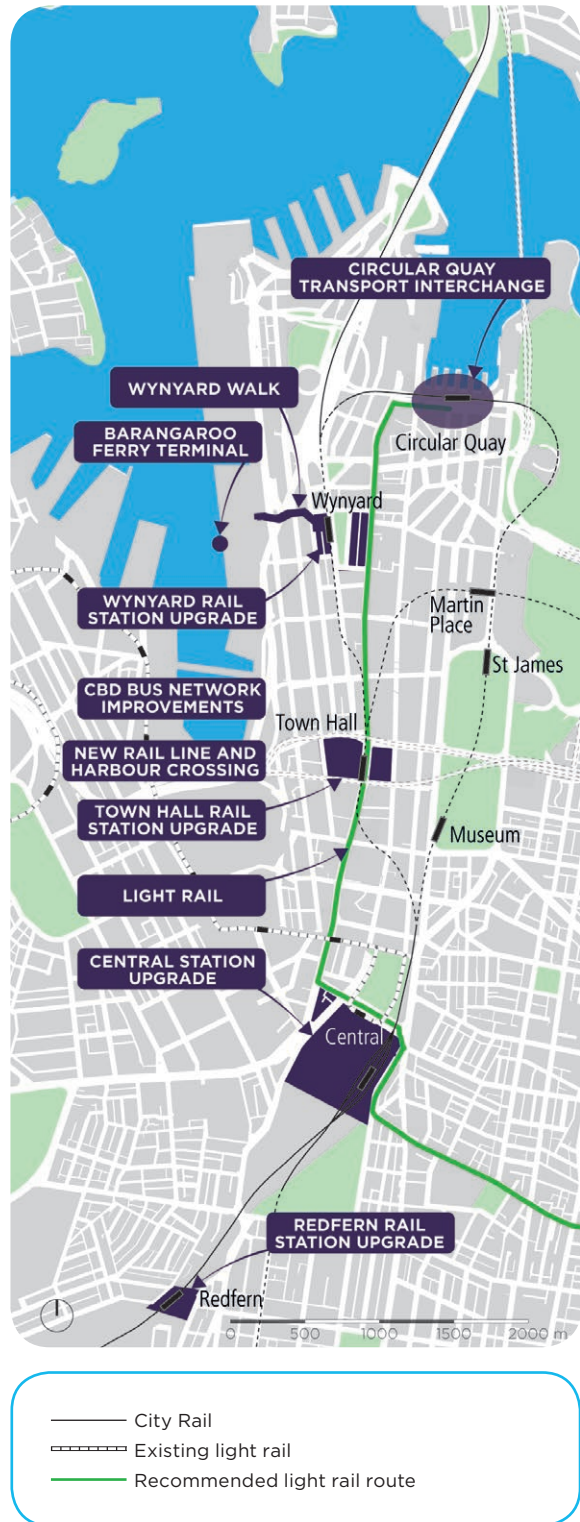


Figure 4.61 Existing bus network am peak hour (8:00 to 9:00am) bus volumes

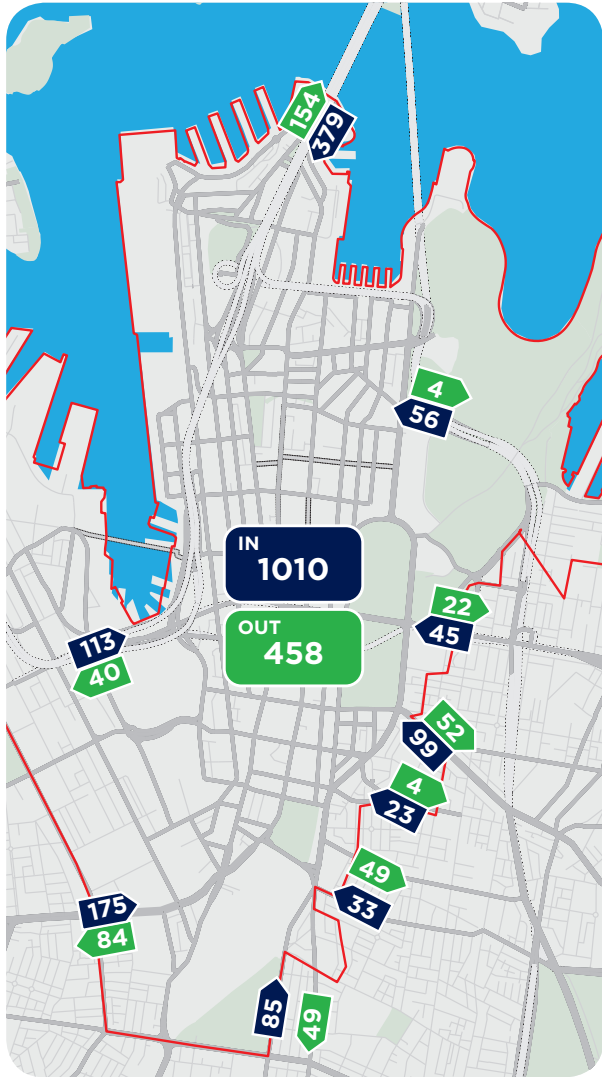


Figure 4.62 Light rail and redesigned bus network am peak hour (8:00 to 9:00am) change in bus volumes



■ Inbound buses

■ Outbound buses

Diverting buses onto the Cahill Expressway

Starting in early 2013, we will re-direct more than seven percent of current morning peak bus services from the North West - about 60 buses - from the Harbour Bridge onto the Cahill Expressway. This will reduce the queue of buses waiting to enter York Street from the Harbour Bridge, ease congestion at the busy Wynyard interchange and help make bus services more reliable for commuters. These buses would terminate at Bridge Street.

Contributing to CBD congestion cuts - Sydney's Rail Future

Congestion cuts will continue with the North West Rail Link, which will remove a further 160 buses from the Harbour Bridge and deliver high capacity, single deck trains every five minutes from the North West into the CBD. In the longer term, the second Harbour rail crossing and new CBD line will see the network carry up to 100,000 more people an hour - offering significant incentive for commuters to leave the car at home and take public transport.

Five steps to cut CBD congestion

1. Diverting 60 buses in 2013 onto the Cahill Expressway and other operational improvements, including the double-decker bus trial, a dedicated police motorcycle team to keep traffic moving and changes to traffic signalling and parking
2. Redesigning the bus network to make services simpler, faster and better for commuters, which together with light rail, would remove about 220 buses from entering the CBD in the busiest hour
3. Light rail in the CBD and South East to move up to 9,000 people every hour, achieve 97 percent reliability and revitalise and activate city streets
4. North West Rail Link to deliver faster travel times to the CBD for more than 300,000 commuters with faster, single deck trains every five minutes in peak periods. Commuters moving onto the NWRL will mean a further reduction of 160 buses entering the CBD
5. Second Harbour rail crossing and new CBD line with capacity to carry up to 100,000 more people an hour - a significant incentive to take public transport.





5



SUSTAINING GROWTH IN GREATER SYDNEY

CHAPTER SUMMARY

Our transport challenges

As Sydney grows, so do its major centres across Greater Sydney. Over the next 20 years, areas of Greater Sydney will grow strongly and the transport system will need to keep pace.

Long Term Transport Master Plan consultations highlighted concern around public transport access, road congestion, commute times, and local access to services. Chapter Five focuses on the following transport challenges in Greater Sydney:

- Improving public transport and cutting congestion to improve the liveability of Greater Sydney and meet growing demand by improving transport services and minimising travel times
- Equipping Greater Sydney for jobs growth to support the development of Sydney's regional economies with sustainable transport solutions nearer to population centres
- Developing new transport connections for greenfield areas as they grow to support the North West and South West Growth Centres and the Western Sydney Employment Area
- Protecting critical corridors to ensure the transport system develops in tandem with communities in Greater Sydney and to tackle congestion.

Taking action

This chapter sets out our long term plans to improve transport infrastructure and services to sustain growth in Greater Sydney. These include:

- **Modernising Greater Sydney's rail network:** Boost capacity across Greater Sydney through *Sydney's Rail Future*, with rapid transit services and improved frequency and capacity on suburban lines
- **Pinch point and congestion management:** Address growing pressure on Greater Sydney's road network with targeted measures
- **Motorway infrastructure:** Including the M5 West widening and Managed Motorway systems on the M4 to improve real-time management of traffic

- **North West Rail Link and South West Rail Link:** New rail infrastructure and services for fast growing outer suburbs, doubling services to the South West and providing rapid transit services to the North West
- **Western Sydney road and bus upgrades:** Optimise North West Rail Link access with bus priority on surrounding road networks, and improve road access to the South West and around Werrington to address social disadvantage in parts of Western Sydney
- **Bus Head Start Program:** Bus priority infrastructure on major road corridors on Sydney's strategic bus network to improve public transport travel times to urban centres or interchanges
- **Delivering WestConnex:** WestConnex integrates the M4 Extension from Parramatta towards the Airport with an expansion of the M5 East. Regeneration of the Parramatta Rd corridor and public transport improvements are integral parts of the scheme
- **Greater Sydney's employment centres:** Work with local councils and communities to support jobs and tailor transport and congestion solutions in the regional cities Parramatta, Penrith and Liverpool
- **Precinct Action Plan for Port Botany and Sydney Airport:** Reduce congestion by targeting traffic pinch points, increasing rail services, investigating additional bus service options to and from Sydney Airport and improving the infrastructure that supports freight flows to and from Port Botany
- **Growth centre roads:** Develop the road network in new growth centres to link the Greater Sydney workforce to employment opportunities and to national and international gateways
- **Interchanges:** Improve our busiest interchanges, with upgrades or car parks as park and ride at Canley Vale, Fairfield, Granville, Guildford, Parramatta, Gordon, Lindfield, Sutherland, Penrith Rooty Hill and Strathfield and with more to follow
- **Corridor protection:** Identify critical corridors and protect them for future needs.

Growth challenges in Greater Sydney

Sydney is a multi-centred city, with important economic and population centres in its greater metropolitan area. To realise our vision for Greater Sydney as a liveable, global city, we will need to focus on connecting our strategic centres to drive economic growth and productivity, reducing journey times and ensuring more people live closer to services and to where they work.

These centres, including Parramatta, Penrith and Liverpool, have well established commercial industries and networks and are major origins and destinations for trips across Sydney. However, as their population and economies have grown, Sydney's traditionally radial network has not responded efficiently to support economic development outside of Sydney's CBD.

The Transport Master Plan, alongside the draft *Metropolitan Strategy for Sydney*, will shape our network to support increasing growth and economic development closer to where people live, and drive transport infrastructure and service improvements around these centres for the long term.

This chapter addresses the challenges and solutions for Greater Sydney, and focuses on Sydney's largest strategic centres and specialised precincts – Parramatta, Penrith, Liverpool, Macquarie Park, and the Port Botany and Sydney Airport precinct.

The pattern of settlement, employment and economic activity across Greater Sydney brings distinct transport challenges to its regions. There are some areas of relatively low density and dispersed residential development where residents travel further on average, making public transport more costly to provide. Manufacturing and freight industries are well established in Western Sydney, while the Port Botany and Sydney Airport precinct has a combination of freight industry, emerging business lands and manufacturing.

The transport network in Greater Sydney needs to provide connectivity to local centres and to the Global Economic Corridor. It also needs to foster its economy, supporting the growing centres including Macquarie Park and North Sydney with efficient links to labour, freight networks and emerging business hubs.

This chapter focuses on the four challenges for Greater Sydney that we need to address to support a competitive economy and strong communities.

1. **Improving public transport and cutting congestion** to improve liveability of outer suburbs and to meet growing demand by improving existing transport networks and services, and minimising travel times.
2. **Equipping Greater Sydney for job growth** to serve jobs growth in outer Sydney centres as population grows, to support self-containment and to encourage jobs growth nearer to Greater Sydney population centres.
3. **Developing new transport connections for greenfield growth areas as they grow** to support new residential and employment areas, namely the North West Growth Centre, the South West Growth Centre and the Western Sydney Employment Area by embedding public transport services and reducing car dependency which can limit transport access and increase vulnerability to oil price increases.
4. **Protecting critical corridors** to ensure the transport system can develop in the future to meet the changing needs of Greater Sydney customers and to tackle congestion as corridors become busier.

5.1 Improving public transport and cutting congestion

Greater Sydney has an established transport network that includes bus, rail and motorway networks. There are opportunities to use Greater Sydney’s existing network to optimise public transport patronage, service levels and frequencies and reduce network congestion.

Car dependency

Regions in the outer suburbs of Greater Sydney have higher average levels of car use and dependency than their counterparts in inner and eastern Sydney, with a higher number of vehicles per household, and with higher average vehicle kilometres travelled per person. Figure 5.1 shows how average vehicle kilometres travelled (VKT) per person varies between regions across Sydney, with a resident in Penrith travelling more than three times more kilometres by car than a person living in inner Sydney.

There are historical reasons for this trend, including a post-war trend towards dispersed, low density development in some areas, which can make public transport service provision difficult and costly to provide. While in recent times the trend has shifted towards greater densification around major urban centres, ease of access can still be hindered in areas of Greater Sydney by local infrastructure, such as unsuitable footpaths or walkways, long walking distances to places of interest or physical barriers such as motorways, rail lines, rivers and bushland.

Figure 5.2 shows the relationship across Greater Sydney between population density and the level of scheduled bus services in 2011 for a typical weekday. It shows that in Sydney’s east and centre, where population densities are consistently high, bus service frequencies are also high. However, further out, in similarly high density areas of Greater Sydney, bus services are less frequent and less intensive.

Figure 5.1 Summary of vehicle use across Sydney Local Government Areas and regions on an average weekday

	Botany Bay	Liverpool	Campbelltown	Parramatta	Penrith	Inner Sydney	Eastern suburbs
% of trips as the vehicle driver	64%	79%	79%	71%	82%	40%	58%
Vehicles per household	1.3	1.8	1.6	1.4	1.9	1	1.2
VKT per person (km)	12.9	22.5	23.4	16.7	29.8	9.3	11.8

Congestion

Greater Sydney faces congestion on its existing transport networks during peak times.

Greater Sydney's roads face increasing congestion and declining performance on the orbital motorway and arterial road network, as shown in

Chapter Four. In particular, periods of high and very high delays will gradually spread further out from inner Sydney, occurring in areas around Macquarie Park, west along the M5 around Liverpool, on the M4 west of Parramatta, and on the M7 around the North West Growth Centre.

Figure 5.2 Population density and bus service frequency



2011 Population Density (persons/ha)

- 1-9
- 10-19
- 20-39
- 40-59
- 60 and above

Total weekday service frequency at bus stops

- 1-49
- 50-99
- 100-299
- 300-599
- 600 and above

On the rail network, performance data from March 2012 shows that the average load on all services on the Western Line in the morning peak was 130 percent of seat capacity. Passenger growth on the Western Line between 2011 and 2012 was approximately seven percent (see Chapter Four).

The Bankstown Line had the highest average load in the morning peak hour at 150 percent. The two faster services from Liverpool via Bankstown had an average load of 140 percent at Campsie.

Such congestion results in reduced public transport reliability. The Western Line, for example, has average on-time running performance in the morning peak of 63.7 percent, compared with Sydney’s average double-deck on-time performance of 79.6 percent. This level of on-time performance on the Western Line is below that of its international counterparts in terms of trains per hour of trains running on schedule.

Bus network performance will also be affected by emerging capacity constraints as the population grows in parts of Western Sydney. Figure 5.3 shows that without concerted action the corridors serving Parramatta and the South West will be under considerable pressure by 2031.

Service levels and frequency

The rail network was developed to convey commuters to the Sydney CBD during the peak. Cross-regional rail connections are fewer in number and services can operate infrequently outside of peak periods. This means that in Greater Sydney, service gaps are more pronounced at particular times of day, when coverage and frequency drops outside peak periods.

Figure 5.4 shows how service frequencies on the public transport network vary widely by time of day. Service levels outside of the peak are low, including those services connecting to outer centres such as Penrith, Campbelltown and Liverpool. This has implications for the coordination of rail and connecting bus service timetables in outer centres across the day. Where public transport frequencies outside the peak are low, demand will be affected, reinforcing car dependency.

Figure 5.3 Bus passenger volume 2011 and base case forecast for 2031

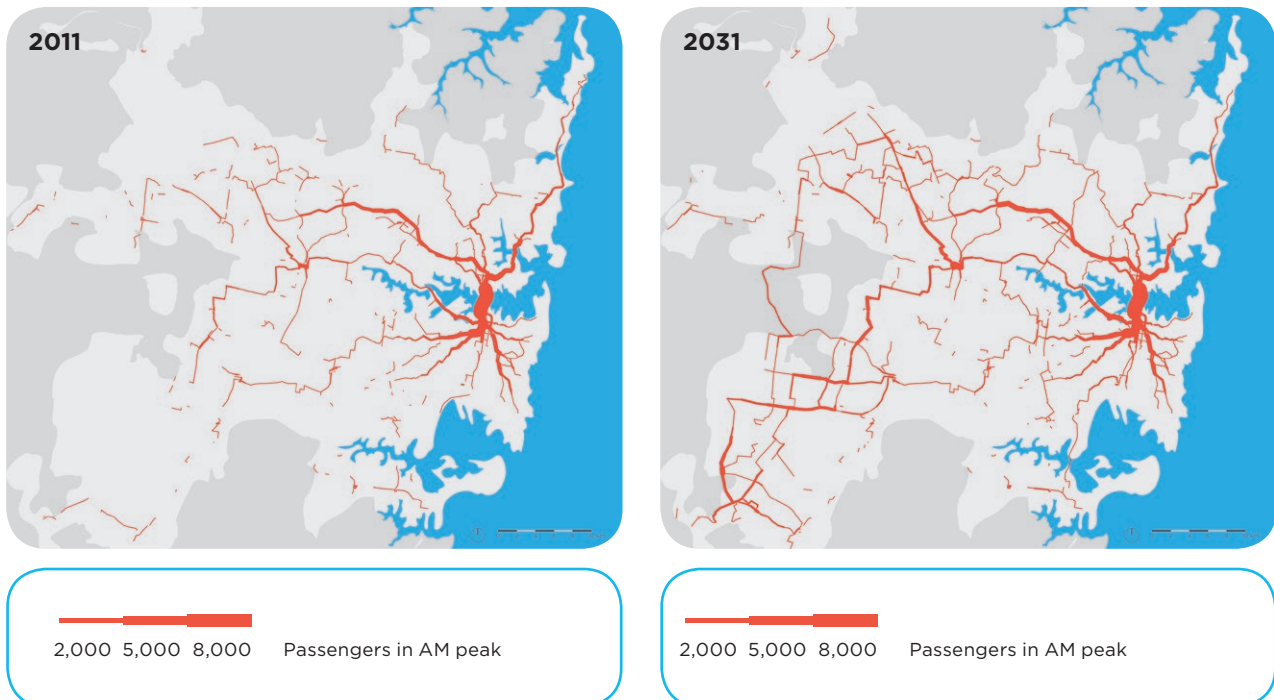
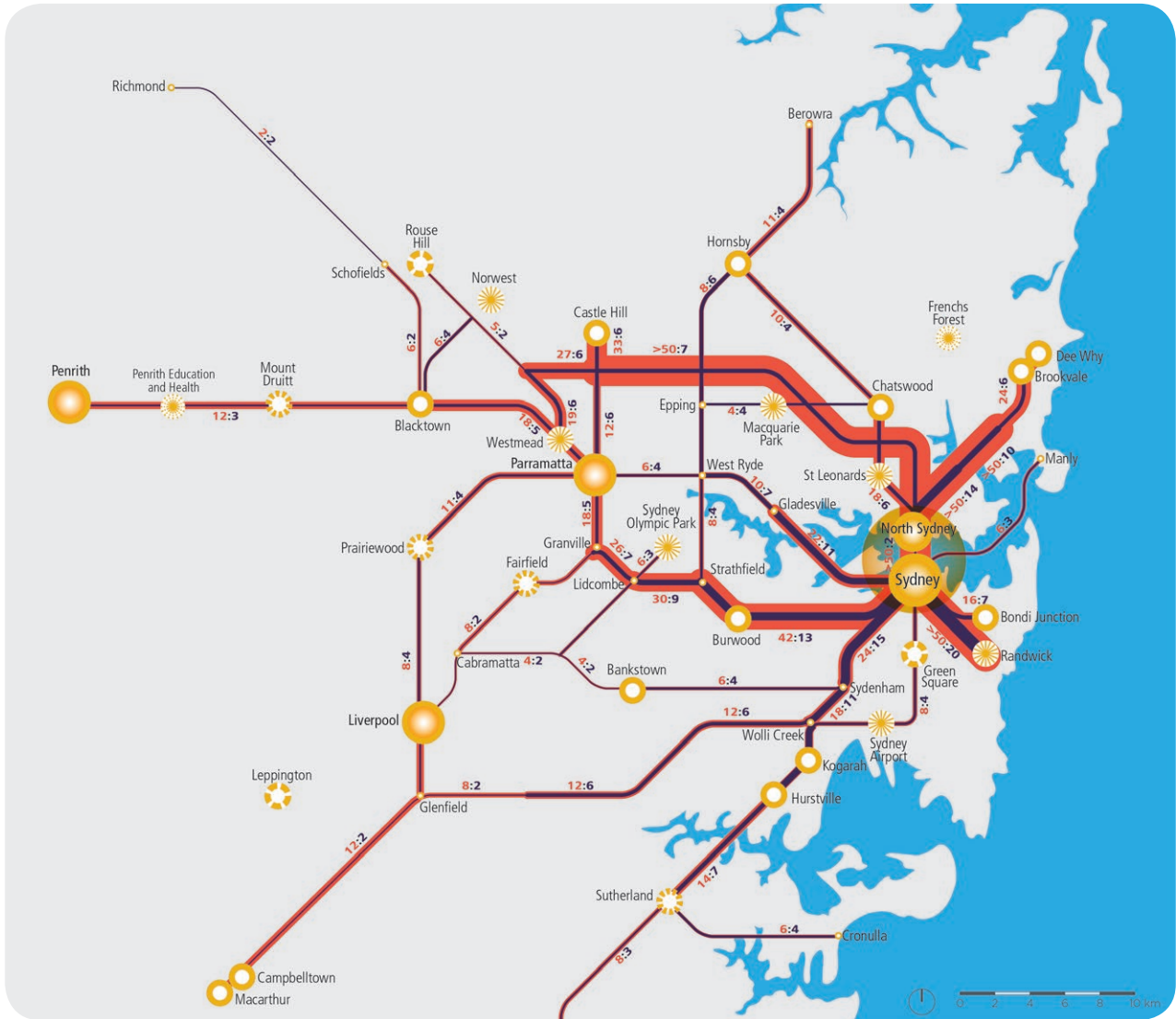


Figure 5.4 Comparison of public transport services per hour in peak and off-peak periods



<ul style="list-style-type: none"> Global Sydney Regional city Major centre 	<ul style="list-style-type: none"> Specialised precinct Potential specialised precinct Planned major centre Potential major centre Interchange/terminus 	<p>Mass and intermediate transit network peak and off-peak service frequencies</p> <ul style="list-style-type: none"> Peak service frequency, inbound (all services per hour) Off-peak service frequency, inbound (all services per hour)
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5.2 Equipping Greater Sydney for jobs growth

Greater Sydney has three regional cities, Parramatta, and the river cities of Penrith and Liverpool. Each has an established commercial centre, regional industries and clusters, and relatively more affordable land and office space. While these cities have capacity to grow, businesses often cite reduced connectivity and lower quality transport connections as a barrier to relocating to them. In addition, there are a number of specialised precincts throughout Greater Sydney, including Macquarie Park, Sydney Olympic Park and the Port Botany precinct.

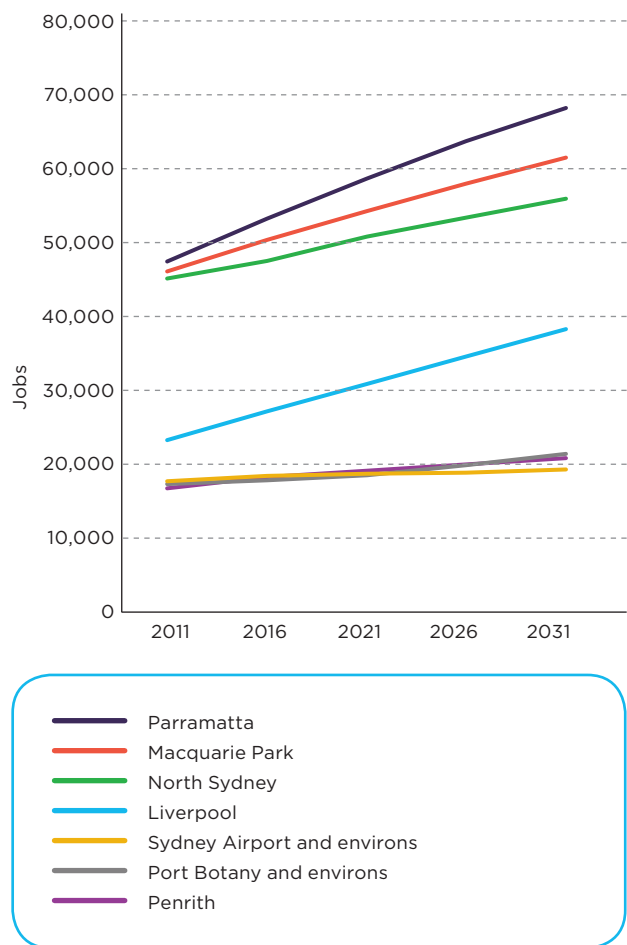
The fastest growing part of Greater Sydney is Western Sydney. Today, Western Sydney is home to 47 percent of Sydney’s residents, and 37 percent of Sydney’s jobs. Only around a quarter of these jobs are located in Western Sydney’s centres, which means Western Sydney residents on average have to commute further than people elsewhere in Sydney. This challenge is increased by lower density development in much of Western Sydney, which increases car dependency and tends towards street-based public transport that can cover wider areas.

The draft *Metropolitan Strategy for Sydney* sets out the largest employment centres in Western Sydney which are Parramatta (47,000), Penrith (16,000) and Liverpool (22,000). The evidence indicates that Western Sydney residents, who hold around 72 percent of Western Sydney jobs, want to work closer to home.

As employment increases across the metropolitan region, centres in the Global Economic Corridor of Sydney are likely to experience some capacity constraints and rent increases, leading to non-essential CBD businesses and activities seeking more cost effective locations elsewhere. Western Sydney’s centres offer an attractive, lower cost location provided the land and workforce, and business to business links are in place.

Figure 5.5 illustrates the forecast employment growth at Macquarie Park, Liverpool, Parramatta, Penrith, North Sydney, Sydney Airport and environs and Port Botany and environs.

Figure 5.5 Forecast jobs growth in Greater Sydney’s major centres and specialised precincts



This trend is an opportunity for economic centres located closer to where people live in Greater Sydney to take advantage of spillover economic activity, and to develop local industries in their own right. In transport terms, this would reduce the impacts of dispersed employment in Greater Sydney, alleviate car dependency and long commutes, and promote more liveable communities.

The remainder of this section examines Greater Sydney’s economic centres that will face growth pressures in the next 20 years and their specific transport constraints.

Parramatta

Almost two million people live in Western Sydney, which is around 47 percent of Sydney's population. Parramatta is its major economic centre, with a strong commercial core, a property and business service focus, and living and cultural opportunities as a city in its own right. The Greater Parramatta area currently has more than 100,000 jobs, with potential for further jobs growth and investment.

The Parramatta CBD is home to a range of services and retail and entertainment venues. Its wider catchment has established industrial and service clusters, including health facilities around Westmead, tertiary education facilities such as the University of Western Sydney campus at Rydalmere, and an industrial precinct at Camellia. The nearby suburbs of Granville, Harris Park and North Parramatta offer comparatively affordable living and space for small businesses.

Parramatta has well-established heavy rail and T-way connections and an extensive bus network focused on Parramatta CBD which complements the rail network. T-ways provide priority for buses through a dedicated right of way. Fifty bus routes serve Parramatta, including those using the T-ways and Metrobus services.

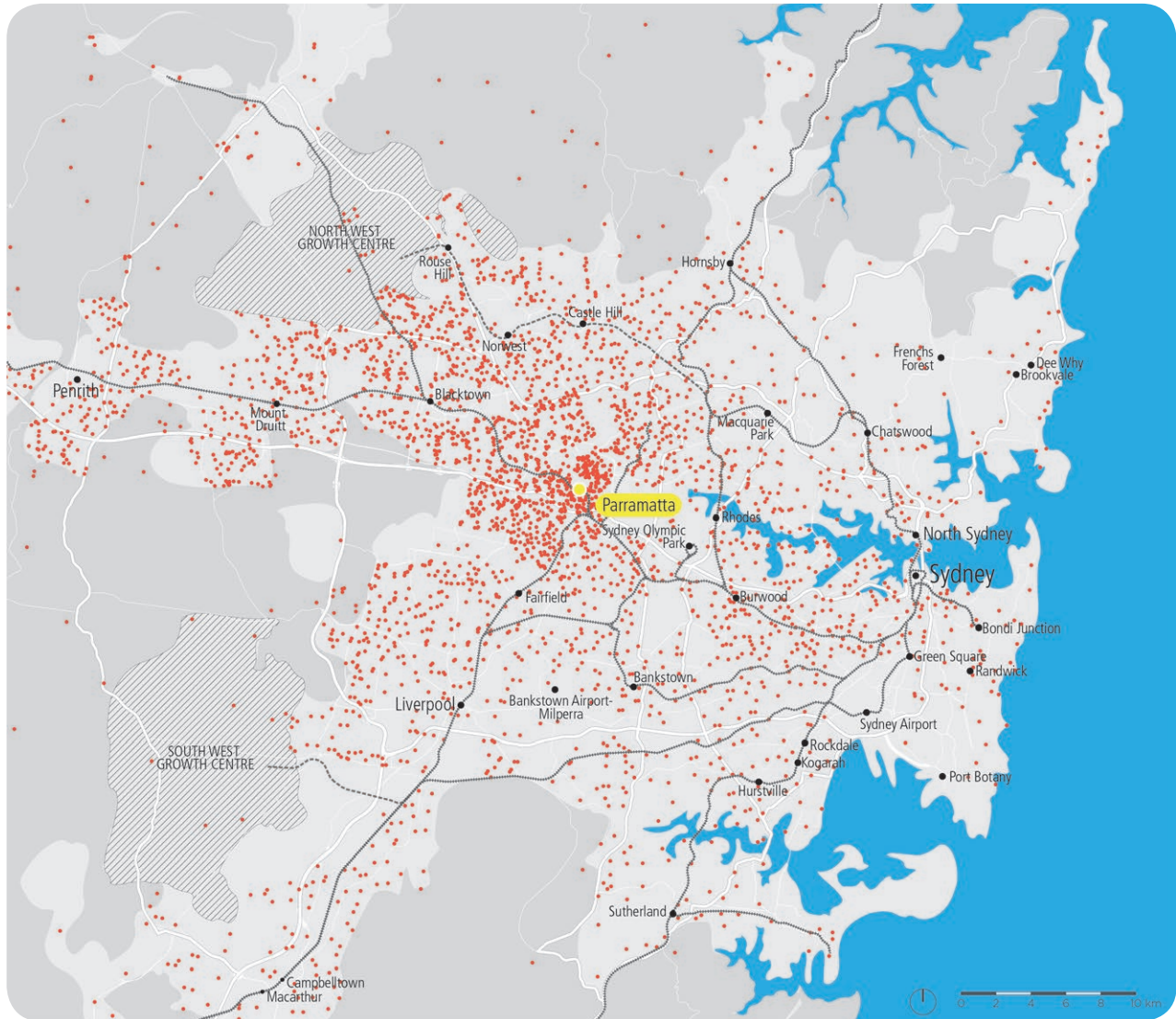
Currently, public transport is used for 15 percent of all trips to Parramatta (40 percent during the peak), which has remained relatively constant over the past five years. Each day, around 26 percent of commuters travel to and from Parramatta CBD using public transport. This is expected to grow to around 32 percent by 2031 without changes to the transport system.

Figure 5.6 shows that commuters start their journey to work in Parramatta from all around Sydney.

Several transport challenges need to be addressed over the next 20 years:

- Peak period congestion around Parramatta's city centre affects bus services and local amenity. Parramatta Station is the fourth busiest in Sydney, with 66,400 daily entries and exits. Western Line services provide strong east-west connectivity, but the line is reaching capacity in the morning peak towards the Sydney CBD. Due to the radial nature of services, buses terminate or commence from Parramatta Interchange, further adding to congestion and delays around the Parramatta CBD and exacerbating a shortage of layover space in the CBD itself. Figure 5.7 projects the change in morning peak travel times by road to the Parramatta CBD from now to 2031 without upgrades to the network.
- Local barriers to movement include Parramatta River, Parramatta Park, major arterial roads and rail lines. These barriers can make local travel indirect and increase congestion as traffic is funnelled at bridges.
- Stronger transport connections to other parts of Greater Sydney are required to provide for commuters travelling from Greater Sydney and to support business-to-business connections. In addition, more efficient connections to the west of Parramatta will be important to serve the Parramatta CBD's primary catchment area.
- Population growth to the west of Parramatta has led to increased travel demand, and additional travel on the road network has affected travel times. Travel times to Parramatta are projected to increase by up to 10 minutes for a proportion of the centre's immediate catchment, and by 20 minutes or more for areas further away from the centre. This will require development of road and transit systems to the west of Parramatta.

Figure 5.6 Parramatta's catchment for journey to work trips, 2006










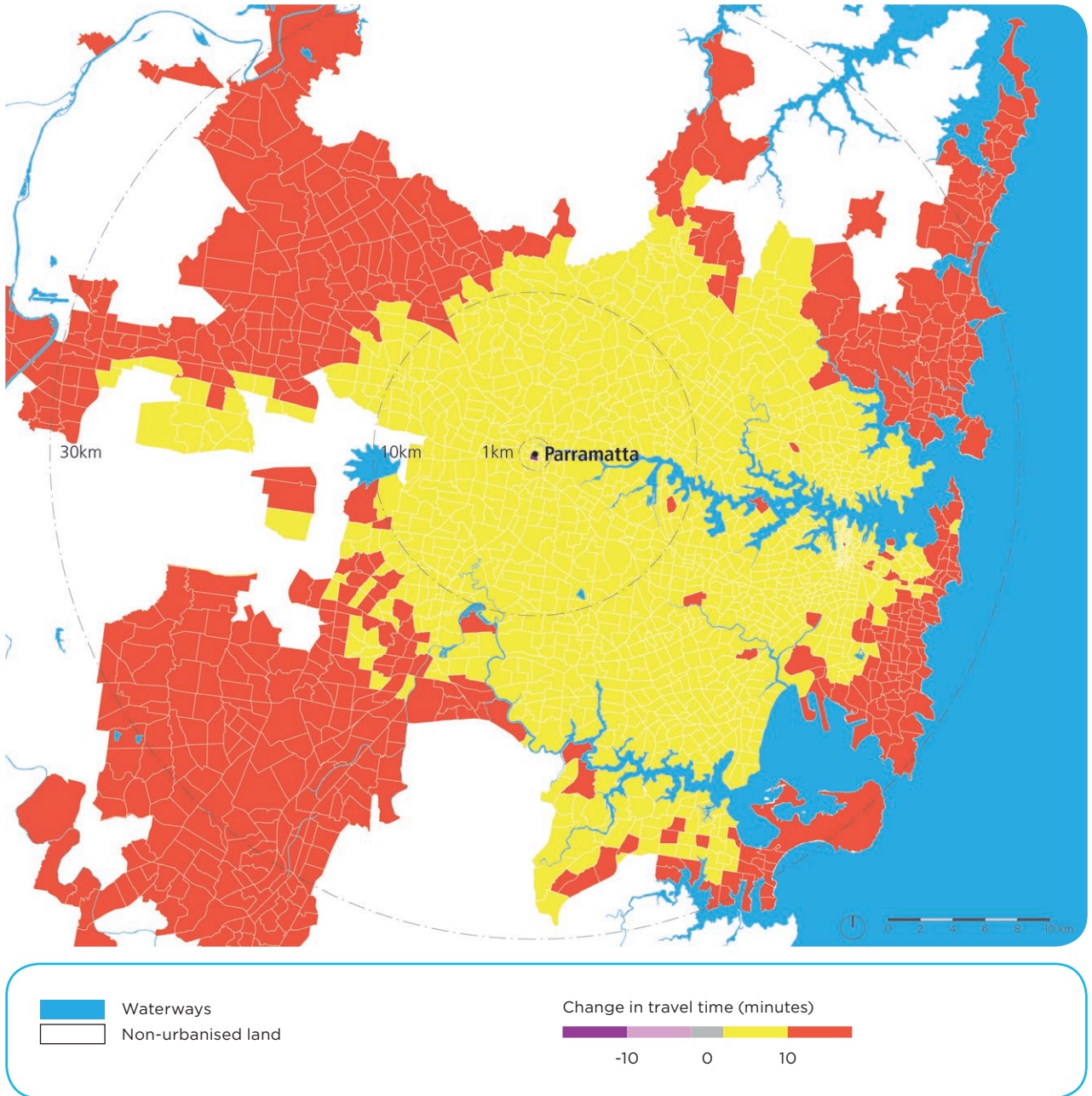
	CityRail network		National parks	 1 dot represents 10 work trips to Parramatta
	North West Rail Link and South West Rail Link		Urban area	
			Growth centres	

Figure 5.7 Change in car travel times from 2011 to 2031 - base case



Penrith

Penrith is Sydney's western gateway and has a wide catchment area, serving communities extending from outer Western Sydney to beyond the Blue Mountains. In recent years, Penrith has developed commercially and now offers retail, community and social facilities. It has capacity to grow over the long term as a jobs and services centre and as an important cultural and civic hub. Penrith is located close to the Nepean River, the Blue Mountains and Penrith Lakes, as well as key infrastructure assets such as the Nepean Hospital and a major education hub at Werrington, and urban growth areas.

Penrith is well connected by road, with the Great Western Highway (A44) providing direct connections from the Blue Mountains and local access to nearby suburbs to the east. The M4 Motorway is relatively uncongested for travel westbound from the Sydney Orbital motorway network during peak hours.

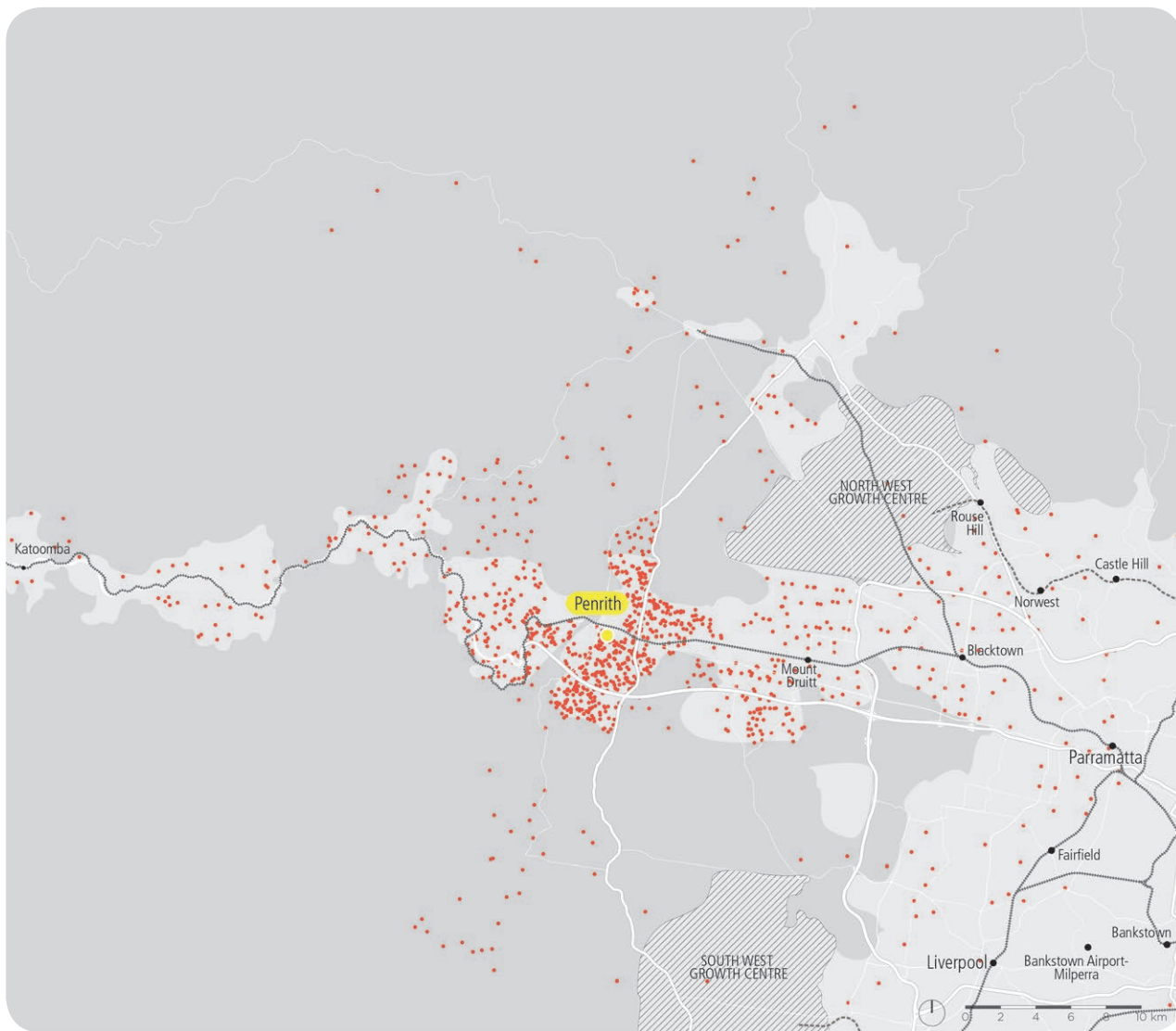
Figure 5.8 shows that most commuters start their journey to work in Penrith from a region close to the Penrith centre.






Penrith is an important station for commuters accessing the Sydney Trains network. Around 53 percent of workers who live in the Penrith local government area travel outside this area each day. Park and ride car parking is provided at Penrith Station and nearby at Emu Plains Station and St Marys Station.

Several transport challenges need to be addressed over the next 20 years:

- Local barriers need to be removed to improve local access. The Western Line is a barrier to north-south movement in the CBD and through the broader local government area, as are major arterial road routes. To the west of Penrith, the Nepean River also affects local connectivity
- By 2031, the number of people working in Penrith is expected to increase to 37,000, from 16,000 in 2011. Around 27,000 of these workers will be travelling to Penrith during the morning peak
- Improved public transport and road connections to the North West Growth Centre and South West Growth Centre will be required, as will better north-south connections
- Freight industry needs must be met throughout the region
- In 2008, 91 percent of all daily trips to Penrith CBD originated inside the North West Subregion – the same proportion as in 2003. Nearly 10,000 people travel to Penrith CBD for work every day, of whom around three-quarters drive. As noted above, the number of workers in Penrith is expected to increase significantly in the coming years. Without action, public transport mode share will remain static at around 16 percent by 2031.

Figure 5.8 Penrith's catchment for trips to the Penrith city centre



 CityRail network	 National parks	● 1 dot represents 10 work trips to Penrith
 North West Rail Link and South West Rail Link	 Urban area	
	 Growth centres	

Liverpool

Liverpool is the major city servicing South West Sydney and parts of regional NSW to Western Sydney. It is a major employment centre, transport hub and shopping district. Its riverside setting, underlying grid layout and road and rail links to Parramatta and Sydney CBD have made it an attractive residential and business location. Major urban growth areas, including the South West Growth Centre and Edmondson Park/Middleton Grange, are in the Liverpool catchment. Prestons/Yarrunga is also a major new employment area. The origin of people travelling to work in Liverpool is shown in Figure 5.9.

As a result, Liverpool's employment is expected to increase from 22,000 in 2011 to 38,000 in 2031.

The city is home to the Liverpool teaching hospital, an education-medical cluster (which accounts for 30 percent of current employment in Liverpool), Warwick Farm Racecourse and its cluster of equine industries, and recreation and cultural facilities. It is also close to the proposed Moorebank Intermodal Terminal and a co-located freight village which has the potential to generate new jobs in the transport and logistics sector and support commercial activity across South West Sydney and the broader city.

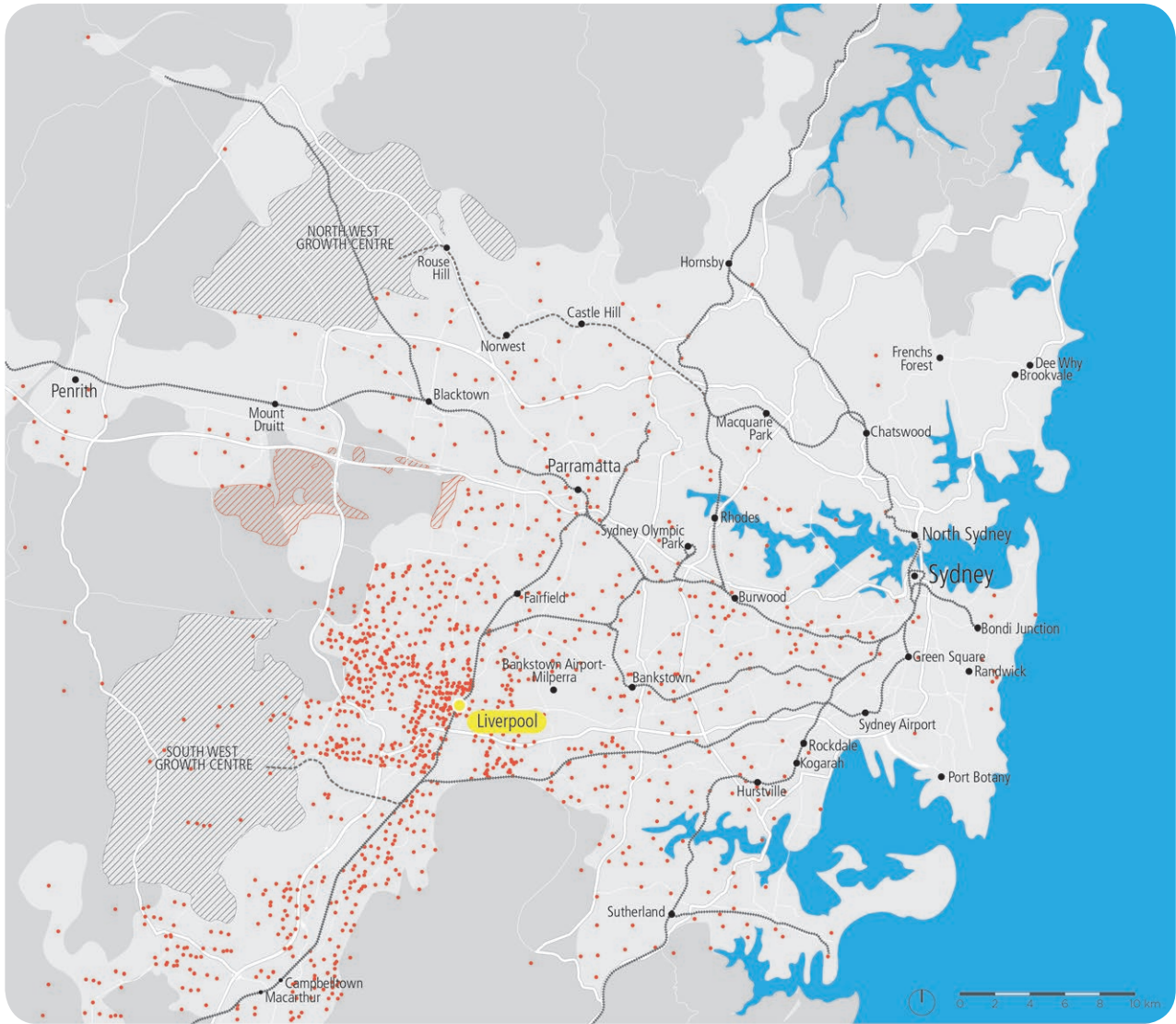
Liverpool is serviced by rail connections operating between Campbelltown and the Sydney CBD and regional bus routes, including the Liverpool-Parramatta T-way services. A motorway and arterial road network supports the city, including the M5 and the M7. These roads experience congestion at peak times. Car transport is the main mode for all trips to Liverpool city centre, accounting for 66 percent of all trips. Across the day public transport mode share is around nine percent but increases to around 15 percent during the peak periods.

Without improvements to the network, much of Liverpool's immediate catchment will experience car travel times up to 10 minutes longer than at present by 2031 and a significant proportion of other areas, including the South West Growth Centre, will have car travel time increases of greater than 20 minutes.

Several transport challenges will need to be addressed over the next 20 years:

- Local connectivity issues exist in relation to the river and rail line (similar to Parramatta and Penrith), which impact pedestrian access, safety for cyclists and increase local road congestion.
- The high level of growth forecast in South West Sydney presents particular challenges for Liverpool. Car travel dominates access to Liverpool and congestion on the road network is forecast to increase. Improved public transport connections to Parramatta and the Sydney CBD, and stronger links to nearby centres including Campbelltown and Macarthur, will encourage sustainable growth.
- Stronger local public transport links are needed between Liverpool and its catchment. In 2008, 73 percent of all daily trips to Liverpool city centre originated within the South West Subregion. The next largest proportion of trips was from the West Central Subregion, predominantly from the Fairfield and Bankstown local government areas.
- Strong population growth in South West Sydney will place pressure on existing road and bus corridors and require more efficient links to Liverpool.

Figure 5.9 Liverpool's catchment for journey to work trips, 2006



<ul style="list-style-type: none"> ———— CityRail network - - - - - North West Rail Link and South West Rail Link 	<ul style="list-style-type: none"> ■ National parks ■ Urban area ▨ Growth centres ▨ Western Sydney Employment Areas 	<ul style="list-style-type: none"> ● 1 dot represents 10 work trips to Liverpool
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5

SUSTAINING GROWTH IN GREATER SYDNEY

Port Botany and Sydney Airport precinct

The Port Botany and Sydney Airport precinct is home to the State's major container terminal and only international airport. It is Sydney's second largest job centre and home to heavy industry, manufacturing, major distribution centres and residential communities.

Many of the challenges facing the freight industry, discussed in Chapter Seven, are felt most acutely in this precinct.

Many transport challenges will need to be addressed over the next 20 years:

- The precinct is served by four of Sydney's five most congested roads, the Eastern Distributor, M5 East Motorway, Western Motorway (M4), General Holmes Drive and Southern Cross Drive. Congestion lasts 11 hours or more each day on all four routes. This congestion is the product of multiple traffic generating sites in the precinct that are close to each other. Other key contributors are growing passenger traffic on key arterials in the precinct and private vehicle use, with less than 10 percent of road trips on the M5 East, for example, being freight related. These circumstances will require an integrated approach to managing growing road demand.
- 20 percent of commuters living in the Botany Bay area use public transport to travel to work. There is growing urban and industrial density in the Port Botany and Sydney Airport precinct and its connecting east-west corridors. An extra 480,000 people (equal to 377,000 commuters) are expected to live in this area within the next 20 years.
- Only 15 percent of people travel to and from Sydney Airport by rail or bus, compared with more than 40 percent of people who travel to London Heathrow. The public transport service offered to Sydney Airport remains limited, which reflects restrictions in the Airport Link contract. There is only one bus route to Sydney

Airport, the 400 bus route, which does not travel to the CBD. There is also one passenger rail line. Several other bus services pass near Sydney Airport but do not stop, for example, the 410, M20 and M30. This means that for the majority of travellers to and from Sydney Airport, public transport requires multiple connections and is inconvenient.

The passenger rail service charges a station access fee, resulting in a premium ticket price for passenger rail to Sydney Airport that may encourage substitution with car or taxi travel. For a 6.7 kilometre train trip to the domestic airport from Central Station, a passenger pays \$15 (single) or \$23 (return).

- Sydney Airport is the nation's busiest airport. In the next 20 years, passenger numbers are set to more than double which will result in increasing pressure on the surrounding transport network. Sydney Airport experiences a number of regulatory constraints that affect its capacity, including a flight cap of 80 movements per hour, operational curfews, fixed access arrangements for regional airlines and constraints on extending the site.

While airport capacity is subject to Commonwealth regulations and to Australian Government approval of master plans submitted by Sydney Airports Corporation Limited (SACL) every five years, the NSW Government can support transport access by road, footpath, cycleway and public transport. The NSW Government is supporting SACL in preparing the Ground Travel Plan to improve public transport usage to the Airport.

Our actions in response to these challenges can be found in Section 5.7.2, including the development of an improvement plan for Port Botany and Sydney Airport to address capacity constraints associated with passenger and freight transport.

Macquarie Park

Macquarie Park forms a key part of Sydney's Global Economic Corridor and is rapidly growing in importance. It attracts many local and international companies from high-tech fields including electronic, scientific, computing, medical, communication, pharmaceutical and business supply solutions. Good access to facilities and services, and an attractive environment are attractions for many corporations.

Employment at Macquarie Park is expected to increase from 45,000 jobs in 2011 to 61,000 within 20 years. There is a growing residential population focused on the eastern and western ends of the corridor.

Macquarie University, located at the western end of the corridor, has over 37,000 students and 2,700 staff. The University has initiated a growth program with additional academic space, a business and research park, a private hospital and student accommodation.

Macquarie Park is bounded to the north and east by the M2 Motorway and the Lane Cove National Park. To the south, Epping Road acts as a barrier separating the business park from the residential areas of Ryde LGA. The nature of development limits road access to Macquarie Park, constraining bus and vehicle movement. It also impacts the attractiveness of walking and cycling.

The Epping-Chatswood Rail Link, opened in 2009, provided three new stations in the area and rail services to Epping, Chatswood and the Sydney CBD. The completion of the North West Rail Link will see Macquarie Park directly connected to North West Sydney.

While much of Macquarie Park's success as a business location can historically be linked to its road access and connectivity to the Sydney CBD and Sydney Airport, there is a need to recognise the limited capacity of the network and prioritise public transport use to support future growth.

The transport challenges facing Macquarie Park over the next 20 years include:

- The growth of Macquarie Park has put pressure on the arterial and local road network. Congestion on surrounding roads and within Macquarie Park affects bus services, reducing reliability and increasing journey times. Facilitating bus priority to deliver improved reliability and reduce travel times, particularly during peak periods, encourage greater take up of public transport.
- Around 85 percent of commuters travel to and from Macquarie Park by car. This level of car use is supported by historically generous parking rates and a low provision of public transport. Recent public transport service improvements, including the opening of the Epping - Chatswood Rail Link have increased public transport use but car travel remains dominant.
- Heavily trafficked arterial roads create barriers to movement, funnelling traffic and making walking and cycling routes unpleasant and circuitous. Within Macquarie Park, heavy traffic, a lack of well located road crossings and the local topography can present an unattractive pedestrian environment.
- Improved connectivity to the Greater Metropolitan Area is required, particularly south to Sydney Olympic Park and west to Parramatta, to support business-to-business connections. Improved links to Western and North West Sydney will ensure Macquarie Park maintains access to a skilled workforce.

5.3 Connecting new growth centres

The North West and South West Growth Centres are the focus of planned greenfield development in Greater Sydney in coming decades.

Together, these centres will be home to some 500,000 residents. This represents a considerable challenge in terms of planning for quality transport connections to employment and services.

In coming decades, we will need to ensure quality connections for the Growth Centres and other areas:

- The North West Growth Centre covers more than 10,000 hectares and will accommodate 70,000 new dwellings and 200,000 people.
- The South West Growth Centre covers more than 17,000 hectares and will accommodate 110,000 new dwellings and 300,000 people.
- The Western Sydney Employment Area comprises 2,200 hectares and has an eventual capacity of 40,000 jobs. The area has development potential for industrial land uses such as major warehousing, distribution, freight transport, industry, high technology and research facilities.
- Norwest already provides around 15,000 jobs and Castle Hill a further 9,000 jobs.

These new growth areas will require new transport networks and the upgrading of existing links and services as demand develops. The South West Rail Link and North West Rail Link will provide important access to the broader rail network and will need to be integrated with the bus network to optimise new rail capacity.

In the North West, bus network development will continue to be important as buses provide more extensive coverage compared to rail. In addition, once the North West Rail Link is operational, an extensive bus network serving the North West Growth Centre will extend the rail network catchment, provide public transport access to stations and ensure integrated, flexible public transport coverage for newly developed areas. Integrated planning of bus priority measures with new road infrastructure in growth areas will also be essential for providing competitive bus services and reducing car dependency over the longer term.

In the South West and around the Werrington Enterprise Living and Learning Precinct, most of the existing roads were not built to support the level of demand now anticipated.

5.4 Protecting critical strategic and growth corridors

As Greater Sydney’s major centres expand, transport demand will grow. The local economy will depend on the successful development of road and rail links to employment centres, national networks and international gateways.

The identification and protection of existing strategic corridors and future growth corridors should be a focus for precinct planning, long term funding requirements and network development to manage congestion and protect future transport development.

In the past, land use and transport planning have been poorly coordinated, leading to dispersed population and employment patterns, car dependency and inadequate infrastructure.

5.4.1 Greater Sydney strategic corridors

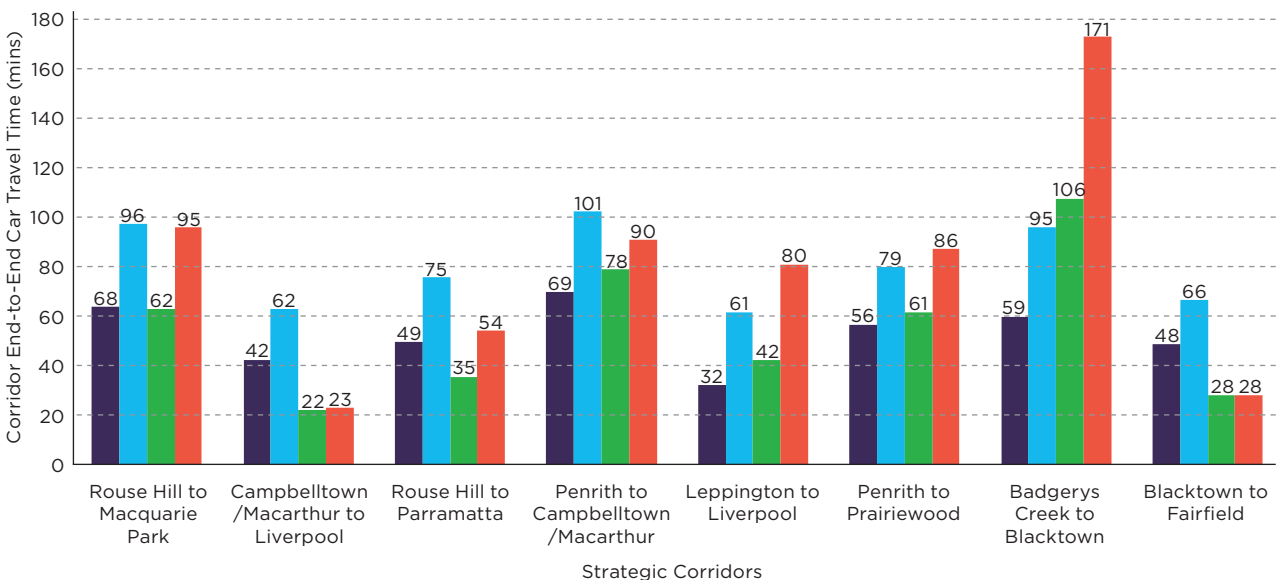
Some strategic corridors are already experiencing capacity constraints, including rail and road corridors into the three Western Sydney regional cities. The Western, South and East Hills Lines are limited by a lack of available line capacity in the Sydney CBD, with the Western Line between

Parramatta and the Sydney CBD already above available seated capacity in the morning peak. Peak travel times for constrained Western Sydney corridors are shown in Figure 5.10.

Our work to identify Sydney’s 46 strategic transport corridors (see Chapter Four) has identified the following:

- Ten corridors provide bus and rail access to Parramatta, including with the Liverpool-Parramatta and North West T-ways.
- Four corridors provide access to Liverpool and provide links to the rest of Sydney, including Parramatta, the Eastern Suburbs, the Global Economic Corridor, Campbelltown and residential areas.
- Corridor development will be needed to support the growth of Penrith. The corridor from Penrith to Blacktown connects Penrith with the rest of Sydney and includes the Western Line and M4. Other corridors will connect Penrith to other parts of Western Sydney, including to Rouse Hill, Campbelltown and Prairiewood via the Western Sydney Employment Area and Wetherill Park.

Figure 5.10 Car and public transport am peak travel times for ‘constrained’ corridors in Western Sydney.



- Car - 2011 Base
- Public transport - 2011 Base
- Car - 2031 'do nothing'
- Public transport - 2031 'do nothing'

5.4.2 Greater Sydney growth corridors

Early protection of future transport corridors will ensure that the right infrastructure can be developed at the right time for Western Sydney. It will provide greater certainty that infrastructure will be delivered in the future and also serve as an important guide to precinct planning.

Connecting the North West and South West Growth Centres to established and emerging employment centres is important in the medium and longer term. These connecting corridors include:

- Rouse Hill/Norwest/Marsden Park to the Western Sydney Employment Area, Liverpool and Fairfield
- North West Growth Centre to Penrith then to South West Centre and Campbelltown/Macarthur
- Penrith to Western Sydney Employment Area
- Liverpool to Port Botany.

In the long term, planning for increased demand on emerging corridors will be critical (see Figure 5.11).

Figure 5.11 Western Sydney corridors facing increased demand



Global Sydney	Specialised precinct	Corridors facing increased demand
Regional city	Potential specialised precinct	Key transport corridors in Western Sydney
Major centre	Planned major centre	Growth centres
	Potential major centre	

Taking action in Greater Sydney

20 YEAR VISION

In the next 20 years, the Long Term Transport Master Plan will support the development of Greater Sydney as a network of centres with strong connectivity between growth centres and economic centres such as Parramatta, Penrith, Liverpool, Macquarie Park, the Port Botany and Sydney Airport precinct and North Sydney. The priority will be to develop a more integrated transport system across Greater Sydney to attract businesses and investment, improve liveability and support efficient freight movements.

As Greater Sydney grows, we will use the existing transport network more effectively. Where we do extend the network, develop transport infrastructure with long term and sustainable objectives in mind. Transport infrastructure in Greater Sydney will be a major factor in the city's economic development and productivity beyond the life of this Long Term Transport Master Plan.

Our actions for Greater Sydney are directed at all elements of the transport network in an integrated package of measures designed to achieve better overall transport outcomes.

Each of the major corridors identified in Greater Sydney has been examined and analysed for the investments needed in road and rail, for both passenger and freight, and for the preservation and protection of important corridors for the future.

The *Sydney's Rail Future* strategy expands the heavy rail network to deal with the substantial growth in North West and South West Sydney, while the second Harbour Crossing has flow-on impacts that expand capacity for all parts of Greater Sydney.

The bus network will support heavy rail by servicing the areas that heavy rail does not reach, providing links on important corridors between urban centres. The bus system will expand to meet the demands of growth in Greater Sydney, with more buses, new services to growth areas, more

rapid services through greater priority on roads where demand requires it and through the pinch point strategy.

The road network will continue to be critical in the future. We will relieve road congestion on important corridors through network expansion, including the Motorway Network, and through a pinch point strategy targeted at specific corridors to improve bus services and improve motor vehicle and heavy vehicle travel times.

At the more localised level within Greater Sydney's major centres, our actions will provide multi-modal solutions to specific centres including Parramatta, Penrith, Liverpool and the Port Botany precinct.

The continued growth of Greater Sydney means we must plan and prepare for the long term by protecting and preserving our most important transport corridors, both road and rail. These corridors are necessary for our future transport network.

Our actions in relation to Greater Sydney will improve public transport, cut road congestion, enhance access to employment centres, develop sustainable infrastructure for greenfield growth areas and protect strategic and future growth corridors.

5.5 Improving public transport

Planning for public transport relies on a hierarchy of centres in Greater Sydney supported by a network of mass, intermediate and local services. In the long term, we will need a network with increased connectivity between centres, more efficient use of infrastructure and more seamless interchange.

5.5.1 Greater Sydney's Rail Future

Sydney's Rail Future will grow and improve the rail network serving Greater Sydney. In addition, new rolling stock, station upgrades and advanced signalling will provide extra capacity on the busiest lines in Greater Sydney. This will structurally change how the rail, bus and road networks interact across Greater Sydney.

Action Increase train capacity on the Western Line

The Western Line will enjoy reduced congestion and overcrowding on trains once the North West Rail Link is built. The first stage of works will enable reliable operation of 20 trains per hour for the busiest of the three Western Lines. This represents a potential additional capacity of 3,600 passengers per hour. In the long term, the second Harbour Crossing, CBD line and better use of all three lines into the city from the west will increase service capacity to the CBD by 35 percent – an extra 14 trains per hour.

Improvements on the line will allow more express trains per hour from Blacktown and Penrith to the CBD, with all-day frequent and reliable Cumberland Line services, providing better connections from Parramatta to Liverpool and the South West.

Action Increase train capacity on the Bankstown Line

Bankstown Line customers will benefit from new peak services from 2013, with a new turnback at Lidcombe improving separation with the Western Line and better reliability on both the Bankstown and Western Lines. The Bankstown Line will be converted for mass transit trains, which will allow faster services and a doubling of services.

Action New rail timetables

The existing train timetables will be rewritten for the Airport and East Hills, South, Inner West and Bankstown Lines to integrate the South West Rail Link and to improve the performance of Greater Sydney's rail network. This will reduce its operational complexity, improve reliability and spacing of services and ensure more user-friendly timetables that integrate with bus connections.

Action Build or upgrade commuter car parks interchanges in Greater Sydney

New car parks as park and ride will extend the existing rail catchment beyond the Transit System through the Transport Access Program by providing car access to the rail network.

Interchange upgrades and car parks for park and ride at varying levels of development at Canley Vale, Fairfield, Granville, Padstow, Gordon, Lindfield, Sutherland and Parramatta. Targeted works at Penrith, Rooty Hill and Strathfield will also improve bus congestion around those interchanges.

In addition, Transport Access Program upgrades to provide easier access for customers are being developed for Oatley, Clyde and Ingleburn. With minor works at Kingswood and Riverstone.

5.5.2 Greater Sydney's bus priority network

Short term

Action Develop Strategic Bus Corridors to provide rapid and more frequent services

Sydney's strategic bus network program will reduce delays for buses and improve travel time reliability for public transport users during weekday peak periods.

The strategic bus network supports access to Sydney's regional centres and new growth areas with work on identified Strategic Bus Corridors as the focus for customer experience improvements, increased service frequencies and investment in bus priority roadworks to improve the speed and flow of buses.

Sydney's Bus Future will define directions for Sydney's strategic bus network program to ensure investment in infrastructure and services aligns with the needs of Sydney's bus customers in the short, medium and long term towards 2031.

Studies have identified a range of bus corridors for bus priority investment. These corridors include the most significant routes in Sydney's strategic bus network, as shown in Figure 5.12:

- Mona Vale to Sydney CBD
- Bondi Beach to Sydney CBD
- Parramatta to Sydney CBD via Victoria Road
- Burwood to Sydney CBD via Parramatta Road
- Maroubra Junction to Sydney CBD
- Hurstville to Macquarie Park via Burwood
- Rouse Hill to Hurstville via Parramatta and Bankstown
- Castle Hill to Liverpool via Parramatta
- Hornsby to Blacktown via Castle Hill
- Parramatta to Macquarie Park
- Rouse Hill to Blacktown via Marsden Park
- Liverpool to Campbelltown via Leppington.

Studies have also identified the following major cross-metropolitan routes for a more limited scope of bus priority investigations:

- Randwick to Sydney CBD
- Bondi Junction to Burwood via Eastgardens
- Bondi Junction to Miranda via Sydney Airport and Eastgardens
- Bondi Junction to Burwood via Green Square and Sydenham
- Chatswood to Sydney Airport
- Lane Cove to Eastgardens
- Hurstville to Sydney CBD via Newtown
- Belrose to Sydney CBD
- Chatswood to Manly via Dee Why

- Burwood to Chatswood via Drummoyne
- Miranda to Hurstville via Sylvania
- Hurstville to Burwood
- Liverpool to Burwood via Bankstown
- Bankstown to Blacktown via Fairfield and Wetherill Park
- Penrith to Rouse Hill via Marsden Park
- Marsden Park to Prairiewood
- Leppington to Camden via Oran Park.

Additional long term future options for bus corridor investment include Mount Druitt to Parramatta via the Western Sydney Employment Area, and Blacktown to Rouse Hill via Marsden Park.

Medium to long term

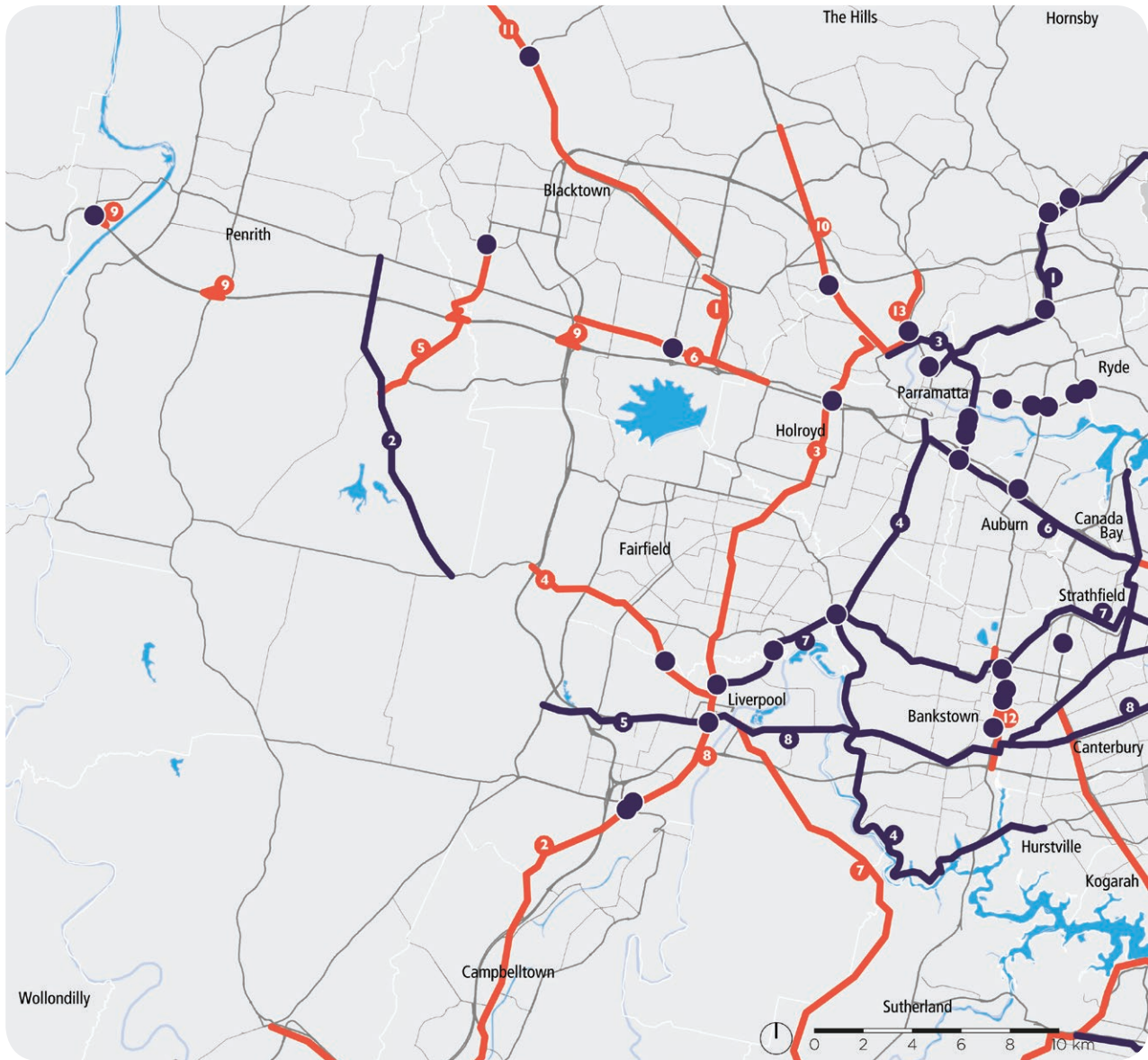
Action Increase bus priority measures and investigate Bus Rapid Transit along priority corridors






Sydney's Bus Future will define the strategic bus network for the Sydney Metropolitan Area, and the different levels of service to be provided by the routes making up Sydney's total bus system. The most important bus corridors will provide the backbone for a connected public transport system, meeting high-demand, centre-to-centre travel needs with frequent, all-day services. To maximise service reliability and congestion relief these strategic corridors will be targeted with the highest investment in operating priority, using T-ways, Bus Rapid Transit (BRT) or arterial roads with significant bus priority measures. Planning and delivery of bus priority and full BRT solutions will be programmed over the short, medium and long term.

Action Explore mass transit options for the Eastern Suburbs corridor through to Malabar

In addition to the NSW Government's consideration of a light rail solution from the CBD to University of NSW, further investigation of mass transit options to Malabar will be undertaken to support expected densification and urban renewal in the South Randwick corridor.

Figure 5.12 Strategic Bus Corridors and pinch point management in Greater Sydney



 Potential sites for treatment	 State road
 New corridor for investigation	 Regional road
 Pinch point corridor	

<p>Pinch point corridor</p> <ul style="list-style-type: none"> 1 Blacktown Road: Prospect to Blacktown 2 Campbelltown Road: Campbelltown to The Cross Roads 3 Cumberland Highway: Warwick Farm to Northmead 4 Elizabeth Drive: Cecil Hills to Liverpool 5 Erskine Park Road - Roper Road - Carlisle Avenue: Orchard Hills to Mt Druitt 6 Great Western Highway: Eastern Creek to Wentworthville 7 Heathcote Road: Lucas Heights to Moorebank 8 Hume Highway: The Cross Roads to Liverpool (M31) 9 M4 Motorway (Interchanges Only) 10 Old Windsor Road: Constitution Hill to Glenwood 11 Richmond Road - Blacktown Road: Blacktown to Richmond 12 Fairford Road - Stacey Street - Rookwood Road: Padstow to Yagoona 13 Windsor Road - Northmead to Baulkham Hills 	<p>New corridors for investigation</p> <ul style="list-style-type: none"> 1 Pennant Hills Road: North Parramatta to Wahroonga 2 Mamre Road: St Marys to Kemps Creek 3 James Ruse Drive: Clyde to Northmead 4 Henry Lawson Drive: Peakhurst to Parramatta 5 Hoxton Park Road: Hoxton Park to Liverpool 6 Parramatta Road: Granville to Strathfield 7 Hume Highway: Ashfield to Liverpool (M31) 8 Canterbury Road: Newtown to Liverpool
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5.6 Congestion and pinch point management

Action Upgrade motorway infrastructure and expand the M5 West

The M5 West widening project will expand the South West Motorway from two to three lanes in each direction from Camden Valley Way to King Georges Road to support the planned residential and employment growth in South West Sydney. Construction has commenced and will take approximately two and a half years to complete. The M5 transport corridor is the main passenger, commercial and freight route between Sydney Airport, Port Botany and South West Sydney, and links key areas across Sydney.

Other work will expand the existing motorway network, starting with the M5 West widening, and over the long term, completing the missing links on the network. This will have important benefits for Greater Sydney including reduced travel times, enhanced road freight productivity, improved safety and reduce conflicts between road users, including freight vehicles, cyclists and pedestrians. The 33 kilometre WestConnex scheme in the M4 and M5 corridors is the immediate priority for addressing missing links in the Sydney Motorway Network.

Action Implement managed motorway technology on the M4

The NSW Managed Motorways Program will better manage high traffic and freight volumes to reduce congestion and crashes, using technology on the M4 Western Motorway to improve traffic flows and reduce emissions. Real-time information can be provided to traffic control centres such as the Transport Management Centre and to customers.

Traffic management and control systems and infrastructure include intelligent vehicle monitoring, adaptive traffic control, incident management and traveller information systems for both the motorway and surrounding arterial road system to ensure integrated operations. In the long term, smart technologies will be considered for other motorways following evaluation of the M4 trial program.

Action Deliver targeted infrastructure improvements and technology solutions to manage congestion

We will implement a new approach to managing congestion in centres, more efficiently managing road space and priority between different road user groups, and implementing clearways, real-time traffic management, incident detection and response, and targeted pinch point relief where required.

Action Implement a program to address pinch points across Greater Sydney

We will invest in targeted measures to improve congestion and road safety and to respond to growing pressure on the road network. Where these corridors are also major bus routes, measures will include targeted bus priority infrastructure. Studies have been completed to inform priorities for targeted improvements along the following corridors:

- Blacktown Road from Prospect to Blacktown
- Campbelltown Road from Campbelltown to the Cross Roads
- Cumberland Highway (A28) from Warwick Farm to Northmead
- Elizabeth Drive from Cecil Hills to Liverpool
- Erskine Park Road – Roper Road from Carlisle Avenue Orchard Hills to Mount Druitt
- Great Western Highway (A44) from Eastern Creek to Wentworthville
- Heathcote Road from Lucas Heights to Moorebank
- Hume Highway (M31) from the Cross Roads to Liverpool
- M4 Motorway (interchanges only)
- Old Windsor Road from Constitution Hill to Glenwood
- Richmond Road – Blacktown Road from Blacktown to Richmond
- Fairford Road – Stacey Street – Rookwood Road from Padstow to Yagoona
- Windsor Road from Northmead to Baulkham Hills.

5.7 Supporting Greater Sydney's employment centres

Action Continue to identify and address pinch points as growth occurs

We will continue to identify and alleviate other congestion hot spots as they emerge. Future corridors to be investigated for congestion management measures include:

- Pennant Hills Road from North Parramatta to Wahroonga
- Mamre Road from St Marys to Kemps Creek
- James Ruse Drive from Clyde to Northmead
- Henry Lawson Drive from Peakhurst to Parramatta
- Hoxton Park Road from Hoxton Park to Liverpool
- Parramatta Road from Granville to Strathfield
- Hume Highway (M31) from Ashfield to Liverpool
- Canterbury Road from Newtown to Liverpool.

Action Continue to build connected cycling networks in Greater Sydney

We will improve cycling connections in and around Greater Sydney's major centres.

As most bicycle trips begin and end on a local road, we are matching funding for NSW local councils to deliver improved bicycle networks, starting with the following projects:

- Milsons Point to Lane Cove cycleway
- Design and development of the Nepean River Green Bridge between Penrith and Emu Plains
- Completion of the M4 Regional cycleway between Wentworthville and Parramatta.

In addition, development is underway for the following cycling infrastructure projects:

- Construction of a cycleway from North Ryde to Macquarie University (Waterloo Road, Macquarie Park)
- Design and development of a cycleway from Lidcombe to Strathfield (Rookwood Cemetery)
- Construction of a cycleway from Prospect to Blacktown
- Construction of a cycleway bridge on Epping Road at Marsfield.

We will develop better connections and improved service levels to the Sydney CBD and Global Economic Corridor from Greater Sydney's major centres to encourage more businesses to locate in Greater Sydney. This will generate local jobs and reduce the need for people to travel long distances to work.

Sydney's three regional cities, Parramatta, Liverpool and Penrith, are the focal points of their regions. As well as being employment centres, they offer essential services, shops, entertainment venues and cultural facilities.

Supporting these centres with adequate transport connections and capacity will attract businesses and jobs. With more of us choosing to live in or near these centres, good public transport services will support for higher density development, reducing our reliance on car travel and relieving pressure on Global Sydney and the Global Economic Corridor. Integrated rail and bus solutions are required, with buses helping to develop emerging transport corridors over time.

5.7.1 Achieving Parramatta's potential

Over the next 20 years, Parramatta will continue to develop as a prime commercial and cultural centre. To realise its potential, Parramatta will require improved public transport links and travel times to the Global Economic Corridor, and better connections within other areas in Western Sydney that support Parramatta's role as the economic centre of Western Sydney.

Short term

The following actions will be implemented to lift the public transportation mode share in Parramatta to achieve the 2031 target:

Action Target bus priority enhancements within 30 minutes travel time of Parramatta

Targeted bus priority enhancements on the road network, pinch point management and the new 2013 rail timetable will extend the catchment of public transport users living within 30 minutes by public transport of Parramatta. These improvements will support more reliable public transport to and from Parramatta, improve congestion and provide faster travel times on existing public transport routes.

Bus priority infrastructure is proposed between Parramatta and the Sydney CBD and Parramatta and Castle Hill providing continuity of bus priority wherever possible along Victoria Road and Windsor Road. This is in addition to the strategic bus corridors already identified for Western Sydney.

Action Plan a major upgrade of the Parramatta interchange

Initial planning for a major upgrade of transport facilities at the Parramatta Interchange will enable increased layover capacity for current and future Parramatta bus services and help create a more attractive and accessible precinct. This project will be one of five major centre interchange projects recommended for further planning and development across Sydney. The upgrade will improve local amenity and create a more attractive precinct around the interchange.

Action Collaborate with Parramatta City Council on city centre improvements and light rail

We will work with Parramatta City Council to enhance the Parramatta CBD and address the oversupply of long-stay parking, which increases congestion in the Parramatta CBD. There are approximately 25,000 car parking spaces in the city centre of which around 14,000 are private parking spaces for residents or businesses. The remainder are public spaces.

Options include better managing demand for access to the Parramatta CBD by private vehicles and improving the pedestrian amenity of the CBD.

We will work with Parramatta City Council as it progresses plans to develop public transport proposals focused on the Parramatta CBD, including a long term light rail proposal that would connect with Castle Hill, Chester Hill, Bankstown, Blacktown and Carlingford. Upgrades to congested bus corridors into Parramatta CBD will need to align with plans to build up public transport patronage.

Action Parramatta cycleway

Improved connections will be developed for pedestrians and cyclists moving through the Parramatta CBD. The Parramatta River cycleway and connections to Sydney Olympic Park will be progressed, and better connections developed through or around Cumberland Hospital to Westmead.

In addition to initiatives set out in Section 5.6, a more comprehensive regional bike network will be developed with the following projects:

- Design, development and construction of a cycleway along the northern side of Parramatta River and eastern side of Subiaco Creek, from 300 metres west of Pike Street to Subiaco Creek
- Construction of a cycleway and other access improvements at Parramatta Park
- Design and development of a cycleway along the northern side of Parramatta River from Charles Street Wharf to Macarthur Street, Parramatta
- Design, development and construction of a cycleway along the northern side of Parramatta River between Thackeray Street and Park Road, Rydalmere.

Medium to longer term

Action Strengthen public transport links between Parramatta, the Sydney CBD, North Sydney and Macquarie Park

We will undertake planning and investment to deliver fast and reliable connections between Parramatta and the Global Economic Corridor to encourage and support businesses locating in Parramatta. Options will focus on service levels along the 10 strategic transport corridors that access Parramatta by public transport, and will also consider potential for new cross-regional bus services and options for the Carlingford Line, which currently offers a poor transport service option and places operational constraints on the Western Line.

To boost integrated connections across the wider Parramatta region, we will consider options to improve efficient links between Parramatta and Macquarie Park as demand develops. Better links will be developed to facilities including high schools, two major hospitals at Westmead and the Cumberland Hospital and heritage precinct.

Action Improve frequency of public transport services to Parramatta CBD

Investment and service planning will improve the frequency of services connecting Parramatta CBD to Westmead, Rydalmere, Camellia, Granville and Merrylands. This will support seamless interchange and improve the relative competitiveness of public transport compared to car travel.

Action Improve road connections to and around Parramatta Road

We will consider further road corridor improvements to address pinch points and target road access to and around Parramatta, including:

- Cumberland Highway (A28): Warwick Farm to Northmead
- Pennant Hills Road: North Parramatta to Wahroonga
- James Ruse Drive: Clyde to Northmead
- Parramatta Road: Granville to Strathfield.

This work will be linked to the widening of the M4 as part of WestConnex and the implementation of managed motorway initiatives on the M4.

5.7.2 Local access to Penrith and Liverpool

Over the next 20 years, Penrith and Liverpool will develop their regional industries, enhance the role of their city centres as transport hubs for outer Western Sydney, improve access to employment, health care and education, encourage agglomeration around their competitive local industries and encourage thriving precincts for business, retail and recreation.

In the short term, we will focus on coordinating transport planning and infrastructure provision, building on committed projects such as the South West Rail Link and the Revesby to Kingsgrove quadruplication.

Action Improve public transport services in Penrith and Liverpool

In the short term, we will work towards *NSW 2021* targets to grow Western Sydney commuter patronage on public transport. Our first priority will be to deliver customer-focused services that improve the attractiveness, service levels and reliability of public transport, with more reliable corridor connections from new growth areas into Penrith and Liverpool.

Action Coordinate planning approaches with Penrith City Council and Liverpool City Council

We will work with Penrith City Council to improve park and ride policy to promote mode shift to public transport, improve local amenity and plan for future growth in the Penrith CBD.

Planning has begun for upgrades to the Penrith Interchange aimed at improving pedestrian amenity and providing better interchange service levels.

We will work with Liverpool City Council to improve park and ride policy to promote mode shift to public transport, develop public transport corridors that support the economic function of Liverpool CBD and encourage more walking and cycling.

Action Provide faster and more frequent services to major employment centres in Penrith and Liverpool

Penrith and Liverpool will need transport connections that keep pace with the development of their urban communities over the next 20 years. Tailored transport solutions will address areas of transport disadvantage, support workforce participation and generate new business and employment opportunities across Greater Sydney.

Penrith's links with its Western Sydney workforce will be strengthened, improving north-south links and increasing the frequency of bus services to local communities to extend the 30 minute public transport catchment.

Improved connections will be required between Penrith centre and the North Penrith development, reducing the barrier created by the rail station and stabling yards and encouraging residents to walk and cycle.

For Liverpool, our priority will be to provide faster and more frequent services that connect the city to its immediate region and reduce car dependency. In addition, better links to Parramatta and Penrith will improve access to jobs and services for local residents.

Action Upgrade Penrith Interchange

Planning has begun for an upgrade to the Penrith Interchange (south of the rail line) to improve pedestrian amenity and provide better interchange service levels. This upgrade will complement the car parks as park and ride that provides 1,000 spaces to help alleviate the acknowledged difficulties in parking near the Station.

In addition, scoping works are underway for a longer term station upgrade at Penrith under the Transport Access Program to ensure alignment with Landcom's development of a major land parcel to the north of the rail line.

Action Build the Nepean River Green Bridge for pedestrians and cyclists

Walking and cycling will be supported by a range of network improvements, including the new Nepean River Green Bridge and improved connections across the rail line.

In addition, a more comprehensive regional bike network will be developed with the following projects:

- Design, development and construction of a cycleway from Penrith to Mulgoa Road
- Investigation of a cycleway for Victoria Bridge, Penrith.

Action Georges River Bridge for pedestrians and cyclists

We will improve walking and cycling links in Liverpool, offering safe and convenient travel within the centre and between the city and its surrounding suburbs. Subject to a feasibility assessment, this will include a Georges River pedestrian and cycle bridge.

In addition, construction of a cycleway will be progressed to link Liverpool CBD to Elizabeth Drive.

Action Improve public transport services to education and health facilities

We will establish better transport links to integrate Liverpool health precinct and tertiary education facilities at Macarthur-Campbelltown with the Liverpool centre, making the Liverpool CBD an attractive location for specialist businesses and supporting research links and employment growth.

Action Deliver incremental road improvements on strategic corridors

Measures will be identified to improve the capacity and performance of strategic corridors into Penrith (Western Line, Blue Mountains Line and M4/Great Western Highway (A44)) and plan for emerging corridors to Rouse Hill (via the North West Growth Centre). We will improve capacity and conditions along these corridors.

Action Investigate traffic flow enhancements to Richmond Bridge

We will work with the Australian Government and Hawkesbury City Council on planning and investigation work to address congestion on the Richmond Bridge and adjoining approach roads. A study is underway to investigate the potential for short term traffic flow improvements and reserve the road corridor that would be required for future traffic needs.

5.7.3 Port Botany and Sydney Airport precinct

We will maintain the economic primacy of the Port Botany and Sydney Airport precinct and ensure that it effectively serves NSW and Australia. The precinct is addressed both in this chapter and in Chapter Seven which considers freight transport and infrastructure around the Port and Airport.

Action Develop an Improvement Plan for Port Botany and Sydney Airport

We will finalise a precinct Improvement Plan for Port Botany and Sydney Airport to address capacity constraints, a growing passenger and freight task, and surface access challenges caused by competing demands on the road and rail networks leading to and surrounding the precinct. The Improvement Plan will provide certainty to investors about the NSW Government's approach to Port Botany and its commitment to ensure the Port continues to deliver value to NSW. The NSW Government strongly supports Sydney Airport being the primary airport for the Sydney region. The Improvement Plan will ensure that Port Botany and Sydney Airport remain competitive international gateways and have the capacity to accommodate forecast growth with efficient landside connections.

Action Upgrade public transport serving Port Botany and Sydney Airport

A central part of the Improvement Plan is to investigate options to improve public transport services in the precinct for commuters and

travellers, and to mitigate growing passenger vehicle congestion around Sydney Airport and on the road network.

We will implement the following initiatives by 2016 to improve public transport in the Port Botany and Sydney Airport precinct:

- Work with Airport Link Corporation to identify ways to improve public transport services to and from the Airport to service growing passenger numbers, including:
 - New timetables to Sydney Airport in the morning peak in 2013 and 2016
 - An increase in the number of peak hour rail services on the Airport Line from eight to 12 per hour, subject to available rolling stock availability
- Investigate new and extended bus route options to the Airport and work with Sydney Airport Corporation Limited to provide appropriate infrastructure to support additional bus services in the precinct
- Work with Sydney Airport Corporation Limited to provide additional signage and indicators at the Airport and elsewhere to advertise and encourage public transport use.

Action Address pinch points and congestion in the Port Botany and Sydney Airport precinct

An efficient road network around Port Botany and Sydney Airport will minimise congestion and make better use of existing investments. We will relieve pinch points and better manage road space in the precinct, delivering a targeted package of works that includes:

- Planning for a light vehicle road underpass at the General Holmes Drive rail level crossing. This would remove an operational slow point on the rail freight network (currently freight trains need to slow down to below 10 km/h when crossing the level crossing), reduce road traffic congestion and remove a safety risk in an area with high volumes of vehicular traffic

- Developing a formalised truck layover area in the Foreshore Road area with Sydney Ports Corporation. The provision of container vehicle parking close to the Port terminal reduces the volume of container vehicle movements on the road network. Potential benefits include:
 - Improved safety along Foreshore Road through the reduction of the slow turn and stopping movements of container vehicles
 - Reducing the use of Foreshore Road shoulders as prime mover or trailer parking while waiting for the Port Botany designated time slot
- Implementing one-way pairs road operation on Bourke Road and O’Riordan Street to manage increased traffic, with complementary measures including the removal of parking, provision of bus priority, enhanced pedestrian movements and examination of an alternative cycleway. This action:
 - Provides greater through capacity for Bourke Road and O’Riordan Street
 - Removes contra-flow turning conflicts on the existing arterial roads, improving route safety
 - Enhances the through capacity for freight movement along the two road corridors
 - Provides for a dedicated bus-lane on each road to link Green Square and the Mascot precinct supporting a future possible project to provide bus priority along the O’Riordan Street corridor
- Widening Mill Pond Road to support increased taxi volumes and private bus operators accessing the Airport precinct. This project would provide enhanced connectivity for freight and commercial vehicle movements to and from key existing industrial and commercial precincts and upgrade key links to access the Port and surrounding industrial areas.

Action Design the interchanges and connections that will allow WestConnex to adequately serve the Port Botany and Sydney Airport precinct

This work will provide high-quality access to both airport terminals and access from industrial areas in the Inner West and inner southern suburbs along the Canal Road/Gardeners Road axis. This will benefit freight access to the Port and surrounds as well as reduce the conflict between heavy vehicle and general traffic.

Action Continue to increase the number of bus and train services to the Port Botany and Sydney Airport precinct

We will develop a long term public transport plan to deliver major improvements in public transport capacity for the precinct. By 2031, we will provide 20 trains per hour in peak periods, multiple 24 hour bus routes serving the Airport for workers and passengers, new dedicated bus interchanges for each airline precinct and new dedicated express bus services using new motorway links.

Port Botany is currently served by three bus routes. In moving from a radial network towards a more connected network, we will investigate opportunities to improve the public transport catchment of Port Botany and provide greater choice of travel options.

5.8 Providing essential greenfield infrastructure for growth centres

In providing quality transport connections for new growth areas, our priority will be to connect these growth centres to established and emerging employment centres, such as the Western Sydney Employment Area, and make the best possible use of existing transit links, such as the Richmond and South rail lines and the North West T-way.

Action Build the North West Rail Link from Epping to Rouse Hill

The North West Rail Link is a high priority project for the NSW Government, and an integral part of *Sydney's Rail Future*. It will be built as the first of Sydney's new rapid transit services and will be the first rail line in Sydney to feature new single-deck trains.

The North West Rail Link will provide eight new stations and services over a 23 kilometre addition to the rail network from Epping to Rouse Hill. Stations are planned at Cherrybrook, Castle Hill, Hills Centre, Norwest, Bella Vista, Kellyville, Rouse Hill and Cudgegong Road. Bus, pedestrian, cycling and customer-oriented access facilities will be provided at all stations, with approximately 4,000 park and ride spaces across five sites.

Other features of the project include:

- New high frequency single-deck train services from Cudgegong Road through to Chatswood – at least 12 trains per hour in the peak
- Convenient cross-platform interchange at Chatswood
- In the future, use of the second Harbour Crossing to access the Sydney CBD and beyond
- Upgrades to railway systems on the existing line between Epping and Chatswood to integrate with the North West Rail Link
- Major bus interchange facilities at Rouse Hill and Castle Hill
- Bus, pedestrian, car, bicycle and accessible facilities at all stations
- Approximately 15 kilometres of new tunnels from Epping to Bella Vista
- Four underground stations – one cutting, two elevated and one at grade
- A four kilometre elevated Skytrain between Bella Vista and Rouse Hill
- A stabling and maintenance facility at Tallawong Road.

The majority of population and jobs growth in North West Sydney will occur around the Hills District and the planned North West Growth Centre. New employment and education centres are developing in North West Sydney, with Rouse Hill emerging as the next major centre. This is a key area for transit work trips, which lend themselves to a turn up and go, fast and frequent service.

The new rail link will provide the following benefits:

- Rail access for approximately 300,000 residents in the North West to Epping, Macquarie Park, Chatswood, St Leonards, North Sydney and the CBD.
- New rail services to existing suburbs in the Hills District and to future areas planned for residential and commercial development.
- Frequent, regular rail services and competitive travel times and reliability compared to car travel.
- Travel time savings from many areas of the North West to the Sydney CBD and Macquarie Park, and within the region, including to the Rouse Hill Town Centre.
- An increase in train services to Macquarie University and Macquarie Park.

Planning is underway on the North West Rail Link – the Environmental Impact Statement 1 (civil works) was exhibited earlier in 2012, site readiness and essential property demolition have commenced, and expressions of interest for tunnelling works were received in August 2012.

Short term

Action Complete the South West Rail Link from Glenfield to Leppington via Edmondson Park

The South West Rail Link will be operational in 2016. The Link will connect residents in the growing South West Sydney to the CBD through the construction of 12 kilometres of rail line from Glenfield to Leppington via Edmondson Park.

Extra train services will follow implementation of the new timetable in 2013. The Kingsgrove to Revesby quadruplication will separate express and all-station trains, allowing new trains on the network and improving reliability.

Services to Holsworthy, Glenfield and the South West will be doubled from eight to 16 services an hour to serve the South West Growth Centre and Campbelltown region. This will provide additional services and extra capacity for people in South West Sydney travelling to the Sydney CBD.

Action Implement bus priority measures and infrastructure upgrades through the Bus Head Start Program as the growth centres develop

The Bus Head Start Program will support the sustainable development of the North West and South West Growth Centres with bus priority measures and passenger infrastructure packages for major road corridors. This will provide integrated bus networks on road corridors as greenfield residential areas develop that provide access to urban centres or via interchange to heavy rail. This Program will provide a wider range of travel options while the North West Rail Link and South West Rail Link are under development.

The Program will plan, develop and operate new Strategic Bus Corridors servicing the North West and South West Growth Centres, as extensions to the identified Sydney strategic bus network. Further, the Program will include discrete projects around fleet acquisition, minimum standards around service frequency, bus priority improvements and marketing to new release area communities to capture benefits early following investment. Examples for investment include:

- Camden to Leppington via Oran Park
- Bringelly to Campbelltown via Oran Park
- Rouse Hill to Schofields via The Ponds
- Mount Druitt to Schofields via Marsden Park.

Action Upgrade the M2

On a typical day, the M2 is used by more than 100,000 vehicles and 27,000 bus passengers. The M2 upgrade will widen the existing motorway between Windsor Road, Baulkham Hills and Lane Cove Road, North Ryde. The widened M2 will mean increased capacity and improved traffic flow for motorists and buses. Once the work is complete, motorists can expect improved travel times. The 100 kilometre speed limit will be restored westbound from Lane Cove Road to Beecroft Road. The first stage of the upgrade is complete and the full upgrade is expected to be completed by the first half of 2013.

Action Upgrade the Greater Sydney bus and road network

We will support the construction of the North West Rail Link by investing in bus connections to the Link and increasing the capacity of access roads. The package will also meet growing transport demand in areas without heavy rail and on cross-regional routes where existing infrastructure is insufficient for growing demand.

The works will be a step change in access to jobs and key centres for the people of North West Sydney.

Bus infrastructure projects will include:

- Construction of a bus-only link on Castle Hill Road between Castlewood Drive and Highs Road and a morning peak bus-only lane from Aiken Road to Pennant Hills Road to improve services from West Pennant Hills and Castle Hill to Macquarie Park, North Sydney and Sydney CBD
- Provision of bus lanes along Pennant Hills Road from Church Street, Parramatta to Jenkins Road, Carlingford to improve the reliability of the M54 bus route from Parramatta to Macquarie Park

- Provision of bus lanes along Windsor Road and Old Northern Road from Church Street Parramatta to Francis Street Castle Hill, to improve the reliability and speed of numerous bus routes including the M60 and M61
- Provision of a bus-only link from Meurants Lane to the North West T-way to bypass the congested Norwest Boulevard and Windsor Road
- Bus priority measures at Showground Road and Victoria, Gilbert and Carrington Roads to improve the reliability of 10 bus routes
- Bus priority measures at Hambledon Road and Schofields Road intersection to provide bus priority for the North West Growth Centre
- Extension of Green Hills Drive, Rouse Hill
- Bus priority measures at Boundary Road and Pennant Hills Road intersection to provide more reliability for the M61 between Parramatta, Castle Hill and Hornsby.

Road upgrade projects will include:

- Upgrade Richmond Road at Marsden Park, with widening from a two-lane undivided road to a four-lane divided road from Grange Avenue to South Creek Flood Plains
- Upgrade and extend Schofields Road between Windsor Road and Richmond Road in three stages, to support east-west arterial connections through the North West Growth Centre from Riverstone to Schofields and Marsden Park with integrated bus priority
- Complete the Green Hills Drive missing section to improve access between Rouse Hill and the North West Growth Centre
- Upgrade Burns Road to Memorial Avenue from a two-lane road between Old Windsor Road and Windsor Road to a four-lane divided carriageway.

Action Expand and upgrade roads in growth centres, including bus priority measures

We will stage the upgrading of growth centre road networks to provide integrated bus priority from the outset. These road networks will provide the basis for the development of high quality transport links, providing access to the motorway network and to national and international ports and gateways. Growth centre road networks will require appropriate infrastructure to support walking, cycling, public transport and vehicle movements.

This initiative will focus particularly on the arc from Castle Hill in the north to Campbelltown in the south as well as arterial road improvements and road network upgrades to support North West Rail Link and South West Rail Link stations and new bus services.

Medium to longer term

Action Complete the Western Sydney Employment Area arterial road network

Our steps to complete the Western Sydney Employment Area arterial road network will include a program of road enhancements and new investment: Erskine Park Link Road, an upgrade of Old Wallgrove Road and the construction of the Southern Link Road to provide north-south and east-west access to Horsley Park, Eastern Creek and Kemps Creek. These measures will complement existing major road works that are planned for Richmond Road, Camden Valley Way and for the Werrington Arterial Stage 1. We will also investigate public transport options to provide the right level of accessibility to this area.

Action Plan transit-oriented development as part of the new North West Rail Link stations

We will develop precinct plans to complement the transit-oriented development proposals for North West Rail Link stations, including the development of employment and retail space at Rouse Hill, Castle Hill and Norwest/Bella Vista.

Elsewhere, we will identify opportunities for transit-oriented development at existing transport hubs in partnership with the Department of Planning and Infrastructure.

Action Upgrade major arterial roads in West and South West Sydney

We will deliver a package of upgrades to major arterial roads to service growth in the South West and around Werrington to address social disadvantage experienced in parts of Western Sydney.

The package includes:

- Upgrade Narellan Road intersections at Mount Annan which are at capacity, with queuing extending onto the F5
- Develop the Werrington Arterial in stages, with additional ramps on to the M4 Motorway and connection to the Great Western Highway
- Upgrade the Northern Road at Oran Park.

Action Plan for pedestrian, cycling and bus networks as part of new land releases and developments in Greater Sydney

We will implement minimum land use and transport requirements for greenfield and infill development areas. These requirements will ensure that new developments represent best practice with respect to land density, use and functional diversity; that reasonable community expectations are met around transport services; and that new areas have pedestrian, cyclist and bus-friendly street systems (see Chapter Eight).



5.9 Protecting Greater Sydney's transport corridors

Action Preserve 19 major transport corridors across Sydney for future transport requirements

The process of reserving important transport corridors will enable the cost efficient, long term development of the transport network.

Working with the Department of Planning and Infrastructure, we will improve the process for identifying and protecting corridors and, over time, will secure the land required to deliver new transport infrastructure. As detailed modal plans are developed, the need for further corridor preservation will arise.

Corridor preservations that we have identified across Sydney for long term transport requirements include (see Figure 5.13):

- South West Rail Link extension
- North West Rail Link extension - Cudgegong Road to Marsden Park via Schofields
- Marsden Park to Mount Druitt to Western Sydney Employment Area to Fairfield and Leppington
- Macquarie Park to Sydney Olympic Park
- Parramatta to Bankstown to Hurstville
- Parramatta to Macquarie Park
- Castlereagh Freeway
- Bells Line of Road
- Outer Sydney Orbital/M9 (Central Coast to Western Sydney to Wollongong)
- Second Harbour Crossing
- Western Sydney Freight Line
- Enhanced north-south links.

Action Undertake incremental improvements to major Greater Sydney strategic corridors as growth occurs

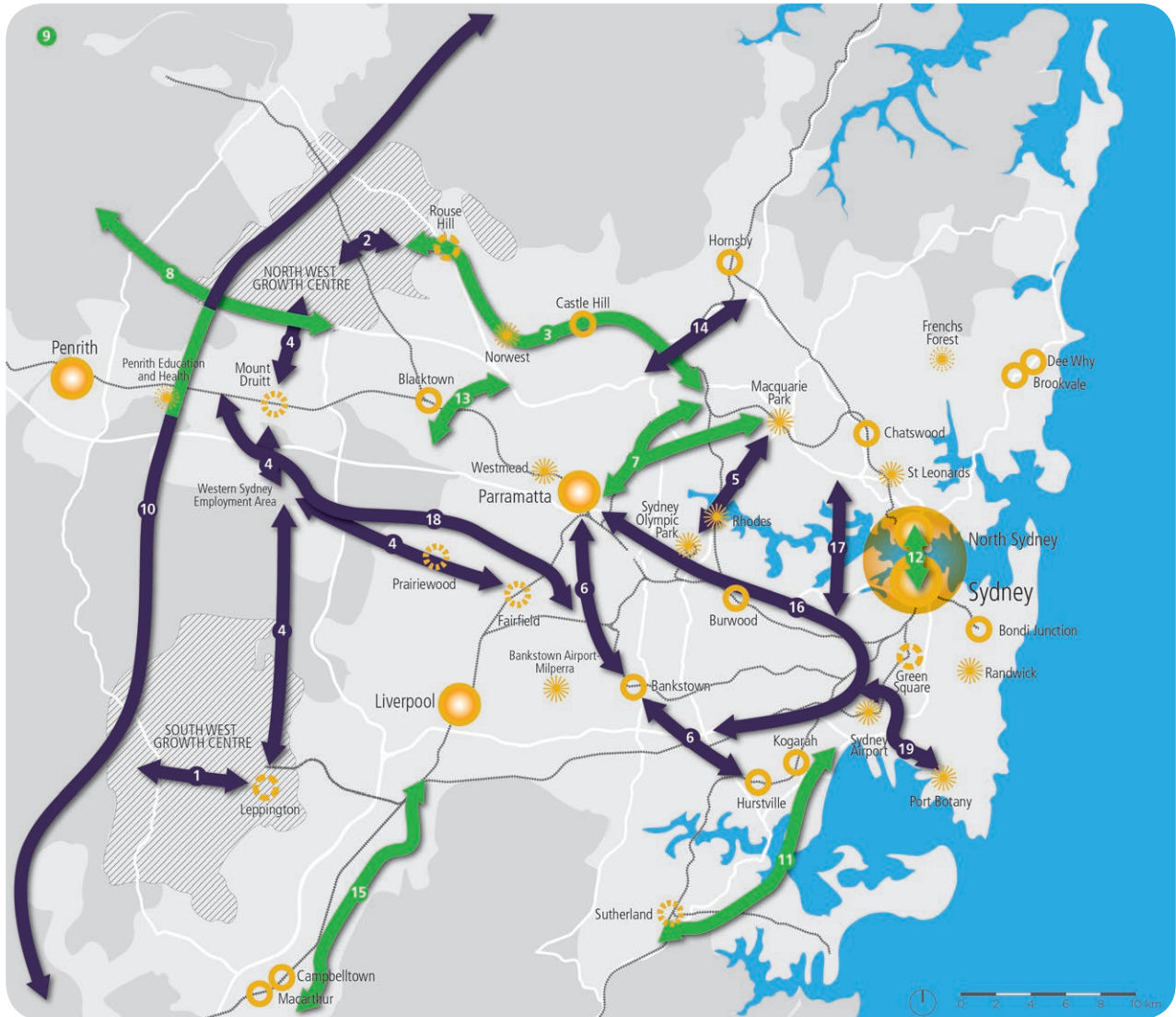
We will enhance major public transport corridors in Greater Sydney that serve Sydney's strategic centres (see Chapter Four), particularly:

- Parramatta to Sydney CBD via Strathfield
- Parramatta to Sydney CBD via Ryde
- Liverpool to Sydney Airport.

We will also monitor and respond to emerging capacity constraints over the medium to long term, including on the eight Western Sydney corridors that are expected to rapidly change in coming years (see Figure 5.11). Current or potential projects on these corridors include:

- Liverpool to Leppington: the South West Rail Link will provide a corridor transport link to meet growing demand
- Rouse Hill to North West Growth Centre: a potential future North West Rail Link extension through to Schofields may be required
- Blacktown to Fairfield: may require improved bus access
- Penrith to Prairiewood: may require enhanced services, including services via Blacktown that use the rail line
- Blacktown to Western Sydney Employment Area: may require improved bus service frequencies and coverage across the day
- Liverpool to Campbelltown/Macarthur: may require additional rail services across the day
- Campbelltown to South West Growth Centre: bus priority and new road links
- Liverpool to Airport: rail line and motorway network improvements, including the M5 West widening project.

Figure 5.13 Protected corridors



5 SUSTAINING GROWTH IN GREATER SYDNEY

	Global Sydney		Potential specialised precinct		Protected corridor
	Regional city		Planned major centre		Corridor for protection
	Major centre		Potential major centre		Growth centres
	Specialised precinct				

	1 South West Rail Link extension		10 Outer Sydney Orbital/M9 (including Werrington arterial)
	2 North West Rail Link extension - Cudgegong Road to Marsden Park via Schofields		11 F6
	3 North West Rail Link		12 Second Harbour Crossing
	4 Marsden Park to Mount Druitt to Western Sydney Employment Area to Fairfield and Leppington		13 Prospect Highway
	5 Macquarie Park to Sydney Olympic Park		14 F3 (M1) to M2
	6 Parramatta to Bankstown to Hurstville		15 Georges River Parkway
	7 Parramatta to Macquarie Park		16 WestConnex
	8 Castlereagh Freeway		17 Inner West Bypass and enhanced north-south links
	9 Bells Line of Road corridor requirements		18 Western Sydney Freight Line
			19 Port Botany links



6



PROVIDING ESSENTIAL ACCESS FOR REGIONAL NSW

CHAPTER SUMMARY

Our transport challenges

The transport challenges facing regional NSW are:

- Delivering better transport links to and within the growing regional cities of Newcastle and Wollongong, and the Central Coast, with faster, safer and more frequent rail services
- Improving accessibility through a better mix of transport options available across regional NSW
- Providing convenient, reliable and safe travel by getting the best use out of our transport networks and providing better road connections, rail passenger services and public transport within and between regional centres
- Making sure our state roads can support the needs of customers, communities and regional industries through improved road maintenance and safety
- Finding workable transport solutions that will protect the vitality, amenity and character of country towns
- Facilitating access to vital services for an ageing regional population with increasing rates of disability.

Taking action

New actions will address these challenges and improve the availability, reliability and timeliness of travel options in our regions:

- **Rural highway upgrades**, including a significant investment in the Pacific Highway (M1) and pinch points on the New England (A15), Newell (A39), Princes (A1), Great Western (A32) and Golden Highways (B84)

- **Establishment of NSW Trains** and the development of a Country Passenger Rail Services Strategy to improve regional NSW rail connections
- **Better bus services for regional towns and growing regional cities**, focused on more frequent services, wider network coverage and better integration with other travel modes
- A renewed focus on improving and **strengthening the community transport sector**
- Initiatives to move regional freight more efficiently, including a **Bridges for the Bush** program to replace and upgrade bridges to address constraints on Higher Mass Limits (HML) routes
- The **Growth Centres Roads Program** to upgrade major roads in growing regional centres to improve travel times and reliability
- A program of **town bypasses** for regional centres to reduce heavy truck traffic through town, using priorities based on consultation with the regions and on defined criteria
- Working in **partnership with local councils** to identify important rural roads for freight
- **Developing Regional Transport Plans** with local communities and integrating them with land use plans so that transport services and infrastructure are provided when and where they are needed.

In addition, the 10 year **Road Safety Strategy for NSW** will emphasise reducing fatalities and injuries on country roads (see Chapter Eight).

This chapter also sets out how these actions are likely to affect the 10 regions across NSW.

Our transport challenges

Regional NSW is growing and changing, with new opportunities being generated alongside some difficult challenges. Across our regions, many changes will influence travel demands over the next two decades. Population growth has averaged 1.2 percent per annum since 2006 and is expected to average 0.8 percent per annum through to 2031. The population will continue to get older, with 21 percent of the population expected to be over 65 years in 2031.

Fast-growing centres and regions must balance increasing demand for housing, infrastructure and services, while protecting productive agricultural land and natural assets. Higher volumes of traffic and increased freight flows have to be managed while preserving the amenity and character of towns and communities.

As our regional economy continues to diversify, we need to accommodate new travel demands and patterns that are being overlaid on routes, corridors and infrastructure designed many decades ago to suit markedly different industries and circumstances.

Areas where populations are declining need to ensure customers continue to have access to the services, resources and opportunities they need.

The Long Term Transport Master Plan identifies major transport challenges to improving essential access for regional NSW:

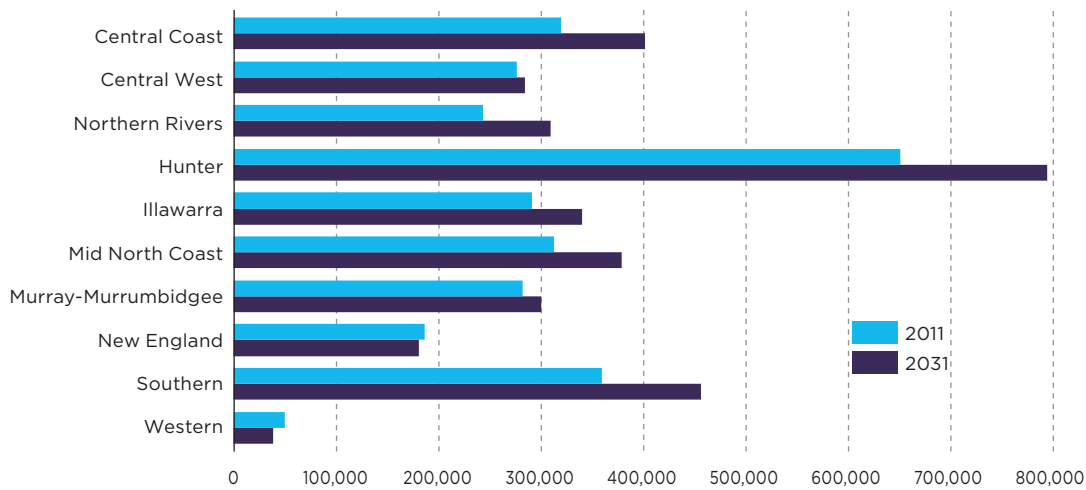
- Delivering better transport links to and within the growing regional cities of Newcastle and Wollongong and also the Central Coast. They will need faster and more efficient transport links to Sydney, better public transport connections and less congestion on major roads.
- Improving accessibility through a better mix of transport options across regional NSW. The uneven population and jobs growth in regional NSW will require a careful balance and mix of options to improve transport access connecting people to the centres they need to travel to.
- Providing convenient, reliable and safe travel in regional areas by modernising and making best use of our transport networks – especially our bus, rail, and taxi services.
- Making sure our state roads in the regions support the needs of customers, communities and regional industries. They must support growing regional industries, as well as contributing to lower business costs and higher productivity.
- Finding workable transport solutions that will preserve the vitality, amenity and character of small and medium-sized country towns. We need to minimise heavy vehicle traffic through regional town centres, make walking and cycling easier and safer and give customers choice when travelling within their towns.
- Facilitating access to vital services for an ageing regional NSW population and people with disabilities. The regional population is ageing faster than in Sydney; our transport system must facilitate access to healthcare and other vital services for our older citizens. Accessible transport services and roadside infrastructure are addressed in relation to the Disability Action Plan in Chapter Eight.
- Identifying and preserving key transport corridors such as the Bells Line of Road (B59).

REGIONAL NSW IS GROWING AND CHANGING

Uneven population growth

Nearly 2.9 million people live in regional NSW – an increase of 229,000 people since 2001. By 2031, an extra 563,000 people will live in regional areas, taking the total regional population to just over 3.4 million. While the population in some regions such as the Hunter is expected to grow strongly, other regions may experience reductions in population as shown in Figure 6.1.

Figure 6.1 Regional NSW population growth, 2011 to 2031



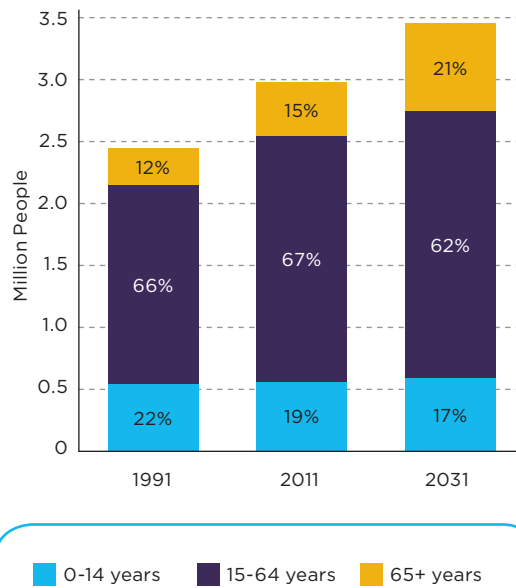
Strong but uneven employment growth

Regional employment growth has outstripped Sydney’s employment growth in the year to November 2010 (2.9 percent compared to 1.6 percent). Yet, like population growth, employment growth is uneven in regional NSW. In 2010, Newcastle recorded the strongest growth (up by 8.8 percent), followed by the Illawarra (6.7 percent), while employment in the Western region fell by 22 percent.

An ageing population

Population growth in regional NSW will be accompanied by a large change in the demographic structure. The number of people over the age of 65 will increase from 15 percent of the regional population in 2011 to 21 percent of the population in 2031 – approximately 800,000 people as shown in Figure 6.2.

Figure 6.2 Regional NSW age profile, 1991 to 2031



HOW WE TRAVEL IN REGIONAL NSW

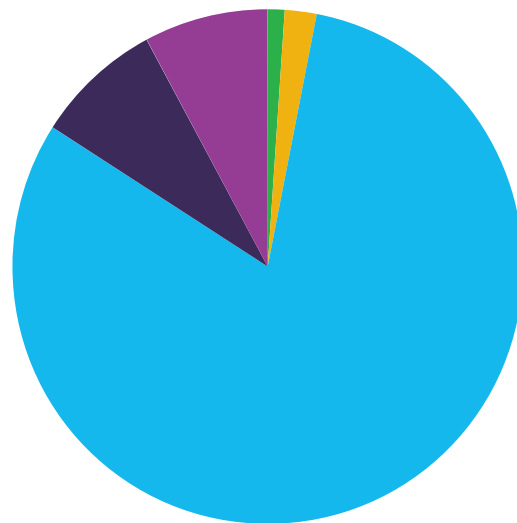
Every day, people in regional NSW make around 7.5 million trips. Most journeys to work are made by car, at approximately 90 percent. Journey to work trips by train or bus account for only three percent of regional travel, as illustrated in Figure 6.3.

Every year, regional bus services carry over 5.7 million passengers, of which just one percent are journeys to work.

CountryLink carries approximately 1.9 million passengers each year, with 43 percent of CountryLink trips being within regional NSW.

Community transport services make 1.4 million trips a year across the State.

Figure 6.3 Journey to work trips in regional NSW 2006



Car - driver	81%
Car - passenger	8%
Train	2%
Bus	1%
Other	8%

6.1 Growing regional cities

Within a two hour drive of Sydney are two of NSW's largest regional cities: Newcastle and Wollongong. The Central Coast, a cluster of towns between Sydney and Newcastle, is also a major, growing urban area in its own right with strong links to Sydney via rail services on the Newcastle and Central Coast Line and by road on the Pacific Highway (M1).

These places are growing into dynamic and diverse centres with their own unique attributes and character. They are locations for commercial activity, drivers of employment growth and the engine rooms of their region's economies. Between them, they make a substantial contribution to the NSW economy and are home to an expanding range of firms and industries. The strongly growing service sectors are changing the way people move around and conduct business.

The population in our regional cities is growing as new residents are attracted to their regional amenity and urban, well-serviced lifestyles. Between 2006 and 2011, the population of Newcastle increased by 9,500, Wollongong increased by 9,300 and the Central Coast population by 16,900. Through to 2031 it is estimated populations will increase by approximately 47,300 people in Newcastle, 41,400 people in Wollongong and 95,900 people in the Central Coast.

This population growth will generate an increasing demand for travel. It is estimated that about 683,000 more weekday personal daily trips will be made across Wollongong, Newcastle and the Central Coast. Substantial increase in private vehicle travel is expected.

Our regional cities will face several transport challenges over the next 20 years:

- As Newcastle, Wollongong and the Central Coast continue to grow in size and importance to the NSW economy, they need faster and more efficient road and rail links to Sydney – and through Sydney to the rest of the world

- With all three cities now facing emerging congestion-related issues, action is needed to keep regional arteries flowing, remove bottlenecks in regional supply chains and protect local amenity and liveability
- With more people choosing to live in these cities, improved public transport connections must support urban renewal, economic development and the creation of local jobs.

The number of arterial road corridors in the Central Coast and Wollongong are limited due to geographical constraints. Congestion results where the same roads are used by local and inter-regional traffic, which also reduces the reliability of bus travel.

Almost nine out of 10 trips in regional cities are undertaken by car. Problems with the road network have a big impact on people's mobility.

Our transport solutions must be integrated with land use planning to maintain the character and attributes that attract people to these regional cities, to avoid creating higher levels of car dependency and to minimise our impact on important natural habitats and assets.

Business and industries in our major regional cities are increasingly tied into global networks. They need fast and reliable connections to and through Sydney to take advantage of Sydney's global city status, participate in international supply chains and access overseas markets.

Customers also need reliable links to Sydney to access businesses, services, entertainment venues and major events, recreational activities and to visit family and friends. The private car will remain the primary choice for a large proportion of this travel.

Rail travel offers a comfortable, convenient and affordable way to get to and from Sydney. However travelling by train to Sydney is seen as slow and inconvenient by many people living in these cities. We need to improve rail connections to Sydney during peak times. Customers in Newcastle, Wollongong and the Central Coast are likely to need more frequent train services, especially during the evenings and on weekends. Better rail connections to Sydney also attract more visitors to these regional cities and their surrounding regions.

Newcastle and Wollongong have major freight routes connecting to the Port of Newcastle and Port Kembla, as well as being major freight destinations in their own right. Urban congestion will impact on the productivity of businesses within these cities.

As our regional cities continue to change and grow over the next 20 years, public transport planning, infrastructure and services must also keep up with evolving travel demands. Alternatives to ever-increasing levels of car travel will need to be developed, creating challenges in delivering viable public transport services and a significant lift in patronage.

6.1.1 Newcastle

Newcastle and the surrounding Lower Hunter area represents the seventh largest city in Australia and NSW's second largest city, with a population of around 356,400 in 2011. The city is a major employment centre and home to the world's largest coal export port. In 2010-11, a record 1.2 million passengers passed through Newcastle Airport. Newcastle is the regional city for the Hunter and incorporates Charlestown and emerging urban areas of Glendale/Cardiff and Morisset. It is close to Maitland, Raymond Terrace and Cessnock.

Newcastle is just under three hours by train from Sydney. For many people, this journey time, often as part of a multi-modal trip that may include another train or bus service, makes driving a faster and more convenient transport option. It is also slow compared to similar journeys in other countries. By comparison, a train trip from Central

London to Leicester, 160 kilometres to its north and a city of approximately 300,000 people, takes around one hour and 15 minutes.

Approximately 2.1 million trips are made daily by residents from Newcastle and surrounding areas. More than 80 percent of all trips are made by car and public transport is used for just four percent of all trips. A number of factors contribute to these low levels of public transport use, including:

- Low frequency of bus services with low patronage and demand levels
- Bus travel times that are not competitive against private vehicle use
- Readily available, low-cost parking in the Newcastle city centre
- Dispersed destinations on the bus network, resulting in indirect services.

Public transport connections to locations such as Newcastle University, John Hunter Hospital and Newcastle Airport are also less attractive than car travel.

The Hunter's rail network remains primarily focused on freight and there has been virtually no expansion in the passenger rail network to support residential growth over the last 30 years. Challenges include finding ways to increase patronage on some rail corridors while recognising the freight requirements on these lines, better integrating bus and rail services and improving access to central Newcastle. Building the Newcastle Rail Bypass will help to alleviate level crossing delays, speed passenger movements and improve urban amenity.

Newcastle is undertaking a dramatic revitalisation of its downtown and waterfront areas, attracting businesses and residents back to the central city. Land use planning measures are supporting this renewal project which includes a focus on increased pedestrian, cycling and public transport access to service population and employment growth in the CBD. Figure 6.4 shows current and forecast road congestion on the major road network in the Newcastle area and shows where problems are likely to emerge if no action is taken.

Traffic volumes will increase significantly on the Newcastle arterial road network without improvements. This will impact local movements, affect bus operations and impede efficient road freight travel.

Public debate surrounds proposals to terminate the Newcastle Rail Line at Wickham and remove existing rail infrastructure from the city centre, to improve pedestrian access between the CBD and the waterfront.

Any decision about the Newcastle Rail Line will reflect land use planning for the revitalisation of the Newcastle City Centre. The Department of Planning and Infrastructure is preparing land use plans for Newcastle and the Lower Hunter which will assess the rail corridor as part of the future transport solutions for the region.

With or without the rail line, the existing corridor will remain an important part of the City's transport network, and transport services will respond to the increased population and employment growth resulting from the urban renewal of the Newcastle CBD.

CHALLENGES FOR NEWCASTLE

- Planning for and managing strong demand for car travel and solutions for extremely low levels of public transport use
- Addressing the declining or static bus use
- Addressing extended peak hours and congestion on key routes
- Developing an urban renewal program that creates an attractive, accessible city centre
- Planning for and managing strong growth in freight to ensure the economic growth of the city and to minimise the impact on neighbourhood amenity
- Providing better public transport connectivity across the city, between modes, and to major service centres.

Figure 6.4 Newcastle and surrounds, current and future (2031) road performance, peak hour volume to capacity ratios

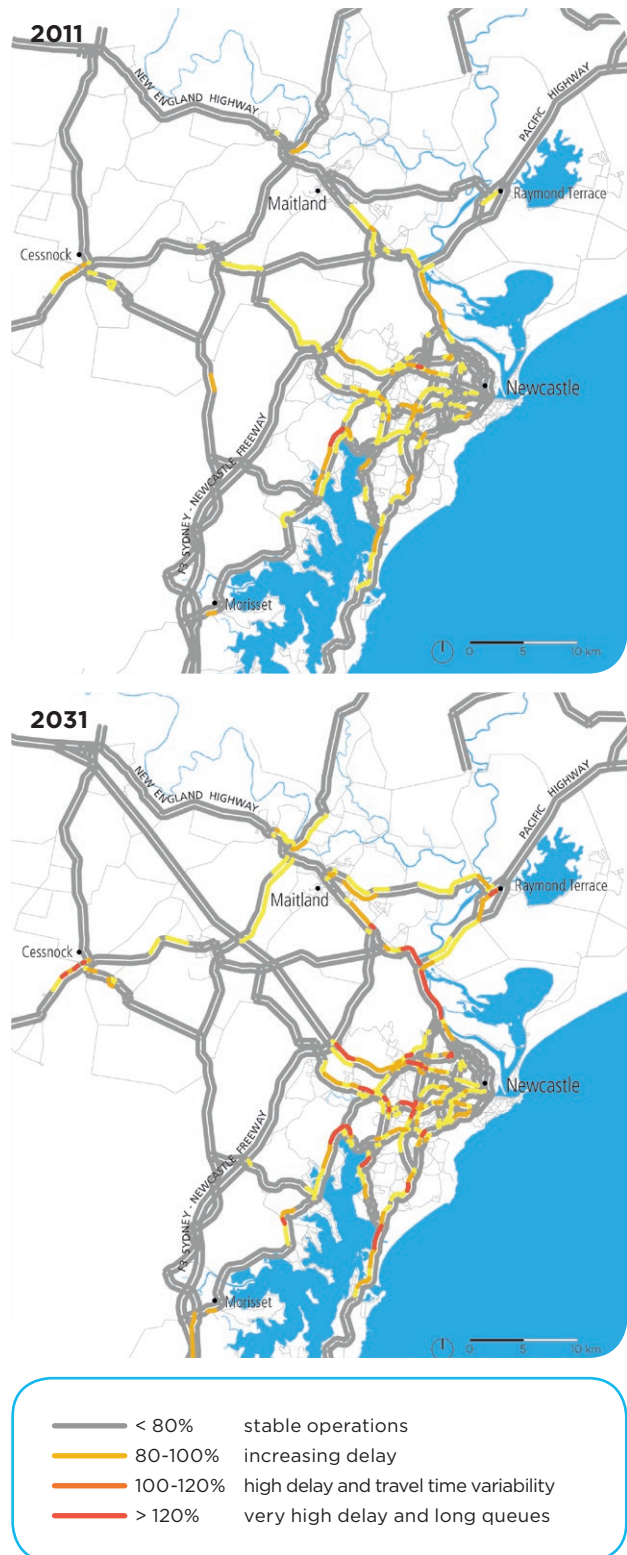
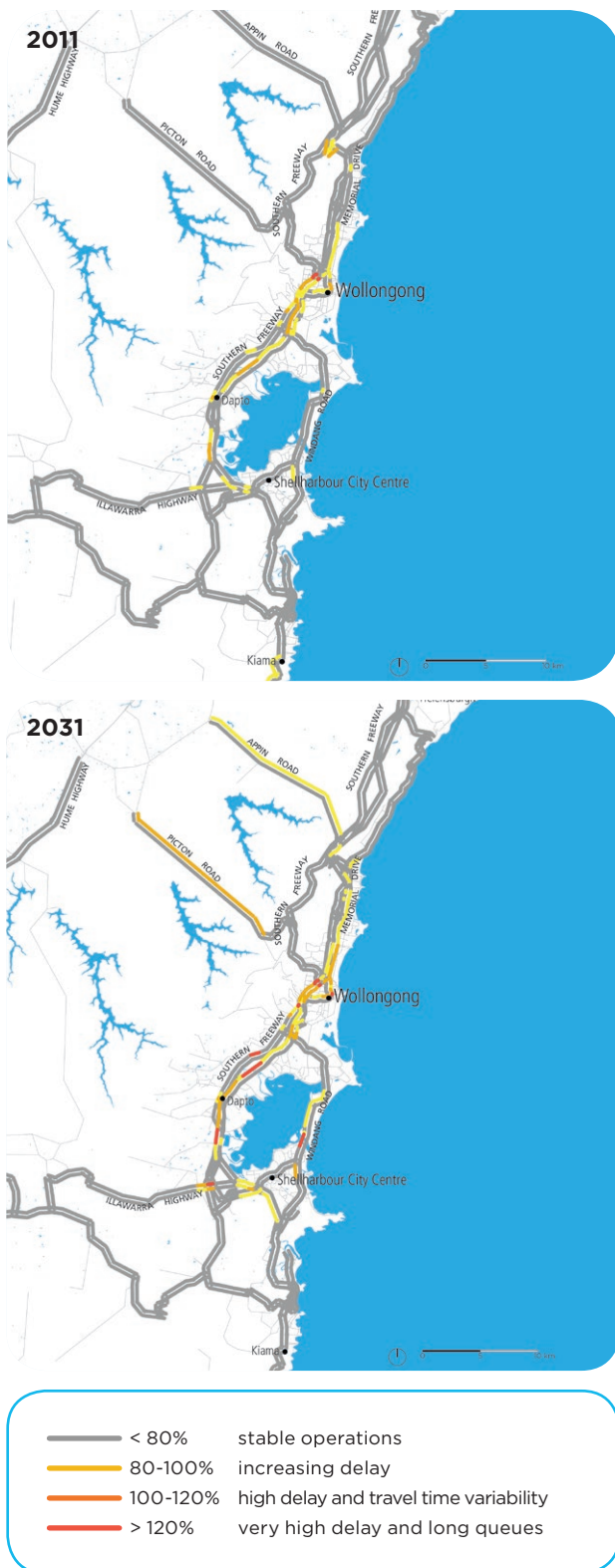


Figure 6.5 Wollongong and surrounds, current and future (2031) road performance, peak hour volume to capacity ratios



6.1.2 Wollongong

Wollongong and the surrounding Illawarra region represents the ninth largest city in Australia and had a population of around 274,200 in 2011. While the city is a liveable, seaside urban centre, a number of constraints make it particularly difficult to improve transport accessibility.

- Wollongong takes up a narrow strip of land between the Illawarra Escarpment and the Pacific Ocean. This causes development to occur in long, narrow corridors along a 50 kilometre stretch from Helensburgh in the north to Shellharbour City in the south.
- The city has few significant east-west transport links and a poorly integrated bus network. Outer areas of the Wollongong metropolitan area are only connected with central Wollongong by road. Public transport in the northern and southern suburbs of the city is particularly poor.
- The level of car ownership is high and car travel is generally the preferred means of moving around the city.
- Around 17 percent of the working population (120,000 workers) in Wollongong commute to jobs in Sydney, with 21 percent of these trips made by rail. People commuting to Sydney from Wollongong and the Illawarra region report car travel provides the most direct access to their workplaces.
- Rail customers suggest the frequency of services could be improved, especially during peak periods. A rail journey between Wollongong and Sydney currently takes one hour and 30 minutes.

A number of major local developments, such as the Stockland Shellharbour retail expansion, GPT Group’s Keira West expansion, the development of the University of Wollongong’s Innovation Campus and Port Kembla will drive higher demand for travel. Improvements will be needed to public transport services to ensure these sites

and Wollongong's city centre are accessible from new residential areas and able to support diverse commercial uses and employment growth.

Wollongong faces similar challenges to Newcastle and the Central Coast in boosting public transport use, including better integration between transport modes, more frequent bus services – especially along major routes to the Wollongong CBD – and improved information and ticketing.

Significant new residential development is underway in Wollongong and the Illawarra region, such as the construction of 17,000 new homes as part of the West Dapto land release. Planning for transport infrastructure and services, direct and well connected bus services and a clear road hierarchy will be needed to support a mode shift to public transport, walking and cycling in these developments.

In Wollongong, up to 20 percent of traffic volumes on the arterial roads are heavy vehicles, mainly moving coal, grain and other freight. Wollongong and the Illawarra also have a number of rail level crossings and more than 20 million tonnes of rail freight moving through the region each year (mainly headed for Port Kembla). These crossings add to road congestion, increase travel times and create additional safety hazards. Figure 6.5 shows current and forecast congestion on the major roads in the Illawarra region.

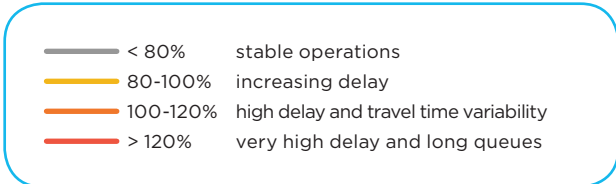
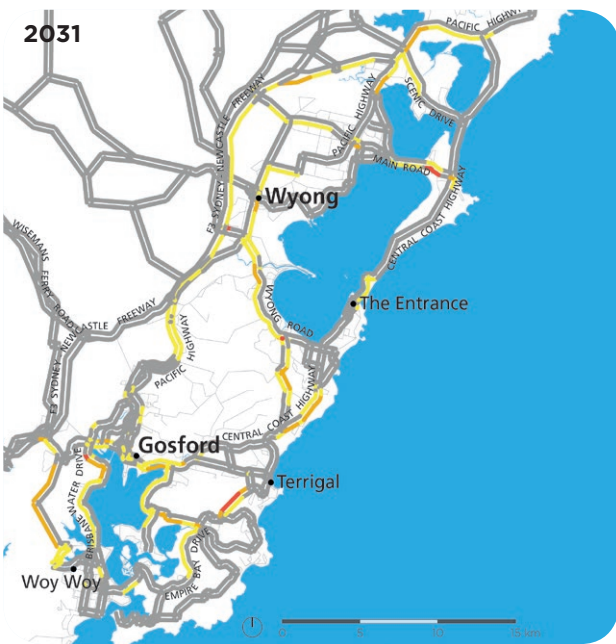
High amounts of through-traffic mean an increasing volume of heavy vehicles interacting with general traffic on local and arterial roads. Better management of freight vehicles on local roads is a particular concern for many residents in these cities, with trucks having an adverse impact on amenity in a number of places through noise and air pollution, road congestion and the safety issues associated with sharing local roads with passenger vehicles, pedestrians and cyclists.

As well as impacting directly on amenity, growth in traffic around and through the city has the potential to create new bottlenecks in regional supply chains, restricting expansion and productivity in key industries.

CHALLENGES FOR WOLLONGONG

- Seventeen percent of the Illawarra workforce travels to Sydney for work
- Public transport is only used for 21 percent of these journeys to work in Sydney
- Support for local jobs growth
- High car dependency
- Poor east-west transport links
- Strong growth in freight traffic competing with general traffic for road space.

Figure 6.6 Central Coast, current and future (2031) road performance, peak hour volume to capacity ratios



6.1.3 Central Coast

The main population centres in the Central Coast are Gosford, Wyong/Tuggerah, Woy Woy, Erina, The Entrance and Toukley. The region has long been a high growth area and this growth is forecast to continue over the next 20 years.

Low density development, combined with a number of regional cities spread across the region has made the Central Coast highly car dependent. Over a quarter of the workforce travels outside the region to work.

With 95,900 more people calling the region home over the next 20 years, weekday car trips could increase by 25 percent on current levels, with most of this increase occurring along already congested corridors. Reducing this car dependency will be particularly important to maintaining local amenity and business productivity.

In particular, good public transport to Gosford, Wyong/Tuggerah, Wyong Employment Zone and the emerging Warnervale Town Centre will support people commuting to jobs and accessing services from around the region. Bus services connecting with the north-south rail corridor will also help to move more people more quickly between major centres and to and from Sydney.

Councils on the Central Coast are also investing in new urban developments, including:

- **Warnervale Town Centre** - A 79 hectare development consisting of a mix of retail, commercial and residential areas that includes cafes, restaurants and entertainment facilities
- **Tuggerah Town Centre** - A large mixed-use development incorporating a range of residential, retail and commercial functions.

6.2 Improving the mix of transport options across regional NSW

- **Gosford waterfront** – A mixed-use redevelopment of the Gosford waterfront designed to be a stimulating and vibrant commercial and residential community featuring entertainment and dining options.

These developments must include cycling, walking and public transport access in their design to ensure they become sustainable and attractive places.

Figure 6.6 shows current and forecast congestion on the major roads in the Central Coast.

CHALLENGES FOR THE CENTRAL COAST

- Strong population growth over the next 20 years
- Above-average share of people over 65
- Very high car dependency, with car ownership outgrowing the population over the last 10 years
- Only four percent of the population uses public transport to get to work
- Over 25 percent of the workforce travels outside the region to work
- Low density, dispersed residential development
- The need to create local employment growth.

Improving equitable access to transport is not a ‘one size fits all’ exercise. It requires getting the right balance and mix of transport options across regional NSW. While we can make broad improvements to the statewide transport system, we also need to consider the specific needs of regional cities and centres, and the requirements of different regional industries, business clusters and supply chains.

These issues are complicated by the uneven distribution of forecast growth for regional NSW; most of the growth is expected to occur in the eastern parts of the State, with the greatest change forecast in the Hunter region where an additional 152,000 people will reside by 2031 (an increase of 24 percent). The Southern Region will grow by 30 percent, the Central Coast by 25 percent and the Northern Rivers by 31 percent. Reductions in population are forecast for the New England and Western regions.

Uneven growth means fast growing areas need to expand transport services while regions facing low or a declining population may struggle to maintain viable services. At the same time, regions will be dealing with an increase in the number of people over 65.

These factors have significant implications for the transport system in regional NSW and will require tailored responses. Regional Transport Plans informed by local input will outline a package of solutions to address the specific challenges of each region.

OUR STRATEGIC REGIONAL CORRIDORS

Across regional NSW, a number of road and rail corridors have strategic value in supporting economic development and population and employment growth as shown in Figure 6.7. Keeping these corridors open and performing well in moving both people and freight efficiently impacts on the broader regional and NSW economies.

Newcastle to Tweed Heads/Kyogle – This provides highway and rail links from major coastal centres to Brisbane and Sydney, traversing some of the fastest growing regions in NSW. The corridor is important for tourism, providing connections to popular tourist destinations on the north coast. It has a poor safety record and experiences peak period and seasonal congestion at various locations. The duplication of the Pacific Highway (M1) will address many road-based issues, but managing strong growth in passenger and freight rail demand will remain an ongoing challenge.

Mittagong to Albury – The corridor is the major rail and road freight route between Sydney and Melbourne. Duplication of the Hume Highway (M31) is largely complete, with one town bypass (Holbrook) yet to be finished. Work to improve the rail line has been carried out recently, but poor track quality in places limits speeds and capacity.

Newcastle to Wallangarra – This diverse corridor caters for major commodity movements, such as wheat and coal to the Port of Newcastle, together with passenger movements to the New England region. The rail corridor between Newcastle and Scone is close to capacity and the New England Highway (A15) passes through several growing towns where local traffic movements impact on longer distance passenger and freight travel markets.

Tocumwal to Boggabilla (Victorian border to Queensland border) – This north-south corridor links many inland regional towns with Victoria and Queensland. The majority of interstate road freight between Victoria and Queensland travels along the Newell Highway (A39), which is also the major road connecting centres along the corridor. Localised congestion is experienced around West Wyalong, Dubbo and Moree.

Public transport along this corridor is primarily conducted by cross-regional coach services, with coach-rail interchange over a number of lines remaining an important consideration.

Lithgow to Dubbo – This corridor links Dubbo with Sydney and provides for passenger and freight movement by road and rail. The corridor's main function is to provide access to Sydney and the movement of commodities from the Central West region to Port Botany and Port Kembla. Localised road congestion is experienced around the Blue Mountains, Bathurst, Orange and Dubbo.

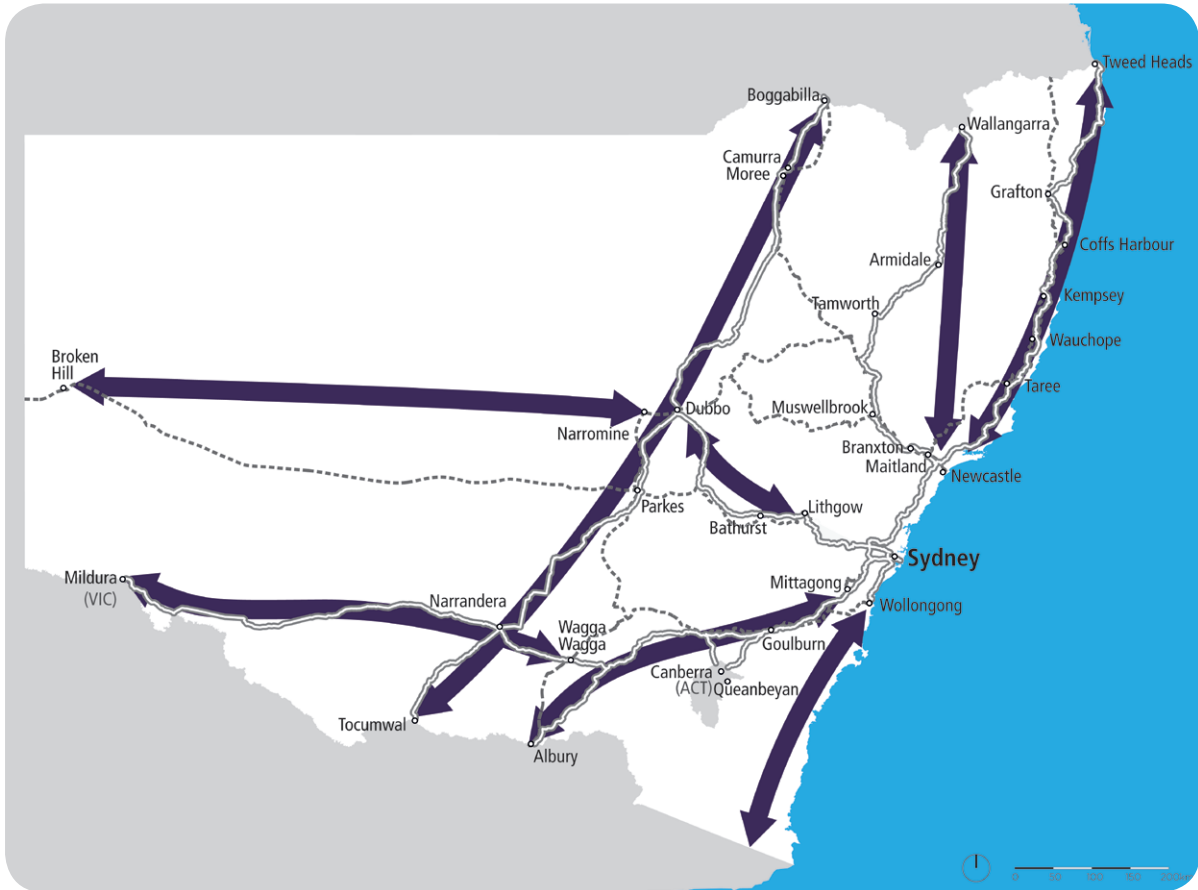
Wagga Wagga to Mildura – This corridor provides an interstate link between NSW and South Australia. Primarily a road-based corridor along the Sturt Highway (A20), it links the towns in the Murray-Murrumbidgee region with Sydney and Canberra. The majority of freight moved between NSW and South Australia passes along this corridor. Delays and congestion are experienced around Wagga Wagga and approaching Mildura.

Wollongong to the Victorian border – Towns on the southern coast connect to Wollongong and Sydney via this corridor, which includes road and rail links (with rail extending to Nowra/Bomaderry from Sydney). The corridor supports the southern coast's growing popularity as a tourist destination. The majority of travel is road-based along the Princes Highway (A1). Localised congestion occurs at many centres along the corridor.

Dubbo/Orange to Broken Hill – This is an important corridor providing access to and from Western NSW. The Mitchell and Barrier Highways (A32) link Dubbo with Broken Hill, while the Mitchell Highway (A32/B71) links Bourke with Dubbo. The rail corridor to Broken Hill passes through Parkes. The role of these links is primarily for access, tourism and moving freight.

OUR STRATEGIC REGIONAL CORRIDORS

Figure 6.7 Key Strategic Regional Corridors in NSW



	Strategic regional corridors		National highway network		National rail network
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REGIONAL TRANSPORT

Regional NSW's extensive transport network requires considerable upkeep to support local, regional and interstate passenger and freight movements.

Roads

The NSW Government manages 18,000 kilometres of state roads, more than 5,000 bridges and nearly 3,000 kilometres of regional roads. Alongside this network, a further 145,000 kilometres of roads is managed by local councils.

A high quality road network underpins the economic viability of regional NSW and Australia, as one third of the nation's road freight is moved through NSW. Maintaining our roads in a sound and safe condition, and making sure that businesses across the State have access to an efficient road network, is fundamental to economic and employment growth in all parts of NSW.

Rail

Regional passenger rail connections from Sydney are operated by CountryLink, with services reaching more than 360 destinations across four corridors:

- Northern (between Sydney and Casino/Brisbane)
- North Western (to Armidale and Moree)
- Western (to Dubbo and Broken Hill)
- Southern (to Canberra, Griffith and Albury/Melbourne).

These rail services are supported by a network of coach services that provide connections to train services at key points along the network.

Outside Sydney, the extent of the passenger rail network in NSW is 3,450 kilometres. For much of this network, the track is managed by the Australian Rail Track Corporation (ARTC), with passenger services operating on the same track as freight services.

There are also around 3,000 kilometres of disused rail lines and corridors across NSW where trains no longer operate.

Bus

Three different types of bus services operate in regional NSW, excluding dedicated school bus services. Regulated timetable services are managed under the bus contract system, with the highest patronage for these services being in Newcastle, the Central Coast and Illawarra.

Deregulated coach services are operated by around 80 operators without any government subsidy. They generally offer charter, school and inter-city services.

Community transport

Community transport services support regional and remote communities where regulated bus services are not available or do not meet local needs. Taxis also provide a critical service in regional areas particularly wheelchair accessible taxis.

Air

Air travel is important for regional NSW, mainly because it provides timely access to Sydney. Regional airlines and charter operators deliver urgent documents, parts for breakdown recovery, medical supplies and high-value food products. Around 30 routes link regional centres directly with Sydney Airport, with 20 percent of flight slots at the Airport set aside for regional air services. Communities across NSW view the retention of these slots as a vital element in transport accessibility. Newcastle and Canberra Airports provide access to the national airline network.

Passenger movements by air on regulated and non-regulated regional air services have increased slightly since 2007-08. This reflects both loss of services and recent economic conditions. Total passenger movements increased from two million passengers (2007-08) to 2.1 million passengers (2010-11), with the biggest increases recorded at Port Macquarie, Albury and Tamworth Airports. This figure excludes passenger counts through Gold Coast Airport and Newcastle Airport which respectively serviced more than 5 million passengers and 1.2 million in 2010/2011.

These services do not receive any public subsidy.

6.3 Convenient, reliable travel

Each day, many residents of NSW travel long distances to undertake basic activities, such as going to work or school, or doing the grocery shopping. Regional communities often have to travel even longer distances to a major regional centre or to Sydney for medical services, entertainment or personal business.

For many people in NSW, it is more convenient to travel to other major Australian cities. Therefore, making efficient connections between these other cities and regional NSW is just as important. As indicated in Figure 6.8, the influence of Brisbane, Melbourne, Adelaide and Canberra extend well into the state of NSW.

Figure 6.9 compares travel times by car, rail and air between regional NSW and Sydney, showing that people living in the west and far north of the State face the longest travel times to get to Sydney by train or car.

These times in Figure 6.9 also show that rail – or rail with coach connections – does not compare well as a travel option for trips between many regional centres and Sydney. For example, a trip to the Far North or the Mid North Coast by rail is considerably slower than a car journey. For some people, the timetable for rail services is also not convenient.

Figure 6.10 compares the travel times and travel costs by mode from regional centres to Sydney, illustrating the higher air travel costs and slower rail travel times.

These figures also show the importance of air travel and access to Sydney Airport for regional NSW, with travel times to Sydney of less than two hours from almost all parts of the State and costs that are comparable to road journeys (where competition in air travel exists). For these reasons, many people in regional NSW value the availability of air services for emergencies, business trips or when they need to get to Sydney as quickly and directly as possible.

Figure 6.12 illustrates the key air services and airports across regional NSW.

Figure 6.8 The influence of other State capital cities on regional NSW



Figure 6.9 Travel times by air, rail and car from regional NSW to Sydney, 2012

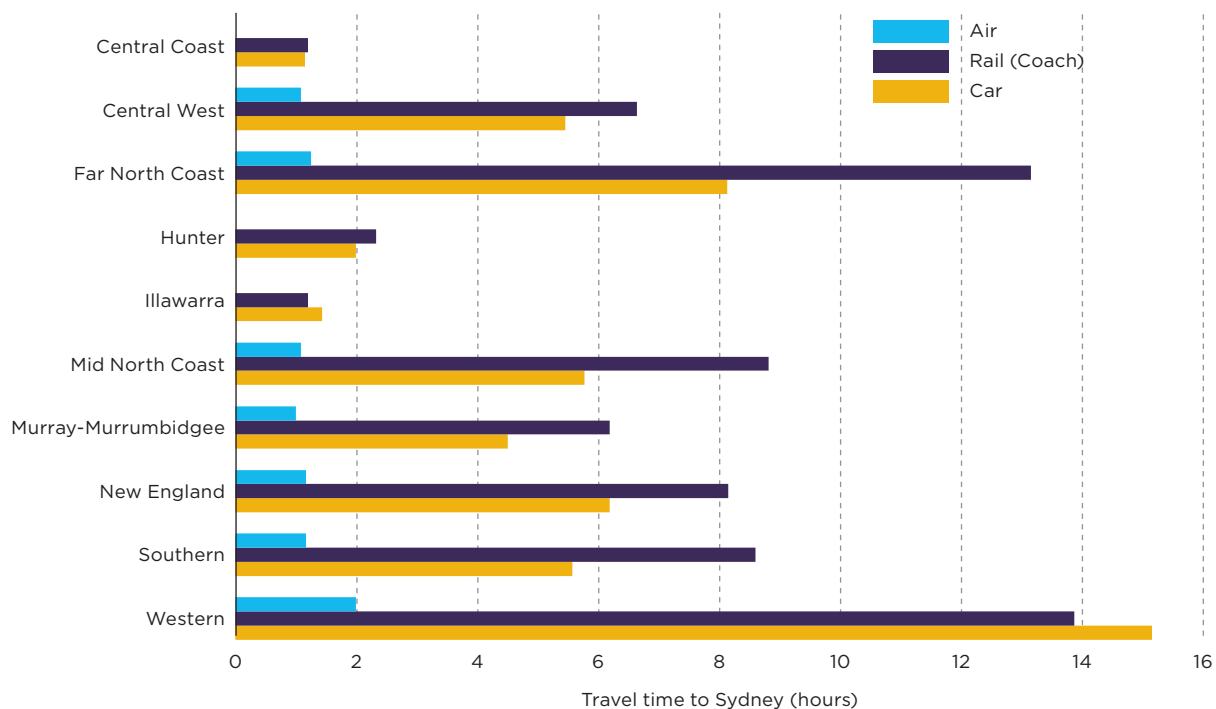


Figure 6.10 Relative travel times and costs from regional centres to Sydney, by mode

Journey	Air		Rail		Road	
	Time	Cost	Time	Cost	Time	Cost
Dubbo	1 hr 10 min	\$160	6 hr 30 min	\$55	5 hr 10 min	\$70
Broken Hill	2 hr 40 min	\$270	13 hr 50 min	\$97	13 hr 10 min	\$200
Grafton	2 hr 10 min	\$190	9 hr 50 min	\$72	7 hr 45 min	\$110
Merimbula	1 hr 45 min	\$200	N/A	N/A	6 hr 15 min	\$80

Air and rail ticket: prices adult full fare one way. Road costs estimated based on fuel consumption for a large car one way. Airline prices change by time of day. Costs represented are lower end calculations.

Figure 6.11 CountryLink passenger rail services

Route	Average Time	Distance Travelled	Average Speed
Sydney to Melbourne	11 hours 24 minutes	952 km	84 km/h
Sydney to Brisbane	13 hours 36 minutes	987 km	73 km/h
Sydney to Dubbo	6 hours 30 minutes	462 km	70 km/h
Sydney to Broken Hill	13 hours 50 minutes	1125 km	81 km/h
Sydney to Canberra	4 hours 19 minutes	329 km	76 km/h
Sydney to Armidale	8 hours 10 minutes	579 km	70 km/h
Sydney to Moree	8 hours 53 minutes	666 km	74 km/h
Sydney to Griffith	9 hours	640 km	71 km/h

6.3.1 Regional passenger rail travel

Regional passenger rail travel has operated for over 150 years in NSW. While routes developed in the early years of the network are still operational, some uneconomic services have been discontinued. Figure 6.11 shows the current CountryLink rail services and travel times and Figure 6.13 shows the extent of existing CountryLink rail and coach networks.

CountryLink rail services are supported by a network of coach services that provide connections to train services along the network. The most heavily used corridor is the Southern corridor, which includes services to Melbourne and Canberra. CountryLink also shares some train paths with freight traffic.

Despite a recent increase in patronage on CountryLink services, the country passenger rail network faces some significant challenges.

- Rail patronage has maintained sustained growth since 2007-8, following over five years of patronage decline. Regional rail customers report that services regularly run late and that infrequent services and slow travel times make the network a less attractive alternative to car travel.
- Outside Sydney, the 3,450 kilometre passenger rail network is mostly managed by the ARTC. Passenger services must operate on the same track as freight trains where they have priority over freight services. As a result, freight rail services are constrained during peak commuter hours and prior to the AM peak period. An increase in freight rail activities and passenger rail activities may not be achievable without future network upgrades, such as longer passing loops that allow trains to operate more efficiently or track duplication in some locations.
- Freight trains can be up to 1.8 kilometres long and generally operate at a lower speed than passenger services. It is likely that in the future freight trains will become even longer, creating further difficulties in coordinating freight and passenger services on the same track without

new works. A review of the NSW rail access regime to better manage conflicts between passenger and freight transport is discussed in Section 7.6.5.

- Most of the interstate passenger train fleet is reaching the end of its operational life. The first series of XPT trains (which operate on interstate routes to Melbourne and Brisbane) entered service in 1981. They were originally designed for 25 years of operation or 6.3 million kilometres of travel. By 2011, the trains had travelled over 9.3 million kilometres and were 28 years old. The second series XPT trains entered service in 1993. A recent refurbishment has extended their operational service life to 2016. The Xplorer fleet (which runs to Armidale, Moree, Broken Hill, Griffith and Canberra) entered service in 1993 and is likely to need replacement between 2023 and 2028.

Ageing rolling stock makes it difficult to maintain a reliable service, and undertake routine maintenance due to the difficulty in acquiring replacement parts.

Country passenger rail services are approaching a critical decision point. We need to establish a clear vision of how we modernise our regional passenger rail service and determine how we can best achieve this outcome.

The NSW Government has established NSW Trains to provide transport services to inter-city and regional customers under the terms of a contract with Transport for NSW. The services to be operated by NSW Trains include between Sydney and the Hunter, Central Coast, Blue Mountains, Southern Highlands and South Coast regions as well as the NSW Trains interstate network. NSW Trains will roll out over the next 12 to 18 months.

We are also working on a Country Passenger Rail Strategy to inform the strategic direction of NSW Trains. It will inform decisions on a host of country rail issues as well as fleet capacity and replacement in regional NSW.

Figure 6.12 Regional air services in NSW

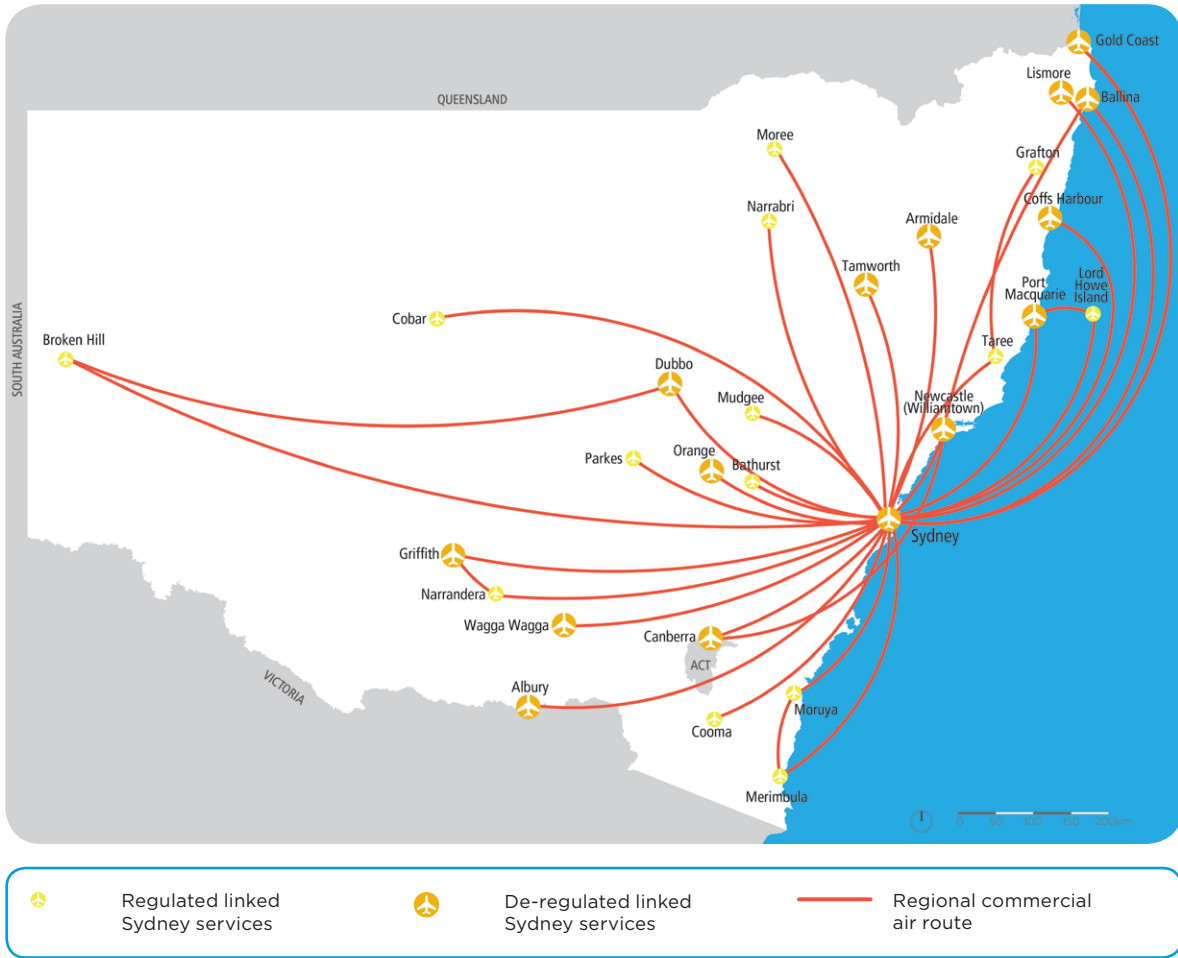
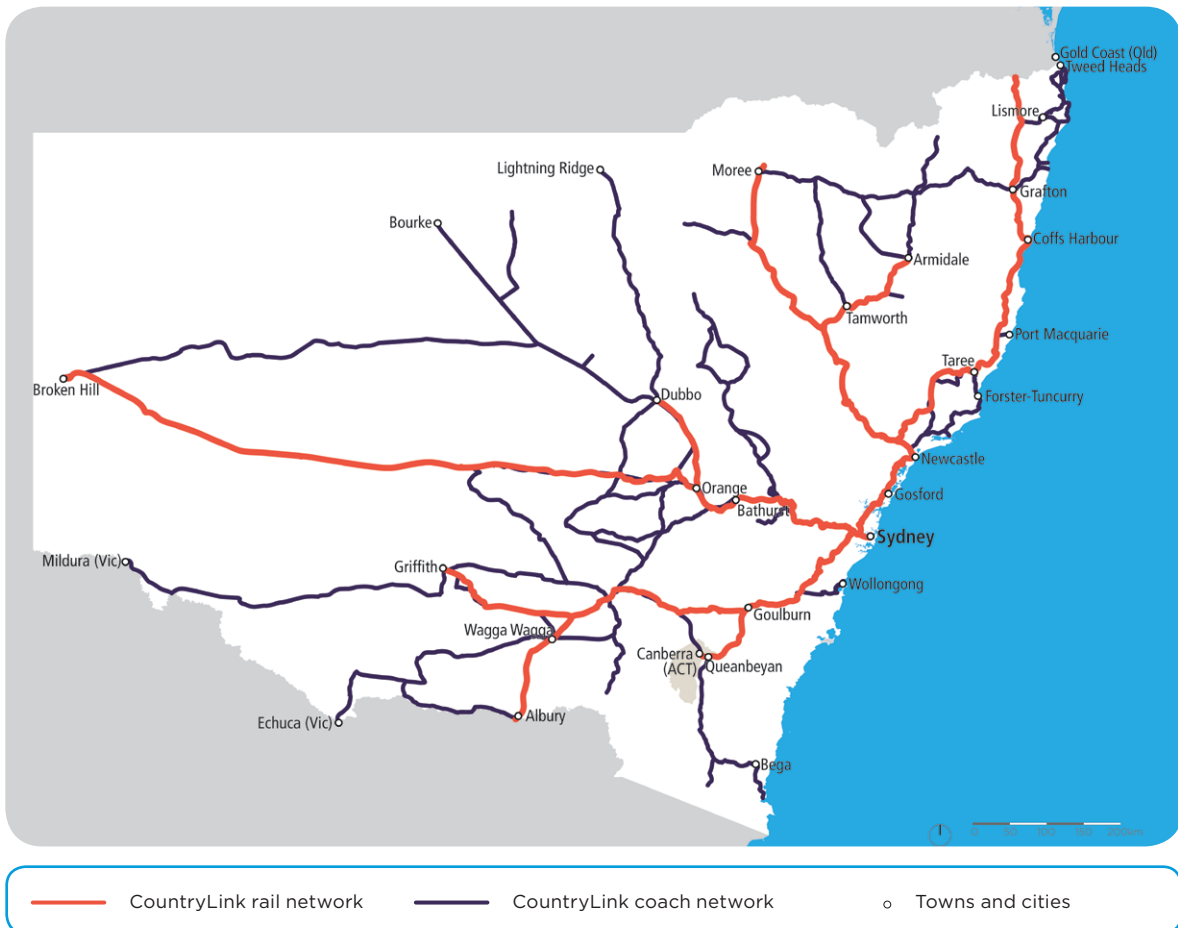


Figure 6.13 CountryLink rail and coach services



6.4 Rural roads

Residents of regional areas nominate the quality of roads as one of their biggest transport concerns. Ageing assets, higher volumes of traffic, more heavy vehicles and higher rebuilding and upgrading costs all contribute to the challenge of maintaining our roads and impact on the quality of sections of the road network. Most trips in regions are undertaken by car. Poor quality roads mean longer trips, less comfortable trips and, most importantly, less safe trips.

Road safety is a major concern for people living in regional areas. Fatal road crashes in 2010 (shown in Figure 6.14) reflect a consistent pattern over many years: while the actual number of deaths has reduced dramatically since the 1970s, fatal crashes are higher in regional NSW than in the metropolitan area. While only one third of people live in regional NSW, two thirds of all fatal crashes occur in regional areas. The fatality rate in regional NSW is more than four times higher than for metropolitan areas.

The road environment impacts the severity of road crashes. Three-quarters of fatal road crashes in regional NSW occur on two-way undivided roads. A high proportion of these crashes are run-off road crashes. Improving our rural road network will help reduce the number and severity of these crashes – but it is a challenging, substantial and costly exercise.

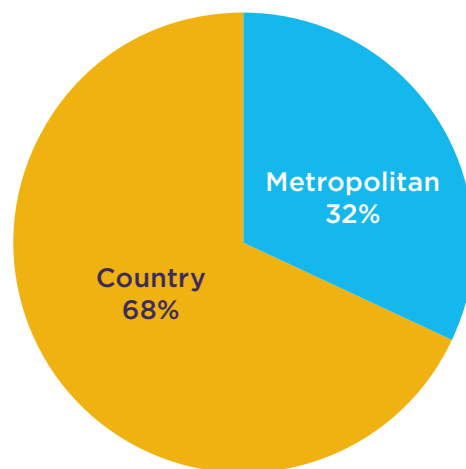
The NSW Government has set performance standards that cover the road network in regional NSW based on the smoothness of roads to support ride quality. While 91 percent of the State road network meets these standards, a considerable effort will be required to reach our target of having 93 percent of the network at or above these standards (see Section 8.4.1). An even bigger task will be ensuring local roads, maintained by local councils, are up to the same standard.

Traffic volumes are growing on the road network in regional NSW as population increases and economic activity generate more business and freight related travel. Figure 6.15 indicates where these volumes are highest: the biggest flows are centred on our major regional cities, the Far North and Mid North Coast regions and growing regional centres such as Wagga Wagga, Bathurst and Orange.

With many rural highways constructed as two-way roads, these higher volumes now exceed the capacity of roads in cities and towns located along these highways. Congestion and reliability issues are now emerging, along a number of arteries and corridors. These issues will need to be managed to avoid creating freight bottlenecks, safety hazards and travel delays.

Without constant attention to maintenance, rural road quality will deteriorate. This is especially the case for gravel and dirt roads, which deteriorate at a faster rate than paved roads. Recent floods have damaged roads and bridges in some regions, placing further pressure on the quality of the road network in the regions.

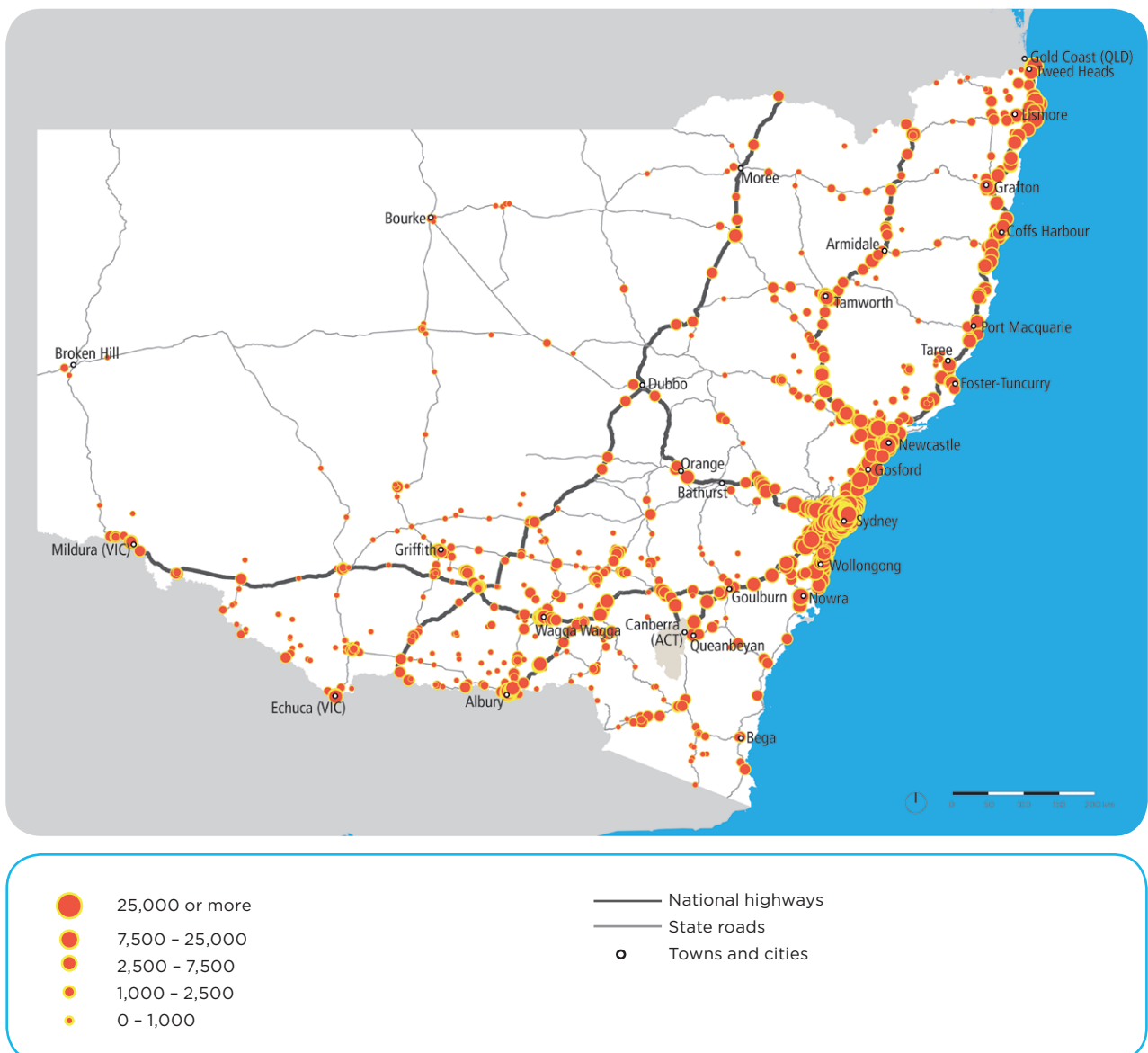
Figure 6.14 Fatal Crashes, NSW, 2010, Urbanisation



Roads classed as 'Regional' and 'Local' (Road and Maritime Services classification) are the responsibility of councils to fund, determine priorities and carry out works. Regional roads are eligible for annual assistance grants from the NSW Government in recognition of their relative importance. Other sources to funding work on regional roads include local rates, developer contributions and funding from the Australian Government. The NSW Government provides only limited assistance under special programs to local roads.

Better quality roads are safer for people and reduce the transport costs to businesses, most notably the mining sector and primary producers who benefit from efficient road connections between the farm gate and processing, storage or intermodal facilities.

Figure 6.15 Average daily traffic flows on NSW roads, 2011



6.5 Preserving the amenity and character of regional towns

Our regional centres and small and medium towns, contribute to the vitality and character of NSW. Often attractive and amenable to walking and cycling, these centres and towns also function as important service and employment nodes for the surrounding hinterlands. Yet, given the dispersed nature of these towns and the growing consolidation of services in larger centres, car travel is often the only choice available to residents of smaller communities to reach key service centres in regional NSW.

Transport capacity is needed in these regional towns and centres to meet the diverse transport requirements of local communities ensuring access to health, education and other essential services. Where possible, the local amenity and character of regional towns and centres should be preserved and impacts limited.

An increase in economic growth is also likely to result in more freight vehicles travelling through regional centres. Towns on major road thoroughfares will experience greater traffic impacts and reduced amenity and character. More efficient road freight movement, town bypasses and moving more regional freight by rail can address these issues.

6.6 Meeting the needs of an ageing regional population

As the population ages, the demand for public and community transport connections between towns and larger regional centres will grow. We will need to find ways to respond to this increasing demand to maintain equity and reduce disadvantage.

With 21 percent of our regional population aged 65 and over by 2031, our transport system will increasingly be called upon to provide convenient and safe access to health and other services for this growing group in our community. Much of this demand will need to be met by the community transport sector. An increasing role will be also played by bus, coach and regional rail depending on the length and nature of journeys.

At present, community transport performs a significant role in regional and remote communities for people with disabilities or reduced mobility. For those regions in NSW with an ageing population, community transport service providers will need further resources and support (this is discussed further in Chapter Eight).

Taking action

20 YEAR VISION

Regional NSW will remain an attractive place where people want to live and visit. Residents in regional areas will take advantage of new opportunities, supported by transport networks and services that sustain the vitality of regional NSW. Our regions will contribute strongly to the NSW economy through expanding mining, agriculture, education and tourism sectors.

While improving access to public transport and reducing our dependence on cars are important objectives in many places across regional NSW, road-based transport will remain the dominant mode of travel in our regions. Ongoing investment in road infrastructure will continue to be essential to support regional growth and prosperity.

In responding to growth, our approach will be a staged process that begins with measures to improve the effectiveness of the existing system before implementing measures to grow the network.

Initiatives will be implemented to modernise our regional transport system through various road programs and to provide better integrated transport system across the state that provides access to opportunities and services sought by people in regional NSW.

People in regional NSW have told us what they want and need to meet the most pressing challenges in their regions. We will take action to:

- **Integrate land use and transport planning** – Each region will have a detailed Regional Transport Plan that is integrated with land use planning and other NSW Government initiatives such as Regional Action Plans and the Department of Planning and Infrastructure regional strategies to ensure transport services and infrastructure are provided in a timely manner, particularly in regions and centres that are growing strongly.
- **Connect communities** – Regional and rural communities will be better connected through improved travel links that are fast, convenient, safe and secure, with stronger community transport and more travel choice for residents and visitors.
- **Make our regional roads safer** – Our 10 year *Road Safety Strategy for NSW* will ensure that we reduce the severity and number of crashes on regional roads, with a corresponding decrease in deaths and serious injuries.
- **Move regional freight more efficiently** – The long term strength and prosperity of regional NSW will be supported through investment in road and rail infrastructure to ensure goods can be moved efficiently around the State while minimising adverse impacts on communities and the environment.
- **Partner with local government** – Local government is a key partner in identifying, funding and delivering the changes and projects required to improve the transport network at the local level.

We will prioritise initiatives in each of these areas over the next 20 years:

- In the short term, we will continue our program of investment in road infrastructure improvements and public transport service delivery to improve connections in and between our regions and support growing and changing travel needs.
- In the medium term, we will continue to deliver key programs and consider potential projects identified through Regional Transport Plans that will be developed alongside strategic regional land use plans and other planning processes. We will put in place evidence-based and robust decision making frameworks to determine which projects will be undertaken (see Chapter Eleven).
- In the long term, we will continue to identify and deliver solutions to meet the future demands on the transport system and continue to modernise and protect our transport system in regional NSW. This includes consideration of high speed rail.

Action Protect corridor for high speed rail

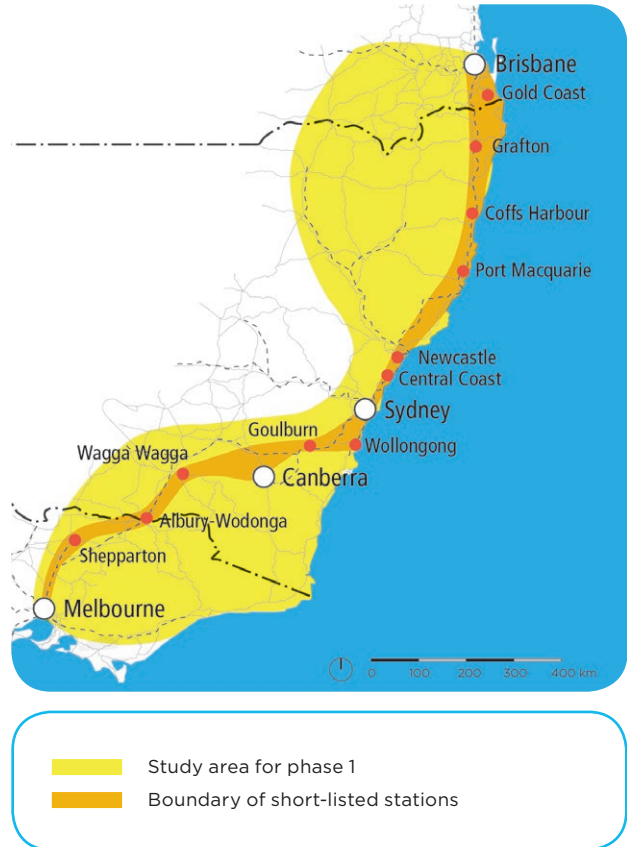
We will work with the Department of Planning and Infrastructure to protect a corridor for High Speed Rail.

The NSW Government is assisting the Australian Government with the high speed rail study. The NSW Government supports the initiative to select a high speed rail corridor between Brisbane and Melbourne as shown in Figure 6.16.

Once the corridor has been identified we will work with the Department of Planning and Infrastructure to determine the best approach to protecting the corridor. Work on the corridor will need to be supported by an integrated approach to land use and transport planning, including to adjoining transport services and networks.

The NSW Government is also committed to ensuring a high quality road corridor between Sydney and Brisbane along the coast. The corridor is required to support anticipated population growth along the corridor.

Figure 6.16 Initial plans for high speed rail, Melbourne – Sydney – Brisbane



6.7 Connecting communities

A package of initiatives will support economic and social opportunities, improved connectivity to major regional centres and enhance connections to national and international supply chains. We will also ensure the transport system is responsive to safety concerns, protects important corridors for the future and supports new growth areas.

The NSW Government is strongly committed to maintaining and enhancing essential access to Sydney from regional NSW across all transport modes. Road, rail and air transport will maintain essential access and accommodate future growth and demand.

Action Deliver rural highway upgrades, and address black spots and safety across the rural road network

We will undertake a targeted program of upgrades to the rural highways network, focusing on improving safety, supporting growth, increasing accessibility and enhancing freight efficiency.

Rural highways in NSW have historically been constructed as two-lane roads, built to standards that are now superseded. The materials used along most of the network are aged or of inadequate strength to support larger High Productivity Vehicles (HPVs), and general wear and tear means that some highways cannot be repaired easily. Poor alignment on sections of the network contributes to vehicle crashes and lower operating speeds. At locations along the rural highways network, bottlenecks can cause unsafe overtaking practices.

Across the broader network, traffic volumes are growing as NSW's population increases and economic activity generates more business and freight related travel. Investment in the rural highways network will focus on improving travel times, tackling congestion and reducing safety risks to road users. Key measures will include localised duplication where required or more frequent and longer overtaking lanes. More frequent and better rest areas for heavy vehicles will assist in making the journey safer, and ensure and maintain compliance to driver fatigue regulations. This upgrade program will deliver substantial benefits through better connectivity, improved safety and more efficient movement of freight.

Various rural highways have been identified for upgrade works, based on:

- The road classification, as improvement to higher order roads generate greater benefits
- The extent to which the project will improve safety by reducing the occurrence of fatal and serious injury crashes
- The extent to which the project will reduce long distance and freight travel time which is important to the NSW economy
- The extent to which the project will address congestion effects, where terrain, geometry, or local development reduces the capacity of the road network and creates localised delays
- The extent to which the project reduces costs by replacing infrastructure that is not economic to maintain.

To a lesser extent in rural areas other objectives considered in the prioritisation of projects are those that improve road-based public transport, improve urban amenity or serve residential and employment growth areas.

Action Deliver new arterial roads and upgrades to meet growth in the Hunter, Central Coast and Illawarra

We will deliver a program of arterial road construction and major road upgrades as population and employment growth in regional cities and areas boosts the demand for road travel, bus services and freight transport.

We will upgrade major highways and other state roads. The growth areas supported by this program are defined as the Hunter region south of Singleton, the Central Coast and the Illawarra region north of Nowra.

The Lower Hunter, the Central Coast and the Illawarra are all forecast to grow significantly to 2031. There is already congestion in these areas. Existing roads in these areas are often regional/rural two-lane roads with simple intersections that are not designed to cope with high levels of traffic or buses. Adequate connectivity must also be

provided across the existing arterial road network to improve access to and from these high growth areas for both people and goods.

This program will address congestion and improve travel times and reliability.

Similar to rural highway upgrades, the Long Term Transport Master Plan identifies roads for improvements based on a range of criteria including:

- The road hierarchy and the extent to which the project would improve safety by reducing the occurrence of fatal and serious injury crashes
- The extent to which the project addresses specific congestion effects resulting from increasing demand
- The extent to which the project improves access to residential and employment growth areas
- The extent to which the project improves the operation of road-based public transport
- The extent to which the project improves urban amenity through measures to mitigate traffic impacts
- The extent to which the project reduces costs by replacing infrastructure that is not economic to maintain.

To a lesser extent in regional growth centres objectives to support freight and long distance travel may also be considered.

Action **Improve regional road safety as part of the new *Road Safety Strategy for NSW***

Significant reductions in fatal and casualty crashes have been achieved over the last 40 years through improvements to driver behaviour, vehicles and the road network, together with concerted enforcement action and policy changes. This has been achieved against a backdrop of a growing regional population and an increasing number of vehicles.

The 10 year *Road Safety Strategy for NSW* will guide road safety initiatives and investment to reduce road trauma. The Strategy will focus on reducing the number and severity of crashes on country roads. Further details are included in Chapter Eight.

Other programs delivered as part of the Long Term Transport Master Plan will contribute to major improvements in road safety, including targeted safety works, rural highway upgrades, major arterial road upgrades in growing areas and bypasses of town centres.

Action **Enhance rail passenger services through timetable, fleet, and targeted track improvements**

We will develop a Country Passenger Rail Services Strategy to deliver a better service outcome for people in regional and rural NSW.

Determining the future direction of NSW country rail passenger services and how these services may develop over the next 20 years is a significant exercise. Our vision is that passenger rail services will continue to perform an important role in connecting regional and rural communities.

Passenger rail travel has operated for over 150 years in NSW. While it has undergone significant changes, the network that was initially developed remains operational – although some passenger services that were not viable have been discontinued. As discussed earlier, country passenger rail is at a critical decision point. Within the life of the Long Term Transport Master Plan, the majority of regional passenger rolling stock will reach the end of its design and operating life. Timetables determined by the passage of trains through Sydney and by the scheduling of interstate services do not provide convenient travel times for many regional centres. Over the next 20 years, capacity constraints in the regional rail network will also occur as a result of the growth in freight services. This will be particularly acute in the Hunter between Newcastle and Muswellbrook.

We recognise that timetables are focused on Sydney and that there is a need for a greater focus on services between regional centres. The Strategy will address issues around more convenient timetables, slow travel speeds, service frequency and other concerns and devise solutions to create a modernised regional rail service that is an attractive option for regional communities. The strategy will canvass initiatives to improve running times network-wide and assess recommendations based on potential customer benefit from these services.

Action Introduce innovative regional bus services that are responsive to specific customer needs

We will encourage increased public transport use in regional areas by identifying and addressing service gaps, with a major focus on extending and improving bus services.

Figures from 2006 show only one percent of work trips in regional areas are undertaken by bus. We need to make public transport more accessible and convenient in regional towns.

However, dispersed small population centres make it difficult to provide people with greater choice. Better frequency, greater reliability and wider network coverage of bus services can make public transport more attractive. A one-size fits all approach will not be appropriate and service options for various regions and centres will need to be considered individually through service planning, Regional Transport Plans and a review of bus contract system guidelines.

To provide real transport choice in regional towns, we will adopt a fresh approach to delivering bus services. Route and timetable changes and integration between different services will reduce travel time. Greater customer confidence can be achieved through upgrading bus stops and ensuring information is accurate. Upgrades to bus stops will assist people with special needs to use bus services safely.

We will improve the quality and level of service provided by focusing on more frequent services, wider network coverage and better integration between travel modes. To cater to different segments of the community and their different needs, we will promote and facilitate the introduction of differentiated services to provide more choices for customers. We will work with regional bus operators and local communities to provide greater choice and get the right balance and mix of services. As a way of exploring what works best, we will consider trial projects to guide future decisions about the provision of regional bus services.

Action Deliver regional station upgrades and access improvements as part of the Transport Access Program

We will continue to support and enhance a public transport infrastructure program that assists local councils in making regional bus stops and rail stations safer, accessible, attractive places that comply with national disability access standards. This will enable more people to use public transport, provide greater confidence in using the system and improve customer travel experiences. In turn, this should encourage more people to use public transport.

This program will focus on improving ease of interchange access across NSW. We will improve coach facilities and interchanges in Sydney CBD and other areas to benefit long distance coach travel.

Action Improve and strengthen community transport in regional areas

We will provide additional funding for community transport services and improve available resources for the community transport sector following a detailed review that includes identifying outcomes in individual regions.

Community transport provides transport services for the elderly and disadvantaged. With an ageing regional population, reliance on community transport services will increase. However, community transport is more costly to provide compared with other transport services and needs to be integrated into the overall transport system.

We recognise the vital role community transport service providers play in regional and remote communities and will work with community organisations and local councils to deliver community transport services. Our work will focus on ensuring that organisations, vehicles and drivers are cost effective and do not duplicate other services or government funding. Our current actions for community transport are discussed further in Chapter Eight.

Action Investigate flexible or on-demand transport solutions for regional NSW

Flexible transport or on-demand transport is responsive to daily fluctuations in travel demand and assists in meeting the accessibility gap in areas where population densities struggle to justify the provision of regular route bus services. Flexible transport covers a range of services and includes dial-a-bus, adaptable routes, smaller vehicles and alternative payment systems. While this type of transport has been deployed successfully in parts of Europe and the US, it has not been widely used in Australia and NSW due to legislative and regulatory hurdles such as funding and fares, and constraints on operator types covered by the NSW *Passenger Transport Act 1990* and associated Passenger Transport Regulation.

We will work with local government and regional transport providers to investigate the possibility of introducing this type of service for areas in regional areas.

If feasible, these services could improve accessibility in regional NSW. Investigating flexible transport will include an assessment of current service provision in the regions and determine whether or not more efficient and effective service provision could facilitate greater access to healthcare, education and other vital services for the communities. If the investigation of such services produces encouraging outcomes, pilot programs could be developed to counter social isolation and transport disadvantage. Such transport services could ensure greater connectivity:

- inter-regionally - not just to the major centres of Sydney, Newcastle and Wollongong but also to South East Queensland, Victoria and the Australian Capital Territory
- intra-regionally - connecting communities with major centres within the regions.

This work will be further developed in the Regional Transport Plans.

Action Invest in local cycleways in partnership with local councils

Cycling provides greater travel choice to regional communities and delivers health and environmental benefits. In addition to statewide initiatives to promote cycling, we will invest in better information and infrastructure to support cycling in conjunction with regional local councils. As part of the Cycling Investment Program we will prioritise opportunities for regional tourism in the assessment criteria and seek to connect cycling networks around major regional towns and centres.

Many regional roads were built without suitable space for cycling. In some cases, these roads now carry high levels of vehicle traffic that deter young or inexperienced cyclists from riding. We will work with councils to improve and enhance paths and cycling routes in regional centres to increase the number of people who choose to cycle. All new road projects or road network upgrades will be required to examine the feasibility of providing for cycling as an essential component of the project.

Action Invest in regional footpaths in partnership with local councils

Walking is an important element for mobility. In addition to statewide initiatives to promote walking, we will invest in better information and infrastructure to support walking in conjunction with regional local councils.

Many regional roads were built without suitable footpaths or space for walking. We will work to improve and enhance walking paths in regional centres to increase the number of people who walk.

Action Support regional air services to and from Sydney Airport

Air travel is vital to the economies and communities of regional NSW. We will work with airport owners and airline operators to continue to support service access between our regions and Sydney Airport.

Action Improve the evidence base for regional travel

Gaining knowledge of regional customers and their travel patterns is a key requirement for planning and improving regional transport services. We will use targeted regional surveys to improve the evidence base for regional travel and to better understand the nature of regional transport disadvantage as well as region-specific transport issues, travel patterns and needs.

Action Take action to identify, preserve and protect future transport corridors in regional NSW.

As well as the corridors identified in this plan, the process of reserving important corridors will enable the cost efficient long term development of effective connections within regional NSW and from regional NSW to Sydney,

Potential future corridors for protection will be identified during the development of Regional Transport Plans. Some corridors that are flagged for development include the connections to Sydney from the Illawarra and Central Coast along the Outer Sydney Orbital Corridor and the Bells Line of Road Corridor from the Central West to Sydney.

BELLS LINE OF ROAD

Roads and Maritime Services (RMS) completed the Bells Line of Road Long Term Strategic Corridor Plan in October 2012.

The key findings from this plan were:

- Forecast traffic numbers do not reach the levels that would trigger a need to upgrade the full length of Bells Line of Road (B59) to four-lanes in any foreseeable planning horizon.
- There is a need for the reservation of an upgraded road corridor connecting the Bells Line of Road corridor at Kurrajong Heights with the Sydney Motorway Network
- The commencement of planning for the identification of a preferred route and reservation on councils' Local Environment Plans is identified as a short term priority (up to five years), and could be expected to continue into the medium term (five to 20 years).

As a result, Transport for NSW and RMS will scope investigations into a potential corridor link between the Bells Line of Road (B59) and the Sydney Motorway Network. RMS will also review the existing Bells Line of Road (B59) to identify safety issues, including potential improvements such as overtaking lanes, safer intersections and better local access arrangements.

6.8 Moving regional freight more efficiently

Economic growth in regional NSW requires the efficient movement of goods and services. A large proportion of goods are moved by road across regional NSW and this freight task will grow. While every effort will be made to achieve a greater mode share on rail, the road network will still be required either to transfer freight from a terminal to its final destination or for the whole journey. This requires identified sections of the road network to be capable of carrying higher mass limit (HML) vehicles or high productivity vehicles (HPV).

Many local roads and parts of the State road network cannot cater for HML vehicles or HPVs, as either the road pavement or bridges do not have sufficient strength. These gaps in the road freight network create localised pinch points, which reduce the overall efficiency of regional road freight movements and have an adverse impact on the amenity of a number of towns.

Action Replace or upgrade key bridges in regional NSW through the Bridges for the Bush program

We plan to progressively upgrade, refurbish and rebuild those parts of the network that are needed to deliver productivity improvements and minimise the costs of transporting goods.

Many regional bridges were built to standards that are now no longer suitable. The introduction of B-Doubles and other HPVs requires a new standard for roads and bridges. At present, the standard of road infrastructure results in vehicles either having to make long detours to make the journey – which is expensive and inefficient – or multiple vehicles to carry out the task when a single vehicle will suffice, again adding costs to the trip.

The Bridges for the Bush program will replace and upgrade bridges across NSW at locations where mass limit restrictions are imposed preventing HML vehicles and HPVs from using the road network. The program will deliver significant benefits to industry, boosting productivity and reducing the cost of many goods that are moved by road. The program has two parts: the first being to replace or upgrade of five high priority HML deficient bridges and the upgrade of bridges to maintain the operability of

the road network; the second to replace six timber truss bridges and upgrading six more timber truss bridges.

The NSW road network is heavily constrained in trying to meet the growing freight task. Challenges can include low-strength, ageing bridges, the condition and strength of some rural State road pavements and poor road geometry.

Between 10 and 20 percent of the road freight task is mass constrained. Therefore, replacing or strengthening bridges at strategically important locations is necessary if mass limits are to be raised. The balance of the freight task is constrained by the dimensions of the heavy vehicle combination. Opportunities to improve efficiency and allow end-to-end productivity for longer vehicles will generally arise from improvements to road geometry and in particular at intersections.

Improving freight access has high economic benefit. RMS has assessed the bridges on State, regional and local roads and identified and prioritised the constrained bridges. Currently 249 bridges have been assessed as unsuitable for HML vehicles. On state roads, 152 of the 249 bridges have restrictions; 70 of these are located outside the Sydney metropolitan area. These structures either require strengthening or replacement with structure to meet the demands of HPVs.

The bridges were identified through a strategy that considered:

- The priority of the road, based on the draft HML priority routes determined through an analysis of commodity flows and vehicle movements, with bridges on higher priority routes provide the greatest benefits
- The extent to which the project extends the road network available to HML vehicles and reduces the distance of heavy vehicle detours
- Potential increases in safety standards
- The extent to which ongoing maintenance costs are reduced by replacing the infrastructure or upgrading the bridge.

To attract more bulk freight onto rail, over the next five years, the NSW Government will put \$277 million towards maintaining and upgrading grain rail lines therefore easing pressure on rural and regional roads.

In the last 18 months, the NSW Government has:

- replaced 109,000 old timber sleepers with modern steel sleepers
- resurfaced 609 kilometres of track
- constructed 27 new bridges and upgraded 18 level crossings
- laid 61, 000 tonnes of ballast
- refurbished 20 kilometres of old worn rail.

Action Build a targeted program of town bypasses in regional areas

Our regional road network has developed as links between towns. These connections are used for long distance travel by cars and heavy vehicles

and local trips within and around town centres. In some cases they also facilitate walking and cycling. As towns have grown, the amount of local activity has increased, leading to localised congestion in some towns.

The Long Term Transport Master Plan proposes a new program of town bypasses to improve travel within towns, reduce delays caused to freight traffic and increase safety.

A list of prioritised town bypasses will be developed in consultation with local communities as Regional Transport Plans are developed. Town bypasses are not appropriate at all locations, but they are highly beneficial in improving freight efficiency and reducing travel times and costs.

Bypass projects allow us to improve safety for road users and increase the amenity of towns through reduced noise, lower emissions and less traffic.

BRIDGES FOR THE BUSH PROGRAM

Many goods are moved by road across regional NSW, yet some rural bridges and roads are ageing, low-strength and struggling to keep up with the increasing loading demands from road freight. To maintain the efficient movement of goods and improve access for HPVs, we will implement the Bridges for the Bush program to progressively replace, upgrade and strengthen bridges and roads at priority locations is necessary.

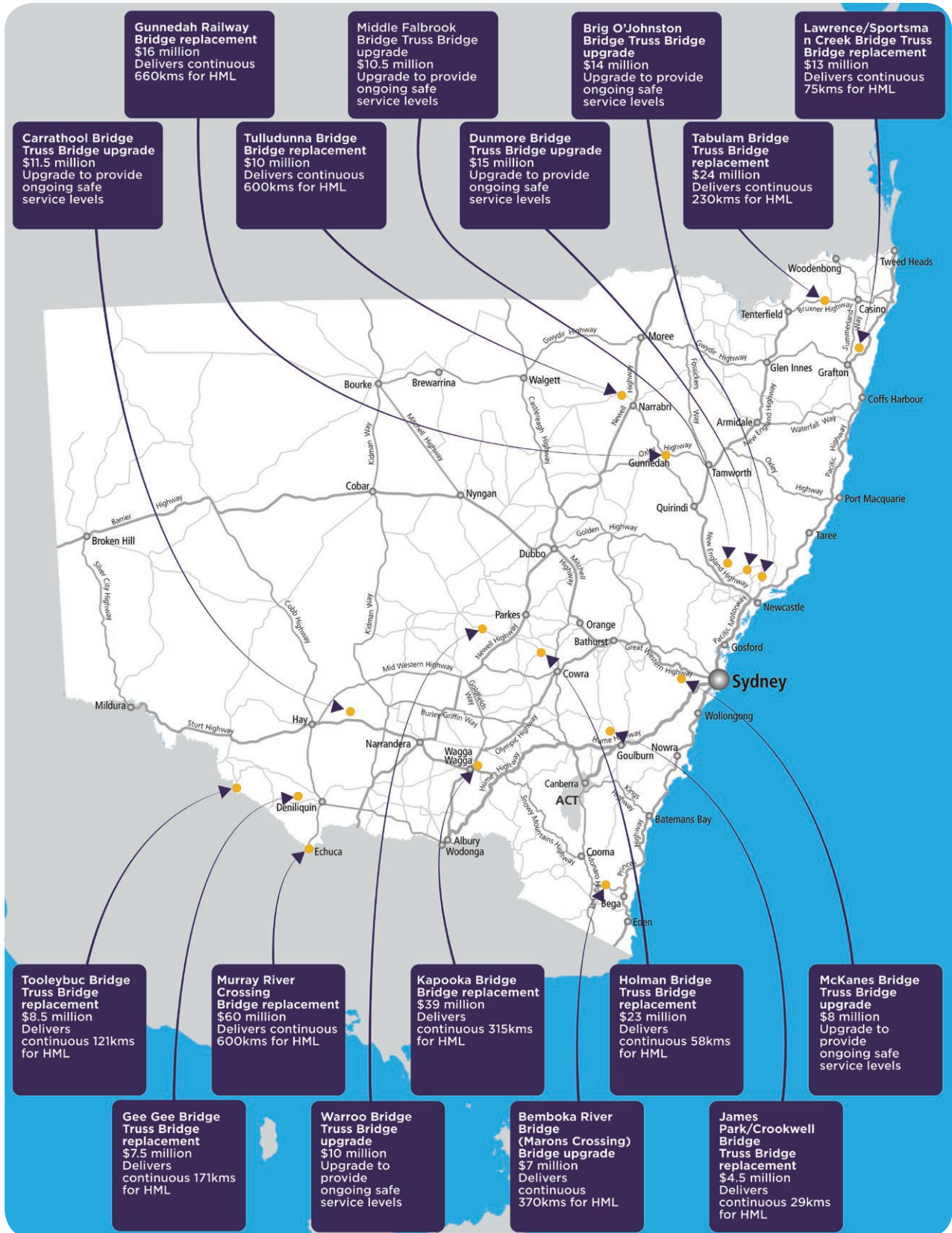
We have allocated \$145 million to the replacement and upgrading of key bridges in regional NSW, including:

- Kapooka Bridge on Olympic Highway (A41), south of Wagga Wagga
- Tulladunna Bridge on Kamilaroi Highway (B51), near Wee Waa
- Gunnedah Railway Bridge on South Street/Oxley Highway (B56)
- Murray River crossing at Echuca on Cobb Highway (B75)
- Bridge over Bemboka River (Marons Crossing) near Cooma.

A new and dedicated infrastructure program over the next five years will fund the necessary upgrade of the network, commencing with the priority HML deficient bridges, as shown in Figure 6.17. Over the next 30 years, \$200 million or 8,000 heavy vehicle trips will be saved in NSW by replacing and upgrading these bridges.

Transport for NSW, in consultation with RMS, has also prepared a submission to Infrastructure Australia seeking half of the \$290 million program.

Figure 6.17 Bridges for the Bush program



The assessment of town bypass proposals would consider:

- The road hierarchy classification of the road, as higher-order roads carry higher levels of through-traffic and generate greater benefits than where through-traffic is much lower. Under this system, the Hume Highway (M31) and Pacific Highway (M1) have the highest classification, and roads such as the Silver City Highway (B79) and Kings Highway (B52) have the lowest road hierarchy classification
 - Proportion of through-traffic for both light and heavy vehicle traffic
 - Time travel time benefits
 - Town or regional centre size – large towns tend to have a lot of local trips and turning movements which can impact through-traffic and create localised congestion, and through-traffic, as a proportion of all traffic, is lower but could still be a reasonable number of vehicle trips
 - Difficult terrain, major rivers and urban development impact the project cost and influence the decision to prioritise a particular bypass
 - Dispersed urban development limits town bypass options as does the nature of development adjacent to an existing corridor. Our approach would be to provide a bypass on higher order roads adjacent to commercial activity (shops and businesses).
- **Inner bypass** – where existing streets within the town are upgraded and used to provide an alternative to the main street. Typically these are considered where traffic volumes and the proportion of through-traffic is lower. Sensible urban planning can prevent the corridor from unsuitable development. Further urban growth may lead to the need for a full bypass in the future.
 - **Heavy vehicle bypass** – typically considered where heavy vehicles can be routed through industrial areas. Similar to an inner bypass, this type of bypass can be an intermediate solution for a full bypass.
 - **Bypass alternative** – in cases where land use change can reorient and develop the town away from the through road. This alternative will take time to occur and requires strong land use planning controls.

A detailed plan for NSW roads and the Regional Transport Plans will include stakeholder and community input into consideration of town bypasses. The planning work will take into account forecast road traffic demand that establishes need and possible route options. Traffic and engineering investigation, together with economic and urban planning elements, combine to allow prioritisation of proposed bypasses.

The Long Term Transport Master Plan will be supported by dedicated Regional Transport Plans for each of NSW's 10 regions. These will detail the transport challenges and solutions for each region. Specific strategies are also being developed to improve regional and interstate connections: a NSW Roads Strategy, a Country Passenger Rail Services Strategy and a Major Airports Plan.

The type of bypass is also a key consideration. Typically bypasses can be considered as:

- **A full bypass** – where the corridor is away from town and typically where there are high traffic volumes and a high proportion of through-traffic. The main street should not rely on business from through-traffic and typically full bypass options are the most expensive.

6.9 Your region

The Long Term Transport Master Plan will influence land use patterns and the shape of regional cities, towns and communities over the next two decades. The Master Plan will fit within a spatial framework for regional NSW that defines how growth, demographic and other changes will be managed. It will complement the regional strategies being prepared by Department of Planning and Infrastructure that will manage long term growth and land use change across NSW.

Transport for NSW will soon commence work with the Department of Planning and Infrastructure and local councils to prepare detailed Regional Transport Plans.

Regional Transport Plans will be linked to land use and will identify important future corridors, protect existing corridors from incompatible adjacent development and coordinate the release of new land with the delivery of appropriate transport infrastructure or promote development where strong transport connections currently exist.

The Master Plan will set principles and provide an overarching direction for transport across NSW. While some specific regional initiatives have been identified in the Master Plan, greater detail is required for implementation at the local level.

Regional Transport Plans will:

- Translate the higher-level principles and strategies from the Long Term Transport Master Plan to actions taken at a local level
- Address identified transport demands and priorities at the regional and local levels
- Support early transport provision for new residential areas in regional NSW, particularly in our major regional cities and centres
- Ensure the right transport links are in place to support and enable regional economic development.

Regional Transport Plans will address local transport needs and priorities, and integrate transport planning with land use planning across regional NSW. Figure 6.18 lists some of the Long Term Transport Master Plan initiatives by region to meet the needs of population and employment growth and provide a mechanism for preserving future corridors.

The strategies, programs and projects discussed for each region will be finalised during the development of the Regional Transport Plans.

Figure 6.18 Long Term Transport Master Plan initiatives by region



Hunter – Newcastle

The Hunter region includes Newcastle and the regional centres of Maitland, Muswellbrook, Forster-Tuncurry and Singleton.

The coal industry, with its supporting infrastructure requirements, and wineries and tourism are the main drivers of the regional economy. Total employment is around 219,100. Other important employment sectors are retail (13 percent of regional employment), health and social assistance (13 percent), and manufacturing (11 percent). The region is experiencing strong growth in mining, particularly coal for export which will increase demand for rail freight. Local manufacturing also has strong freight distribution needs. Effective transport services to and from this region provide an opportunity to grow the tourism opportunities provided by wineries and region's proximity to Sydney.

The region is linked by an extensive road network and public transport which connects people to centres. The major roads are the Golden Highway (B84), F3 Freeway (M1), Pacific Highway (M1), Lakes Way, New England Highway (A15), Bucketts Way and Hunter Expressway (M15), which is under construction. The main rail lines are the Main North Line (freight and passenger), the North Coast Line (freight and passenger), and the Hunter Valley Coal Chain (freight).

The following sections outline the actions for the Hunter – Newcastle and Hunter – Regional.

Short term

- The Hunter region's growth will occur around Newcastle, Lake Macquarie and Maitland. The Growth Centre Roads Program will support this growth, including delivering the Newcastle Inner Bypass, Newcastle Link Road and Newcastle Road corridor improvements. Capacity improvements will improve travel time reliability and support an expansion of bus services.
- We will strengthen bus operations in the region's major centres, as well as connections between these centres through network and timetable reviews in the context of the current

Outer Metropolitan Bus Service Planning Guidelines. Emerging customer needs will be reflected in all bus contracts.

- To increase the proportion of commuter trips on public transport to Newcastle centre, we will progressively implement Strategic Bus Corridors to provide high quality bus services that reflect demand and land use change. The strategic bus corridors will be modelled on the successful implementation of these services within Sydney.
- *Sydney's Rail Future* and the development of the Country Passenger Rail Services Strategy and the creation of NSW Trains will improve rail services between Newcastle and Sydney and benefit the Central Coast. We will reduce travel time between Newcastle and Sydney.
- We will develop a Port Growth Plan for the Port of Newcastle. We will work with Newcastle City Council on a transport strategy for the CBD that will assist in meeting the NSW 2021 target of increasing commuter trips by public transport to 20 percent by 2016.
- Northern Sydney Freight Corridor Stage 1 will boost freight capacity and improves train operations for inter-city passengers and freight trains.

Medium to longer term

- We will continue our investment in the Newcastle road network to address capacity constraints that impact on travel time reliability and public transport operations.
- We will continue to deliver the Newcastle Inner Bypass.
- We will continue to enhance and expand bus services and Strategic Bus Corridors to reflect demand and land use change.
- The development of the Newcastle Rail Bypass and Northern Sydney Freight Corridor Stages 2 and 3 will add freight capacity, reduce freight transit times and alleviate key level crossing delays.

Hunter – regional

Short term

- The Hunter Expressway (M15) will provide a new east-west connection between Newcastle and the growing Lower Hunter and is one of the biggest road infrastructure projects to be built in the Hunter. It will alleviate road congestion on the lower New England Highway (A15) between Newcastle and Maitland and provide greater reliability for freight and passenger travel on the New England Highway (A15).
- In conjunction with the Hunter Expressway (M15), we will upgrade the link between the F3 Freeway (M1)/Hunter Expressway (M15) interchange and Broadmeadow in Newcastle.
- We have committed \$15 million to support Lake Macquarie City Council to deliver improved road connections at Glendale, improving access to the Stocklands retail centre and surrounding growth areas for all modes of transport, including buses, taxis and private vehicles.
- Enhanced bus services into the Lower Hunter will complement the enhancements made to the Newcastle bus system. The renewal of bus contracts will provide an opportunity to review and update Bus Service Planning Guidelines to deliver enhanced services in the region's centres that reflect changes in the urban environment and that are consistent with emerging customer needs.
- We will identify opportunities to enhance local bus services in the Upper Hunter to provide a real alternative to private vehicle travel, with a focus on improving travel times, service frequency and integration, passenger information and comfort.
- The competition for track access in the Hunter Valley is acute and will require resolution if rail is to fulfil its potential in the region. We will work with stakeholders to develop an agreement that supports the timely and efficient movement of coal and freight, and supports our objectives for passenger rail.

- We will consider how best to reduce freight movements in Scone, including evaluating various options to eliminate the rail level crossing between the New England Highway (A15) at Kelly Street and the Main Northern Railway Line at Werris Creek.

Medium to longer term

- To ensure freight moves efficiently, we will consider extending the F3 (M1) to Raymond Terrace. We will also consider how best to reduce the impacts of freight movements on centres such as Muswellbrook and Singleton.
- New England Highway (A15) upgrades will address safety and congestion issues as they emerge.
- We will implement improvements on the New England Highway (A15) at Scone and Aberdeen to improve pedestrian facilities and create safer environments.
- We will protect and plan for the construction of the strategic rail freight corridor at Fassifern and the Hexham rail bypass.
- We will work with community groups, regional transport coordinators, local councils and local bus operators to continue to enhance the public transport system.
- We will increase public transport service levels and coverage as new residential areas and associated demand develops, including around Branxton, Huntlee, Maitland, Catherine Hill Bay and North Cooranbong.
- We will develop a strategy to address the constraints on rail operations in the Lower Hunter.
- The Bridges for the Bush program will upgrade or replace timber bridges at Glennies Creek, Williams River and the Patterson River.

Central Coast

The Central Coast has outstanding environmental amenity and a diverse industry base with a strongly growing population, particularly in the north around Wyong, which requires good access to local centres and to Sydney. Major employment sectors are retail, health and social assistance, and manufacturing. The major roads are the Central Coast Highway (A49), F3 Freeway (M1) and Pacific Highway (M1). The main rail line is the Newcastle and Central Coast Line (freight and passenger).

Over the next 20 years the Central Coast is expected to grow strongly. The higher than State average share of people over 65 provides a transport challenge. Car dependency in the Central Coast is very high. Only four percent of the Central Coast population use public transport for the commute to work, of which train trips to Sydney are the major component. Over 25 percent of the workforce travels outside the region to work.

The road and rail links to Sydney are critical to the area for access to employment, services and social activities. There is a need to ensure the region develops a transport network that matches its growth in population.

Short term

- The Central Coast is very constrained geographically and the State road network is critical. Investment in the road network will reduce congestion, improve travel time reliability and facilitate enhanced bus operations. This investment will focus on the Pacific Highway (M1), Central Coast Highway (A49), Terrigal Drive, Manns Road and Sparks Road.
- Improvements to interchanges on the F3 (M1) will support the effective operation of the motorway.
- The Regional Transport Plan and the renewal of bus contracts will provide an opportunity to investigate better accessibility through enhanced services and reflect changes in the urban environment. Options will be explored to deliver improved public transport services.

This will occur through network and timetable reviews in the context of the Outer Metropolitan Bus Service Planning Guidelines. We will consider improving Strategic Bus Corridors servicing and connecting the main centres of Gosford, Wyong and Terrigal to reflect demand and land use changes.

- *Sydney's Rail Future* and the creation of NSW Trains will improve rail services between the Central Coast, Sydney and Newcastle. These rail services will be supported by an integrated bus service. We will reduce travel time between Gosford and Sydney.
- We will deliver a new transport interchange to support the development of the Warnervale town centre.

Medium to longer term

- We will widen the F3 (M1) between Tuggerah and Doyalson to improve the efficiency of the interstate road network, improve travel time and reduce transport costs.
- Completing Stage 1 of the Northern Sydney Freight Corridor will reduce interaction between freight and passenger services and result in more reliable operations. In the long term, construction of Stage 2 will commence if current traffic growth continues.
- We will continue our investment in the urban road network to address capacity constraints that impact on travel time reliability and public transport operations.
- We will ensure the North Wyong employment zone has an appropriate level of bus service. We will also provide appropriate public transport services as required to support Warnervale town centre.

Illawarra – Wollongong

The Illawarra region includes Wollongong and the major centres of Shellharbour and Kiama. Over 90 percent of the population lives in the major centres. There are logistics and port-related industries at Port Kembla. Significant employment sectors are manufacturing, retail, health and social assistance, and education. The major roads are the Illawarra Highway (A48), Picton Road, Princes Highway (A1) and F6 Freeway (M1). The main rail lines are the South Coast Line (freight and passenger) and the Moss Vale to Unanderra Line (freight).

The Illawarra will experience population growth and demographic change. The transport system needs to evolve to meet the requirements of both new residential areas and new employment. Good links between Sydney and the region are required to support population growth and tourism. The Princes Highway (M1) section upgrades and the construction of bypasses will assist travel between Sydney and the region.

The following sections outline the actions for Wollongong and the wider Illawarra region.

Short term

- The Growth Centres Roads Program will continue to deliver a road network that supports strong growth. We will continue to improve the F6 (M1), Princes Highway (M1) and Mount Ousley Road to boost capacity, improve travel time, support public transport operations and provide efficient freight connections to Port Kembla.
- We will strengthen bus operations in major centres, as well as connections between these centres. This will occur through the development of the Regional Transport Plan and network and timetable reviews in the context of the Outer Metropolitan Bus Service Planning Guidelines. This will reflect emerging customer needs in all our bus contracts.
- The timetable changes being investigated for *Sydney's Rail Future*, the creation of NSW Trains and modern signalling technology will deliver faster travel times and greater travel reliability between Wollongong and Sydney. Our goal is to reduce public transport travel time between Wollongong and Sydney. We will support these rail services with an integrated bus service.
- We will deliver the Port Kembla Growth Plan to plan for Port Kembla's future trade requirements and ensure its long term access (see Chapter Seven).
- Work with Wollongong Council on a plan for achieving the NSW 2021 public transport mode share target by 15 percent (by 2016) for Wollongong CBD and on a transport strategy for key precincts such as West Dapto, as part of the Illawarra Regional Transport Plan.

Medium to longer term

- We will continue to enhance and expand bus services and Strategic Bus Corridors to reflect developing demand and land use changes.
- Future inter-city train services will focus on the needs of longer distance customers rather than modifying short distance trains.

Illawarra – Regional

Short term

- We will upgrade the Princes Highway (A1) between Gerringong and Bomaderry, which would include the proposed Foxground and Berry bypass providing a four-lane divided highway (two lanes in each direction) with median separation for 11.6 kilometres between Toolijooa Road and Schofield Lane. The upgrade will provide enhanced freight connectivity to Port Kembla.
- We will upgrade Picton Road to support safer operations.
- As part of the NSW Government's Transport Access Program, a new train station will be built at Flinders and improvements will also be carried out at Dapto, Albion Park, Wollongong, Kiama and Gerringong Stations.

Medium to longer term

- We will continue our investment in the urban road network to address capacity constraints that impact on travel time reliability and public transport operations.
- Transport services will be provided as early as possible in new development areas, with an appropriate level of bus service provided to West Dapto. This will support and reflect our vision for connected regional communities.
- We will seek to establish connections to the South West Growth Centre, The Southern Highlands and the South Coast – with upgrade works to Picton Road, the Princes Highway (A1) and the Illawarra Highway (A48) as required.
- We will deliver previously identified regional road upgrades to support the planned growth around the new release areas of West Dapto, Calderwood and Tallawarra, including the widening of the F6 (M1) and sections of the Princes (A1) and Illawarra (A48) Highways and a number of new ramps and interchanges on the F6 (M1).

Northern Rivers

The Northern Rivers includes the regional centres of Tweed Heads, Lismore, Ballina, Casino and Byron Bay. The region has both high employment and population growth, supported by migration from Sydney, regional NSW and South East Queensland. The high population and employment growth in South East Queensland attracts Northern Rivers residents across the border as commuters. The growth of the Gold Coast-Tweed major city will also create strong demand for transport connections. The concentration of employment in service industries in Tweed and Lismore is increasing local congestion.

The regional economy is focused on the services sector including retail, health and social assistance, education, accommodation and food. The manufacturing sector is also a significant employer in the region.

The major roads are the Bruxner Highway (B60), Pacific Highway (M1) and Summerland Way (B91). The main rail line is the North Coast line.

The Northern Rivers has an ageing population that needs to access health and aged care services in regional centres. The population in the Northern Rivers also has a high proportion of social/economic disadvantage, where many require access to health care, as well as education and employment.

The tourism sector is one of the strongest industries within the region, especially around Byron Bay. During the peak season there is a marked seasonal impact on road use and local transport services.

Short term

- We will complete the duplication of the Pacific Highway (M1) and widening works and upgrades to the Bruxner Highway (B60).
- We will release the Casino to Murwillumbah rail corridor investigation and consider its recommendations.

- The renewal of bus service contracts within the next five years will be an opportunity to improve outcomes for bus customers in the region. We will consider possible new routes, additional services and greater integration of services to give the region a higher level of bus services and take into account customer priorities.
- We will continue to work with the Queensland Government on cross-border issues that relate to transport regulation and infrastructure that supports travel into South East Queensland, such as cross-border bus services or Gold Coast Airport.

Medium to longer term

- Population and employment growth in the region will increase pressure on main arterial roads. We will commence the necessary road network planning for upgrades to support the growth of Lismore, Ballina and the Tweed Coast, and address congestion and capacity issues as they emerge.
- We will provide an additional crossing of the Clarence River at Grafton that will improve access across the region and provide an alternative route to the Pacific Highway (M1).
- We have identified the Tabulam Bridge across the Clarence River for replacement in part two of the Bridges for the Bush program.
- We will improve bus services, including frequency and coverage of the bus network, as an ongoing priority to reduce social disadvantage, particularly for a growing and ageing population. We will work with local operators and the community to consider possible new routes, additional services and greater integration to create better accessibility for the Northern Rivers. This will also include potential new connections to improve integration between the Northern Rivers and South East Queensland.

Mid North Coast

The Mid North Coast region includes the regional centres of Port Macquarie, Coffs Harbour, Grafton and Taree. This region has one of the fastest ageing populations in NSW, with the number of people over 65 expected to double in the next 25 years. They will require much greater access to health and aged care services in regional centres.

The main industry sectors are retail, health and social assistance, accommodation and food services, education and manufacturing. The major roads are the Pacific Highway (M1), Oxley Highway (B56), Waterfall Way (B78), Summerland Way (B91) and Gwydir Highway (B76). The main rail line is the North Coast Line (freight and passenger).

The continued growth forecast for the Mid North Coast over the next 20 years will demand a range of transport responses. For example, transport planning will be essential in any new low density suburban development to ensure connections into the regional centres. There is increased demand on road use and local transport services in the tourism peaks.

Short term

- We will complete the duplication of the Pacific Highway (M1) running through the region. We will also complete upgrades to sections of the Oxley Highway (B56) between Port Macquarie and Wauchope.
- We have completed planning for the Coffs Harbour bypass and will continue progressing land acquisition for the project.
- We will investigate opportunities to improve accessibility through stronger bus operations in the region's major centres and improve connections between regional centres in line with our vision of connected regional communities. The Country Passenger Rail Services Strategy and bus operator contract

renewals provide opportunities to create a service structure that better meets the needs of communities between Taree and Grafton. We envisage a system that operates services linking larger centres along the Pacific Highway (M1), supported by local services within each centre and connections to smaller areas. An integrated system will require suitable interchange locations, which will need to be identified and developed.

Medium to longer term

- We will continue to invest in the Mid North Coast road network to address localised congestion as demand increases in the future. This will also improve bus travel times.
- We will work with community groups, regional transport coordinators, local councils and local bus operators to enhance the public transport system to meet the needs of the region's residents and businesses.
- We will provide an additional crossing of the Clarence River at Grafton to support Grafton as a major regional centre and relieve congestion on the existing bridge.
- The Bridges for the Bush program part two will upgrade the timber bridge over Sportsman Creek Bridge at Lawrence.
- Planning for a Coffs Harbour bypass has been completed and a route identified. We will deliver the Coffs Harbour bypass in the longer term.

New England

The New England region includes the regional centres of Tamworth, Armidale, Inverell, Moree, Narrabri and Tenterfield. While population growth is expected in Tamworth, the population of the region is expected to remain relatively stable. An ageing population and areas of social disadvantage present future transport challenges in ensuring access to services and to counteract isolation. Agriculture, forestry and fishing have the highest employment with retail, health and social assistance, education and manufacturing also being significant contributors to the local economy.

The major roads are the Newell Highway (A39), Gwydir Highway (B76), New England Highway (A15), Oxley Highway (B56), Thunderbolts Way, Bruxner Highway (B60), Fossickers Way (B95) and Kamilaroi Highway (B51). The main rail lines are the Main North Line and the network of branch lines that carry freight.

Large demand for freight transport from the agricultural industries is impacted by seasonal fluctuations and crop sizes. Demand for coal movements is also increasing, particularly from the Gunnedah Basin, to export facilities at the Port of Newcastle.

Short term

- We will focus on road network upgrades for the New England Highway (A15) near Tamworth to address localised congestion.
- Additional overtaking lanes will be provided on the Newell Highway (A39) to improve overtaking opportunities and safety.
- We will complete heavy-duty pavement construction on the Newell Highway (A39) between Narrabri and the Queensland border.
- The renewal of bus contracts within the next five years offers an opportunity to improve outcomes for bus customers in the region. We will consider whether more flexible bus services tailored to the region's needs will reduce reliance on cars.
- A strong focus on driver fatigue within our new *Road Safety Strategy for NSW* means we will provide additional rest areas, as well as upgrades to some rest areas to a better standard. This

will be required on the Newell Highway (A39) to accommodate High Productivity Vehicles (HPVs), as well as the New England Highway (A15).

- Growth in heavy vehicle and long distance traffic is likely in the medium to longer term in Moree and Tenterfield. Within the next five years, we will deliver stage two of the Moree Bypass and undertake the planning study for the Tenterfield bypass to fully assess these issues and identify preferred bypass routes.

Medium to longer term

- Population in the region is forecast to decline, but there is likely to be a move from smaller settlements to the larger centres. This may result in localised congestion, particularly around Tamworth. Road network improvements will be identified and delivered at the appropriate time.
- General road freight will grow over the next 20 years, which will impact on the New England (A15), Newell (A39) and Oxley (B56) Highways. Road upgrade works to address access and safety issues will be undertaken as required.
- We will work with community groups, regional transport coordinators, local councils and local bus operators to continue to enhance the public transport system. Ongoing monitoring of bus contracts will offer the opportunity to review operational guidelines and address issues that emerge.
- A high proportion of the coal freight growth in the Gunnedah basin will be transported by rail. There will also be a significant increase in road freight. We will work with the mining industry and local councils to ensure the road network has the appropriate capacity to service the industry's needs.
- The Bridges for the Bush program identifies Tulludunna Bridge on the Kamilaroi Highway (B51) at Wee Waa and for replacement.
- We will also complete upgrades to sections of the New England Highway (A15) at Bolivia Hill south of Tenterfield.
- We will work with and assist Gunnedah Shire Council to build a rail overbridge at New Street.

Western

The Western region is vast. It occupies about 39 percent of NSW or over 300,000 square kilometres. It is characterised by very long distances between settlements and a sparse population. More than half of the population in the Western region lives in remote areas, which presents unique transport challenges, especially in areas where social disadvantage and isolation are endemic. The mining centre of Broken Hill in the far west and the regional centres of Cobar, Lightning Ridge, Coonamble, Bourke and Walgett are the main centres in this region. Agriculture and forestry is a major industry sector for the region with health and social assistance, retail, education and public administration sectors contributing to regional employment.

The transport network in the Western region comprises over 3,000 kilometres of state roads. The major roads are the Silver City Highway (B79), Mitchell Highway (A32/B71), Kidman Way (B87), Kamilaroi Highway (B51), Castlereagh Highway (B55), Gwydir Highway (B76), Barrier Highway (A32), Cobb Highway (B75), Lachlan Valley Way and Oxley Highway (B56). The main rail lines are the Main Orange to Broken Hill Line (freight and passenger), and an extensive branch line network for freight movements.

Short term

- The vastness of the Western region poses many challenges. Road-based transport will remain the primary mode for most travel in the region. The Mitchell (A32) and Barrier (A32) Highways are important to the economic viability of the region. Our focus will be on maintaining the region's roads to a suitable standard.
- Mining will remain a major industry in the Western region, particularly around Broken Hill. We will support a heavy vehicle haulage bypass of Broken Hill to improve travel efficiency for the mining and agriculture industries.
- The Western region has the highest use of community transport in regional NSW per capita. We will continue to support community transport services for the region and make appropriate resources available.

Medium to longer term

- We are committed to providing accessibility and equity to people in the Western region by supporting good transport access to Broken Hill, Dubbo, Sydney and Newcastle for goods and services. Our longer term focus will ensure realistic travel options exist, whether by air, rail or bus. This will require continued investment to maintain transport infrastructure and services to a suitable standard.
- Road safety infrastructure assessments for Aboriginal communities have identified road safety issues on state roads, the local road network and roads in Aboriginal communities that connect to the nearby towns with access to goods and services. A program of infrastructure works will include sealing roads, installing delineation (such as line marking and signage) and building pedestrian facilities.

Central West

The Central West is a major agricultural, industrial and commercial region, spanning the Central Tablelands and plains. It includes the regional centres of Orange, Dubbo, Bathurst, Lithgow, Parkes, Forbes and Cowra. The Central West has significant employment in retail, agriculture and forestry, health and social assistance, education and manufacturing sectors.

The major roads in the region are the Golden Highway (B84), Newell Highway (A39), Mid Western Highway (B64), Great Western (A32) and Mitchell (A32) Highways, Lachlan Valley Way, Bells Line of Road (B59) and Castlereagh Highway (B55). The main rail lines are the Main West Line (freight and passenger), the Main Orange to Broken Hill Line (freight and passenger) and the network of freight branch lines.

The region has major interstate corridors that need to be maintained, including Sydney-Adelaide-Perth (road and rail) and Melbourne-Brisbane (Newell Highway - A39). Access to and across the Blue Mountains is an ongoing priority for the region.

In October 2012, a new daily Bathurst to Sydney return rail service was introduced. This express service provides a fast and reliable rail link between the growing Bathurst region and Sydney.

Short term

- Our road network program will focus on the Newell Highway (A39) upgrade including the Trewilga realignment near Peak Hill. We will also complete work to address localised congestion on the Great Western Highway (A32) in the Blue Mountains and in Kelso and on the Mitchell Highway (A32) in Bathurst, Orange and Dubbo. We completed the study into the Bells Line of Road in October 2012 and will protect the corridor for future transport needs.
- We will work on the realignment of Goanna Hill on the Mitchell Highway (A32) near Molong.
- We are improving train services with the introduction of a daily return service between Bathurst and Sydney.
- The development of the Central West Regional Transport Plan and the renewal of bus contracts within the next five years offer opportunities to seek better outcomes for bus users in the region. As part of our commitment to increasing public transport use to reduce reliance on cars, we will consider whether more flexible bus services tailored to the region's needs will achieve better outcomes.
- We will conduct heavy-duty pavement upgrades to accommodate heavy vehicle traffic on the heavy vehicle bypass at West Wyalong.

Medium to longer term

- As traffic levels increase on the Newell Highway (A39), further upgrades and additional overtaking lanes will be required to alleviate constraints and unsafe operations. Similar actions will be required on the Mitchell (A32), Great Western (A32) and Mid Western (B64) Highways to cater for growing travel between Bathurst and Sydney and Bathurst and Dubbo.
- We will work with community groups, regional transport coordinators, local councils and local bus operators to continue to enhance the public transport system so that it meets the needs of the region's customers and businesses. Ongoing monitoring of bus contracts will offer the opportunity to review operational guidelines and address issues that emerge.
- We will provide pedestrian facilities in Cowra on the Mid Western Highway (B64) to improve pedestrian access and safety in the town centre.
- We will enhance town and regional bus services to increase access to the key regional centres of Bathurst, Orange and Dubbo and to connect smaller communities.
- The Bridges for the Bush program part two will upgrade three timber bridges in the region: McKanes Bridge over the Cox River, Warroo Bridge across the Lachlan River and Gooloogong with the Holman Bridge on Nanima Road.

Murray–Murrumbidgee

The Murray–Murrumbidgee region adjoins the border with Victoria. It includes the regional centres of Wagga Wagga, Albury, Griffith and Young. Agriculture is the highest employment sector for the region with retail, manufacturing, health and social assistance and education also contributing to the regional economy.

The major roads are the Silver City Highway (B79), Sturt Highway (A20), Cobb Highway (B75), Mid Western Highway (B64), Newell Highway (A39), Olympic Highway (A41), Hume Highway (M31), The Kidman Way (B87), Burley Griffin Way (B94) and Riverina Highway (B58). The main rail lines are the Main South line (freight and passenger), and a number of freight branch lines.

Short term

- We will finish the duplication of the Hume Highway (M31) by completing the remaining bypass at Holbrook.
- On the Newell Highway (A39), we will complete upgrades with additional heavy vehicle rest areas and addressing localised capacity constraints.
- The Country Passenger Rail Services Strategy will examine how to improve rail services to Griffith and create better connections to regional centres as well as to Sydney, Canberra and Melbourne.
- The development of a Regional Transport Plan and renewal of bus contracts within the next five years offers opportunities to build for the future and achieve better outcomes for bus users in the region taking into account emerging customer needs. As part of our commitment to increasing public transport use to reduce reliance on cars, we will consider whether more flexible bus services tailored to the region's needs will achieve better outcomes.
- We know that people in the region travel across the border into Victoria and ACT to carry out personal business. Improving transport options is complicated by the various jurisdictional regulatory arrangements and operations. The NSW Government will continue to work with the Victorian and ACT Governments to make travelling to Melbourne, Canberra and Victoria easier and more convenient.
- We will realign the Newell Highway (A39) at Grong Grong.

Medium to longer term

- We will manage congestion and safety on the major road corridors of the Newell Highway (A39), Sturt Highway (A20) and the Mid Western Highway (B64) through upgrades such as additional overtaking lanes and heavy vehicle rest areas when safety concerns arise.
- We will work with community groups, regional transport coordinators, local councils and local bus operators to continue to enhance the public transport system. Ongoing monitoring of bus contracts will offer the opportunity to review operational guidelines and address issues that emerge.
- We will identify and deliver options to improve walking and cycling infrastructure in the region's major centres, in particular additional river crossings.
- The Bridges for the Bush program part one has identified replacement of the Kapooka Bridge on the Olympic Highway (A41) and (in conjunction with the Victorian Government) the Murray River Bridge at Echuca on the Cobb Highway (B75).
- We will deliver the Bridges for the Bush program part two, with upgrade or replacement of bridges at Tooleybuc over the Murray River and Swan Hill over the Wakool River.
- We will investigate upgrades to Gocup Road to accommodate modern freight demands and address vehicle safety requirements.

Southern

The Southern region covers the areas south of Mittagong and surrounds the ACT. It includes the regional centres of Queanbeyan, Nowra-Bomaderry, Mittagong-Bowral-Moss Vale and Goulburn and is growing strongly. The main industries for the region are retail, health and social assistance, accommodation and food services, manufacturing and education.

This region has been experiencing an in-migration of retirees, and an out-migration of young people, resulting in an ageing population. The population aged over 65 is expected to increase by 2031. This means that access to health and aged care services will become more important, and community transport will have a major role. Growth rates across the region are uneven. In some areas the population fluctuates seasonally, particularly along the coast and in the Snowy Mountains, requiring servicing by quality road and good public transport connections. A number of locations along the coast are isolated and not serviced by a major regional centre.

The major roads are the Barton Highway (A25), Federal Highway (M23), Hume Highway (M31), Princes Highway (A1), Monaro Highway (B23), Kings Highway (B52), Snowy Mountains Highway (B72), Main Road 92, Alpine Way and Imlay Road. The rail lines are the Main South Line (freight and passenger), the Goulburn to Canberra Line (freight and passenger) and the Moss Vale to Unanderra (freight).

Short term

- Upgrades to the Princes Highway (A1) between Gerringong and Bomaderry will increase capacity, improve traffic flow, reduce travel time and improve road safety. The upgrade will provide enhanced freight connectivity to Port Kembla.
- Princes Highway (A1) improvements to safety and capacity will strengthen the connections between centres along the coast from Nowra to Eden. We will develop a system that offers these communities a high quality bus system with improved levels of operation.
- We know that people in the region travel across the border into Victoria and ACT to carry out personal business. Improving transport options is complicated by the various jurisdictional regulatory arrangements and operations. The NSW Government will continue to work with the Victorian and ACT Governments to make travelling to Melbourne, Canberra and Victoria easier and more convenient.
- We will strengthen bus operations in the region's major centres, as well as improve connections between regional communities. The Country Passenger Rail Services Strategy and bus operator contract renewals provides opportunities to create a service structure that meets the needs of communities along the South Coast, and in Queanbeyan and the Southern Highlands. The bus contract renewal process offers the opportunity to reflect emerging customer needs in new bus contracts. We will plan a system that operates services linking larger centres along the Princes (A1), Kings (B52) and Hume (M31) Highways, supported by local services within each centre and connections to smaller outlying areas. An integrated system will require suitable interchange location, which will need to be identified and developed.

Medium to longer term

- The Rural Highway program will continue investment in the Princes (A1), Barton (A25), Kings (B52), Federal (M23), Monaro (B23) and Snowy Mountain (B72) Highways to address capacity constraints and unsafe areas as they emerge. The environmental assessment for Foxground and Berry bypass has been proposed.
- We will identify and provide improvements to the corridor between Mittagong and Bowral to reduce congestion and provide safer facilities for walking and cycling.
- We will improve pedestrian facilities in Nowra on the Princes Highway.
- We will work with community groups, regional transport coordinators, local councils and local bus operators to continue to enhance the public transport system to meet the needs of the region's residents and businesses. We will continue to integrate local and regional buses with rail services to create a seamless public transport network across the region.
- We will protect a corridor between Sydney and Canberra so high speed rail can be delivered when required.
- The Bridges for the Bush program part one identified the Bemboka River Bridge on the Snowy Mountains Highway (B52) for upgrade to create a HML route between the coast and the Hume Highway (M31).

7



SUPPORTING EFFICIENT AND PRODUCTIVE FREIGHT

CHAPTER SUMMARY

Our network challenges

This chapter identifies a number of major challenges facing the freight network over the next 20 years, as it prepares to service significant increases in demand, and increasingly globalised supply chains and industries.

Freight logistics is an enabler of almost all economic activity in NSW. With the NSW freight task set to almost double by 2031, the efficient performance of the NSW freight network will have a direct bearing on the transport and other costs we pay for goods and raw products, and on the competitiveness and productivity of NSW.

The transport challenges this chapter addresses are to:

- Increase network efficiency by fixing bottlenecks on road and rail networks, improving coordination, ensuring better regulation, better using the existing network and removing obstacles to improved freight productivity
- Grow freight network capacity to meet the future freight task through targeted investment that expands road and rail capacity and supports economic growth
- Manage the community and environmental impacts of freight to promote sustainability.

Taking action

The Long Term Transport Master Plan proposes better use of existing assets, investment in new infrastructure, and approaches that deliver a more level playing field through balanced policy and regulation.

The highlights of our response are:

- Finalise and implement the new **NSW Freight and Ports Strategy**
- **Identify future demand** for network capacity so that revenue streams can be identified to fund expansion of the network or new infrastructure

- **Develop Port Growth Plans** for NSW Ports with the Port Corporations and the new long term lessees of Port Botany and Port Kembla. The focus will be on driving efficiencies, transparency and investment, and implementing a market-driven approach to port operations for identified ports
- **Prepare an action plan for the Port Botany Precinct**
- **Establish** NSW Cargo Movement Coordinator
- **Develop a project pipeline to support network capacity**, with a consistent approach to evaluating freight projects on road and rail networks together with ports and terminals
- **Undertake a pilot of next generation Higher Productivity Vehicle (HPV) access** on the Hume Highway (M31) aimed at safely managing growing freight volumes on NSW's most heavily used road corridor, and improve last mile access for critical freight journeys
- **Implement rail freight infrastructure enhancements** to increase the share of freight carried on the rail network, with new investment in rail pinch points, measures to improve rail competitiveness and the development of a metropolitan intermodal terminal network
- **Protect strategic freight corridors** to support growing population centres and production regions in NSW, increase separation between passenger and freight movements, and integrate land use and transport development
- **Implement a new measurement and reporting framework** to promote transparency and allow assessment of network performance by providers and users
- **Develop a package of measures to grow off-peak freight movements** to better use the transport network and reduce congestion and conflicts with passenger movements
- **Protect strategic freight corridors from urban encroachment** to enable the freight network to grow alongside population centres and productive regions in NSW.

Our transport challenges

7.1 The freight customer

Customer needs are at the centre of our freight and ports strategy. Freight customers include industry participants such as port operators, rail freight operators and road freight carriers, and end-users connected by the transportation of goods or raw materials, such as cargo owners, business customers and end users of freight.

Different freight customers have different freight requirements, depending on the characteristics of their supply chains. For example, the horticultural industry produces around 100 key commodities, such as vegetables, fruit, and nuts. The freight network enables this \$1.3 billion industry to sell

its product in domestic and international markets, by transporting goods from regions such as the Murrumbidgee Irrigation Area and the north coast, mostly by road, ship or air freight. Produce is seasonal, and is perishable, meaning that timely and direct transport is a priority.

While different freight customers have different needs, all freight customers want more efficient journeys and reliable journey times, which can impact on the costs of doing business, and the costs of receiving or sending goods. Freight customers value reliable, secure and capable transport networks to support vessels, vehicles and rolling stock.

Freight industry regulation and the freight network must be designed to meet customers' needs. To do this, we will need to:

- **Increase network efficiency** by fixing bottlenecks on road and rail networks, ensuring better regulation, modernising the network, and removing obstacles to improved freight productivity
- **Grow future freight capacity** to meet the growing freight task through targeted investment that expands road and rail capacity to support the growth of critical industries and by making better use of the existing network
- **Manage the community and environmental impacts** of freight to promote sustainability.

NSW's diverse economy means that our transport system will have to accommodate the different and changing needs of a range of industries. While some of these industries share common transport needs (such as the need to move large volumes of heavy freight along particular routes), others have specific needs that may require fit-for-purpose infrastructure.

THE ROLE OF GOVERNMENT IN FREIGHT

The role of the NSW Government in freight is to establish a market-driven regulatory framework to support an efficient and competitive freight system and remove obstacles to productivity increases.

The NSW Government also plays a role in strategic planning, in facilitating private investment, in providing services and infrastructure where the market will not deliver solutions, and coordinating economic activity where there are multiple commercial players involved.

A competitive freight industry in NSW requires a light touch approach where possible, and also relies on a competitive *national* freight industry. That is why efforts to reduce the burden of compliance and regulatory inconsistency across jurisdictions must remain a focus for governments across Australia. This will deliver improved national productivity and provide the right environment for investment. The NSW Government is committed to the harmonisation of regulation, and the establishment of single national regulators for rail, heavy road vehicles and maritime safety.

7.1.1 The freight network

Freight customers rely on a network of transport infrastructure across NSW to move raw materials and finished goods. Government primarily provides this physical network, and governs its access arrangements, which is why the decisions and actions of government affect the performance of the logistics task across the economy.

The NSW freight network is a system of rail lines, roads, ports, Sydney Airport and regional airports, and intermodal terminals.

The network comprises:

- 185,000 kilometres of state and local roads

- 9,400 kilometres of rail line
- Four major commercial sea ports (Port Botany, Port Jackson, Port Kembla and the Port of Newcastle) and 27 smaller regional ports and coastal harbours
- Sydney Airport and some regional airports
- Intermodal container freight terminals and various smaller multi-modal terminals and rail sidings.

The NSW regional freight network and major freight corridors are shown in Figures 7.1 and 7.3. Figure 7.2 illustrates the Sydney freight network.

Figure 7.1 The NSW freight network, including regional intermodal container freight terminals

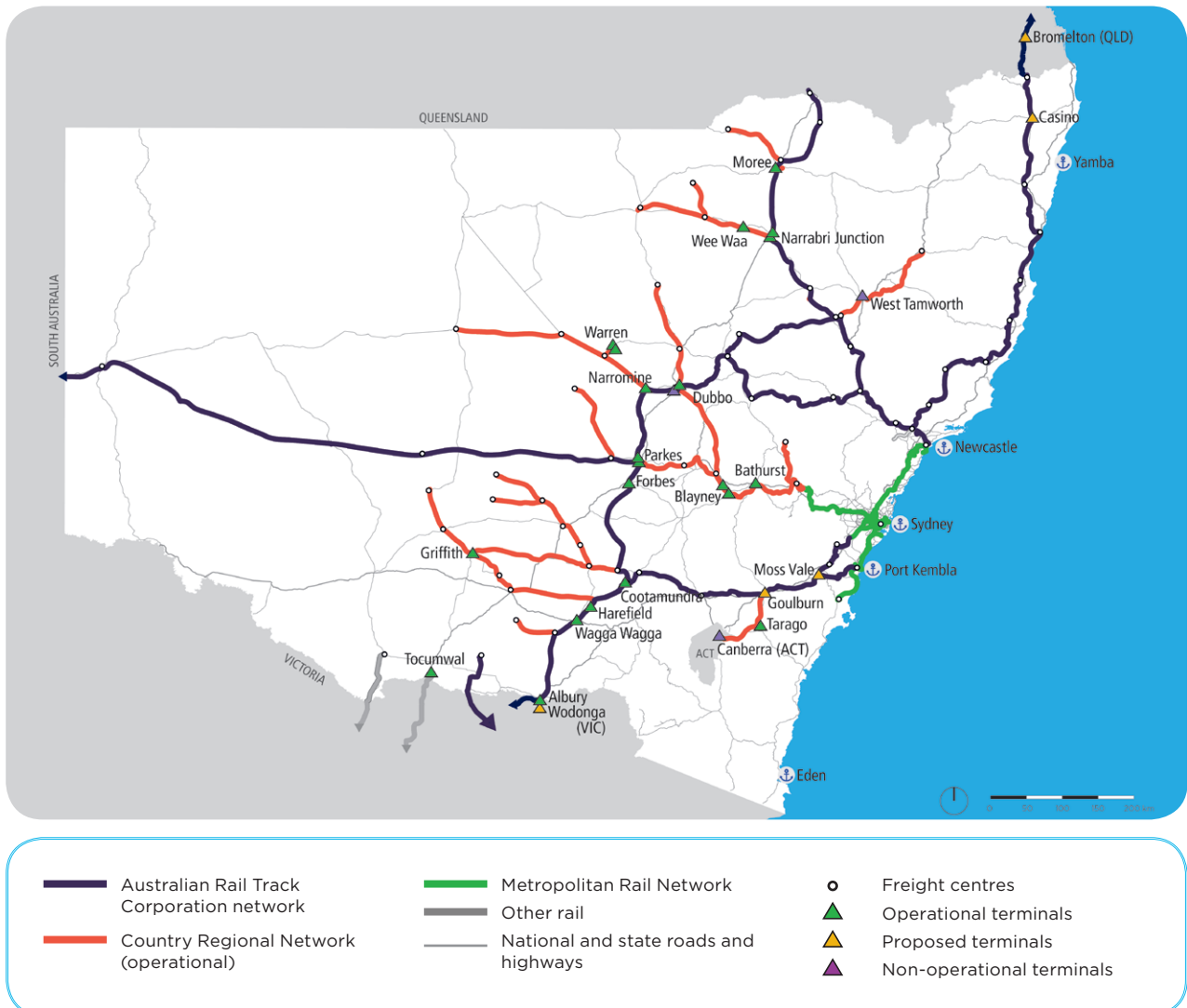
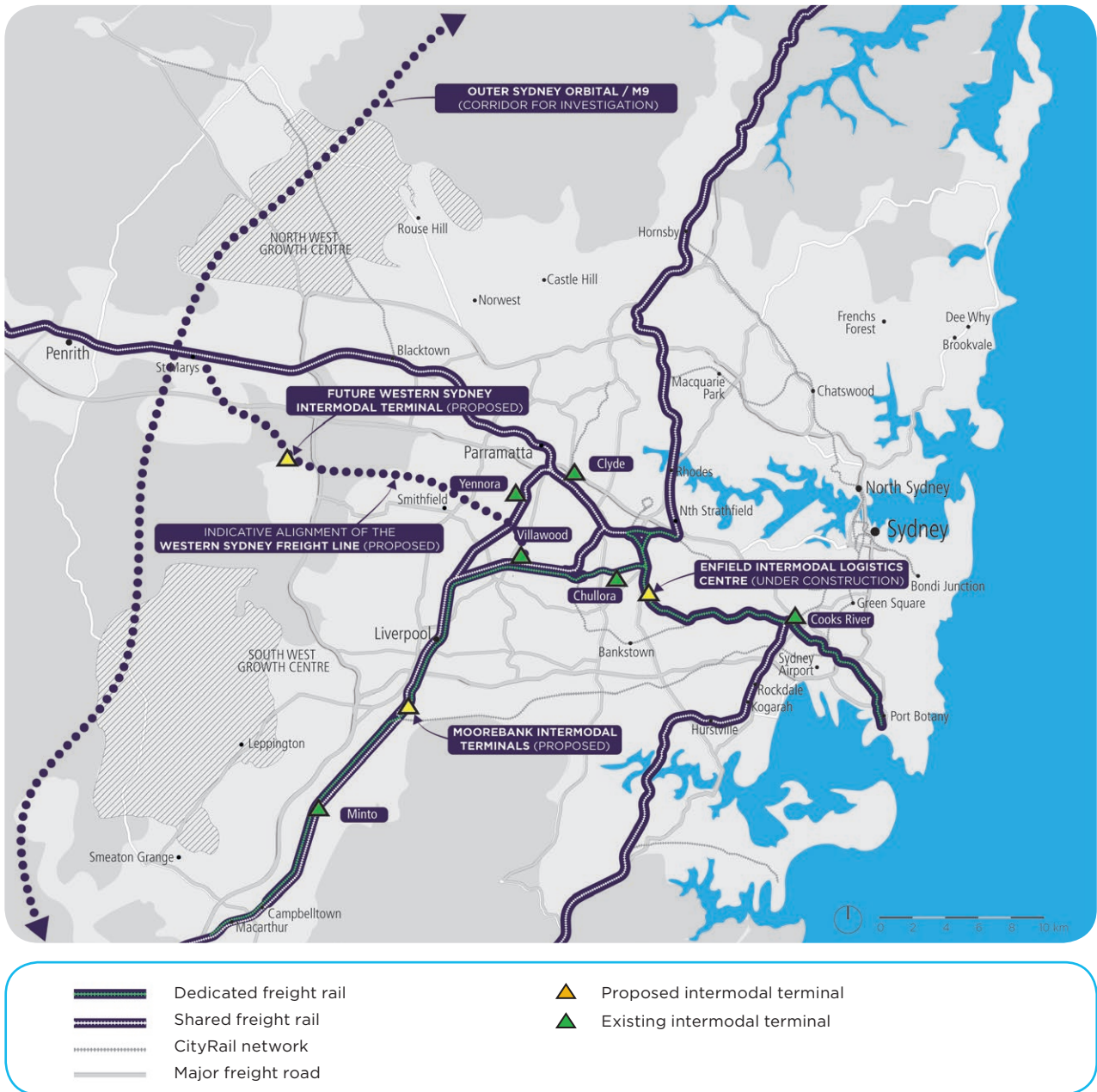


Figure 7.2 The Sydney freight network, including intermodal terminals

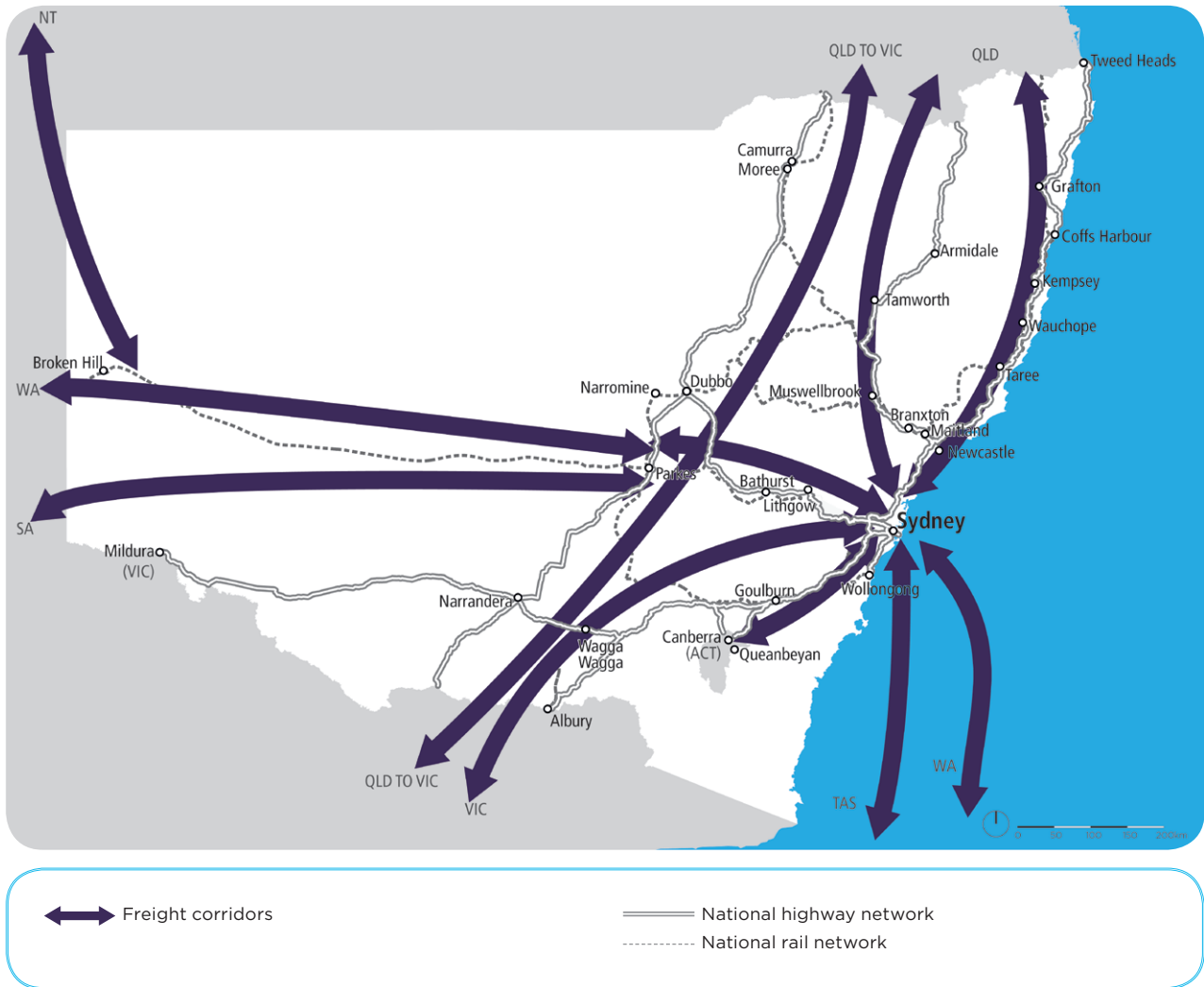


Each section of the network relies on connections with other network nodes. For example, freight terminals require road and/or rail links to origin or destination points, ports likewise require landside road and rail connections. Integrated supply chains need a consistency of capacity end-to-end, and consistent regulation. For example, freight trucks may be restricted on local roads, having to

transfer goods to smaller vehicles (or decoupling larger ones) to travel the 'last mile' of road trips to intermodal terminals, distribution centres or key customers.

Freight infrastructure networks are shared in many places with passenger transport. While this can reduce the total cost of transporting freight, it can also lead to congestion or conflict on the network

Figure 7.3 Key non-bulk freight transport corridors in NSW



where supply of road or rail space is limited and impacts on freight operations. For example, rail freight services cannot operate easily at certain times on the RailCorp network when priority access to passenger rail services is given. Road freight traffic mixing with peak passenger vehicle travel encounters congestion, and reduced travel speeds. Ports and airports may be unable to expand their operations if they are located near suburban neighbourhoods.

7.1.2 Why freight matters

Freight enables the exchange of goods and commodities within the economy, and distributes the benefits of this economic activity across our community. At the most basic level, freight determines the availability of, and the prices we pay, for goods. It helps to create a worldwide market for NSW products by facilitating the transport of goods from the place of production to the place where they are consumed, including assembly of raw materials and distribution of finished goods. The Australian Bureau of Statistics estimates that turnover by the freight sector is

EXAMPLE NSW INDUSTRIES THAT RELY ON FREIGHT

<p>Horticulture</p> <p>The NSW horticultural industry produced \$1.3 billion of horticulture in 2009-10 (gross)</p>	<p>Meat and Livestock</p> <p>Forecast value of beef and veal exports total \$4.5 billion. The NSW cattle industry is the second largest in Australia</p>
<p>Building and Construction</p> <p>The building and construction industry in Australia contributes \$11.7 billion in GDP</p> <p>NSW consumes 30 million tonnes of heavy construction material a year</p>	<p>Wool</p> <p>Nationally, wool production had an export value of \$2.6 billion in 2009-10. NSW produced nearly 600,000 bales of wool in 2011</p>
<p>Cotton</p> <p>Australia is the fourth biggest cotton exporter in the world</p>	<p>Forestry and Timber</p> <p>The forestry and timber industry contributes more than \$2 billion a year to the NSW economy</p>
<p>Wine</p> <p>NSW is the second largest wine producing state, with over 30 percent of the \$5 billion a year wine industry</p>	<p>Motor Vehicles</p> <p>In 2011, some 314,594 vehicles were sold in NSW, equal to 31.2 percent of total new sales in Australia. Most are imported through Port Kembla</p>
<p>Steel</p> <p>The NSW steel sector generates \$5-8 billion in revenue each year (industry/investment)</p>	<p>Coal</p> <p>NSW exported over \$16 billion in coal in 2010-11</p>

around \$21.2 billion, and that it directly employs 128,000 people. However, when considering the wider impacts of transport activity in other industries, this contribution is much higher. One estimate is that in 2011, the gross value added for freight and logistics in NSW was \$58 billion, with half a million people in NSW working in logistics in NSW.

Freight is particularly critical to the economic development of regions, by facilitating the production of goods best suited to specific regions, and enabling larger scale production than would otherwise occur.

There are costs to the economy and to our community from not supporting more efficient freight movements. For example, when congestion

occurs on important freight corridors it imposes costs on the community in the form of higher prices due to extra travel time, increased unreliability and higher vehicle and fuel costs. It imposes specific costs on business, which needs to operate larger fleets, making more trips at slower speeds.

Transport related inefficiencies and congestion costs reduce our state and national competitiveness and productivity. The Bureau of Infrastructure, Transport and Regional Economics estimates the cost of urban traffic congestion in Sydney in 2005 was around \$3.5 billion. Without significant action this is expected to reach approximately \$8 billion in 2021.

7.2 Investment in Infrastructure

The NSW Government is investing in new infrastructure to deliver greater capacity across the freight transport network. Improvements across existing road and rail networks will also unlock greater capacity and performance to meet increasing demands over the next twenty years:

- \$1 billion investment in establishing the third container terminal at Port Botany.
- Outer Harbour Expansion at Port Kembla
- Further development of the Port of Newcastle, including the T4 coal facility
- Development of an intermodal terminal at Enfield
- Over \$1 billion investment in improving capacity on the rail network through Stage One of the Northern Sydney Freight Corridor Program
- \$277 million over the next five years to maintain and upgrade 996 kilometres of grain rail lines
- Working with the Australian Rail Track Corporation (ARTC) on the completion of the Southern Sydney Freight Line - will provide a freight only rail line from Sefton Junction to Macarthur
- As part of the Port Botany Expansion, the Penrhyn Road roundabout provides grade separation between trains and trucks near the main terminal entrance.
- Providing ongoing and indexed funding for the maintenance and upgrade of the Country Regional Network - including funding for replacement sleepers and upgrade of the Coonamble-Dubbo line
- Road upgrades across the State, including the Pacific Highway (M1), Great Western Highway (A44), Holbrook Bypass on the Hume Highway (M31), construction of the Hunter Expressway, Newell Highway (A39) overtaking lane and rest area improvements and Picton Road safety upgrades (see Figure 7.4).

Figure 7.4 Commitments to date on network infrastructure tasks across NSW



- Railways - operational
- National highway
- State road
- Freight centres
- △ Operational intermodal terminals
- ⚓ Ports

7.3 Increasing network efficiency

To be efficient and effective, and to meet the needs of freight customers, the freight network must operate as a series of integrated end-to-end supply chains. Freight customers need goods and raw materials to move seamlessly to the next stage of production or the end user, regardless of the mode or location.

Network efficiency is achieved when whole of supply chain performance is optimised. This requires a mix of the right physical infrastructure, good control systems and efficient user performance. Inefficiencies cause friction and lead to unnecessary costs to industry and consumers.

Most goods moving along a supply chain will change hands a number of times. These points of transfer involve transport and handling costs and may involve some complexity. For this reason, businesses along the supply chain seek efficient end-to-end connections to minimise delay for deliverables and to minimise the costs of moving goods through the supply chain. However, inefficiencies and poor coordination can arise where there are network disconnections, poor regulation and insufficient capacity.

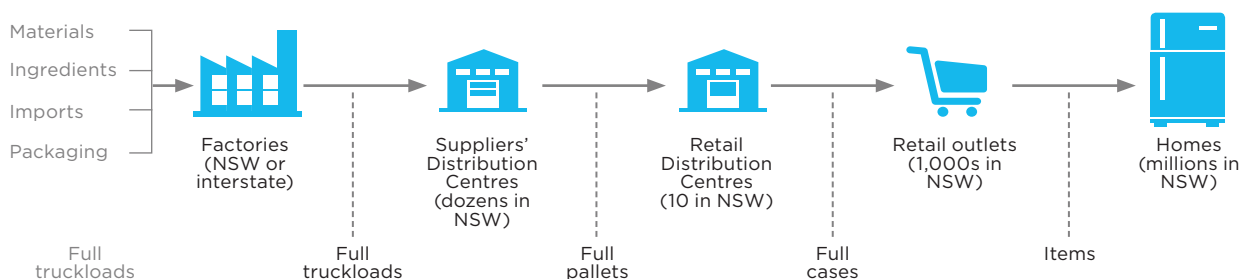
A lack of integration can prevent the efficient performance of the whole supply chain and lead to existing infrastructure not being used optimally. Fixing these integration obstacles is important to the economy. The Australian Logistics Council (2011) estimates that every one percent increase in freight efficiency saves the national economy \$1.5 billion.

An example of how supply chains transfer goods is the food and beverage industry. Each day, raw materials, ingredients, imports and packaging are transported to factories in NSW or interstate for processing and production, before being transported by truck to distribution centres across NSW. From there, food and beverage is transported on pallets to one of 10 retail distribution centres across NSW and packaged into cases for delivery to retail outlets, before being purchased and consumed by NSW households. Figure 7.5 outlines the journey of typical food and beverage products across NSW.

Looking at the overall network, there are a number of key obstacles to end-to-end supply chain efficiency, including:

- Poor coordination and transparency along the supply chain
- Management of shared rail access between passenger and freight rail trains
- Management of shared road network between general traffic and road freight traffic
- Inconsistent regulation of road access including interstate regulation for heavy vehicles and last mile access on local roads in urban areas
- Rail freight competitiveness issues, such as a lack of critical mass volumes in certain markets, the relative short distance of imported container movements, unreliability of journey times as a result of shared network arrangements and asset condition, pricing distortions and the need for delivery points closer to customers (for example, intermodal freight terminals in Western Sydney).

Figure 7.5 Food and beverage volumes supplied in NSW each average week



CASE STUDY - NSW WINE SUPPLY CHAIN

The NSW wine supply chain commences where the grapes are grown, travels to a winery for production and ends either at a domestic retailer or packed for export overseas.

In the initial stage of the supply chain, grapes are delivered to wineries in bins on trucks ranging in size from small farm vehicles to B-Doubles.

The processed wine is then transported in bulk or bottled/packed into wine casks, for both the domestic and export market.

Road transport is currently the dominant mode used for domestic distribution. In the past, rail had been used to transport bulk wine to Sydney for bottling; however changes to track access resulted in this task moving to road.

Rail is used for the transport of bulk wine predominantly for export. However, there have been some issues with leakage from wine bladders when transported over an undulating rail network or when train stopping shunts the wine into one side of the bladder. These issues can cause containers to bulge, and a bulging container cannot be exported. This has resulted in a preference for shipping by road.

Transport is a key cost component of the NSW wine supply chain. Savings through more efficient transport will contribute to the viability and continued growth of the wine industry.

An example of how regulation impacts on supply chain integration is the meat and livestock industry. Livestock is transported in small and articulated vehicles from rural farms to saleyard, then from saleyard to feedlot and/or meat processor. Once processed, containerised meat is transported to port either by rail or by truck (usually a B-Double)

on to domestic or export markets. In the process of moving from producer to market, the product changes hands several times, and its handlers may encounter differing rules around vehicle standards or road access for heavy vehicles, or varying operational standards such as rail gauge. These differing rules and standards impose costs on the industry in the form of over-handling, which cause delays and requires administrative resources to comply with.

Improving the end-to-end performance of supply chains can optimise existing transport infrastructure and to ensure the global competitiveness of our services, mining, agriculture and manufacturing industries.

7.3.1 Supply chain coordination

Supply chains only function as well as their weakest link. This means that actions will be needed to improve the efficient coordination of operations along the supply chain, enhance the transparency of operations and target seamless connections at points where freight transfers between modes. Such actions will promote the improved performance of the network and optimise its existing capacity.

Poor supply chain coordination can cause delays in the movement of goods and impose unnecessary costs on businesses and their customers.

The underlying causes of poor supply chain coordination relate to inefficiencies such as different operating hours, unmatched delivery times or poorly matched road access arrangements, which mean that larger freight vehicles cannot travel the 'last mile' of their journey on local roads without transferring goods to smaller vehicles - resulting in those goods incurring a double-handling cost.

More broadly, new trends in many industries will create new supply chains and change the pattern of freight movements across NSW. These trends include continuing strong growth in the services sector, an increase in containerised freight, just-in-time business practices and the growing use of sophisticated logistics technologies. The failure of the freight network to keep up with these trends

will exacerbate existing bottlenecks, create fresh constraints and undermine the global and national competitiveness of our firms and industries.

The number of different players along a supply chain makes coordination more difficult. Initiatives aimed at improving supply chain coordination include the Hunter Valley Coal Chain Coordinator (HVCCC) and the Port Botany Landside Improvement Strategy (PBLIS), which bring together participants in the supply chain to coordinate planning and activity.

A challenge for planning investment and interventions for the freight network is a lack of consistent data regarding growth, transport patterns and supply chain requirements. Australia lacks consistent national information on freight transport across modes. Obtaining ongoing accurate and nationally consistent freight data has been identified as a high priority data gap by the Australian Government and State and Territory governments through various mechanisms including the Australian Transport Data Action Network (ATDAN). Transport for NSW has established the Bureau of Freight Statistics to manage strategic freight data.

In addition, the absence of a consistent national approach to monitoring freight performance inhibits decision making and consistent performance measurement approaches.

7.3.2 Freight access to the rail network

ARTC manages access to the Metropolitan Freight Network (the dedicated freight line extending from Port Botany), the Interstate Rail Network, and the Hunter Valley Network. Access to the Country Regional Network is managed by John Holland Rail on behalf of Transport for NSW.

In order to remove the obstacles for increased rail freight market share, rail access regulation needs to promote transparency and provide certainty in the form of reliable train paths for rail freight operators on the shared rail network, and access pricing needs to be based on similar principles to road access to promote competition.

Access issues for the regional rail network relate to the existing access undertaking and whether the current arrangements actually support competition and efficient use on these networks. In its 2006 report, *Road and Rail Freight Infrastructure Pricing*, the Productivity Commission found that there is the need for a case by case approach to determine if the benefits of mandated access are outweighed by the costs. In particular, it noted in some cases, low volumes on some regional networks “strongly suggest that there is limited capacity for above-rail competition and separation may further reduce their commercial viability.” It then goes on to note that a single operator on these networks may be a more efficient outcome. Transport for NSW has commenced a review of the NSW Rail Access Regime. The review will assess the current regime to ensure that it continues to facilitate efficient use of the shared rail network.

7.3.3 Freight access to the road network

Freight on the road network is subject to regulation by three tiers of government in Australia. This creates increased compliance costs and red tape for the industry, along with logistical inefficiencies caused by complying with uneven regulation of road and rail access and safety across state borders. These uneven regulations are traditionally around safety, licensing, vehicle standards and access to the road network.

For our agricultural industries, the role of local roads in the supply chain is vital. Across regional NSW, trucks carrying grain, dairy products and other produce need to access farms, storage facilities, silos and processing plants efficiently, and this usually means using larger vehicles. Many of these facilities rely on local road access. Without access to these roads, double-handling is prevalent and the productivity of some industries suffers. Efficient intermodal connecting points are also important to these industries, many of which transfer goods from road to rail for moving to export gateways.

EXAMPLE CHAIN ISSUES

Horticulture

SUPPLY CHAIN: 100 commodities, mostly seasonal, of vegetables, fruit and nuts, are produced around the State in Sunraysia, Murrumbidgee Irrigation Area and the north coast. Goods are transported mostly by road, from around the State and also from Queensland and Victoria, to Sydney markets; exports are often shipped from Brisbane or Melbourne or by air freight.

CHALLENGES: Rail is not capable of point to point, timely delivery, road congestion, heavy vehicle curfews and constraints, lack of regional hubs for transshipping produce, workforce (drivers).

Building and construction

SUPPLY CHAIN: 600 quarries in NSW, focused on Southern Highlands and north coast, with 75 percent destined for Greater Sydney. Raw materials are transported from quarries to manufacturing plants to customers for use in infrastructure and construction projects. Cement is imported from Tasmania and Queensland.

CHALLENGES: Rail access, first/last mile access, inconsistent (interstate) regulation

Wool

SUPPLY CHAIN: Wool is transported from farms to one of 54 wool warehouses in NSW or selling centres, which are often located nearby in Sydney or Newcastle. After sale, wool is compressed at compaction facilities in Yennora, then to Port Botany by either road or rail. Wool bales also travel to Victoria and South Australia for sale or for processing, and some arrive from Queensland.

CHALLENGES: Regulation for heavy vehicles (mass loading regulations), unsealed local roads and other inadequate road facilities, and rail access on the metropolitan rail network for wool heading to Port Botany.

Meat and Livestock

SUPPLY CHAIN: Cattle farming is dispersed across the State, often close to grain supplies, with the top five feedlots in Riverina, Quirindi, Glen Innes, Caroon and North Star. Livestock is transported from rural farms to saleyard, to feedlot and meat processor, using small and articulated vehicles, with containerised produce travelling to port by rail or B-Doubles to domestic/export markets.

CHALLENGES: Inconsistent interstate regulation around vehicle standards, road and last mile access for B-Doubles and larger vehicles, related infrastructure like rest facilities, and an ageing workforce.

Cotton

SUPPLY CHAIN: Cotton production occurs mostly in northern NSW. As a seasonal industry, cotton gins operate for three to five months a year between April and September. Cotton is transported from farm to the gin (processor) to the purchaser/port by rail, semi-trailer or B-Double trucks. From some locations in NSW cotton is also exported through Brisbane.

CHALLENGES: Inconsistent (interstate) regulation, workforce, quality roads, reliable rail access, port costs, power supply.

Wine

SUPPLY CHAIN: NSW has 14 official wine regions, with the largest wine producing region being the Riverina. The State has 10 of Australia's top 20 wine exporters. Wine production is seasonal, with grapes being harvested between January and late April. Once grapes are harvested, they are transported by truck to wineries for processing, and moved to tanks for maturation or to another facility for blending. Wine is then bottled or packed and placed in 20 foot containers for distribution. For domestic markets, wine is transported by B-Doubles, road tankers and semi trailers, and for export markets, wine is often transported by rail.

CHALLENGES: Poor rail infrastructure and access, congestion and delays around Port Botany, rest facilities for drivers, workforce issues, regulatory inconsistency around last mile access and heavy vehicles, HPV access, high operating costs in NSW.

The following figures show the current flows of coal, wool and cotton within NSW:

Figure 7.6 Coal export commodity flows through NSW in 2010-11 in kilotonnes

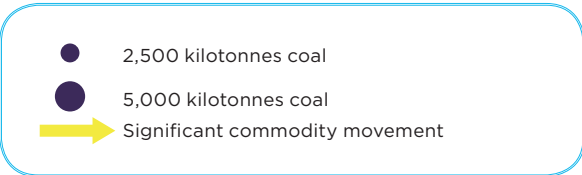
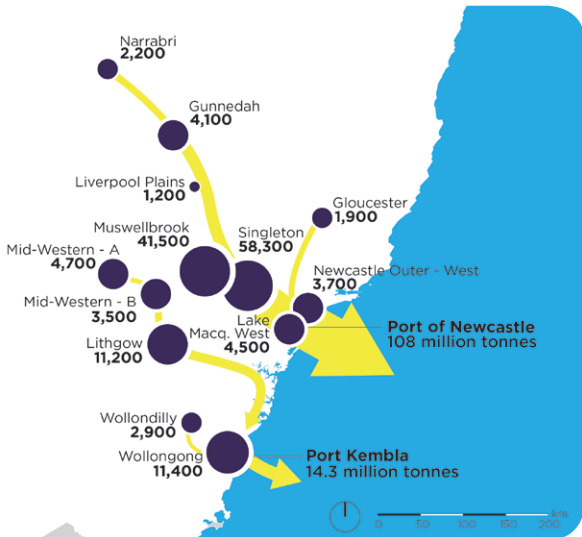


Figure 7.7 Wool export commodity flows through NSW in 2010-11 in kilotonnes

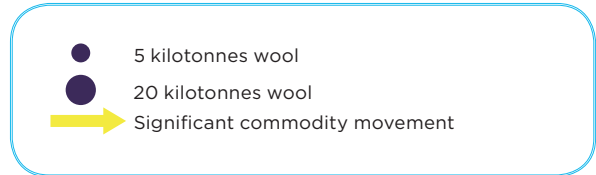
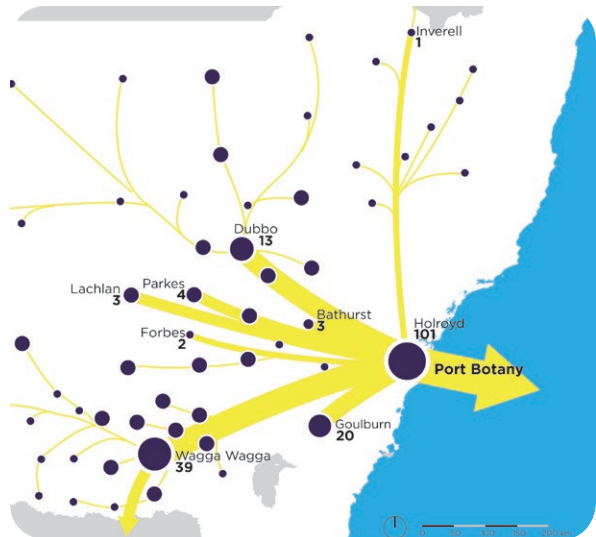
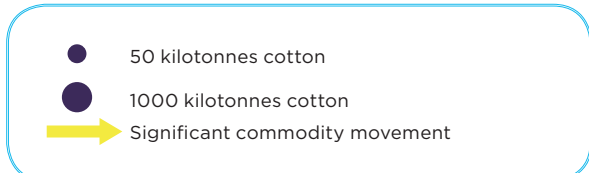
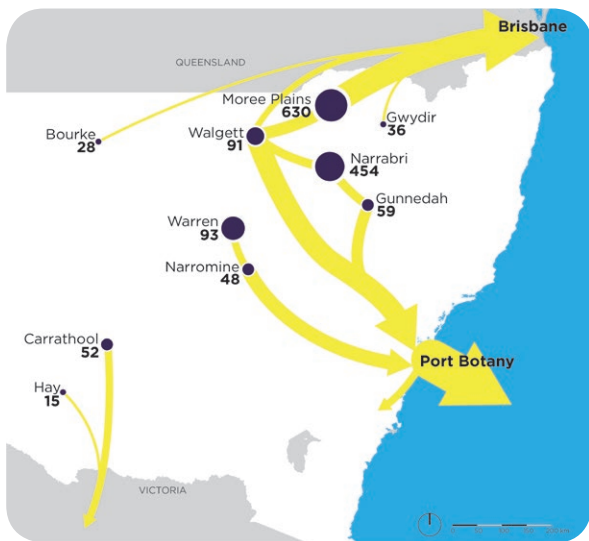


Figure 7.8 Cotton export commodity flows through NSW in 2010-11 in kilotonnes



Inconsistent regulation and access conditions for heavy vehicles between states, and even at a local council level, is limiting the productivity improvements that can be gained by industry in the efficient use of HPVs and Higher Mass Limit (HML) vehicles.

Sub-optimal heavy vehicle charging arrangements are also impacting NSW's ability to manage and maintain the road freight network to the standards required. These charging arrangements are also impacting on small and medium sized operators who do not necessarily undertake the same level of travel as the higher level operators and are effectively cross-subsidising high-kilometre operators. This can mean that freight and supply chain costs in areas where these businesses operate are increased.

Currently, restricted access vehicles operate on a pre-approved network with access determined through a Notice under the Road Transport Act or a permit granted by RMS. Where a road has not been assessed, a Local Council assessment may be required and the decision to grant RAV approval lies with local road managers, who may be reluctant to grant approval due to local amenity or community concerns, or because funding is not available to enable upgrades for that HPV access. Poor road access outcomes can lead to more traffic on local roads and higher costs for NSW industry.

Recent reforms by NSW Government to improve access regulation include:

- Assessing an additional 600 kilometres of the State road network as suitable for semi-trailers and B-Doubles operating at higher mass limits.
- Improving access restrictions for the movement of livestock by approving the operation of 4.6 metre high vehicles at all 108 identified priority access points and for 38 of 70 priority routes for HML vehicles.
- Modern road trains east of the Newell Highway (A39) such as Narrabri to Gunnedah Regional Saleyards
- New livestock transport and loading scheme
- HML access for truck and dog (Quad and Quin)
- Expansion of B triple access west of the Newell (A39)
- High Productivity Vehicle access pilot on Hume Highway (M31)
- Stamp duty reform to improve uptake of High Productivity Vehicles

7.3.4 Rail operating restrictions

Accommodating freight movements through the metropolitan rail network creates challenges due to operational constraints that apply to freight trains where they share the same tracks as passenger trains. On shared corridors, passenger services have priority over freight services, with constraints on rail freight activities operating during the peak commuter hours, and also prior to the AM peak period due to the need to position passenger trains before the AM peak. Within the RailCorp network, the peak passenger periods require the use of all train paths for passenger trains, restricting freight trains from running at these times.

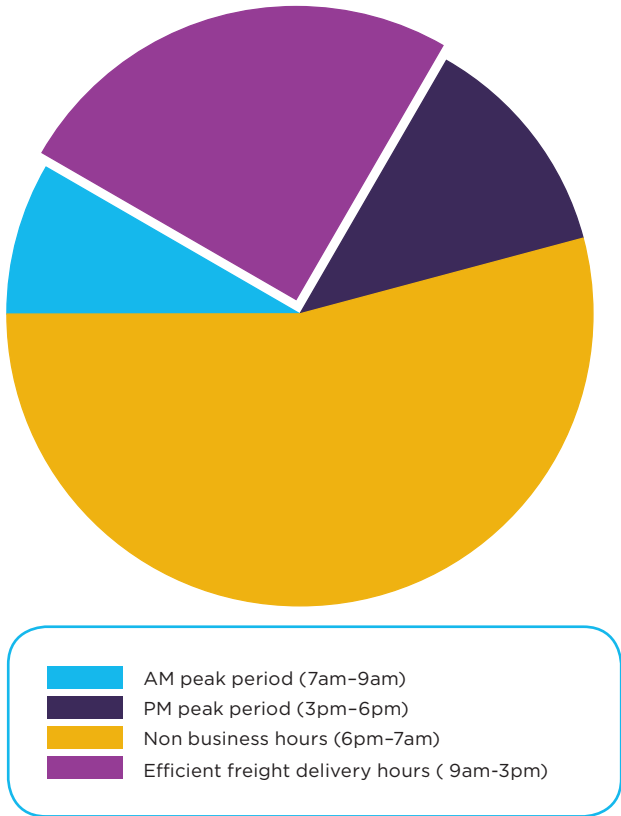
These restrictions reduce rail's responsiveness and competitiveness, creating obstacles to increasing the proportion of the freight task being moved on rail and further contributing to congestion on the road network, particularly around Port Botany and Sydney Airport.

7.3.5 Promoting off-peak freight movements

With growth in traffic, particularly within the Sydney metropolitan area, the peak periods are becoming longer and congestion is spreading further across the network. Coupled with the issue of disconnected supply chain operating hours and night time curfews in some local areas, this congestion constrains the most efficient freight delivery times being achieved, which can be a drag on industry competitiveness.

At present, the most efficient window for freight delivery to businesses is during regular business hours but outside of peak periods, meaning that efficient freight movements can occur for less than one quarter of the day, as shown in Figure 7.9.

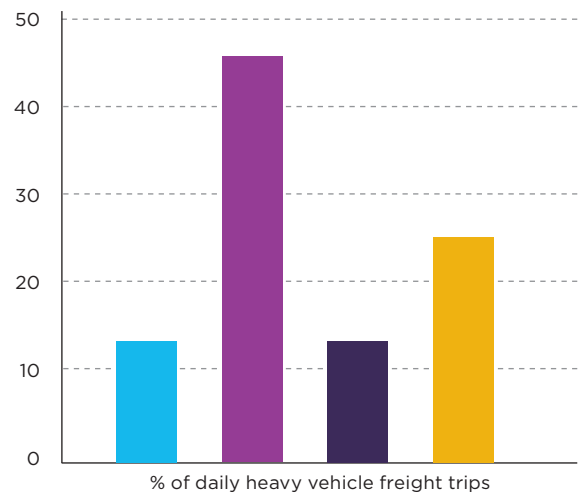
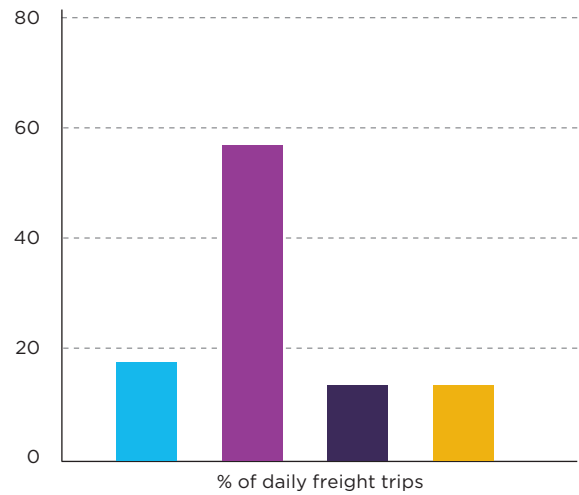
Figure 7.9 Efficient Road freight delivery hours



This is borne out by the current trends of freight vehicle travel showing the split of freight trips over the average weekday as shown in Figure 7.10. Less than 20 percent of daily freight trips take place over the evening period, although heavy vehicles are more likely to use this congestion free period with up to 25 percent of heavy vehicles travelling during the evening period.

The efficient management and effective connectivity of the road network ensures that the freight and logistics industry remains efficient and assists our mining, retail, wholesale and agricultural industries to remain globally competitive. In addition, improvements to supply chain operations such as increased operating hours to enable more off-peak freight movements will considerably improve the productivity and efficiency of the freight task.

Figure 7.10 Split of freight trips across the average weekday



7.3.6 Managing travel time volatility

Travel time volatility, usually caused by congestion, is a key factor in businesses determining the most efficient way of delivering their goods, and therefore the number of trips they need to undertake in a day to meet their delivery requirements. A degree of uncertainty over how long a particular trip will take constrains the ability of businesses to be more efficient in how they might link trips together. This results in not only more freight trips, but also more vehicles in their fleets, resulting in lower productivity for those businesses.

For example, a freight truck needing to travel in the AM peak from Casula in Western Sydney, to Port Botany or Sydney Airport to pick up or deliver goods faces the possibility of the 29 kilometre trip taking anywhere from 21 minutes to 45 minutes, with an average time of around 38 minutes. On this route, the AM peak can stretch from 5.15am to 8.15am.

This means that the freight operator carrying time sensitive freight to the port or airport must make a decision regarding whether this trip could also be used to deliver or pick up other goods along the way, or whether this trip is solely committed to the one delivery or pickup.

7.3.7 Pricing

Current pricing and regulatory arrangements are hampering the efficient provision and productive use of road and rail infrastructure.

Road and rail have different pricing models and it has been argued that road freight transport does not pay the full cost of infrastructure use.

It is argued that uncaptured negative externalities in the form of congestion, pollution and poor amenity are not fully accounted for in road freight pricing. The inability of road prices to capture and pass on the costs of using the infrastructure can distort consumption and investment decisions and gives rise to a perception of an 'unlevel playing field'.

On the other hand, the 2006 Productivity Commission Inquiry into Road and Rail Freight Infrastructure Pricing found limited price distortions between road and rail once registration and fuel charges were accounted for, and factoring in externalities. The Commission argued that road and rail have unique advantages and therefore the opportunity for substitution between the modes is relatively low: road freight is flexible and suited to short distances and time-sensitive items, while rail freight has higher fixed costs, with lower marginal costs for higher volumes and longer hauls.

Nevertheless, a number of stakeholder groups have identified that the differential pricing between road and rail is a key barrier to more efficient network use around congested container ports and for increasing rail's share of freight transport.

NSW is disadvantaged under the current heavy vehicle charging arrangements, with only about 60 percent of the cost of providing and maintaining the roads for heavy vehicles being returned to NSW through heavy vehicle registration charges and relevant Australian Government funding (as assessed by the National Transport Council). The NSW Financial Audit 2011 (the Lambert Report) estimates that replacing the existing fuel excise and registration charges with efficient heavy vehicle road pricing could raise over \$1 billion per year for NSW.

7.4 Growing future freight network capacity

Based on national forecasts, the domestic freight task across Australia is set to triple by the year 2050 from around 504 billion tonne-kilometres in 2008 to over 1,504 billion tonne-kilometres in 2050.

In NSW, this rate of growth is supported by the NSW Freight Movement Model which identifies that the current freight task of around 409 million tonnes in 2011 will almost double to an estimated 794 million tonnes by 2031.

For all intra and interstate truck freight across Australia, around 50 percent uses the NSW road network for some part of its journey. When only considering interstate truck freight across Australia, some 75 percent uses the NSW road network for some part of its journey. This means the NSW road network is supporting a large proportion of total truck traffic and national freight productivity by joining Melbourne to Brisbane, and Canberra, Adelaide, and Perth.

7.4.1 Why is it growing?

Population and consumer growth

As a society, not only are we growing in population, we are consuming more and demanding more choice. The Australian Bureau of Statistics identifies a measure of consumption as 'final consumption expenditure'. This measure is considered relevant as it provides an aggregate measure of societal living standards. From 1998-99 to 2008-09, final consumption expenditure per capita rose by an average of two percent per year, which was higher than the population growth experienced over this period.

In addition to this growth in consumption, consumers are also demanding more choice. In 2011, research by the retailer Woolworths identified that the number of items on Australian supermarket shelves has more than doubled in the past 20 years.

This growth in consumption, coupled with growing consumer choice, means that the number of freight journeys required to service this demand is also growing rapidly.

Longer supply chains and faster reaction times

The distance between links in the supply chain and also the number of links in the supply chain is increasing, particularly with the rise of imports and the statewide and national centralisation of major retailers and distributors. This means that businesses must have alternative plans in place in the event of disruption to ensure that their customers receive their goods when they ordered them.

THE MINING INDUSTRY

The surge in international demand for Australia's resources has yielded benefits to the NSW economy, with mining investment more than doubling over the past two years to \$5 billion in 2011, and with the industry doubling its NSW workforce in the past four years.

Mining products equal around half of the current freight task. Coal is the largest and fastest growing commodity freight task in NSW (around 167 million tonnes in 2011), and is forecast to continue growing at a rate of four percent over the next 20 years. This means the coal freight task will grow from 167 million tonnes in 2011 to nearly 367 million tonnes in 2031. It will be NSW's largest export commodity and rail network activity for the foreseeable future.

The strong growth forecast for our resources sector raises two other challenges for the freight sector. The first is ensuring adequate infrastructure access for non-resource industries, including efficient connections to the ports at Newcastle and Port Kembla.

The second is workforce shortages, including for freight truck drivers, or in freight-reliant industries such as horticulture, and meat and livestock.

In addition, we are demanding faster service, primarily due to the rise of electronic commerce.

With road and rail capacity at a premium and the cost of distribution high, businesses are continuing to examine ways to reduce transportation costs. This is changing the face of the freight task with new distribution models emerging, with bigger loads being moved over longer distances and smaller loads being moved faster to meet just-in-time delivery needs.

7.4.2 Growth on the rail network

Current rail mode share of the whole NSW freight task is approximately 33 percent by tonnage in 2011. Based on a 'business as usual' scenario, where existing supply chains continue to be used, rail freight mode share across both bulk and container freight is expected to rise to 37 percent in 2031. This increase in modal share is driven by growth in coal exports, which are primarily transported by rail.

Rail has varying success based on the type of freight. In NSW, most of the bulk freight task is carried by rail networks in the Hunter Valley and Port of Newcastle area. Over 70 percent of the coal task is carried on rail with coal being the primary commodity for rail transport, followed by the other bulk commodities of grain, cotton, wool, steel and rice.

Based on this modal share and the growth expected in the total freight task, the amount of freight to be moved on the rail network will more than double from 2011 to 2031. Figure 7.11 shows the growth in the total commodity movements in NSW between 2011 to 2031; note the dominant increase in the coal task.

However, the relative share of container freight that is moved by rail is far less. To and from Port Botany, the current rail freight mode share is around 14 percent. Total trade through Port Botany was over two million TEU (twenty-foot equivalent units) in 2010-11 and is expected to reach 3.2 million TEUs between 2018 and 2021.

In order to maintain current rail freight mode share, the numbers of containers on rail will need to increase by around 50 percent from around 300,000 TEU per annum to 448,000 TEU per annum.

Lack of metropolitan intermodal terminal infrastructure

Metropolitan intermodal terminals are critical to increasing the share of container freight moved by rail and to manage growing import container trade particularly in Sydney. Currently, 85 percent of import containers are delivered to destinations within 45 kilometres of Port Botany. Intermodal terminals in the metropolitan area therefore enable the delivery of container freight on rail close to major road links and end users.

Intermodal terminals in Sydney include those located at Cooks River, Yennora, Leightonfield and Minto. Trains to and from Yennora and Minto interact with passenger trains, which restricts their effectiveness and reliability. The Chullora intermodal is the only dedicated interstate intermodal terminal.

Intermodal terminal infrastructure has the potential to move the port gate inland, providing points on the rail network for trains to take freight for processing and delivery. This reduces congestion around the port and uses capacity in other areas of Sydney and provides an opportunity to avoid bottlenecks occurring due to a single point of focus for port related road freight movements. It also provides some resilience in the system in the event of incidents causing blockages at the port.

Sustainability of regional intermodal terminal infrastructure

About 90 percent of export containers are transported to Port Botany by rail which reinforces the importance of intermodal container freight terminals in regional areas. In regional NSW, there are more than 200 intermodal terminals, including grain silos. These intermodal terminals can enable economies of scale to be achieved, particularly when co-located with production or processing

Figure 7.11 Growth in total commodity movements in NSW 2011 – 2031, in million tonnes per annum (mtpa)

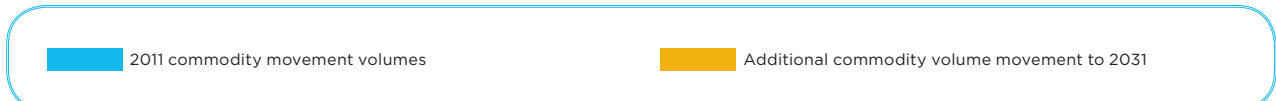
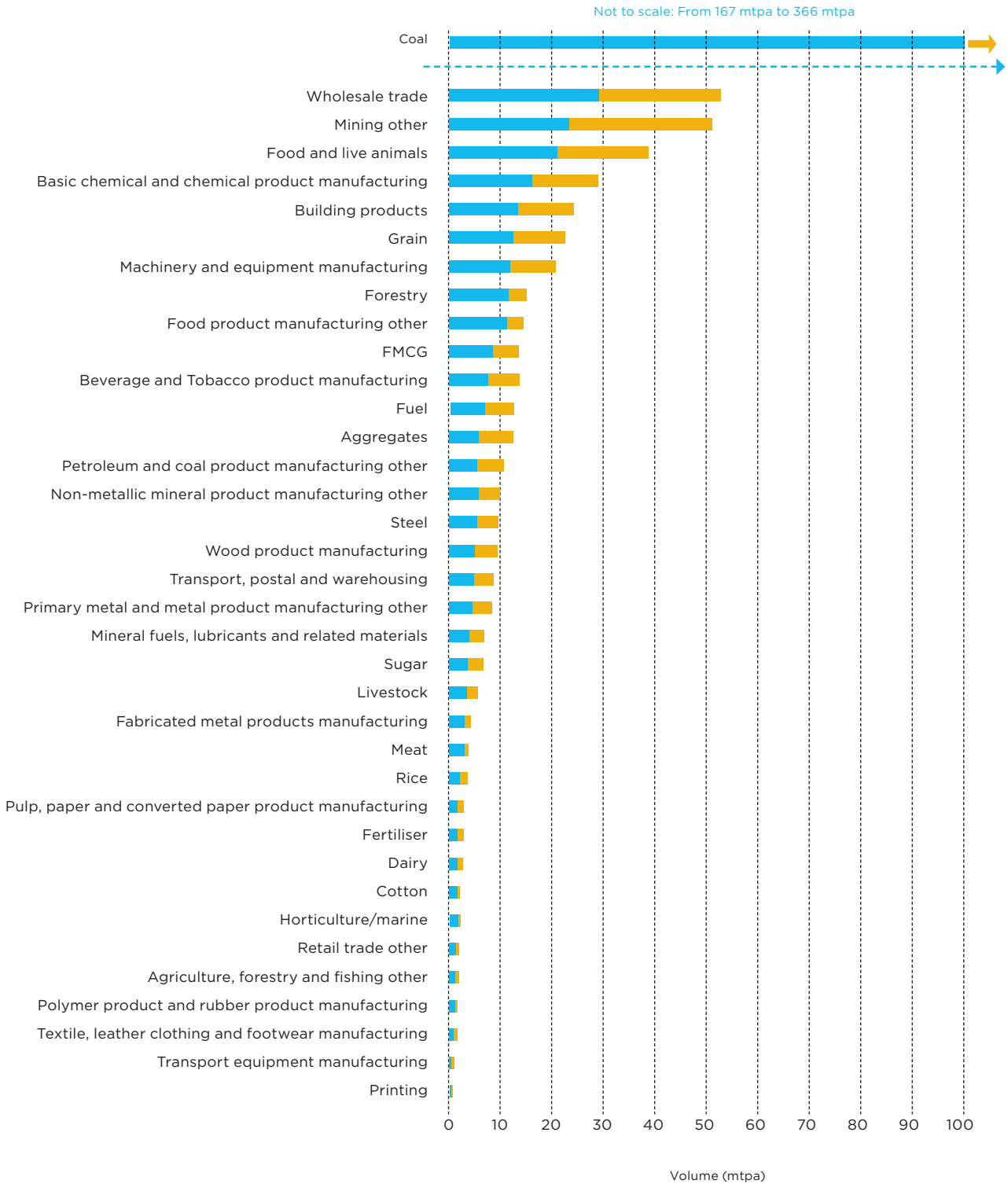
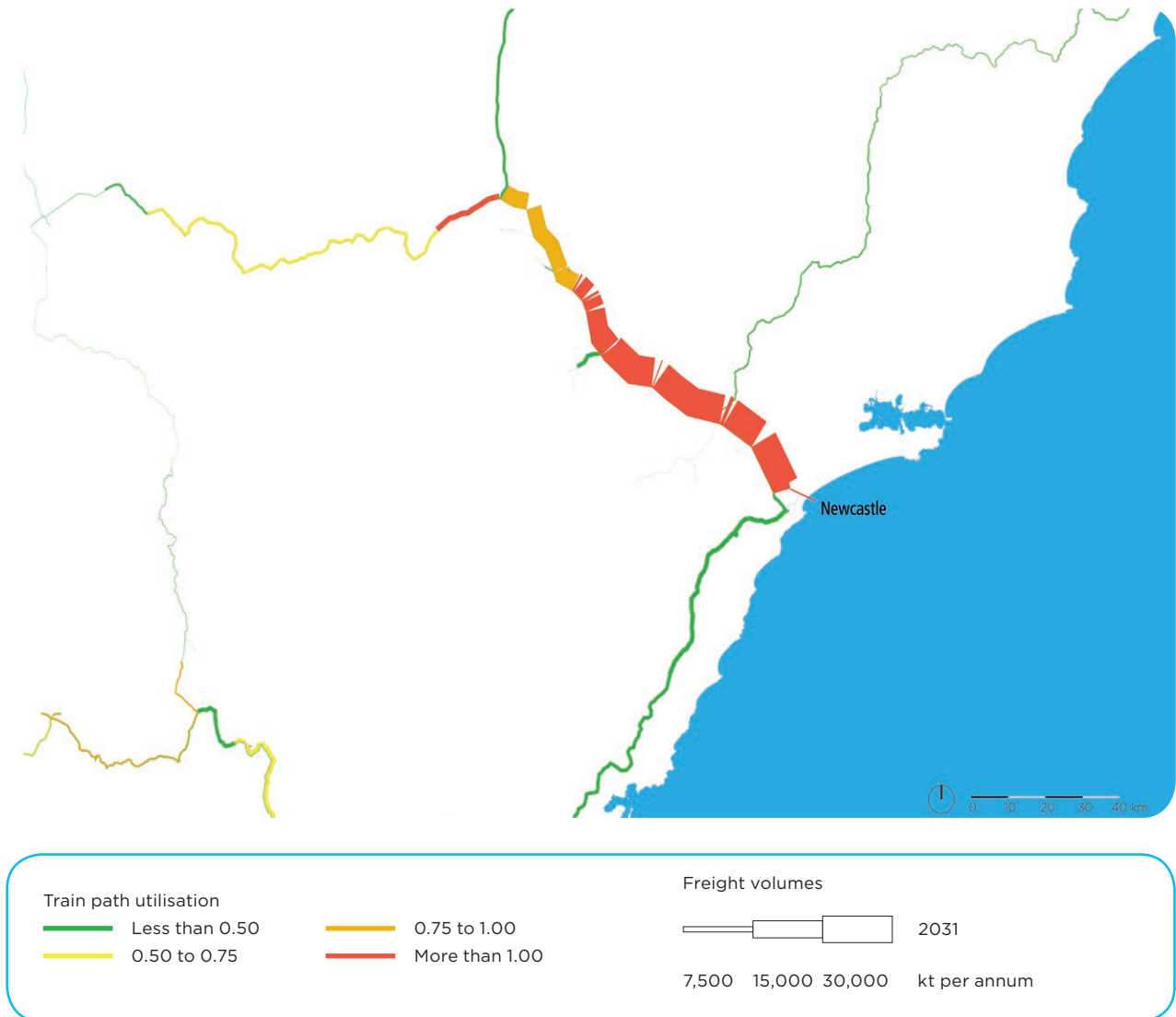


Figure 7.12 2031 Hunter train path utilisation and freight volumes defined in kilotonnes per annum



facilities. However, many are not designed for modern trains, have varying infrastructure requirements and different levels of commercial viability. Ensuring the proper development and assessment of freight related proposals will ensure more sustainable regional intermodal terminals.

Growth in the coal task

Some rail network sections away from the metropolitan area have heavy freight traffic, including the Hunter Valley Network, the Illawarra Line and the Moss Vale-Unanderra Line, where the number of freight trains being moved is close to the capacity of the current infrastructure. By 2031,

sections of the Sydney-Illawarra Line may be at or approaching full capacity in terms of train path utilisation. Further detailed work needs to be done on demand and path availability to ensure future needs are met.

In addition, while the bulk of the coal task is carried on rail, a large amount is still carried on the road network and this will need to be addressed in the landside transport networks at Port Kembla.

The growth in the coal task at Port of Newcastle to 2031 levels is shown in Figure 7.12.

7.4.3 Growth on the road network

The current road mode share of the NSW freight task is around 63 percent in 2011 or 256 million tonnes. If the coal task is viewed separately from the total freight task, then road accounts for nearly 90 percent of the remaining freight task in NSW.

This results in around 320,000 trips on an average weekday for heavy vehicles and over 1.2 million trips for light commercial vehicles within Sydney and between the Greater Metropolitan Area and the rest of NSW and other states.

In 2031, the road mode share is expected to be around 59 percent of the total freight transport task, or 468 million tonnes. It is anticipated this will result in nearly 500,000 trips on an average weekday for heavy vehicles and over 1.5 million light commercial vehicle trips per day within Sydney and between the Greater Metropolitan Area and the rest of NSW and other states.

In Sydney, the number of heavy freight vehicle trips is expected to increase by 56 percent from around 278,000 trips per day in 2011 to approximately 433,000 trips per day in 2031. The number of light commercial vehicle trips in Sydney is anticipated to increase by 25 percent from around one million trips in 2011 to nearly 1.3 million trips in 2031.

Figure 7.13 shows the growth in the daily number of heavy freight vehicle trips within Sydney from 2011 to 2031 and the critical role the Sydney motorway network plays as part of the primary freight network in Sydney.

To and from Port Botany, currently over 1.7 million TEUs are transported on the road network, not including transshipments. With no change to the current road mode share, this task is set to increase to over 2.7 million TEUs by 2017-18. Even if a significant mode shift to rail can be achieved, the road task to and from Port Botany will increase to over 2.3 million TEU per annum, again not including transshipments.

The nation's busiest interstate freight routes, the Hume (M31) and Pacific Highways (M1), support the majority of interstate road freight movements, with the amount of freight to be transported along this corridor predicted to increase significantly between 2011 and 2031 as shown in Figure 7.14.

7.4.4 Growth through ports and airports

Port Botany

Total trade through Port Botany was over two million TEU in 2010-11, making it the second largest port for international container movements in Australia. Container movements through Port Botany have grown around seven percent each year, on average, over the last 15 years. With the expansion of Port Botany, Sydney Ports Corporation estimates that there is the potential for Port Botany to cater for up to seven million TEU in the longer term.

Port of Newcastle

At the Port of Newcastle, over 121 million tonnes of coal was handled in 2011-12, with the total overall trade reaching nearly 129 million tonnes. Approved expansion at the Port of Newcastle provides potential for coal export capacity to increase to 300 million tonnes per annum. In addition, the landside transport infrastructure is struggling to meet this rise in demand, resulting in the requirement for ships to queue off the coast of Newcastle while awaiting loading. This increases the cost of shipping hire-rates, and results in increasing costs associated with demurrage or late-loading fees paid by coal companies to the ship owners. In May 2009, the Australian Competition and Consumer Commission (ACCC) identified that a queue of about 55 ships would cost coal companies about US\$400 million, or almost AUD\$600 million at the time.

Port Kembla

Port Kembla is the NSW port for vehicle imports and also supports export trades such as coal, iron ore, minerals and grains. Over 14 million tonnes of coal was handled in 2010-11, with the total overall trade reaching nearly 34 million tonnes. The current capacity of the Port Kembla car import terminal is estimated at around 847,000 vehicles per annum, and it is estimated by Transport for NSW that the freight task will approach 1.2 million by 2036.

The nominal capacity of the coal infrastructure at the port is around 17-18 million tonnes per annum and is proposed to be upgraded in two stages to around 25.5 million tonnes per annum.

Figure 7.13 Heavy vehicle movements in Sydney 2011 and 2031

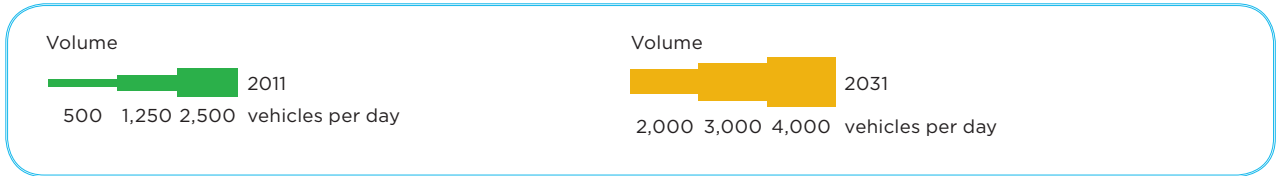
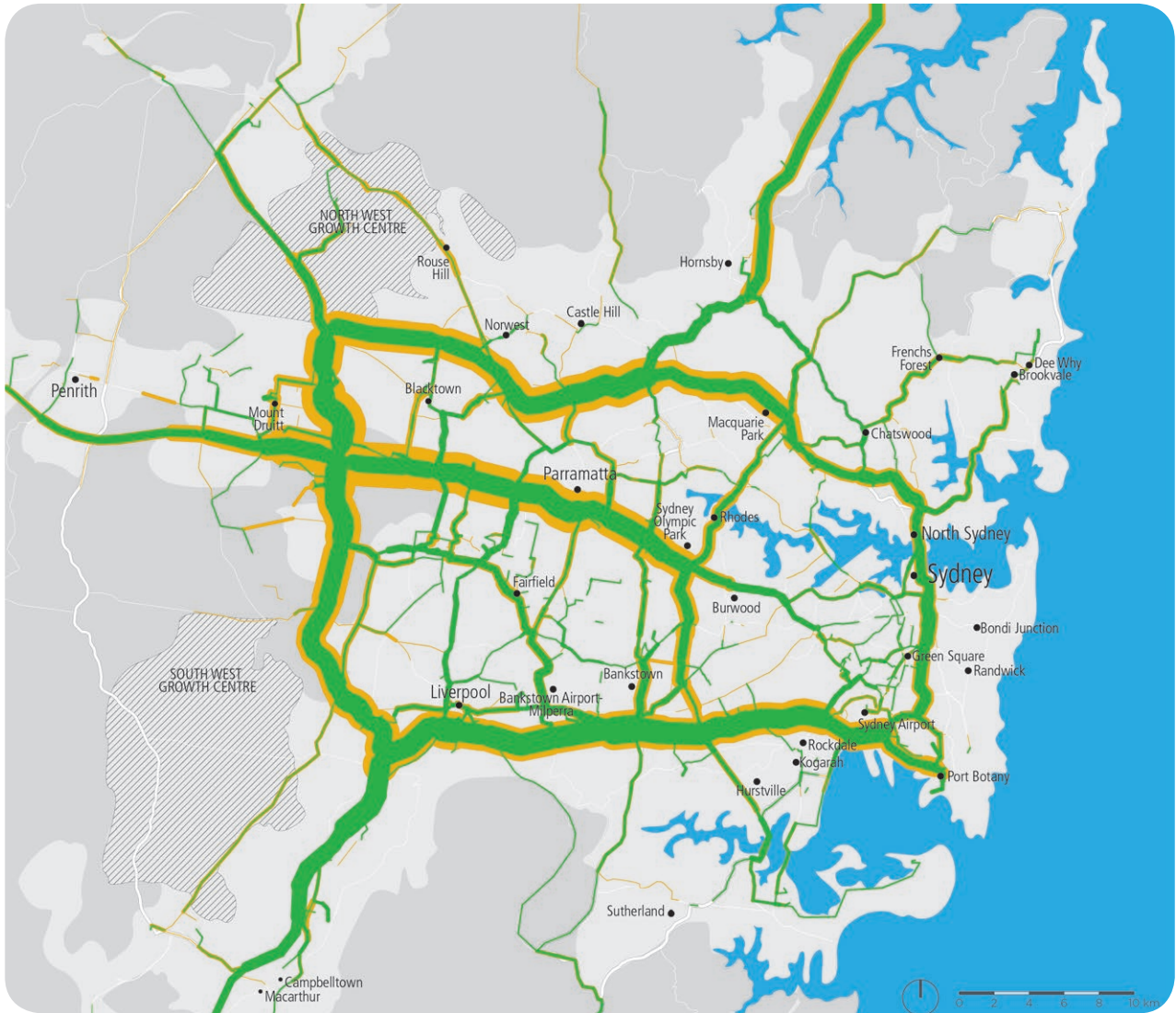
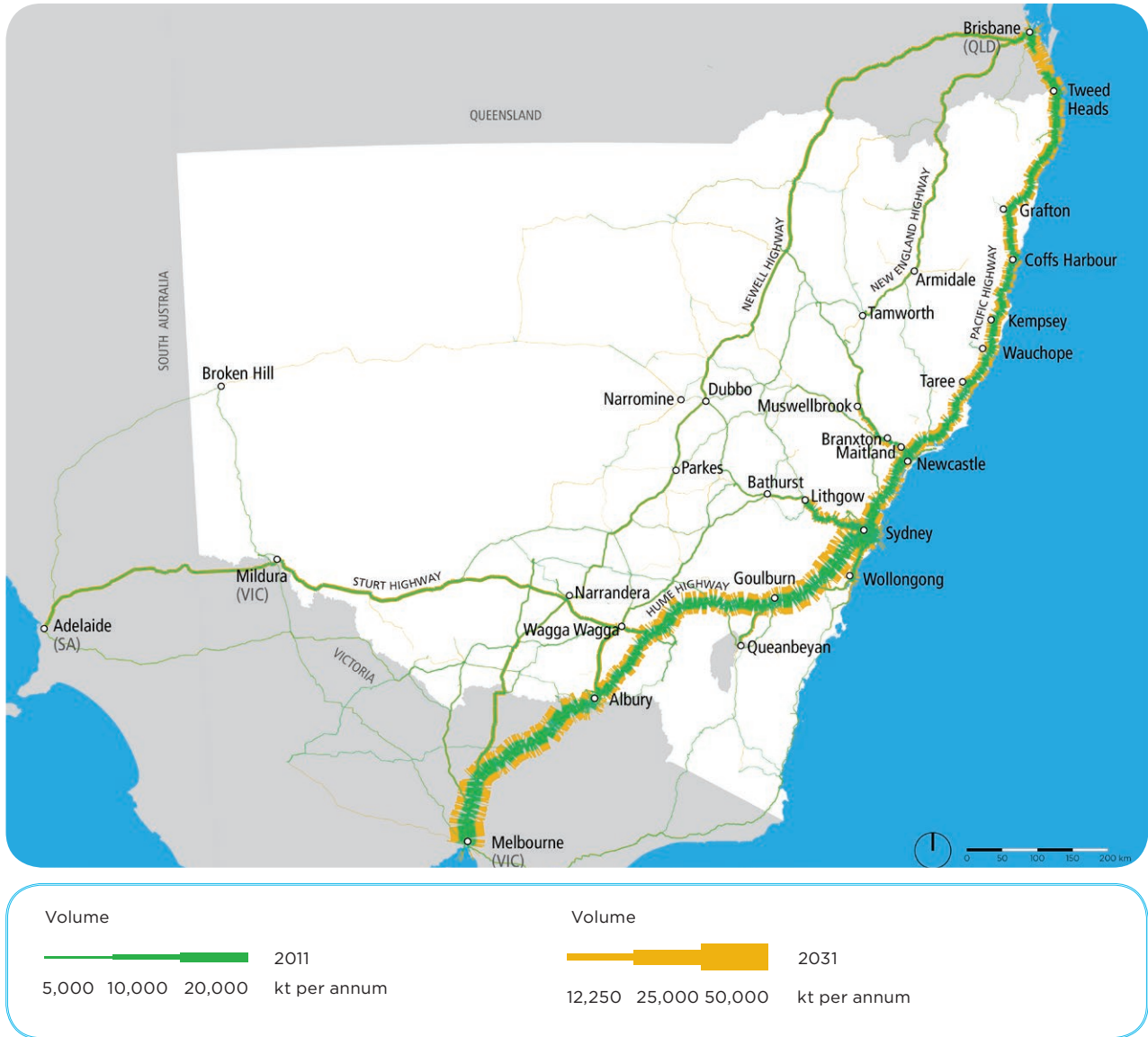


Figure 7.14 Freight flows in kilotonnes per annum on major NSW roads 2011 and 2031



Sydney Airport

Sydney Airport is the nation's busiest airport. In the next 20 years, passenger numbers are set to more than double which will result in increasing pressure on the surrounding transport network. Also, domestic and international air freight at Sydney Airport will increase from over 500,000 tonnes in 2010 to 1,077,000 tonnes in 2029. While only a small proportion of the freight task when comparing the volume of freight moved, air freight carries a higher proportion in terms of value. For example, the average value of air cargo, by

weight, is in the order of 300 to 350 times that of sea cargo. Sydney Airport caters for over half of international air freight task in Australia.

While airport capacity is subject to Australian Government regulations and to Australian Government approval of five yearly master plans submitted by Sydney Airports Corporation (SACL), the NSW Government supports road and public transport access to Sydney Airport.

7.4.5 Creating an integrated rail freight network

Gaps and pinch points on the rail freight network are restricting us from making the best use of the assets we already have, and planning for enhancements to the rail network to enable it to meet the capacity requirements of the future.

These constraints include low speed junctions, wagon weight limits, restricted train speeds, single line sections of track and even some areas with steep grades. Significant pinch points being experienced in some of our busiest rail freight areas include low speed junctions at Chullora and constraints on the rail network in the Blue Mountains.

To the north of Sydney and up to Newcastle, there are numerous constraints on the rail freight network, including a shortage of holding loops (overtaking lanes), several steep inclines, junctions causing delays at critical locations and passenger services restricting freight services in the Sydney metropolitan area. Stage One of the Northern Sydney Freight Corridor Program is addressing some of these issues. However, with the growth in the freight task, further stages of this project will be required. This includes additional capacity to support coal movement to Central Coast power stations beyond 2015.

Due to expansion at Port Kembla, further rail freight access planning is required to ensure that landside freight connections are improved and enhanced to service this expansion. Rail access to Port Kembla is increasingly constrained, including the Port Kembla branch line servicing the Outer Harbour where the expansion proposal is focused. Also, while the Southern Sydney Freight Line work will considerably increase the capacity of rail freight in the south of Sydney, there are capacity constraints on the Illawarra Line for freight travelling to and from Port Kembla.

Port Botany Rail Freight

Currently, the share of freight moving on rail from Port Botany is around 14 percent of all container freight. The Metropolitan Freight Network between Port Botany and Enfield is underused, with an average 14 trains scheduled in each direction each day out of 36 potential train paths. This reflects a range of inefficiencies and complexities in the rail supply chain, including:

- Currently available train paths and arrangements that give passenger trains priority making regional freight rail less reliable
- Fixed schedules and poor coordination between trains and stevedoring windows at the port which causes delays and lost productivity
- Pricing arrangements that create competitive disparity between road and rail freight, due to the extra handling costs for rail on shorthaul trips within the metropolitan region.

An example of how poor reliability leads to productivity losses and extra costs is illustrated where a regional train operator purchases two stevedore windows in case the train runs late for its first slot. If the train is late, it is penalised for missing the first slot, on top of the added cost of purchasing the second slot. Moreover, this 'hoarding' prevents another user from using the second time slot. In late 2011, 57 percent of trains were late.

NORTHERN SYDNEY FREIGHT CORRIDOR

The 155 kilometre section of the Main North Line between Sydney (Strathfield) and Newcastle (Broadmeadow) is an integral part of the East Coast interstate rail network between Sydney and Brisbane. The Sydney to Brisbane rail line is part of Australia's busiest rail corridor, the East Coast rail network.

The Northern Sydney Freight Corridor (NSFC) Program is a rail corridor investment strategy designed to resolve some of the constraints on the rail network between Sydney and Newcastle. The NSFC Program consists of a package of 19 indicative projects that will be delivered in stages as they are further refined and prioritised. Stage One of the NSFC Program includes North Strathfield rail underpass, Epping to Thornleigh third track, Gosford passing loops, and Hexham passing loop. These will be complemented by planning for a Newcastle Rail Bypass to provide alternative access to the Port of Newcastle.

The volume of freight on this corridor is currently greater than 20 million tonnes per annum and is growing at approximately four percent a year.

Currently, interstate freight rail has low mode share. However, ARTC forecasts suggest that demand for interstate rail freight will triple over the next 10 years from 1.7 million tonnes to five million tonnes per annum.

The movement of coal by rail to the Port of Newcastle and to power stations on the Central Coast is also forecast to increase significantly, as are coal freight trains from the south of Newcastle to the port. The Newcastle Rail Bypass would provide alternative access to the port facilities in Newcastle, providing increased capacity, operational flexibility and improved amenity through residential areas of Newcastle.

Rail capacity will become a limiting constraint to coal throughput at the Port of Newcastle, and hence economic growth from increased trade by reducing the efficiency and reliability of coal trains to service power stations in the Hunter Valley and on the Central Coast.

The NSFC Program, together with Newcastle Rail Bypass, will contribute to a more efficient freight rail network connecting Australia's three largest cities by:

- Relieving the most serious bottlenecks on the East Coast interstate rail network
- Improving freight train access through northern Sydney to the metropolitan freight network, Port Botany and intermodal terminals
- Reducing freight transport operating costs
- Easing peak hour restrictions on freight services
- Improving reliability of passenger services on the Main North Line.

To develop a whole of life solution to the issues associated with rail freight in this corridor, 57 initial functional options were reviewed against the functional requirements of freight and passenger rail for the corridor and against competing alternatives.

To ensure that investment in this important freight link meets the long term objectives for this corridor, 34 shortlisted options resulting from the initial review were rigorously assessed for performance, cost, decongestion benefits and time savings, and community and environmental impacts, resulting in a selection of the 19 indicative projects making up NSFC Program. This package of 19 indicative projects will be delivered in stages as they are further refined and prioritised.



7.4.6 Creating an integrated road freight network

Major challenges on our road freight network relate to motorway access and congestion within Sydney and managing the increasing road freight task productively on our major interstate routes, particularly the Hume Highway (M31) and Pacific Highway (M1). Freight trips on the motorway and arterial road network within Sydney are set to increase significantly, as shown in Figure 7.13.

Large sections of the primary road freight network within Sydney are already operating at capacity in the peak periods and will spread further by 2031.

The need to increase freight vehicle productivity

More freight on the roads means either more trucks and therefore congestion on our roads, or more productive vehicles which are larger and can move more freight per trip. More trucks has impacts on local traffic and communities, and has direct costs to business.

For example, in NSW, a B-Double truck is only able to carry 56-60 cattle, whereas in Queensland, the same vehicle can carry up to 66-72 cattle. The cost of this difference is an extra \$8 per animal. Similarly, where a B-Double truck may take 26 trips to move 1,000 tonnes, a B-Triple truck may take 20 trips to move the same tonnage, taking six trucks off the road for the same freight task. Therefore, we need to safely increase the productivity of the road task through improved HML and HPV access, as vehicle technology also improves. Accommodating this growth, while balancing community concerns about safety, noise and amenity, is essential.

Road freight productivity has more than doubled over the past 40 years, with productivity growth of rigid and articulated trucks increasing nearly six-fold. Modelling by the Bureau of Infrastructure, Transport and Regional Economics (BITRE) estimates that without these productivity improvements over the nearly four decades from 1971 to 2007, the delivery of the 2007 road

freight task would have required twice as many freight vehicles on the road network than was otherwise experienced.

Productivity improvements have been enabled by improvements to freight vehicles, road conditions and regulation, information technology, better logistics management and market competition. Improved fuel efficiency and labour productivity have also contributed to these productivity gains.

While these productivity improvements have been impressive, modelling by the BITRE indicates that productivity growth for road freight has slowed over the past few years and that, in the absence of further productivity reforms, future heavy vehicle productivity growth will be relatively low. This will result in more congestion, higher prices to consumers and reduced global competitiveness for our mining, agricultural and manufacturing industries.

Road freight productivity improvements can be achieved by using modern HPVs, vehicles that carry a greater mass than traditional road mass limits and are restricted to roads capable of supporting heavier vehicles. Under a nationally agreed scheme, some approved HPVs can operate at Higher Mass Limits (HML) on a restricted HML network subject to specified conditions. However, gaps on the HPV and HML networks particularly on interstate routes prevent freight operators from moving freight as efficiently as possible.

These gaps reflect constraints on the wider use of HPVs on the NSW road network, and can be physical, administrative or safety and amenity related, such as community sensitivity about heavy vehicles on public roads.

Physical constraints are primarily related to structural capacity and geometric constraints, particularly in urban and township areas. Administrative constraints involve inconsistency across jurisdictional boundaries, lack of regulatory reform and pricing signals, and a lack of a strategic focus on improving the network for these types of investment.

Port Botany precinct roads

The Port Botany and Sydney Airport precinct is the origin of different traffic generators with multiple destinations all over Sydney and NSW. The trips radiating from this precinct interact with traffic generated in other areas, including those with a destination in the precinct and the Sydney CBD. This complex interaction requires integrated solutions that recognise the main functions of this precinct and identify the most efficient way to deliver the passenger and freight tasks passing through this area.

Road congestion is caused by growing passenger traffic on key arterials in the precinct, with less than 10 percent of road trips around the port area being freight related. In addition, missing links on Sydney's motorway network that require freight trucks to travel through local areas and heavy vehicle restrictions and other traffic pinch points on the corridor reduce the overall efficiency of the surrounding road network.

Truck restrictions are in place on Bunnerong Road and Qantas Drive, Airport Drive, Southern Cross Drive, M5 East main tunnel, Cooks River tunnel and Airport tunnel. Dangerous goods are prohibited in all tunnels. Monthly maintenance on the M5 East can prevent HPVs operating outside daytime periods. Other network access constraints between the precinct and Western Sydney restrict the operation of HPVs in terms of their height, length and/or mass.

The growing air passenger task at Sydney Airport is resulting in congestion on the road network, which affects freight traffic in and around this area. Given the prominence of the precinct in the nation's import and export task, this is not sustainable in the longer term. Consideration of more efficient ways to provide for the air passenger task are required to ensure that this precinct can operate at the optimum level for the freight task in this area. A key driver of road congestion in the precinct is low levels of public transport use.

7.4.7 Encouraging private investment in freight networks

While freight terminals and logistics operations are managed by industry, the freight transport network has mostly been planned and delivered by the State. Increasing private sector ownership and direct involvement in key parts of network supply chains, especially in the resources sector, has increased the availability and appetite for private investment in the freight network. Therefore, encouraging private investment in freight networks is important to grow these networks for the long term and support greater separation between freight and passenger movements.

This is a welcome development – private sector investment needs to play a role in developing freight networks. This needs to be viewed in the context of acknowledging the influence of the State over the preconditions to private investment decisions.

The best way to encourage and foster private investment in an efficient State freight network is to provide certainty to industry on the future of that network and a clear and unambiguous set of rules for investment.

In order to provide certainty to industry, a successful freight network framework must include a long term vision and planning for developing infrastructure capacity. In addition, approval processes need to be simplified to promote private investment in the development of that infrastructure.

7.5 Managing community and environmental impacts

Efficient freight movement is critically important to ensuring the sustainability of the freight industry, our economy, and our households and businesses. However, where freight operates on the same road and rail networks as other users, conflicts can arise around the use of that infrastructure or where freight traffic adversely impacts on community amenity or the environment.

7.5.1 Land use conflicts

Currently, strategic land use planning does not specifically address the development of freight facilities near to major transport links. This can impose costs on industry through lost productivity and increased freight times, as well as costs on the community through increased interaction with local traffic. Insufficient planning for freight logistics chains when planning for the location of businesses, services and housing developments can hamper the efficient use of the rail, road and air freight networks and prevent the formation of economies.

Often, the local response to increased freight movements is to regulate to minimise the impacts of heavy vehicles in local areas, rather than make allowance for essential freight requirements within planning decisions. The result is that industries such as waste disposal facilities and construction materials are increasingly locating beyond metropolitan boundaries, increasing the costs of transporting materials for housing construction and waste disposal.

In addition, delays to assessing and approving freight developments can result in costs to industry and to the economy through lost export opportunities.

7.5.2 Environmental and noise impacts of freight

If growth on freight networks is not managed and future networks are not well planned, increases in freight volumes will adversely impact the natural and built environment, particularly in the context of increased emissions and noise pollution. This will reinforce negative community views and perceptions about freight, potentially driving a less efficient outcome for all.

Emissions

Heavy vehicles make up just four percent of the Australian vehicle fleet but contribute 22 percent of total transport emissions. Some estimates indicate that by 2020 these emissions will account for 25 percent of transport sector emissions, or double that of 1990 levels.

Transport for NSW works with industry in implementing two programs aimed at managing the emissions from the road freight task.

The Green Truck Partnership seeks to identify and test new technology to improve the environmental performance of road freight vehicles. The aim of the program is to assist road transport operators to make an informed decision when purchasing products that can improve the environmental performance of their heavy vehicles.

The Clean Fleet Program is a vehicle maintenance program for which freight companies can register. It is designed to improve air quality by reducing diesel vehicle emissions and also results in lower vehicle maintenance costs.

Noise

Noise from rail or road freight transport can adversely affect those living close to these corridors.

Rail noise arises from a number of sources and includes wheel squeal, shunting and loading, wagon and locomotive noise. There is little agreement around how best to manage rail freight noise.

Road noise arises from noise generated by tyres on road surfaces, and also engine noise. Programs work to reduce the effects of road noise from new road projects and road development projects.

Chapter Eight provides more detail around the management of noise and emissions from the transport task more generally.

7.5.3 A safer freight environment

Freight transport can be a dangerous workplace and requires constant safety vigilance, particularly in the context of road and rail safety and the transport of dangerous goods. Current efforts in this area are considered to be world-class; however, continued efforts are required to ensure that the growth in freight is managed safely.

One way that Transport for NSW is tackling the ongoing issue of road freight safety is by enforcing the Chain of Responsibility legislation, introduced in 2005. Also, the NSW Government, through its Road Toll Response package has allocated funding to investigate a Five Star Trucking Safety Rating system. The proposed rating system aims to encourage safety management and quality within the heavy vehicle industry by rewarding effort.

In addition, the National Heavy Vehicle Regulator (NHVR) will commence operating in 2013. The NHVR will be responsible for implementing a new national system for regulating all heavy vehicles more than 4.5 tonnes. Transport for NSW is currently preparing for the changes that the NHVR will bring to NSW.

On the rail network, the National Rail Safety Regulator will commence on 20 January 2013. The independent Transport Safety Regulator will deliver rail safety regulation services on behalf of the National Rail Safety Regulator under a service agreement. A national rail safety investigator will commence on 20 January by expanding the role of the Australian Transport Safety Bureau (ATSB). In NSW, the Office of Transport Safety Investigation (OTSI) will deliver rail investigation services on behalf of the ATSB under a collaboration agreement.

7.5.4 Workforce constraints

The labour force for the freight industry is shrinking, which adds another layer of cost to freight movements. Semi-skilled labour upon which the freight industry depends – particularly truck and train drivers – are finding more attractive employment options in the resources industry and are able to demand higher salaries. Ageing and shrinking populations in regions also mean that a smaller labour force is available to service a growing freight task, further increasing costs.

Taking action

7.6 Improving network efficiency

The systematic and strategic coordination of supply chains will ensure the competitiveness of our freight and logistics industries. The key role of government in contributing to effective supply chains is its involvement in pricing and regulation, governance, market participation and reform. It also must ensure continuous improvement in its own management of freight and supply chain issues and measure and report critical freight and supply chain data regularly to enable better decision making. This will ensure the freight and logistics industry can continue to do what it does best: deliver best practice logistics functions to support industry.

7.6.1 Identify freight movements and network demand

We will develop a rigorous regime to measure and monitor performance, asset management and congestion which will form a cohesive performance management tool across the supply chain. This framework will promote greater transparency across the supply chain, reduce operational complexities caused by multiple owners and operators, and inform targeted efforts to optimise performance across modes. This initiative will also include arrangements to ensure improved data capture and analysis to better identify freight movements and demand for network capacity.

Action Establish freight network performance indicators and measure performance

In order to assess the performance of the current network, the value of proposed improvements and assist in coordination of supply chain activities, we will define, measure and report on Key Performance Indicators (KPIs) of freight network efficiency.

The establishment of KPIs will ensure government and industry are working to a single performance measurement regime.

Action Improve freight data collection and strategic analysis

Good, accurate data is the key to better performance measurement, economic analysis and forecasting of demand. Transparent data collection, collation and modelling also supports economic analysis that assists decision making regarding deficiencies in the network and the quantification of potential benefits of new infrastructure investment.

Transport for NSW has established the Bureau of Freight Statistics to streamline freight data collection and strategic analysis and provide a single, reliable source of data for analysing the freight network. Transport for NSW will also build a Sydney Metropolitan Cargo Movement Model. This will be a model of the Port Botany cargo movement chain from quayside through to the inland logistic centres, incorporating both rail and road.

Action Undertake detailed economic analysis of the impacts of freight transport in NSW

A detailed economic analysis will inform decision making and cost benefit analysis of supply chain efficiency and network capacity investments.

It will also assist in ensuring that all stakeholders in the freight network understand the economic value of the freight transport task. Transport for NSW will maintain a dataset that articulates the value of the NSW transport and logistics task, the value created by the efficient operation of the network and future network demand.

Improving the measurement of future network demand will enable revenue streams to be identified to support investment in expanding the network.

7.6.2 Shift more freight movements to off-peak periods

While heavy traffic during peak periods causes significant congestion and impacts freight efficiency, network capacity is underused at other times of the day, impacts freight efficiency, network capacity is under used at other times, particularly in the evening, night or early morning. Limited freight activity during off-peak periods is the result of higher labour costs and the difficulty of undertaking freight operations near residential areas during the evening, night or early morning.

Action Support a greater shift to off-peak freight movements

In order to facilitate a move to more efficient transport outcomes for supply chain operations, we will:

- Identify the infrastructure requirements for off-peak freight handling
- Support reform of work practices to grow off-peak freight transport, including preparation of a business case that takes into account all relevant variables such as reduction in congestion costs (including fuel), higher labour costs and higher asset utilisation
- Build the case for off-peak freight handling for planning purposes to assist regulators and business to achieve better value outcomes including reductions in congestion, productivity gains, higher employment and targeted capital investment
- Identify the infrastructure requirements for off-peak freight handling that will help to minimise urban amenity issues such as noise, light and vibration impacts on residential areas.

7.6.3 A seamless national freight network

The NSW freight network plays a critical role in the national freight network. The regulation of the freight networks and operating conditions across Australia must be better aligned to avoid unnecessary duplication and imposition of costs on freight operators who cross state boundaries.

Action Authorise the system of national transport safety regulators

NSW, together with other jurisdictions is finalising legislation to authorise the system of national transport safety regulators, which is planned to become fully operational in all jurisdictions in January 2013. We will continue to support these initiatives to deliver a more seamless interstate freight network that will enhance road and rail freight productivity.

The national regulators include the establishment of three bodies covering maritime, rail and heavy vehicles:

- The Australian Maritime Safety Authority (AMSA)
- The National Rail Safety Regulator (NRSR)
- The National Heavy Vehicle Regulator (NHVR).

Action Expand the National Road Freight Network

Building on existing work with the Council of Australian Governments Standing Committee on Transport and Infrastructure, we will continue to review the expansion of the road network available to modern, safer and more productive heavy vehicles, particularly the national modular B-Triple network. We have already expanded B-Triple access west of the Newell Highway (A39), and will continue prioritising the assessment of the B-Triple network with relevant local councils and working on national access arrangements for next generation HPVs.

7.6.4 Road freight network productivity

Short term

Action Reform road access regulations for High Productivity Vehicles

Greater use of HPVs can help drive productivity improvements in the freight industry through lower transport costs and reduced road wear. Transport for NSW will work with the NHVR (in its capacity as a safety regulator) and other jurisdictions to develop consistent access conditions for HPVs operating on key interstate freight routes.

We will review regulatory arrangements on NSW roads for restricted access heavy vehicles. Considerations will include a move from an ad-hoc, administrative system to a more standard commercial access regime, similar to rail and shipping wharves. This would allow the access arrangements in NSW to become more commercially oriented and would aim to promote the efficient use of and investment in NSW roads to support the NSW economy.

Action Pilot High Productivity Vehicle access on the Hume Highway (M31)

Extending the network where HPVs can operate requires investment in road and bridge upgrades as well as monitoring and enforcement regimes. We will investigate options to allow HPVs to use the Hume Highway (M31) under a direct charging arrangement.

As part of this work, we will seek to work with the Victorian Government on a potential HPV route from Sydney to Melbourne via the Hume Highway (M31). The duplication of the Hume Highway (M31), due for completion in mid 2013, can enable HPV access in the future, with only specific enabling works such as driver rest areas and trailer change over areas required to support HPV access.

Allowing HPVs on the Hume Highway (M31) between Sydney and Melbourne could cut the number of freight vehicles needed to service the growing road freight task. On initial estimates, this could result in almost a million less B-Double equivalent trips over a 30 year period, with the potential to improve congestion and safety to passenger vehicles.

Under the proposed arrangement, HPV operators who benefit directly from these enabling works would contribute towards the cost of these. Initial consideration indicates that charging for HPV use on the Hume Highway (M31) between Sydney and Melbourne could provide labour and fuel cost savings to industry that would offset potential costs.

Action Improve approval process for Restricted Access Vehicles

The approval of Restricted Access Vehicles (RAVs) can be a lengthy process, impacting on the ability of industry to use these vehicles to improve productivity. Often approval to use RAVs can be denied or delayed due to protracted local council processes or lack of resources. We will increase our involvement in the approval process for RAVs by facilitating assessments and ensuring a consistent, efficient and transparent process for approvals that aligns with key strategic freight links.

Action Incorporate freight considerations into Managed Motorway access decisions

As part of the introduction of the Managed Motorway System, a program of freight access considerations will be included. Safe and priority access for heavy vehicles will be incorporated by considering improvements to heavy vehicle provisions at access ramps and the potential introduction of dedicated freight lanes.

Action Review efficient freight usage on arterial roads

Transport for NSW will undertake a review of arterial roads to identify important freight routes, with a view to improving productivity and efficient usage of these roads. This review will consider the needs of both passenger vehicles, public transport and freight movements, particularly with respect to parking arrangements.

Action Deliver the Bridges for the Bush program to support more efficient freight movement

To support the expansion of the HPV network, we will work with communities and local government to replace or upgrade regional bridges that constrain the operation of HML and HPVs on identified freight routes. These actions will assist in improving productivity in the freight industry and creating a better connected road freight network (refer to Chapter Six).

Medium to longer term

Action Reform road pricing for heavy vehicles

While the road freight task is projected to double over the next 20 years, road freight productivity growth will slow without further reform in the sector. NSW is providing support to the national reforms looking at incremental charging and activity-based charging for heavy vehicles. We will continue to support these reforms, and look to invest the revenue from heavy vehicles charges in the roads used by heavy vehicles.

7.6.5 Reforming rail access

Action Review NSW rail access regime

We will assess and reform regulatory access arrangements that apply to the Metropolitan Rail Network, the Country Regional Network and interfaces with ARTC access undertakings for the metropolitan and regional freight networks. This will improve the management of conflicts between passenger and freight transport, improve the reliability of rail freight to Port Botany and develop a more integrated and contestable national rail market.

The planning for access arrangements on these networks will also examine the provisions and operation of the NSW Rail Access Undertaking (RAU) and will inform recommendations to government on the form and scope of future rail access regulation applying to those networks that remain in NSW Government control.

7.6.6 A productive Port Botany

Port Botany will continue to serve as NSW's major container port and will be supported to maintain its productivity and competitiveness while managing growing freight volumes. With the new \$1 billion Terminal T3 due to commence operations soon, improving port productivity and capacity will focus on improving the landside transport network that enables goods to move to and from the Port. In addition, changes in and around the Port such as the refinancing of Sydney Ports Corporation and the transfer of the responsibility for the metropolitan freight network to the ARTC will also result in a renewed focus on improving supply chain performance.

Short term

Action Reform funding and governance of Port Botany

We will proceed with the long term lease of Port Botany to enhance the efficiency of port operations and free up funds for investment in priority infrastructure.

Action Investigate new NSW Cargo Movement Coordinator

We will investigate the expansion of the Port Botany Landside Improvement Strategy (PBLIS) to include a new body, the NSW Cargo Movement Coordinator. This should optimise landside cargo transport to meet Port Botany and Port Kembla demand growth, and minimise overall supply chain costs including externalities such as congestion. The coordinator would focus on operational efficiency, capacity management, advocacy and managing stakeholder relationships. This reform would also include the potential for market intervention in rail operations at the Port to improve the competitiveness of rail.

The PBLIS seeks to reduce truck turnaround times, smooth the flow of freight vehicles into off-peak and weekend time slots, and ensure greater transparency around stevedore time slots.

Action Implement pinch points improvement program

We will relieve pinch points and better manage road space in the precinct, delivering a targeted package of works that includes:

- Replacing the General Holmes Drive level railway crossing with a grade-separated solution and related road infrastructure improvements to maintain road network capacity
- Implementing one-way pairs road operation on Bourke Street and O’Riordan Street to manage increased traffic, with complementary measures including the removal of parking, provision of bus priority, enhanced pedestrian movements and examination of an alternative cycleway
- Widening Mill Pond Road to support increased taxi volumes and private bus operators accessing the Sydney Airport precinct.

Construction will commence this year on widening the M5 South West Motorway from two to three lanes in each direction between Camden Valley Way and King Georges Road.

We will work with the Australian Government on a comprehensive review of the land transport system associated with the precinct to develop a joint transport improvement plan that focuses on improving the infrastructure required to support productive long term freight flows.

Medium and longer term

With four of Sydney’s five most congested roads running through the precinct – the Eastern Distributor, the M5 East Motorway, General Holmes Drive and Southern Cross Drive – a suite of measures will be required to manage growing congestion and coinciding demand for road space between passenger and freight vehicles during peak periods.

Action Improve efficiency of road connections in the Port Botany and Sydney Airport precinct

An efficient road network around the Port and Airport will minimise congestion and make better use of existing investments, staving off the need for costly new investment as the freight task grows. Even with a targeted doubling of rail modal share for freight, there will still be an increasing number of heavy trucks servicing the precinct and operating on Sydney’s road network. This means that reducing road congestion will remain a long term priority.

Action Implement intelligent road management systems

We will deploy intelligent road management systems to better manage the motorway network around the precinct and make better use of existing road capacity.

Action Manage growth in private vehicle demand in the Port Botany and Sydney Airport precinct to reduce congestion

If 40 percent of journeys to Port Botany and Sydney Airport were made by public transport, there would be around 25,000 fewer people travelling on the roads around the precinct every day, reducing road congestion in the area. However, only 15 percent of airport users travel to Sydney Airport by public transport, a low level by international and local standards. Chapter Five contains the public transport initiatives for relieving congestion around the Sydney Airport precinct.

7.7 Growing future freight network capacity

We will manage the growing freight task by providing better access, encouraging more efficient use of the existing network and removing constraints to its improved productivity.

We will work with industry and other State agencies to grow the freight network with targeted investments that expand capacity and maintain strong international, intrastate and interstate connectivity.

By coordinating regional infrastructure and service delivery and developing and maintaining a pipeline of freight infrastructure projects, we will provide greater certainty to industry on the future of the freight network.

Short to medium term

Action Develop a metropolitan network of intermodal terminals

We will seek to increase the share of freight that is transported by rail by developing an efficient and competitive network of intermodal terminals in Sydney.

In the short to medium term, we will complete the new Enfield intermodal terminal and work with the Australian Government and industry on the development of the Moorebank terminal precinct. These intermodal container terminals will be located on dedicated freight lines and will each provide around one million additional TEUs of rail capacity per year in the Sydney metropolitan area, providing a more competitive rail alternative to road freight.

Development of the Moorebank intermodal container terminal precinct will have impacts on the local road network. Initial analysis suggests that traffic on the M5 (between the Hume Highway (M31) at Casula and Moorebank Avenue) could exceed capacity as early as 2016, and capacity will be exceeded at key intersections that provide access to the precinct. We will work with the Australian Government on a road access strategy for the intermodal terminal precinct.

In the longer term, the intermodal terminal proposal at Eastern Creek will require land and associated transport corridors.

Transport for NSW will support the completion of the Southern Sydney Freight Line and development of the Enfield staging roads to better manage late trains and enable the splitting of loads to support more efficient processing of trains that arrive at the Port Botany yard.

Action Develop intermodal terminals in the regions in collaboration with councils and industry

To enhance the role of regional intermodal terminals in the NSW freight system, we will work with regional councils to develop the required infrastructure at strategic locations.

We will engage regional councils on planning issues around the sustainable development of intermodal facilities in industrial precincts, and adjoining land, road and rail access to proposed sites. We will promote best practice terminal development, including on noise mitigation and heavy vehicle access.

We will work with councils and the private sector to identify future sites, preserve land where required and work with proponents to design facilities (including future proofing) on a case by case basis.

Action Facilitate individual Port Growth Plans

Transport for NSW will support the Port Corporations and new long term lessees of Port Botany and Port Kembla.

Long term Port Growth Plans respond to the specific requirements of each of our ports can help us meet this challenge. These Port Growth Plans will reflect the different challenges being faced by each port and demonstrate how infrastructure will be provided to meet the forecast trade task over the next 25 to 30 years.

Equally important is the requirement for each of these Port Growth Plan will be consistent with national, state and regional planning schemes including the *National Ports Strategy* and the *National Land Freight Network Strategy*. NSW's commercial ports are national assets that need to be developed consistently with the themes and priorities of the *National Ports Strategy*.

Much of the future investment and operation of the ports will rely on the private sector. The ports and freight supply chains involve long-life assets, so optimal private investment and use of assets depends on the Port Corporations providing certainty about their future plans. In particular, port users and investors require certainty about the provision and use of port lands and access to associated road and rail systems.

The operating and institutional environments for bulk and container ports differ in location, the extent of integration of stakeholders in the supply chain, land transport arrangements, the markets they serve and growth needs.

Given this diversity, port owners will develop Port Growth Plans to clarify how their port will expand to meet future freight volumes, and to integrate planning of port and landside infrastructure needs.

Action Identify and upgrade HML and HPV networks within NSW

In addition to connecting interstate HPV networks, we will continue to strengthen HML restricted bridges on intra-state HML and HPV networks as part of Bridges for the Bush, as outlined in Chapter Six. In addition to the Bridges for the Bush program, we will also identify and resolve other restrictions to intrastate HML and HPV routes, such as:

- narrow and low strength irrigation structures in South West NSW
- low or narrow road and rail bridges over HML routes
- last mile issues on local roads that restrict access to initial origins and final destinations by these vehicles.

We will also develop a strategic road network enabling greater movement of HML and HPV to ports within NSW.

Action Develop a Newell Highway (A39) Corridor Strategy to support greater use of high productivity vehicles

Strategy will provide access for HPVs along the entire length of the highway in the short to medium term. The Corridor Strategy will address road safety, transport efficiency and asset performance issues and set a framework for the management of the corridor.

Action Deliver the Northern Sydney Freight Corridor Program (Stage One)

The NSFC Program has been designed to resolve the constraints between Strathfield in Sydney and Broadmeadow in Newcastle.

Over \$1 billion to improve capacity on the rail network will be invested through Stage One of the Northern Sydney Freight Corridor Program. The project is jointly funded by the Australian and NSW Governments and will deliver a range of benefits including speeding up freight trains through the Sydney Metropolitan area, improving the reliability of passenger trains and increasing the capacity of the corridor.

A package of 19 indicative projects will be delivered in stages and will include further enhancements to provide more separation of passenger rail, passing loops, additional track sections and the potential for signalling upgrades.

The work on this corridor will also include planning for the Newcastle Rail Bypass – a bypass enabling most freight trains operating on the Main North Line to avoid the suburban areas of Newcastle and several level crossings.

There are a number of more immediate short term projects required to increase capacity in the NSFC prior to the completion of Stage One. These projects include crossing loops at Awaba and traffic management solutions at Adamstown to provide congestion relief for local residents. The feasibility of grade separated options for Adamstown will also be investigated.

This corridor, in addition to the nearly completed Southern Sydney Freight Line providing dedicated rail access between Macarthur and Port Botany, will assist in the ongoing objective of separating passenger and freight tasks on the rail network in Greater Sydney.

Action Establish a freight investment framework and maintain a program of freight infrastructure projects

We will prioritise freight infrastructure projects that ensure value for money and that integrate different modes, demands and networks for the benefits of our customers. This approach will consider strategic long term planning outcomes, project assessment and evaluation, and governance and reform. Maintaining a pipeline will provide a degree of certainty for planning and investment, and support more efficient delivery once funding becomes available.

Medium term

Action Develop rail freight capacity projects

We will continue to identify infrastructure enhancements to improve freight operations on the shared rail network and will investigate the protection and development of selected freight only rail corridors to increase the overall capacity and improve rail freight service delivery.

In the short to medium term, enhancements to the Sydney rail network that may be implemented (in addition to the Northern Sydney and Southern Sydney Freight Corridors) include:

- **Upgrade the Chullora Junction** (operated by ARTC) – improvements to low speed junctions at Chullora, including possible duplication of the Chullora North/Chullora West connection
- **Duplicate the Port Botany line** (operated by ARTC) – Stage One, Cooks River to Mascot and Stage Two, Mascot to Port Botany following the removal of the existing railway level crossing at General Holmes Drive
- Complete planning in preparation for delivery of the Maldon-Dombarton Rail line.

Action Protect strategic rail freight corridors

Long term rail freight corridors and intermodal sites are under pressure from urban growth, making future development of strategic freight networks difficult to achieve if these corridors are not protected in advance.

We will identify and protect strategic rail freight corridors and sites, commencing with the proposed Western Sydney Freight Line and Western Sydney Intermodal Terminal.

Other long term rail freight corridors currently under investigation to service valuable export and domestic demands include:

- Newcastle Rail Bypass
- Maldon-Dombarton Rail Link
- (Long term) inland rail corridor
- Coalcliff eastern loop extension
- Outer Sydney Orbital (M9) – potential multi-modal corridor.

Action Protect strategic road freight corridors

Long term road freight corridors are currently under review to support the road freight task and to provide important connections for intermodal journeys. The long term road freight corridors under investigation to service export and domestic demands include:

- Outer Sydney Orbital (M9)
- M2 to F3 Link
- WestConnex.

In addition, a number of town bypasses are being considered that will ensure the continued productivity of freight journeys and amenity for town residents, as outlined in Chapter Six. Appropriate land use surrounding these town bypasses is also important to ensure through-traffic is not impeded by local traffic movements.

Long term**Action** Plan for a Western Sydney Freight Line and Western Sydney Intermodal Terminal

Western Sydney is a major destination for freight journeys, particularly for those coming in from Port Botany and also Port Jackson. The most recent additions to the motorway network have assisted in the freight task to this area. However, rail infrastructure (particularly dedicated rail infrastructure) does not service this area well. Without investment in this area, it is unlikely that the targeted rail freight modal share will be met. We will continue to work with the Australian Government to identify further opportunities to advance this corridor and look to protecting the corridor to ensure its viability into the future.

Action Complete missing Motorway network links

Road congestion around freight nodes such as freight precincts, ports and airports has a noticeable impact on commercial freight operators and businesses. It leads to slower travel times, and the need for businesses to operate larger fleets. Sydney's motorway network is part of the primary freight network in Sydney and its efficient operation is critical to the ongoing productivity of the freight task. As outlined in Chapter Four, we will continue to deliver the motorway network for Sydney, to improve freight access, connectivity and reliability across the greater Sydney area. The motorway network will also be enhanced with the introduction of managed motorway systems.

The 33 kilometre WestConnex project is Sydney's next motorway priority. It includes capacity improvements on the existing roads and new sections of motorway in the M4 and M5 corridors all combining to better link Western Sydney with its international gateways and key places of business.

Action Continue to work with the Australian Government to develop the inland rail route

The Inland Rail Route is a national project consisting of an inland route from Victoria, through the central and north west of NSW and then into Queensland. This rail project will increase the capacity of freight rail paths between Melbourne and Brisbane and free up capacity on the coastal rail route through Sydney. We will continue to work with the Australian Government to support the development of this project.

The proposed inland railway comprises a 1,731 kilometre alignment between South Dynon in Melbourne and Acacia Ridge in Brisbane. The rail line would pass through the towns of Albury, Parkes, Narrabri, Moree in NSW and Toowoomba in Queensland.

7.8 Managing community and environmental impacts

Delivering a sustainable freight system requires all levels of government and industry to work together. Together, we can manage community and environmental impacts associated with the freight task.

Short term

Action Improve integration of land use and freight planning

We will engage with industry, the community and local councils to develop effective guidelines, information sharing and best practice partnerships on land use planning for freight.

These initiatives will seek to resolve issues around local access and ensure that planning decisions about the location of businesses, services and housing developments also consider freight logistics needs and network implications. The aim is to maximise the existing freight network, minimise conflicts between local and freight traffic where possible, and promote the development of more efficient supply chains and transport access in local areas by preventing encroachment by incompatible development and sensitive land use.

We will also look at ways of working with industry to optimise freight network management, which can result in reduced emissions and improve the productivity of the network.

As part of this integration, planning for the movement of waste and construction materials will also be considered.

Action Prioritise safety on the Freight Transport Network

We will continue to support the introduction of the National Rail Safety Regulator and the National Heavy Vehicle Regulator within the NSW environment and ensure freight continues to be considered within the Road Toll Response package. We will work with industry to further investigate safety initiatives in the other links in the freight networks such as additional rest areas on the freight networks, safer ports and intermodal terminals and also safer workplaces for freight and transport workers.

This includes initiatives in the *Road Safety Strategy for NSW* that focus on heavy vehicle safety including:

- Developing enforcement and education programs targeting speed

- Developing compliance and accreditation regimes for the management of heavy vehicle driver fatigue
- Developing programs for the testing of drivers for the use of illicit substances
- Developing education and awareness programs on the use of seatbelts for heavy vehicle drivers
- Investigating the feasibility of Five-Star Trucking Safety Rating System designed to encourage best driving practice and reward those operators who foster safe driving.

Medium term

Action Address freight emissions and noise impacts

Chapter Eight outlines the measures that will be undertaken to address emissions and noise from the road transport task on a statewide basis.

In relation to the freight task, we will work with industry to identify emission reduction measures, such as supporting the adoption of alternative fuels and vehicle technologies and continuing to support the Green Truck Partnership and Clean Fleet programs.

We will also work with industry to achieve further reductions in road freight noise by promoting the use of low noise tyres and reducing the impacts of engine brake noise – one of the more intrusive noise emissions from road freight.

On the rail network, we will develop a comprehensive approach to managing the impacts of rail freight noise which will involve inputs from infrastructure owners, developers, train operators and the community.

Recognition of the costs of congestion will be a key component of this initiative, including transition to a lower carbon future.

Long term

Action Maintain our freight workforce

We will support initiatives to attract and retain skilled workers in the freight industry, such as the Green Light Day. We will work with industry, universities, TAFE and training organisations to improve training and workforce opportunities.

8



STATEWIDE ACTIONS

CHAPTER SUMMARY

Our transport challenges

There are a number of transport challenges that present across NSW. These include ensuring accessibility for disadvantaged groups, meeting community expectations in environmental performance and sustainability, harnessing technology to improve the customer experience, improving maintenance, managing travel demand and ensuring that the transport system is safe. Over the next 20 years we will address these challenges through statewide action.

This chapter identifies statewide challenges that we must address in the next 20 years, including:

- Integrating land use and transport planning to shape development such as transport plans for greenfield development or urban renewal of brown field sites
- Reducing transport inequality by addressing affordability and making public transport more convenient and more accessible
- Increasing the use of technology to modernise the transport system
- Stepping up efforts to provide safe travel options and networks for car or heavy vehicle drivers, passengers, pedestrians, cyclists, motorcyclists and waterway users
- Promoting sustainability and protecting the environment in our transport planning, decisions and projects
- Maintaining our transport infrastructure.

Taking action

We will take action to meet statewide issues and take up new opportunities. Highlights include:

- **New mechanisms to improve integrated land use and transport planning** to develop more accessible and liveable communities, and improve access to public transport
- **The delivery of more transit-oriented urban renewal projects** and the introduction of minimum land use and transport requirements for new residential developments

- **A Social Access Framework and updated NSW Disability Action Plan** that will be integrated into the Long Term Transport Master Plan to work towards an inclusive transport system
- A 10 year **Road Safety Strategy for NSW** to reduce the road toll and improve safety for all road users
- **Initiatives to manage and minimise the environmental impacts of our transport system**, including a coordinated approach to addressing environmental issues at all levels of transport planning, sustainable design guidelines for transport projects and better ways to assess the environmental and social benefits of projects
- An **Electric Vehicles Road Map** to encourage the uptake of electric vehicles in NSW.
- A **prioritised approach to maintenance** of our vital transport assets
- **Actions to manage travel demand**, including facilitating Travel Management Associations, Travel Access Guides and Workplace Travel Plans
- A **comprehensive new Metropolitan Parking Policy** to promote mode shift to public transport, improve local amenity and encourage more active travel options
- Making **better use of technology** and improve productivity across the transport system, including progressive rollouts of real-time information systems
- A technology-enhanced **Managed Motorways program** to improve travel efficiency and reliability
- A **Transport information communication technology and Innovation Strategy** to develop Transport for NSW's capability to test, support and deploy information communication technology solutions to address transport challenges in a new way including real-time transport information and road network management
- Collaboration with other governments to assess options for **high speed rail** for the east coast to support NSW's economic and population growth.

Our transport challenges

The Long Term Transport Master Plan focuses on addressing six major statewide transport challenges that apply to the entire transport network, that is they are not specific to any one city or region:

- **Integrating land use and transport planning to shape development:** Better integration of land use and transport planning will shape the pattern of economic and urban development in Sydney and across NSW.
- **Reducing transport inequality:** We will address affordability and make public transport easier to catch and more accessible.
- **Stepping up our efforts to provide safe travel options and networks:** Being able to travel safely is an important feature of any transport system. Road trauma continues to cost us dearly and we must step up our efforts to reduce deaths and serious injuries on our roads. We also need to make sure our public transport customers feel safe at all times of the day and night.
- **Taking up the opportunities provided by modern online information communication technologies:** New technology will let us modernise our transport networks and will drive future efficiencies.
- **Promoting sustainability and protecting the environment in our transport planning, decision making and projects:** Our travel choices, along with land use and transport planning must minimise environmental degradation and damage, reduce greenhouse gas emissions and use energy more efficiently.
- **Maintaining our transport infrastructure:** With a modern, efficient transport system vital to supporting our population and economic growth, we will need to find the resources to upgrade ageing infrastructure and assets and maintain our transport networks.

The Long Term Transport Master Plan also takes up important opportunities to re-shape our transport system. These opportunities were consistently nominated as matters of importance in our consultations with public transport customers, road users and communities across NSW:

- **Using the best available technology solutions to modernise our transport system and give customers better travel experiences:** We must build our capacity to take advantage of technological advances to give our customers better travel experiences, improve transport safety and manage our transport networks more efficiently.
- **Managing demand across our transport system while making better use of existing infrastructure and encouraging more sustainable travel choices and practices:** We must better manage demand, especially during peak periods and encourage alternative, sustainable travel behaviour.
- **Exploring the options for high speed rail along Australia's east coast:** Cooperation with the Australian, Victorian and Queensland Governments will support the future development of high speed rail for Australia's east coast. We will need to identify a corridor to ensure the future network is not compromised by development.

Our future transport planning, actions and investment will need to consider and address these challenges and opportunities for all modes of transport and across all parts of NSW.

8.1 Reducing transport inequality

Transport provides people with mobility and access. Without it, people can become isolated. Transport disadvantage stems from non-existent or infrequent public transport services, a lack of access to private transport, and transport services that are too expensive or that cannot be physically accessed by people with mobility difficulties.

Groups most likely to be disadvantaged are elderly people, young people, people with a disability, single parents, people with poor health and low income earners.

8.1.1 Areas of transport inequality

Transport inequality is experienced by people living in geographic areas where public transport services are infrequent, difficult to access or non-existent.

In Sydney, transport inequality is particularly concentrated in the outlying areas of the north west, west and south west (as shown in Figure 8.1). Factors that have led to this inequality include a radial public transport network focused on the CBD, poorly coordinated land use and transport planning, and dispersed, low density residential developments. Today, large numbers of Sydneysiders, estimated to include around 700,000 in Western Sydney, travel long distances for employment and/or have limited public transport options.

In regional NSW, small towns and remote areas rely mainly on car travel. Long travel distances, small populations and difficult terrain are all factors that affect on the viability of public transport services.

Long distances tend to increase reliance on cars, which can turn suburbs and towns into heavily car-oriented environments, reducing the viability of other modes of transport.

Low income households are particularly exposed to transport inequality as they spend a larger proportion of their household budgets on travel. Low income households are also more exposed to the combined effects of rising petrol prices and mortgage stress. Figure 8.2 shows that in Sydney, oil and mortgage vulnerability is closely aligned with distance from the heavy rail network.

Addressing transport inequality is not only a matter of providing more frequent public transport services – it also means getting the right transport and other conditions in place so that more people live closer to local jobs and have better and more affordable daily travel options.

Measures such as more frequent bus services will assist in reducing inequality in larger regional centres. In small towns and remote communities innovative, and better targeted solutions will be required.

EXTENDING THE '30 MINUTE CATCHMENT'

The further away we live from where we work, the more likely we are to need a car. One aim of integrated land use and transport planning is to reduce the time it takes to get to a city or major centre by public transport.

At present, 77 percent of all Sydneysiders live within a 30 minute catchment of a major centre. Many of those who are outside the 30 minute catchment live in Western Sydney. Our challenge is to address transport disadvantage by extending this catchment. We need to increase the percentage of the Western Sydney population living within 30 minutes by public transport of a major centre through a combination of improved land use planning and public transport services. The North West Rail Link and South West Rail Link are two examples of how we are addressing transport inequality.

Figure 8.1 The distance and level of access of metropolitan areas in Sydney to public transport station and stops

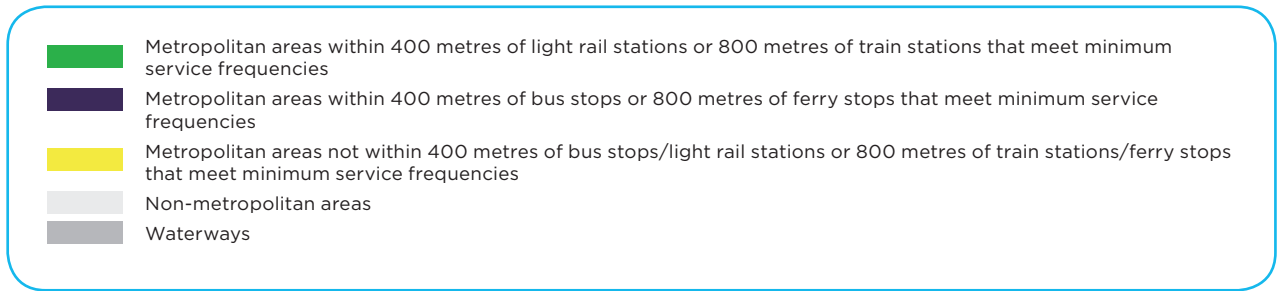
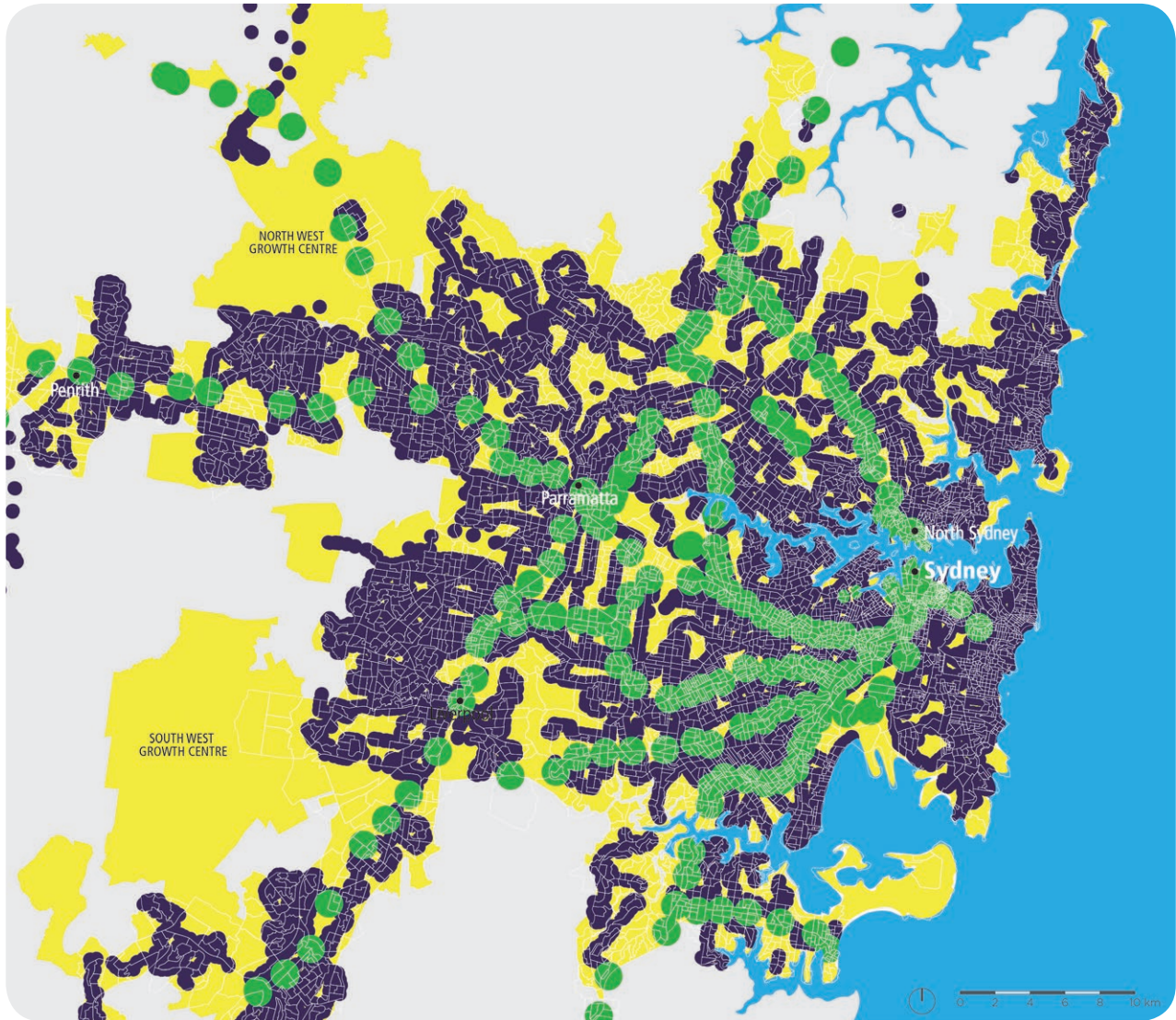
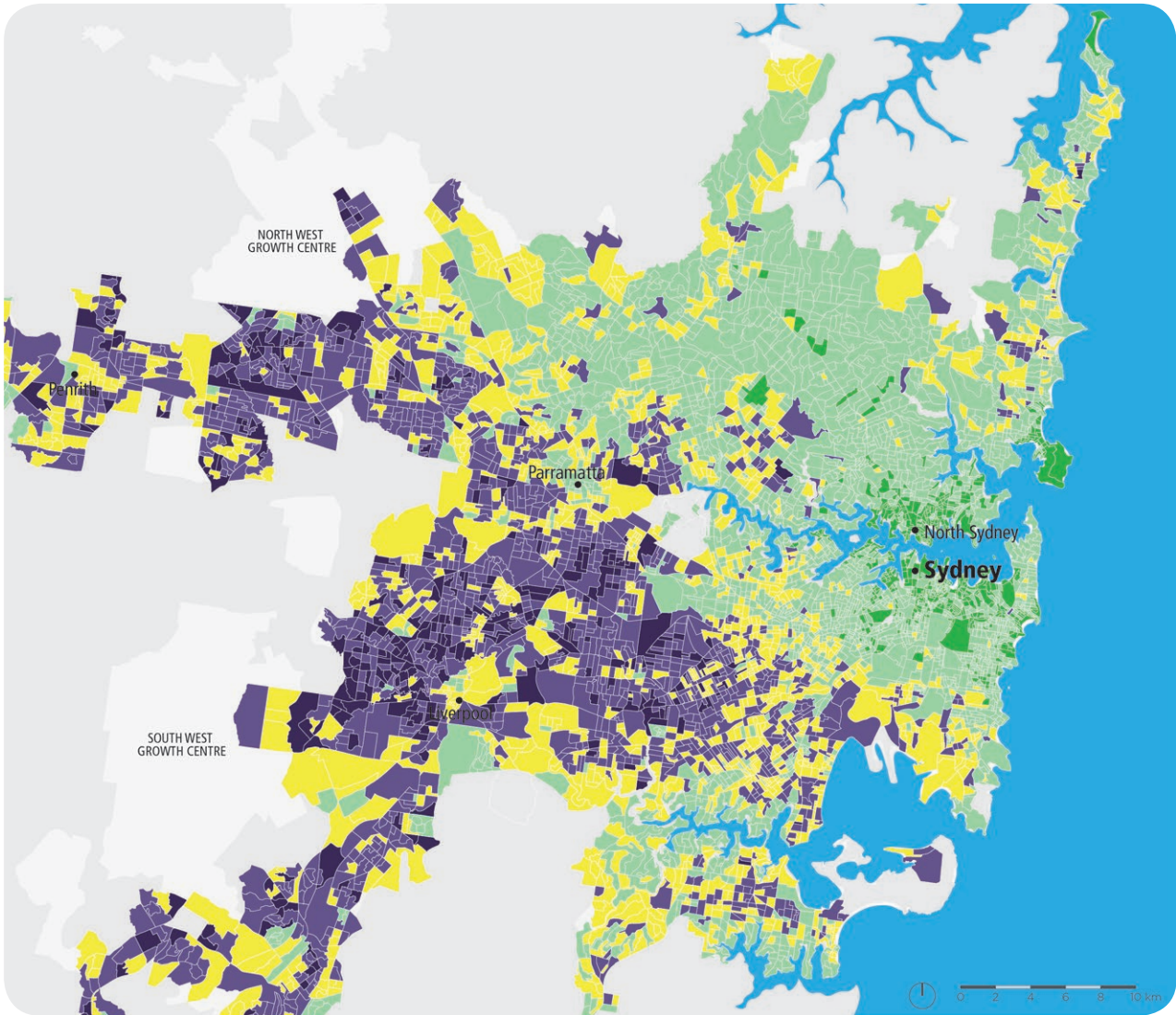


Figure 8.2 Oil and mortgage vulnerability in Sydney, 2006



VAMPIRE (Vulnerability Assessment for Mortgages, Petroleum and Inflation Risks and Expenses)
 Index of Oil and Mortgage Vulnerability - Griffith University, 2008

- 0-9 (Minimal vulnerability)
- 10-14 (Low vulnerability)
- 15-16 (Moderate vulnerability)
- 17-18 (High vulnerability)
- 19-30 (Very high vulnerability)
- No data

8.1.2 Expanding the use of community transport

Community transport is an important option for people with limited access to mainstream forms of transport. Across the State, around 1.4 million community transport trips are made each year.

Community transport is not-for-profit transport that is operated by local councils, volunteer groups, community organisations and service providers under the Australian Government's Home and Community Care scheme. Community transport services include assisted door-to-door services, regular services to fill gaps in public transport and occasional trips for people who are ill or temporarily disabled. These services help reduce transport disadvantage. They will, however, come under increasing pressure.

- Our ageing population means the number of people relying on community transport services is expected to increase. This demand will exceed the capacity of existing volunteer-based services without higher levels of support and resourcing.
- The eligibility for using community transport – which is set by the Australian and State Governments, community service providers and health agencies – needs updating to ensure people do not fall into the service gaps that occur when people are unable to access public transport services, but do not qualify for community transport. These people are at a particular disadvantage as their mobility can be significantly reduced, leaving them with few – if any – affordable and accessible travel options.

- While often subsidised by the State, most community transport services are delivered by a range of private groups and agencies. Historical and organisational issues limit the sharing of the community transport fleet, leading to inefficiencies in the use of resources and infrastructure. Legislative impediments to community transport providers make fleet and staff arrangements less efficient.

Reducing transport inequality across NSW will require this small but important part of the transport system to be better used. Community transport is also discussed in Chapter Six.

As the reliance on community transport grows by the most vulnerable members of the community, the Government is considering strengthening the safety framework for service delivery by accrediting community transport operators.

City Access Strategies being developed as part of the Long Term Transport Master Plan will address mobility and access issues for transport-disadvantaged parts of Sydney, while Regional Transport Plans will address these issues for specific regions, in conjunction with the *Metropolitan Strategy for Sydney* and Regional Land Use Plans.

A MORE INTEGRATED ROLE FOR TAXIS

Taxis complement public transport by providing flexible, door-to-door services that give us a level of mobility we cannot get from trains and buses.

Taxis are particularly important for tourists and visitors and provide an essential means of transport for people who cannot easily access public transport (such as people with disability) or when public transport is not available (such as late at night, in small towns or where journeys start and end far from a public transport route).

Taxis services are poorly integrated with the broader public transport network. There are a number of barriers to taxis being used more effectively as a complement or alternative to community and public transport services.

Many passengers with a disability continue to experience long waiting times for a taxi, making it hard for them to participate in aspects of community life. Many people in wheelchairs depend on Wheelchair Accessible Taxis (WATs) for transport. Transport for NSW has commenced work to improve WAT service for customers. Further detail is provided in Section 8.6.

Tackling these problems raises challenges for both the industry and government. Solutions need to be found if taxis are to help address transport disadvantage and provide better support for people with reduced mobility.



8.2 Making travel safer

Being able to travel safely is an important feature of any transport system. Safety is a shared responsibility between transport system users, governments and the community. Safe travel environments are built into transport planning and infrastructure design and development. We must work to reduce road trauma and increase public transport safety.

8.2.1 Reducing road trauma for motorists, cyclists and pedestrians

Road trauma costs us dearly with lives lost, serious injury and the devastation caused to families and friends. Between 2006 and 2010, road crashes in NSW claimed 2,163 lives and caused 124,061 injuries.

NSW road crashes cost the community over \$5 billion in 2011. As Figures 8.3 and 8.4 illustrate, while fatalities on our roads have reduced in the last two decades, the number of people suffering injuries has remained fairly constant. Our most vulnerable road users – pedestrians, cyclists and motorcyclists – continue to be at high risk. Approximately two thirds of fatal crashes occur in regional NSW, with the crash rate in regional areas more than four times the rate for metropolitan areas.

Figure 8.3 also shows that policy reforms and the economy correlate to rates of fatality and that innovative improvements in safety can lead to significant drops in fatalities.

We still have much to do to reduce road crashes and trauma. The *Road Safety Strategy for NSW 2012-2021* has targets to reduce annual fatalities and serious injuries by 30 percent by 2021. This Strategy sets the direction for road safety in NSW for the next decade. It will also be supported through the development of action plans.

Achieving this goal will require ongoing investment to improve road infrastructure, delivery of enforcement programs facilitate behaviour change, safer vehicles and the uptake of safety technology. We will identify, implement and enforce effective safety measures as new evidence becomes available.

The *Road Safety Strategy for NSW 2012-2021* supports the short term actions contained in the *National Road Safety Strategy 2011-2020*.

Figure 8.3 Road traffic crash fatalities per 100,000 population, NSW, 1908-2011

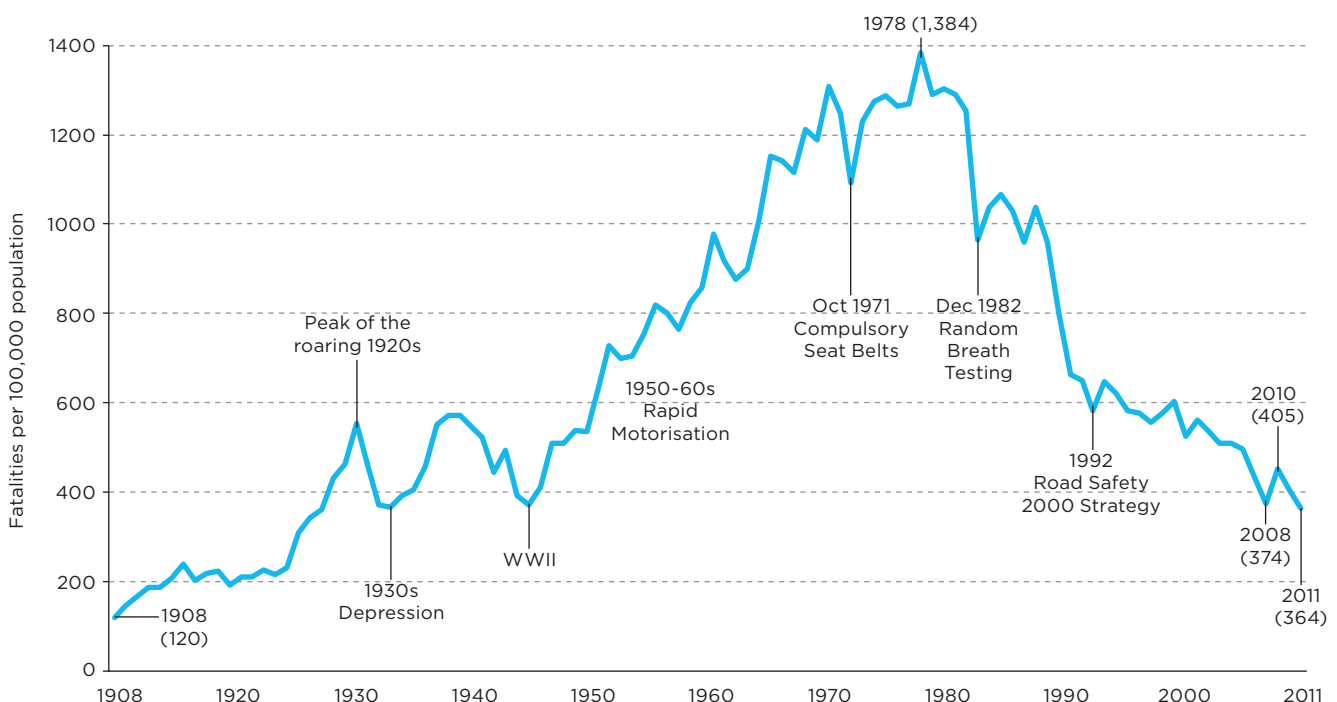


Figure 8.4 Number of road users injured, 1960 to 2011

Year	Injured
1960	22,655
1965	29,157
1970	34,886
1975	38,141
1980	38,816
1985	39,336
1990	32,153
1995	25,963
2000	28,812
2005	25,209
2010	24,623
2011	26,366

THE 2011 ROAD TOLL IN NSW

- 364 people were killed in 336 fatal road crashes
- 26,366 people were injured
- Country roads accounted for 35 percent of all crashes, but 71 percent of fatal crashes
- Crashes involving speeding represented at least 41 percent of fatal crashes and 17 percent of all crashes
- Alcohol was a contributing factor in 56 percent of fatal crashes on Thursday, Friday and Saturday nights and 23 percent of all fatal crashes
- Driver fatigue was assessed as being involved in at least 19 percent of fatal crashes
- Nearly one third of all speeding drivers and motorcycle riders involved in fatal crashes were males aged 17 to 25.

8.2.2 Feeling safe on public transport

Crime, or a fear of crime, can affect the travel choices we make and may deter people from using public transport. Fear of crime is often reported to be of most concern to people from minority groups, people with disability, women and those on low incomes. Our fears are not always justified or due to a known threat, but feelings of vulnerability and insecurity make many of us reluctant to use particular modes of transport in certain locations or at night.

The factors contributing to a fear of crime include witnessing or being a victim of crime, signs of disorder and disrepair, feeling vulnerable or isolated, the level of assistance or protection available and being unfamiliar with our surroundings. These factors suggest that we can reduce safety fears through good lighting, extra security (including CCTV and an increased police and security presence), cleaner and more inviting facilities, more frequent services and awareness campaigns.

The NSW Government is creating a dedicated, centralised Police Transport Command within the NSW Police Force. The Police Transport Command is planned to be fully operational by the end of December 2014. The Command will consist of 610 police officers who will deal with serious crime and anti-social behaviour across all public transport services.

We will also develop Modal Strategies and an *Interchange Strategy* that will address specific safety issues on public transport.

8.2.3 Safe waterways

An estimate of 1.8 million people go boating along the NSW coastline and on inland lakes, rivers and estuaries during the course of the year. The NSW Government has an important role to play in promoting community safety and understanding around on-water risks and responsibilities, in consultation with schools, communities and industry organisations in this respect.

A Boating Safety Strategy will address safety on waterways.

MOTORCYCLE SAFETY

A number of submissions to the *NSW Long Term Transport Master Plan Discussion Paper* raised issues related to motorcycle safety.

Recognising the specific issues related to the safety of motorcyclists, the Centre for Road Safety is finalising the *NSW Motorcycle Safety Strategy 2012-2021* in collaboration with stakeholders such as NSW Police and motorcycling groups. The Strategy will outline a number of road safety initiatives to make riding motorcycles safer and reduce motorcycle fatalities and injuries in NSW.

The Strategy will recognise motorcyclists as a unique road user group, acknowledging the specific risks and counter-measures for motorcyclists, and highlighting the need for motorcyclists to be risk managers.

The Strategy will complement existing measures to improve motorcycle safety, including safety awareness campaigns throughout the year, and facilities to report motorcycle road hazards to the Roads and Maritime Services.

8.3 Promoting sustainability and protecting the environment

The journeys and travel choices we make each day have an impact on the environment. Over the next two decades, our statewide transport network will need to be upgraded and improved in ways that minimise environmental degradation and protect the natural assets and surroundings that contribute to our wellbeing and quality of life. Our transport infrastructure must be able to adapt to changing weather patterns and be resilient in the face of natural disasters.

8.3.1 Minimising damage to our environment

As we take action to improve our transport system, careful planning and comprehensive assessments will minimise our impact on iconic natural assets (such as our national parks), ecosystems, waterways and wildlife. In some places, we may have to accept restrictions on our travel options – or take different approaches to how and where we build transport infrastructure to preserve important habitats, species or biodiversity.

8.3.2 Adapting our transport infrastructure to be resilient

Our transport infrastructure must be able to withstand the predicted impacts of a changing climate, including an increase in adverse weather patterns, storm surges and heatwaves. We will need to understand the vulnerability of existing transport infrastructure to these impacts, reinforce and maintain these assets, and carefully plan where we build infrastructure in the first place.

NSW experiences more natural disasters than any other Australian state and the risk of these disasters is expected to increase. Severe storms, floods and bushfires are the most costly disasters, with other hazards posed by tropical cyclones, earthquakes and landslides.

A large proportion of our population lives along the south eastern coastal strip, with many settlements located in flood-prone river catchments and close to extensive bushland. This requires capacity to mitigate the impact of natural catastrophes on our transport system.

8.3.3 Maintaining Sydney's air quality

Cold start VOC (volatile organic compound) emissions – the emissions produced immediately after the car starts – contribute 54 percent of total petrol passenger vehicle exhaust VOC emissions and 39 percent of fleet total emissions. In other words, numerous short journeys contribute more pollution than the same total number of kilometres travelled as a long journey. This means that reversing the large increase in short car trips that has occurred in recent years – trips that could be taken by walking or cycling – can make a significant contribution to improving air quality.

8.3.4 Reducing emissions and managing energy use

Australia has set a target of reducing greenhouse gas (GHG) emissions by five percent on 2000 levels by 2020.

At present, approximately 14 percent of GHG emissions in NSW come from the transport sector. As shown in Figure 8.5, road transport makes the greatest contribution to transport-generated CO₂ equivalent and particle emissions – 83.3 percent in 2008.

Figure 8.6 shows that emissions of all types from road transport in NSW have declined or remained stable since 1998, with the exception of CO₂ (and CO₂ equivalent) emissions. CO₂ emissions for NSW are projected to increase in line with increases in vehicle sales and registrations, while improvements in engine technology and shifts in vehicle and fuel types are projected to decrease overall emissions for certain types.

Reducing our reliance on car travel is just one way of reducing CO₂ emissions. We will also need to reduce emissions from public transport by shifting to low emissions energy sources and by using energy more efficiently.

On a per-passenger kilometre basis, as shown in Figure 8.7, domestic air is the least energy intensive of the domestic passenger modes, followed by heavy rail, buses, light rail, motorcycles, unscheduled domestic airlines and passenger cars. Ferries are the least efficient mode.

Coastal shipping is the most energy efficient mode for moving domestic freight followed by rail, pipelines, articulated trucks, rigid trucks and light commercial vehicles.

For overall energy consumption by road transport, as shown in Figure 8.8, passenger cars are the highest energy consumers, followed by trucks and light commercial vehicles.

Transport energy use also depends how far and how often we have to travel. In Sydney, energy use rises with increasing distance from the city centre, as shown in Figure 8.9.

These various dimensions of transport energy use and efficiency demonstrate the inter-relationship between land use and transport planning, reducing GHG emissions and developing a more energy efficient transport system.

NSW 2021 identifies a number of targets to help to reduce our carbon emissions, including 'growing patronage on public transport by making it a more attractive choice'. We will need to power our transport system with more sustainable sources of energy, adopt more energy efficient practices across the system and make land use choices that will help to reduce car use.

Various Modal Strategies will address environmental and energy issues in greater detail.

Figure 8.5 Domestic transport CO₂ equivalent emissions by mode, NSW, 1990 to 2010

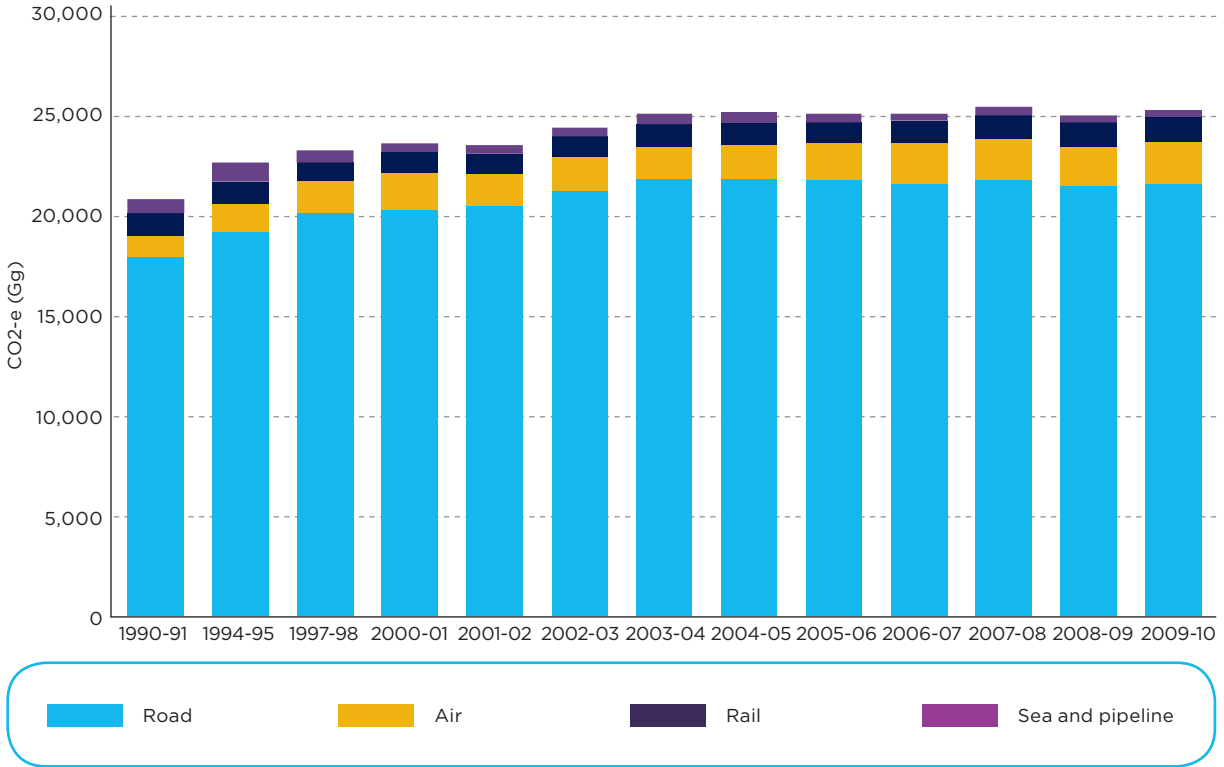


Figure 8.6 Historic emissions for NSW road transport, 1990 to 2010

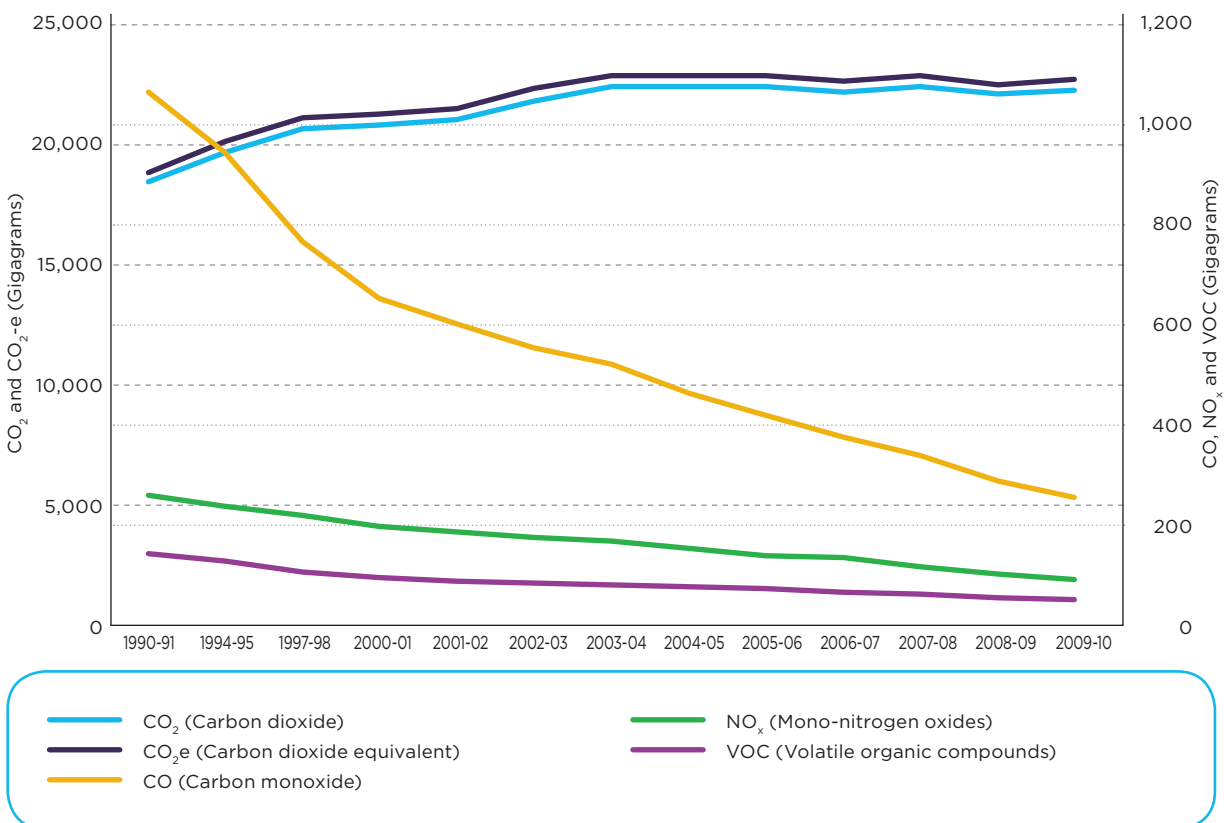


Figure 8.7 Passenger task energy intensity, 2007-08

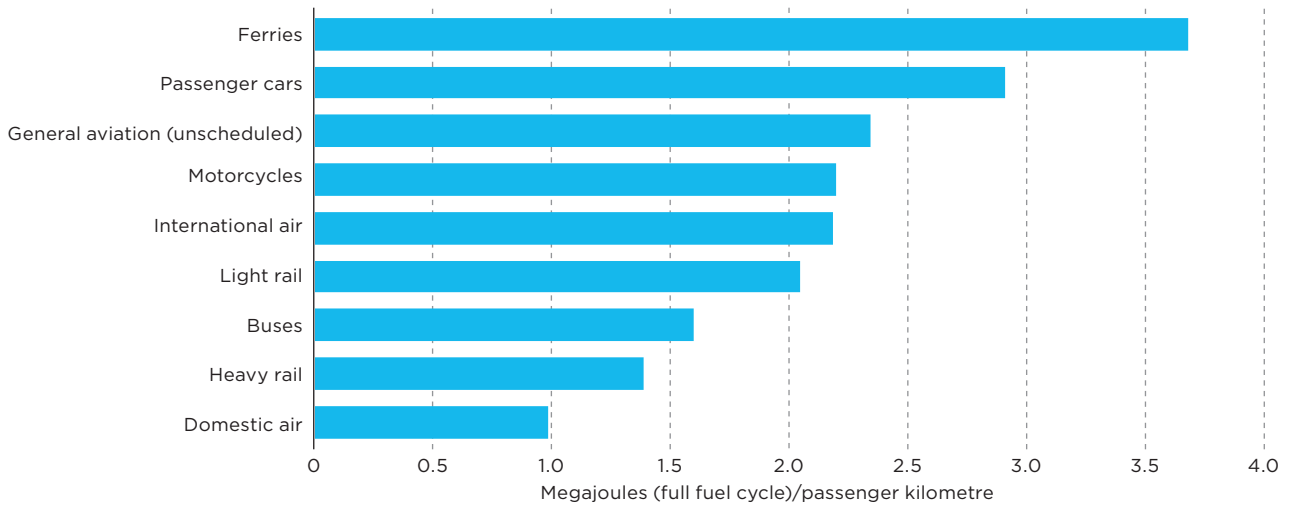


Figure 8.8 Energy consumed by road transport, NSW, 2009-10

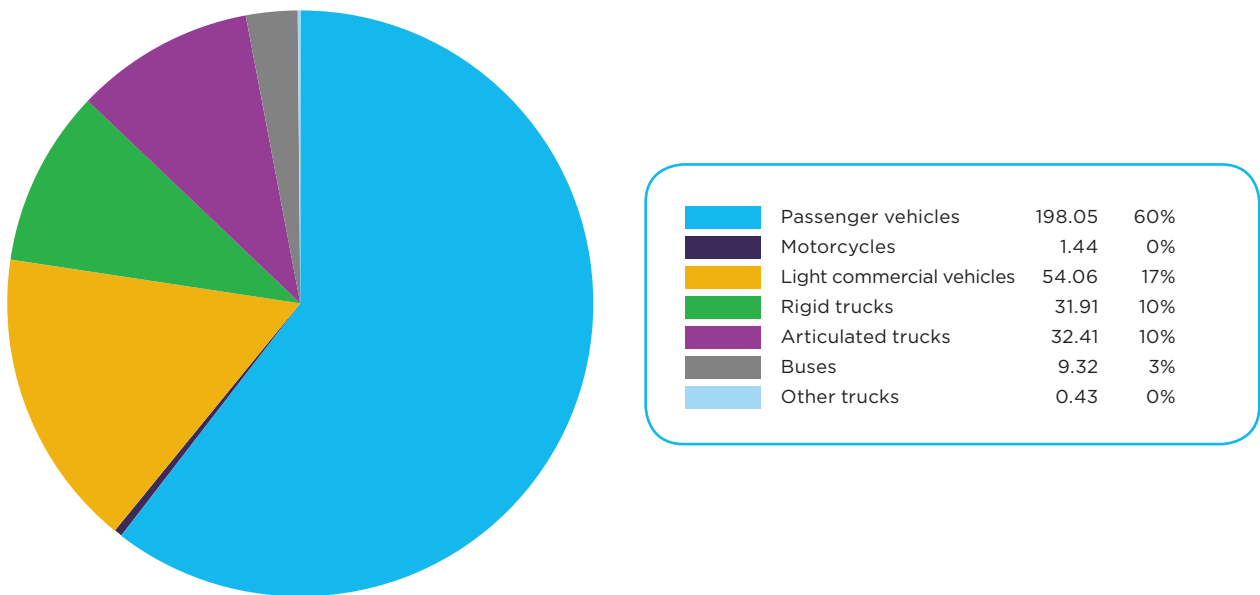
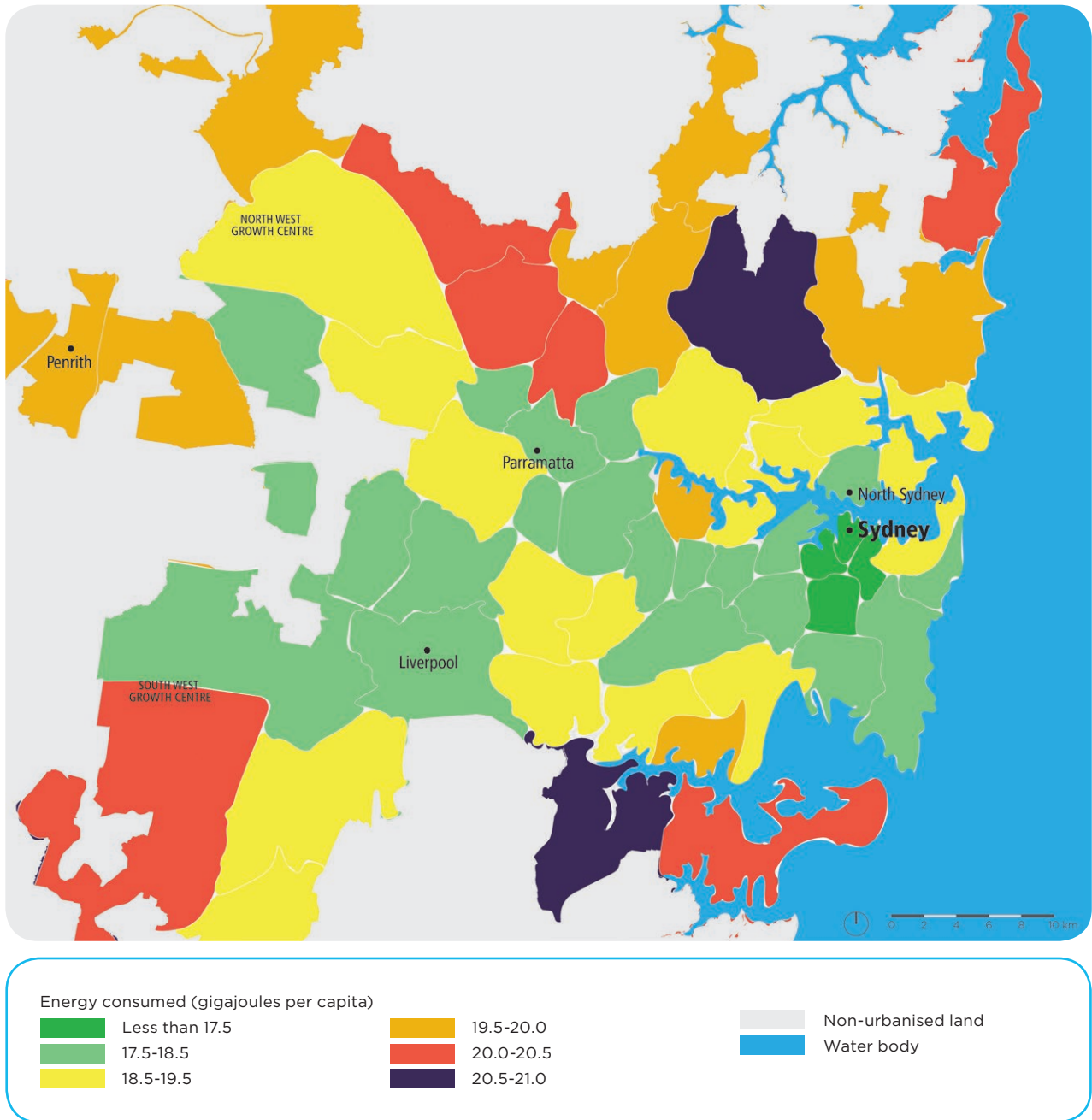


Figure 8.9 Energy consumed by transport in regions of Sydney, 2007



8.4 Maintaining our transport infrastructure

A modern, efficient transport network requires ongoing maintenance. Meeting this commitment in NSW, with widely dispersed towns and centres, is a constant, costly and demanding exercise.

With more than 18,000 kilometres of state roads and more than 4,500 kilometres of operational rail lines – many of which extend for long stretches and are subject to extremes in

weather conditions – setting priorities for maintenance works is also a major challenge.

Alongside regular maintenance, we need to respond promptly to the maintenance needs generated by natural disasters such as floods and bushfires, which can put extra pressure on the State’s budget for road and rail maintenance. The implications of the flooding in NSW are set out in Figure 8.10.

Expanding our transport network with new assets also adds to the overall ongoing maintenance task.

Making sure that we have the means and ability to maintain our transport infrastructure is a significant challenge for NSW in the years ahead.

REPAIRING ROADS AFTER DISASTERS

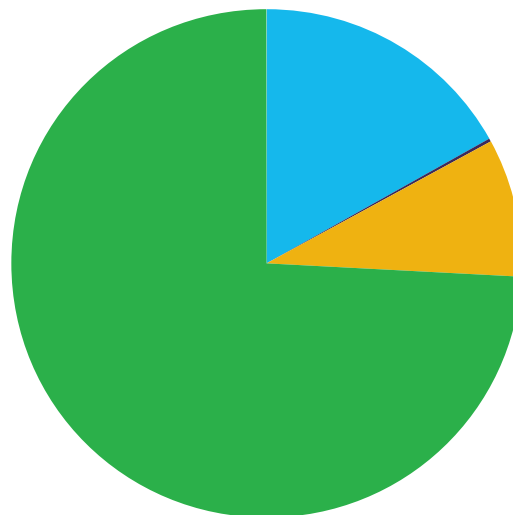
Transport infrastructure is often hit hard by natural disaster, particularly floods and storm surges. Between February 2009 and October 2010, NSW experienced a series of major floods that caused considerable damage to the State’s road network. In the 2010-11, major expenditure was required to rectify damage caused by:

- Five separate North Coast floods between February 2009 and October 2009 – costing \$22.6 million
- North West NSW flooding in December 2009 – \$16.7 million
- Mid-Western NSW flooding in December 2010 – \$43.2 million
- Riverina flooding in March and October 2010 – \$25.4 million.

Much of the damage occurred on local roads.

The extent of many of these events means restoration works will continue in 2011-12 and beyond, with over \$200 million in outstanding damage still to be restored as at 30 June 2011.

Figure 8.10 Natural disaster expenditure, 2010-11 for roads



State Roads	\$25.8M	17%
Crown Roads	\$0.3M	0%
Regional Roads	\$13.4M	9%
Local Roads	\$113.4M	74%

8.4.1 Keeping our roads in good condition

The State Road network is one of our most valuable assets. Each year, NSW spends more than \$1.2 billion to keep our roads in good condition. Keeping up with this task is becoming more and more difficult.

While the average expected life of a road is around 50 years, we are demanding more and more from our roads. Modern traffic loads are higher than many roads and bridges on the network were designed to cope with. In particular:

- The load limits for trucks have increased by 40 percent over the last 40 years
- Traffic on the network has almost doubled in the last 25 years, and heavy vehicle traffic is growing at a faster rate than other traffic
- Lower-profile, high pressure tyres on newer trucks cause more wear and tear on our roads than conventional tyres.

With heavy vehicle and commercial traffic increasing, the remaining life of a road or bridge will almost certainly become shorter. Along many routes, we may have to undertake more maintenance at shorter intervals.

Many of our roads are ageing as shown in Figure 8.11. Despite considerable road rebuilding and new road construction in the 1990s, around one third of the State Road network is more than 40 years old. Many of these roads are approaching the end of their expected life and need upgrading.

Similarly, a significant proportion of the 5,000 bridges on the State Road network are more than 40 years old, as shown in Figure 8.12. Older bridges were built to different standards to those built in the last 30 years and some need upgrading to carry heavier vehicles safely. While there are now no structurally deficient bridges on the network, 175 bridges are rated in poor condition.

Figure 8.11 The age profile of roads in NSW 2012 (based on pavement area not length)

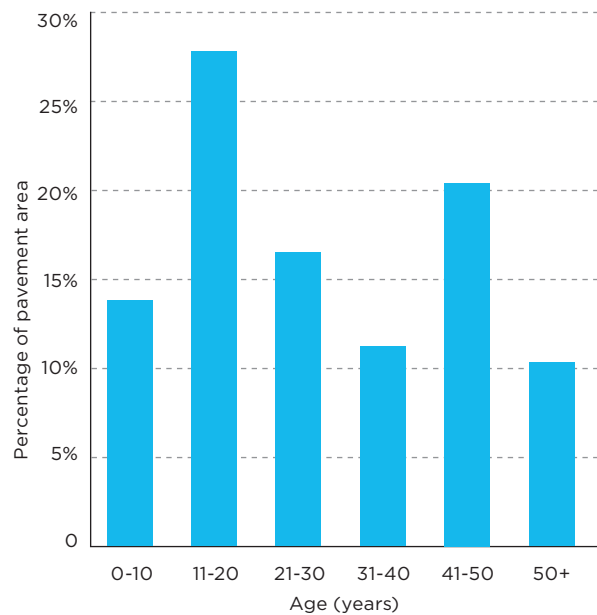
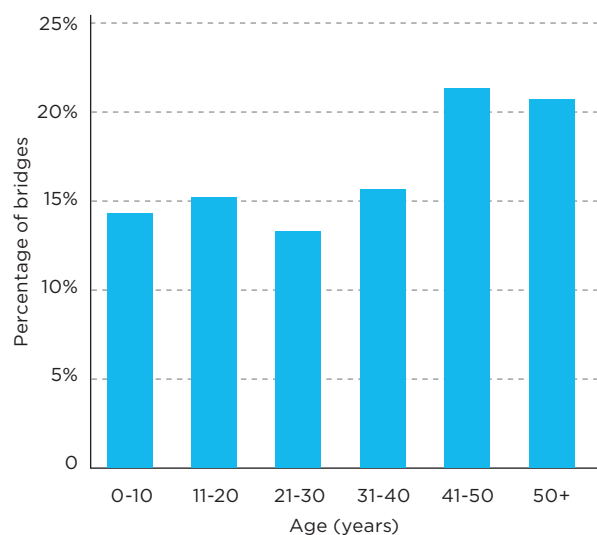


Figure 8.12 The age profile of bridges in NSW 2012



The pace of road maintenance is behind where it needs to be by 2016. Around 60 percent of assets are being renewed on a sustainable basis making their performance unpredictable and potentially undermining the performance and threatening the viability of the network.

To maintain an average expected life of 50 years across the network, RMS has set a road rebuilding target of two percent each year. As Figure 8.13 shows, our rate of rebuilding in NSW has been consistently below this target since 2005-2006 and is currently around 1.4 percent.

The costs of building new roads or rebuilding and maintaining existing roads have escalated. At each stage of a project, land acquisition, materials and labour costs are now more expensive than they were 10 or 20 years ago. The cost of maintaining our ageing road assets has increased at a rate faster than funding or consumer price index.

The NSW Government has set a target of having 93 percent of the State road network at or above smoothness standards, shown in Figure 8.14. The average smoothness of state roads is currently 91.2 percent.

It is clear that ageing assets, higher volumes of traffic, more heavy vehicles and higher rebuilding and upgrading costs all combine to make the challenge of maintaining our roads a particularly difficult one. We must plan carefully to set priorities, finance road rebuilding and strike the right balance between funding road maintenance and funding new infrastructure. This effort will need to be a partnership between local, state and national governments. Falling further behind in road maintenance will lead to longer travel times, greater unreliability and reduced safety for road users, while also increasing the risk of widespread and prolonged loss of serviceability on key road connections and the potential for a critical failure in the road network.

The NSW Roads Strategy, being prepared as part of the Long Term Transport Master Plan, will include a detailed road maintenance plan.

Figure 8.13 Annual rate of rebuilding roads against 40 year target

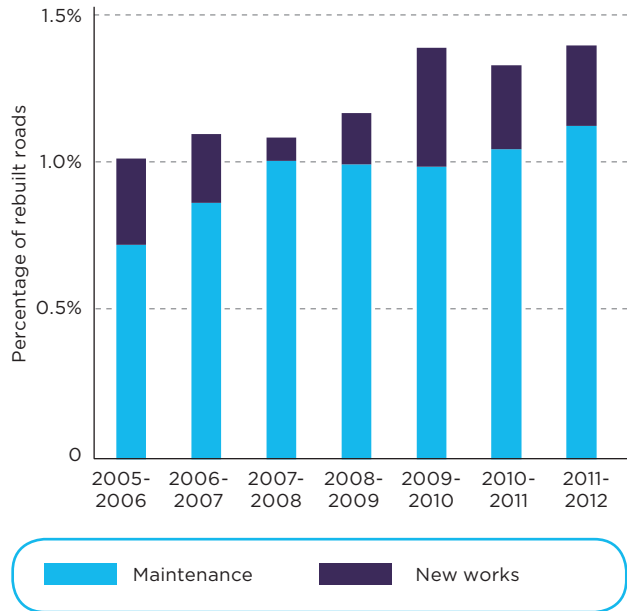
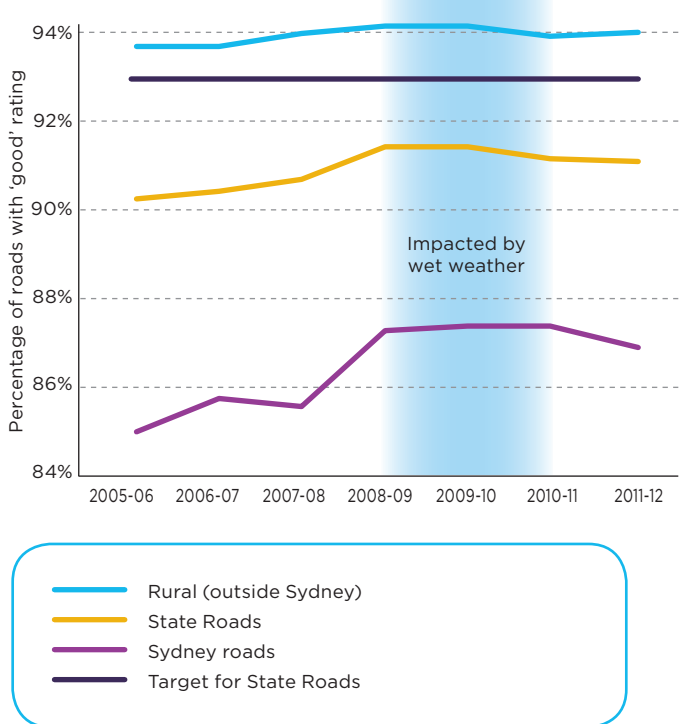


Figure 8.14 NSW 2021: 93 percent road smoothness target



ROAD RESPONSIBILITIES

The public road network in NSW is managed by a range of government agencies, which influences how we deliver solutions to our road transport challenges.

- The 152 councils across NSW are the designated road authorities for local roads within their local government areas.
- RMS exercises the power of a road authority on state roads and freeways.
- Some assets and structures on public roads are also owned and maintained by other entities such as rail, port and irrigation corporations, State Forests and National Parks.
- The Australian Government contributes funding for key inter-capital corridors and also provides funding directly to local government for the management of local roads.

Councils are solely responsible for decisions regarding the management and application of expenditure on regional roads and local roads. Transport for NSW provides annual funding support to councils for the management of regional roads.

Road infrastructure investments compete for limited funds, which impacts the standard and timing of treatments and interventions. As noted in Chapter Six, NSW councils have identified a funding gap in excess of \$600 million per annum for the maintenance of locally managed roads.

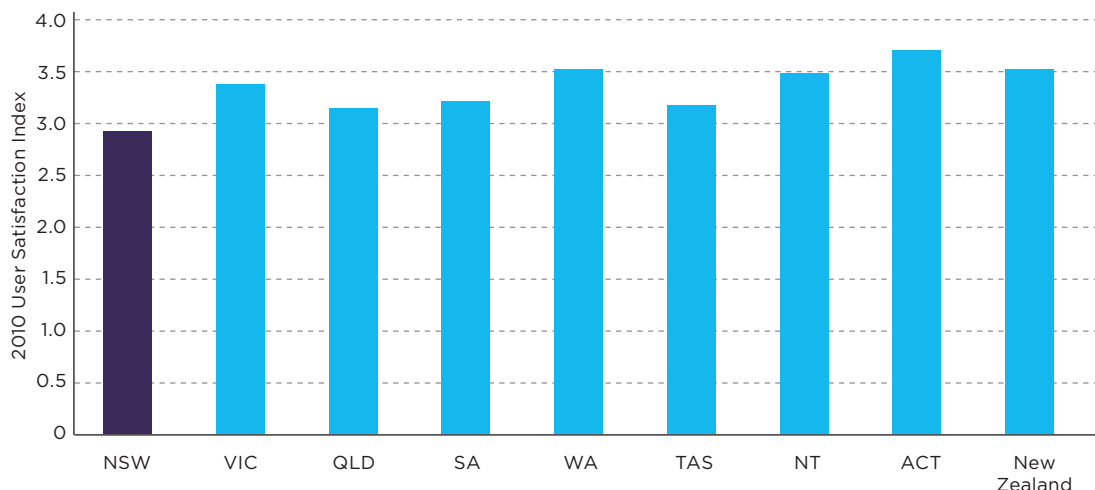
Regulatory standards for heavy vehicle access are decided at the state and national level. This can place pressure on council priorities and resources to assess and upgrade road assets.

NSW ROAD USERS WANT BETTER ROADS

Aside from issues of safety and function, the views of road users are also an indication of the condition of our roads. Private vehicle drivers in NSW have indicated a strong preference for safety and quality of roads, while also valuing smoothness of traffic flow and safe and courteous driving from fellow motorists.

According to the Austroads 2010 User Satisfaction Index, NSW has the lowest road user satisfaction in Australia and New Zealand, 2010.

Figure 8.15 Road user satisfaction, 2010



8.4.2 Replacing and upgrading our rail assets

As with our road network, keeping our rail system in good shape is challenging and costly.

Some of our rail assets are over 150 years old. While structures such as tunnels may have long life expectancies of over 100 years, the life expectancy of most railway assets varies from around 15 years for electronic systems to 30 years for rolling stock. Some of these older assets are now highly unsuited to a modern, sophisticated and technologically advanced rail network.

As well as the physical age of assets, the performance of our rail network is hampered by:

- Poor condition of assets – some infrastructure and fleets are fatigued or technologically obsolete with no readily available replacement parts. Poor asset condition translates into adverse impacts on the reliability.
- Design limitations – some assets were designed to standards that limit their capacity to respond to modern demands.

Gaining access to assets for maintenance is difficult without causing major disruptions to the network’s operations.

Speeds on our rail network are restricted when conditions deteriorate below designated safety thresholds. This provides a clear record of the link between maintenance and the state of our rail assets.

8.4.3 Wharf access and maintenance

Boat ownership in NSW is forecast to increase by approximately three percent per year, creating a significant challenge in accommodating demand for both on-water and off-water boat storage facilities.

While there is sufficient capacity in some areas, there are lengthy waiting lists in others. Increasing boat ownership will also increase demand for facilities and infrastructure which promote access to waterways including boat ramps, public wharves, public pontoons, dingy storage and sewage pump-out facilities.

The Maritime Policy Agenda, released August 2012, will guide the work of Transport for NSW agencies over the next three years in the areas of boarding safety, boat storage and safe waterway access strategy, and reducing red tape.



Taking action

20 YEAR VISION

Residential developments will be well connected to public transport services and transit-oriented urban renewal will be a major feature of Sydney's growth. Areas of transport disadvantage will be significantly reduced and our transport system will be accessible to people with a disability. We will optimise use of technology to provide better travel experiences, improve safety and manage demand more efficiently. Effective and timely maintenance of our transport infrastructure will be the foundation of a safe, reliable and efficient transport system across the State.

We will deliver a broad range of actions to address priority statewide transport issues and take up the opportunities identified by our customers.

8.5 Integrating land use and transport planning

We aim to shape the pattern of development in Sydney and across NSW by integrating land use and transport planning, and influencing the location, scale and density of development. We will plan population and employment growth where there is capacity on the transport network, and provide transport services to meet growth in release areas.

Initiatives set out in this section focus on improving local and regional accessibility through integrated land use and transport solutions. These actions have been developed with the Department of Planning and Infrastructure and many actions relate closely to the objectives for transport being presented in the *Metropolitan Strategy for Sydney* and Regional Strategies, currently under development.

Action Support Department of Planning and Infrastructure in delivering urban renewal

We will support the Department of Planning and Infrastructure and the Department of Housing in establishing clear coordinated decision making processes around future urban renewal locations, as part of integrated regional and subregional land use, transport and infrastructure plans.

This process will include identifying the transport infrastructure required to service urban renewal areas and assessing the relative benefits and costs of urban renewal and associated transport and other infrastructure proposals.

Urban renewal in the right locations will increase the land use and transport efficiency of Sydney and regional NSW. Sydney has relatively high population

density by Australian standards. However, in Sydney's inner areas there are pockets of lower and medium intensity development along passenger railways that don't fully use the existing rail network capacity. There are also low and medium intensity areas where improved public transport could facilitate redevelopment and better use of the limited land available in Sydney's inner areas.

In recent years, campus style business parks have increased and new housing is being provided in new release areas. Urban renewal will balance this development to take advantage of existing infrastructure and deliver housing close to jobs and services.

Figure 8.16 shows the medium and long term corridors currently identified for investigation to support urban renewal outcomes in Sydney. These corridors have been identified on the basis of existing, planned or potential improvements in transport services and capacity. For example, within the next 10 years, there may be opportunities for renewal around the new North West Rail Link stations, along the Airport and East Hills Lines (taking advantage of improved services from the South West Rail Link), and new opportunities associated with the WestConnex motorway and South East light rail. In the longer term, investigation for urban renewal will be focused on corridors where increased population could support improved transport services, including the Victoria Road corridor and cross regional corridors linking northern and southern Sydney.

Action Encourage transit-oriented development

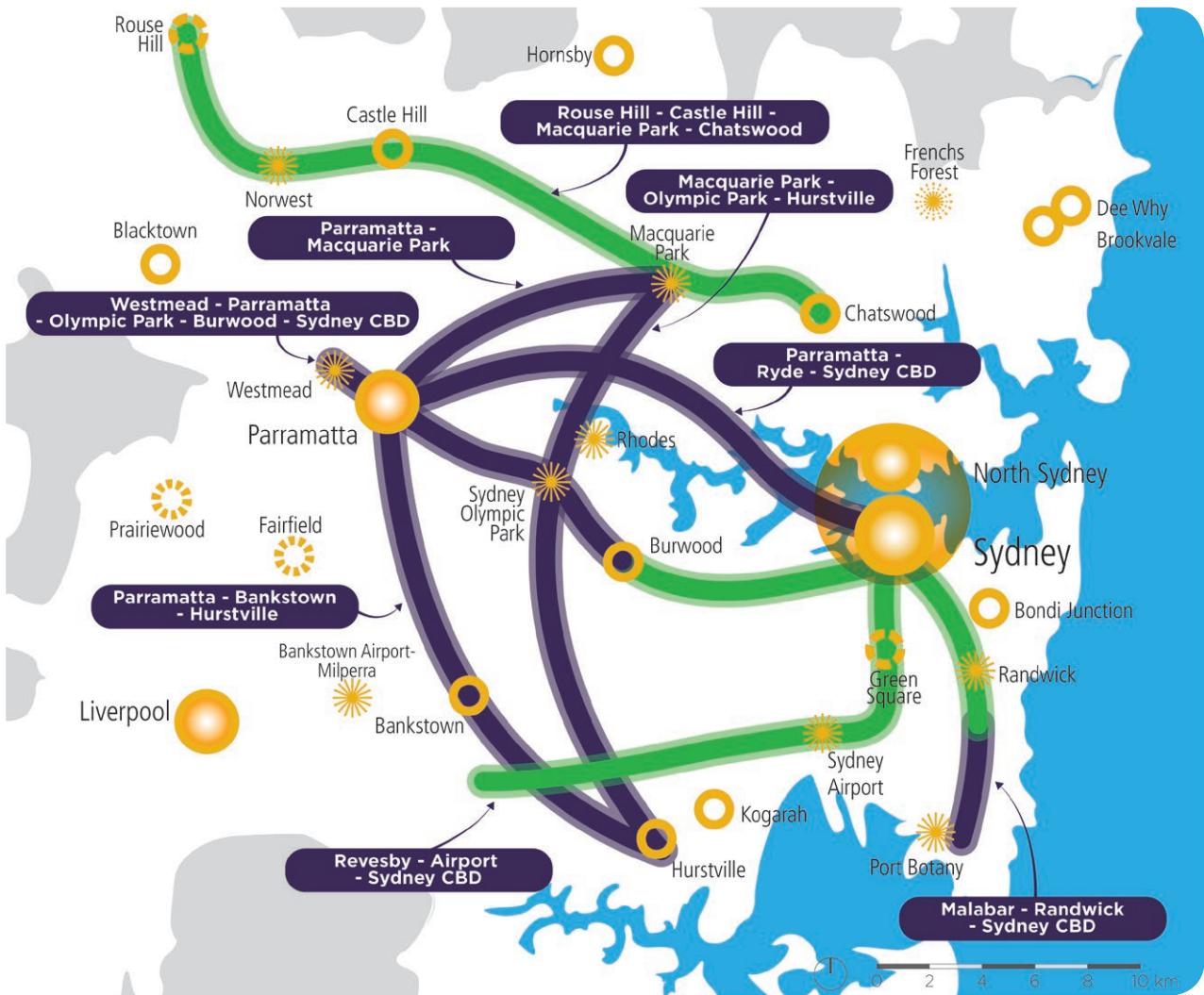
Transport for NSW will support transit-oriented urban renewal across the Greater Metropolitan Area by working with relevant agencies to:

- Identify the interventions required to support urban renewal in different localities (potentially ranging from providing technical advice to

local councils through to large scale urban regeneration projects undertaken in partnership with the private sector)

- Identify and champion wider mechanisms for overcoming barriers inhibiting private sector-driven urban renewal

Figure 8.16 Medium and long term transport corridors for investigation to support urban renewal in Sydney



Global Sydney	Specialised precinct	Medium term corridors for investigation
Regional city	Potential specialised precinct	Long term corridors for investigation
Major centre	Planned major centre	
	Potential major centre	

- Establish a centre for excellence within NSW Government on transit-oriented development and work with the private sector to deliver best practice examples of transit-oriented development that demonstrate the social, environmental and economic benefits and address community concerns regarding increasing urban density
- Improve the rate of urban renewal across the Greater Metropolitan Area, and meet housing production and employment growth targets while enhancing land use and transport efficiency and supporting economic growth and high quality of life.

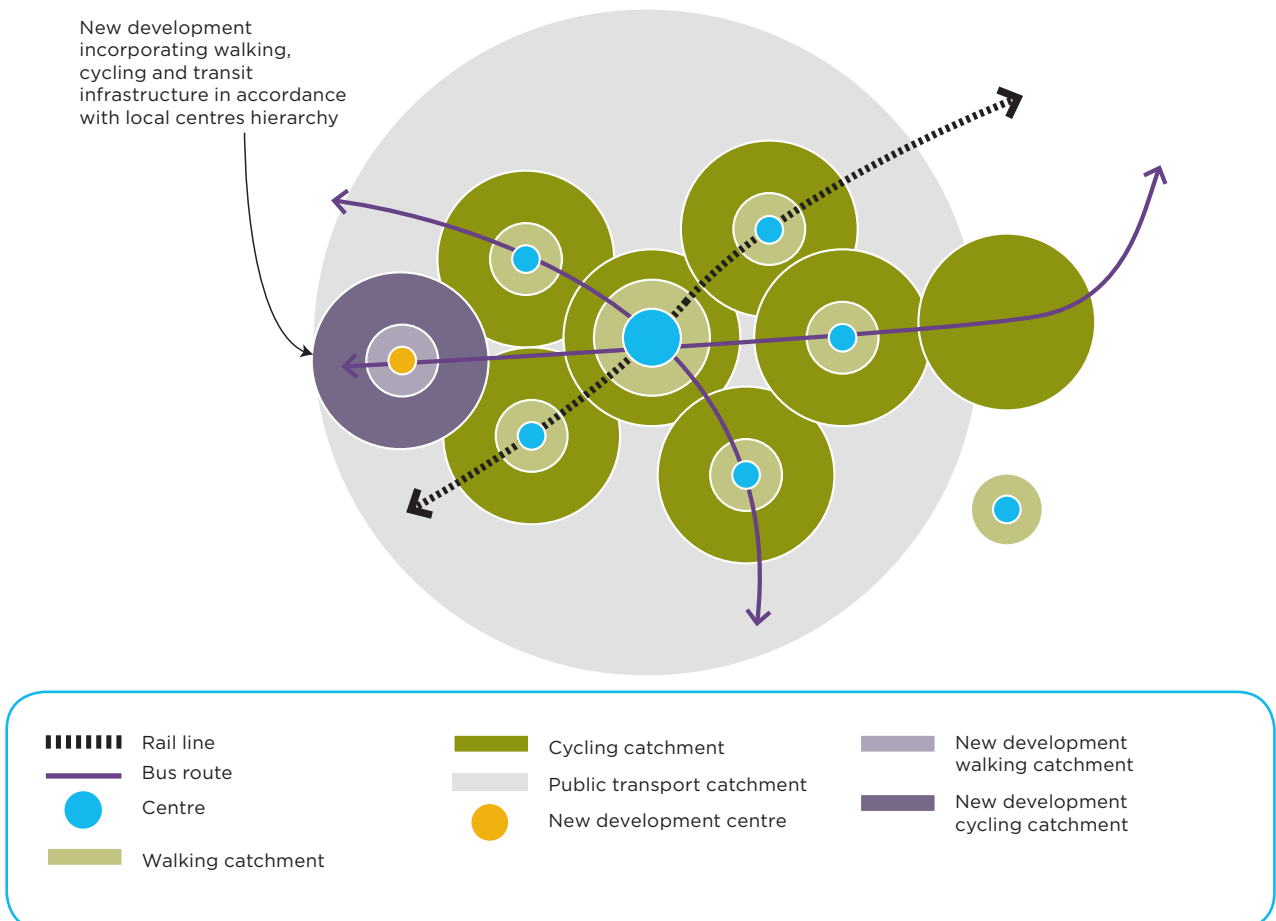
Action Implement minimum standards for transport and land use integration

While good quality urban development has taken place in NSW over recent years, some developments lack good urban design and quality transport infrastructure, in particular walking, cycling and public transport infrastructure. Transport for NSW will work with the Department of Planning and Infrastructure to define transport requirements to support better quality development for greenfield and infill developments. These requirements will ensure the transport system is well integrated into new developments. They will cover areas such as:

These requirements will ensure the transport system is well integrated into new developments. They will cover areas such as:

- Building and land use intensity, with greater intensity supported by appropriate transit system capacity

Figure 8.17 Model approach demonstrating connectivity for new developments



- Land use mix and functional diversity is generally preferable to create balanced demand flows into or out of an area
- Proximity to local destinations including parks, schools and shops and services
- Support for walking and cycling through appropriate block size, with small, walkable blocks preferable, safe access to a variety of destinations and appropriate paths
- Multi-modal circulation network connectivity to the surrounding catchment and region.

In developing these minimum standards, we will consider the cost impacts on development and, where appropriate, examine options for joint State and private sector initiatives to minimise costs and overcome obstacles while still meeting reasonable community expectations for connected and accessible new developments.

Figure 8.17 shows one approach to catchment and regional connectivity for new residential developments that could be incorporated into the new minimum requirements.

Action Engage with local councils

We will work with local councils to drive better transport and land use outcomes, focusing on the issues that influence public transport mode share, access and congestion outcomes including walking infrastructure, cycling links and parking provision and control. As a first step, we will engage Regional Organisations of Councils and individual councils to agree to a governance and coordination mechanism that will align State and local government strategic plans.

Action Deliver new and improved public transport, walking, cycling and road links to growth centres across NSW

Transport networks will be developed to serve new greenfield residential and employment areas within growth areas. We will ensure appropriate infrastructure is in place to support walking, cycling, public transport and vehicle movements. Chapter Five discusses these issues in relation to Greater Sydney, but they also occur more broadly across NSW.

By definition, greenfield sites are located in areas that are not yet serviced by extensive urban infrastructure, including transport infrastructure. The arrival of significant development in these areas will place considerable pressure on existing transport infrastructure, particularly roads, over the next 20 years. New residential and employment areas will require high quality road networks and public transport provision.

Delivery of transport networks in greenfield areas will include:

- Arterial road improvements and new arterial roads where appropriate
- Corridor protection identified through transport plans
- Road networks to support public transport infrastructure including train stations and new bus services
- Working with developers and government agencies to incorporate local transport plans into planning processes and developments as appropriate and include the proper provision of road and transport infrastructure.

8.6 Moving towards an accessible transport system

Action Update the Disability Action Plan

We will work towards building a fully accessible transport system for all users, including access to physical facilities and transport modes and to information services.

We will focus our actions on particular groups of users such as the older people, parents with prams, and customers with disability and reduced mobility. In particular, there will be a focus on providing access to the bus system that meets the needs of people with mobility impairment and complies with the Australian Government's *Disability Discrimination Act 1992* requirements.

Transport for NSW is updating the NSW Disability Action Plan, reflecting broader transport portfolio responsibilities and whole of government directions under the National Disability Strategy, NSW Implementation Plan, and the requirements of the *Disability Discrimination Act*.

The NSW Disability Action Plan will be integrated into all relevant aspects of the Long Term Transport Master Plan initiatives and the supporting Modal Strategies.

The updated Plan sets out a process of continuous improvement over the five year period 2012-2017. The strategies in the Plan cover five key areas of development of accessible services:

- **Building an accessible transport network** sets accessibility as a performance criteria for all public transport products and projects; and sets out actions to progressively upgrade accessibility of the network
- **Reducing transport disadvantage for people with disability** ensures that people with disability are helped to cover the cost of transport services and that alternative transport options are available for people who are unable to access mainstream services
- **Improving the journey experience of people with disability** outlines efforts to improve customer service, information and wayfinding for people with disability
- **Enhancing customer insight and engagement** provides a commitment to qualitative research into the journey experience of people with disabilities and increasing opportunities for ongoing engagement with people with disability, their carers and peak organisations
- **Supporting accessibility through partnerships** recognises the important role played by non-transport partners, most notably local governments in the delivery and maintenance of accessible infrastructure

There are significant difficulties with bus stop and roadside infrastructure in both metropolitan and rural and regional areas which is owned and maintained by local government. Accessible bus stop infrastructure and road and kerb treatments that allow low floor buses to operate effectively have been identified as the major impediment to delivering completely accessible bus routes in NSW.

Supporting actions include:

- Seeking funding to develop a multi-year program to progressively upgrade the network of bus stops to meet Transport Standards requirements in partnership with local councils
- Working with local councils to undertake risk reviews to identify bus stops along major corridors that need improvements to meet the *Disability Discrimination Act* Standards for Accessible Public Transport.

Action Improve Wheelchair Accessible Taxi services

Transport for NSW has commenced work to improve Wheelchair Accessible Taxi (WAT) service for customers. This will involve consultation with WAT users and the taxi industry, and will assess the effectiveness of the measures in place to promote the availability and quality of WATs. These measures include the Taxi Transport Subsidy Scheme, subsidised training for WAT drivers and reduced licence fees. A review of arrangements is underway to further explore ways to improve WAT services such as booking arrangements.

Action Develop a Social Access Framework

The Social Access Framework currently being developed will enhance our understanding of the components of transport disadvantage for particular population groups including frail older people, Aboriginal communities, people with disabilities, people from culturally and linguistically diverse communities, young people in outer metropolitan, regional and remote areas and low income families, including single parent families. The framework will identify strategies to make better use of existing resources, including community transport and improve transport planning for social access.



8.7 Improving the safety of our transport system

We will respond to the challenges of improving the safety of travel on NSW roads and our public transport networks. Strategic safety initiatives are described below. Road safety improvements and public transport improvements are described for Sydney and regional NSW in Chapters Four and Six while freight safety is discussed in Chapter Seven. Technological initiatives described later in this chapter offer the next stage for road safety innovation in NSW.

Safety on our transport system is also regulated by other independent bodies. The Office of Transport Safety Investigations conducts transport safety investigations into rail, bus and ferry safety occurrences. They investigate factors that contribute to a safety occurrence and make recommendations to prevent recurrence. The Independent Transport Safety Regulator, an independent statutory authority of the NSW Government, has the principal objective of facilitating the safe operation of transport services in NSW through regulatory compliance activity

Action Implement the *Road Safety Strategy for NSW*

NSW has endorsed the three year actions included in the *National Road Safety Strategy 2011-2020* along with the target of an annual 30 percent reduction in fatalities and serious injuries. *NSW 2021* has set a goal to improve road safety through a range of priority actions. *The Road Safety Strategy for NSW 2012-2021* will deliver a 10 year plan to guide road safety initiatives and investment to reduce road trauma.

The Strategy will focus on improving and upgrading roads, reducing roadside hazards, promoting safer vehicles, providing more rest areas for private and heavy vehicles, matching speed limits to the road environment and undertaking education, legislation and enforcement to promote safer behaviour by road users. These programs will target improved behaviour across all road users, including safety awareness in relation to vulnerable groups such as motorcyclists, cyclists and pedestrians.

The Strategy will require a partnership approach involving the all key stakeholders such as Transport for NSW, NSW Police, Roads and Maritime Services and local councils.

Action Improve road safety assessments

We will use the Austroads National Risk Assessment Model as part of the *National Road Safety Strategy 2011-2020* to assess risk levels for highest volume roads and to prioritise road sections for safety improvement.

Action Develop a boating safety strategy

The Boat Storage and Safe Waterways Access Strategy will include actions designed to increase the capacity of boat storage, waterways access and related facilities.

As part of the Maritime Policy Agenda, the Strategy will include a range of actions focused on personal responsibility issues such as skipper responsibility and lifejacket wear.

Action Implement Automated Train Protection and Operation

Automatic Train Protection (ATP) and Automated Train Operation (ATO) enhancements to trains and lines will be an important element of *Sydney's Rail Future*. ATP is a system and equipment responsible for basic train safety that helps avoid collisions, red signal overrunning and exceeding speed limits by applying brakes automatically. It ensures trains remain a safe distance apart and have sufficient warning to allow them to stop without colliding with another train.

ATO is commonly used on busy commuter lines. It tells a train that is approaching a station exactly where to stop so that the complete train is in the platform. The system controls the acceleration and deceleration of trains, which enables a higher frequency of train service, consistent journey times and highly reliable services. ATO does not mean driverless trains. ATO is a technique to improve the way trains accelerate and brake at stations to enable more trains on the line. The rapid transit lines will use single-deck trains, which will also have ATO.

Action Improve rail safety

Implement the national rail safety regulator and supporting national rail safety law in NSW which will harmonise rail safety requirements across the country and promote improvements in safety and productivity. The national regulator for rail safety will be established on 20 January 2013.

8.8 Protecting the environment

We will manage and minimise the environmental impacts of our transport system. These actions mark a fundamental change in the way we deliver critical transport infrastructure and major projects in terms of their impact on the environment and the communities in which they are located.

8.8.1 Enhancing environmental and sustainability outcomes

Action Develop a coordinated Transport Environmental and Sustainability Policy Framework

A Transport Environment and Sustainability Policy Framework will establish a collective and coordinated approach delivering the NSW Government's environmental and sustainability agenda across the transport sector. The Framework will properly address environmental issues at all levels of transport planning, policy development and project delivery – leading to better environmental outcomes and reduced environmental impacts across our cities, towns and suburbs.

The Framework will comprise governance arrangements that support the continuous improvement of sustainability performance, including targets, measures and action plans to deliver positive environmental outcomes.

Action Develop and implement an Environment and Sustainability Plan for Transport

The Transport Environment and Sustainability Plan will include actions for delivering environmentally sustainable solutions that support the objective of minimising the impact of transport on the environment. This includes setting and applying sound governance policies to drive, monitor and report on environmental sustainability across the portfolio, and collaborating with other departments to influence and deliver the NSW Government's environment and sustainability agenda.

Action Develop and promote Transport Infrastructure Sustainable Design Guidance

We will develop a Transport Infrastructure Sustainable Design Guidance to improve the quality and standard of transport projects and minimise their impact on the environment. We will also trial

industry examples, such as the Australian Green Infrastructure Council's Infrastructure Sustainability Tool to test their suitability as a quality benchmark for transport infrastructure in NSW.

Action Incorporate sustainability principles in procurement policy

We will adopt a Sustainability in Procurement Policy to incorporate sustainability criteria into calls for tenders and general transport procurement, and to set minimum standards for the sustainable design, construction and delivery of transport infrastructure and services. This will improve environmental performance and energy efficiency of the public transport fleet.

8.8.2 Improving air quality, efficiency of energy use and reducing GHG emissions

Action Develop an electric vehicles road map

We will collaborate with the Standing Committee on Transport and Infrastructure, other State Governments and participants in the electric vehicle market to develop an Electric Vehicles Road Map. The map will identify goals, timeframes, tasks and responsibilities to encourage the uptake of electric vehicles across the State.

Action Consider the air quality impacts of transport projects

We will continue to explore opportunities to reduce vehicle emissions, improve air quality and lower GHG emissions from the NSW transport sector. These opportunities will include initiatives to reduce the need for travel, promote cycling and walking, influence driver behaviour, use energy more efficiently and support the adoption of low emission vehicle and fuels.

Action Restructure motor vehicle registration charges

We will restructure motor vehicle registration charges to encourage the earlier adoption of low emissions vehicle technologies that aim to minimise environmental damage (discussed in greater detail in Chapter Ten).

8.8.3 Boosting our resilience to climate change and natural disasters

Action Assess transport climate resilience

We will strengthen the resilience of the transport network to climate change. We will conduct climate change adaptation assessments to understand where our system is most vulnerable and follow this up with a program of action to 'future-proof' vital transport infrastructure against climate impacts of coastal surges, extreme storms, floods and bushfires.

We will work in collaboration with the NSW Police and State Emergency Services to help deliver comprehensive and coordinated responses to natural disasters.

8.8.4 Noise abatement

Operational noise from transport impacts surrounding land uses, especially residential areas, schools and hospitals. In some NSW neighbourhoods and town centres, the noise from transport has an adverse impact on quality of life. We will continue to address transport related noise issues as a matter of priority through various initiatives.

Action Mitigate noise from road projects

We will administer the Road Noise Abatement Program to provide noise mitigation to locations where road traffic noise is high and no road upgrades or developments are planned.

Action Mitigate noise from rail projects

A Rail Noise Abatement Program will mitigate noise in affected locations and establishing permanent noise monitoring stations across the rail network.

Action Mitigate noise from ports

Collaborating with the various Port Corporations, we will ensure appropriate mitigation measures and schemes are in place to manage port-related noise.

Action Mitigate noise from aircraft

We will work with the Australian Government and local councils to ensure appropriate aircraft noise mitigation measures are in place.

8.9 Maintaining our infrastructure

Transport for NSW holds infrastructure assets with a written-down value of \$91 billion, including the land beneath assets. It also holds property, plant and equipment, private sector funded infrastructure and other non-current assets.

Transport for NSW holds or manages just over 1,600 kilometres of main line track in the CityRail network; about 18,000 kilometres of state roads and nearly 3,000 kilometres of regional and local roads; more than 5,000 bridges and a range of other road related assets; a state bus fleet of over 4,000 buses; a ferry fleet of 28 vessels; more than 4,300 kilometres of on- and off-road cycleways; and specialised assets such as the Transport Management Centre and transport interchanges.

Long lengths of lightly trafficked roads ensure all communities have reasonable all-weather access to towns, regional facilities and major cities. Maintaining this network presents considerable ongoing management and funding challenges. We will meet these challenges through a structured program of asset management, led by Transport for NSW.

The risk of not performing maintenance is significant loss of network or system availability. However, the cost to the State for transport asset maintenance has escalated above the rate of inflation, due primarily to material costs. Without additional funding sources, this is most likely unsustainable over the longer term. Funding for infrastructure maintenance is discussed in Chapter Ten.

Action Set maintenance priorities

We will identify critical service gaps through ongoing monitoring and analysis of transport system asset performance in order to address the needs of our customers. Our priorities for maintaining the transport system will be identified using a risk-based approach with consideration given to funding and delivery constraints.

Our approach for maintenance investment will be to appraise and rank options and potential projects according to their ability to address critical gaps in system performance based on the condition and useful life of transport assets. These performance requirements will be defined by:

- Customer service requirements, including passenger and freight travel
- Government priorities and legislation
- Performance standards and guidelines for safe and reliable operations
- Transport for NSW objectives
- Minimising whole of life costs.

Action Improve asset maintenance

We will implement an asset maintenance improvement program that introduces greater contestability to provide best value outcomes. Initially, we will establish a greater understanding of the transport asset portfolio and an understanding of asset condition and performance. This will inform whole-of-transport trade-offs between outcomes, funding and delivery and also assist in establishing a long term plan to address the backlog of local road maintenance. The improvement approach will develop a greater understanding of customer issues and risks and maintenance effectiveness and efficiency from which service performance measures can be established. This will enable monitoring of maintenance programs to achieve value for money.

Action Revise and implement the wharf access regime

Roads and Maritime Services owns and maintains a network of 69 public ferry wharves on Sydney Harbour. These wharves are used by a range of commercial vessel operators providing regulated ferry services and deregulated tourist and charter services.

We will develop a wharf access regime that facilitates additional ferry services on Sydney Harbour on a cost-neutral basis to taxpayers. A consistent and transparent wharf access policy will provide certainty to commercial ferry operators, and also identify potential opportunities for access by recreational boat users.

Governance arrangements will ensure that Transport for NSW has appropriate control over access for public transport services. Wharf infrastructure requirements will be taken into account in the long term Ferries Strategy.

Action **Develop the Boat Storage and Safe Waterways Access Strategy**

The Boat Storage and Safe Waterways Access Strategy will include actions designed to increase the capacity of boat storage, waterways access and related facilities. The Strategy will also consider boat storage capacity requirements in NSW on a waterway-by-waterway basis. Starting with Sydney Harbour we will explore options to encourage the development of a major dry-stack storage facility on the Harbour. We will also assist councils to establish alternative off-road boat trailer parking facilities.

8.9.1 Managing our road assets

Transport for NSW spends over \$1.2 billion a year on road maintenance, of which over \$850 million is spent in rural areas. In more remote parts of NSW, the maintenance task dominates road investment. The Auditor General's 2006 performance audit, *Condition of state roads*, made 14 recommendations for improvements: 12 have been initiated, with seven completed. Other improvements that will continue to direct our road asset management activities are:

- Establishing an improved set of performance indicators
- Developing a more rigorous and reliable method to assess the future condition of bridges
- Developing a pavement condition model to predict structural performance of roads and assets
- Improving consistency in regional maintenance decision making.

Maintenance of services

For ongoing road maintenance, Roads and Maritime Services will oversee and deliver maintenance activities associated with the physical maintenance and long term renewal of state roads, consisting of road pavements, bridges, traffic facilities and roadside assets, and roads in the unincorporated area of the State, as well as 160 bridges and vehicular ferries of State-significance on regional and local roads.

Support for local councils

We will continue to provide formula based funding assistance to local councils for the maintenance and upgrade of their roads. Local councils have autonomy to determine work priorities on their regional and local roads networks.

Eighty-two NSW local councils currently provide routine road maintenance services on state roads under contract arrangements with Transport for NSW. Transport for NSW is seeking greater efficiencies in road network maintenance through increased cooperation between adjacent councils and increasing the size of some sub-contracted works.

8.10 Managing demand and making better travel choices

We will introduce policies and programs directed towards managing the demand side of our transport system. These measures will work with supply side improvements (associated with providing new or enhanced infrastructure) to achieve our broader transport objectives and goals.

Demand-related measures can occur across all aspects of the transport system, involving passenger and freight movements and different modes. A comprehensive approach will be developed over time across the following broad categories of actions:

- Peak demand management – While it is often the case that peak demands define the overall capacity requirements for the transport system, providing for peak demands can be inefficient if it is possible to shape or influence the demand profile to make better use of spare capacity outside of peak periods.
- Travel behaviour change – Programs falling under this banner seek to encourage more sustainable travel choices by the community.
- System wide policy – These broader measures aim to influence multiple parts and levels of the transport system, such as parking policy.

The initiatives outlined below are targeted as high priority for development and implementation. In addition, measures described elsewhere in the Long Term Transport Master Plan will also contribute to managing demand, including better transport and land use integration, and initiatives to promote walking and cycling.

We will facilitate actions that will lead to the development and implementation of travel management plans. These actions will promote more sustainable travel practices such as walking, cycling, using public transport and car-pooling.

Action Support the development of travel access guides

We will support the development of Travel Access Guides for large trip-generating facilities such as universities, TAFEs and hospitals. These guides use similar measures to Workplace Travel Plans, with a focus on informing visitors or users of the transport options available to them. We will and provide accessible and up to date information on transport services.

Action Pilot transport management associations

We will pilot transport management associations as a governance mechanism to develop partnerships between multiple levels of government and local businesses to implement travel demand measures at a broader precinct level. These can leverage transport outcomes through small scale investment from multiple stakeholders. Example transport outcomes where transport management associations may have a role include improved walking and cycling outcomes at the precinct level such as through bike lock up and or end of trip facilities.

Action Promote workplace travel plans

We will promote workplace travel plans to encourage organisations to consider their travel needs and impacts. This includes easing the commute to and from the workplace for employees, reducing dependence on the use of private vehicles and supporting the use of public transport, cycling, walking and car-pooling.

Action Implement a Metropolitan Parking Policy

Transport for NSW and the Department of Planning and Infrastructure will work with local councils across Sydney to prepare a comprehensive new Metropolitan Parking Policy.

Parking impacts on the competitiveness between individual developments within an area and can affect the competitiveness of entire centres when compared to other locations for development. This includes centre-versus-centre competition and centre-versus-out of centre competition. In the longer term, a Metropolitan Parking Policy for Sydney will enable management of parking to support a shift towards public transport through the introduction of a consistent set of principles for parking that overcome concerns over competition between localities.

In the short term, our first priority will be to focus on parking policy for key centres, including the Sydney CBD, North Sydney, Macquarie Park and Sydney's regional cities. We will work with Parramatta, Penrith and Liverpool city councils to improve local car parking policies to promote mode shift to public transport, improve local amenity and encourage more sustainable transport options.



8.11 Using technology for better customer experiences

Information and communication technology (ICT) will support many of the initiatives and solutions proposed in this Long Term Transport Master Plan.

A number of technology applications to assist and improve customer experience are already in place and these include:

- **Transport Info 131500:** trip planning and transport service information for trains, buses and ferries in the Greater Metropolitan Area (including Newcastle and the Central Coast, Wollongong and the Illawarra).
- **Public transport for Google Maps:** directions on public transport are available on Google Maps and includes information on buses, ferries, trains and light rail services in the Greater Metropolitan Area

As discussed in Chapter Three, real-time information systems will be progressively improved and new capabilities provided over the 20 year span of the Long Term Transport Master Plan. Further details regarding real-time information are also available in Section 3.7 Information and Ticketing. Specific technology initiatives that will be introduced over the life of the Long Term Transport Master Plan are described below.

Action Improve traffic and road management

We will continue to support the role of the NSW Transport Management Centre (TMC) in real-time management of traffic flows across the NSW road network. As discussed in Chapter Four, the trends in AM and PM peak speeds on the seven major routes to and from Sydney have remained broadly

HOW TECHNOLOGY WILL CHANGE TRANSPORT IN NSW

The use of ICT will change the face of transport in NSW over the next 20 years, giving us better ways to do things and offering new solutions to old problems.

In five years

- Intelligent transport systems (ITS) will be a primary road safety countermeasure
- A national ITS framework will promote an open and interoperable platform for application developers that will be available at pilot sites in NSW
- The Transport ICT and Innovation Strategy will be guiding Transport for NSW's actions and investment in technology-enabled, customer-oriented transport solutions
- ICT will be a core capability of all business and operational units of Transport for NSW in achieving their strategic and operational goals
- Managed Motorways projects will have improved road efficiency, reliability and safety through the use of adaptive traffic control, incident management and real-time traveller information systems.

In 20 years

- Widespread deployment of smart vehicles will prevent collisions or reduce their severity, dramatically reducing crashes and pedestrian accidents in NSW
- Information will be delivered to our customers – whenever, wherever and however they want it
- ICT-enabled innovation will continually improve services and performance over time
- The majority of vehicles on the NSW road network will be connected with each other and with road managers, public transport providers and emergency services through a national ITS framework and associated architectures
- Systems will be interoperable, with international systems and standards in place to cater for imported vehicles.

consistent despite a growth in traffic of 49 percent since 1990. In part, this is due to the management of traffic flows by the TMC. The TMC's systems and facilities will be enhanced to improve congestion and incident management, enable the TMC to manage each peak period as a multi-modal major event and provide real-time traveller information. The TMC's functions in supporting public transport operations will also be enhanced.

We will commence a Managed Motorway Program, jointly funded with the Australian Government, which will introduce new traffic management systems and infrastructure to manage traffic flows along the motorway network and integrate the network with surrounding arterial roads. The program will include intelligent vehicle monitoring, adaptive traffic control, incident management and traveller information systems, and will aim to deliver significant benefits including improved travel efficiency, reliability and productivity, reduced emissions and improved safety. Further detail is described in Section 5.6.

Action **Develop and implement a Transport ICT and Innovation Strategy**

We will work with industry to implement a centralised Transport Information, communication, technology and Innovation Strategy that develops Transport for NSW's capability to test, support and deploy ICT where it will improve transport safety, customer service, network or administrative efficiency or network responsiveness. The Strategy will also coordinate and unify ICT decision making, service delivery and systems across the transport cluster to boost common capability and achieve efficiencies.

Through the Strategy, we will develop partnerships with the private sector to set appropriate service and procurement models that will encourage a timely industry response to our emerging requirements and support market-led development of innovative transport applications.

Action **Deploy Intelligent Speed Adaptation and Collision Detection / Avoidance across the State vehicle fleet**

We will explore the deployment of Intelligent Speed Adaptation (ISA) and collision detection/avoidance (CDA) systems across the State vehicle

fleet to improve safety and support the diffusion of these technologies across the broader NSW car market. Research shows that these systems have the potential to deliver an up to 20 percent saving in work related crashes.

The state fleet of more than 27,000 vehicles is the largest State Government fleet in Australia. Deploying these systems across the fleet will significantly reduce the annual costs of vehicle crashes to the State – currently around \$110 million. Each year the NSW Government moves around \$220 million worth of vehicles into the second hand car market. Fleet vehicles sold with ISA and CDA installed will help to boost the demand for these systems, as well as improve road safety.

LIVE TRAFFIC NSW

In September 2010 the new Live Traffic NSW website (livetraffic.rta.nsw.gov.au) launched, providing motorists with up-to-the-minute news of incidents and conditions that affect their journeys. With access to 66 live traffic cameras that update images every 60 seconds, the website helps motorists make the best possible travel decisions, contributing to the safe and efficient management of our roads. Live Traffic features include:

- Traffic flow information on major NSW roads that shows if traffic is light, medium or heavy
- Latest information about incidents, road works, major events and weather conditions
- Travel time information on the F3, M4 and M7
- A trip planner that allows users to view journeys on a map and filter information to show current conditions or scheduled road work and events for a specified date
- Trip planning features such as heavy vehicle checking stations, rest areas, train stations, ferry wharves and more.



9



TIMETABLE FOR ACTION

CHAPTER SUMMARY

The Long Term Transport Master Plan takes an integrated and balanced approach to planning and investing in our transport network. This approach recognises the different strengths and roles that individual transport modes play with respect to the network as a whole.

This means that roads, public transport and freight infrastructure all have a unique part to play in meeting future requirements. While public transport on road and rail will need to take on a bigger share of the growing transport task, competitive road and freight rail networks will help to meet growing demand in our economy.

This chapter highlights how the actions in the Master Plan will transform the customer experience on individual modes – like buses, ferries and trains – over the short, medium and long term. It is the beginning of an action plan for the delivery of the Master Plan, and a clear statement of the infrastructure pipeline and service reform program for the next 20 years.

Consistent with the approach we have taken in developing the Master Plan, short term actions are more detailed, and have more concrete delivery timeframes than medium to long term actions, for which delivery planning will be progressed immediately.

This chapter summarises the initiatives outlined in the Master Plan by mode and outlines the actions we are taking now to deliver these initiatives.

9.1 Public transport

Actions proposed in the Master Plan for each of the key modes are summarised in Sections 9.2 to 9.5.

Many of these projects are being implemented and progressed now, while others are scheduled for implementation in the medium term (five to 10 years) or long term (10 to 20 years). Other new measures that will drive integration and take effect across the public transport system include:

Measures in the Master Plan	Timetable for Action
<p>Trial of a new integrated electronic ticketing system – known as Opal – commencing in late 2012 on Sydney Ferries.</p>	<p>Actions in progress We have allocated \$124 million in 2012-13 budget to the trial of a new integrated electronic ticketing system. The trial commences on Sydney Ferries in 2012 and will be rolled out across the network over the next two years, with Opal being available on Sydney trains from mid 2013.</p> <p>Medium to long term priorities We will use data collection from the new Opal system to improve service planning around customers needs and will investigate options to implement Opal outside Sydney and use it to pay for other types of services that will be progressed.</p>
<p>Continued investment in interchanges under the Transport Access Program, assessing future priorities for car parks, facilities and interchange upgrades.</p>	<p>Actions in progress We have allocated \$770 million to the Transport Access Program over four years and implementation of this program is underway.</p> <p>Medium to long term priorities Future rounds of Transport Access Program funding will continue major transport interchange upgrades and targeted works and will consider supporting public transport use at strategic interchange locations between the road and bus networks.</p>
<p>An <i>Interchange Strategy</i> to ensure a seamless operational model for managing and investing in interchanges, with customer-centred design principles and guidelines.</p>	<p>Actions in progress The <i>Interchange Strategy</i> is under development. Detailed assessment will soon be completed to identify the next round of interchange upgrades, with a continued focus on evidence-based criteria to prioritise funding under the Transport Access Plan, including patronage, customer demographic, accessibility requirements and proximity to critical services.</p> <p>Medium to long term priorities Implementation of the <i>Interchange strategy</i>, including a new operating model, the roll-out of customer-centred design guidelines and improved urban design, and the fostering of commercial and transit-oriented development opportunities around interchanges.</p>

Measures in the Master Plan	Timetable for Action
<p>Accurate and modern real-time and wayfinding information to support customers using the public transport systems within Sydney and NSW, including initiatives to provide real-time information on commuter car parking availability, and on public transport services via Google Maps.</p>	<p>Actions in progress</p> <p>We have allocated \$2.2 million in the 2012-13 budget to develop and test improved customer information and wayfinding for interchanges.</p> <p>By June 2013 we will have a strategy for rolling out improved customer information and wayfinding across the public transport network.</p> <p>The Public Transport Information and Priority System (PTIPS) is now deployed to over 3,300 buses and more than 1100 traffic lights across Sydney to prioritise late buses. The TXTBUS SMS service provides real-time bus arrival prediction information provided by PTIPS, while the Live Traffic NSW website and iPhone application report real-time traffic and incidents.</p> <p>More applications for smartphones are under development, including to supplement the TXTBUS SMS service and Android and iPad versions of Live Traffic.</p>
<p>An integrated Strategic Transit Network model for Sydney, supported by clear network hierarchies, to clarify roles, functions and service standards for specific transit corridors.</p>	<p>Actions in progress</p> <p>Detailed planning on the Strategic Transit Network is being used to inform the Modal Plans that support the Master Plan.</p> <p>Medium to long term priorities</p> <p>Incremental improvement of public transport service frequency, priority and infrastructure on strategic corridors as demand develops.</p>
<p>Immediate work to align, improve and simplify public transport timetables, beginning with work to develop the new 2013 rail timetable.</p>	<p>Actions in progress</p> <p>This planning work is ongoing, and the new Sydney Trains timetable will commence in 2013.</p> <p>Medium to long Term Priorities</p> <p>Improved timetables and improved integration across modes will be further implemented with the 2016 timetables once the South West Rail Link is operational.</p>

Measures in the Master Plan	Timetable for Action
<p>Investment in a modern public transport fleet, including new trains and ferries for Sydney and new buses for growth areas and strategic corridors.</p>	<p>Actions in progress We have allocated \$127 million to new buses in the 2012-13 budget.</p> <p>Medium to long term priorities We will replace 52 percent of Sydney Trains rolling stock within 10 years, provide approximately 460 additional new carriages by 2020 and replace and grow the ferry fleet as part of a fleet procurement strategy developed with the new ferry operator.</p> <p>We will provide new high capacity single-deck rolling stock on parts of the network including on North West Rail Link.</p>
<p>A Passenger Transport Legislation Review to support the NSW Government's vision for more integrated transport services and innovative and efficient procurement, focusing on customer outcomes.</p>	<p>Actions in progress We released a discussion paper for the Passenger Transport Legislation Review for public comment in September 2012. Following completion of the Review, reforms to public transport will be introduced in Parliament in early 2013.</p>

9.2 Rail

Rail is the backbone of the public transport system and provides a platform that supports all other transport modes. It is a mass transit mode, able to move many people quickly. Our investments and improvements to the rail network affect all other transport modes. The measures we are pursuing on the rail network include:

Measures in the Master Plan	Timetable for Action
<p>North West Rail Link and South West Rail Link, providing new rail infrastructure and services for fast growing outer suburbs, doubling services to the South West and providing mass transit services to the North West.</p>	<p>Actions in progress</p> <p>We have allocated \$360 million to the North West Rail Link in the 2012-13 budget for detailed planning and assessments and \$3.3 billion in the next four years for construction. First stage planning approval has been received and 22 tenders and 44 key contracts have been awarded so far.</p> <p>We have allocated \$397 million to the South West Rail Link in the 2012-13 budget to continue construction. We remain on schedule for completion in 2016.</p> <p>Medium to long term priorities</p> <p>The North West Rail Link will be operational, providing rapid transit rail services for approximately 300,000 residents in the North West to Epping, Macquarie Park, Chatswood, St Leonards, North Sydney and the CBD.</p>
<p><i>Sydney's Rail Future</i>, a long term plan to modernise Sydney's rail network that will progressively implement rapid transit to the rail network. Major components include the rail efficiency program to maximise performance of the existing network in the short to medium term, and the long term addition of network capacity through a second Harbour Crossing and new CBD line.</p>	<p>Actions in progress</p> <p>Detailed planning has commenced and improvements to operational efficiency are being rolled out across the network. Over the next year, these will include:</p> <ul style="list-style-type: none"> • Timetable improvements • Improved dwell management • Platform decluttering • Better incident recovery management. <p>Medium to long term priorities</p> <p>A program of network efficiency improvements that transition towards a new rapid transit system, introducing Automatic Train Operations, dedicated fleet types for certain lines, completing track enhancements and platform redesign.</p> <p>Completion of the second Harbour Crossing will enable a further 90,000 to 100,000 people to travel on the network per hour in the peak.</p>

Measures in the Master Plan	Timetable for Action
<p>A comprehensive Country Passenger Rail Services Strategy to guide the development of NSW regional rail services over the next 20 years and assess the investment required to support an improved and efficient NSW Trains business and operating strategy.</p>	<p>Actions in progress</p> <p>We have allocated \$182 million to country regional network upgrades in the 2012-13 budget. Detailed planning for improved country passenger services is underway. We introduced a new daily Bathurst to Sydney express train service and are examining the potential for more frequent, faster, and more convenient services.</p> <p>Medium to long term priorities</p> <p>A modern regional rail service with improved services and new rolling stock will be in place.</p>
<p>Fleet upgrade programs to renew and expand Sydney Trains and regional rolling stock, including the provision of new single-deck trains as part of <i>Sydney's Rail Future</i>.</p>	<p>Actions in progress</p> <p>We have allocated \$88 million to upgrade renew and expand the rolling stock of Sydney Trains and NSW Trains in the 2012-13 budget. Fourteen of the new carriages are currently operational, with 20 expected to be operational by the end of 2012, and a total of 78 by the end of 2013. Quiet carriages have been introduced on the Newcastle/Central Coast, Blue Mountains and South Coast lines.</p> <p>Medium to long term priorities</p> <p>A NSW Trains fleet management strategy will address future needs, alongside a Sydney Trains procurement strategy which includes over the short to medium term the new Waratah fleet with air-conditioned carriages to replace 498 life-expired suburban cars, refurbishment of the Tangara fleet, and new single-deck rolling stock to improve overall line capacity on certain lines.</p>
<p>Major investment in rail safety and technology systems, including Automatic Train Protection and digital train radio systems.</p>	<p>Actions in progress</p> <p>We have allocated \$114.5 million in the 2012-13 budget to rail safety systems. We completed a trial of Automatic Train Protection (ATP) this year, and will roll-out ATP and digital train radio systems to improve the way trains accelerate and brake at stations.</p>

Measures in the Master Plan	Timetable for Action
<p>Completion of the Northern Sydney Freight Corridor Program and the Southern Sydney Freight Line improvements.</p>	<p>Actions in progress We have allocated \$84.5 million in the 2012-13 budget to conduct an Environmental Impact Statement and review of Environmental Factors in relation to the Northern Sydney Freight Corridor Program and enabling works have commenced. The Southern Sydney Freight Line will be completed in 2012.</p> <p>Medium to long term priorities Progress planning for Stages 2 and 3 of the Northern Sydney Freight Corridor will lead to completion that will take 200,000 heavy vehicles off the road each year.</p>
<p>Development of a metropolitan intermodal terminal network and invest in rail freight capacity projects to move more freight by rail and improve rail competitiveness, including planning and corridor protection for a future Western Sydney freight line and intermodal terminal.</p>	<p>Actions in progress Main construction works on the Enfield Intermodal Logistics Centre began in July 2011 and will be complete in 2013. Work is underway on a local road access strategy for the Moorebank intermodal terminal precinct.</p> <p>Medium to long term priorities We will preserve a corridor for a future Western Sydney freight line and a site for an intermodal terminal.</p>
<p>Rail maintenance programs to improve safety and reliability across the Sydney Trains and regional networks, including sleeper replacement programs and bridge renewals.</p>	<p>Actions in progress We have allocated \$215.6 million in the 2012-13 budget to improve and maintain the Sydney Trains and NSW Trains networks.</p>
<p>NSW Rail Access Review of regulatory arrangements applying to the Metropolitan Rail Network, Metropolitan Freight Network and the Country Regional Network to improve the management of the shared network between passenger and freight trains.</p>	<p>Actions in progress We are developing a new access regime for the rail network.</p>

Measures in the Master Plan

Continued collaboration with the Australian Government to examine the feasibility of and issues associated with high speed rail proposals. This includes consideration of land use planning issues, identification of routes and station locations in the Sydney region, and accessibility of existing public transport links for connection to a potential high speed rail solution.

Timetable for Action**Actions in progress**

In September 2012 we commenced consultation with the Australian Government Department of Infrastructure and Transport on options for routes and stops for a potential high speed rail line. Two options for stations in the South West Sydney area will be proposed by the Australian Government. Phase 2 of the high speed rail study will be completed by early 2013.

Medium to long term priorities

We will identify and protect the corridor for future high speed rail once identified and commence planning for integrated land use and transport networks and services.

9.3 Light rail

Light rail is an important intermediate mode of transport, providing for cross-regional connections while also facilitating mass transit services. The key measures we are pursuing with regard to light rail are:

Measures in the Master Plan	Timetable for Action
Completion of the 5.6 kilometre Inner West Light Rail Extension from Lilyfield to Dulwich Hill.	<p>Actions in progress</p> <p>We have allocated \$116 million in the 2012-13 budget for the Inner West Light Rail Extension. Construction commenced in 2012 with operations ready to commence in early 2014.</p>
CBD and South East Light Rail	<p>Around \$1.6 billion project cost</p> <p>The NSW Government is proceeding with a new light rail line extending from Circular Quay through George Street to Central Station and to the University of NSW via Anzac Parade and Alison Road. Detailed planning has commenced.</p>
Consideration of light rail as part of future long term corridor planning as an option to serve other major centres as demand grows, consistent with the modal hierarchy.	<p>Actions in progress</p> <p>We are preparing <i>Sydney's Light Rail Future</i>. This will be NSW Government's plan for considering extensions to the light rail network.</p>
Collaboration with Parramatta City Council as they progress plans to develop a light rail network proposal focused on the Parramatta CBD and connecting with Castle Hill, Chester Hill, Bankstown, Blacktown and Carlingford.	<p>Actions in progress</p> <p>Transport for NSW is working collaboratively with Parramatta City Council to understand future public transport needs in Western Sydney and determine the potential triggers for investment in bus priority or light rail.</p> <p>Medium to long term priorities</p> <p>We will upgrade congested bus corridors into Parramatta CBD that align with possible future light rail routes to build up the use of public transport services over time and support the case for transition to light rail on those corridors.</p>

9.4 Bus

Buses are a key component of the overall transport system expanding the rail catchment area and providing an important intermediate mode for cross-regional connections. The measures we are pursuing with regard to buses include:

Measures in the Master Plan	Timetable for Action
<p>Increase bus priority measures and investigate Bus Rapid Transit along priority corridors as part of a bus strategy that includes a restructured three-tier network of improved local, intermediate and rapid mass transit services, supported by a bus network redesign, and a better, modern fleet.</p>	<p>Actions in progress</p> <p>We have completed a pre-feasibility study for Bus Rapid Transit options for the Northern Beaches corridor, and consultation with key stakeholders is ongoing. We have also advanced planning for <i>Sydney's Bus Future</i> and an <i>Interchange Strategy</i> that will lay the groundwork for this new network.</p>
<p>A CBD bus plan for all bus routes to and through the CBD, to reduce congestion and improve bus travel time and reliability to the CBD and complement <i>Sydney's Light Rail Future</i>.</p>	<p>Actions in progress</p> <p>In early 2013, we will re-direct more than seven percent of current morning peak bus services from the North West – about 60 buses – from the Harbour Bridge onto the Cahill Expressway. This will ease congestion at the busy Wynyard interchange and help make bus services more reliable for customers</p> <p>We will introduce more cross-city Metro-style bus routes, avoiding termination in the City Centre. We will also use road space gained from the removal of the Sydney Harbour Bridge toll plaza to improve transport operations in the Northern City Centre.</p> <p>Medium to long term priorities</p> <p>The implementation of light rail in the CBD will provide further opportunities to reduce and optimise bus operations in the CBD.</p>
<p>A detailed feasibility study for a new bus interchange in Sydney CBD, consistent with the CBD bus plan and <i>Sydney's Light Rail Future</i>.</p>	<p>Actions in progress</p> <p>We have commenced detailed planning for optimising bus routes in the CBD. We are programming immediate improvements to bus services in the Wynyard precinct.</p> <p>Medium to long term priorities</p> <p>We will develop long term options for a major interchange in the northern CBD consistent with the CBD bus plan and <i>Sydney's Light Rail Future</i>.</p>
<p>A bus fleet expansion and renewal program that includes more than 500 new buses over five years that provide modern standards of capacity, fuel efficiency, comfort and accessibility.</p>	<p>Actions in progress</p> <p>\$127 million allocated to new buses in 2012-13 budget.</p> <p>Medium to long term priorities</p> <p>Develop a fit-for-purpose bus fleet that supports the performance needs of the bus service hierarchy.</p>

Measures in the Master Plan	Timetable for Action
<p>Longer term investigation of Bus Rapid Transit on Sydney's busiest corridors that are not served by other mass transit modes.</p>	<p>Actions in progress</p> <p>We are developing the draft Bus Strategy, to be known as <i>Sydney's Bus Future</i>, which will identify 11 primary established bus corridors - including the Northern Beaches - for investigation of extensive bus priority treatments, elevated service standards, and longer term Bus Rapid Transit investment. Route upgrades are being categorised into short, medium and long term actions. An additional two greenfields corridors - one each in the North West and South West Growth Centres - will be highlighted in <i>Sydney's Bus Future</i> for route identification and longer term development.</p>
<p>A Strategic Bus Network program focusing on higher service frequencies and on-road priority for buses along strategic corridors will improve services and better manage road congestion, offering better public transport travel times and reliability at significant pinch points during weekday peak periods.</p>	<p>Actions in progress</p> <p>We are developing a long term plan for Sydney's bus network, <i>Sydney's Bus Future</i>. The plan will show the city's primary centre-to-centre bus system, as well as the next tier of cross-metropolitan bus routes, which will benefit from improved service standards and supporting bus priority works.</p>
<p>A Bus Head Start program will embed bus priority infrastructure on major road corridors close to emerging growth centres. This will provide more direct access to urban centres and heavy rail interchanges. The program includes a package of bus priority works in Western Sydney to optimise access to the North West Rail Link.</p>	<p>Actions in progress</p> <p>Detailed planning has commenced on a program to embed bus priority in Growth Centre Roads.</p> <p>We have submitted a joint funding proposal to the Australian Government to develop a program of bus infrastructure projects to improve bus services in the North West and support access to the North West Rail Link.</p> <p>The South West Growth Centre Bus Servicing Plan is being updated to take advantage of the accelerated delivery of the South West Rail Link, and to reflect the work in <i>Sydney's Bus Future</i> identifying the most important Growth Centre bus corridors. The updated South West Growth Centre Bus Servicing Plan will guide investment under the Growth Infrastructure Program in bus priority infrastructure works and Growth Centre roads.</p>

Measures in the Master Plan	Timetable for Action
<p>Enhanced service coverage and frequencies to promote public transport use and access in our regions, particularly in the Lower Hunter, Central Coast and Illawarra.</p>	<p>Actions in progress</p> <p>Work has begun on Regional Transport Plans across NSW that will develop bespoke public transport solutions to better meet the needs of regional customers. The focus will be on improving service frequency and coverage and ensuring accessible local bus stops, interchanges and coach facilities.</p> <p>We have introduced four daily return bus services to Dubbo for Narromine and Wellington residents.</p> <p>Medium to long term priorities</p> <p>We will develop differentiated services that respond to local customers and transport demand and work with regional bus operators to trial innovative bus services.</p>
<p>Progress options to improve bus services to Sydney Airport as part of the Port Botany and Sydney Airport precinct Improvement Plan to encourage public transport to and from the Airport to manage growing road congestion.</p>	<p>Actions in progress</p> <p>We have commenced detailed planning as part of the Improvement Plan for Port Botany and Sydney Airport precinct to address capacity constraints caused by competing demands on the road and rail networks in the precinct, and have begun identifying potential new and extended bus route options in the precinct.</p> <p>Medium to long term priorities</p> <p>By 2031, we will work towards multiple 24-hour bus routes serving the Airport for workers and passengers, new dedicated bus interchanges for each airline precinct and new dedicated express bus services using new motorway links.</p>

9.5 Ferries

Ferries are a specialised transport mode and an internationally recognised symbol of Sydney. We will pursue opportunities to enhance the ferry services by encouraging greater service innovation, examining options for private sector involvement in service delivery and building on the popularity of ferry services with Sydney's tourism market. The measures we are pursuing with regard to ferries include:

Measures in the Master Plan	Timetable for Action
Work with the new franchised operator of Sydney Ferries to improve service quality, develop fleet modernisation options and provide reliable service delivery for our ferries.	<p>Actions in progress</p> <p>Collaboration with Harbour City Ferries is underway and will continue to advance customer service improvements, potential fleet options and reliability improvements.</p>
Progressively provide new ferries for Sydney through a fleet procurement strategy to be developed under the service contract with the new private operator.	<p>Actions in progress</p> <p>We are actively developing a fleet procurement roadmap for ferries, underpinned by customer-focused future network requirements.</p>
Improving and growing the ferry network through new wharves, new timetables and new and extended routes, including consideration of additional cross-harbour trips, loops and services to Barangaroo.	<p>Actions in progress</p> <p>We are analysing options for network adjustments and improvements to better match demand for ferries, and to cater for and stimulate growth in ferry trips over time. Options include new routes and services across the week, new and upgraded infrastructure, and extensions to the network including the Barangaroo Ferry Plan.</p> <p>Medium to long term priorities</p> <p>Continue to strengthen the contracting and policy framework to support the development of innovative services on routes of high and growing demand.</p>
A Sydney Harbour wharf upgrade program to replace ageing wharves, make wharves accessible to people with a disability and create attractive ferry terminal precincts.	<p>Actions in progress</p> <p>We have allocated \$17 million in the 2012-13 budget for the upgrade of wharves. This includes \$4.6 million for wharf maintenance to replace hydraulic ramps at ferry wharves at Circular Quay and Manly, which is now complete.</p> <p>By the end of 2012, three wharf upgrades will have been completed, with one additional on schedule for completion in mid 2013. We have also commenced planning on a comprehensive upgrade to Circular Quay interchange.</p>
A Barangaroo Ferry Plan to support the Barangaroo development and relieve pressure on Circular Quay, including new routes and services to the central city from Lower North Shore, Manly, Parramatta River and Inner Harbour areas, and a new city terminal.	<p>Actions in progress</p> <p>We have commenced detailed planning including the development and assessment of options for new routes, a new terminal, adjoining transport services and supporting infrastructure.</p>

Measures in the Master Plan	Timetable for Action
Better integration of ferries with other modes, including improved alignment of timetables with other modes and provision of real-time information to ferry customers.	<p>Actions in progress</p> <p>We have commenced detailed planning across all modes to improve integration and better align timetables, with potential implementation in 2013.</p>
Changing ferry operations to focus services around customer needs and demand, rather than around historic operational and infrastructure constraints.	<p>Actions in progress</p> <p>We are undertaking a fresh customer and needs-driven approach to defining modern and future service requirements. Operational and infrastructure considerations will inform but not drive ferry services.</p>
Continuing provision of deregulated high speed ferry services on Sydney Harbour that have increased patronage growth and provided innovative services on our waterways.	<p>Actions in progress</p> <p>We have implemented a new franchised operating arrangement for Sydney Ferries and are analysing options to enable continued private sector innovation to improve ferry services for customers.</p>

9.6 Roads

Roads support around half of all public transport services, enabling personal journeys including walking and cycling and facilitating productivity and economic growth across the State. An integrated package of solutions is proposed to ensure the right road infrastructure is supported by the right pricing, investment and maintenance approaches. Actions across NSW's urban and rural road network include:

Measures in the Master Plan	Timetable for Action
<p>A long term plan to complete critical links in Sydney's motorway network, with the 33 kilometre WestConnex scheme in the M4 and M5 corridors being the immediate priority for Sydney.</p>	<p>Actions in progress We have committed \$1.8 billion in funding for WestConnex and detailed planning has commenced.</p> <p>Medium to long term priorities Planning will be progressed for future motorway links including the F3 to M2 link, F6 corridor, the M7 widening and enhanced north-south links. In addition, corridor protection will be undertaken for the Outer Sydney Orbital (M9), Bells Line of Road and Castlereagh Freeway.</p>
<p>A Managed Motorway program will introduce new traffic management systems and technologies on the M4 to better manage traffic flows and reduce travel times along the motorway network.</p>	<p>Actions in progress We will introduce a trial of new traffic management systems and technologies to be rolled out on the M4 in the short term.</p> <p>Medium to long term priorities The Managed Motorway program will be rolled out across the Sydney motorway network.</p>
<p>Pilot of HPV access on the Hume Highway to safely improve freight vehicle productivity, using direct charges to fund enabling works such as additional driver rest areas, and collaboration with the Victorian Government to potentially enable HPVs to operate the full interstate route between Sydney and Melbourne.</p>	<p>Actions in progress We are in the process of commencing:</p> <ul style="list-style-type: none"> • Developing a detailed business case • Commencing internal investigations and planning • Starting discussions with the Victorian Government and other government stakeholders such as Infrastructure Australia • Exploring funding opportunities. <p>Medium to long term priorities Seek more direct charging of heavy vehicles on the basis of road usage with revenue being reinvested in transport and continue to make the strong case for national charging and investment reforms.</p>

Measures in the Master Plan	Timetable for Action
Reform vehicle registration policy to promote the growth of safer and more environmentally friendly light vehicles on NSW roads and to make registration payments easier and more convenient.	<p>Actions in progress</p> <p>We are preparing a Discussion Paper outlining the proposed reforms to light vehicle registration policy. This will be released in early 2013 for community and stakeholder consultation.</p>
Corridor protection for future road needs, including the Bells Line of Road and the Outer Sydney Orbital (M9).	<p>Actions in progress</p> <p>We have commenced detailed planning for corridor protection for future road needs including for WestConnex and the F3 to M2. Corridors that are already protected include the F6, Georges River Parkway, Bells Line of Road and Castlereagh Freeway.</p>
Investigate, develop and test a distance-based tolling regime for Sydney's motorways in consultation with private sector tollway operators and cross-disciplinary experts.	<p>Actions in progress</p> <p>We are studying the feasibility of distance-based tolling on new and improved motorways in Sydney and we anticipate that WestConnex will be the first trial of a new distance-based tolling system.</p> <p>Medium to long term priorities</p> <p>Tolling reform on Sydney's motorway network, many move towards consistent distance-based tolling.</p>
A new Growth Centres roads program to develop the road network in new residential areas to link the Greater Sydney workforce to employment opportunities and to national and international gateways. This includes completion of the Western Sydney Employment Area arterial road network.	<p>Actions in progress</p> <p>Works currently under construction are being accelerated with funds from the Housing Acceleration Fund. Further works are under development.</p>
Upgrades to major highways to improve safety and efficiency, including a significant investment in the Pacific Highway.	<p>Actions in progress</p> <p>The NSW and Australian Governments have committed \$8 billion for the period 2009 to 2016. Construction is currently underway.</p>
A 10 year <i>Road Safety Strategy for NSW</i> to improve safety on our roads and reduce road crashes, with a focus on improving safety on country roads for passengers and freight.	<p>Actions in progress</p> <p>We have completed consultation on the <i>Road Safety Strategy for NSW</i>, and will roll out the recommendations of the Strategy in the short term and over the next 10 years.</p>

Measures in the Master Plan	Timetable for Action
<p>Connection of vital freight routes in regional NSW, with Bridges for the Bush program to replace and upgrade bridges at key locations to enable freight vehicles on the HML network, and a program of town bypasses to reduce heavy truck traffic through town centres.</p>	<p>Actions in progress</p> <p>We have allocated \$145 million to the replacement and upgrading of key bridges in regional NSW. Bridges identified for strengthening and upgrade include Tabulam Bridge in the Northern Rivers, Glennies Creek Bridge in the Hunter, Gunnedah Rail Bridge in New England and Sportsman Creek Bridge in the Mid North Coast.</p>
<p>Two Western Sydney road packages, with bus priority infrastructure, to optimise the North West Rail Link and improve access for growing communities in the South West and around Werrington.</p>	<p>Actions in progress</p> <p>Detailed planning work is underway on these packages, and a submission has been made to the Australian Government for funding to commence construction in the short to medium term.</p>
<p>Requirement for all road initiatives to consider the needs of all road users, including on-road public transport, cyclists and pedestrians, as well as the specific requirements of motorcycles. In particular, road safety improvements will target motorcycle and cycling safety.</p>	<p>Actions in progress</p> <p>Major new road projects are being reviewed to ensure that they consider the needs of public transport, cyclists, motorcycles and pedestrians.</p>
<p>Support seamless national regulation by working with other states and the Australian Government on the introduction of the National Heavy Vehicle Regulator and road pricing reform.</p>	<p>Actions in progress</p> <p>NSW will introduce legislation for the National Heavy Vehicle Regulator once the enabling legislation has passed through the Queensland Parliament, which will be the host jurisdiction for the Regulator. This is expected in 2013. For road pricing reform, NSW is on the Project Board of Heavy Vehicle Charging and Investment Reform. In 2013, options will be finalised for inclusion in a Regulatory Impact Statement. In NSW, national regulators will also be established on 20 January 2013 for rail safety and on 31 March for maritime safety relating to commercial vessels.</p>
<p>More efficient management of road space in the CBD by all users through the allocation of road space to priority users.</p>	<p>Actions in progress</p> <p>We are currently progressing a road user hierarchy for Sydney CBD that will improve traffic flow by prioritising different parts of the CBD road network for different types of users. The hierarchy will be tested in early 2013 and finalised by June 2013.</p>

Measures in the Master Plan	Timetable for Action
Measures to fix Port Botany precinct pinch points, with targeted road works designed to alleviate congestion around the Port Botany and Sydney Airport precinct.	<p>Actions in progress</p> <p>We have commenced detailed planning as part of the Improvement Plan for Port Botany and Sydney Airport. The Plan will address capacity constraints, a growing passenger and freight task, and surface access challenges caused by competing demands on the road and rail networks leading to and surrounding the precinct.</p>
Investigating ways to support motorcycling as part of the NSW Roads Strategies and the Metropolitan Parking Policy, with a focus on safety, security, environmental issues and parking.	<p>Actions in progress</p> <p>We have announced a trial of motorcycle filtering lights for Sydney CBD. Through the trial, we will test whether motorcycle filtering lights are a safe way to enable motorcycles to move more quickly in the CBD, reducing overall congestion for all drivers.</p>
Congestion management across Greater Sydney's road network with targeted measures to reduce congestion, better use existing road capacity and improve road safety.	<p>Actions in progress</p> <p>Transport for NSW and RMS are working together on the Sydney Road Network Congestion Management Program. The Program will deliver targeted measures to reduce congestion, better use existing road capacity and improve road safety. These measures will include:</p> <ul style="list-style-type: none"> • Operational protocols to provide dynamic multi-modal road network management, including road network allocation and priority by time of day • Real-time traveller information • A CBD Motorcycle response team to enable a speedy response to identified points of congestion to re-establish traffic flow and minimise delays • Road network capital infrastructure projects. • Clearway and on-street parking management measures • Road network operations measures, intelligent transport systems and devices.
Critical investment in the far west of NSW, including road safety infrastructure for Aboriginal community roads, and the Mitchell and Barrier Highways on a needs basis.	<p>Actions in progress</p> <p>We have commenced detailed planning to improve sections of the Mitchell and Barrier Highways.</p>

9.7 Cycling

Cycling represents both a transport mode and a recreational activity. New measures relating to cycling will focus on safety (particularly around roads) and integration with public transport. The measures we are pursuing with regard to cycling include:

Measures in the Master Plan	Timetable for Action
Improved access to user-friendly, bike trip information.	<p>Actions in progress</p> <p>We are currently improving bike trip information by:</p> <ul style="list-style-type: none"> • Making bike route information available on bicycleinfo.nsw.gov.au and sharing this information with third parties (eg. Google Maps) • Incorporating bike route information on 131 500 website • Incorporating bicycle routes into wayfinding information available at public transport interchanges • Exploring opportunities for working with local governments and bicycle user groups to establish a consistent symbology and approach to bicycle signage and maps • Exploring opportunities to incorporate bicycle trips in a broad individualised social marketing strategy.
A long term NSW Cycling Investment Program to improve the planning, management and delivery of cycleway capital programs, supported by design solutions and standards to reflect customer needs.	<p>Actions in progress</p> <p>We are consulting people who want to cycle but may be discouraged by safety and other concerns to understand the hierarchy of cycleway design standards that should guide the provision of attractive cycling facilities in different traffic conditions.</p>
A program to increase and improve bike parking at public transport interchanges.	<p>Actions in progress</p> <p>We are investigating options to deliver bike parking through the Transport Access Program, and minimum standards for the routine inclusion of bike racks and secure cages as part of all public transport interchange upgrades. Bike-and-ride criteria are being developed as part of the <i>Interchange Strategy</i>.</p>

Measures in the Master Plan	Timetable for Action
<p>A Connected Cycling Network that targets investment in clearly defined cycleways within a five kilometre radius of major urban centres in the short term and 10 kilometre larger radius of centres in the longer term.</p>	<p>Actions in progress</p> <p>We are working with relevant local councils to plan and deliver priority cycling infrastructure including:</p> <ul style="list-style-type: none"> • Nepean River Green Bridge (Penrith) • North Ryde to Macquarie University link • Parramatta Valley Cycleway • Prospect to Blacktown link. <p>Medium to long term priorities</p> <p>We are investigating major projects for medium-term development to feed into our busiest bicycle routes on the inner Sydney regional bicycle network, including the North Shore Cycleway, a connection to Sydney CBD from the east, completing the cycleway to the Airport and pathway connections along the Cooks River to White Bay corridor (parallel to the Inner West Light Rail Extension).</p> <p>We are enhancing and connecting cycle routes as land is released and developed in Sydney's Growth Centres, working closely with the Department of Planning and Infrastructure.</p>
<p>Enhanced cycling routes in regional centres to increase the number of people who cycle.</p>	<p>Actions in progress</p> <p>We are continuing to co-fund projects with local councils across NSW, to provide connected cycleway networks.</p>

9.8 Walking

Walking is an important transport mode in our efforts to promote liveability around urban and regional precincts and will be better integrated into the public transport network. The measures we are pursuing with regard to walking include:

Measures in the Master Plan	Timetable for Action
<p>Prioritised pedestrian access and amenity around public transport interchanges.</p>	<p>Actions in progress</p> <p>We are working to improve pedestrian access and amenity around public transport interchanges. This will include improved safety and lighting and prioritisation of pedestrian desire lines.</p> <p>It will also include better wayfinding through standardised signage and pedestrian infrastructure at public transport interchanges, and the development of enhanced online walking customer information and promotion tools.</p>
<p>A CBD Pedestrian Improvement Program, including improved pedestrian links along George Street and pedestrian infrastructure to support Barangaroo, including the Wynyard Walk.</p>	<p>Actions in progress</p> <p>A number of actions are currently underway to improve pedestrian access in the Sydney CBD. We have commenced planning for a Pedestrian Hazard Removal Program in the city centre. Through the ongoing city access planning we are identifying areas for improved pedestrian connections. We have allocated funding for the completion of the Wynyard Walk in 2015.</p> <p>Medium to long term priorities</p> <p>Subject to light rail proceeding, we will develop a pedestrian boulevard along George Street and create new sub-surface pedestrian links around busy CBD interchanges.</p>
<p>Identification of opportunities to improve pedestrian priority at signalled intersections on major urban centre desire lines.</p>	<p>Actions in progress</p> <p>We are exploring the use of new traffic signal technology and operating protocols to improve pedestrian priority at signalled intersections on major urban centre desire lines. We are also evaluating a pilot scheme for the use of pedestrian countdown timers to improve the safety and convenience of crossings.</p>

Measures in the Master Plan	Timetable for Action
<p>Improved pedestrian connections in major urban centres including Liverpool, Parramatta and Penrith, offering safe and convenient travel within and around centres.</p>	<p>Actions in progress We are in the process of identifying and mapping key catchments around major urban centres. This information will be used to improve pedestrian access in these catchments. We are currently exploring Australian Government funding opportunities for walking infrastructure, and walkability design guidelines for new developments.</p>
<p>Expansion of the Walking Investment Program, including the construction of pedestrian bridges to connect walking paths safely across busy roads, with a focus on pedestrian access to centres with arterial through-traffic.</p>	<p>Actions in progress We are developing a NSW walking strategy to improve pedestrian access. The strategy will include investments in better walking information, and a review of support for local government investment in walking networks.</p>

9.9 Non-government transport services

The Long Term Transport Master Plan recognises that the non-government transport sector is a crucial part of the NSW transport system. Generally, government does not provide direct services in this sector. However, the NSW Government does exert influence over the sector through funding agreements, licensing or regulation regimes to ensure safety for users and determine how access to public infrastructure should be organised and priced. The NSW Government also steps in to fill gaps or provide minimum levels of service where there is clear evidence of market failure.

There are opportunities to improve outcomes for customers across the non-government transport sector, particularly when offering customers greater choice and flexibility in services.

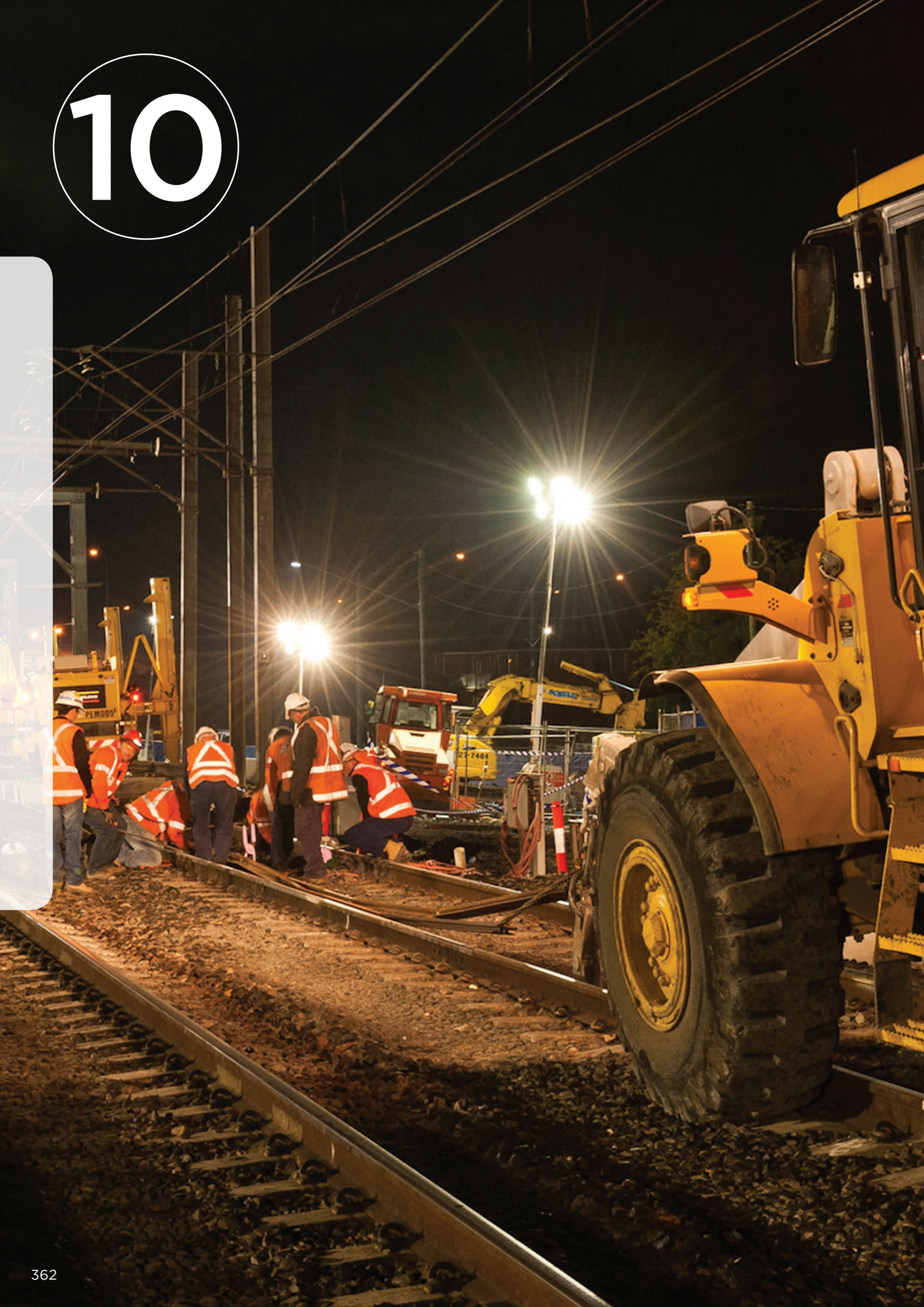
A number of initiatives can improve the delivery of non-government transport services. The NSW Government will work with transport service providers, local councils, industry associations and community and business groups to deliver these initiatives.

Measures in the Master Plan	Timetable for Action
Taxis	
Review taxi network regulation.	<p>Actions in progress</p> <p>In September we released a Passenger Transport Legislation Review Discussion Paper for public comment and a stakeholder forum was held on 16 October 2012. We are continuing to consult with customer and industry groups on the issue. Implementation of our findings is expected in 2013.</p> <p>Medium to long term priorities</p> <p>We will improve integration between taxis and the public transport network.</p>
Consider improvements to booking services to take advantage of new technologies.	<p>Actions in progress</p> <p>The Passenger Transport Legislation Review will explore opportunities to enhance taxi services through new booking services and technologies, such as apps and private car services.</p>

Measures in the Master Plan	Timetable for Action
<p>Improve services for customers of Wheelchair Accessible Taxis by examining the supply and demand side incentives which support their provision and service quality.</p>	<p>Actions in progress</p> <p>We have introduced initiatives to reduce the cost of owning/operating Wheelchair Accessible Taxis (WAT) and help the industry to meet Transport Standards' requirements for parity between standard and WAT service response times. These include WAT licences being made available in urban areas for \$1,000 per annum and at no cost in regional NSW. The need for a new vehicle has been removed (but a 10 year age limit has been retained) and interest-free loans are available for the purchase of WATs by regional operators. We also assist WAT customers through subsidising the cost of taxi fares.</p> <p>We are conducting a customer survey in early 2013 to get customers views on how to improve services.</p>
<p>Incorporate requirements for taxis at public transport interchanges into transport planning and delivery to help integrate these services with public transport systems.</p>	<p>Actions in progress</p> <p>We are considering these requirements in the planning for each individual interchange as investment in the interchanges is rolled out through the Transport Access Program.</p> <p>Medium to long term priorities</p> <p>We will improve integration between taxis and the public transport network.</p>

Measures in the Master Plan	Timetable for Action
Community transport	
<p>A renewed approach to resourcing the community transport sector to ensure it can meet increasing demand for service.</p>	<p>Actions in progress We have allocated \$2 million to community transport in 2012-13 budget. Consultation with the community transport sector is underway, and we will implement the recommendations of the consultation in 2013.</p>
<p>Improve driver standards for community transport by strengthening requirements relating to driving history and police and medical checks for community transport operators contracted to Transport for NSW.</p>	<p>Actions in progress Following our consultation with the community transport sector, we will implement new standards for community transport sector in 2013.</p> <p>Medium to long term priorities We will ensure the safe and reliable provision of community transport services for the ageing population.</p>
<p>Re-license intrastate air transport routes for five years, pursuant to the <i>Air Transport Act 1964</i>.</p>	<p>Actions in progress We have re-licensed airlines for five years for all 14 regulated routes in NSW.</p>
NSW waterways	
<p>A wharf access regime that provides sustainable funding and transport access for a range of services and waterway users.</p>	<p>Actions in progress We are developing the Boat Storage and Safe Waterways Access Strategy that will include actions designed to increase the capacity of boat storage, waterways access and related facilities.</p>

10



FUNDING

CHAPTER SUMMARY

Our transport challenges

Maintaining and growing our transport system requires significant ongoing investment. When making transport investment decisions, we consider how we will afford to maintain our existing system at the level we require and extend the system into new areas and new services.

The Long Term Transport Master Plan has identified many challenges and the solutions needed to maintain and improve our transport system over the next 20 years. Delivering these solutions requires choices about how to allocate funding and which projects to prioritise.

We have identified four ways to increase available funding for new capacity and service improvements:

- Doing more with what we have, using our existing funds and assets more efficiently
- Finding smarter ways to deliver projects, including innovative procurement models
- Reforming pricing and revenue
- Capturing value from public investment.

We will also need to be innovative. Finding new ways to deliver infrastructure and transport services can promote good partnerships with the private sector, drive competition and give incentives to more efficient operators.

Taking action

The Long Term Transport Master Plan sets out initiatives for funding our transport solutions, allowing us to get on with modernising and improving transport infrastructure and services in NSW. These include:

- **Efficient public sector operating models** to promote growth through better performance and increased productivity, including a long term program to reform transport operations and improve the efficiency of service provision which will incorporate the franchising of Sydney ferry operations as well as the reform of RailCorp into Sydney Rail and NSW Rail
- **Smarter project procurement** to achieve greater value for money from our investment in transport assets
- Consideration of the benefits of **more efficient road user charges** for High Productivity Vehicles (HPV) and users of the Sydney motorway network, with pricing and revenue reforms that better reflect the costs of providing well maintained roads, the level of road use and the safety and environmental performance of vehicles
- **Capturing value from major investments** to help fund transport infrastructure and to encourage private investment and urban renewal around public facilities such as rail interchanges
- A new **Community Road Safety Fund**, with all revenue raised from camera-detected speeding and traffic light offences to directly fund road safety projects in NSW
- Identifying **future funding opportunities** by working with NSW Treasury to explore how additional revenue from transport can be used to fund specific projects and initiatives.

10.1 Introduction

The Long Term Transport Master Plan will guide the NSW Government's transport funding priorities over the next 20 years, providing the overall framework for our transport system – both the services that are delivered and the infrastructure that underpins them.

The Long Term Transport Master Plan sets out the range of transport solutions that are required to improve our transport systems over the next 20 years. It will guide the NSW Government's decisions on how we respond to current challenges and how we respond to emerging issues over the next 20 years.

What we invest now will drive the change we need to transform transport in NSW and shape our State. In 2012-13 the NSW Government allocated a record \$13.2 billion in funding, with a total of more than \$53 billion for the first four years of the Master Plan. Over the 20 year life of the Master Plan this level of funding equates to around \$260 billion on delivering transport services and infrastructure across the State.

Further to this, NSW Government funding will be enhanced through public private partnerships, additional Australian Government funding and further revenue from transport networks, for example, advertising in transport corridors.

This level of investment needs to be based on a strong plan. The Long Term Transport Master Plan can ensure we get the most out of future investments and that we use the funds to shape the transport systems we want for the future.

This Long Term Transport Master Plan examines the funding that is currently available and our options to grow that funding, armed with details of the opportunities we have to invest in our transport system.

10.2 Funding our transport system

Transport services and infrastructure are funded through a combination of user based charges and State and Australian Government allocations.

In 2011-12, \$13.1 billion was directed towards transport in NSW, across all agencies and modes, a 12 percent increase on 2010-11. In 2012-13, the funding allocation will be \$13.2 billion.

Transport investment represents around 40 percent of total State infrastructure investment.

The deployment of those funds is split between capital and operating activities, and across three main categories:

- **Maintain** – first and foremost, funding is directed towards maintaining and sustaining the assets we have now over their design life.
- **Operate** – funding is also directed towards the customer-centred provision of efficient and effective transport services.
- **Grow** – once assets are maintained and services provided, available funding is directed towards expansion and improvement projects to ensure services can be increased to meet growing demand.

10.2.1 The sources of transport funding

Of the \$13.1 billion funds allocated to transport in 2011-12, two thirds were sourced from State and Australian Government contributions, while the remainder was from other sources (see Figure 10.1):

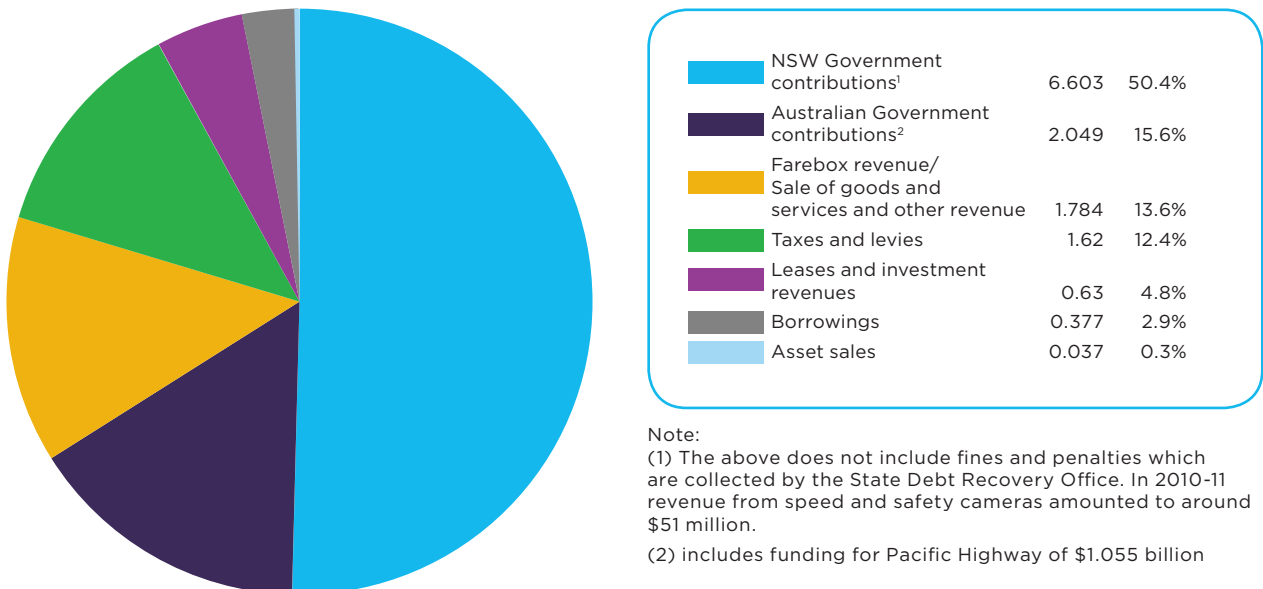
- Farebox revenue from public transport customers
- Transport-related fees and charges, such as motor vehicle registration, driver licensing and mooring fees
- Direct charges and land rental paid by the users of port, rail and related infrastructure and services – for example, shipping and stevedoring companies
- An annual allocation to Transport for NSW in the State Budget, which is then distributed to transport service providers and agencies within the transport cluster
- Australian Government capital contributions to specific projects or programs, with funds paid under Australian Government funding programs
- Council funding, particularly for local road maintenance and improvements.

Transport is funded both on a user pays basis through public transport fares and road user charges, and through general taxation, with the costs borne by the whole community.

Public transport farebox revenue contributes approximately a quarter of the costs of public transport. In the case of rail, this proportion drops to a fifth. Some but not all of the contribution by taxpayers to the costs of public transport represents the benefits to the broader community from the provision of public transport services, such as reduced congestion. NSW road user charges contribute less than 70 percent of the NSW Government’s expenditure on roads and related services. Proposed national charging and investment reforms, if agreed, will lead to more direct charging of heavy vehicles for the roads that they use, resulting in new funding arrangements whereby collected funds will be re-invested in transport. This would result in NSW receiving heavy vehicle revenues based on heavy vehicle use of the NSW road network. This is discussed in Section 10.4.3.

Access to the road network requires drivers to hold a licence and a registered vehicle. The NSW Government regulates these fees to car users with certainty in terms

Figure 10.1 Sources of transport funding in \$billions, 2011-12



of charges, while also collecting an important revenue stream that assists to maintain the road network.

Again, the NSW Government must balance the extent to which the cost of providing the road system and traffic management services should be borne by customers using the network, as opposed to being born by the broader community through general State revenue.

Other pricing arrangements apply for associated parts of the transport system, including tolls on motorways and the parking space levy, a charge on car parking in urban centres. Tolls paid by users of Sydney's motorways are paid to the private concessionaires managing the motorway.

10.2.2 Transport funding in the future – 'steady state'

As noted, \$13.1 billion has been directed towards transport in NSW in 2011-12, with an allocation of \$13.2 billion in 2012-13. Figure 10.2 sets out the NSW Government's recurrent and capital funding allocations to transport over the next four years. It identifies the split of funding sources between the State and Australian Governments.

THE FUNDING GAP

While many people would like to see an expansion of our transport system we face some major challenges in funding these options.

Public transport

Around a quarter of the costs of our public transport services are paid by customer revenues. The other three-quarters comes from the broader community through taxes.

While the Australian Government offers some funding for specific projects (such as the Pacific Highway), it does not directly fund public transport in NSW.

The NSW Government is seeking to reduce the costs of public transport services through various reforms, such as franchising ferries and reforming train operations.

Roads and traffic

Transport for NSW spent around \$4.7 billion to maintain, upgrade and operate the NSW and local roads and traffic network in 2010-11. Road users pay a majority (less than 70 percent) of these costs through a combination of road user charges, motor vehicle taxation (MVT) and tolls on State-owned motorways. Local government

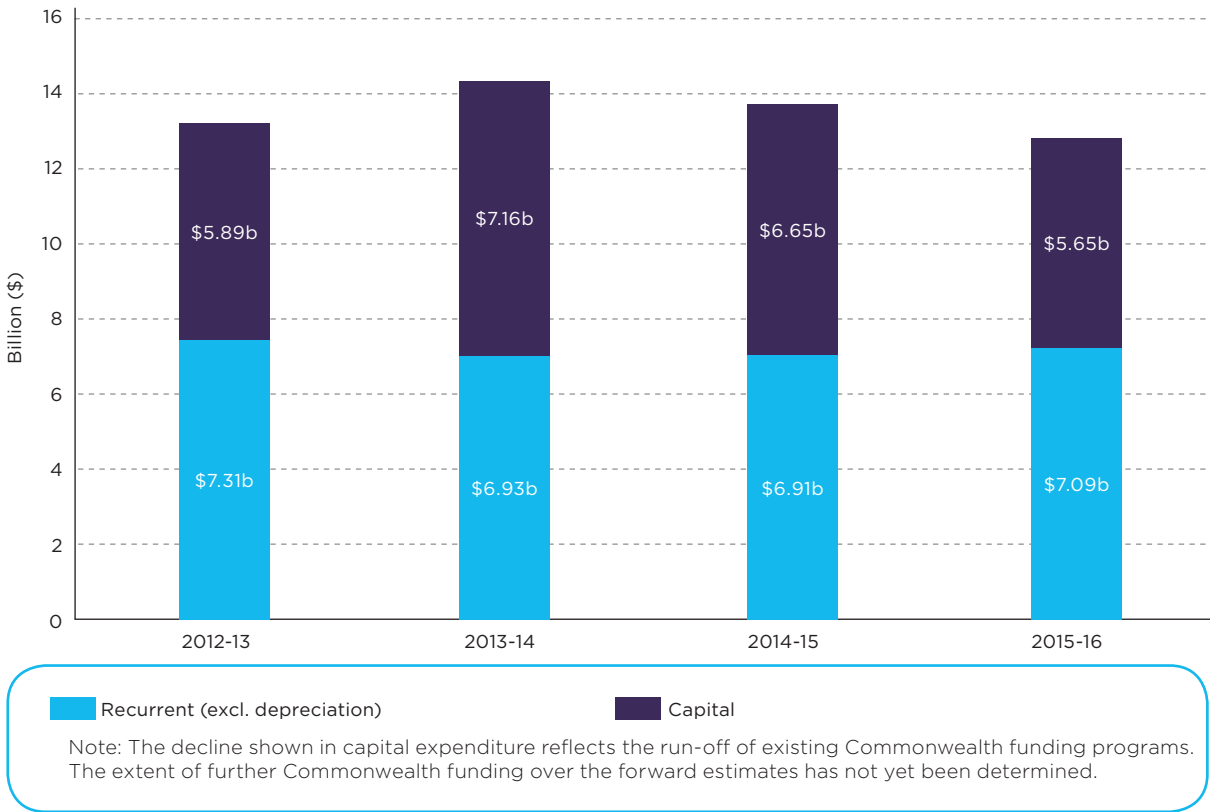
expenditure on the local and regional road network is also significant and is the largest spend area for many councils.

While the Australian Government receives more than \$17 billion per annum from total excise, NSW has received only around \$1.7 billion in 2011-12 through transport grants even though NSW has over 30 percent of the Australian population and contributes around 30 percent of Australia's GDP. NSW also carries by far the largest proportion of interstate truck traffic and, as a result, bears the higher crash and road maintenance costs.

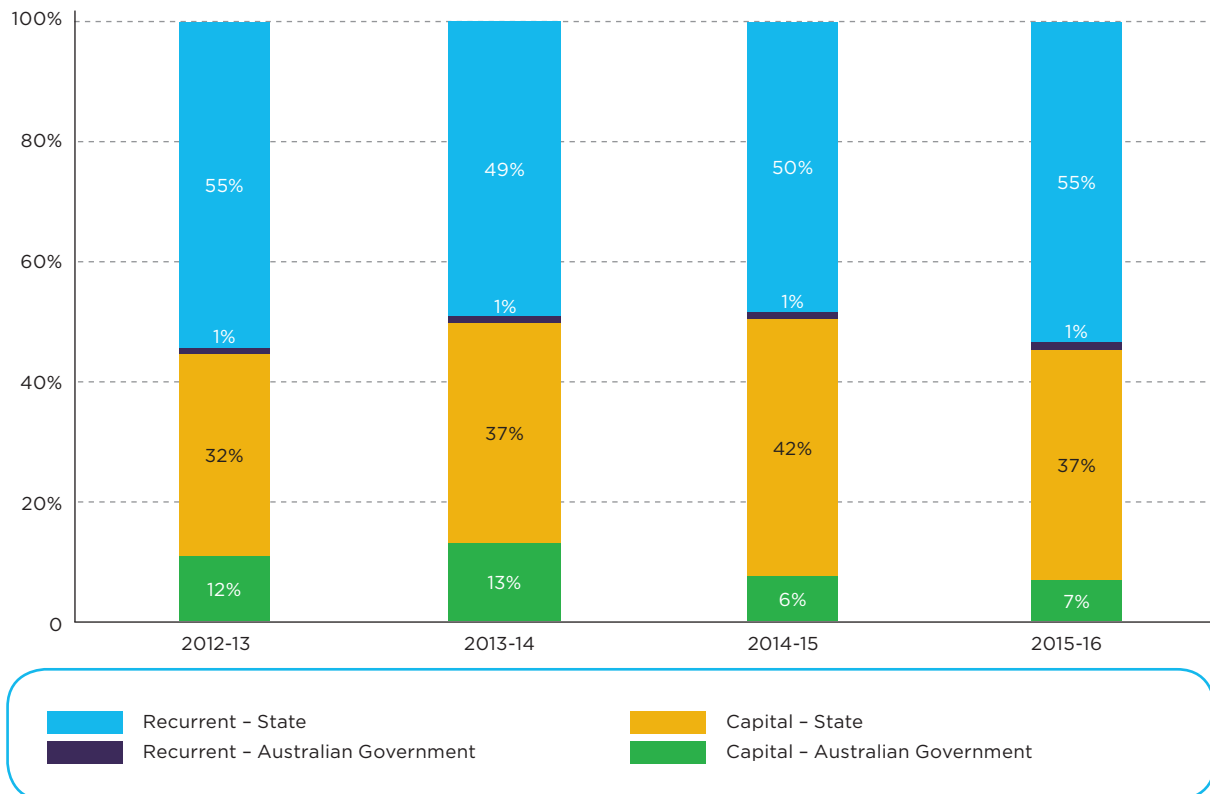
While substantial, our current level of road funding is not sufficient to upgrade and maintain the road network over the long term. The NSW Government will explore innovative approaches to managing and undertaking maintenance for both roads and rail. This will include working effectively with the private sector to encourage innovation and best practice. We will also continue to work with the Commonwealth Government on this important issue, particularly as the freight task grows over the longer term.

Figure 10.2 Recurrent and capital funding to transport, 2012-13 to 2015-16

NSW transport expenditure by type



Capital and recurrent transport expenditure



10.3 Funding our Master Plan projects

The large amount of funding needed to undertake large-scale projects or substantive service improvements highlights the difficult choices we must make as a community to significantly improve our transport system as well as the need to explore new and innovative ways of generating additional funds for investment.

Some \$6 billion to \$7 billion of funding each year is directed towards transport capital expenditure. Much of these capital funds go to major periodic maintenance of, and necessary upgrades to, existing assets. Growth of the system to meet future demand is only a limited component of this capital budget.

To achieve our transport goals, we will need to explore new funding options, change the way we operate and rethink how we price transport.

10.4 Considering our options

In delivering the Long Term Transport Master Plan, we will explore new options across four critical areas:

- **Doing more with what we have** – increasing the efficiency and effective use of our existing transport infrastructure and making sure we extract maximum value from these assets and currently allocated funds
- **Finding smarter ways to deliver projects** – making sure we get maximum value for money from our investments in new transport assets
- **Reforming pricing and revenue** – improving and changing the way we price transport to raise new revenue and encourage better use of our existing infrastructure
- **Capturing value from our public investments** – introducing measures to capture a share of the additional value that accrues to land and properties from transport infrastructure.

MAINTENANCE IS A PRIORITY

Transport for NSW is one of the largest asset holders in Australia, holding infrastructure assets with a written down value of about \$93 billion including land under assets.

Metropolitan rail network – including 307 Sydney Trains stations, 69 NSW Trains stations, 1,604 kilometres of track main line, 1,141 bridges, 93 tunnels, 641 embankments, 974 cuttings

Country rail network – including 2,387 kilometres of track, 3,100 rail underbridges, 4,900 culverts and 3,139 kilometres of non-operational rail corridor

Road network – 18,082 kilometres of state roads including 4,323 kilometres of national highway, 23 tunnels, around 70,000 culverts and 2,500 kilometres of road safety barriers

Interchanges – around 580 interchanges have been identified by TfNSW

Ticketing – including 272 automatic ticket booking office machines, 404 ticket vending machines and over 600 ticket gates

Rolling stock fleet/depots – including 1,671 electric fleet cars, 144 diesel fleet cars, 477 work train wagons, 465 mobile plant/track machines and 120 infrastructure maintenance depots

Public bus fleet/infrastructure/depots – 2,252 buses and 13 depots

Private bus fleet/infrastructure/depots – 2,664 buses and 49 depots

Ferry fleet/maintenance depots – including 28 vessels, two Newcastle ferries, one shipyard and 43 wharves

Light rail infrastructure – including nine underbridges, seven Variotrams, seven kilometres of track and two viaducts.

10.4.1 Doing more with what we have

By extracting more value from our transport infrastructure and reducing the costs of providing transport services, we aim to free up funds for reinvesting in new services and projects. Key initiatives are:

- Fixing the trains – reforming rail service delivery
- Franchising of ferry services
- Transport for NSW – one integrated transport agency
- Efficiency improvements across all NSW Government departments and agencies.

Action Introduce whole-of-Government efficiency improvements

The NSW Government will seek efficiency improvements across the entire transport portfolio over the next 10 years. These improvements include re-tendering a number of major contracts and reviews to drive efficiencies in contracting, contract administration and business overheads.

Efficiency improvements such as these will improve service delivery while also freeing up funds from the NSW State Budget. These efficiencies will deliver better customer service, more reliable and frequent services, and more funds to re-invest in infrastructure improvements.

The creation of Transport for NSW in November 2011 means one central agency is now responsible for the coordination and integration of planning and policy for transport, instead of multiple agencies each preparing their own plans. Since Transport for NSW commenced operations, a far more efficient structure for the NSW transport agencies has been developed – one that brings together previously disparate groups to plan and integrate transport across all modes and sectors. This approach allows customers to be placed at the centre of all transport decision-making and service delivery. The move to an integrated structure also saves costs and increases efficiency. In particular, operating in a more centralised and coordinated way – including through common planning cycles – removes a great deal of duplication that existed within the transport cluster of agencies.

The NSW Government will complete the full-scale restructuring of Transport for NSW and ensure that the benefits of this central agency approach are realised, measured and re-invested in transport service improvements.

The franchising of Sydney ferry operations to the private sector signals a new era of service quality, modernisation and delivery for our ferries. In addition to service improvements, franchising will lead to greater efficiency and cost savings, giving us further flexibility to invest more in transport services without affecting the State Budget.

The NSW Government has already announced the private sector team to take over ferry operations, bringing international expertise and efficiency improvements to Sydney. Harbour City Ferries has operated Sydney Ferries under the NSW Government's franchise since 28 July 2012. The Government has also announced that surplus Government lands will be sold to help fund infrastructure improvements.

Action Reform delivery of rail services

Recent work to benchmark the cost of providing rail services in NSW has found that we have one of the most costly systems in Australia and internationally, as depicted in Figure 10.3.

Over the past four years, passenger numbers have increased by over seven percent while operating costs have increased by over 40 percent. This highlights the need for greater efficiency in rail service delivery.

The NSW Government has commenced a long term program to reform the rail system and improve customer experience. Train services will be separated into NSW Trains for regional services and Sydney Trains to serve city commuters.

These new entities will be structured to lift customer service levels in their respective markets. This means rationalising back office functions and introducing new work practices to ensure we are directing as many funds as possible to front line services for customers.

10.4.2 Finding smarter ways to deliver projects

Infrastructure will be procured differently depending on the scale of the project, the funding arrangements and the allocation of delivery risk between the State and private sector organisations:

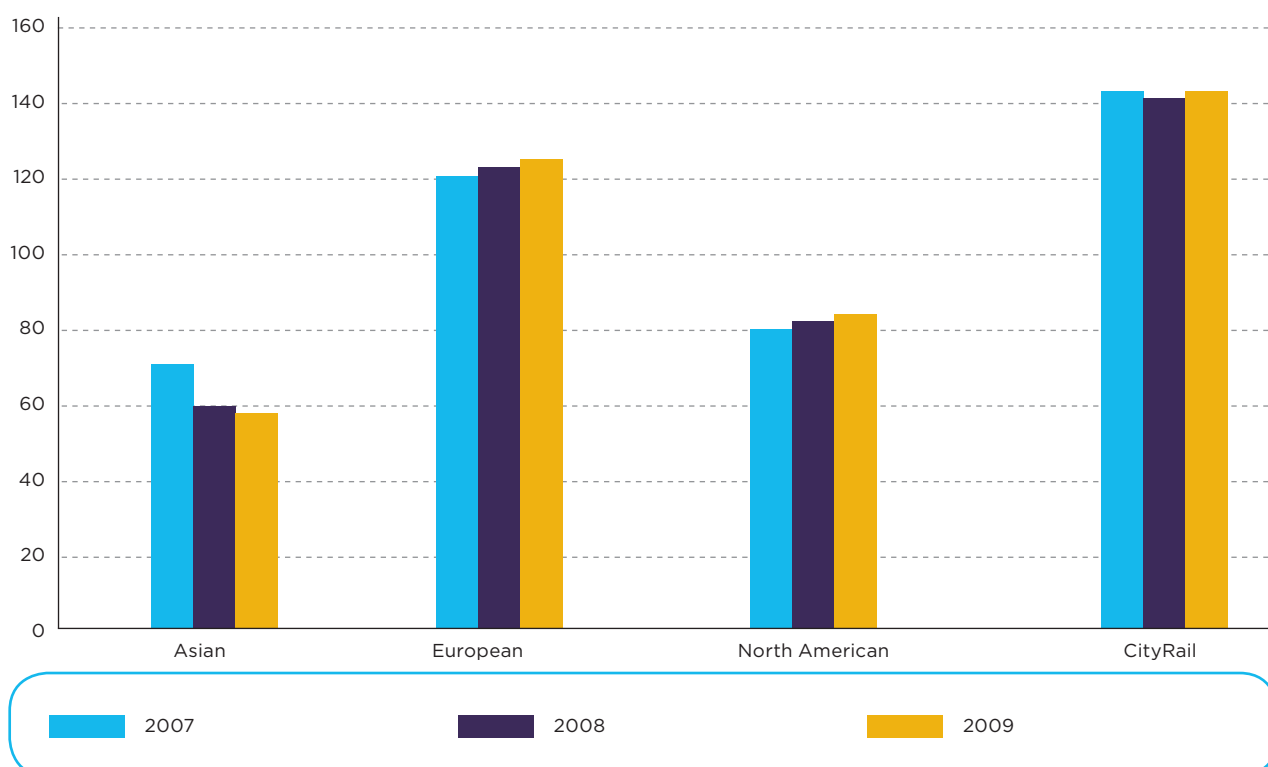
- Transport for NSW will:
 - Deliver rail projects
 - Deliver transport interchange projects
 - Procure train rolling stock, buses and ferries.
- Roads and Maritime Services (RMS) will:
 - Manage and deliver roads projects
 - Manage and procure traffic control systems
 - Manage maritime infrastructure projects.

Once assets are delivered, they are managed via a Total Asset Management Plan that oversees all assets that make up the transport system in NSW. The Plan is updated annually to set out the service standards, funding and priorities required to ensure that the transport system's assets support the delivery of transport services for the people of NSW.

The range of projects and areas of specialisation needed to deliver transport initiatives means we need to consider how major project procurement occurs and how expert advice can be integrated into project planning and procurement. The North West Rail Link is an example of a large project that has involved significant industry engagement that considers all ideas as part of the procurement process.

Infrastructure delivery principles consistent with industry best practice will put customers' needs at the forefront of transport infrastructure decision making and delivery, so that the community and business can expect value for money from the expenditure of taxpayer funds. Through greater oversight and application of these principles, we will achieve better value for money in capital project procurement by:

Figure 10.3 International benchmarking - total operating cost/passenger kilometres



- Ensuring **transport system integration** principles are rigorously applied in all infrastructure delivery, through full analysis of all options
- Applying **robust risk allocation principles** where there is private sector involvement in delivery
- Adopting **rigorous procurement analysis**, including expert advice, to ensure the most appropriate procurement methodology is applied to each particular project
- Ensuring **best practice standards of cost estimation** are applied.

In delivering initiatives under the Long Term Transport Master Plan, we will focus on:

- Improving the **customer experience** and **system integration**
- **Making procurement decisions** based on an analysis of benefits and costs for capital projects and programs
- Developing a clear, **committed pipeline of transport projects** that can be rolled out in a strategic and coordinated way
- Creating **aligned programs or streams of work** that have a standard approach to procurement and contracting, enabling more efficient and effective program management during delivery
- Providing the right **market conditions** to attract maximum private sector engagement and create an infrastructure market, including structuring projects appropriately to attract investors, developing principles that make it clear to industry which future projects are potential public private partnerships (PPPs), simplifying tender processes and opening discussions and engaging with the market before commencing any procurement processes.

The creation of Transport for NSW enables a more centralised and consistent application of best practice project management, business case development and procurement processes across the transport cluster. For example, the NSW Government is now examining the potential for greater contestability in the provision of road maintenance.

TESTING MARKET INTEREST - NORTH WEST RAIL LINK CASE STUDY

Transport for NSW has conducted two phases of industry consultation for the North West Rail Link, with market sounding conducted in the second half of 2011 and a more detailed industry engagement process conducted in the first half of 2012. Consultation has included both interactive sessions and written submissions.

Both stages of consultation saw strong interest in the project from a variety of market segments. Over 30 organisations participated in the engagement process, including major civil contractors, tunnellers, financiers, infrastructure maintenance companies, rail systems providers and rail operators. The engagement process included participants from Australia, Canada, China, France, Germany, Hong Kong, Italy, Japan, Spain and the United Kingdom.

The process demonstrated that there are a range of domestic and global players, across a variety of disciplines, who have the interest, capability and capacity to deliver transport projects and services.

Action Work with the Infrastructure Financing Unit to identify innovative finance opportunities

In the 2012-13 State Budget, the NSW Government announced the creation of the Infrastructure Financing Unit within NSW Treasury to provide oversight of alternative procurements – particularly PPPs. The Infrastructure Financing Unit examines opportunities to leverage private sector financing in a way that ensures value for money for the State. It also explores variations to the standard PPP model to achieve the optimum mix of public and private finance and risk allocation.

CREATING AN INFRASTRUCTURE MARKET - PRIVATE INVESTMENT IN TRANSPORT INFRASTRUCTURE

The debate around how to fund the transport infrastructure we need can become confused when discussion turns to the use of private finance.

Ultimately, all public infrastructure is paid for by the community through general taxation or through direct charges on users and beneficiaries of infrastructure such as public transport fares and motorway tolls. The role that private investment plays is financing infrastructure, not funding it. Funding is how infrastructure is paid for. Finance describes the money that must be raised to deliver infrastructure and then must be repaid to lenders and investors.

Nevertheless, there is still a very important role for private finance in the provision of transport infrastructure. Public private partnerships (PPPs) have now been used successfully in every State in Australia as a means of procuring infrastructure across many sectors, not just transport.

The use of PPPs as a procurement method has delivered good value-for-money outcomes to governments when the offering to the market has encouraged design innovation, whole-of-life asset management, efficient risk allocation and efficient capital structuring.

We will continue to actively explore opportunities to apply PPPs and private financing to transport infrastructure procurement where there are clear value-for-money benefits for taxpayers, and the newly established Infrastructure Financing Unit in NSW Treasury will develop new models to drive innovation and greater private sector participation.

We will work with industry to encourage the development of a mature and substantial infrastructure market in NSW and Australia.

10.4.3 Pricing and revenue reform

There are several options for pricing and funding reform of direct user charges. Such reform will create opportunities to bring forward many of the initiatives identified in the Long Term Transport Master Plan while increasing the efficiency of our existing assets and services.

While some of these options could be introduced in the short to medium term, others are likely to only become effective and achievable over the longer term.

The pricing reform options have been identified as ideas that warrant serious consultation with the community. They are described in this Long Term

Transport Master Plan to stimulate further debate and to gauge community support for this new approach to funding transport.

The funding options being considered by the NSW Government to deliver the Long Term Transport Master Plan include:

- Consistent distance based charging for the Sydney motorway network
- Paying a fair share for heavy vehicle road use
- Paying for the true cost of parking
- Restructuring motor vehicle registration.

Action Implement distance based charging on new or upgraded motorways

Direct charging or road pricing is a way of raising revenue for new infrastructure and/or lessening congestion.

We will investigate a consistent distance-based tolling regime for the Sydney motorway network. Implementation will require discussions with the private sector tollway operators currently managing significant parts of the network.

The potential timeframes for delivering direct charging are:

- WestConnex will deliver the next phase of distance based tolling in the Sydney motorway network.
- In the medium term, distance charging for all heavy vehicles on all routes
- In the longer term, directly aligning the charge (based on mass, distance or location) applied to all vehicles with their frequency of use of the road network.

The NSW Government has already introduced direct charging on many parts of the Sydney motorway system and has previously had tolls on the F3 (M1) to Newcastle and the F6 (M1) to Wollongong. The community has over 20 years' experience in road pricing on these select high-volume links and has shown an acceptance of tolls when they provide the immediate benefit of reduced travel times.

The objective of road pricing proposals is to ensure that those drivers who travel less – and therefore use and damage the roads less – pay less, and that those who use the roads more pay more. In the same way as any other product is purchased by a customer, this is a more consistent way of charging customers for using road and traffic services. Just as importantly, this approach is considered to significantly increase the efficiency with which we use our road network.

OUR PRINCIPLES FOR ROAD CHARGING REFORM

In developing the most appropriate road tolling options on Sydney's motorway network and other possible changes to road use charges in licensing and parking will be based on the following policy goals:

Consistency on NSW roads – Motorists should expect to pay the same amount for the same type of road use.

Responding to Sydney's growth – Directly allocate toll revenues to fund public transport and complete missing motorway links.

Grow NSW freight productivity – Introduce higher productivity on key NSW freight routes for a direct fee.

Under our current system, there are many costs associated with road use that are not completely borne by the individual road user. These costs include the provision of road maintenance, the cost of pollution from our vehicles, the cost of accidents and the additional time cost to all road users arising from increases in congestion.

As highlighted previously, parts of the Sydney motorway network are subject to direct pricing through tolls. The fact that some parts of the motorway network are tolled and some parts are not means that where people live or travel largely dictates whether they have to pay to use the network. In addition, different tolls across the network are not priced to influence or optimise the use of the network, meaning it is not used as efficiently as it could be.

For example, the development and introduction of a standardised cents-per-kilometre charge across the entire Sydney motorway network has the potential to deliver significant benefits, notably:

- **Consistency for motorway users** – Regardless of the part of the network people use regularly or where they live, motorists' charges to use the motorways will be directly linked to their level of use of the motorways.
- **New funds for roads** – New funds could be generated and directed towards completing the motorway network, maintaining existing roads and increasing our investment in public transport alternatives.

Developing new road tolling options is a significant undertaking and will require discussions with the community and major contract renegotiations with current motorway owners and future developers. We must consider the benefits of the available options and the extent to which these would outweigh any negative impacts.

Action Reform pricing for heavy vehicle road use

The NSW road network supports a significant proportion of total truck traffic across Australia, generating high costs for our State in the maintenance of our roads.

Because of the crucial role the road network plays in the national land freight network, the condition and upkeep of NSW's vital road freight links are a national productivity issue, not just a NSW issue. To increase productivity, access to our road network is being sought by heavier trucks – but while these bigger, heavier vehicles with improved technologies improve national productivity and road safety, NSW motorists and taxpayers bear much of the cost of additional maintenance.

Building on recent moves by the Council of Australian Governments (COAG) to introduce heavy vehicle charging and investment reform, NSW will seek more direct charging of heavy vehicles for the roads that they use, with these revenues being re-invested in transport. This would result in NSW receiving heavy vehicle revenues based on heavy vehicle use on the NSW road network.

The pilot of HPV access on the Hume Highway discussed in Chapter Seven is a precursor to these new arrangements.

The NSW Government will continue to make the strong case for national charging and investment reforms to ensure NSW receives heavy vehicle revenues based on heavy vehicle use of the NSW road network.

Action Make parking charges more consistent and efficient

As the demands on our road network increase, the issue of how we use our limited road space becomes increasingly complex. This competition for road space is also relevant to parking. Balancing the competing needs of freight operators, buses, private motor vehicles, motorcycles, bicycles and pedestrians for valuable shop-front or kerbside parking spaces is consistently raised as a transport planning issue.

There is considerable retail activity on some of our most important roads – as well as in the central activity areas of our major centres – where road space is at a premium. Without the ability for customers to park, many traders fear that their businesses will suffer.

We have become accustomed to paying for a car parking space via a ticket or parking meter in recognition of the valuable space we occupy. The amount and application of these charges needs to be re-examined in light of the transport challenges we need to meet over the next 20 years. There are two important factors to consider:

- If we want to prioritise road space to get the most efficient use of our transport network, affording more priority to buses and other users in busy periods will become increasingly important.
- To move larger numbers of people during peak periods to busy activity centres such as the Sydney CBD, we will need to encourage more people to use high volume public transport options rather than private motor vehicles.

The NSW Government already has parking space levies in place in major centres in Sydney, with the revenue raised invested directly in public transport infrastructure. However, there is considerable scope to improve how parking is charged in NSW's major activity centres.

Future changes need to be made in consultation with the broader community and local councils, taking into account actions and strategies around retail trade, the need to protect deliveries and the shape and form of our urban centres and spaces.

Action Reform motor vehicle registration

In line with our policy approach to more closely link vehicle use and registration to the associated environmental and road wear impacts, we have an opportunity to review and change the way we pay for the registration of light vehicles in NSW. In particular, we should consider changes to improve safety and environmental outcomes.

Restructuring registration charges for light vehicles from a mass-based (weight only) regime to one that takes account of mass, safety, road use and environmental criteria would promote such outcomes by encouraging the early adoption of safer and greener vehicles.

At the same time, we can improve customer service and convenience for vehicle owners. For example, the introduction of continuous direct debit monthly payment arrangements for vehicle owners can help people to manage their budgets and make paying registration less onerous.

We will reform motor vehicle registration policy to promote the growth of safer and more environmentally friendly light vehicles on NSW roads. In addition, we will implement reforms to improve customer convenience in paying motor vehicle registration.

To promote road safety, the NSW Government introduced a 50 percent reduction on licence fees from 1 July 2012 for safe drivers.

Action Identify future funding opportunities

Transport for NSW will work with NSW Treasury to explore how additional revenue from transport can be hypothecated for the purposes of funding specific projects or initiatives.

Transport for NSW will investigate the potential for industry contributions for infrastructure development to support future mining development and meet funding shortfalls where the developments are State significant.

10.4.4 Capturing value from publicly funded investments

Action Capture land value uplift from major transport investments

The development of new transport infrastructure positively influences the appeal of new neighbourhoods and communities as a result of improved transport access – regardless of whether property development takes place before or after the creation of the transport links.

Many countries, such as Hong Kong, Singapore, Japan and the United States, have introduced measures to capture a share of the additional value to nearby properties, including developer contributions and targeted levies. We have reviewed such options and identified those with the greatest potential for application in NSW.

Some examples of these measures are:

- Tax increment financing (TIF) in Chicago where there are presently 130 TIF districts which account for approximately 29 percent of the city's area and approximately 19 percent of the property tax base
- Developer contributions in the UK where a charge is dependent upon the scale of development
- North Sydney station upgrade where the collectable amount is linked to the amount of increased floor space approved by the North Sydney City Council and the Western Sydney Growth Area contribution
- Transit joint development (TJD) in Washington where joint development projects include revenue producing schemes (air rights leasing and station-retail connections) and cost-sharing arrangements. TJD is also operational in Toronto subway and Mass Transit Railway (MTR) in Hong Kong, generating a significant revenue stream for MTR
- Transport levies are imposed in Sunshine Coast and in France to raise capital for investment in local public transport infrastructure.

Action Leverage commercial opportunities associated with existing infrastructure

Building new train stations, ferry terminals and interchanges – or refurbishing these sites – can create opportunities for commercial developments that offset some of the capital cost of a transport project.

In making these sites attractive places and precincts, and integrating them with local areas, they may also become attractive to investors for developments such as retail and other services. The sale of these commercial rights, or the lease income over time, can help to reduce the cost of the transport asset.

Southern Cross Station in Melbourne is one such example, where a PPP project and the sale of the adjacent retail and office development sites partially offset the Victorian Government's total project costs.

We will explore and consult further on the potential options available to the NSW Government in developing measures to capture additional value arising from transport investments.

10.4.5 Community Road Safety Fund

Action Create a NSW Community Road Safety Fund

As discussed in Chapter Eight, the NSW Government is committed to stepping up actions on road safety. In meeting this commitment, we will implement more coherent road safety arrangements – particularly for speed management on the NSW road network, with speeding the largest cause of fatalities and injuries and a major source of costs to the community.

As part of these arrangements, we have established a NSW Community Road Safety Fund so that all speed camera-related fines are invested in road safety initiatives. This action aims to improve safety while also eliminating the ongoing perception that such cameras are simply revenue raising devices.



11



DELIVERING THE NSW LONG TERM TRANSPORT MASTER PLAN

CHAPTER SUMMARY

Taking action

In line with leading international examples of modern transport planning, we will adopt a range of actions to ensure that the Long Term Transport Master Plan is delivered and renewed efficiently and effectively. Highlights of these actions are:

- Provide an **annual update**, with a full review of the Master Plan every five years
- **More detailed regional, precinct, modal and interchange delivery plans**
- A commitment to ensure decisions are founded on a **solid evidence base**, including the formal incorporation of customer priorities into decision making processes
- Continued **collaboration with Regional Organisations of Councils and other stakeholders** to develop detailed area plans such as regional transport plans, city access plans and precinct plans, and with the Australian Government on transport issues of national significance
- A commitment to **extensive community engagement and customer consultation**.

11.1 An integrated transport authority for NSW

11.1.1 Transport for NSW

Transport for NSW was established in November 2011 as the lead agency for integrating the transport system and improving the quality of transport services in NSW.

Transport for NSW is an important component of the NSW Government's whole-of-government reform to restore economic growth, improve service delivery, renovate infrastructure, strengthen communities and restore accountability to government. The creation of this new agency marks a major shift in direction for the transport sector and is the first step in enhancing the quality of experiences for our customers.

Transport for NSW promotes integration between all transport modes and coordination across all stages of transport planning and decision making.

Figure 11.1 shows how Transport for NSW relates to the broader transport cluster and other transport agencies. As this relationship evolves and strengthens, the operating agencies will become increasingly engaged as part of a fully integrated transport system – one that offers a quality, seamless travel experience to our customers as well as underpinning the productivity and competitiveness of our economy.

11.1.2 Our progress so far

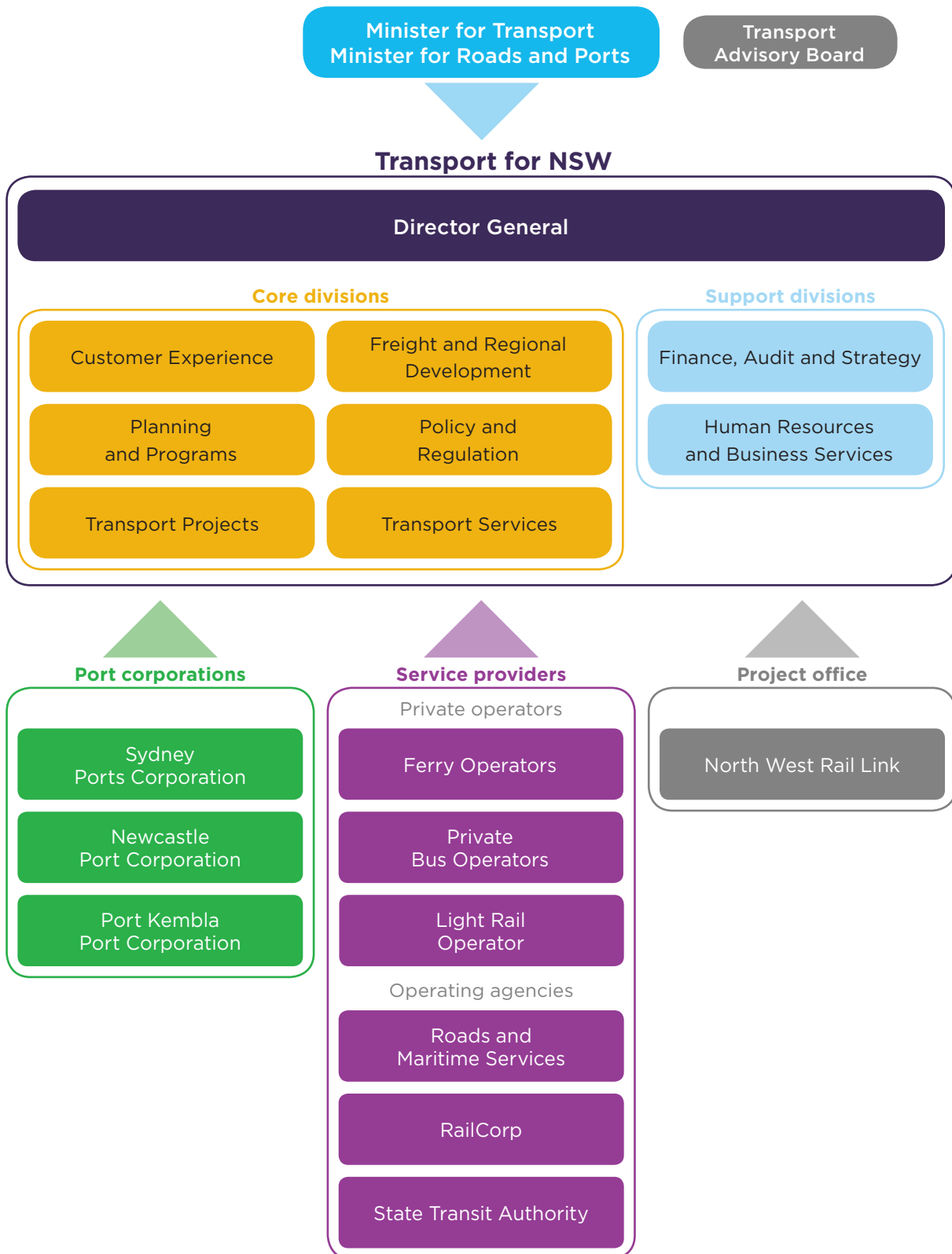
Transport for NSW has a clear mandate and the direction and leadership to plan and administer transport programs and initiatives in a coordinated and customer-focused way. This has enabled action to be taken quickly.

Transport for NSW has:

- Brought together the planning and decision making functions within Transport for NSW from operating agencies
- Designed new structures to enable previously separate areas to work together
- Consolidated the transport budget as part of Transport for NSW, allowing initiatives across modes to be considered and prioritised in one place.

The Long Term Transport Master Plan provides the opportunity to adopt governance arrangements for long term planning that will further reinforce the strengths of customer-focused and integrated transport planning, operation and delivery.

Figure 11.1 Transport for NSW, operating agencies and advisory structures



11.2 Next steps

Delivering the Long Term Transport Master Plan requires the right supporting strategies and plans, the right structures for decision making, and the resources and funding to get things done. Our investment prioritisation will be guided by strategic fit with the Long Term Transport Master Plan and criteria including customer and economic benefits.

11.2.1 Rolling out supporting plans

This Plan represents a major milestone in setting priorities, strategic directions, actions and policies for our transport system.

The Long Term Transport Master Plan allows the NSW Government, local councils, industry and the community to make decisions with confidence.

More detailed plans for regional areas, key centres and important precincts such as Sydney Airport and Port Botany – as well as detailed delivery plans for all transport modes – will follow from the Long Term Transport Master Plan. These plans will build on the strategic directions, initiatives and statewide context provided by the Long Term Transport Master Plan. The Master Plan alignment and update program is shown in Figure 11.2

11.2.2 A framework for decisions

Transport for NSW will deliver the Long Term Transport Master Plan through a best practice decision making and strategic planning framework that will ensure the right decisions are made at the right times and followed through appropriately.

Action Create a decision making framework that reflects Long Term Transport Master Plan priorities

Planning and investment decisions made by Transport for NSW will align with the objectives of the Long Term Transport Master Plan.

The Long Term Transport Master Plan sets the long term direction by painting a picture of future transport systems needed to support expected land use development. It also identifies other policy initiatives such as private sector involvement and pricing that may make an important contribution in meeting transport outcomes for the community.

Armed with the long term strategy it is then important to address the sequencing of projects and initiatives using metrics. For transport, this means looking at congestion and constraints on the networks and addressing the worst first.

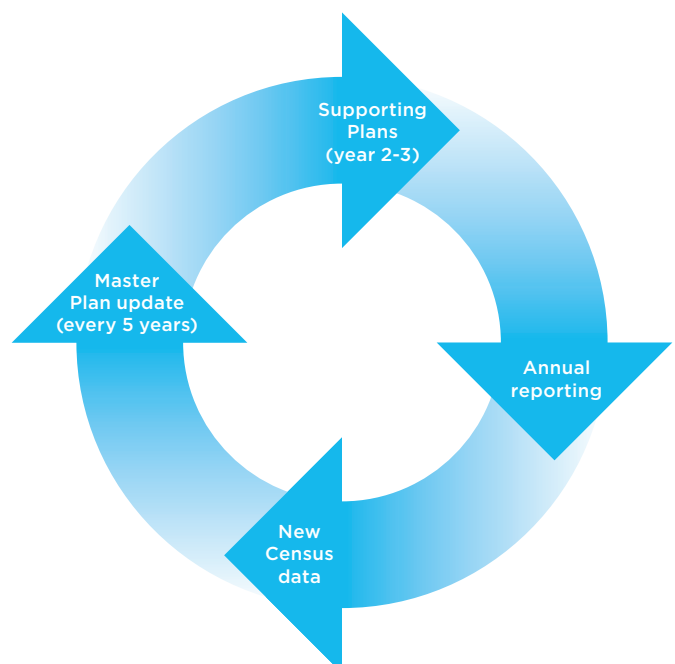
In addition, transport investment focuses on three key service programs:

- Asset maintenance
- Services and operations
- Growth and improvement.

Asset maintenance is the first priority for investment since to provide services networks must be serviceable and the community's investment must be protected.

Funds are then allocated to services such as trains and buses and to operating the network so the most can be achieved in transporting customers and goods.

Figure 11.2 Five year rolling alignment and update program



An appropriate level of investment then needs to be made in growth and improvement in response to growing demand.

The capital works program for growth and improvement is built on five foundations. These are:

- Completing works in progress as quickly and as cost effectively as possible
- Strategic small to medium size investment in existing systems and infrastructure to improve its performance
- Major works to be completed or commenced in the current five year cycle
- Planning for the next batch of projects
- Planning to preserve future corridors.

Detailed costing and scheduling for projects becomes available as projects development and planning is completed.

Therefore, a rolling five year program is used to manage capital works implementation:

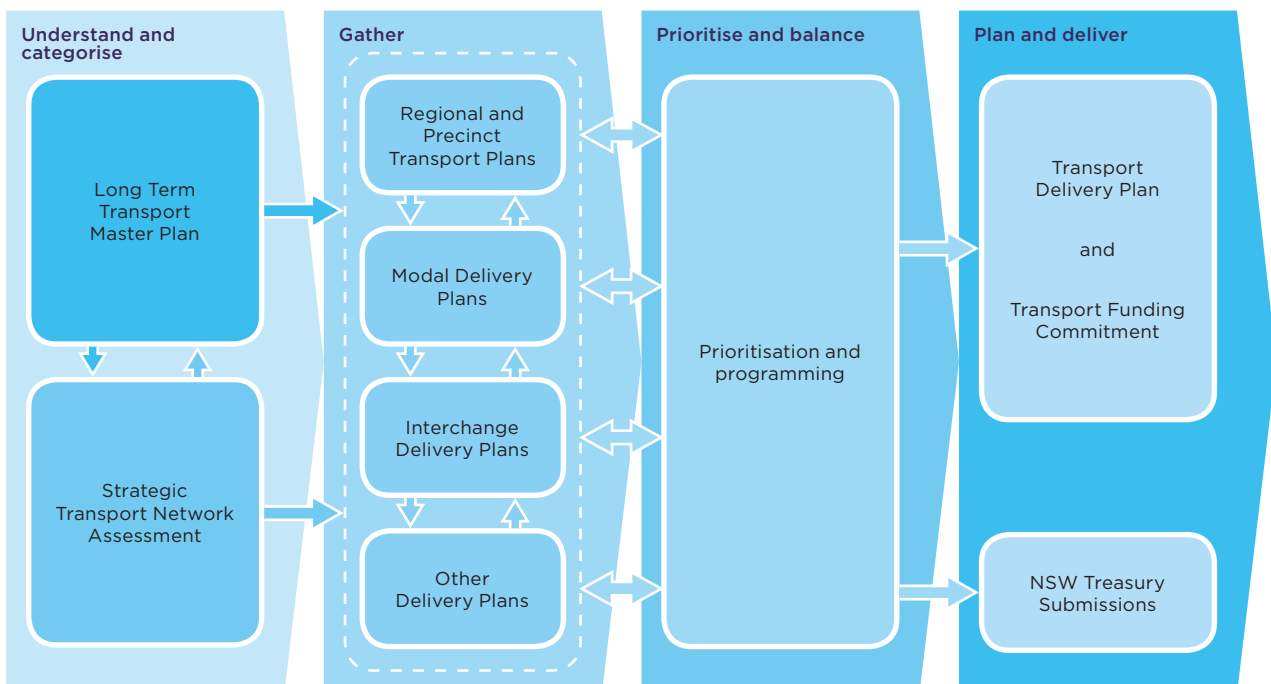
1. Set the strategic direction for the next 20 years through the Master Plan

2. Establish the program for the first five years to get started, focusing on maintaining, integrating and growing services
3. Identify those actions that need detailed work to plan, design, scope, cost and determine construction timeframes for medium to longer term projects
4. Reserve key corridors to meet future transport needs.

The Long Term Transport Master Plan, informed by strategic transport network assessments, will set the objectives and expected outcomes that will be used to determine investment decisions and to underpin subsequent detailed modal and regional plans.

Detailed Delivery Plans as outlined in Figure 11.3 will set out the specific initiatives required across different transport modes and in different places to achieve the Long Term Transport Master Plan objectives and outcomes. These plans will be based on detailed assessments of demand, travel behaviour, detailed customer analysis, existing capacity of the system and modelling to predict impacts of different scenarios to inform investment decisions.

Figure 11.3 Decision making and strategic planning framework



Initiatives will be assessed against:

- Customer benefits
- Capacity of the system to meet growing demand and changing expectations
- Reliability and resilience of the system
- Efficiency taking into account the initial investment cost and whole-of-life costs
- Achievability of the plan, taking into account risk and impacts.

Decisions will be prioritised based on how they meet the objectives of the Long Term Transport Master Plan, available resources and an assessment against the above criteria.

An appropriate mix of prioritised initiatives will be determined to ensure the right balance is achieved between operating and maintenance costs, capital maintenance works and new capital projects.

11.2.3 Making evidence-based decisions

Transport for NSW will base its decisions on solid evidence beginning with analysis of land use, objective assessment techniques and close monitoring of the effectiveness of initiatives.

Action Continually improve the data used for decision making

The data underpinning transport decisions will be improved by:

- Incorporating insight on customers' priorities and travel experiences in the transport system into decision making processes as more of this information becomes available
- Analysing the detailed travel information captured through the new electronic ticketing system
- Analysing the travel information captured through the enhanced contract reporting required of transport operators
- Utilising targeted regional surveys to better understand the nature of regional transport disadvantage, as well as region-specific transport issues, travel patterns and needs.

- Preparing and implementing a 10 year plan to enhance transport demand modelling capabilities that covers best practice, data needs, governance and software platforms
- Developing greater expertise in cost estimation, particularly of infrastructure projects and programs, to enable better informed economic assessments and prioritisation
- Continuing a strong program of community consultation regarding transport priorities and desired outcomes to better understand community views and customer expectations
- Rigorously monitoring indicators of performance.

Action Improve assessment techniques and expertise used to assess projects, programs and policy

Assessment techniques for projects, programs and policy initiatives will be improved by:

- Ensuring investment priorities are determined based on strategic fit with the objectives and priorities of the Long Term Transport Master Plan, including triple bottom line assessments of benefits and costs as well as sound data
- Working with NSW Treasury to improve the assessment to reflect the full benefits of investing in public transport cycling and walking infrastructure including to health and social capital
- Further developing existing skills and capabilities in economic assessment to better understand and assess the increasing complexity of multi-modal projects and programs, including undertaking further work around wider economic impacts
- Requiring benefit cost analysis as a minimum for all projects and programs costing more than \$100 million
- Commissioning peer reviews by local and international experts.

11.2.4 Working together

Continuing collaboration with other government agencies is essential to the successful implementation of the Long Term Transport Master Plan.

Action Continue to collaborate with our stakeholders

In the immediate and short term, we will:

- Collaborate with Regional Organisations of Councils and other stakeholders to develop detailed area plans such as regional transport plans, city access plans and precinct plans
- Explore opportunities for joint planning, delivery and funding of programs with partner agencies and councils, such as programs to improve local walking and cycling, update interchange and bus stop infrastructure and deliver transit-oriented development
- Continue to work with Australian and State Government agencies to fully integrate transport and land use planning.

11.2.5 Transparency

The Long Term Transport Master Plan will enhance transparency by setting strategic objectives based on unprecedented public consultation, a comprehensive analysis of the challenges facing NSW and an examination of the various options available to address these challenges. These objectives provide a clear and transparent basis for developing decision making criteria for investing in transport projects and prioritising particular initiatives.

Transport for NSW will further strengthen transparency by continuing its extensive community engagement and customer consultation throughout the five years of the planning cycle, improving the quality and regularity of public reporting and making more use of independent insight into planning activities.

Action Update the Long Term Transport Master Plan

We will provide an annual update with a full review of the Master Plan every five years.

Action Continue to undertake community consultation on future updates of the Long Term Transport Master Plan

Transport for NSW will continue its community engagement and customer consultation on future updates of the Long Term Transport Master Plan.

ALIGNMENT WITH NSW 2021

The Master Plan framework incorporates the *NSW 2021* goals and targets. Transport for NSW is the lead agency for the following *NSW 2021* goals:

- **Goal 7** – Reduce travel times (private and public transport)
- **Goal 8** – Grow patronage on public transport by making it a more attractive choice
- **Goal 9** – Improve customer experience with public transport services
- **Goal 10** – Improve road safety

Transport for NSW will also contribute to the *NSW 2021* goals of:

- **Goal 19** – Invest in critical infrastructure
- **Goal 20** – Build liveable cities

12



WHAT OUR CUSTOMERS SAY

CHAPTER SUMMARY

The NSW Government took a new approach to transport planning by drawing on the input of the entire State to create the Master Plan. Our extensive, 12 month engagement process involved unprecedented collaboration with our customers, experts (industry, government and business) and the community. Anyone interested in improving transport in NSW was encouraged to participate, whether a commuter or a truck driver, an industry representative, a business person or part of local government.

Feedback on the draft Long Term Transport Master Plan has strengthened the final Master Plan. Some of the areas where the Master Plan has been strengthened are:

- Increased focus on the environment and the integration of transport and land use
- Commitment to planning and delivering WestConnex
- Bolstered discussion about the future of buses
- Increased discussion around motorcycles
- Included additional information about walking and cycling
- Strengthened the focus on regional NSW
- Committed to the development of a social access framework
- Strengthened the linkages between funding and delivery.

Our extensive consultation included:

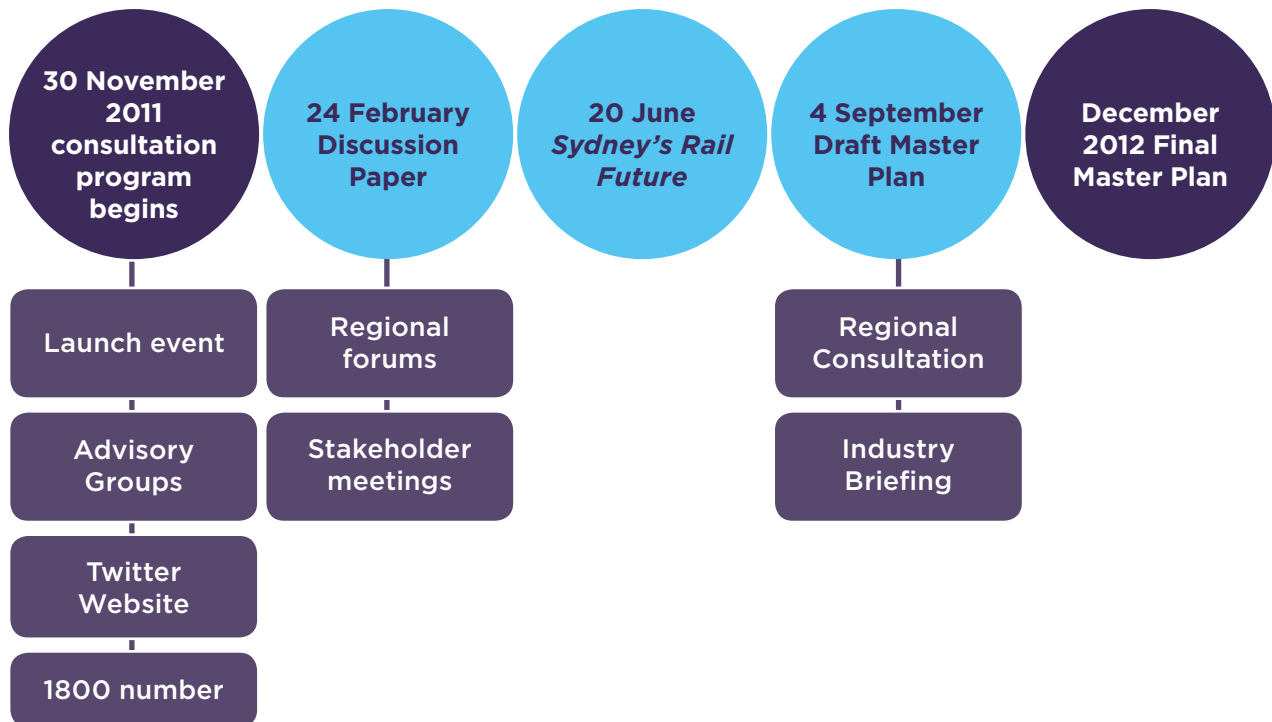
- A launch event attended by over 130 experts from across business, community, government and industry
- Over 130,000 hits on the dedicated website
- Four Advisory Groups involving 54 participants representing customers and community, local government, industry and transport specialists which have already met four times. Freight customers are being consulted in Reference Groups in a parallel initiative
- Over 1,200 submissions on the Discussion Paper received between 24 February and 27 April 2012
- Over 480 submissions to the draft Master Plan, received between 4 September 2012 and 26 October 2012
- Fourteen regional forums across the State between February and May 2012, involving over 1,000 participants. These forums enabled us to hear and understand the views of people in all parts of Sydney, and every region of NSW
- Consultation with Regional Organisations of Councils and Regional Development Australia representatives on the draft Master Plan
- Industry briefing (on the Master Plan) involving over 140 participants
- 1800 number, website and Twitter to talk with our stakeholders and gain feedback.

12.1 Consultation to develop the Master Plan

Our 12 month Master Plan consultation process involved unprecedented engagement with our customers, experts (industry, government and business) and the community (see Figure 12.1).

There were 5 steps in developing the Master Plan.

Figure 12.1 Master Plan Process



1. 12-month consultation begun with launch of Master Plan Process

The consultation began with the launch of the process in November 2011 at an event attended by over 130 stakeholders. At this event we asked people to identify their key transport priorities, which were then used to inform the development of the Discussion Paper.

Between November 2011 and February 2012 we received detailed input through the Master Plan website and we met with key stakeholders including our Advisory Group members. The insights gathered through this process informed the development of the Discussion Paper.

2. Discussion paper

The Discussion Paper sought feedback on the priorities, issues and solutions for meeting the State's transport needs over the next 20 years. It asked 23 strategic questions to assist customers and stakeholders to prepare submissions.

3. Customer priorities identified through consultation

There were a number of avenues for customers to provide input on the 23 strategic questions. The methods of consultation were:

- Fourteen Regional Forums across NSW
- Over 1,200 submissions to the Discussion Paper
- Four Advisory Groups
- Ongoing consultation through our website, 1800 number and Twitter
- Feedback gathered through this consultation directly informed our view on the long term challenges and priorities for the State's transport system.

Sydney's Rail Future, our long term plan to expand and modernise the rail system, was informed by the consultation on the Discussion Paper.

4. Gathering evidence and developing actions

We took the priorities identified through feedback on the Discussion Paper and developed an evidence base to support action. We undertook detailed analysis and modelling including:

- Extensive modelling of transport scenarios through the Strategic Transit Model
- Systematic research of customer preferences through the Customer Value Proposition work
- Consideration of customer feedback gathered through the Household Travel Survey
- Initial results from a pilot Regional Household Travel Survey
- The latest Census data and land use projections, gathered through close collaboration with the NSW Department of Planning and Infrastructure.

We then developed actions to address those priorities and meet the challenges. The draft Master Plan includes 220 actions to address customer priorities with evidence-based solutions.

5. Consultation leading to final Master Plan

Following the release of the draft Master Plan, we sought feedback by:

- Opening the draft Master Plan for comments on the Master Plan website. We received and considered over 480 comments
- Conducting meetings with each of the Regional Organisations of Councils and Regional Development Australia to get feedback on the draft Master Plan
- Continuing Advisory Group meetings
- Briefing over 140 industry representatives on the draft Master Plan.

Figure 12.2 Consultation with our stakeholders



12.2 What changed as a result of your contributions

Feedback on the draft Master Plan has strengthened the final Master Plan. The areas where this has occurred include:

Chapter 1, 2, 3

- Strengthened the focus on environmental issues in transport
- Clarified the liveability objective of the Master Plan to include a specific reference to supporting more jobs close to home
- Strengthened the focus on the link between land use and transport planning and the importance of integration
- Increased the focus on interchanges and clarified support for car parking to support park and ride
- Clarified that new rolling stock for NSW Trains will be fit for various journey types across the network.

Chapter 4

- Included the planning and delivery of WestConnex including urban renewal solutions for the Parramatta Road corridor and strategies to optimise benefits from new investment
- Strengthened the focus on integrated road solutions to address concerns about new motorway infrastructure inducing private vehicle travel demand
- Provided additional detail on the need for single-deck rolling stock in *Sydney's Rail Future* including the need to load and unload passengers more quickly, enabling shorter dwell times, and increasing train capacity at busy rail stations
- Strengthened discussion of bus network improvements to clarify the benefits of a more connected bus network that is focused on simplifying the bus system through reducing route duplication and increased connectivity, improved service frequency and coordinated timetables to make it faster for customers to get where they need to go
- Amended bus fleet action to support a more fit for purpose bus fleet, such as larger buses for high demand routes
- Added actions for motorcycles – including the motorcycle lane filtering trial to begin in February 2013
- Added further detail on cycling including the need for more bicycle parking at interchanges
- Strengthened actions on walking initiatives including separated walking paths where possible, working with councils to improve facilities, and investment in links around centres and interchanges.

Chapter 5

- Emphasised the relationship of transport connections to the centres identified in the *Metropolitan Strategy*
- Included additional action to extend consideration of road corridor improvements to address pinch points and target road access to and around Parramatta, including the Cumberland Highway, Pennant Hills Road, James Ruse Drive and Parramatta Road
- Added detail on new bus routes and roads as part of the precinct Improvement Plan for Port Botany and Sydney Airport
- Increased the focus on Macquarie Park
- Added action on addressing the local traffic impacts of the Moorebank intermodal terminal.

Chapter 6

- Added more detail and context to discussion and actions for each region
- Provided more detail on the Bridges for the Bush program
- Noted the potential to prioritise regional tourism opportunities in the funding assessment criteria for cycling infrastructure
- Included Gold Coast Airport as an example of cross-border infrastructure and transport access
- Added detail on the importance of regional air services and Newcastle and Canberra airports
- Committed to examine options to enhance passenger rail service levels for regional NSW
- Enhanced references to improving travel times between Sydney and regional cities; and regions and their centres
- Introduced a new action supporting flexible transport to reflect submissions requesting more service options in regional NSW
- Added an action to preserve future transport corridors in regional NSW
- Brought forward an action to address freight impacts at Scone with a short term initiative to remove the level crossing between the New England Highway at Kelly Street and the Main Northern Line at Werris Creek
- Provided further details on road upgrades such as on the Newell and Great Western Highways in the Central West.

Chapter 7

- Strengthened the focus on port growth plans and their priorities
- Strengthened the proposed role of the Cargo Movement Coordinator role to drive increased rail freight share for Port Botany and Port Kembla
- Mitigated impacts of freight movements on local roads by committing to WestConnex and improving freight access on Sydney's motorway network
- Added a new action to develop a Newell Highway (A39) Corridor Strategy to support the safe use of high productivity vehicles.
- Reflected the Government's investment of \$277 million over the next 5 years to maintain and upgrade 996 kilometres of grain rail lines.

Chapter 8

- Added a new action to prepare a social access framework to understand and address transport disadvantage across NSW, and provided more detail on the Disability Action Plan
- Added a new action to establish a long term plan to address the backlog of local road maintenance to enhance contestability in the market
- Added a new action to ensure CBD and City Access Strategies review and identify appropriate and safe taxi stopping areas.
- Committed to create a single booking line for Wheelchair Accessible Taxis, allowing SMS bookings, using customer database, and notification if WAT taxi not available
- Committed to examine potential role of Workplace Travel Plans to improve transport outcomes including through the provision of bike lock up and end of trip facilities
- Emphasised our commitment to work with local councils on land use and transport integration
- Added a new action to prepare an environment and sustainability plan for transport in NSW
- Added a new action to develop the Boat Storage and Safe Waterways Access Strategy.

Chapter 9

- Strengthened language on integrated road solutions to address concerns about new motorway infrastructure inducing private vehicle travel demand
- Explained rationale of single-deck rolling stock in *Sydney's Rail Future* that is to load and unload passengers more quickly, enabling shorter dwell times, and increasing train capacity at busy rail stations
- Amended bus fleet action to note a more fit-for-purpose bus fleet will be developed over the long term, such as some larger buses for high demand or BRT routes
- Committed that, on WestConnex, the Government will work closely with industry to drive the best solution, including urban renewal solutions for the Parramatta Road corridor and strategies to optimise benefits from new investment
- Provided further detail on the status of key projects.

Chapter 10

- Strengthened the linkages between funding for transport and the ability to deliver the plan
- Reflected the NSW Government's decision to sell selected surplus lands and reinvest money from these assets
- Committed to investigate the potential for industry contributions for infrastructure development to support future mining development and meet funding shortfalls.

Chapter 11

- Provided more detail about the process for delivering the Master Plan
- Strengthened discussion about project prioritisation and assessment to include the broad range of benefits in active travel modes
- Noted that we will continue to collaborate with our partners in government, in industry and the people of NSW to prioritise initiatives that will help us to achieve an effective transport system.

12.3 What we heard in response to the draft Master Plan

12.3.1 Chapter 1 – Why Transport Matters

Responses to the draft Master Plan included strong feedback on the importance of integrating land use and transport planning so that transport is considered in terms of:

- Giving people access to jobs, services, recreation activities, friends and family
- Supporting businesses in providing goods and services to society and in so doing, supports jobs and economic productivity
- Transport's broader role in supporting vital, interesting, attractive and resilient towns, regions, suburbs and centres – with minimal negative social or environmental impacts.

12.3.2 Chapter 2 – Customer-focused integrated transport planning

Initiatives putting the customer at the centre of decision making, such as providing **real-time information** and **transport interchanges** were strongly supported. There was also support for the approach of integrating modes and recognising the needs of business and freight customers.

12.3.3 Chapter 3 – Integrating modes to meet customer needs

There is strong support for integrated, electronic ticketing and the introduction of the **Opal card**. Comments also suggested that pricing could be used as a means of encouraging travel at different times of the day to help spread demand on the system. There was also feedback on not penalising customers for changing between different modes of transport.

Wayfinding and real-time information initiatives were supported. These actions were seen to positively help customers to locate the right service, find the right platform or bus stand or plan a journey from home.

Interchanges are seen as a key aspect of a customer's journey with call for attractive, safe and sheltered interchange facilities to enhance commuter comfort. **Park and ride facilities** are supported. Those who commented would like to see more park and ride facilities at rail and bus interchanges to encourage greater public transport use.

New transport fleet was also mentioned as a positive action in the draft Master Plan with those commenting suggesting that this would contribute positively to sustainability outcomes, but also to the comfort and reliability of a public transport journey.

Actions to simplify and align public transport timetables were welcomed in the comments received.

12.3.4 Chapter 4 - Getting Sydney Moving Again and Chapter 5 - Sustaining Growth in Greater Sydney

We have responded to feedback on the draft Master Plan about how to get Sydney moving again and how we sustain growth in Greater Sydney. The table below outlines the key issues that we heard in response to the draft Master Plan and how the final Master Plan responds.

Key issues raised	How the Long Term Transport Master Plan responds
Equitable transport access for all types of customers in all locations, not just the CBD	<p>Actions including to update the Disability Access Plan towards a fully accessible transport system for all users, including the elderly, parents with prams and customers with reduced mobility.</p> <p>Expanding the discussion of community transport to increase access across different user groups, create a network that compliments the city and is a feature of good urban design, get transport conditions right so that more people live closer to jobs and economic centres.</p> <p>Actions to improve reliability and safety on the weekends and late at night through the new 2013 timetable and the Police Transport Command.</p>
Reducing car use and place public transport first	<p>Actions to increase the number and capacity of commuter car parks, improved infrastructure to make walking and cycling more viable, new rail infrastructure, including South West Rail Link, North West Rail Link, Strategic Bus Corridors and strengthen local transport connections.</p>
Tackle congestion	<p>Actions supporting management of demand, investigation of a distance-based tolling model and maximising road space, implementing a CBD street hierarchy to manage access.</p> <p>Actions to improve public transport to cut congestion, meet growing demand and improve existing travel times, and maximise performance of the existing network.</p> <p>Supporting improved management of the urban road network in real-time through the Transport Management Centre.</p>
Rail network is at capacity - in particular city stations and on high volume lines	<p>Actions to implement five stages of <i>Sydney's Rail Future</i>, including a Second Harbour rail crossing in the long term, and network efficiencies in the short term.</p> <p>Actions supporting the upgrade of busy city interchanges including Town Hall, Wynyard, Central, Circular Quay and Redfern Stations.</p>

Key issues raised	How the Long Term Transport Master Plan responds
<p>Active transport – cycling and walking. Make it safe, and make it a priority.</p>	<p>Commitment to initiatives including user-friendly bike trip information, facilities at transport interchanges, local cycling infrastructure that feeds into Sydney’s urban centres from a five kilometre catchment – e.g. Georges River Bridge for cyclists.</p> <p>Actions including prioritised pedestrian access and amenity at public transport interchanges, give access to each urban centre from a 10 kilometre catchment over the medium to long term.</p> <p>CBD Pedestrian Improvement Program including better links along George Street, Barangaroo and Wynyard, wayfinding for customers and visitors.</p> <p>Actions to expand the walking investment program, including the construction of pedestrian bridges.</p>
<p>Interchanges and connections/ integration – between locations and transport modes</p>	<p>Actions to improve ticketing with the introduction of the Opal card, improve real-time information available to customers, user-friendly and aligned timetables between transport modes.</p> <p>Commitment to investing in new public transport fleets to provide higher frequency services.</p> <p>Actions including the development of an <i>Interchange Strategy</i>, with design based on principles and hierarchy, and standardised signage.</p>
<p>Plan for growth, and link transport and land use planning</p>	<p>Actions to improve integrated land use and transport planning, work with the NSW Department of Planning and Infrastructure to define transport requirements to support better quality development for greenfield and infill developments.</p> <p>Commitment to protect corridors for future transport infrastructure, both public transport and for roadways.</p> <p>Actions to compliment the expanding CBD footprint with new transport options – e.g. potential light rail, Wynyard Walk and a Ferry Hub to support Barangaroo.</p> <p>Commitment to progressively implement mass transit to the rail network through <i>Sydney’s Rail Future</i>.</p>
<p>Work with stakeholders and commit to identified priorities, bold decisions like second airport and high speed rail, and drive behavioural change</p>	<p>Commitment to a clear decision making framework that includes detailed plans and funded actions, a cost benefit analysis as a minimum for all projects.</p> <p>Developing new mechanisms to improve the integration of land use and transport planning.</p> <p>Actions to develop detailed delivery plans, create the Infrastructure Financing Unit within NSW Treasury.</p> <p>Commitment to an annual Master Plan update with a review every five years.</p>

Key issues raised	How the Long Term Transport Master Plan responds
<p>Use of the freight network to transfer freight from road to rail, ensure freight is carried safely on roads, connect to regions</p>	<p>Actions including the development of the precinct Improvement Plan for Port Botany and Sydney Airport and building on Port Botany Landside Improvement Strategy, and introducing a Cargo Movement Coordinator to improve rail competitiveness at the port.</p> <p>Plans to invest in rail freight infrastructure enhancements including in pinch points and measures to improve competitiveness and development of a metropolitan intermodal terminal network.</p>
<p>Network wide changes, e.g. introduce a hierarchy of train stations to limit number of stops, and integrate this with land use planning, encourage employment closer to home</p>	<p>Actions to connect centres, move away from radial network, embrace interchanges in the network-wide design.</p> <p>Growth Centres Roads program.</p> <p>Commitment to new high capacity mass transit services connecting centres as part of <i>Sydney's Rail Future</i>.</p> <p>Actions including new 'access points' so customers can access the transport system from more entry points in the network, for example light rail in the city, completion of the light rail extension to Dulwich Hill and also investigation of potential new light rail corridors, for example Parramatta.</p>
<p>Overhaul bus network</p>	<p>Actions including to redesign bus network based on the Strategic Transit Network Hierarchy to implement a restructured three-tier network of local, intermediate and mass transit services, supported by bus services, bus fleet expansion to improve customer experiences.</p> <p>Continuing to develop a Strategic Bus Network Program focusing on higher service frequencies and on-road priority.</p> <p>Introducing the Bus Head Start Program including bus priority infrastructure and improved cross-regional bus services including north-south links.</p>
<p>Public campaign to promote information about services and public transport use, engaging the community through high profile public figures</p>	<p>Actions to enhance customer access to real-time information about transport services and trip planning, improve passenger comfort and safety, and enhance the reliability and efficiency of public transport services.</p> <p>Actions to promote public transport use and to encourage business to undertake workplace travel planning.</p>
<p>Complete the missing links in Sydney's motorway network, but balance this investment with investment in public transport particularly to access the CBD</p>	<p>Actions committing to the development of WestConnex and completing the missing gaps that are slowing the motorway network down and contributing to congestion and delays across the city.</p> <p>Actions to protect Outer Sydney Orbital corridor (M9).</p>

12.3.5 Chapter 6: Providing essential access for regional NSW

Following the release of the draft Master Plan, Transport for NSW met with representatives from Regional Development Australia (RDA) and Regional Organisations of Councils (ROCs) to listen and understand issues to help strengthen the Master Plan.

Some thoughts and suggestions were:

- Moving more freight from road to rail, reducing the impact of trucks on regional roads
- Retaining air services from regional centres to Sydney Airport
- Increasing community transport to meet the needs of our ageing population as well as people with a disability, those living in remote areas and other transport disadvantaged customers
- Creating better links between regional centres
- Improving the frequency of public transport services
- Improving road safety to reduce fatalities and serious injuries on country roads
- Better integrating land use and transport planning.

All feedback received throughout the 12-month consultation period will be used in the development of Regional Transport Plans.



Key issues that we heard from the consultation on the draft Master Plan by each region and how the Master Plan responds include:

Northern Rivers

Key issues raised	How the Long Term Transport Master Plan responds
Additional capacity and upgrades to address increased regional road use, largely driven by population increase, tourism, recognise impact of coal seam gas industry on region	Complete upgrades to road infrastructure focusing on improving safety, supporting growth and enhancing freight efficiency, including duplication of the Pacific Highway, widening works to the Bruxner Highway, upgrades supporting the growth of Lismore, Ballina and the Tweed Coast, additional crossing of the Clarence River at Grafton, and replacing the Tabulam Bridge.
Transfer freight from road to rail	Manage freight task and make best use of current networks, then grow networks with targeted investment that expands capacity, implement rail freight infrastructure enhancements to increase share of freight carried on the rail network, invest in rail pinch points, and modernise freight networks by increasing their productivity.
Increase funding for community transport and improve bus services	Develop Regional Transport Plans, apply a renewed approach to resourcing the community transport sector and a fresh approach to delivering bus services including route and timetable changes and better integration with other public transport modes.
Increase access for all residents to public transport, recognise that people use it to travel to essential services including health appointments	Develop a Country Passenger Rail Services Strategy to deliver a better service outcome for people in regional NSW and continue to enhance public transport infrastructure via programs that assist local councils to make country bus stops and station safer, more accessible and attractive.
Look at encouraging alternative modes of transport such as cycling and walking	Introduce a long term NSW Cycling Investment Program to improve the planning, management and delivery of cycleway capital programs, enhance cycling routes in regional centres to increase the number of people who cycle.
Cross boarder connectivity and integration with South East Queensland	Continue to work with the Queensland Government to overcome various jurisdictional regulatory arrangements and improve regional travel.
Casino to Murwillumbah connection	Complete the Casino to Murwillumbah rail corridor investigation and consider its recommendations.
Use technology better to improve services	Provide real-time information based on customer needs, develop journey planning information that is consistent, customer centred and helpful for customers.
Provide increased funding to Councils to make improvements to rural roads	Continue to provide formula based funding assistance to local councils for the maintenance and upgrade of roads.
Importance of links with Gold Coast Airport	Included Gold Coast Airport in the Plan to recognise the important role that this airport plays in the regions travel network.

Mid North Coast

Key issues raised	How the Long Term Transport Master Plan responds
Transport that meets the needs of an ageing and changing population	Integrate land use and transport planning, coordinate decision making between Transport for NSW and the NSW Department of Planning and Infrastructure on future urban renewal locations, and improve the way that customers interchange and access transport information.
Shift freight off roads and onto rail, and upgrade regional roads and wooden bridges	Enhance rail infrastructure so that a greater share of freight is able to be carried on the rail network, including investment in pinch points.
Get the most out of existing infrastructure and systems, develop and refurbish existing infrastructure instead of letting it degrade	Monitor and analyse transport system asset performance, upgrade, refurbish and rebuild parts of the network needed to deliver productivity improvements and minimise cost of transporting goods.
Funding – managing expectations about what is possible, and the true cost involved	Reduce cost of public transport services through various reforms.
Provide a more integrated and flexible transport system, accessible to all and meets the needs of the community	Continue to support and enhance a public transport infrastructure program, encourage increased public transport use in regional areas, investigate opportunities to improve accessibility on different modes of transport.
Ease congestion in Coffs Harbour, both freight and commuter traffic, base decisions on bypasses on economic analysis	Deliver the Coffs Harbour bypass in the long term and continue to invest in the Mid North Coast Road network to address localise congestion.
Improve CountryLink, including connectivity	Develop a Country Passenger Rail Services Strategy to deliver a better service outcome for people in regional and rural NSW, establish NSW Trains and develop a Country Passenger Rail Services Strategy to improve regional NSW rail connections.
Effective corridor planning	Identify and protect strategic rail freight corridors and sites and develop a Transport Environment and Sustainability Policy to deliver the NSW Government’s environmental and sustainability agenda across the transport sector.
Regional air access – ensure continued access to Sydney Airport	Work with aviation and airport stakeholders to ensure continued access via air from Sydney Airport to the regions.
Equity of access to public transport	Work towards building a fully accessible transport system for all users including access to physical facilities and transport modes, focusing on particular groups of users such as the elderly and parents with prams, customers with a disability and reduced mobility.

New England

Key issues raised	How the Long Term Transport Master Plan responds
Transport that meets the needs of the community, including the elderly and those living with a disability	Provide ongoing funding for community transport services, including access to physical facilities as well as information, focus on particular groups of users including the elderly, parents with prams and customers with disabilities and reduced mobility, review taxi network regulation, renew approach to resourcing for community transport, update the Disability Access Plan.
Make roads safer – trucks, railway crossings and road upgrades	Deliver a targeted program of upgrades for the rural highway focusing on safety, supporting growth and improving accessibility, 10 year <i>Road Safety Strategy for NSW</i> , program of town bypasses, speed management on roads.
Planning for growth – provide appropriate infrastructure for mining and agriculture, linking land use planning to transport	Continue to review expansion of the road network available to modern, safer and more productive heavy vehicles, coordinate decision making around future urban renewal and industry locations and identify service gaps through monitoring and analysis.
Improve links from Tamworth to Sydney, Brisbane and Newcastle	Focus attention on road network upgrades for the New England Highway (near Tamworth), complete upgrades to sections at Bolivia Hill (south of Tenterfield) and provide additional overtaking lanes and complete pavement reconstruction of the Newell Highway between Narrabri and Moree.
Maintain access for regional services at Sydney Airport, and better access and integration between different transport modes and Tamworth Airport	Maintain regional air services to Sydney Airport.
Improve integration between public and private transport services	Encourage public transport use in regional areas, improve quality and level of service, wider network coverage and better integration between modes, and to develop Regional Transport plans with input from local communities.
Transfer freight from roads to rail	Manage freight task and make best use of current networks, then grow networks with targeted investment that expands capacity, implement rail freight infrastructure enhancements to increase share of freight carried on the rail network, invest in rail pinch points, and modernise freight networks by increasing their productivity.
Appropriate funding for regional road services, infrastructure and maintenance	Continue to provide formula based funding assistance to local councils for road maintenance, prioritise investment in road maintenance and improve contestability assessing projects against critical system gaps.
Access to real-time public transport information	Improve real-time information systems and provide new capabilities over the 20 year span of the Long Term Transport Master Plan.
Share benefits of mining royalties and reinvest in the community	Identify future funding opportunities to explore how additional revenue from transport can be hypothecated for the purposes of funding specific projects.

Western

Key issues raised	How the Long Term Transport Master Plan responds
Seal roads to ensure all-weather access	Focus on maintaining the region's roads at a suitable standard, and a program of infrastructure works which allows for sealing of roads, line markings and signage, implement a 10 year <i>Road Safety Strategy for NSW</i> and a targeted program of upgrades to rural highways network.
Bypass/haulage route around Broken Hill	Support for a heavy vehicle haulage bypass of Broken Hill which will assist mining industry, agriculture and improve travel efficiencies.
Improve rail services to Broken Hill	Develop a Country Passenger Rail Services Strategy to deliver a better service outcome for people in regional and rural NSW and establish NSW Trains and develop a Country Passenger Rail Services Strategy to improve regional NSW rail connections.
Intermodal hub for Broken Hill	Work with councils and the private sector to identify future sites and preserve land where required, on a case by case basis.
Invest royalties from mining into local transport infrastructure	Provide accessible and equitable transport options for people in NSW's regions and support good access to Broken Hill and other regional centres.
Upgrade Broken Hill airport	Work with airport owners and stakeholders to support service access between our regions and Sydney Airport.
Consider relocating government services to Broken Hill, concern that the town is too reliant on mining	Continue collaboration with Regional Organisations of Councils and other stakeholders to develop detailed area plans such as transport strategies, city access plans and precinct plans.

Hunter

Key issues raised	How the Long Term Transport Master Plan responds
Capacity and frequency of public transport services, particularly rail	Identify and respond to service gaps, network and timetable reviews, strategic bus corridor planning, creation of NSW Trains and the Country Passenger Rail Services Strategy.
Improve community transport, in particular for older people, families and people with disabilities	Provide ongoing funding for community transport services, including access to physical facilities as well as information, focus on particular groups of users including the elderly, parents with prams and customers with disabilities and reduced mobility, review taxi network regulation, renew approach to resourcing for community transport, update the Disability Access Plan.
Coordinated land use and transport planning	Work with the NSW Department of Planning and Infrastructure to define transport requirements and support development for new greenfield areas. Establish clear decision making processes around future urban renewal locations.
Revitalise the Newcastle CBD	The Department of Planning and Infrastructure is preparing a land use plan for Newcastle and the Hunter which will assess the rail corridor as part of the future transport solutions to support renewal in the Newcastle city centre.

Key issues raised	How the Long Term Transport Master Plan responds
Improved connections out of Newcastle and within the Hunter region	Implement Our Growth Centres roads plan and implement Strategic Bus Corridors. Continue delivering key upgrades and projects: <ul style="list-style-type: none"> • Newcastle Inner Bypass • Newcastle Link Road • New east-west connection between Newcastle and Lower Hunter through the Hunter Expressway • Upgrade the link between the F3 Freeway/Hunter Expressway interchange and Broadmeadow in Newcastle • Fast rail from Newcastle to Sydney through <i>Sydney's Rail Future</i> network improvements.
Better interchanges and connections between transport modes	Introduce the Opal card, continued investment in the Transport Access Program to upgrade facilities at interchanges, introduction of an <i>Interchange Strategy</i> , real-time information and work to align, improve and simplify timetables.
Improve bus services and make them more frequent	Implement Strategic Bus Corridors and monitor them to reflect demand and land use changes.
Road and highway maintenance and upgrades	Safety improvements for the Pacific Highway, and investment in road maintenance where projects are assessed against system gaps and performance standards.
Active transport - cycleways and pedestrian paths	Improve planning, management and deliver of cycleway capital works programs and improve access to bike trip information for customers. Invest in cycleways within a five kilometre radius of major urban centres through a Connected Cycling Network, and in facilities at interchanges.
Shift freight off roads and onto rail	Enhance rail infrastructure so that a greater share of freight is able to be carried on the rail network, including investment in pinch points, develop a Port Growth Plan for Newcastle as part of the Regional Transport Plan for the Hunter, protect and plan for construction of the Fassifern freight rail corridor and the Hexham rail bypass.
A transport system that is easy to use, quick, reliable and affordable	Introduce the Opal card for the Hunter and ongoing work with stakeholders to deliver network benefits.
Safety	Create a Police Transport Command consisting of 610 Police Officers who will deal with serious crime and anti-social behaviour across all public transport services and incorporating safety into interchange planning.

Central Coast	
Key issues raised	How the Long Term Transport Master Plan responds
Building and maintaining infrastructure	Invest in the region's road network to reduce congestion, improve travel time reliability. Specific improvements to including investment in the urban road network, widening the F3 between Tuggerah and Doyalson, F3 interchanges and upgrades to the Pacific Highway, Central Coast Highway and Terrigal Drive, as well as Manns Road and Sparks Road.
Delivering services for a growing and aging population	Encourage increased public transport use by identifying and addressing service gaps, including facilitating better bus operations and resourcing the community transport sector. Integrate community transport into the overall system, provide funding, and improve services for customers of wheelchair taxis.
Improve road and rail connections to Sydney and to Newcastle, ease crowding on trains and congestion on roads	Develop a Country Passenger Rail Services Strategy to deliver a better service outcome for people in regional and rural NSW, and implement <i>Sydney's Rail Future</i> . Invest in the region's road network to reduce congestion, improve travel time reliability and facilitate enhanced bus operations, continue investment in the urban road network that impacts on bus operations.
Public transport services are infrequent	Consider options to deliver improved public transport services through network and timetable reviews, and begin immediate work to align and improve public transport timetables.
Improve the safety and customer comfort of using public transport and encourage more people to use it	Continue to support and enhance public transport through an infrastructure program that assists local councils make bus stops and railway interchanges safer, more attractive and more accessible for all types of users. Create a Police Transport Command consisting of 610 Police Officers who will deal with serious crime and anti-social behaviour across all public transport services and incorporating safety into interchange planning.
Integrate fares and ticketing and make more affordable for young people	Introduce the Opal card, including for the Central Coast, from 2013.
Move freight from road to rail	Complete the Northern Sydney Freight Corridor to separate freight from passenger rail and make sure the two don't compete for the same track space, enabling faster easier movement of freight.
Encouraging public transport over cars, and behavioural changes, such as teleworking	NSW Cycling Investment Program to improve planning, management and delivery of cycling initiatives, increase and improve bike parking at interchanges, enhance cycling routes in regional centres to increase the number of people who cycle, expand the Walking Investment Program, develop and implement travel management plans.
Integrate transport modes and services and land use planning engaging ROCs as they have a regional perspective	Ensure land use and transport planning is fully integrated to strengthen transport planning processes, encourage increased public transport use in regional areas by adopting a corridor hierarchy approach and identifying gaps in service, focusing on making improvements.

Central West

Key issues raised	How the Long Term Transport Master Plan responds
Maintain regional flight access to Sydney Airport	Work with airport owners and airline operators to continue to support air access between Sydney and regional areas.
Improve connectivity and integration of transport modes	Introduce an <i>Interchange Strategy</i> to ensure seamless travel, real-time information, align, improve and simplify public transport timetables.
Improve public and community transport access, especially to support an aging population	Ongoing funding for community transport services, by identifying and assessing gaps in service, operator accreditation, new approaches to resourcing, and a program that assists local councils invest in making country bus stops more accessible, stations safer and disability access compliant.
Funding for transport services and infrastructure	Obtain greater value for money from investments through smarter procurement, consider benefits from road user charges, value capture from major investments.
Move freight off the road and on to rail, including improved rail infrastructure	Invest in road and rail infrastructure to ensure goods can be moved efficiently around the state, implement rail freight infrastructure enhancements, invest in pinch points, identify strategic freight corridors linked to supply chain movements and freight flows.
Coordinated approach to land use planning and transport	Clear processes for coordinated transport and land use planning decision making with the NSW Department of Planning and Infrastructure.
Improving regional links - for example the Bells Line of Road and connections between Mudgee to Orange	Completed the Bells Line of Road Corridor Study and working to protect the corridor for future transport needs.
Prioritising key road and rail infrastructure	Deliver upgrades and additional overtaking lanes and investigate actions on the Mitchell, Great Western and Mid Western Highways, deliver Newell Highway upgrades and complete work on the Great Western Highway to address localised congestion in the Blue Mountains, Bathurst and Orange.
Improving reliability and frequency of rail	Introduce a daily return service between Bathurst and Sydney, develop a Country Passenger Rail Services Strategy to deliver a better service outcome for people in regional and rural NSW, establish NSW Trains.
Road safety and investment, for the long term	Deliver targeted safety works, duplication or more frequent overtaking lanes, more frequent and better rest areas, develop a pavement condition model to predict structural performance of roads, improve consistency in regional maintenance, implement Bridges for the Bush.
Collaboration between industry and government	Collaborate with Regional Organisations of Councils and other stakeholders to develop detailed area plans such as Regional Transport Plans.
Move freight off the road and on to rail, including improved rail infrastructure	Invest in road and rail infrastructure to ensure goods can be moved efficiently around the state, implement rail freight infrastructure enhancements, invest in pinch points, identify strategic freight corridors linked to supply chain movements and freight flows.
Coordinate and integrate transport that connects the region with Sydney and other regional centres	Continue to enhance regional bus services to increase access to key regional centres of Bathurst, Orange and Dubbo and to connect smaller communities.

Illawarra

Key issues raised	How the Long Term Transport Master Plan responds
Transport that meets the needs of a changing population	Provide connections to new development areas, through minimum land use requirements, in particular West Dapto, to support and reflect vision for connected regional communities, ensure integrated planning for new greenfield areas, establish connections to the South West Growth Centre, Southern Highlands and the south coast with upgrades to Picton Road, Princes Highway and Illawarra Highway.
Manage freight task as it grows, especially between Port Kembla and Western Sydney	Develop Growth Plans for NSW Ports, with a focus on driving efficiencies, complete the Port Kembla Growth Plan including development of the port's Outer Harbour and multi-purpose berth in the long term.
Shift freight off roads and onto rail including Maldon to Dombarton Rail Link	Enhance rail infrastructure so that a greater share of freight is able to be carried on the rail network, including investment in pinch points.
Improving and integrating different modes of transport to make it attractive and accessible	Strengthen bus operations, accessible attractive stops and stations and investment in partnership with local councils in infrastructure to make stops safer, introduce the Opal card, continue investment in the Transport Access Program, improvements to wayfinding, interchange upgrades and timetable overhaul as part of <i>Sydney's Rail Future</i> and creation of NSW Trains to make travel from Sydney to the Illawarra faster and more reliable.
Making roads safer – trucks, black spots and school zones	Invest in road upgrades such as duplication, rest areas for heavy vehicles, 10 year <i>Road Safety Strategy for NSW</i> , program of building and upgrading town bypasses, upgrades to Picton Road and Princes Highway between Gerringong and Bomaderry to increase capacity, improve traffic flow, establish Community Road Safety Fund and new speed management arrangements.
Improving links to and within the Illawarra	Invest in urban road network, connect developing areas with transport infrastructure and services, establish connections between the South West Growth Centre, Southern Highlands and south coast with upgrades to Picton Road, Princes Highway and Illawarra Highway.
Extend the F6 to Sydney	Recognise this project as a major long term priority and progress a project to connect Loftus and St Peters in the long term.
Accountability for funding for transport	Transparent reporting and measurement to allow for assessment by providers and users, and Regional Transport Plans.
A reliable system that gets you from A to B quickly	Invest in new Oscar outer suburban trains and rolling stock for the journey from Sydney to the region, implement integrated ticketing, <i>Interchange Strategy</i> , accurate and modern wayfinding and immediate work on a timetable overhaul.
Safety – on rail, particularly at weekends	Creation of the Police Transport Command unit within the NSW Police Force, consisting of 610 officers.
Improving transport to key Illawarra destination	Growth Roads program and improvements to the F6, Princes Highway and Mount Ousley Road to boost capacity for passengers and freight.

Murray-Murrumbidgee

Key issues raised	How the Long Term Transport Master Plan responds
More integrated and flexible transport system, accessible to all and meets the needs of the community, improving taxi services in regional areas	Continue to support and enhance a public transport infrastructure program, encourage increased public transport use in regional areas, investigate opportunities to improve accessibility on different modes of transport.
Maintenance and upgrade of road and rail infrastructure	Undertake targeted program of upgrades to rural highway networks, duplicate and increase overtaking lanes, manage congestion and safety on major road corridors of the Newell Highway, Sturt Highway and Mid Western Highway.
Increase access to public transport including number and timing of services and overhaul CountryLink	Establish NSW Trains and develop a Country Passenger Rail Services Strategy to improve regional NSW rail connections, operate country rail passenger services through the region to Griffith and Melbourne, improve quality and level of service, focusing on more frequent services, wider network coverage and better integration between modes, establish a Regional Transport Plan.
Move road freight to rail, and decrease impact of trucks	Finish duplication of the Hume Highway by completing the remaining bypass at Holbrook, complete upgrades on the Newell Highway, including additional heavy vehicle rest areas, invest in rail freight infrastructure enhancements, identify and protect strategic corridors for future development, enhance rail infrastructure so that a greater share of freight is able to be carried on the rail network, including investment in pinch points.
Cross-boarder and interstate connectivity to major cities	Continue to work with Victorian and ACT Governments to achieve a better outcome that makes travel easier and more convenient.
Safe cycling and walking	NSW Cycling Investment Program, enhance cycling routes in regional centres, implement a Walking Investment Program, including construction of pedestrian bridges and walking paths.
Support local productivity with rail and road infrastructure and simplified freight regulation	Introduce initiatives to move regional freight more efficiently, implement rail freight infrastructure enhancements to increase the share of freight carried on the rail network. Improve local road infrastructure including replacement of Kapooka Bridge on the Olympic Highway and the Murray River Bridge at Echuca on the Cobb Highway, continue to deliver Bridges for the Bush and connect vital freight routes in regional NSW.

Southern	
Key issues raised	How the Long Term Transport Master Plan responds
Greater funding for community transport, particularly to meet the needs of a growing ageing population	Provide ongoing funding for community transport services following a detailed review, ensure that organisations, vehicles and drivers are cost effective, improve driver standards for community transport, introduce operator accreditation for drivers.
Fair and equitable transport funding to regional areas	Consider the specific needs of cities, towns and regions and the requirements of different regional supply chains, industries and businesses in developing plans.
Improved maintenance of regional roads and increased funding to local government	Undertake targeted program of upgrades to the rural highway network focusing on improving safety, supporting growth and efficiency for freight. Examples of upgrades to include longer overtaking lanes and more frequent and better rest areas for heavy vehicles. Upgrade specific roads including the Princes Highway between Gerringong and Bomaderry and also improve the safety and capacity of Princes Highway along the coast from Nowra to Eden.
Move freight off the road and on to rail, including improved rail infrastructure	Invest in road and rail infrastructure to ensure goods can be moved efficiently around the state, implement rail freight infrastructure enhancements, invest in pinch points, identify strategic freight corridors linked to supply chain movements and freight flows.
Also, use existing rail infrastructure better - through improved timetabling	Develop a Country Passenger Rail Services Strategy to deliver a better service outcome for regional NSW, establish NSW Trains.
Improve safety on public transport and roads	Implement the 10 year <i>Road Safety Strategy for NSW</i> , upgrade Princes Highway (as above), continue investing in the Princes, Barton, Kings, Federal, Monaro and Snowy Mountain Highways under the Rural Highway Program, target improved driver behaviour, Police Transport Command for public transport and partner with NSW Police, RMS and local councils for trouble spots.
Faster inter-regional transport and faster transport between Sydney, Goulburn and Canberra. Better connections for freight from Western Sydney to the region	Highway upgrades, focusing on improving safety, supporting growth; increasing accessibility and enhancing freight efficiency; integrate and align public transport timetables, and the new 2013 Sydney Trains timetable to provide better connections, support the initiative to select a high speed rail corridor between Brisbane and Melbourne.
Improved customer service on all public transport	Establish NSW Trains and Country Passenger Rail Services Strategy, develop Regional Transport Plans, Transport Access Program, opportunities to strengthen bus operations to connect regional centres and communities, accurate and real-time wayfinding.
Wider roads to encourage cycling	Support for the NSW Cycling and Investment Program, and develop a Connected Cycling Network to target investment in priority projects.

12.3.6 Chapter 7 – Supporting efficient and productive freight

Feedback on the draft Master Plan confirmed that the need to increase the share of freight moved by rail is seen as a major transport priority, with the Northern Sydney Freight Corridor cited as a good initiative. Similarly, implementing dedicated or separate freight lines in selected regional areas was supported. The piloting of HPV's on the Hume Highway was supported, particularly by stakeholders in the freight industry.

There continued to be concern about the safety of freight on roads and recognition that road freight is the biggest cause of road deterioration. Councils, in particular, mentioned the need to recognise the impact of freight over the first and last mile of the journey and for increased funding for local roads as a result of road freight impact.

Fostering intermodal terminal networks in the Greater Sydney area was supported, closely linked to land use planning.

There was support for the actions to improve access and reduce congestion around Sydney Airport and Port Botany. There was recognition of the ongoing collaborative working between the NSW Government and key stakeholders in the area including the Sydney Airport Authority and the Australian Government. There was also support for the development of the Port Growths Plan for NSW ports.

12.3.7 Chapter 8 – Statewide Actions

Comments called for greater clarity on how the Master Plan, *Sydney Metropolitan Strategy for Sydney* and *State Infrastructure Strategy* would integrate to deliver on the goals of *NSW 2021*. Collaboration between Transport for NSW, NSW Department of Planning and Infrastructure and Infrastructure NSW beyond the release of the final Plan was viewed as integral to creating well connected communities in the future.

There was support for transit-oriented development to create connected transport, community and retail hubs across NSW, particularly in key centres. Councils, in particular, mentioned the need for local input in planning transit-oriented development, to ensure community needs are well considered.

In addition, comments supported the update to the Disability Access Plan, with some noting the need to acknowledge the important role taxis play in transporting people with disabilities, particularly in regional areas where in some instances there are limited taxis available.

There was strong support for the 10 year *Road Safety Strategy for NSW*, however, more details on its implementation and funding were sought. Maintenance of transport assets was mentioned as critical both broadly across the network and in particular for roads, to ensure safety, reliability and efficiency. Comments also indicated general support for the environmental sustainability initiatives mentioned in the draft Master Plan, which included modernising the transport fleet, managing congestion and investing in public transport to minimise environmental impacts.

Travel demand management was supported, and mentioned as an area where government and the private sector can work together to create improved outcomes across the transport network, for example, through workplace travel plans and initiatives. Technology improvements across the network were viewed as important, including real-time information and managed motorway systems.

To the extent that it would bring more consistency in different areas in terms of parking availability and cost, a new metropolitan parking strategy was supported, however more detail was requested. In addition, there was strong support for a high speed rail network to provide fast connections both interstate and between key regional centres, offering an alternative to car travel.

12.3.8 Chapter 9 - Timetable for Action

The majority of comments about transport modes focused on public transport, in particular rail, as well as roads and the need to get the balance right for the NSW transport network.

Roads

Councils in Western Sydney emphasised the need for better access to key areas such as the Sydney CBD and Port Botany, while at the same time introducing urban renewal along key routes. There was also support for the M5 widening and M4 East extension, tempered by the need to manage local construction impacts. Comments also indicated that investment in and expansion of the motorway network may increase car use – and demand management initiatives are needed to address this.

There was general consensus about the need for tolling reform on Sydney’s motorway network – and that it should be more equitable – however, there were differing views on whether distance-based tolling would achieve this. In the regions, Councils reiterated earlier comments to the Discussion Paper that adequate funding was needed to maintain local roads, particularly those with heavy freight vehicle movements.

There was strong support expressed for a second Sydney Harbour crossing as part of *Sydney’s Rail Future*, however, more information on the benefits of single-deck trains was requested. Initiatives including the introduction of NSW Trains and Sydney Trains, interchange and timetable improvements were also supported. In addition, comments noted the need to strengthen rail connections between major employment centres in Western Sydney and Northern Sydney to ensure Sydney manages population growth in the future. Protecting corridors for high speed rail to regional centres and interstate also received support, particularly amongst regional stakeholders who said improving these connections was critical.

Buses

There was support for public transport improvements to the Northern Beaches, with those commenting often suggesting Bus Rapid Transit. More broadly, comments recognised the need for more buses and more high capacity buses on strategic routes, along with more detail on specific initiatives to improve and expand the bus network in the future.

Interchanges

Comments noted the need for new or upgraded interchanges to promote public transport uptake and make it easier to change between modes. The need for interchanges to be more accessible to people with disabilities was also noted as important in comments.

Ferries

While there were only a few submissions which specifically commented on ferries as a mode, those who did comment supported the roll-out of new ferry infrastructure and services, in particular at Barangaroo to support the new commercial, residential and tourism development.

Cycling and walking

Comments supported the draft Master Plan's policy direction in relation to cycling in particular increases to infrastructure investment around key centres. Stakeholders requested further detail on how it would be implemented.

Pedestrian and cycling interest groups in particular emphasised the need for improved separate cycling and walking paths, along with driver education initiatives, to increase safety for both cyclists and pedestrians. The need for connected footpaths around centres was noted to encourage more people to walk to local destinations.

Aviation

Regional stakeholders restated the importance of continued access into Sydney Airport in the future, to meet regional communities' transport needs. The need for further detail on the Government's approach to airport strategies was requested, with stakeholders noting the possibility of a second Sydney airport in the long term.

Light rail

Light rail initiatives identified in the draft Master Plan attracted support in stakeholder comments, however, many called for the network to be expanded beyond the CBD to the broader metropolitan area.

Community transport and taxis

Community transport was recognised as a critical transport service in the regions, but stakeholders said there was a need to integrate it more effectively within the wider transport network. Comments also recognised the importance of taxis in community transport delivery. The need for more dedicated taxi parking bays, particularly in busy urban areas, was also noted as important to increasing safety.

12.3.9 Chapter 10 – Funding

Comments received on the draft Master Plan noted the benefits and considerations of increased private investment through public private partnerships.

Similar to feedback received on the Discussion Paper, there were calls for ensuring that decision making maximises existing infrastructure; aligns land use, transport and infrastructure planning; identifies and commits resources over the long term; and increases transparency around funding to transport projects.

There was general consensus about the need for tolling reform on Sydney’s motorway network – and that it should be more equitable – however, there were differing views on whether distance-based tolling would achieve this.

Feedback also suggested the need to be clearer in the final Master Plan about key priority projects in the short term and the funding allocated to delivering them.

12.3.10 Chapter 11 – Delivering the Master Plan

There was strong support from local councils across the regions for the development and implementation of Regional Transport Plans. Local councils have been clear about wanting to see these plans developed as soon as possible in consultation with local councils and local communities.

Working in an integrated way across government agencies – including local and Australian Government agencies – to ensure a unified focus to meet desired transport outcomes.

Comments from the private sector requested stronger involvement in contributing ideas and identifying future solutions and there is strong support for annual updates and a full review of the Master Plan every five years.



12.4 What next

Our extensive consultation in preparing the Master Plan sets a positive precedent for future transport planning and engagement with the community. A series of detailed Regional Transport Plans - together with detailed precinct and modal plans - will follow the release of the Master Plan. We will closely consider local level transport issues and work closely with all our stakeholders and the community in developing these specific plans and strategies.

We will undertake annual Master Plan updates taking into account customer and community feedback received over the course of each year. Every five years, there will be a thorough review of the Master Plan. It is anticipated that, as part of this review, there will be a high level of stakeholder consultation to understand how customer and stakeholder needs and priorities have changed. But most importantly, the NSW Government will now deliver the Master Plan you helped to create.

12

WHAT OUR CUSTOMERS SAY

12.5 Thank you

We acknowledge and thank everyone who has provided input into the development of the Master Plan. In particular we would like to thank the members of our Advisory Groups who worked with us as we developed the Master Plan. They are:

- Action for Public Transport
- Australian Institute of Traffic Planning and Management
- Bicycle NSW
- Bus NSW
- Central Coast Regional Organisation of Councils (CCROC)
- Central NSW Councils (CENTROC)
- City of Sydney Council
- City of Sydney Council
- Community Transport Organisation
- Council of Social Service of NSW (NCOSS)
- Council on the Ageing (COTA)
- Dick Flemming
- Gary Glazebrook
- Disability Council of NSW
- Hunter Councils Inc
- Infrastructure Partnerships Australia (IPA)
- Institute for Sustainable Futures
- Institute of Transport and Logistic Studies - University of Sydney (2 members)
- Local Government Association of NSW
- Macarthur Regional Organisation of Councils (MACROC)
- Mid North Coast Group of Councils
- Motorcycle Council of NSW
- Namoi Regional Organisation of Councils (NamoiROC)
- New England Local Government Group
- Northern Rivers Regional Organisation of Councils (NOROC)
- Northern Sydney Regional Organisation of Councils (NSROC)
- NRMA Motoring & Services
- NSW Aboriginal Land Council
- NSW Business Chamber Limited
- NSW Commuter Council
- NSW Taxi Council
- Orana Regional Organisation of Councils (OROC)
- Pedestrian Council of Australia
- Property Council Australia
- Research Centre for Integrated Transport Innovation
- Riverina and Murray Regional Organisation of Councils (RAMROC)
- Riverina Eastern Regional Organisation of Councils (REROC)
- Ron Christie
- Shires Association of NSW
- Shore Regional Organisation of Councils (SHOROC)
- SMART Infrastructure Facility, Wollongong University
- South East Regional Organisation of Councils (SEROC)
- Southern Councils Group
- Southern Sydney Regional Organisation of Councils (SSROC)
- Sydney Business Chamber
- Sydney Coastal Councils Group Inc
- The Sydney Alliance
- Total Environment Centre (TEC)
- Tourism and Transport Forum Australia (TTF)
- University of Technology, Sydney
- Urban Development Institute Australia (UDIA)
- Urban Taskforce Australia Ltd
- Warren Centre
- Western Sydney Regional Organisation of Councils (WSROC)
- Youth Action and Policy Association

GLOSSARY

Amenity

The extent to which a place, experience or service is pleasant, attractive or comfortable. Improved features, facilities or services may contribute to increased amenity.

Arterial roads

Main roads that link centres that carry high volumes and generally form the main freight routes.

Automatic Train Operation (ATO)

ATO tells a train that is approaching a station exactly where to stop so that the complete train is in the platform. The system controls the acceleration and deceleration of trains, which enables a higher frequency of train service, consistent journey times and highly reliable services.

Automatic Train Protection (ATP)

The system and equipment responsible for basic train safety that helps avoid collisions, red signal overrunning and exceeding speed limits by applying brakes automatically. It ensures trains remain a safe distance apart and have sufficient warning to allow them to stop without colliding with another train.

CBD

Short form for central business district, which is the area of a town or city where a concentration of major offices and businesses are located.

Centre

A place where varying concentrations and combinations of retail, commercial, civic, cultural and residential uses are focused around transport facilities.

CityRail

The passenger train service covering suburban Sydney and extending to the Hunter, Central Coast, Blue Mountains, Southern Highlands and South Coast regions. CityRail operates under Rail Corporation New South Wales (RailCorp).

Community transport

Programs and services that provide essential transport to allow disadvantaged groups to access essential services and social contact where conventional public transport systems are not generally viable or appropriate.

Corridor

A broad, linear geographic area between major centres or trip generators.

Cost-benefit Analysis

A systematic process to assess project viability by calculating and comparing the costs and benefits of the project.

CountryLink

Passenger rail and some coach services outside the CityRail network in regional NSW. CountryLink operates under Rail Corporation New South Wales (RailCorp).

Customer

Everyone who uses transport services or infrastructure is a customer of the NSW transport system. Whenever a person drives, travels by train, bus or light rail, or walks or cycles they become a customer of the transport system. Our customers also use our transport networks for business purposes, to deliver goods and services, and to move freight across the State and beyond.

Electronic ticketing

A ticketing system that allows a person to make a journey on any public transport mode, or between multiple modes using a single ticketing system.

Fleet

The collective vehicles of a transport company or service.

Freight

Goods or cargo transported by truck, rail, aircraft or ship.

Freight and Logistics Network

The road, rail, ports, airports, intermodal terminals and distribution centres

Global city

Those cities that service and support the complex and specialised economic activities of global markets. Sydney is a global city.

Global Economic Corridor

An corridor from Sydney Airport and Port Botany to Macquarie Park via through Sydney City, North Sydney, Chatswood and St Leonards, encompassing significant high-value jobs and economic activity.

Global Sydney

Comprising the Sydney City Centre and North Sydney, Global Sydney is the main focus for national and international business, professional services, specialised shops and tourism. It is also a recreation and entertainment destination for the Sydney region.

Greater Metropolitan Area

The region stretching north to Newcastle and south to Wollongong and containing the 51 local government areas of: Ashfield, Auburn, Bankstown, Blacktown, Blue Mountains, Botany, Burwood, Canada Bay, Camden, Campbelltown, Canterbury, Cessnock, Fairfield, Gosford, Hawkesbury, the Hills Shire, Holroyd, Hornsby, Hunters Hill, Hurstville, Kiama, Kogarah, Ku-ring-gai, Lake Macquarie, Lane Cove, Leichhardt, Liverpool, Maitland, Manly, Marrickville, Mosman, Newcastle, North Sydney, Parramatta, Penrith, Pittwater, Port Stephens, Randwick, Rockdale, Ryde, Shellharbour, Shoalhaven, Strathfield, Sutherland, Sydney, Warringah, Waverley, Willoughby, Wingecarribee, Wollondilly, Wollongong, Woollahra, and Wyong.

Greater Sydney

See Metropolitan Sydney.

Gross Domestic Product (GDP)

This is a measure of the economic output of the country.

Gross State Product (GSP)

This is a measure of the economic output of a state or territory. It is the sum of all value created by industries within the state and serves as a counterpart to the national measure of Gross Domestic Product.

Growth centres

The North West and South West Growth Centres are areas in Sydney that will accommodate over 180,000 new homes and land for employment over the next 30 to 40 years.

Heavy rail

A rail system which is built for large suburban trains with braking, acceleration and maximum speed characteristics, well suited to moving large loads and reaching relatively high speeds. Sydney's CityRail network is a heavy rail system.

High Productivity Vehicle (HPV)

A vehicle that carries a total mass exceeding traditional road mass limits. When carrying a higher mass these vehicles are limited to specific roads capable of supporting heavier vehicles.

Higher Mass Limits (HML)

A nationally agreed scheme that permits approved heavy vehicles to operate with additional mass on certain types of axle groups, on a restricted road network and subject to specified conditions.

Household Travel Survey

An annual travel survey of personal travel of residents of the Greater Metropolitan Area.

ICT

Information and communication technologies.

Independent Pricing and Regulatory Tribunal (IPART)

The independent regulator that determines the maximum prices that can be charged for certain retail energy, water and transport services in NSW. It also determines local government rates.

Infrastructure

The fundamental facilities and physical systems which service a city or region, such as railways, roads, bridges or bike lanes.

Integrated ticketing

An electronic ticketing system that allows a person to make a journey on any public transport mode, or between multiple modes using a single ticketing system.

Intelligent Speed Adaptation (ISA)

A system that constantly monitors vehicle speed and the local speed limit on a road and implements an action when the vehicle is detected to be exceeding the speed limit.

Interchange

A facility to transfer from one mode of transport, or one transport service, to another. For example, a major rail station, bus facility or park and ride.

Intermediate transit network

The Intermediate Transit Network has a lower level of service and volumes than the Mass Transit Network. It is formed by corridors of regional importance that do not have the highest levels of demand or other service level requirements. These secondary corridors link town centres and regions to major centres and connect people to the Mass Transit Network. Buses, light rail and interchanges connecting one or more modes are the most common aspects of an Intermediate Transit Network.

Intermodal terminal

An intermodal terminal is an area of land used to transfer freight between at least two modes of transport. It is typically used to describe the transfer of international shipping containers from road to rail and vice versa.

International gateway

Key entry and exit points for goods and/or passengers to/from overseas. These include international ports and airports.

Journey

For the purposes of this document, the term journey refers to the door-to-door movements of a customer through the transport system. A journey may include several sections, or legs, and use more than one mode of transport.

Kilotonnes

A thousand tonnes of freight.

Land use planning

Land use planning is the process of making decisions and regulating the use of land to guide future actions. It involves analysis of population and employment and manages development, infrastructure and services.

Light rail

Light rail is a system of electrically propelled passenger vehicles with steel wheels that are propelled along a track constructed with steel rails. The vehicles are capable of sharing streets with vehicular traffic and pedestrians, but may also be constructed within exclusive rights-of way such as a segregated rail corridor, tunnel or elevated structure.

Liveability

The way a place supports the quality of life and wellbeing of its residents.

Major centre

The major shopping and business centre for the district, usually including the council offices, taller office and residential buildings, a large shopping mall and central community facilities.

Market segmentation analysis

A detailed analysis that looks at individual customers. In transport this analysis will take into account customers' reasons for travel, and their transport mode choice.

Mass transit network

The Mass Transit Network is formed by the most important corridors and the corridors with the highest levels of demand in a region. The network is made up of the corridors that connect major centres and form the backbone of a city's transport system. Heavy rail, Bus Rapid Transit, light rail systems and interchanges serving multiple modes and large volumes of people are good examples of the Mass Transit Network.

Metropolitan Strategy for Sydney

The *Metropolitan Strategy for Sydney* sets the Government's spatial framework for managing growth and change in Sydney over the next 20 years. The Strategy accommodates emerging housing and employment needs and informs infrastructure investment and the use of Sydney's land resources in accordance with a long term vision.

Metropolitan Sydney

The metropolitan region including the 41 local government areas of Ashfield, Auburn, Bankstown, the Hills Shire, Blacktown, Blue Mountains, Botany, Burwood, Canada Bay, Camden, Campbelltown, Canterbury, Fairfield, Hawkesbury, Holroyd, Hornsby, Hunters Hill, Hurstville, Kogarah, Ku-ring-gai, Lane Cove, Leichhardt, Liverpool, Manly, Marrickville, Mosman, North Sydney, Parramatta, Penrith, Pittwater, Randwick, Rockdale, Ryde, Strathfield, Sutherland, Sydney, Warringah, Waverley, Willoughby, Wollondilly and Woollahra.

Mobility

The ability to move or be moved easily and without constraint.

Mode

The type of vehicle or method used for a trip. For example train, bus, light rail, car, motorbike, bicycle, ferry or walking.

Mode share

The proportion of use of each main travel mode.

Motorway

A divided highway for through-traffic with no access for traffic between interchanges and with grade separation at intersections.

NSW 2021

The NSW Government's 10 year plan to rebuild the economy, return quality services, renovate infrastructure, strengthen the local environment and communities and restore accountability to government.

NSW Trains

A new specialist organisation that will serve intercity, regional and country train customers who travel longer distances and need comfortable and reliable services, with onboard facilities.

Opal

The name of the new, electronic ticketing system that will allow a person to make a journey on any public transport mode, or between multiple modes using a single ticketing system.

Operators

Providers of bus, coach, taxi, hire car and intrastate air services in NSW. As well as those public and private operators contracted by Transport for NSW to provide customer rail, bus and ferry services.

Orbital motorway network

Sydney's network of linked tolled and untolled freeways made up of the Sydney Harbour Tunnel, Eastern Distributor, M5, Westlink M7, M2, Lane Cove Tunnel and the Warringah Freeway. See map at Figure 4.31.

Park and ride

Car parks located in close proximity to transport services that allow people to park their car and complete their journey using public transport.

Peak travel

Refers to travel taken during the periods of 6am-9am or 3pm-6pm on weekdays excluding public holidays.

Portable devices

Hand held mobile phones, computers or electronic devices.

Precinct

A geographical area with boundaries determined by land use. For example, the Macquarie Park business precinct, or the Port Botany and Sydney Airport precinct.

Procurement

Processes for purchasing or obtaining goods and services. The NSW Government's procurement policy provides the framework for agencies to achieve value for money from their procurement while being fair, ethical and transparent.

RailCorp

The Transport for NSW agency that manages the Metropolitan Passenger Network (MPN), extending south to Nowra and Macarthur, west to Lithgow and north to Newcastle. RailCorp also operates CountryLink and CityRail trains, which are currently undergoing restructure to become NSW Trains and Sydney Trains.

Real-time information

Current, up-to-the-minute information about transport services provided at rail stations, bus stops or on roads, or via personal electronic devices.

Regional city

The three cities of Liverpool, Parramatta and Penrith are Sydney's regional cities.

Restricted access vehicles

A vehicle that may be restricted from using certain infrastructure due to height, length, width or mass limits

Road pricing

The charges paid by motorists for use of roads. It can take many forms including tolls or per kilometre charges.

Rolling Stock

Refers to all vehicles that move on rail, including passenger carriages, powered (locomotives) and unpowered (wagons) rail vehicles.

Roads and Maritime Services (RMS)

The Transport for NSW agency responsible for major road infrastructure, licensing of drivers, registration of new vehicles and improving road safety (previously Roads and Traffic Authority).

Services economy

The sector of the economy focused on services provision sectors such as finance, insurance, retail, health, government, education, biotechnology, engineering, design or transport. The majority of NSW employees are engaged in service provision sectors.

Specialised precinct

Precincts that include specialised services such as hospitals, education facilities or business centres that perform vital economic, education and employment roles across Sydney.

Stabling

Railway facility where trains not in service are stored, generally overnight or during off peak times during the day.

State Infrastructure Strategy

The *State Infrastructure Strategy* was developed by Infrastructure NSW to provide the NSW Government with independent advice on the infrastructure needs of the State over the next 20 years.

Strategic Bus Corridors

Designed to connect major centres across Sydney by bus, linking to important transport, health and educational facilities and other community facilities.

Strategic Transit Network

The Strategic Transit Network sets out the required public transport service levels based on an assessment of customer requirements along each corridor, taking into account capacity, speed and frequency.

Sustainable

Designed to meet present needs while also taking into account future costs, including costs to the environment and depletion of resources.

Sydney Airport

Sydney's Kingsford Smith Airport located at Mascot.

Sydney CBD

Sydney Central Business District - see Sydney City Centre.

Sydney City Centre

Sydney City Centre is the primary economic and cultural centre of Sydney. It is bound by Woolloomooloo to the east, Surry Hills and Redfern to the south and Blackwattle Bay to the west. The Sydney City Centre is the primary focus for national and international business, professional services, shopping and tourism.

Sydney Metropolitan Area

See Metropolitan Sydney.

Sydney Trains

A new specialist organisation that will serve customers who need quick, frequent and reliable trains in the greater Sydney suburban area, covering suburban Sydney and extending to the Hunter, Central Coast, Blue Mountains, Southern Highlands and South Coast regions

TEU

The short for of "twenty-foot equivalent unit", which describes the cargo carrying capacity of a ship or the handling capacity of a shipping terminal.

Tonne-kilometres

The number of tonnes moved multiplied by the distance travelled in kilometres.

Transport Access Program

The Transport Access Program is a funded program of station upgrades, interchange improvements, ferry wharf upgrades and commuter car parks, with investment in both major infrastructure upgrades and smaller tailored projects.

Transport disadvantage

Where access to transport is unequally distributed, low income earners, the elderly and the unemployed can be disadvantaged with increased social isolation and reduced opportunities for employment, recreational and social activities.

Transport hub

Typically a public transport interchange, major bus stop or major train station. In terms of freight, typically a freight rail yard, intermodal terminal, seaport or truck terminal. Major airports are also considered transport hubs.

Transport for NSW

The centralised transport department responsible for improving the customer experience, planning, program administration, policy, regulation, procuring transport services, infrastructure and freight in NSW.

Urban Renewal

A planned approach to the improvement and rehabilitation of city areas with new infrastructure, improved services and renovation or reconstruction of housing and public works.

Volume to capacity ratio (V/C)

A measure that reflects mobility and quality of travel on a facility, such as a road or rail line, or a section of a facility. It compares demand (vehicle or passenger volumes) with supply (the theoretical carrying capacity). The higher the number the more congested the network.

Wayfinding

Wayfinding encompasses all of the ways in which people orient themselves in physical space and navigate from place to place.

Western Sydney Employment Area

An area at the intersection of the M4 and M7 motorways that will provide more than 2,200 hectares of employment land and will support around 40,000 jobs.







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